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RECORD OF REVISIONS

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

RECORD OF TEMPORARY REVISIONS

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

HIGHLIGHTS OF REVISIONS

Revision Number	Date of Revision	Reason for Revision	Revision Number	Date of Revision	Reason for Revision
A.01	30.04.13	Initial issue.			
A.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 revisons 1 & 2 incorporated			
A.06	29.02.16	Control surface ply lay-up added; repair procedures revised			
A.07	10.06.16	6000h check & TBOs added; battery check; wing bolts safetying			
A.08	09.10.18	Beringer: new axle and new wheels; Rotax: new spark plugs			
A.09	28.02.20	New model AT01-200			
A.10	05.03.21	Garmin GFC 500 autopilot			

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

The technical content of this document (revision A.10) is approved under the authority of the DOA ref. EASA.21J.025.

05.03.21 AQUILA Head of Airworthiness

Date, Signature Office of Airworthiness

CHAPTER 5

TIME LIMITS / MAINTENANCE CHECKS

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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	Wheel assembly[1)]	no	10.000 h or 20 years Note 4
32	Brake assembly[1)]	no	10.000 h or 20 years Note 4
32	Wheel bearings and bearing retaining rings[1)]	at wheel maintenance (1000 h or 10 years)	no Note 6, 8

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
32	Wheel O-ring seals[1)]	5 years each tire change	no
32	Brake caliper seals, pistons and assembly screws[1)]	10 years / Note 6	no
32	Brake pads[1)]	5 years / Note 7	no
32	Brake discs[1)]	10 years / Note 6	no
34	WINTER instruments	no	Note 5
34	ASPEN internal battery	800 h or 3 years	no
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	200 h / Note 3	no

1) Beringer wheel and brake system only.
3) AT01-100 only.
4) AT01-200 only.

NOTES:

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

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

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

Note 4: Refer to manufacturer instruction for overhauling.

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

Note 6: Parts must be changed by pair on both left and right sides at the same time.

Note 7: Brake pads must be changed all four at the same time even if not worn out.
When new brake discs are installed brake pads must be changed to new ones even if not worn out.

Note 8: Immediate replacement if corroded or damaged.

SCHEDULED MAINTENANCE CHECKS

1. General

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

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

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

2. Inspection Time Intervals Chart

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

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

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

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

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

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

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

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

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

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

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

E. Inspection Time Intervals Chart:

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

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

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

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

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

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

No.	Engine	Reference	Interval 100h	Interval other	Initials
1.	Engine cowling - Remove engine cowling. Check for cracks, overheated areas, deformation, loose or missing fasteners. Check condition of fire protect paint and heat resistance shielding.		X		
2.	Engine oil change - Remove oil drain screw from oil tank. Drain old oil and dispose in accordance with environmental regulations.	12-12-00 R912* 12-20-00 R914* 12-20-00	X[6)]	50 h[7)]	
3.	Oil tank - Check oil tank and clean if contaminated.	R912* 12-20-00 R914* 12-20-00	X[6)]	50 h[7)]	
4.	Oil filter - Remove old oil filter from engine and install new oil filter. Lubricate mating sealing ring of new oil filter with engine oil. Tighten new oil filter by hand. Cut open old oil filter without producing any metal chips and inspect filter mat, filter cover, sealing lip, spring of bypass valve (small) and positioning spring (large) for particles, wear and missing material. Findings:_____	12-12-00 R912* 12-20-00 R914* 12-20-00	X[6)]	50 h[7)]	
5.	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)]	50 h[7)]	
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 100h	Interval other	Initials
10.	Cooling system - Renew coolant. Flush the cooling system.	12-14-00 R912* 12-20-00 R914* 12-20-00		2 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 metal oil lines[4)] 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 100h	Interval other	Initials
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		X[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)], exaust 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)] 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

No.	Engine (Cont.)	Reference	Interval 100h	Interval other	Initials
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. CAUTION (Rotax 914 only): High torques on the float chamber attachment screw may damage the float chamber gasket and cause rough engine run.	R912* 12-20-00 R914* 12-20-00 SI-912-021 SI-914-023		200h annual	
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.	Propeller	Reference	Interval 100h	Interval other	Initials
49.	Engine mounts (manufactured by ROTAX and AQUILA) - Check mounts for deformation, cracks, corrosion, security and damage from heat. Check mounting bolts for condition and correct torque value. At 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.	R912* 12-20-00 R914* 12-20-00 SB-912-028 SB-914-016 SB-AT01-022	X[6)]		
50.	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.	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 100h	Interval other	Initials
1.	Spinner - Remove from aircraft and check for delamination and cracks.	61-10-00	X		
2.	Spinner plate - Check for cracks and fit.		X		
3.	Blade root and hub area - Examine for oil and grease leaks.		X		
4.	Propeller blades - Check blade play (up to 3 mm [1/8 in.] allowed).		X		
5.	Propeller blades - Check blade angle play. (max. 2°)		X		
6.	Hub - Inspect outside condition of the hub and parts for cracks, corrosion and deterioration.		X		
7.	Check nuts for low pitch - Inspect for tightness and safety wire.		X		
8.	Propeller assy - Check safetying.		X		
9.	Propeller flange stop nuts - Check correct torque value (45 - 47 Nm [398 - 416 in.lbs]).		X		
10.	Propeller blades - Visual inspection for damage, repair if necessary. Attach spinner.	MT* 6.2) - 6.10)	X		
11.	Propeller governor - Visually inspect for signs of oil leakage. Check bolts and nuts are tightened properly and safety wired. Check governor actuation for free movement and bulging.	61-20-00	X		

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

4) AT01-200 only.

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

4) AT01-200 only.

No.	Fuselage / Cabin (Cont.)	Reference	Interval 100h	Interval other	Initials
23.	Rudder control - Check rudder control weldment and rudder bellcrank for cracks, distortion, chafing and security. Examine rudder control support brackets, rudder pedal pivot brackets and connection of the rudder controls with the nose gear steering tubes for security, condition and correct splintering. Check centering of springs and cables. Inspect control cables, control cable guides, cable connections, turnbuckles and hardware for correct installation, corrosion, wear, safetying and proper operation.		X		
24.	Rudder / aileron control interconnection - Check condition and correct function.		X		
25.	Autopilot - Inspect all installed 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.	12-15-00		2 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	

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

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

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

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

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

12) If installed.

No.	Nose and Main Landing Gear	Reference	Interval 100h	Interval other	Initials
1.	Wheel fairings - Check condition and correct fit. Remove and clean. Check for paint coat damage, cracks, dents and delamination.		X		
2.	Fairing mounts - Inspect for cracks, distortion or other damage.		X		
3.	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		
4.	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		
5.	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.	Main landing gear - Check main gear struts for deformation, cracks, damage to the paint coat, and corrosion. Inspect wheel axles for security of attachment to struts and for any damage.		X		
7.	Wheels and rims - Clean. Check tires for wear, cuts, foreign matter and deterioration. Inspect rims for security, deformation, cracks and other damage. Examine wheel bearings for excessive play, corrosion and irregular operation. Check tire pressure and proper location of the red slide marks.		X		
8.	Wheels - Disassemble, remove bearings. Remove screws and clips if they are out of tolerance. Clean all metal parts. Visually inspect wheel flanges and central spacer for cracks, nicks, corrosion or other damage.	32-40-00		1000h[1)] 10years[1)]	
9.	Wheel bearings - Clean and lubricate.	12-22-00		500h[2)] annual[2)]	
10.	Wheel brakes - Clean. Apply brakes, examine system for leaks. Inspect brake fluid carrying lines at the main landing gear for condition, leakage and security of attachment. Inspect brake discs for cracks, corrosion and wear. Replace brake discs if worn below: Beringer: 3.8mm (0.15 in.) Cleveland / Grove: 4.3mm (0.17 in.) Inspect brake pads for condition and wear. Replace linings when worn to: Beringer: 1mm (0.04 in.) Cleveland / Grove: 2.6mm (0.10 in.) Check freedom of movement of the pistons and pressure plates.	32-40-00	X		

1) Beringer wheel and brake system only.
2) Cleveland / Grove wheel and brake system only.

No.	Nose and Main Landing Gear (Cont.)	Reference	Interval 100h	Interval other	Initials
11.	Wheel brakes - Check pistons retraction. Check brake caliper assembly bolt torque. Check play between brake disc and wheel clips. Change clips if play is above 0.4mm (0.016 in.)	32-40-00		annual[1)]	
12.	Wheel brakes - Remove caliper assembly from axle, disconnect from brake hose. Disassemble brake caliper. Clean all metal parts. Visually inspect caliper casing and back plate for cracks, nicks, corrosion or other damage.	32-40-00		3000h[1)] 5 years[1)]	
13.	Wheel axles - Clean. Visually inspect for cracks, nicks, corrosion or other damage.			every wheel removal	

1) Beringer wheel and brake system only.

No.	Electrical System / Avionics	Reference	Interval 100h	Interval other	Initials
1.	Electrical wiring system - Check the complete electrical wiring system for security, damage, wear and secure fit. Check all cable connections for tight fit, good contact, corrosion and condition.	R912* 12-20-00 R914* 12-20-00	X[6)]		
2.	Tank inlet bonding wires - Check bonding between electric ground (exhaust port) and tank inlet (max. 1Ω).			annual	
3.	Instruments - Check instrument panel mounting brackets for security and condition. Examine instruments for security of attachment. Check electrical cables, hoses and lines for correct installation, condition and proper routing.			annual	
4.	Pitot / static system - Perform pitot / static system leak test.	34-11-00		2 years	
5.	Pitot / static system - Check pitot tube for security of attachment, condition and obstructions. Check pitot and static pressure lines for correct installation, condition, water and proper routing. Check water traps for water.	34-11-00	X		
6.	Pitot heating system - Carefully check pitot tube for heating up with pitot heating switched ON. WARNING: RISK OF SKIN BURNS! DO NOT TOUCH PITOT TUBE WHEN HEATING IS SWITCHED ON!		X[12)]		
7.	Engine monitoring system - Check transducers and lines for leakage, loose fittings and proper installation. Check fittings for corrosion. Check electrical wires for chafing, breakage and loose connections. Check system for proper operation.		X[6,12)]		
8.	Integrated flight system - Check all components and wiring for damage, corrosion, proper operation and security of attachment.	34-25-00		annual[12)]	
9.	Integrated flight system - Check bonding.	34-25-00		2000h[12)] 10years[12)]	
10.	Aspen EFD1000 system - Perform bonding check.	34-25-00		annual[12)]	
11.	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 100h	Interval other	Initials
1.	Install 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].	06-30-00	X		
2.	Flight controls - Check for full range of travel and excessive friction.		X		
3.	Flaps - Operate through full extension and retraction for steady and complete deployment. Check correct limit switches operation at CRUISE, T/O and LDG flap positions. Verify the corresponding flap switch position and the corresponding flap position indicator reading.		X		
4.	Elevator trim - Check for full range of travel and excessive friction. Inspect proper operation of the trim control switch, limit switches, and the trim position indicator. Verify that elevator control forces decrease or increase when operating elevator trim. Measure control force to move stick rearward with full nose-down trim (40 ±5 N).	27-31-00	X		
5.	Engine and propeller controls - Check full range of motion without any obstruction or excessive friction to travel. Check throttle and propeller control levers friction lock.		X		
6.	Foreign items - Remove any foreign items from the aircraft.		X		

4) AT01-200 only.

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

Service Station:

Next inspection when _____ hours of operation have been reached.

Place, Date

Name, Signature of Mechanic

Name, Signature of Inspector

Stamp

3. 6000-Hour Inspection

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

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

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

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

V	Visual inspection
T	Tap test
F	Functional / fit check

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

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

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

E. 6000-Hour Inspection Checklist

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Service Station:

Place, Date

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

DAILY INSPECTIONS

1. General

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

2. Pre-Flight Check

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

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

3. Post-Flight Check

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

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

UNSCHEDULED MAINTENANCE CHECKS

1. General

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

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

2. Special Checks

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

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

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

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

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

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

C. Engine Fire

After an engine fire, carry out the following:

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

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

D. Violent Stop of the Engine

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

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

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

CHAPTER 06

DIMENSIONS AND AREAS

TABLE OF CONTENTS

DIMENSIONS AND AREAS - GENERAL

1. Introduction

   A. This chapter provides information about dimensions and control surface travel and tolerances. Furthermore, this chapter contains information about aircraft zoning and access and inspection plates.

   B. Dimensions are presented to aid the operator and/or maintenance personnel in the ground handling of the aircraft, e.g. in full hangars.
   Information concerning aircraft zoning and the position of access / inspection plates helps to locate and access aircraft components.

2. General Description

   The following sets out a brief description and intended purpose of each section of this chapter:

   A. Section 6-00-00 - Dimensions and Areas - General. This section provides a general overview of content and purpose of the chapter.

   B. Section 6-10-00 - Aircraft Dimensions and Areas. This section provides aircraft dimensions and identifies areas of the aircraft.

   C. Section 6-20-00 - Aircraft Zoning. This section shows illustrations of all aircraft zones.

   D. Section 6-30-00 - Access and Inspection Plates. This section contains the position and numbering of all access and inspection plates.

AIRCRAFT DIMENSIONS AND AREAS

1. General

   A. The wing and tail spans are measured parallel to the relevant reference level.

   B. Refer to figure 1 for an illustration of aircraft dimensions.

2. Dimensions and Areas

Aircraft overall:

Wing span	10,3 m	33.8 ft
Overall length	7,4 m	24.2 ft
Height max.	2,4 m	7.9 ft

Wing:

Wing profile	HQ 42 mod.	
Wing area	10,5 m²	113.6 ft²
Dihedral angle	+4,5 ° ± 0 °	
Mounting angle	+2,5 ° ± 0 °	
MAC	1,07 m	3.52 ft
Max. load	71,4 kg/m²	

Ailerons (both):

Area	0,65 m²	7.0 ft²
Up travel	16 ° + 1,5 °	
Down travel	11 ° + 1,0 °	
Neutral position	0 ° up	

Flaps (both):

Area		1,23 m²	13.31 ft²
Flap setting (ground)		Tolerance Left	Right
Up	0 °	0 °	0 °
Take-off	17 °	± 1,5 °	± 1,5 °
Landing	35 °	± 1,5 °	± 1,5 °

Horizontal Stabilizer and Elevator:

Profile	FX 71/L150-30	
Area (entire)	2,0 m^2	21.64 ft^2
MAC	0,68 m	2.24 ft
Elevator area	0,58 m^2	6.28 ft^2
Up travel	23 ° ±1,5 °	
Down travel	24 ° ±1,5 °	
Span	3,0 m	9.87 ft

Vertical Stabilizer and Rudder:

Profile	FX 71/L150-30	
Area	1,45 m^2	15.67 ft^2
Rudder area	0,44 m^2	4.76 ft^2
Travel	29 ° ±1,5 °	

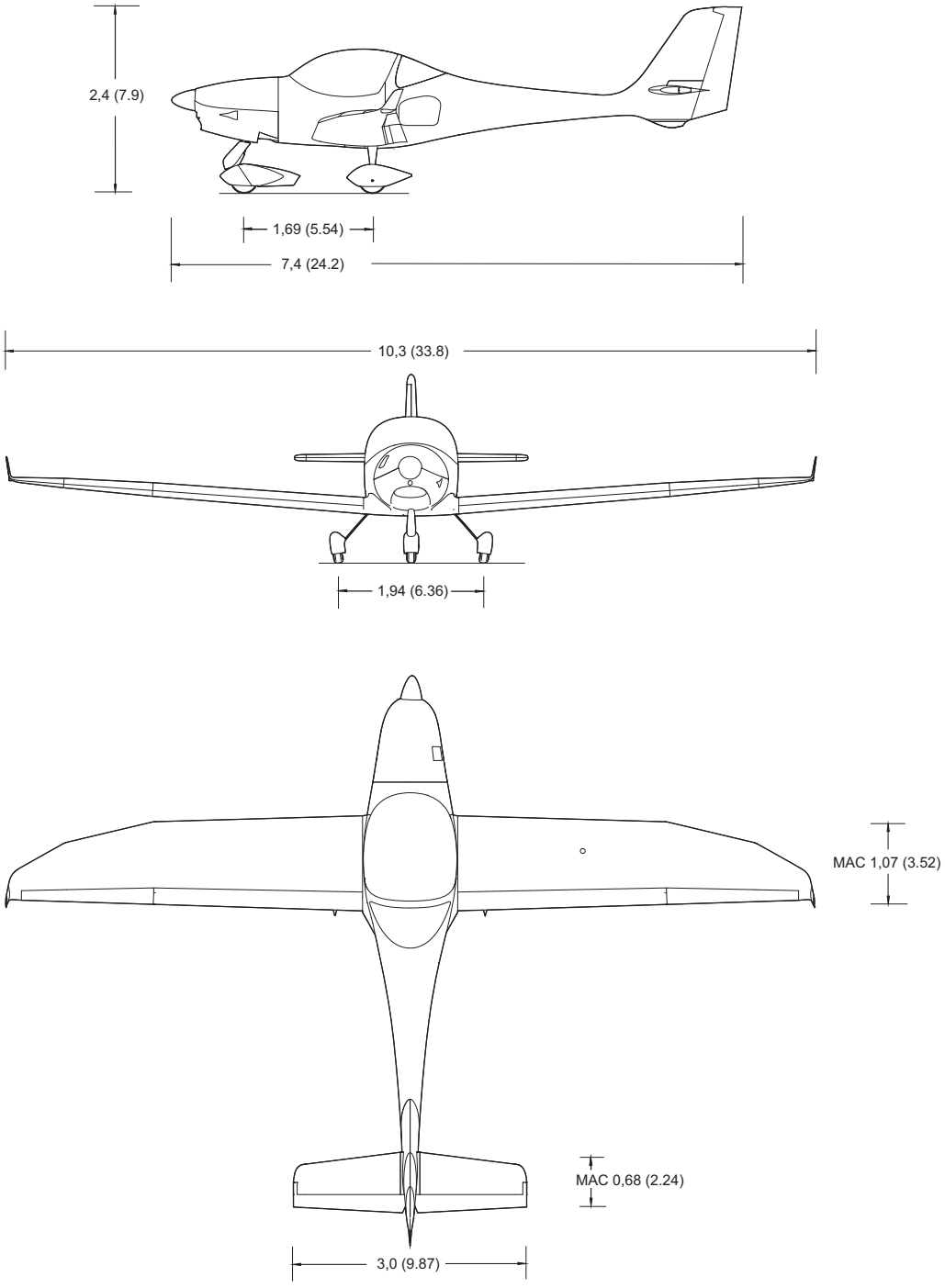
Landing Gear:

Wheel track	1,94 m	6.36 ft
Wheel base	1,69 m	5.54 ft
Nose gear wheel size	5.00-5	
Main gear wheel size	5.00-5	

3. Weight and Static Moments of Control Surfaces

	Control surface weight kg	Control surface static moment Ncm
Aileron	1,35 - 2,0	20 - 90
Fowler flap[1)]	2,7 - 3,4	500 - 660
Elevator[2)]	4,3 - 5,4	-30 - +40
Rudder	3,5 - 4,5	20 - 80

1) Weights are given for one flap. The moment is given for both flaps in the 35° position, flap actuator disconnected.
2) Weights are given for elevator assembly including both elevator halves.



Aircraft Dimensions [m (ft.)]
Figure 1

AIRCRAFT ZONING

1. General

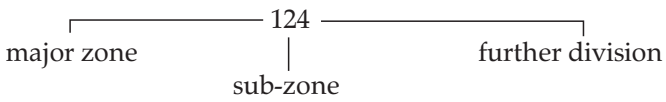
A. The aircraft is divided into numbered zones to facilitate the location of aircraft components and parts. The zoning used here is standard.

B. The zones are identified by a three-digit number. The first digit in the sequence denotes the major zone:

Major zones:
(1) 100 - Forward side of firewall and forward.
(2) 200 - Aft side of firewall to rear door post of the baggage door.
(3) 300 - Rear door post of the baggage door to end of aircraft.
(4) 500 - Left wing.
(5) 600 - Right wing.
(6) 700 - Landing gear.

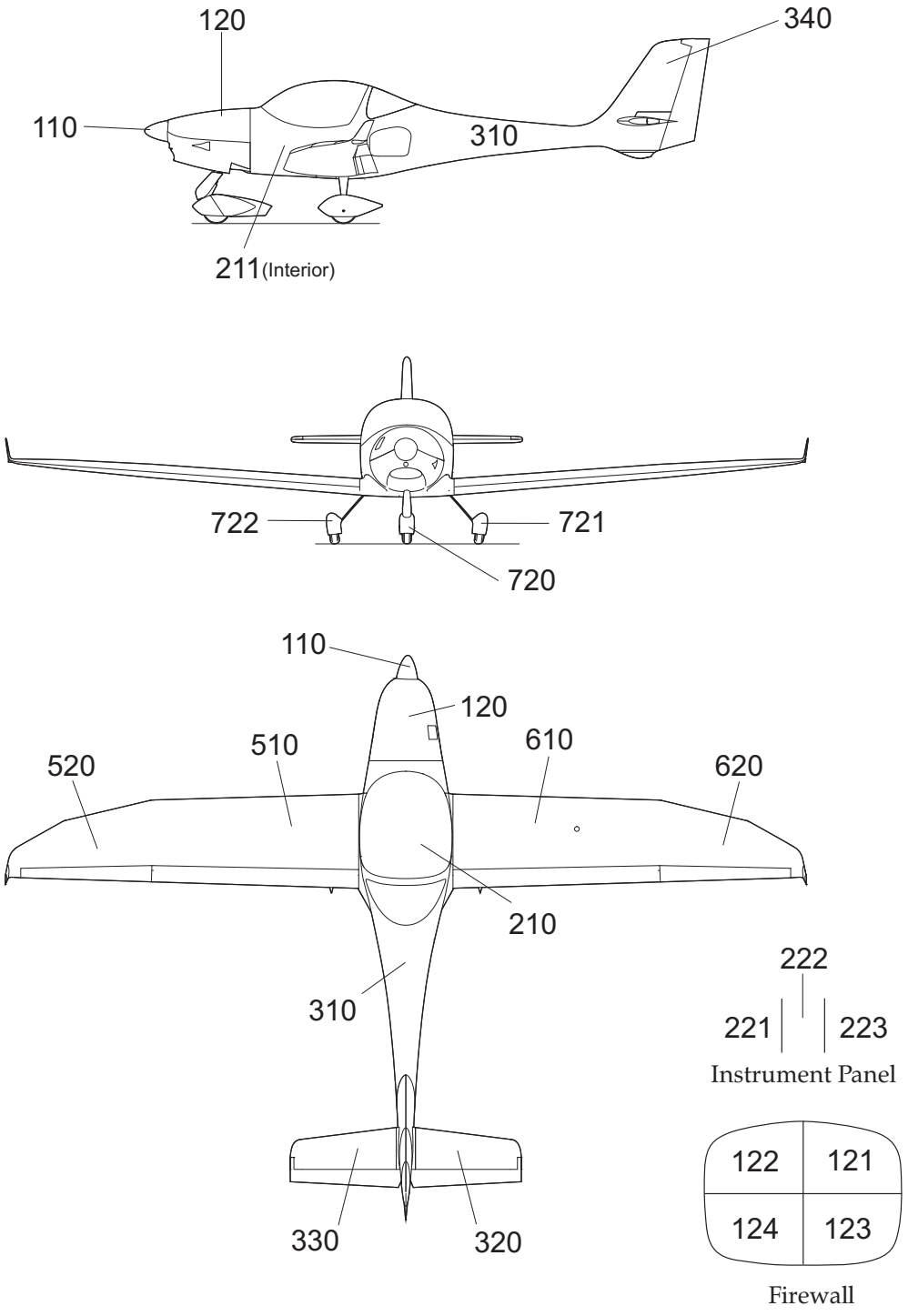
The second digit in the sequence divides the zones into sub-zones (zone 110 - propeller and spinner, zone 120 - upper and lower cowling). The third digit (if needed) divides the sub-zone into smaller subdivisions.

Example:



2. Description

A. For a classification of the aircraft zones, refer to figure 1.



Aircraft Zones
Figure 1

ACCESS & INSPECTION PLATES

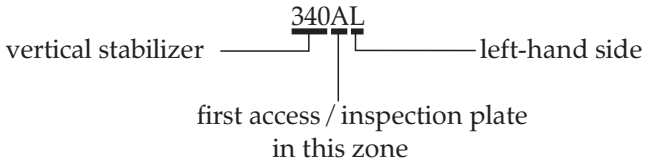
1. General

A. Access / inspection plates are used to gain access to various systems, components and parts of structure during maintenance and for inspection.

B. The access and inspection plates are designated logically.

(1) Access / inspection plates numbering system:
All access / inspection plates are identified using a series of numbers and letters which specify the aircraft zone (see section 6-20-00) and location within this zone. Primary identifiers follow the three-number sequence, with the first plate identified as "A", the second as "B" and so on. Locators follow the primary identifier and denote top, left, right or internal orientation of the plate.

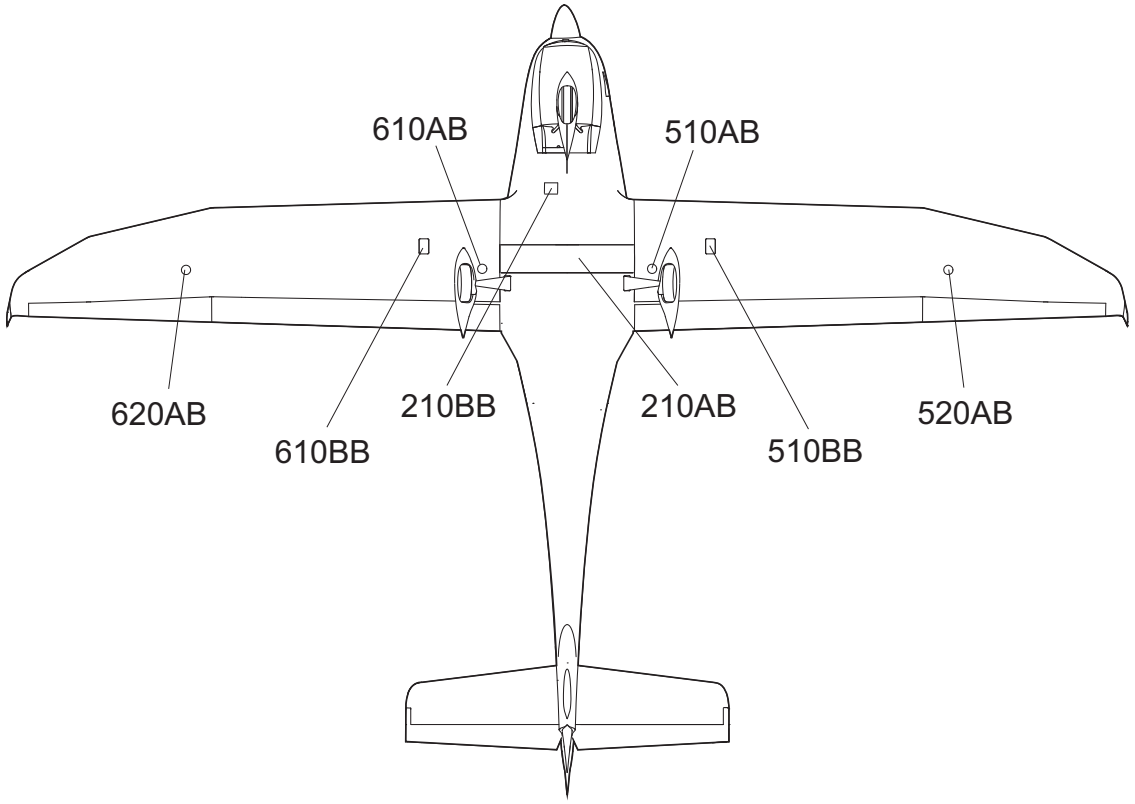
Example:



2. Description

A. For an illustration of the various access / inspection plates used on the aircraft, refer to figure 1.

210AB	Wing removal /installation, aileron / flap control systems, fuel system, wing structure (masked with cloth tape, e.g. Tesa 4651, to prevent intrusion of exhaust gases)
210BB	Gascolator, drainer, fuel pump package connections (Rotax 914 only)
510AB	Left flap actuation lever
610AB	Right flap actuation lever
510BB	Left inboard fuel tank rib, fuel / vent lines, fuel lever sender
610BB	Right inboard fuel tank rib, fuel / vent lines, fuel lever sender
520AB	Left aileron bellcrank
620AB	Right aileron bellcrank



Access / Inspection Plates
Figure 1

CHAPTER 11

PLACARDS AND MARKINGS

TABLE OF CONTENTS

PLACARDS AND MARKINGS - GENERAL

1. Introduction

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

2. General Description

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

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

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

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

EXTERIOR PLACARDS AND MARKINGS

1. General

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

2. Tools, Equipment and Material

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

3. Removal/Installation

A. Remove Self-Adhesive Placards

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

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

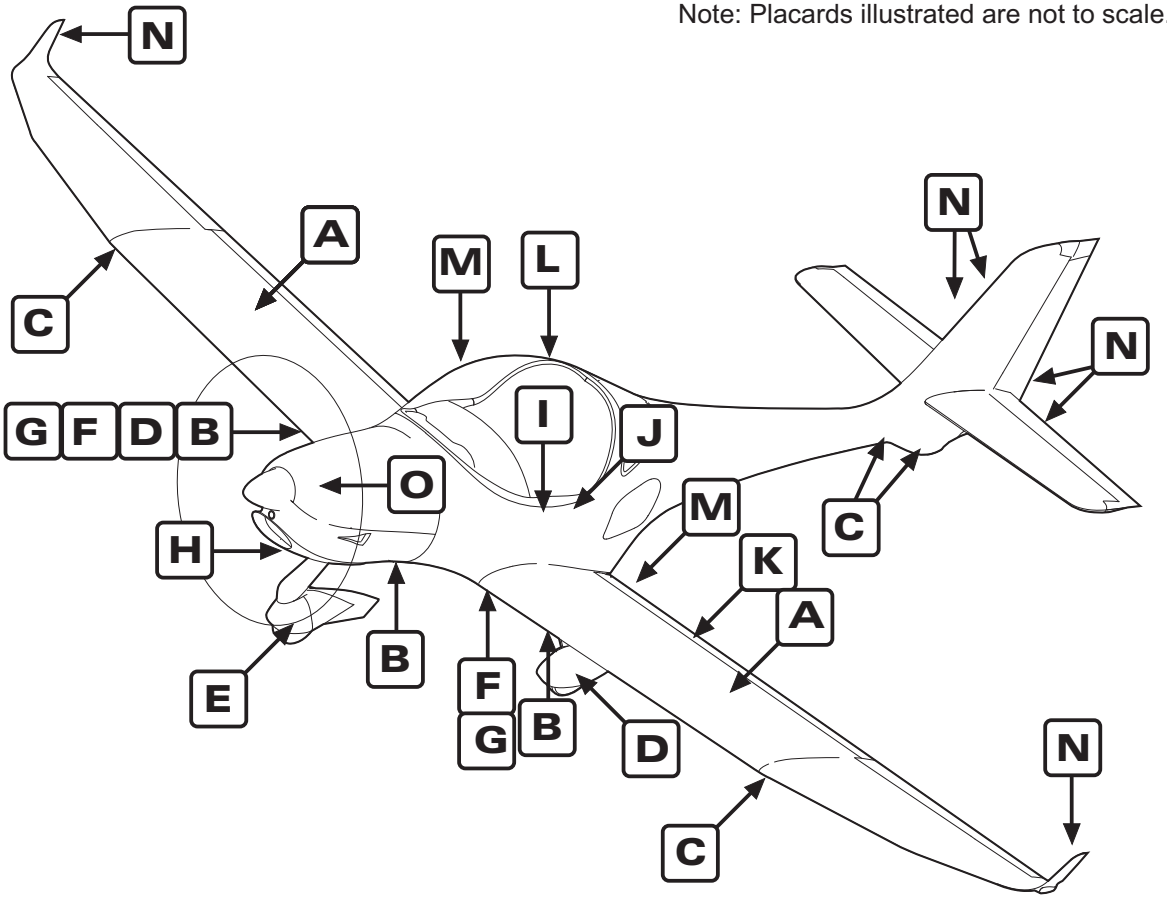
B. Placing Self-Adhesive Placards
(1) Clean aircraft surface carefully. Remove all old adhesive traces using isopropyl alcohol.
(2) Remove paperliner from backside of placard to expose adhesive.
(3) Position top edge of the placard precisely.
(4) Work uniformly downward and apply placard to aircraft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

4. Maintenance/Care

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

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

Note: Placards illustrated are not to scale.



Detail-**A**

Exterior Placards and Markings
Figure 201 (1)

Note: Placards illustrated are not to scale.

KRAFTSTOFF ABLASS

Detail-**B**

FUEL DRAIN

VERZURRPUNKT

Detail-**C**

TIE DOWN

2,5 bar

Detail-**D**

36 psi

2,5 bar

Detail-**E** 1)

36 psi

2,0 bar

Detail-**E** 2)

29 psi

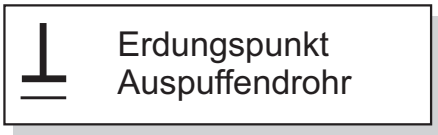
(red jack point markings)

Detail-**F**

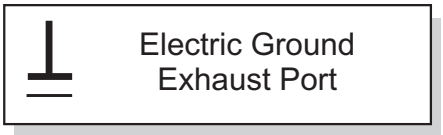
Aufbockpunkt

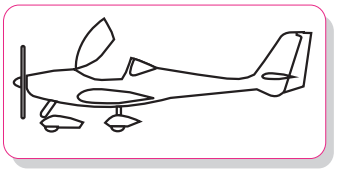
Detail-**G**

Jack Point

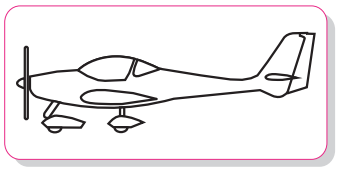


Detail-**H**





Detail-**I**



Detail-**J**

Exterior Placards and Markings
Figure 201 (2)

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

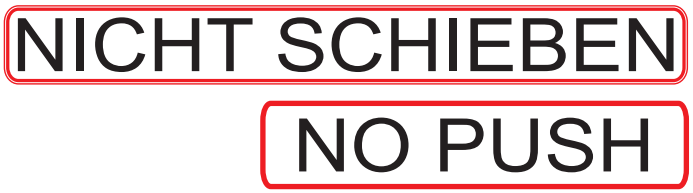
Note: Placards illustrated are not to scale.

Detail-**K**

(flap position markings)

Detail-**L**

Detail-**M**

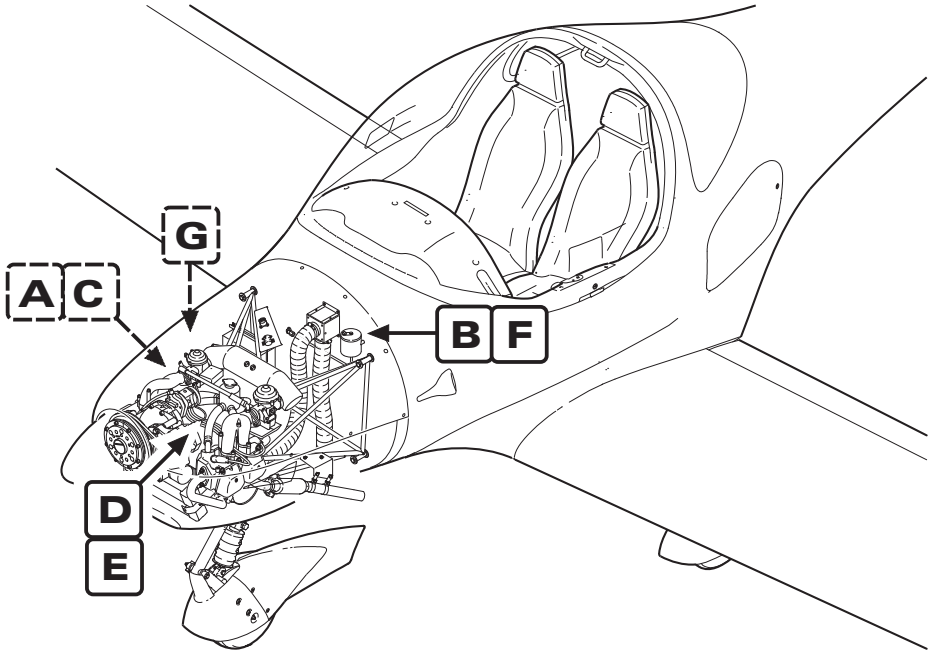


Detail-**N**

Detail-**O**

Exterior Placards and Markings
Figure 201 (3)

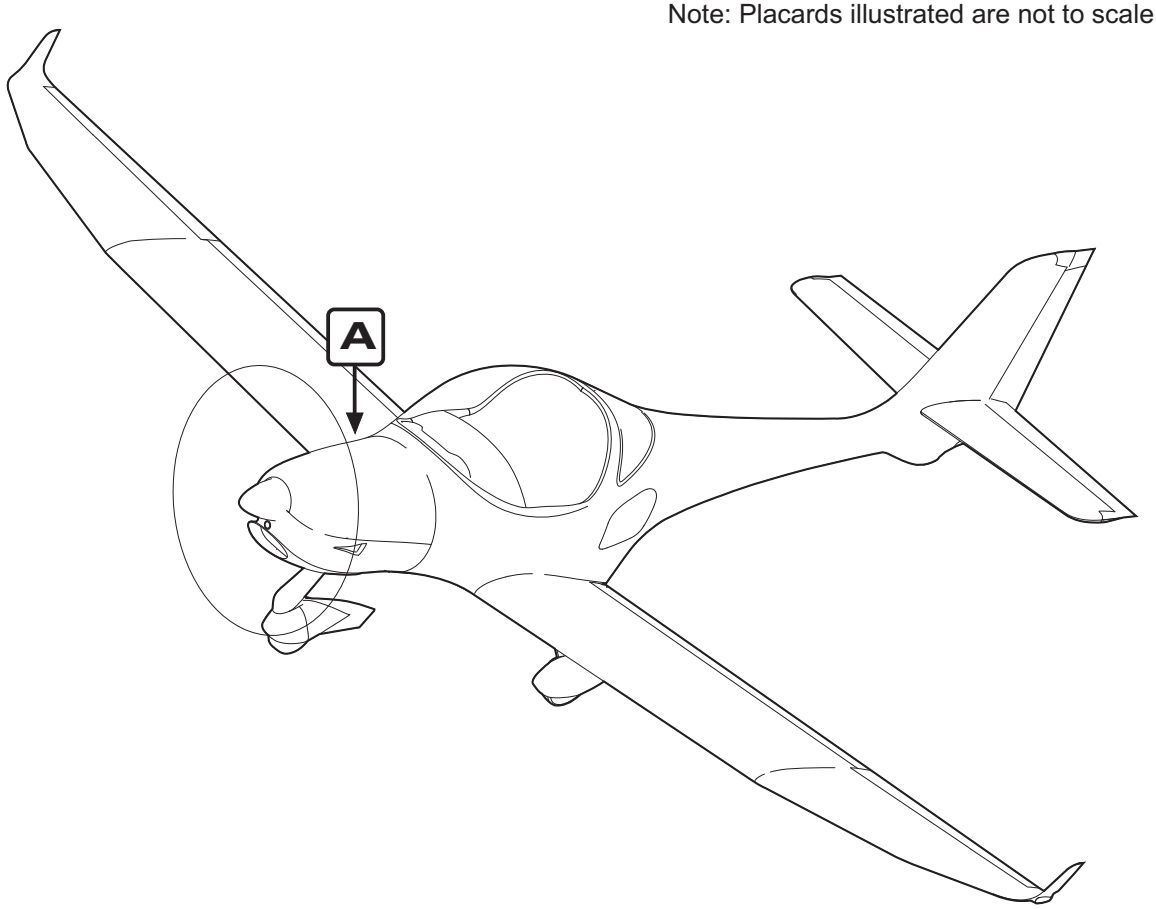
Note: Placards illustrated not in scale.



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

Exterior Placards and Markings
Figure 201 (4)

Note: Placards illustrated are not to scale.



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

Exterior Placards and Markings
Figure 201 (5)

EFFECTIVITY

Aircraft equipped with external power receptacle

INTERIOR PLACARDS AND MARKINGS

1. General

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

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

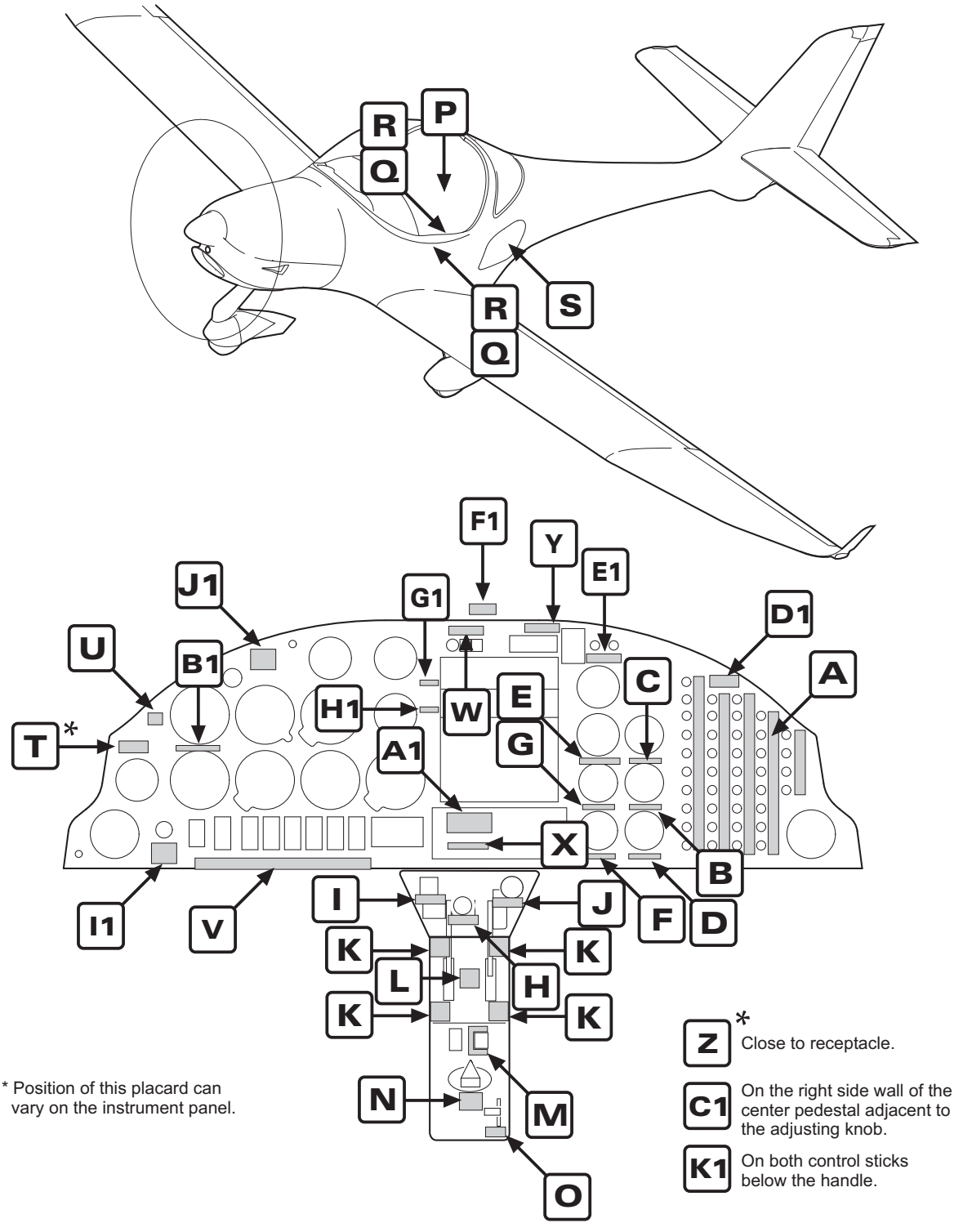
2. Tools, Equipment and Material

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

3. Removal/Installation

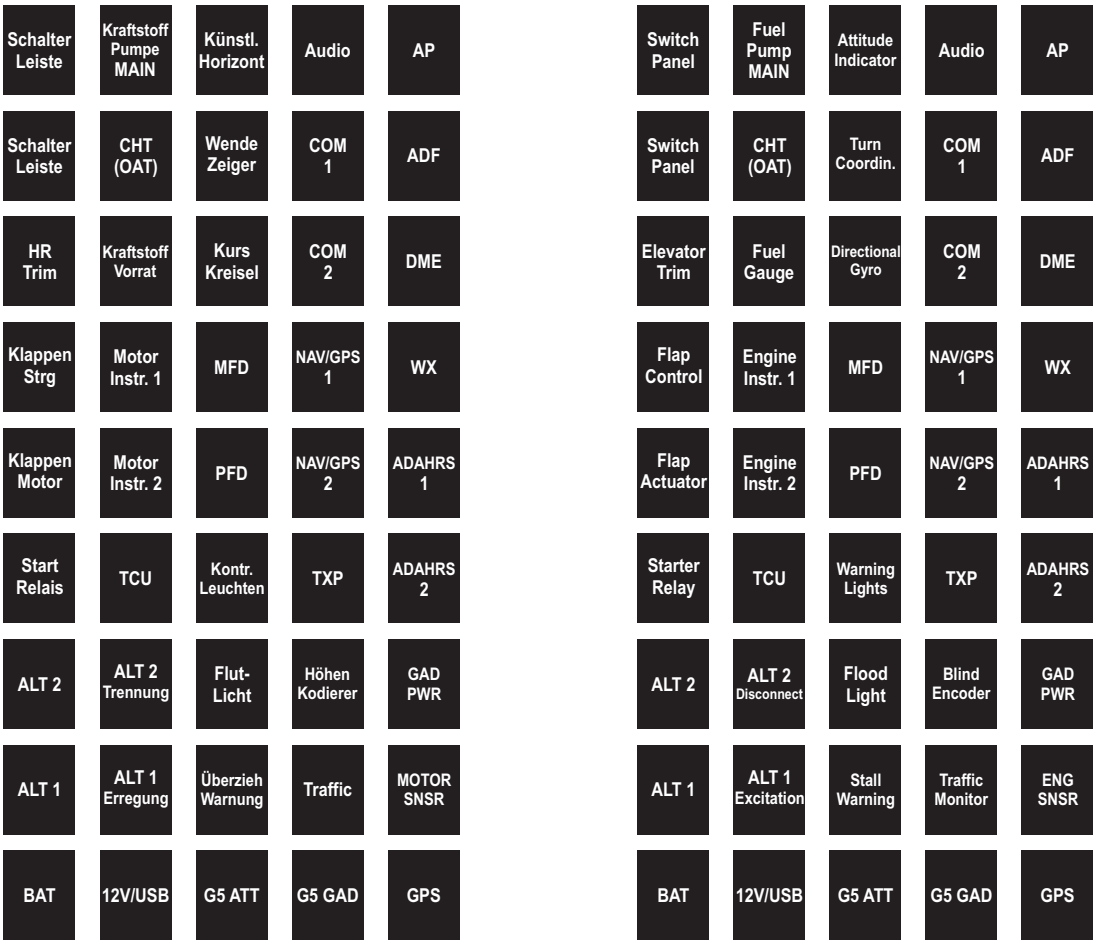
   A. Remove Self-Adhesive Placards
      (1) Warm the placard a little using a heat gun (approx. 40-50°C).
      (2) Carefully separate a corner of the placard from the aircraft and then pull off parallel to the surface to remove it.
      (3) Remove all traces of old adhesive by using a cloth with isopropyl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

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



Interior Placards and Markings
Figure 201 (1)

Note: Placards illustrated are not to scale.

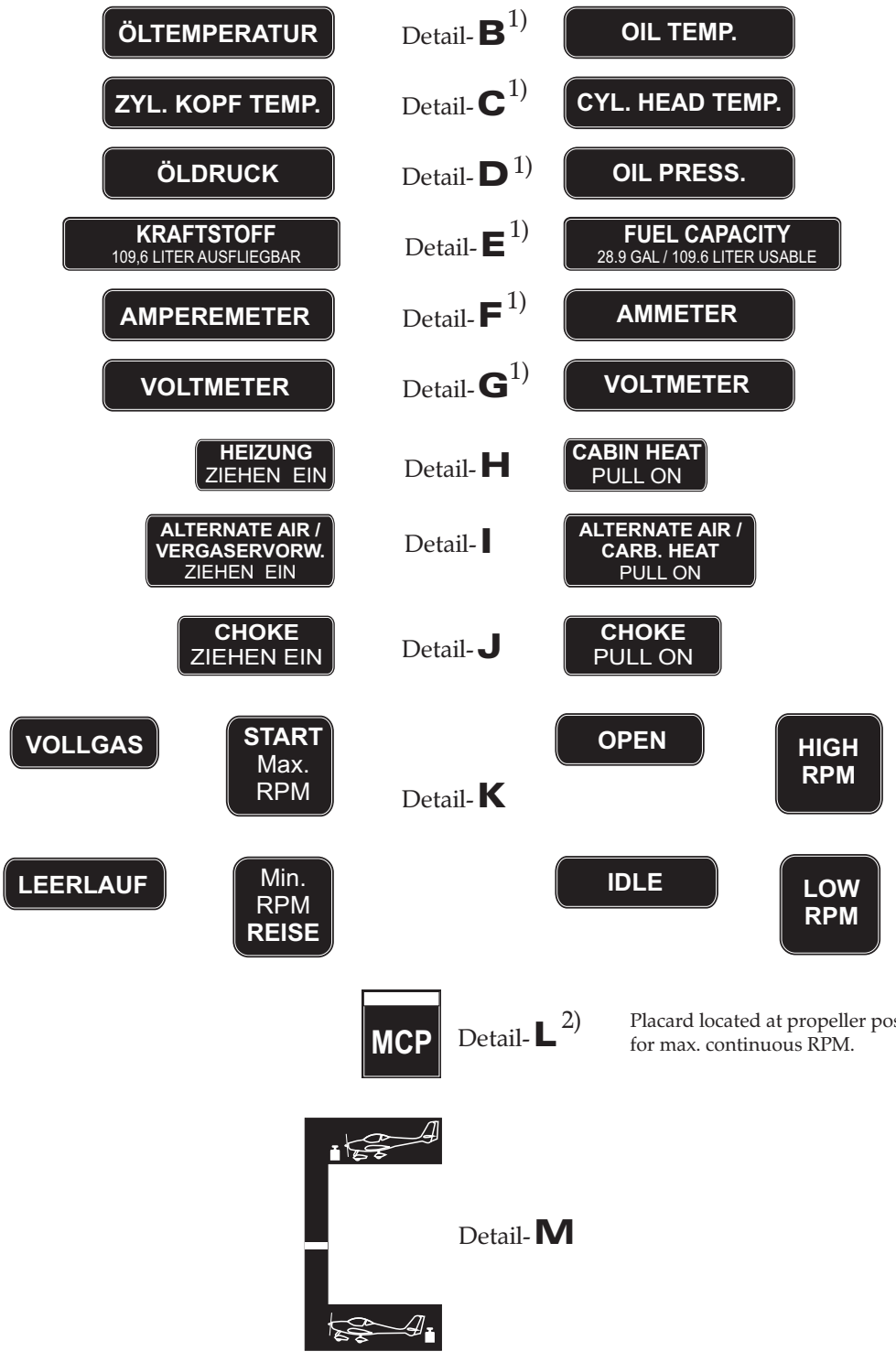


Detail-A

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

Interior Placards and Markings
Figure 201 (2)

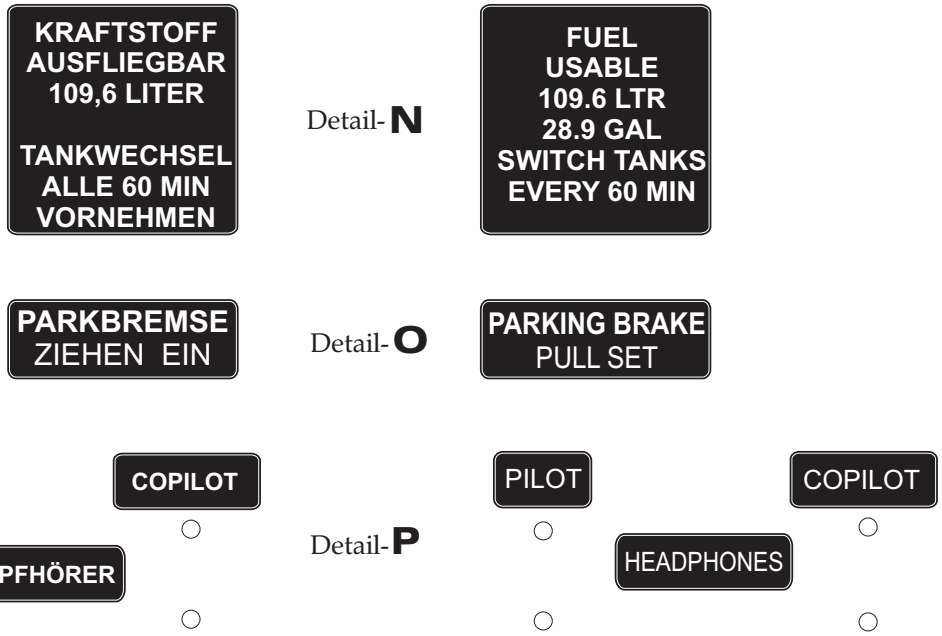
Note: Placards illustrated are not to scale.



Interior Placards and Markings
Figure 201 (3)

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

Note: Placards illustrated are not to scale.



Interior Placards and Markings
Figure 201 (4)

Note: Placards illustrated are not to scale.

TCU Detail-U 3)

ALT1 / BAT	ALT2 / BAT2	Kraftst.-Pumpe AUX	PFD	Avionik	Positions-lichter	ACL	Lande-licht	Instrumenten-beleuchtung	P/S Heat
	3)		2)						4)

Detail-V

ALT1 / BAT	ALT2 / BAT2	Fuel Pump AUX	PFD	Avionics	Nav Lights	ACL	Landing Light	Instrument Lights	P/S Heat

ALT1	ALT2	KRAFTSTOFF-DRUCK	SPANNUNG	P/S HEAT
				4)

Detail-W 1)

ALT1	ALT2	FUEL	VOLT	P/S HEAT

GPS NUR ZUR INFORMATION Detail-X 5) GPS FOR INFORMATION ONLY

ELT-FERNBEDIENUNG
ELT Hauptschalter auf ARMED stellen!

Detail-Y

ELT-REMOTE CONTROL
Switch ELT-transmitter to ARM !

STECKDOSE 12 - 14 V max. 5 A

Detail-Z

RECEPTACLE 12 - 14 V DC MAX: 5 A

Dieses Flugzeug ist in der Kategorie VLA zertifiziert und nur für den Betrieb VFR-Tag ohne Vereisungs-bedingungen zugelassen. Alle Kunstflugmanöver, einschließlich beabsichtigtem Trudeln, sind verboten. Weitere Betriebsgrenzen stehen im Flughandbuch.

Detail-A1

This aeroplane is classified as a very light aeroplane approved for day VFR only in non-icing conditions. All aerobatic manoeuvres, including intentional spinning are prohibited. See Flight Manual for other limitations.

Dieses Flugzeug ist in der Kategorie VLA zertifiziert und für den Betrieb VFR-Tag und VFR-Nacht ohne Vereisungs-bedingungen zugelassen. Alle Kunstflugmanöver, einschließlich beabsichtigtem Trudeln, sind verboten. Weitere Betriebsgrenzen stehen im Flughandbuch.

Detail-A1 6)

This aeroplane is classified as a very light aeroplane for day VFR and night VFR in non-icing conditions. All aerobatic manoeuvers including intentional spinning are prohibited. See Flight Manual for other limitations.

Interior Placards and Markings
Figure 201 (5)

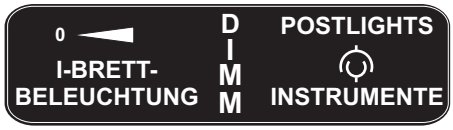
1) Aircraft equipped with analog engine instruments only.
2) Aircraft equipped with Aspen avionics only.
3) AT01-200 only.
4) Aircraft equipped with pitot heating system only.
5) Aircraft equipped with non-(E)TSO'd GPS-receiver only.
6) Aircraft equipped for Night-VFR only.

Note: Placards illustrated are not to scale.

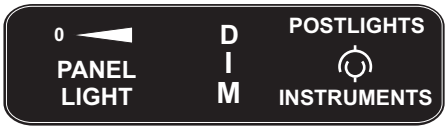
Detail-**B1**

Detail-**C1**

Detail-**D1**



Detail-**E1**



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

Detail-**F1**

Detail-**G1**

Detail-**H1**

Detail-**I1** [3)]

Interior Placards and Markings
Figure 201 (6)

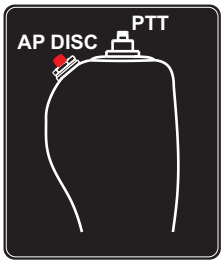
[3)] AT01-200 only.

Detail-**J1** 7)

AP operation restricted to = 2000ft AGL		
Speed range 60 KIAS to 150 KIAS with Flaps up (cruise) only		
if indicated	↓ Trim ELE DN / FWD ↑ Trim ELE UP / AFT	in intervals of max. 2 sec.

AP-Betrieb beschränkt auf ≥ 2000ft AGL		
Geschwindigkeitsbereich 60 - 150 KIAS, ausschließlich mit Klappen in Reisestellung		
wenn angezeigt	↓ ELE DN / VORNE trimmen ↑ ELE UP / HINTEN trimmen	in Intervallen von max. 2 Sek.

Detail-**K1** 7)



Placard located on both control sticks.

Detail-**L1** 7)

ROLL
PITCH

Placard located on roll / pitch servo pushrod.

Detail-**M1** 7)

YAW SERVO
ROLL SERVO
PITCH SERVO

Placard located on yaw / roll / pitch servo.

Interior Placards and Markings
Figure 201 (7)

7) Aircraft equipped with Garmin GFC 500 autopilot only.

CHAPTER 22

AUTO FLIGHT

TABLE OF CONTENTS

AUTO FLIGHT - GENERAL

1. Introduction

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

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

For further information refer to the applicable Garmin manuals.

2. General Description

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

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

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

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

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

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

AUTOPILOT - MAINTENANCE

1. General

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

B. Maintenance of the GFC 500 System has to be carried out in accordance with Garmin GFC 500 Part 23 AML STC Maintenance Manual, P/N 190-02291-01, revision 6 or later.

C. The operation of the GFC 500 requires the following software versions:
- for G5: software version 6.82 or higher
- for GMC 507: software version 2.90 or higher
- for GSA 28: software version 4.80 or higher
- for A429 GAD29B: software version 3.30 or higher

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

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

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

E. Following any removal, repair or exchange of equipment, perform the GFC 500 Return to Service-Procedure per GFC 500 MM, section 9.

2. Inspection/Check

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

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

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

3. GMC 507 Removal/Installation

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

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

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

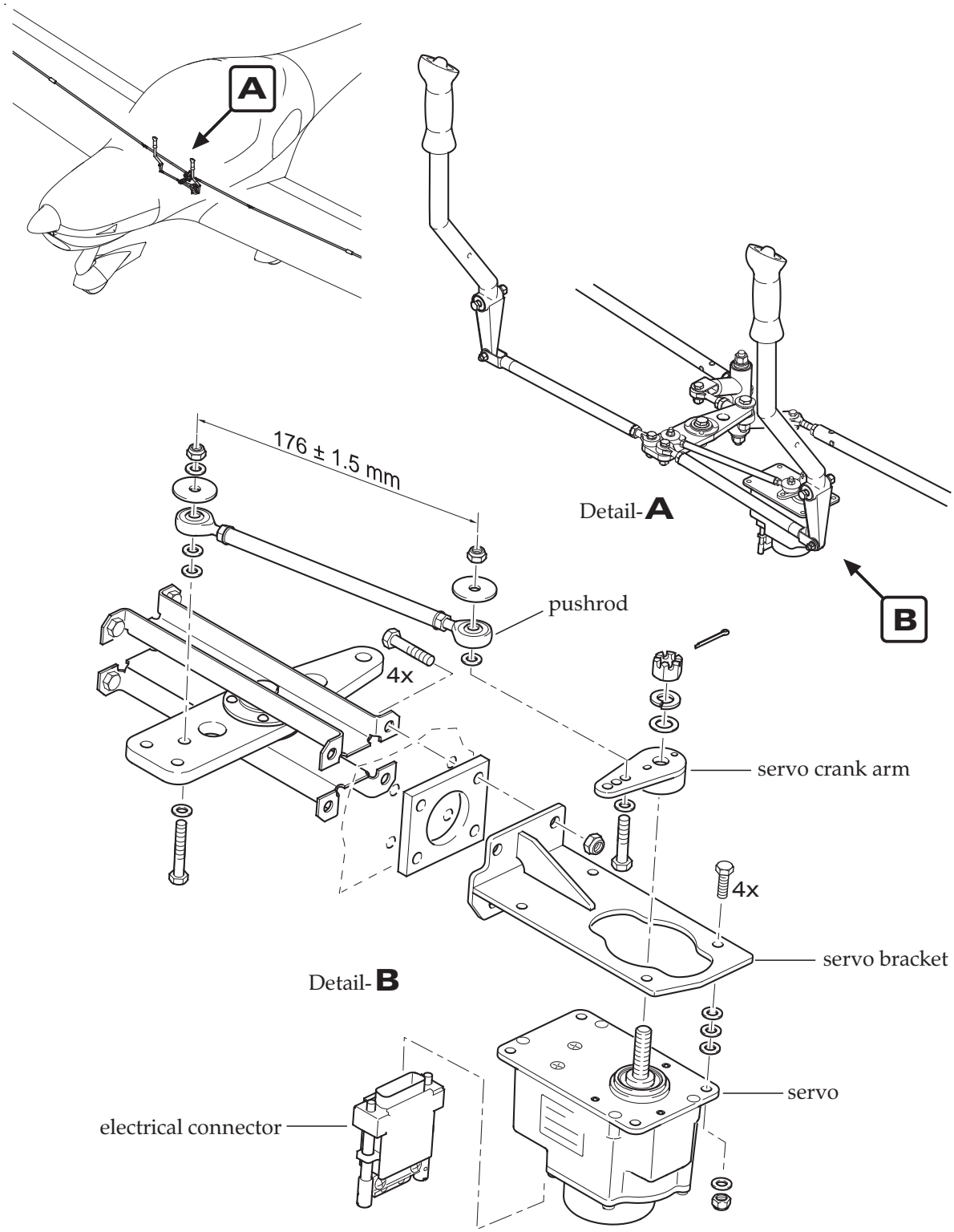
A. Remove Roll Servo
(1) Ensure electrical power to aircraft and AP main switch are OFF.
(2) Remove access panel 210 AB (refer to 06-30-00).
(3) Remove access panels 211BB, 211HL and 211HR (refer to 25-12-00).
(4) Disconnect pushrod at bell crank.
(5) Disconnect electrical connector from servo.
(6) Remove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

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

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

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

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



Roll Servo Installation
Figure 201

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

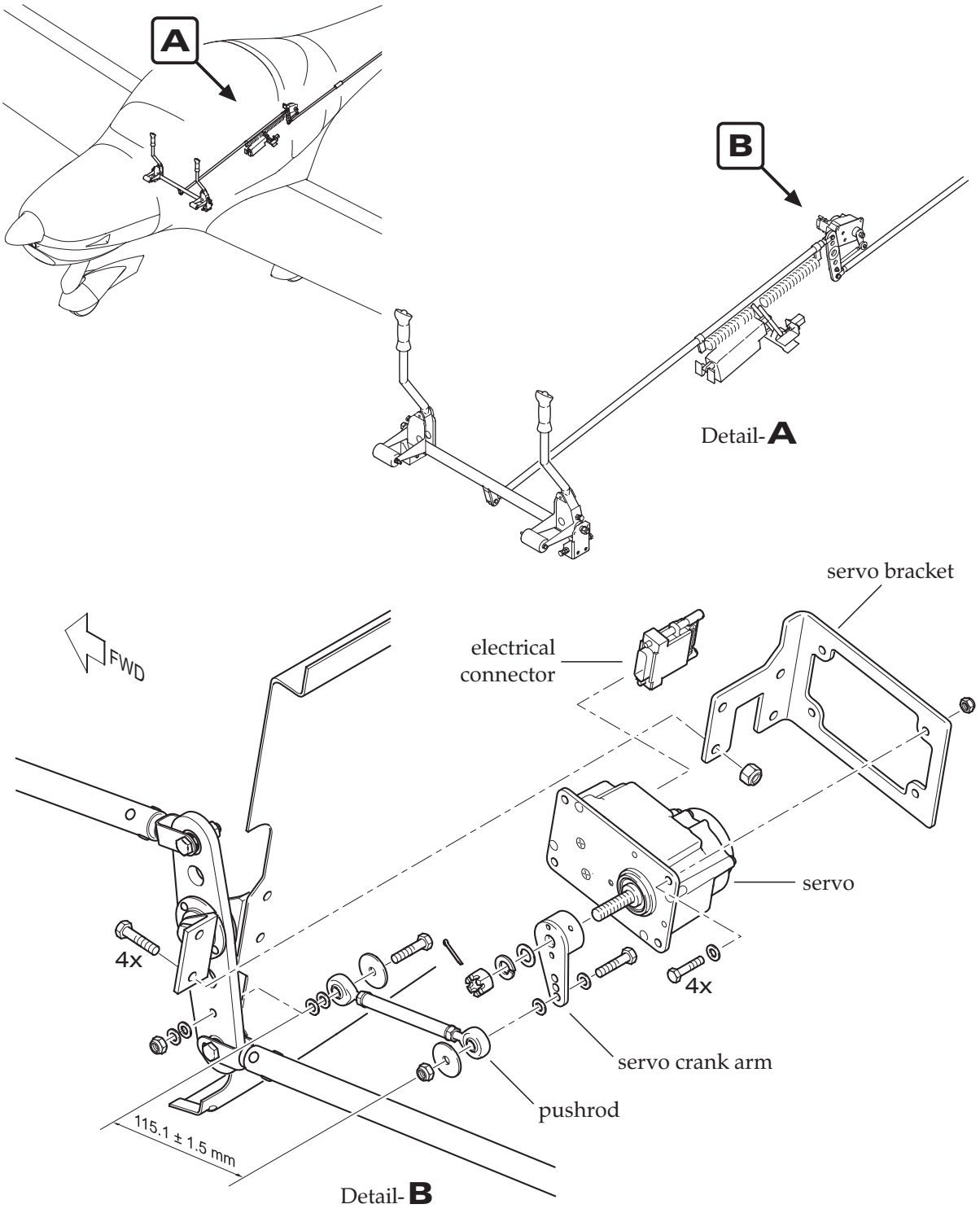
A. Remove Pitch Servo
(1) Ensure electrical power to aircraft and AP main switch are OFF.
(2) Remove access panel 211KC (refer to 25-12-00).
(3) Disconnect pushrod at bell crank.
(4) Disconnect electrical connector from servo.
(5) Detach servo from servo bracket.
(6) Disconnect servo crank arm from servo.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

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

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

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

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



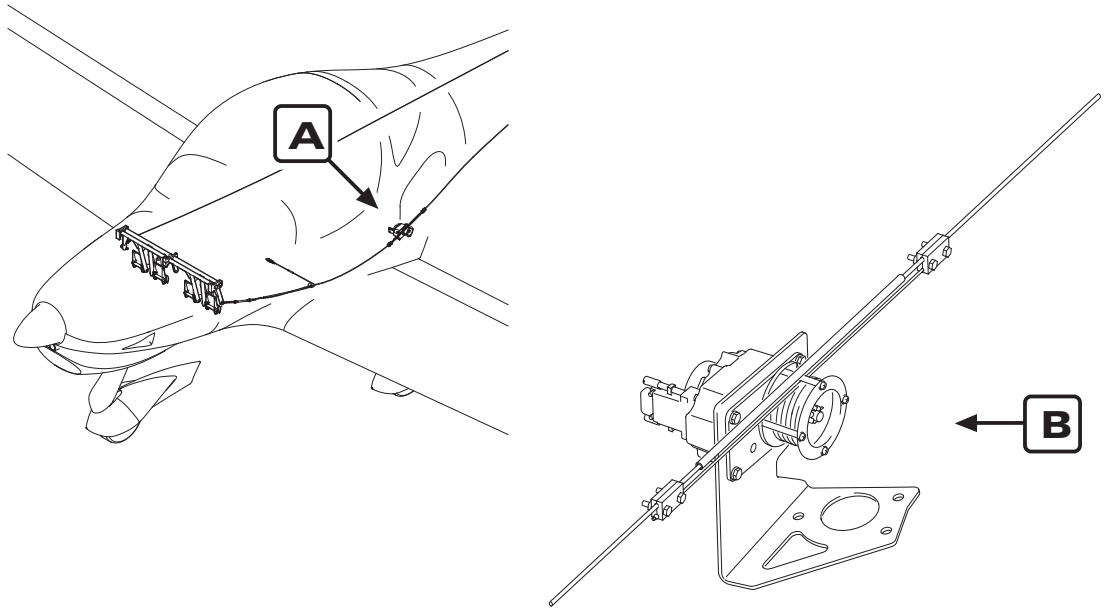
Pitch Servo Installation
Figure 202

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

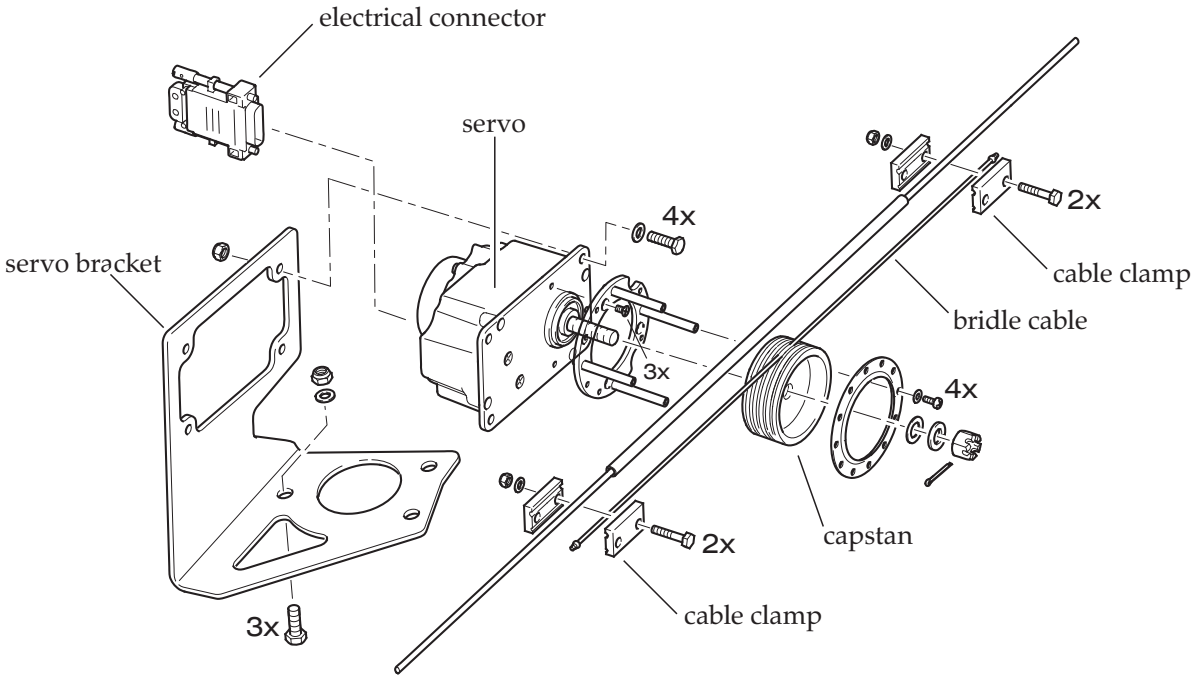
A. Remove Yaw Servo
(1) Ensure electrical power to aircraft and AP main switch are OFF.
(2) Remove access panel 211 JB (refer to 25-12-00).
(3) Remove 2x cable clamps.
(4) Pull out cable from capstan.
(5) Disconnect electrical connector from servo.
(6) Detach servo from servo bracket.

B. Install Yaw Servo
(1) Mount servo to servo bracket.
(2) Reconnect the electrical connector to the servo.
(3) Ensure pre-tension of rudder control cable is 95 ± 3 N (21.4 ± 0.7 lbs). Adjust if necessary.
(4) Wrap bridle cable around capstan; one full wrap is required.
Ball should be on opposite side of rudder flight control cable in the capstan groove.
(5) Pre-position cable clamps and bridle cable.
(6) Pre-tension bridle cable to 85 ± 3 N (19.1 ± 0.7 lbs).
(7) Tighten clamp-kit nuts to 5,1 Nm (45 in.lbs)
(8) Perform a functional check of the rudder control system and verify free movement from stop to stop.
(9) Load correct software to the servo (via G5 update) if new servo is installed.
(10) Perform a functional check and further procedures per GFC 500 MM, section 7.2.
(11) Reinstall access panel 211 JB (refer to 25-12-00).

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



Detail-**A**



Detail-**B**

Yaw Servo Installation
Figure 203

CHAPTER 27

FLIGHT CONTROLS

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont.)

FLIGHT CONTROLS - GENERAL

1. Introduction

   A. This chapter contains information about the flight controls used to manually control the aircraft in flight. It also includes functional and maintenance information about the flaps.

2. General Description

   A. The conventionally designed flight control system is divided into aileron control, rudder control, elevator control and the wing flaps system. The aircraft is equipped with dual controls. The control stick and rudder pedals are used for control input. Elevator trim can be actuated electrically. Aileron and elevator control motion is transferred to the control surfaces via pushrods and bellcranks. The rudder control system utilizes control cables and bellcranks for rudder actuation. The flaps are operated and fixed in the desired position by an electrical flap actuator.

   B. For dimensions, areas and free play tolerances of the control surfaces refer to 06-00-00.

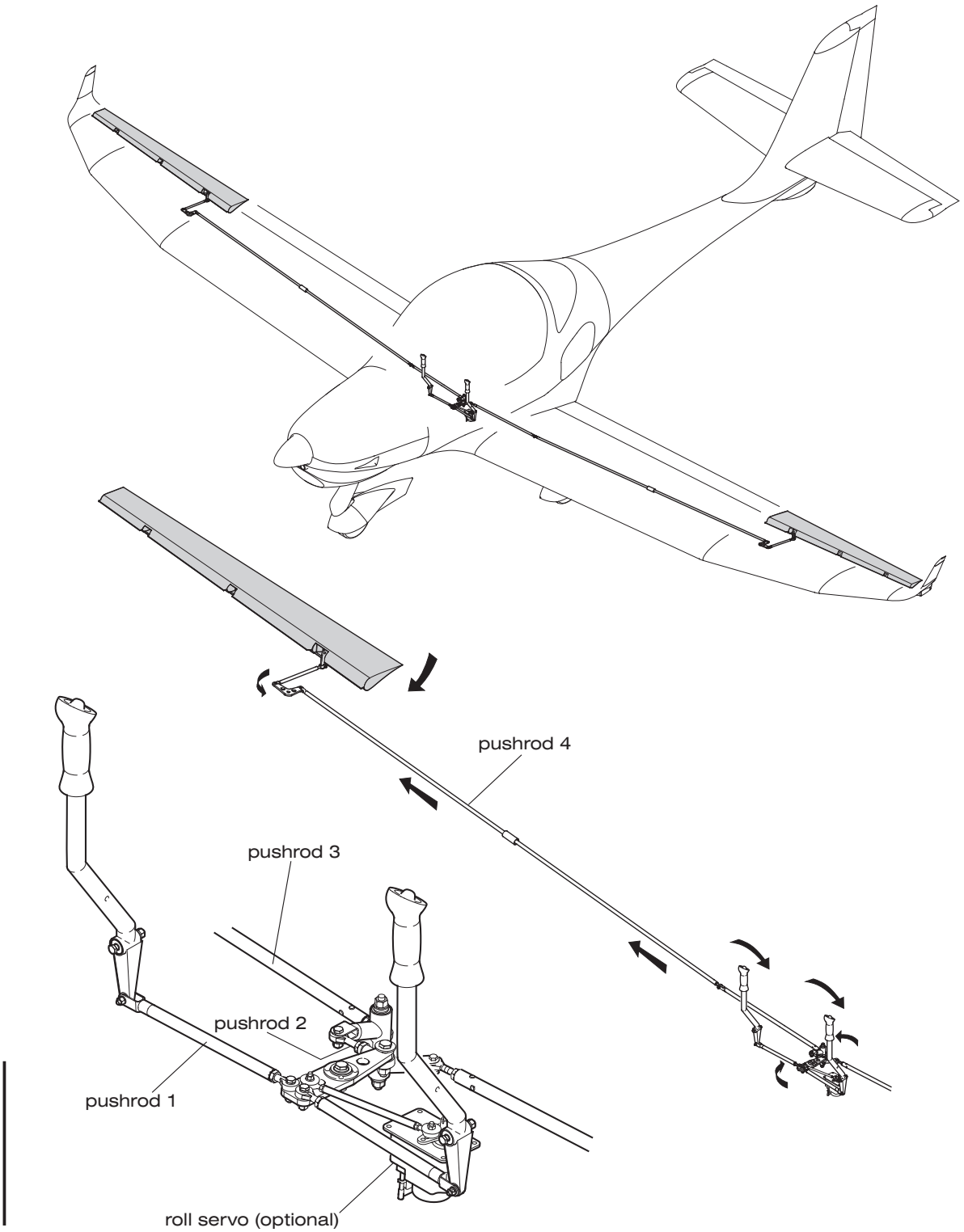
AILERON CONTROL SYSTEM - DESCRIPTION

1. Introduction

   A. This section describes that portion of the flight control system which controls the position and movement of the ailerons. The rigging procedure for the aileron control system is also provided. The ailerons are actuated via pushrods and bellcranks. Each aileron has weight compensation. To correct the tendency to roll precisely, a ground-adjustable trim tab is provided at the leading edge of the left aileron.

2. Description and Operation

   A. For aileron control system design and function refer to figure 1.



Aileron Control System Design and Function
Figure 1

AILERON CONTROL SYSTEM - MAINTENANCE

1. General

   A. For a breakdown of components, refer to figure 201, 202 and 203.

WARNING: WHEN INSTALLING COMPONENTS OF CONTROL SYSTEM, NEW SELF-LOCKING NUTS SHOULD ALWAYS BE USED. NEVER USE A SELF-LOCKING NUT MORE THAN ONCE.

2. Control Stick Removal/Installation

   A. Remove Control Stick
      (1) Remove access panel 211 HL (HR) (refer to 25-12-00).
      (2) Disconnect electrical cable to the transmission button.
      (3) Disconnect pushrod at control stick base.
      (4) Remove bolt securing control stick to torque tube assembly and remove stick.

   B. Install Control Stick
      (1) Position control stick and secure to torque tube assembly using bolt, washer and nut.
      (2) Connect pushrod to control stick base.
      (3) Reconnect electrical cable to the transmission button.
      (4) Install access panel 211 HL (HR) (refer to 25-12-00).

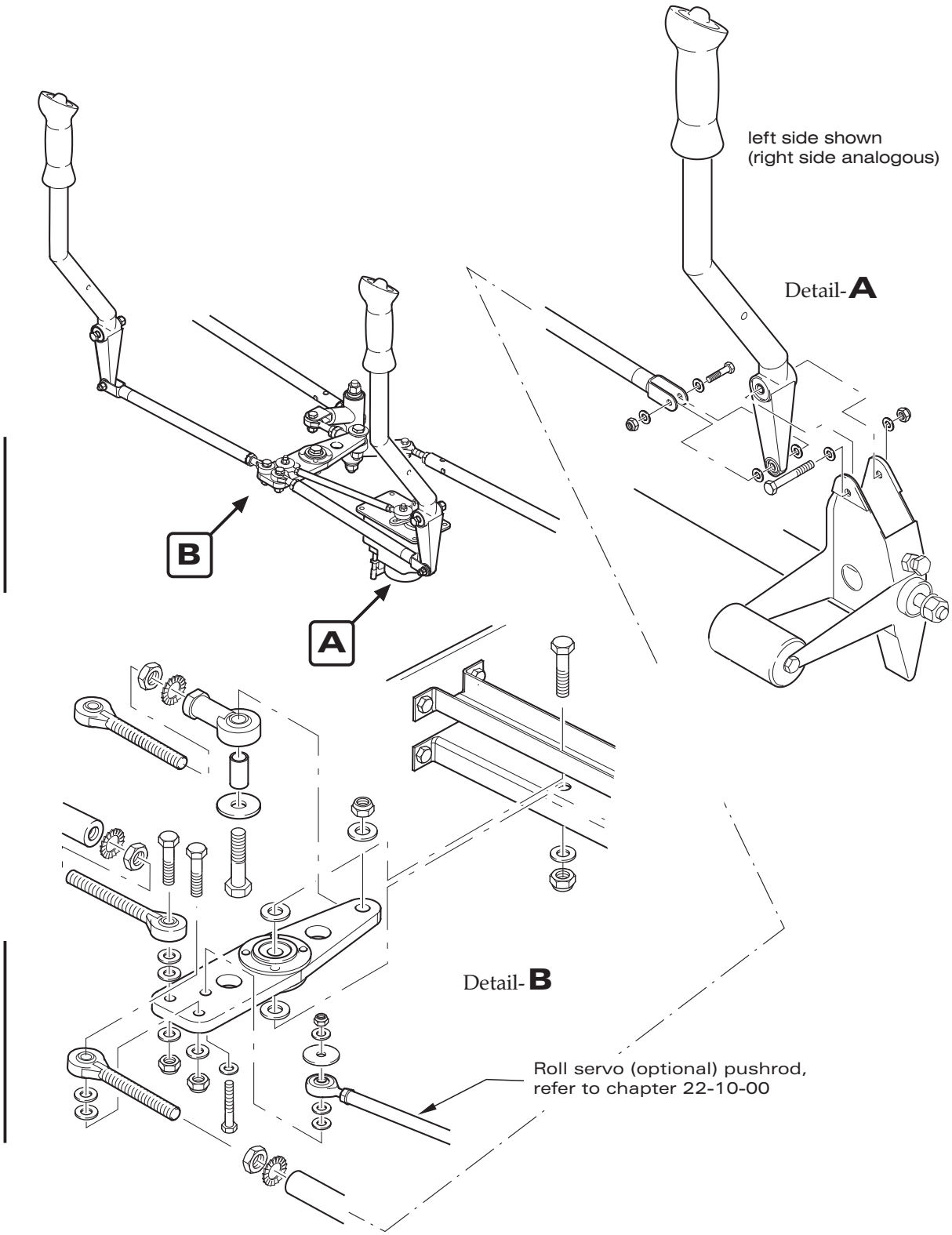
3. Pushrod Removal/Installation

   A. Remove Pushrod 1
      (1) Remove access panel 211 HL (HR) (refer to 25-12-00).
      (2) Disconnect pushrod at control stick base.
      (3) Disconnect pushrod at front bell crank and remove pushrod.

   B. Install Pushrod 1
      (1) Connect pushrod to front bellcrank and control stick base.
      (2) Perform aileron control system inspection/check (refer to “Inspection/Check” below).
      (3) Install access panel 211 HL (HR) (refer to 25-12-00).

4. Front Bellcrank Removal/Installation

   A. Remove Front Bellcrank
      (1) Remove access plate 210 AB (refer to 06-30-00).
      (2) Remove access panel 211 HL and 211 HR (refer to 25-12-00).
      (3) Disconnect pushrods at front bellcrank (optional roll servo pushrod: refer to 22-10-00).
      (4) Remove pivot bolt securing bellcrank to bellcrank brackets and remove bellcrank.



Component Installation
Figure 201

B. Install Front Bellcrank
   (1) Position front bellcrank between brackets and secure using bolt, washer and nut.
   (2) Connect pushrods to front bellcrank (optional roll servo pushrod: refer to 22-10-00).
   (3) Perform aileron control system inspection/check (refer to "Inspection/Check" below).
   (4) Install access plate 210 AB (refer to 06-30-00).
   (5) Install access panel 211 HL and 211 HR (refer to 25-12-00).

5. Pushrod 2 Removal/Installation

A. Remove Pushrod 2
   (1) Remove access plate 210 AB (refer to 06-30-00).
   (2) Disconnect pushrod at front bellcrank.
   (3) Disconnect pushrod at rear bell crank and remove pushrod.

B. Install Pushrod 2
   (1) Connect pushrod to front bellcrank and rear bellcrank.
   (2) Perform aileron control system inspection/check (refer to "Inspection/Check" below).
   (3) Install access plate 210 AB (refer to 06-30-00).

6. Rear Bellcrank Removal/Installation

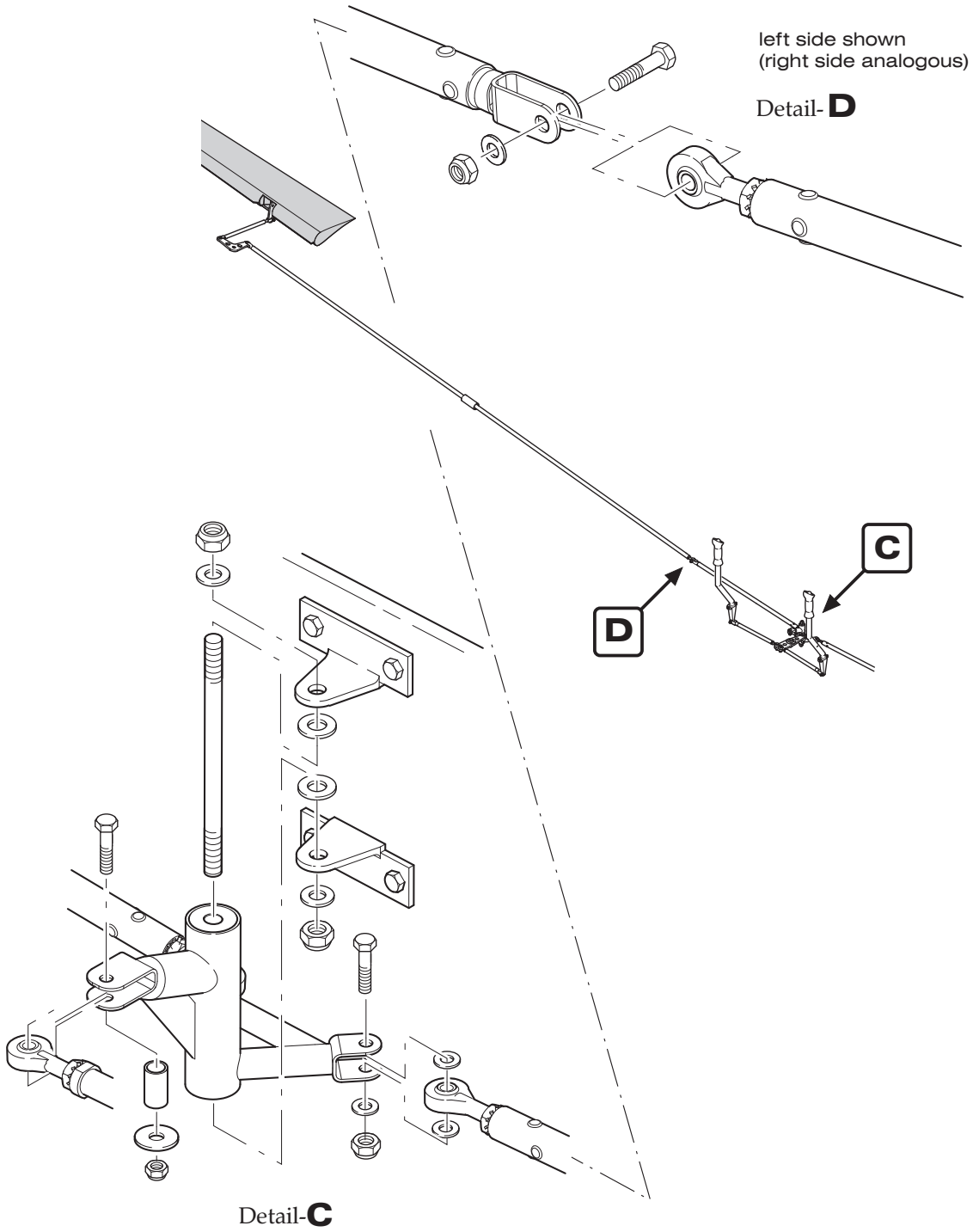
A. Remove Rear Bellcrank
   (1) Remove access plate 210 AB (refer to 06-30-00).
   (2) Disconnect pushrods at rear bellcrank.
   (3) Remove nuts, washers and bellcrank axle securing bellcrank to bellcrank brackets and remove bellcrank.

B. Install Rear Bellcrank
   (1) Position rear bellcrank between brackets and secure using axle, washers and nuts.
   (2) Attach pushrods to rear bellcrank.
   (3) Perform aileron control system inspection/check (refer to "Inspection/Check" below).
   (4) Install access plate 210 AB (refer to 06-30-00).

7. Pushrod 3 Removal/Installation

A. Remove Pushrod 3
   (1) Remove access plate 210 AB (refer to 06-30-00).
   (2) Disconnect pushrod at rear bellcrank.
   (3) Disconnect pushrod at pushrod 4.

B. Install Pushrod 3
   (1) Connect pushrod to rear bellcrank and pushrod 4.
   (2) Perform aileron control system inspection/check (refer to "Inspection/Check" below).
   (3) Install access plate 210 AB (refer to 06-30-00).



Component Installation
Figure 202

8. Pushrod 4 Removal/Installation

A. Remove Pushrod 4
(1) Remove wing (refer to 57-10-00).
(2) Open access panel 520 (620) AB (refer to 06-30-00).
(3) Disconnect pushrod at aileron bellcrank.
(4) Remove rod end bearing.
(5) Cautiously withdraw pushrod from wing.

B. Install Pushrod 4
(1) Position pushrod into the wing.
(2) Install rod end bearing.
(3) Attach pushrod to aileron bellcrank.
(4) Install wing (refer to 57-10-00).
(5) Connect pushrod 4 to pushrod 3.
(6) Re-rig aileron control system (refer to "Adjustment/Test" below).
(7) Perform aileron control system inspection/check (refer to "Inspection/Check" below).
(8) Close access panel 520 (620) AB (refer to 06-30-00).

9. Aileron Bellcrank Removal/Installation

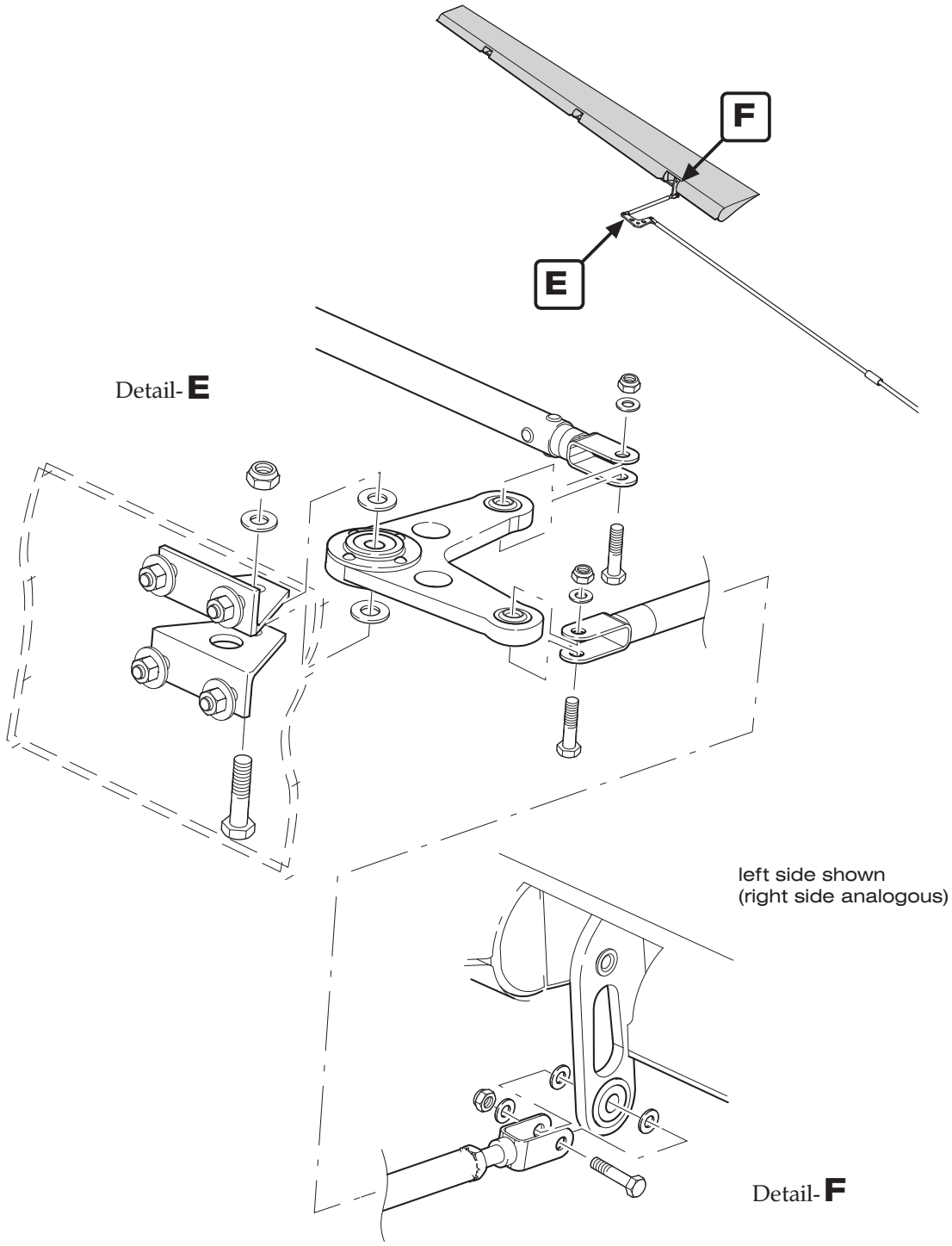
A. Remove Aileron Bellcrank
(1) Open access plate 520 (620) AB (refer to 06-30-00).
(2) Disconnect pushrods at aileron bellcrank.
(3) Remove pivot bolt securing bellcrank to bellcrank bracket assembly. Remove bellcrank and washers through access plate.

B. Install Aileron Bellcrank
(1) Attach bellcrank to structure using pivot bolt, ensuring required washers are in place.
(2) Reconnect aileron pushrod to bellcrank.
(4) Reconnect pushrod 4 to the bellcrank.
(5) Perform aileron control system inspection/check (refer to "Inspection/Check" below).
(6) Close inspection/access plate 520 (620) AB (refer to 06-30-00).

10. Inspection/Check

A. Inspection/Check
(1) Perform a visual inspection of the aileron control system. Check all components for proper installation and security. No signs of excessive play.

NOTE: The maximum permissible value of aileron play at the hinge pins is 1,0 mm (0.04 in.) axial play and 0,3 mm (0.01 in.) radial play. The maximum control circuit backlash is 10 mm (0.4 in.).
In case of excessive play of the control surfaces in their hinges, replace worn hinge bushings (refer also to 57-50-00).



Aileron Bellcrank Installation
Figure 203

(2) Verify minimum rod end thread engagement of 8 mm (0.312 in.).
(3) Verify ailerons can be moved smoothly through the full travel. No grinding is audible.
(4) Check ailerons for correct travel using an inclinometer. If necessary perform aileron control system adjustment/test (refer to "Adjustment/Test" below).

NOTE: For aileron rigging specifications, refer to chapter 6 „Dimensions and Areas".

(5) Install all items removed for access.

11. Adjustment/Test

A. Adjustment/Test
(1) Remove access plate 210 AB (refer to 06-30-00).
(2) Remove access plate 620 AB and 520 AB (refer to 06-30-00).
(3) Remove access plate 211 HL and HR (refer to 06-30-00).
(4) Adjust pushrod 2 until:
(a) front and rear bellcrank are parallel to each other.
(b) both bellcranks are perpendicular to the wing spar.
(5) Fix bellcranks in a suitable manner.
(6) Adjust pushrod 3 for each aileron so the aileron bellcrank is in neutral position (line between bellcrank pivot bolt and aileron pushrod attach bolt is parallel to the wing spar).
(7) Adjust each aileron pushrod until the control surface is neutral with reference to wing trailing edge.
(8) Adjust pushrod 1 for each control stick until the control stick is in neutral position.
(9) Set free the front and rear bellcrank.
(10) Fasten inclinometer to left aileron and set at 0°.
(11) Adjust aileron stop bolts at control yoke assembly to allow up and down aileron travel specified in 06-10-00.
(12) Perform an aileron control system inspection/check (refer to "Inspection/Check" above).
(13) Install all items removed for access.

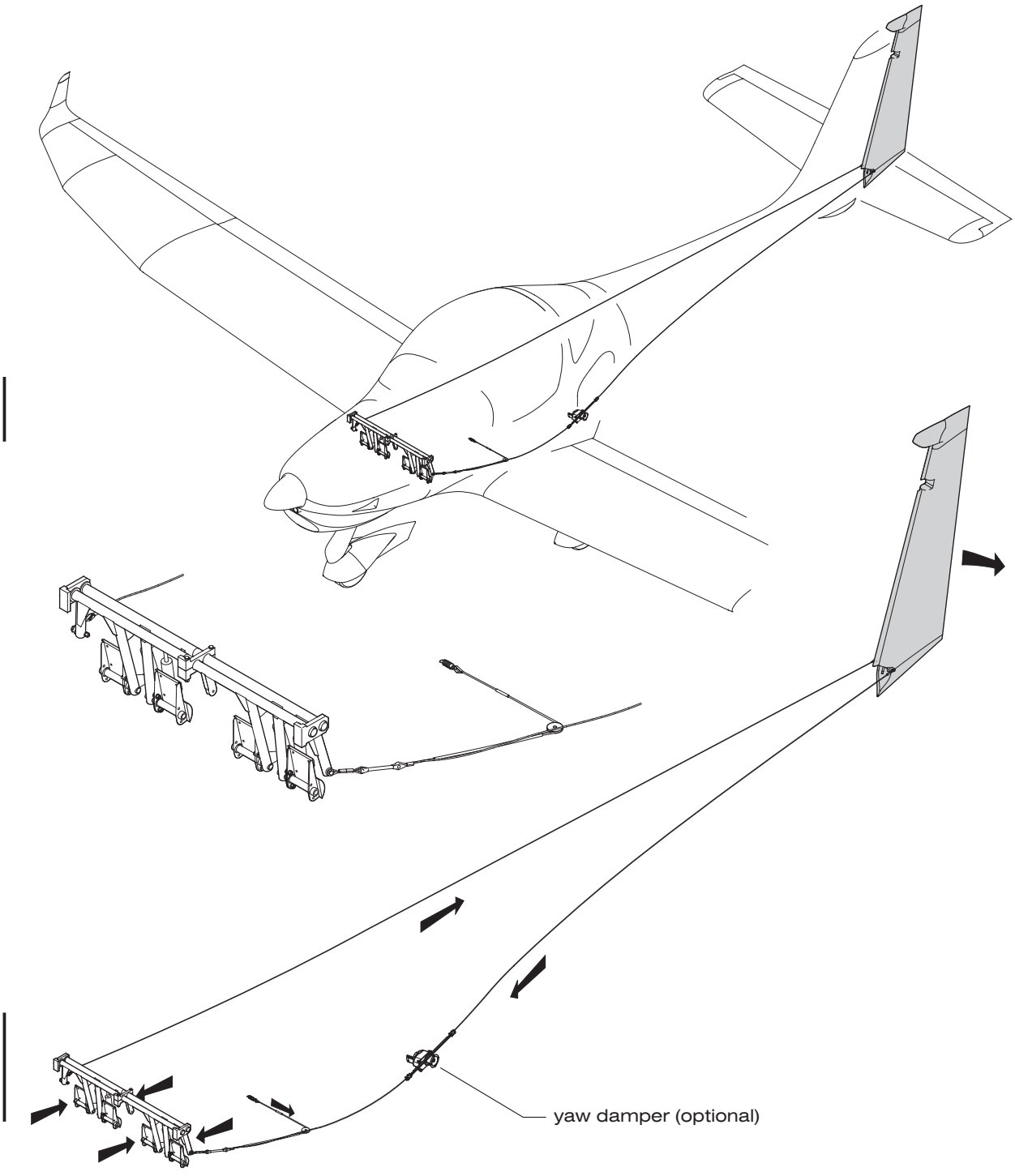
RUDDER CONTROL SYSTEM - DESCRIPTION

1. Introduction

   A. This section describes that portion of the flight control system which controls the position and movement of the rudder. The rigging procedure for the rudder control system is also provided. The rudder control system consists of conventional rudder pedals, cables and pulleys.

2. Description and Operation

   A. For rudder control system design and function refer to figure 1.



Rudder Control Design and Function
Figure 1

RUDDER CONTROL SYSTEM - MAINTENANCE

1. General

   A. For a breakdown of the components, refer to figure 201 and 202.

WARNING: WHEN INSTALLING COMPONENTS OF THE CONTROL SYSTEM, NEW SELF-LOCKING NUTS SHOULD ALWAYS BE USED. NEVER USE A SELF-LOCKING NUT MORE THAN ONCE.

A SYSTEM RIGGING AND INSPECTION/CHECK MUST BE PERFORMED AFTER LOOSENING ANY FLIGHT CONTROL CABLE TO ENSURE PROPER CONTROL SURFACE OPERATION.

2. Control Cables

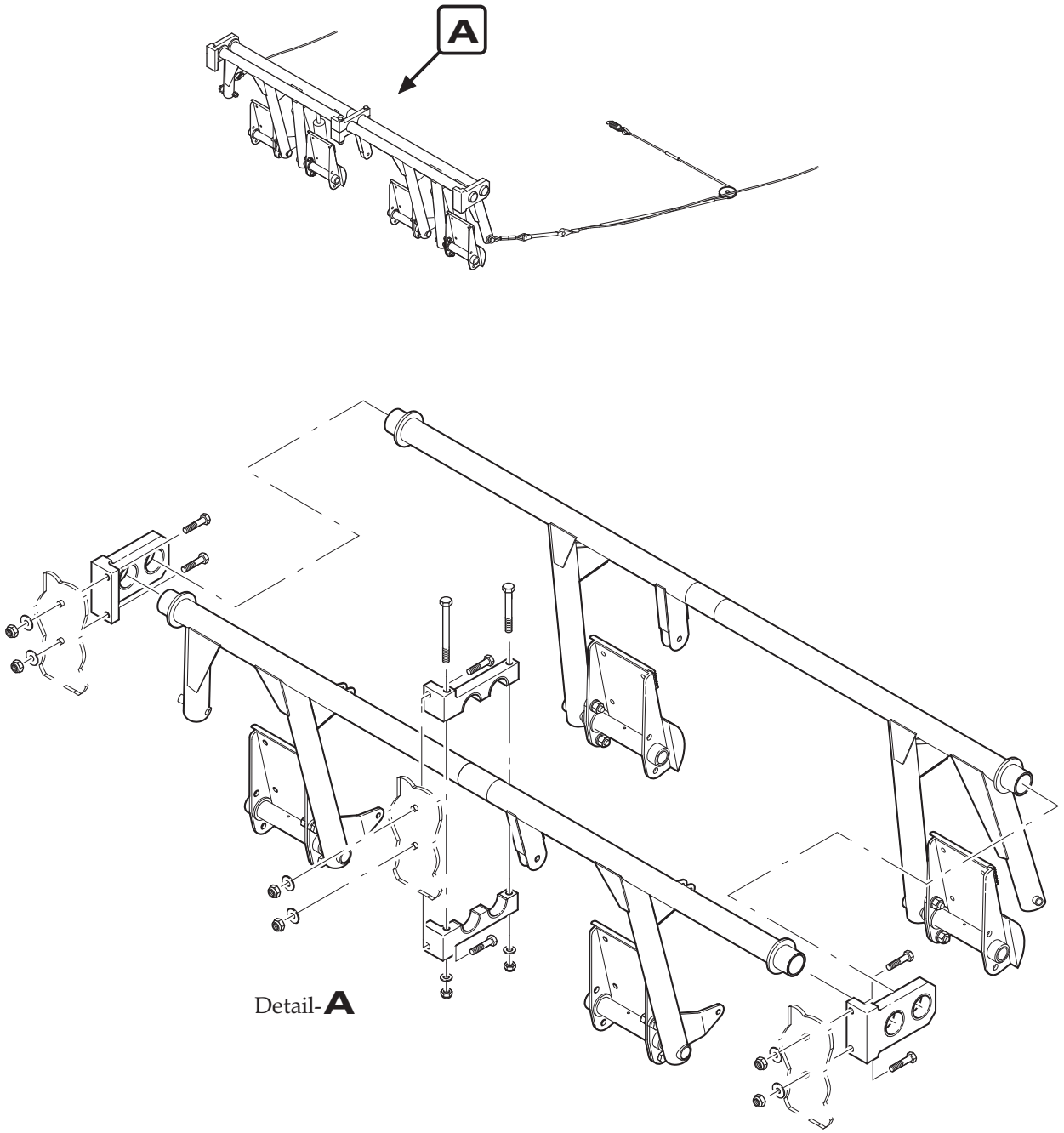
   A. The maintenance of the control cables is important for the precise and safe functioning of the rudder control system. Control cables should be regularly checked for mechanical damage and damage caused by corrosion.

      (1) Broken Wire Check
      Check cables for broken strands of wire by passing a cloth along length of cable. The cloth will snag at such places. Check particularly carefully at the bridle cable clamps, if the yaw damper (GFC 500 autopilot) is installed. If broken wires are found, the affected control cable must be examined in more detail and removed if necessary. If a broken single wire is found, the control cable must be replaced. The procedures for control cable removal and installation are described below.

      (2) Corrosion Check
      External corrosion can be detected by a careful visual examination of the cables. Finding internal corrosion is more difficult. If internal corrosion is suspected, remove cable from the aircraft and examine more closely, especially in areas with broken wires.

3. Rudder Pedal Assembly Removal/Installation

   A. Remove Rudder Pedal Assembly
      (1) Slacken control cables of rudder control.
      (2) Disconnect control cables from rudder control actuator arms.
      (4) Disconnect brake master cylinders at rudder pedal assembly.
      (5) Disconnect steering tubes at rudder bars.
      (6) Remove bolts securing lower half of the middle bearing block to upper half and remove lower bearing block half.
      (7) Remove bolts attaching left and right bearing blocks to firewall and work rudder bars out of area below instrument panel.



Rudder Control Installation
Figure 201

B. Install Rudder Pedal Assembly
(1) Position rudder bars in left and right bearing blocks and secure bearing blocks to firewall using bolts.
(2) Reinstall lower half of middle bearing block.
(3) Reconnect steering tubes to rudder bars.
(4) Reconnect master cylinders to the rudder pedal assembly.
(5) Reconnect control cables to rudder control actuator arms and re-rig system (refer to "Adjustment/Test" below).
(6) Check correct operation of the rudder control system (refer to "Inspection/Check" below).

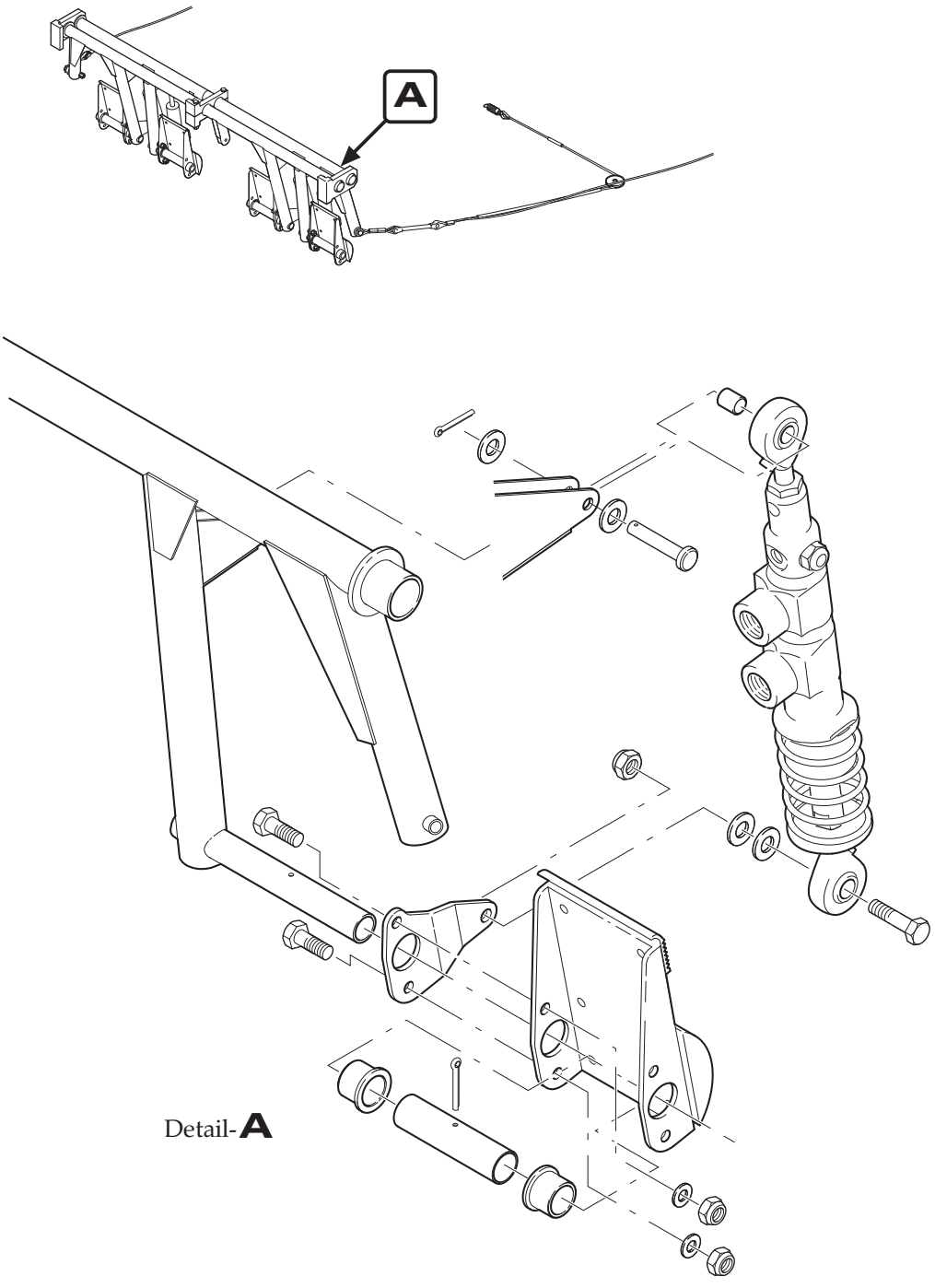
4. Control Cable Removal/Installation

A. Remove a Control Cable
(1) Relieve cable tension at turnbuckle.
(2) Disconnect control cable at the turnbuckle.
(3) Disconnect control cable at the rudder.
(4) If a yaw damper is installed (GFC 500 autopilot): Disconnect bridle cable from left rudder cable (refer to 22-10-00).
(5) Cut the eye-end from the control cable which is to be removed at the turnbuckle end.
(6) Withdraw control cable from the aircraft.

B. Install a Control Cable

WARNING: THE CONTROL CABLE EYE-ENDS SHOULD BE INSTALLED BY TRAINED AND AUTHORIZED PERSONNEL ONLY. IF THE EYE-ENDS ARE NOT INSTALLED PROPERLY; A RUDDER CONTROL SYSTEM FAILURE MAY OCCUR.
USE CABLES TO SPECIFICATION LN9374 OR ISO 2020 OR MIL-DTL-83420, STRECHED TO 60% MBS (DIAMETER 3,2 MM [1/8 IN.]).

(1) Prepare a new control cable with the required length and one eye-end.
(2) Push that control cable through the tube from the rudder side.
(3) If a yaw damper is installed (GFC 500 autopilot): Ensure the control cable passes through a PTFE tube piece (length: 290 mm) at the servo installation position (refer to 22-10-00 for an illustration).
(4) Install the second eye-end at the turnbuckle end.
(5) Reconnect the control cable to the rudder using bolt, washer and nut.
(6) Reconnect the control cable to the turnbuckle using bolt , washer and nut.
(7) Rig rudder control cable including cables of the aileron-rudder interconnect.
(8) If a yaw damper is installed (GFC 500 autopilot): Connect the bridle cable to the left rudder control cable (refer to 22-10-00). Adjust pretension of rudder control cable and servo bridle cable (refer to 22-10-00 for tension values).
(9) Check correct operation of rudder control system / aileron-rudder interconnect (refer to "Adjustment/Test" and "Inspection/Check" below).



Rudder Pedal / Master Cylinder Installation
Figure 202

5. Inspection/Check

A. Inspection/Check

(1) Perform a visual inspection of the rudder control system. Check all components for proper installation and security. No signs of excessive play.

NOTE: The maximum permissible value of rudder play at hinge pins is 1,0 mm (0.04 in.) axial play and 0,3 mm (0.01 in.) radial play.
In case of excessive play of the control surface in its hinges, replace worn hinge bushings (refer also to 57-50-00).

(2) Examine control cables for broken wires and corrosion.
(3) Verify rudder can be moved smoothly through full travel. No grinding is audible.
(4) If a yaw damper is installed (GFC 500 autopilot): Check rudder control cable and servo bridle cable for correct pretension. Adjust pretension if necessary (refer to 22-10-00 for tension values).
(5) Check rudder for correct travel using an inclinometer, if necessary perform rudder control system adjustment/test (refer to "Adjustment/Test" below).

NOTE: For rudder rigging specifications, refer to chapter 6 "Dimensions and Areas".

(6) Install all items removed for access.

6. Adjustment/Test

A. Adjustment/Test

(1) Remove engine cowling (refer to 71-10-00).
(2) Slacken control cables of rudder control.
(3) Tie down or weight tail to raise nose wheel off the ground.
(4) Set the rudder pedals to neutral and fix in suitable manner.
(5) Fix the rudder in neutral position with reference to vertical stabilizer.
(6) Tension the control cables with the turnbuckles until the control system is free of clearance at room temperature.
(7) If a yaw damper is installed (GFC 500 autopilot): Adjust pretension of rudder control cable and servo bridle cable (refer to 22-10-00 for tension values).
(8) Adjust nose wheel steering tubes so the nose wheel is streamlined.
(9) Set the rudder control system free.
(10) Adjust secondary stops on the nose wheel strut so that for full right and left rudder deflection:
  (a) the rudder stops contact before secondary stops.
  (b) secondary stops show a 0,5 mm (0.02 in.) gap between stop bolt and nose wheel assembly.
(11) Tighten jam nuts.
(12) Verify rudder pedals are free for the full range of movement.
(13) Perform a rudder control system inspection/check (refer to "Inspection/Check" above).
(14) Install engine cowling (refer to 71-10-00) and lower nose wheel.

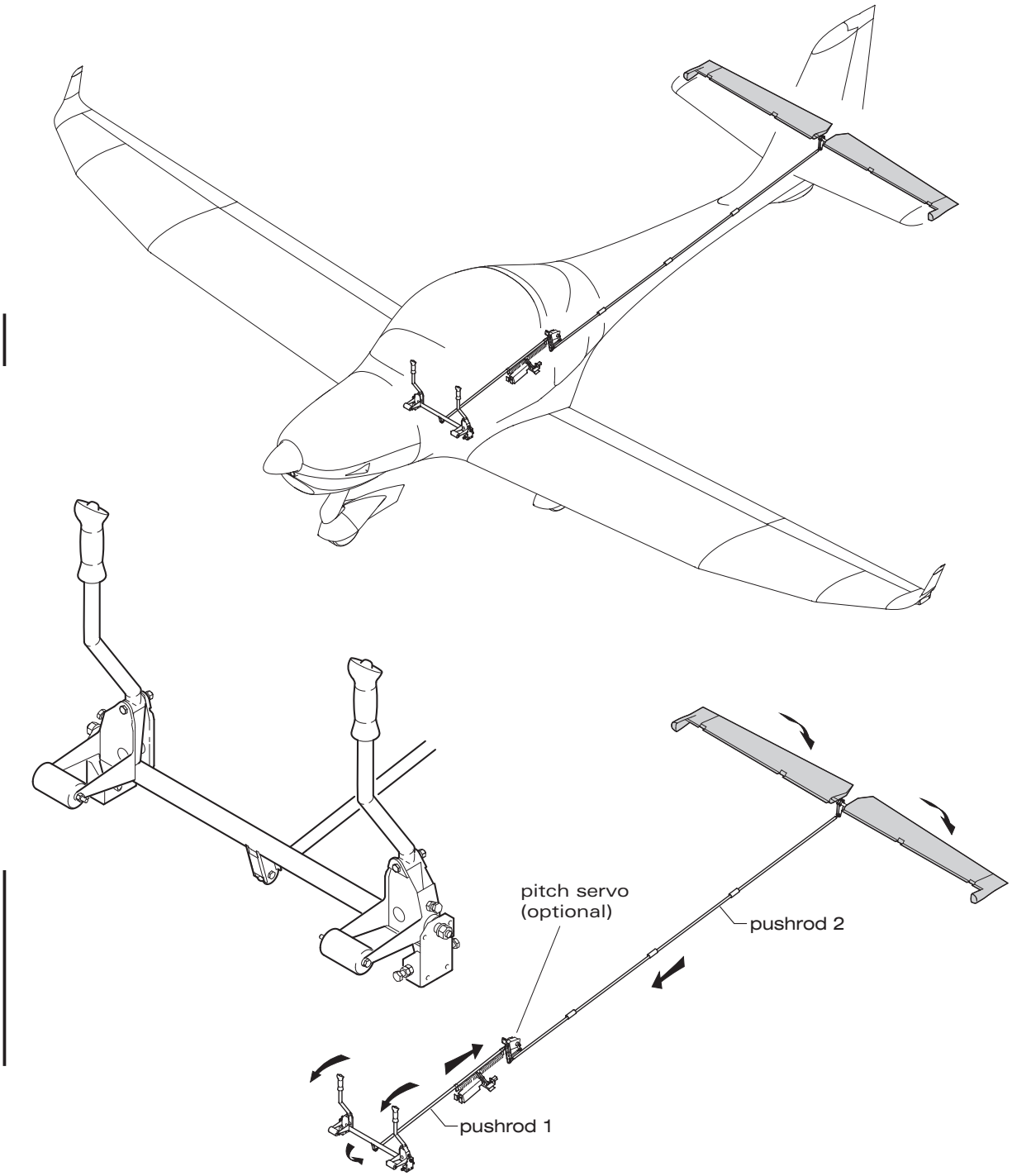
ELEVATOR CONTROL SYSTEM - DESCRIPTION

1. Introduction

   A. This section describes that portion of the flight control system which controls the position and movement of the elevator. The rigging procedure for the elevator control system is also provided. The system consists of control sticks, elevator torque tube assembly, pushrods and the elevator bellcrank.
   The aircraft is equipped with an electrical spring-force elevator trim system.

2. Description and Operation

   A. For elevator control system design and function refer to figure 1.



Elevator Control System Design and Function
Figure 1

ELEVATOR CONTROL SYSTEM - MAINTENANCE

1. General

   A. For a breakdown of the components, refer to figure 201 and 202.

WARNING: WHEN INSTALLING COMPONENTS OF THE CONTROL SYSTEM NEW SELF-LOCKING NUTS SHOULD ALWAYS BE USED. NEVER USE A SELF-LOCKING NUT MORE THAN ONCE.

2. Elevator Torque Tube Assy Removal/Installation

   A. Remove Elevator Torque Tube Assy
      (1) Remove seats (refer to 25-10-00).
      (2) Remove control sticks (refer to 27-10-00).
      (3) Disconnect pushrod 1 from elevator actuation arm.
      (4) Remove pivot bolt, washers and nut from both ends of the torque tube with which the torque tube is attached to the support bracket.
      (5) Remove torque tube from aircraft.

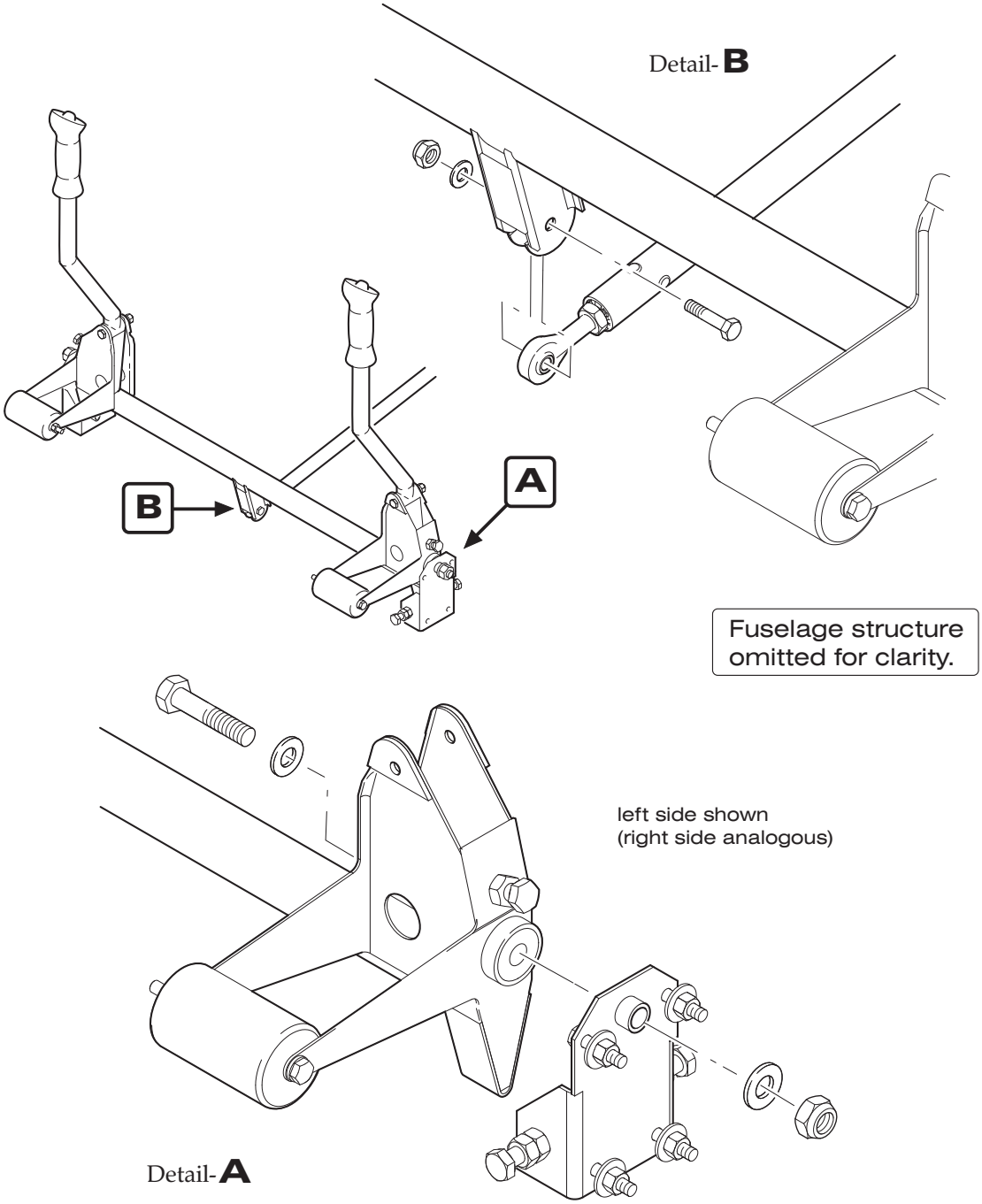
   B. Install Elevator Torque Tube Assy
      (1) Position torque tube between support brackets.
      (2) Attach pivot bolt, washers and nut to both ends of the torque tube with which the torque tube is attached to the support bracket.
      (3) Connect pushrod 1 to elevator actuation arm.
      (4) Install control sticks (refer to 27-10-00).
      (5) Check elevator and aileron control for proper operation and rig if necessary (refer to “Aileron Control System Maintenance“ and „Adjustment/Test“ below).

3. Pushrod 1 Removal/Installation

   A. Remove Pushrod 1
      (1) Remove seats (refer to 25-10-00).
      (2) Remove baggage compartment floor panel (refer to 25-12-00).
      (3) Disconnect trim system springs from pushrod.
      (4) Disconnect pushrod at elevator actuation arm.
      (5) Disconnect pushrod at elevator bellcrank.
      (6) Remove pushrod from aircraft.

   B. Install Pushrod 1
      (1) Position pushrod and connect to elevator bellcrank.
      (2) Connect pushrod to elevator actuation arm.
      (3) Connect springs of trim system to pushrod.

      NOTE: If spring attachment clamps have been removed, refer to 27-31-00 for their correct position.



Component Installation
Figure 201

(4) Check elevator control system and elevator trim system for proper operation and rig if necessary (refer to 27-30-00 and 27-31-00).
(5) Install baggage compartment floor panel (refer to 25-12-00).
(6) Install seats (refer to 25-10-00).

4. Elevator Bellcrank Removal/Installation

A. Remove Elevator Bellcrank
(1) Remove baggage compartment floor panel (refer to 25-12-00).
(2) Disconnect pushrods from elevator bellcrank (optional pitch servo pushrod: refer to 22-10-00).
(3) Remove pivot bolt securing elevator bellcrank to support brackets.
(4) Remove elevator bellcrank.

B. Install Elevator Bellcrank
(1) Mount bellcrank to structure using pivot bolt, nut and washer. Ensure spacers are placed correctly.
(2) Reconnect pushrods to bellcrank (optional pitch servo pushrod: refer to 22-10-00).
(3) Check elevator control system and elevator trim system for proper operation and rig if necessary (refer to 27-30-00 and 27-31-00).
(4) Install baggage compartment floor panel (refer to 25-12-00).

5. Inspection/Check

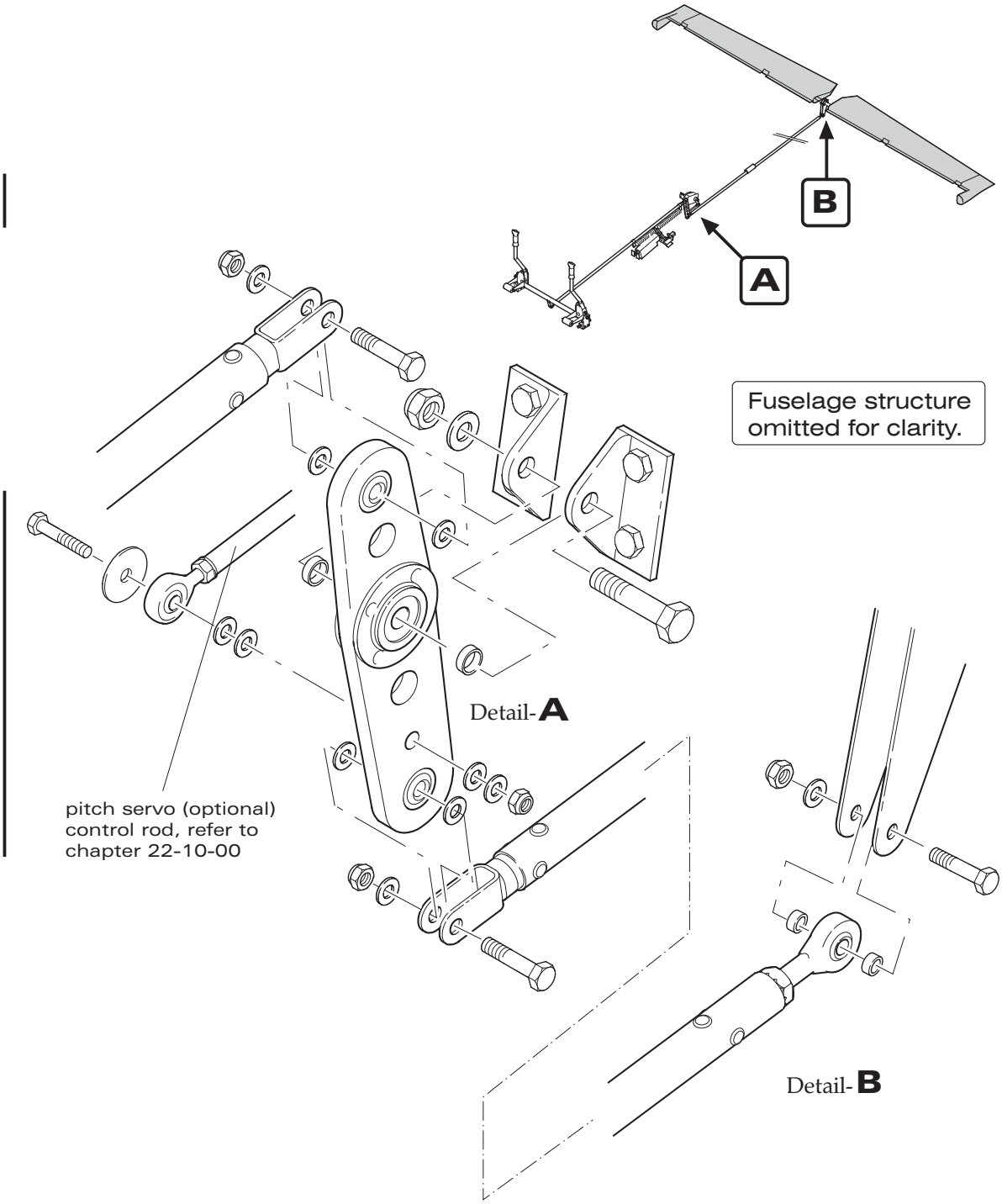
A. Inspection/Check
(1) Perform a visual inspection of elevator control system. Check all components for proper installation and security. No signs off excessive play.

NOTE: The maximum permissible value of elevator play at hinge pins is 1,0 mm (0.04 in.) axial play and 0,3 mm (0.01 in.) radial play. The maximum control circuit backlash is 10 mm (0.4 in.).
In case of excessive play of the control surfaces in their hinges, replace worn hinge bushings (refer also to 57-50-00).

(2) Verify minimum rod end thread engagement of 8 mm (0.312 in.).
(3) Verify elevator can be moved smoothly through full travel. No grinding is audible.
(4) Verify both sticks are free for the full range of movement and maximum up and down elevator travel is achieved.
(5) Check elevator for correct travel using an inclinometer, if necessary perform elevator control system adjustment/test (refer to "Adjustment/Test" below).

NOTE: For elevator rigging specifications, refer to chapter 6 "Dimensions and Areas".

(6) Install all items removed for access.



Component Installation
Figure 202

6. Adjustment/Test

A. Adjustment/Test
(1) Remove baggage compartment floor panel (refer to 25-12-00).
(2) Remove access plate 211 HL and HR (refer to 25-12-00).
(3) Lock elevator bellcrank in neutral position in a suitable manner (the line between pushrod attach points on bellcrank is perpendicular to the pushrod 2).
(4) Streamline elevator to neutral with horizontal stabilizer by adjusting elevator pushrod (pushrod 2).
(5) Adjust pushrod 1 until the control yoke assembly is in neutral position.

ELEVATOR TRIM CONTROL - DESCRIPTION

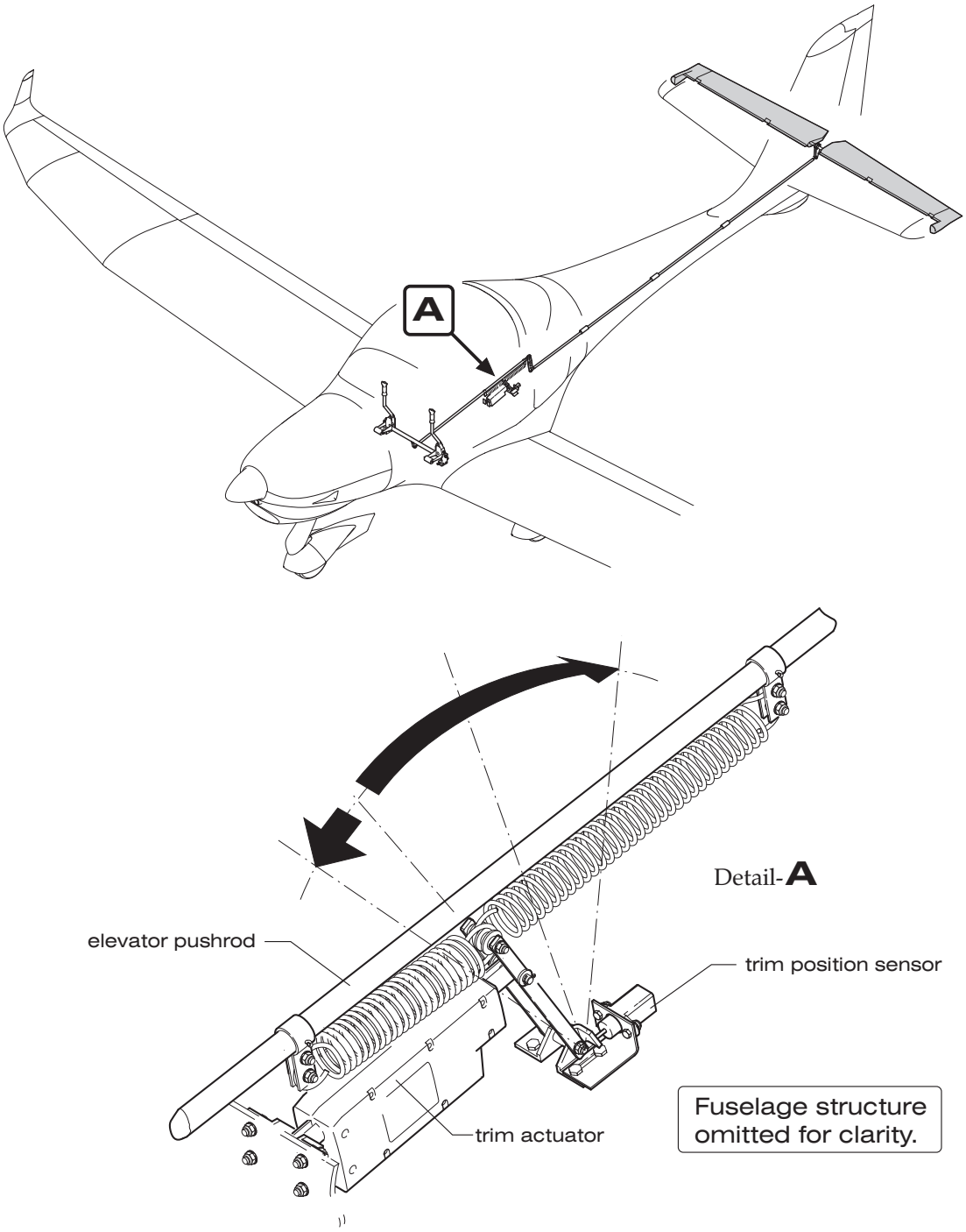
1. Introduction

   A. The aircraft isequipped with an electrical spring-force trim system. An electrical trim actuator changes the pre-load of a pair of springs that applies a defined force to the elevator pushrod.

2. Description and Operation

   A. For an illustration of elevator trim control design and function refer to figure 1.

   B. The trim system is controlled by a rocker switch located on the rear portion of the middle console. Pressing the forward side of the switch will trim nose down; pressing the rear side of the switch will trim nose up.
   The switch operates an electrical trim actuator that is mounted under the baggage compartment floor panel, parallel to the elevator pushrod.
   The electrical circuit of the trim system is protected by a circuit breaker that can be pulled in the event of a trim system malfunction.



Elevator Trim System Design And Function
Figure 1

ELEVATOR TRIM CONTROL - MAINTENANCE

1. General

   A. For a breakdown of the components, refer to figure 201.

2. Trim Actuator Removal/Installation

   A. Remove Trim Actuator
      (1) Set the elevator trim system to neutral.
      (2) Place the BAT switch in OFF position.
      (3) Remove baggage compartment floor panel (refer to 25-12-00).
      (4) Disconnect trim actuator electrical wires at connector.
      (5) Disconnect the springs at trim system actuation arm.
      (6) Disconnect trim actuator push rod at trim system actuation arm.
      (7) Remove bolts securing trim actuator to fuselage structure and remove trim actuator.

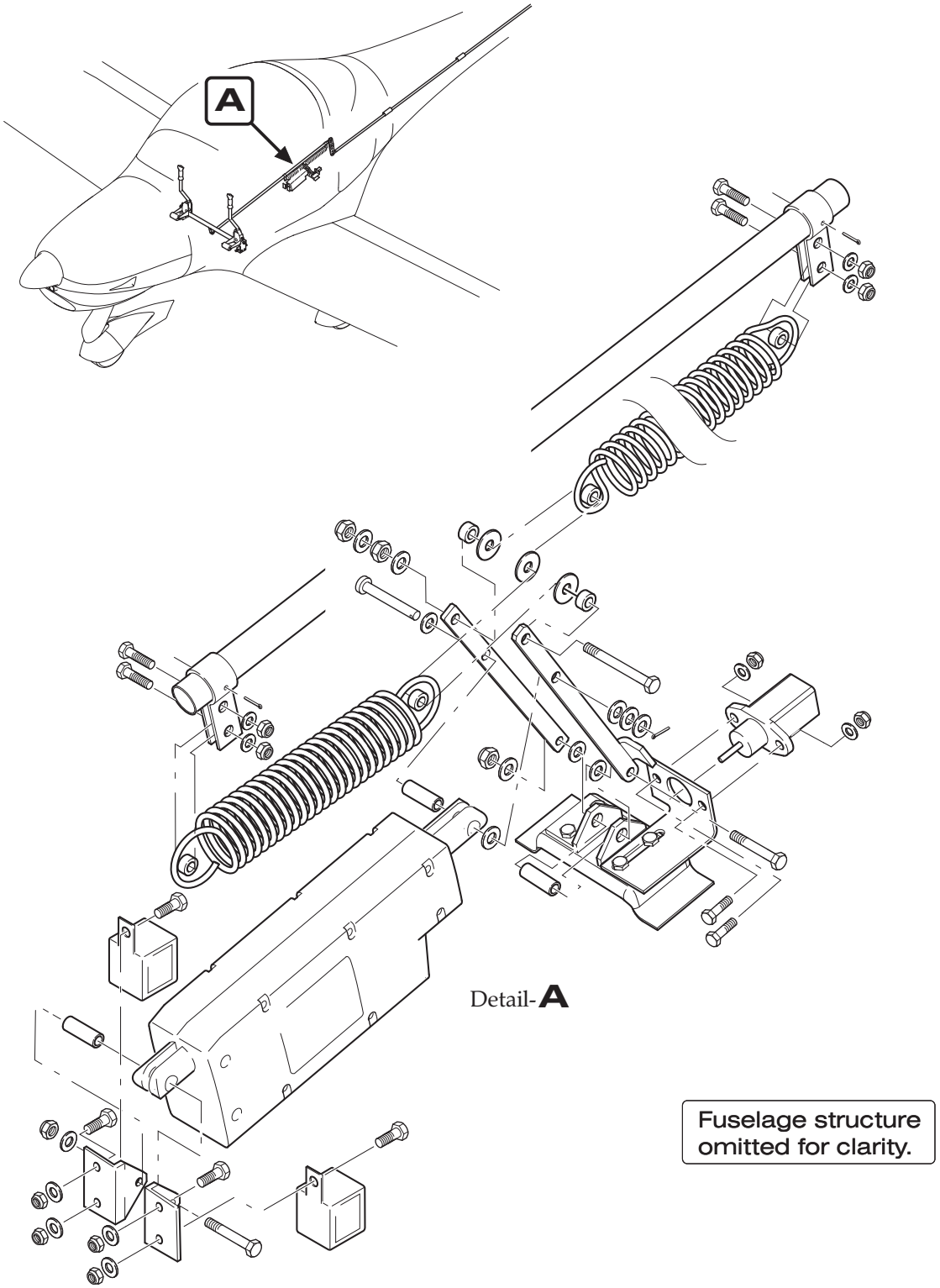
   B. Install Trim Actuator
      (1) Attach trim actuator to fuselage structure with bolts, washers and nuts.
      (2) Reconnect trim actuator push rod to trim system actuation arm using hardware.
      (3) Reconnect springs to trim system actuation arm.

      NOTE: There are two different types of springs used in the trim system. The spring on the forward side is black colored, the spring on the rear side is silver colored.

      (4) Connect trim actuator electrical connection.
      (5) Check elevator trim control for proper function (refer to "Inspection/Check" below).
      (6) Install baggage compartment floor panel (refer to 25-12-00).

3. Inspection/Check

   A. Inspection/Check
      (1) Perform a visual inspection of elevator trim system. Check all components for proper installation and security. No signs off excessive play.
      (2) Verify distance between rear edge of rear pipe bracket (securing rear spring to elevator pushrod) and connecting bore of rear fork head. Nominal value: 55 ± 2 mm (2.17 ± 0.08 in.)
      (3) Place BAT switch in ON position.
      (4) Keep hands away from control stick and run trim actuator to full nose-down trim position until travel is stopped by limit switch.
      (5) Check forward movement of the control stick. Verify proper trim position indicator reading.
      (6) With full nose-down trim: Measure control force by means of a spring balance. Attach balance in upper third of grip piece and pull rearward until control stick moves from stop. Control force nominal value: 40 ± 5 N (9 ± 1.1 lbs)
      (7) Keep hands away from control stick and run trim actuator to full nose-up trim position until travel is stopped by limit switch.
      (8) Check backward movement of the control stick. Verify proper trim position indicator reading.
      (9) Set the elevator trim to neutral and place BAT switch in OFF position.
      (10) Install all items removed for access.



Elevator Trim System Installation
Figure 201

FLAP CONTROL SYSTEM - DESCRIPTION

1. Introduction

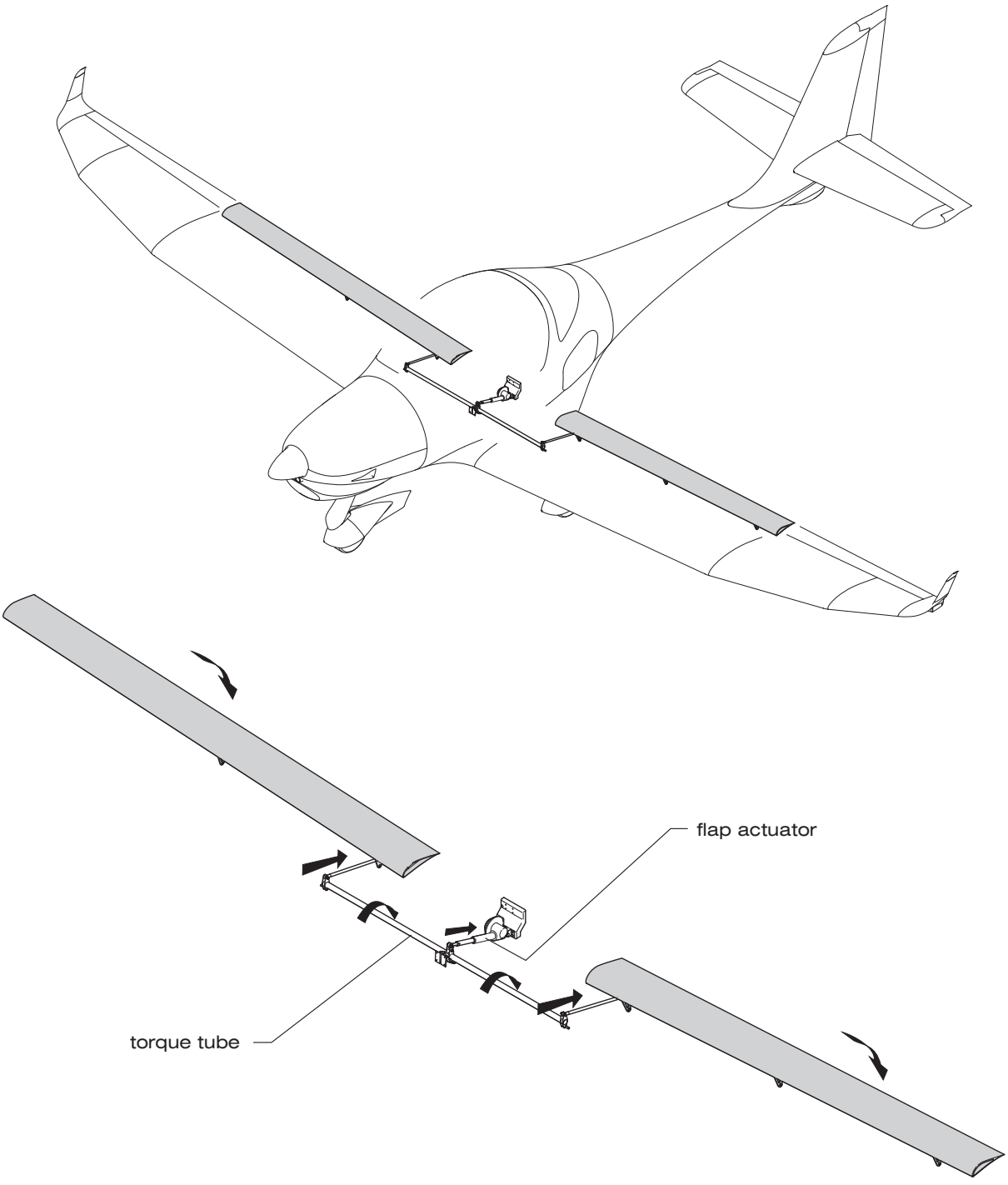
   A. This section describes that portion of the flight control system which controls the position and movement of the flaps. The rigging procedure forthe flap control system is also provided. The aircraft is equipped with electrically actuated flaps. They are operated and fixed in the desired position by an electrical flap actuator.

2. Description and Operation

   A. The wing flaps system consists of a three-position selector switch which is incorporated in the instrument panel, a LED flap position indicator near the three-position selector switch, the electric flap actuator, located under the baggage floor, a torque tube, pushrods and the flaps on each wing.

   B. The linear flap actuator drives the torque tube interconnected between the left and right flaps. Limit switches are attached to the flap actuator. They identify flap position and surface travel, and turn off the actuator once the desired position is reached, i.e: 17° or 35°.
   The flap actuator has a slip coupling to prevent mechanical damage if a restriction occurs. In the event of a failure in the electric flap control circuit, torque tube/actuator geometry prevents the flaps from causing an uncontrollable flight condition.

   C. For an illustration of flap control system design and function refer to figure 1.



Flap Control System Design and Function
Figure 1

FLAP CONTROL SYSTEM - MAINTENANCE

1. General

A. This section provides instructions for removal and installation of components and instruction for flap control system rigging.

B. For a breakdown of the components, refer to figure 201, 202, 203, and 204.

2. Flap Actuator Assembly Removal/Installation

A. Remove Flap Actuator Assembly
(1) Ensure electrical power to aircraft is OFF.
(2) Remove baggage compartment floor panel (refer to 25-12-00).
(3) Disconnect flap actuator electrical wires at connector.
(4) Disconnect flap actuator from torque tube coupler.
(5) Remove nut, bolt and washers securing the flap actuator assembly to the actuator bracket and remove flap actuator assembly from aircraft.

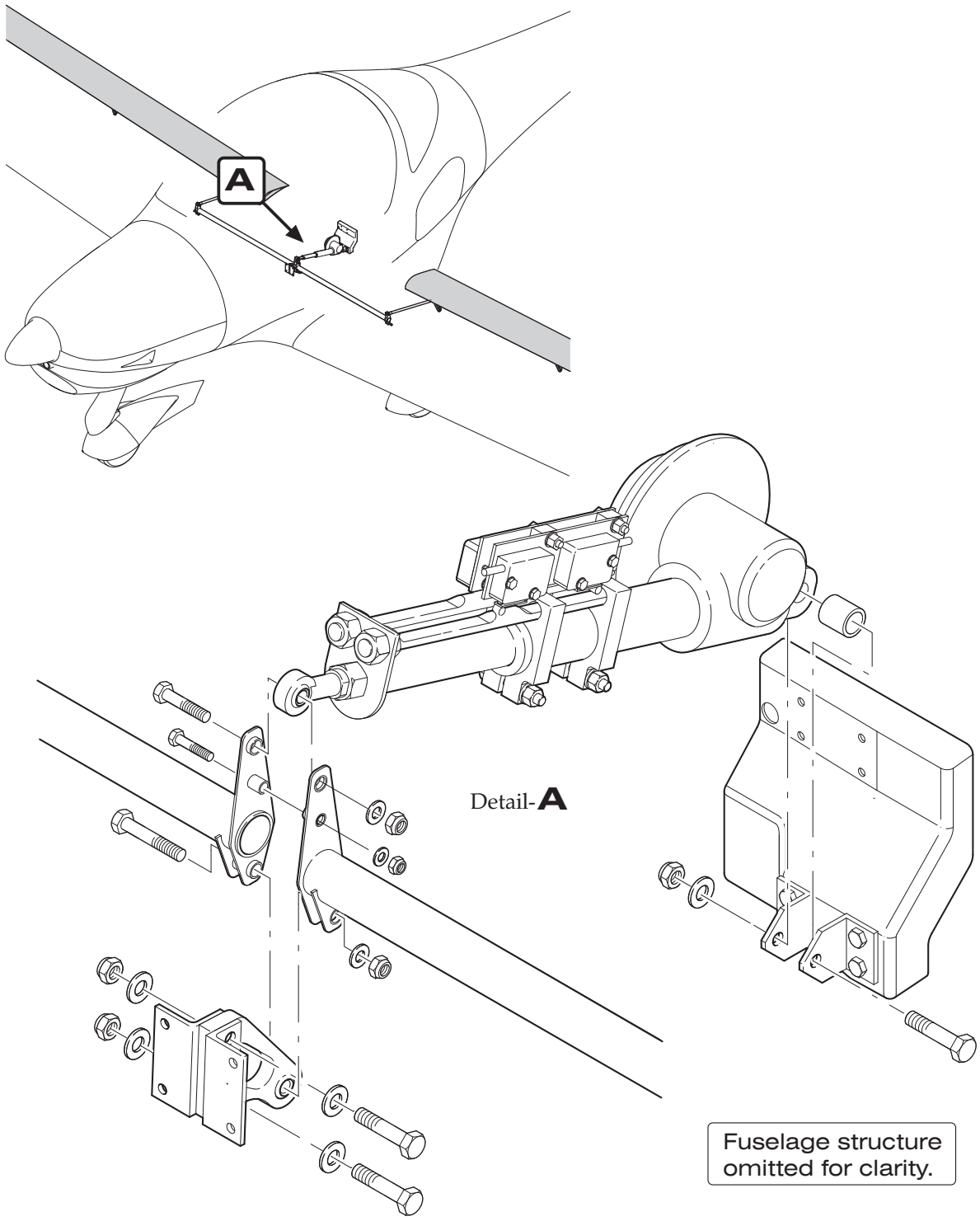
B. Install Flap Actuator Assembly
(1) Place flap actuator assembly in the actuator bracket and attach using washers and bolt.
(2) Attach washers, bolt and nut securing the flap actuator pushrod to the torque tube coupler.
(3) Connect flap actuator electrical wires at connector.
(4) Perform flap control system inspection/check and rig system, if necessary (refer to "Inspection/Test" and "Adjustment/Test" below).
(5) Install baggage compartment floor panel (refer to 25-12-00).

3. Torque Tube Assembly Removal/Installation

A. Remove Torque Tube Assembly
(1) Remove access plate 210 AB (refer to 06-30-00).
(2) Remove access plate 610 AB and 510 AB (refer to 06-30-00).
(3) Disconnect flap pushrod from torque tube assembly at each flap.
(4) Disconnect flap actuator pushrod from torque tube assembly.
(5) Remove bolt connecting torque tube halves.
(6) Remove bolt securing torque tube halves to pivot bracket.
(7) Withdraw right and left torque tube halves from inside the wing.

B. Install Torque Tube Assembly
(1) Position torque tube halves inserting pivot pin located at outer end into the bearing inside the wing.

CAUTION: ENSURE THE LONG EDGE OF THE COUPLER IS FACING TOWARDS THE WING SPAR.



Flap Control System Installation
Figure 201

(2) Secure both halves to pivot bracket using bolt, washer and nut.
(3) Install spacer and bolt, washer and nut connecting halves.
(4) Connect torque tube assembly to flap actuator pushrod.
(5) Perform flap control system inspection/check and rig system, if necessary (refer to "Inspection/Check" and "Adjustment/Test" below).

4. Flap Pushrod Removal/Installation

NOTE: Left and right flap pushrod removal/installation is analogous.

A. Remove Flap Pushrod
(1) Remove wing access plate 610 AB (510 AB)(refer to 06-30-00).

CAUTION! WHEN DISCONNECTING FLAP PUSHROD FROM FLAP HORN, EXERCISE CAUTION TO PREVENT THE FLAP FROM INADVERTENT SWINGING DOWNWARD.

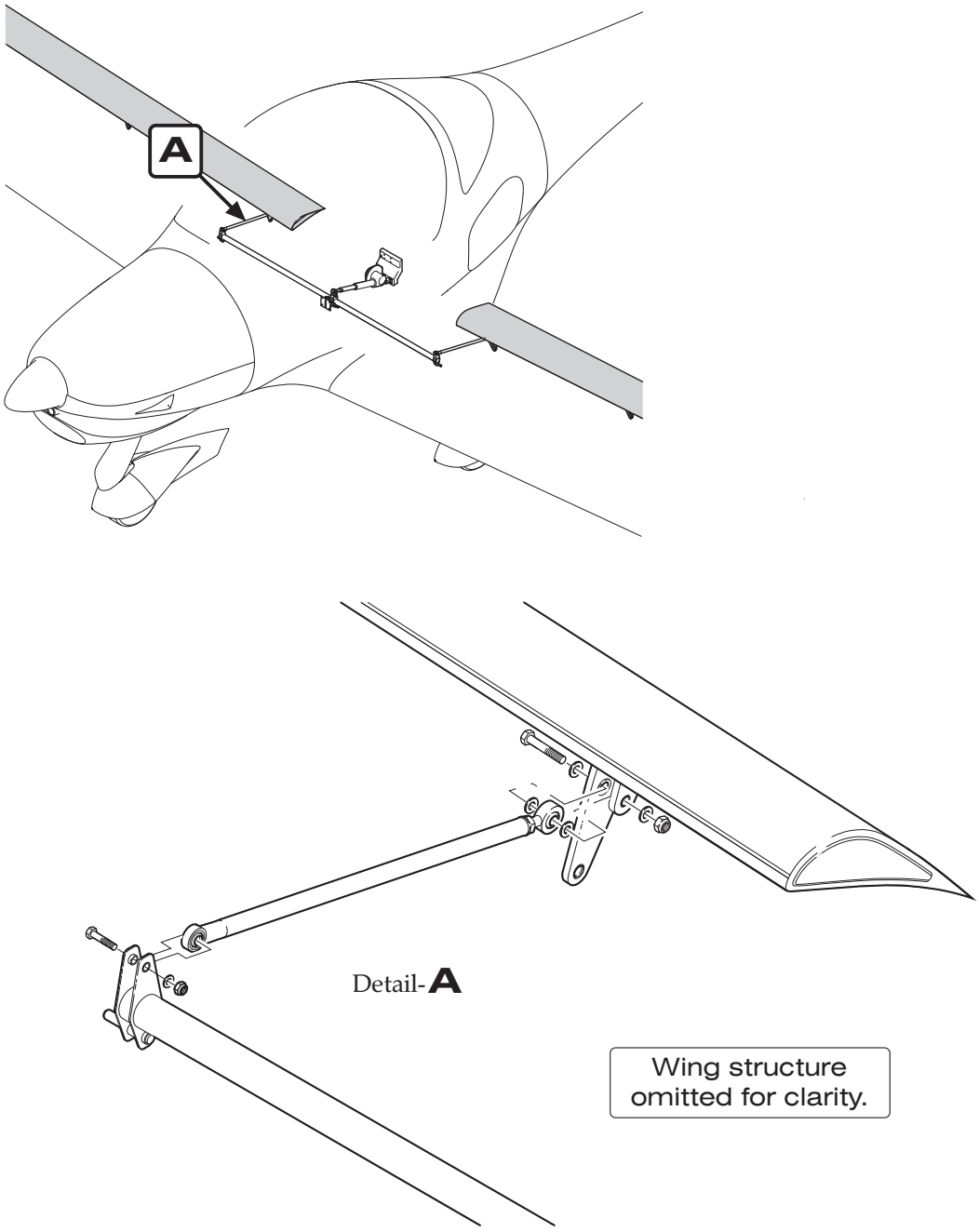
(2) Supporting the flap, disconnect flap pushrod at the flap horn.
(3) Disconnect flap pushrod from torque tube assembly and remove pushrod from wing.

B. Install Flap Pushrod
(1) Position and connect flap pushrod to torque tube assembly.
(2) Connect flap pushrod at flap horn.
(3) Re-rig flap control system and perform inspection/check (refer to "Inspection/Check" and "Adjustment/Test" below).
(4) Install all items removed for access.

5. Inspection/Check

A. Inspection/Check
(1) Prepare inspection.
(a) Remove baggage compartment floor panel.
(b) Remove fuselage access panel 210 AB (refer to 06-30-00).
(c) Remove access panel 610 AB and 510 AB (refer to 06-30-00).
(2) Inspect flap control system visually.
(a) Verify proper installation and safetying of all items in the entire flap control system.
(b) Check electrical connections.
(c) Examine limit switches for security and condition.
(d) Verify minimum rod end thread engagement of 8 mm (0.312 in.).
(e) Verify no excessive play of control surfaces at hinge pins. Check the control circuit backlash.

NOTE: The maximum permissible value of control surface play at hinge pins is 1,0 mm (0.04 in.) axial play and 0,3 mm (0.01 in.) radial play. The maximum control circuit backlash is 5 mm (0.2 in.).
In case of excessive play of the control surfaces in their hinges, replace worn hinge bushings (refer also to 57-50-00).



Flap Control System Installation
Figure 201

(3) Perform operational check of the flap control system.
  (a) Operate flaps through their full range of travel, observing for uneven travel or jumpy motion and binding.
  (b) Check correct flap full UP position. Rig if necessary (refer to "Adjustment/Test" below).
  (c) With flap full UP, fasten an inclinometer to inboard side of left flap and set to 0°.
  (d) Lower flap to T/O and then to LDG positions and check flap angles as specified in 06-10-00.
  (e) Repeat check on right flap.

  NOTE: If the results of inspection do not fall within the tolerance specified in 06-10-00, contact AQUILA Aviation for disposition.

(4) Install all items removed for access.

6. Adjustment/Test

A. Adjustment/Test
  (1) Remove access plate 210 AB (refer to 06-30-00).
  (2) With BAT switch in ON position turn flap control switch to CRUISE.
  (3) Turn BAT switch OFF.
  (4) Adjust push rod at flap actuator so that the flap torque tube assembly is in neutral position (refer to figure 201).
  (5) Adjust pushrods at each flap until the control surfaces are neutral with reference to wing trailing edge at root area.
  (6) Perform an flap control system inspection/check (refer to "Inspection/Check" above).
  (7) Install all items removed for access.

CHAPTER 34

NAVIGATION

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont.)

NAVIGATION - GENERAL

1. Introduction

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

2. General Description

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

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

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

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

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

PITOT/STATIC SYSTEM - DESCRIPTION

1. Introduction

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

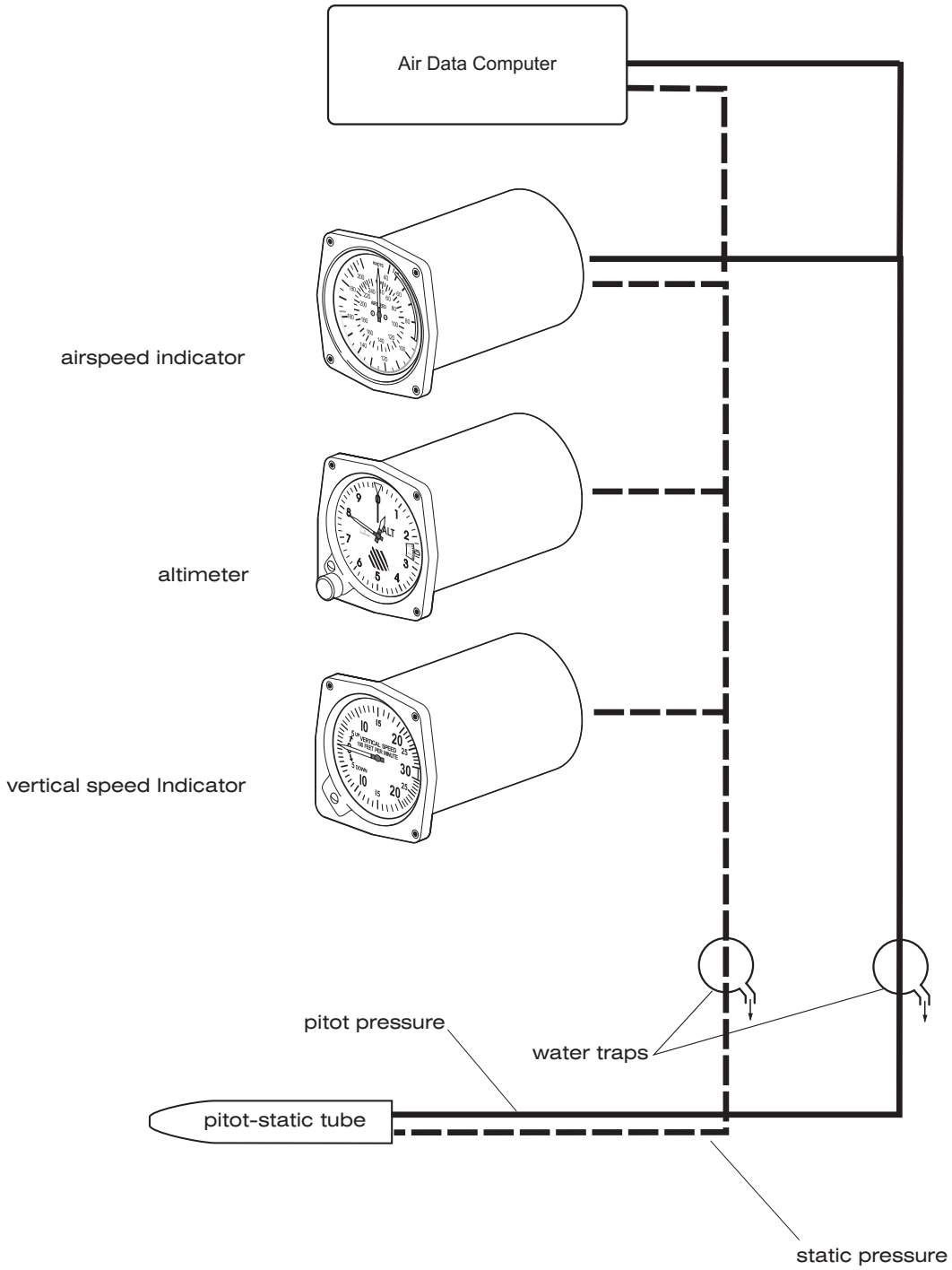
2. Description and Operation

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

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

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

NOTE: Equipment installed may vary depending on aircraft configuration.



Pitot-Static System Schematic
Figure 1

PITOT/STATIC SYSTEM - MAINTENANCE

1. General

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

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

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

2. Tools, Equipment and Material

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

3. Pitot-Static Tube Removal/Installation

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

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

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

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

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

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

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

5. Instruments Removal/Installation

A. Remove an Instrument

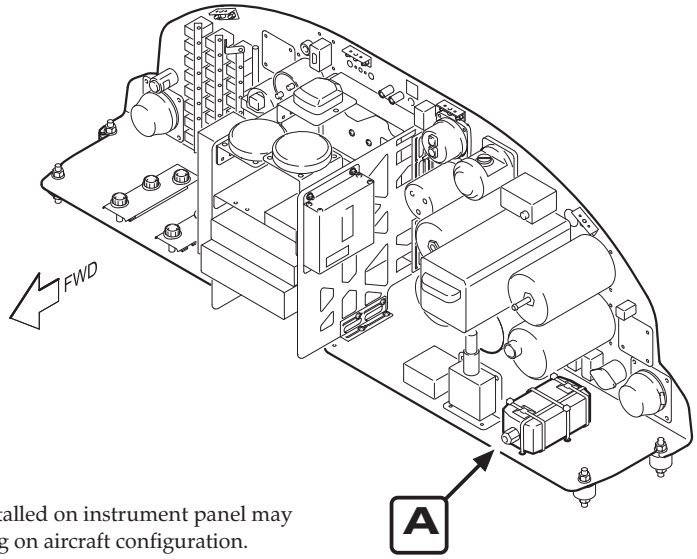
CAUTION: PLUG OR CAP INSTRUMENT PORTS IMMEDIATELY AFTER DISCONNECTING PITOT OR STATIC LINES TO PREVENT DIRT OR FOREIGN MATERIAL FROM ENTERING.

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

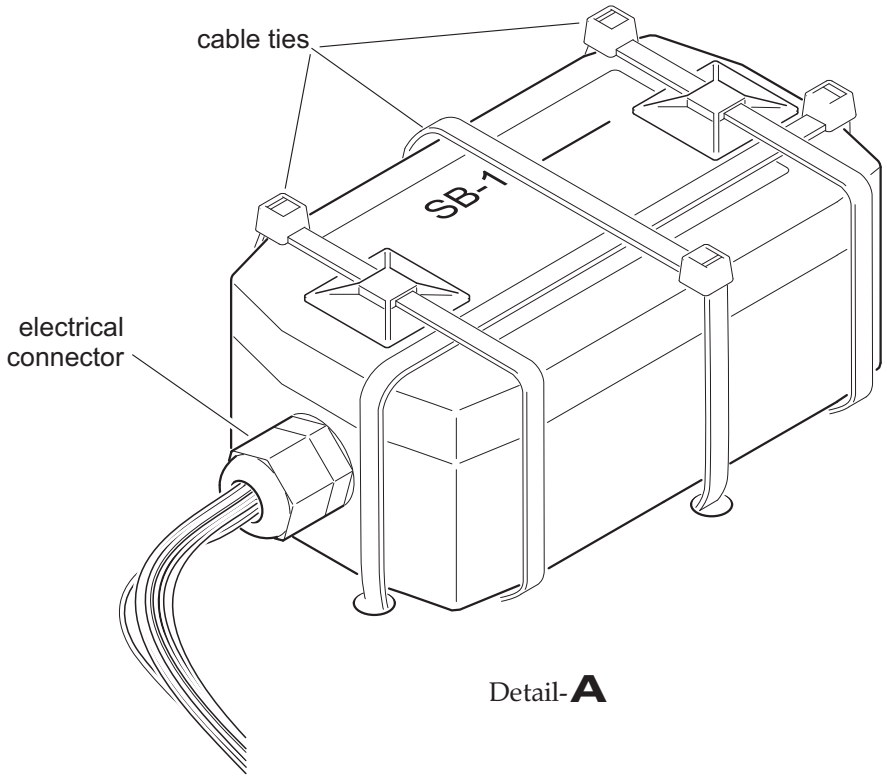
B. Install an Instrument
(1) Place instrument to instrument panel and secure with screws.
(2) Reconnect static/pitot hose to instrument.
(3) Perform a pitot-static system functional test (refer to “Inspection/Check” below).

6. Water Trap Inspection/Draining

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



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



P/S Heat Control Box
Figure 202

7. Inspection/Check

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

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

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

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

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

STALL WARNING SYSTEM - DESCRIPTION

1. Introduction

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

2. Description and Operation

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

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

STALL WARNING SYSTEM - MAINTENANCE

1. General

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

2. Transmitter Removal/Installation

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

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

3. Warning Buzzer Removal/Installation

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

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

4. Adjustment

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

ATTITUDE AND DIRECTION - MAINTENANCE

1. General

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

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

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

2. Magnetic Compass Removal/Installation

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

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

3. Turn Coordinator Removal/Installation

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

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

4. Attitude Indicator Removal/Installation

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

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

5. Directional Gyro Removal/Installation

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

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

6. Adjustment / Test

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

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

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

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

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

INTEGRATED FLIGHT SYSTEM - MAINTENANCE

1. General

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

B. Maintenance of the EFD1000 system has to be carried out in accordance with the Aspen EFD1000 and EFD500 SW v2.x Installation Manual, P/N 900-00003-001, revision Z or later and the Aspen EFD1000 and EFD500 Instructions for Continued Airworthiness, P/N 900-00012-001, revision K or later.

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

D. The operation of the Aspen EFD 1000 PFD requires the following software version:
For Aspen EFD1000 PFD software version MAP 2.x or higher.

Software-updates will be released via Service Information (SI) at www.aquila-aviation.de.
The actual software version is documented in the aircraft equipment list, located in chapter 6 of the airplane flight manual.

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

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

2. EFD Removal/Installation

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

B. Install EFD
(1) Verify electrical power to aircraft is OFF.
(2) Install 44 pin D-sub connector and tighten jacks crews until connector is fully seated.
(3) Install pitot and static lines (EFD1000 only) to back of EFD by firmly pressing the fitting until fully seated (pitot and static quick connectors are keyed and cannot be crossed).
(4) Gently pull on connector to ensure proper connection.
(5) Connect braided bonding strap to EFD with nut.
(6) Insert bottom of EFD into bracket and pivot top forward until it locks into place on bracket.
(7) Reconnect battery (refer to 24-30-00).
(8) Verify all system interfaces are functional (refer to section 10.6 of the Aspen EFD1000 and EFD500 SW v2.x Installation Manual, P/N 900-00003-001, revision Z or later) and the correct software version is installed.
(9) Verify proper bonding per section 10.1.2 of the Aspen EFD1000 and EFD500 SW v2.x Installation Manual, P/N 900-00003-001, revision Z or later.
(10) Perform a system leak test (refer to 34-11-00).

3. EFD Battery Replacement

A. Replace EFD Battery

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

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

4. Remote Sensor Module (RSM) Removal/Installation

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

B. Install RSM
(1) Verify electrical power to aircraft is OFF.
(2) Replace the O-ring on the RSM. Contact Aspen Avionics for O-ring replacement (256-00001-001).
(3) Verify RSM shim is installed between aircraft skin and RSM if required.

(4) Feed circular connector down through ½ inch hole in aircraft skin and mount RSM (vent hole faces aft) with four 8-32 non-ferrous screws. Tighten to 1,4-1,7 Nm (12-15 in.lbs).

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

(5) Connect the circular electrical connector and cable tie harness to prevent chafing and interference.
(6) Connect shield ground wire to ground stud.
(7) Seal around base and on top of four mounting screws of the RSM using a good quality electrical sealant (Sikaflex-221 or equivalent, silicone-free).
(8) Reconnect battery (refer to 24-30-00).
(9) Verify proper bonding per section 10.1.2 and perform RSM calibration per section 10.5 of the Aspen EFD1000 and EFD500 SW v2.x Installation Manual, P/N 900-00003-001, revision Z or later.
(10) Check OAT operation per section 10.6.4 and check RSM GPS operation per section 10.6.6 of the Aspen EFD1000 and EFD500 SW v2.x Installation Manual, P/N 900-00003-001, revision Z or later.

5. Configuration Module (CM) Removal/Installation

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

B. Install CM
(1) Verify electrical power to aircraft is OFF.
(2) Plug the Molex connector into the module until it clicks.
(3) Cable tie the module to the PFD wiring harness..
(4) Reconnect battery (refer to 24-30-00).
(5) Perform the installation menu unit configuration per section 10.4.5 of the Aspen EFD1000 and EFD500 SW v2.x Installation Manual, P/N 900-00003-001, revision Z or later.
(6) Perform RSM calibration per section 10.5 of the Aspen EFD1000 and EFD500 SW v2.x Installation Manual, P/N 900-00003-001, revision Z or later.

6. Inspection/Check

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

B. EFD Inspection
(1) Inspect the EFD(s) for damage and verify proper operation using the documents identified in section 1 of the Aspen EFD1000 and EFD500 Instructions for Continued Airworthiness, P/N 900-00012-001, revision K or later.
(2) Check the EFD wiring, pneumatic tubing and quick disconnects for integrity, damage, chafing or excessive wear.
(3) Check EFD braided bonding strap for proper termination at the EFD and aircraft grounding point to maintain HIRF and lightning compliance.
(4) Verify the resistance is 3 mΩ or less from EFD ground stud to airframe ground.
(5) Inspect the installation of the EFD for corrosion on the EFD and the mounting structure.
(6) Inspect the fasteners for tightness and general condition.

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

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

INTEGRATED FLIGHT SYSTEM - MAINTENANCE

1. General

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

   B. Maintenance of the G500 system has to be carried out in accordance with the Garmin G500 AML STC Installation Manual, P/N 190-01102-06, revision 8 or later and the G500 PFD/MFD System Instructions for Continued Airworthiness, P/N 190-01102-00, revision 4 or later.

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

   D. The operation of the Garmin G500 system requires the following software versions:
   - for GDU 620: software version v3.01 or higher
   - for GRS 77: software version v2.12 or higher
   - for GDC 74A: software version v3.02 or higher

   Software updates will be released via Service Information (SI) at www.aquila-aviation.de.
   The actual software version is documented in the aircraft equipment list, located in chapter 6 of the airplane flight manual.

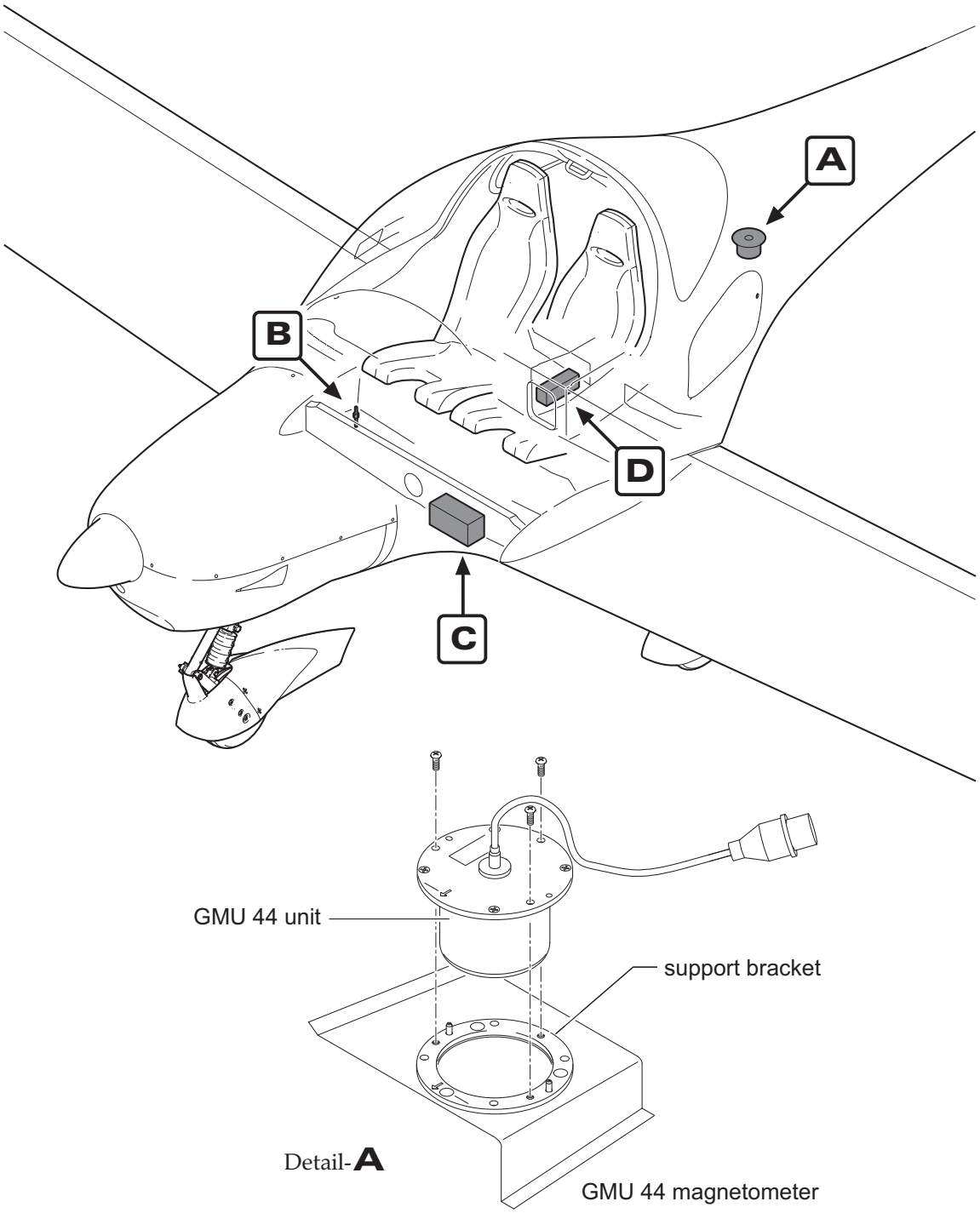
   All service information released from AQUILA and related to software versions has to be attached to this maintenance manual for continuing airworthiness!

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

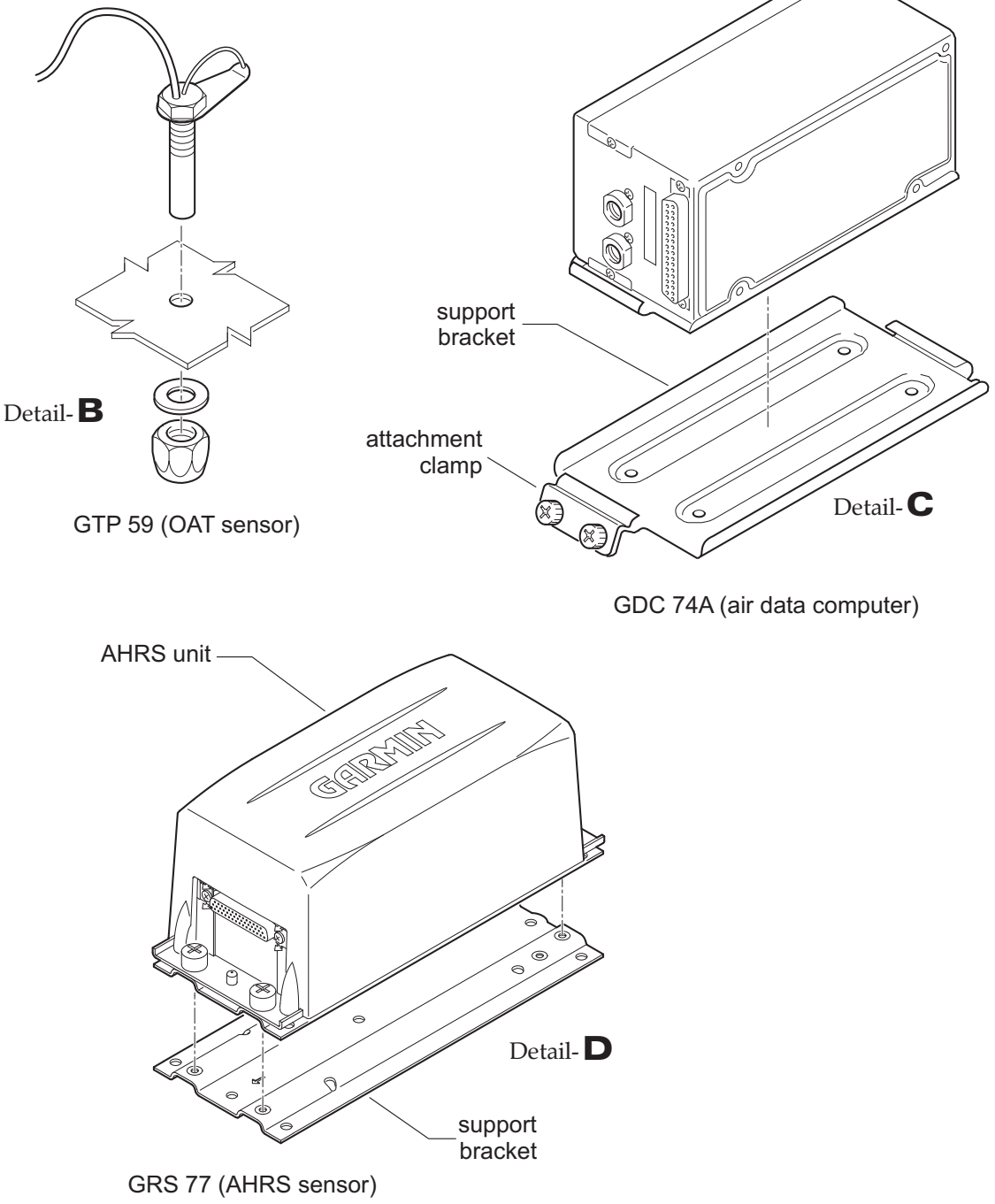
2. G500 Removal/Installation (Ref. Fig. 201)

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

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



G500 System Components
Figure 201 (1)



G500 System Components
Figure 201 (2)

3. Inspection/Check

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

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

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

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

INTEGRATED FLIGHT SYSTEM - MAINTENANCE

1. General

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

   B. Maintenance of the G500 TXi system has to be carried out in accordance with the Garmin G500 TXi Part 23 AML STC Maintenance Manual, P/N 190-01717-B1, revision 1 or later.

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

   D. The operation of the Garmin G500 TXi system requires the following software versions:
   - for GDU 1060: software version v 3.01 or higher

   Software updates will be released via Service Information (SI) at www.aquila-aviation.de.
   The actual software version is documented in the aircraft equipment list, located in chapter 6 of the airplane flight manual.

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

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

2. G500 TXi Removal/Installation

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

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

3. Inspection/Check

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

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

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

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

INTEGRATED FLIGHT SYSTEM - MAINTENANCE

1. General

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

B. Maintenance of the G3X Touch system has to be carried out in accordance with the Garmin G3X Touch EFIS Part 23 AML STC Maintenance Manual, P/N 190-02472-02, revision 4 or later.

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

D. The operation of the Garmin G3X Touch system requires the following software versions:
- for GDU 460/470: non-STC software version v8.61 or higher

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

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

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

2. G3X Removal/Installation

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

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

3. Inspection/Check

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

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

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

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

INTEGRATED FLIGHT SYSTEM - MAINTENANCE

1. General

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

   B. Maintenance of the G5 has to be carried out in accordance with the Garmin G5 Electronic Flight Instrument Part 23 AML STC Maintenance Manual, P/N 190-01112-11, revision 6 or later.

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

   D. The operation of the Garmin G5 requires the following software versions:
   - for G5 electronic flight instrument: STC software version v6.82 or higher

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

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

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

2. G5 Removal/Installation

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

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

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

3. Inspection/Check

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

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

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

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

INTEGRATED FLIGHT SYSTEM - MAINTENANCE

1. General

A. This section provides instructions necessary for authorized personnel to inspect and maintain the Sandia SAI 340 / Bendix King KI 300.

B. Maintenance of the SAI 340 has to be carried out in accordance with the Sandia SAI 340 Installation Manual, P/N 306181-00, revision 2 or later.
Maintenance of the KI 300 has to be carried out in accordance with the Bendix King KI 300 Electronic Attitude Indicator Installation Manual, P/N 89000004-101, revision 1 or later.

C. Except regular battery replacement, maintenance is "on condition" only. Refer to "Inspection/ Check" below for necessary tests or checks and the specific intervals for the SAI 340 / KI 300.

D. The operation of the SAI 340 / KI 300 requires the following software versions:
- for Sandia SAI 340: software version v18.2 or higher
- for Bendix King KI 300: software version v18.2 or higher

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

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

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

2. SAI 340 / KI 300 Removal/Installation

A. For removal/installation and configuration/testing of reinstalled or replaced SAI 340 / KI 300 units, refer to the unit installation procedures in section 3 of the SAI 340 / section 4 of the KI 300 installation manual.

3. Inspection/Check

A. Except regular battery replacement, SAI 340 / KI 300 maintenance is "on condition" only. No component-level overhaul is required the SAI 340 / KI 300. "On Condition" replacement and/or servicing should occur when an item exhibits conditions, symptoms, and/or abnormalities defined in section 4.5 of the SAI 340 / section 6 of the KI 300 installation manual .

B. Operation of the SAI 340 / KI 300 is not permitted unless an inspection as described in this section has been completed within the preceding 12 calendar months. See the following table for necessary tests or checks and the specific intervals for the SAI 340 / KI 300:

No.	Sandia SAI 340 / Bendix King KI 300	Reference	Interval	Initials
1.	Visual inspection - Complete visual inspection of all installed system and wiring harnesses must be performed to ensure continued integrity of the installation.		12 months	
2.	Pitot-static and airspeed checks - Perform an altimeter and a pitot-static and airspeed check every 24 month or when the unit is removed and reinstalled/replaced or the pitot and static system connectors are disturbed.	34-11-00 SAI 340 IM 4.4 KI 300 IM 5.4	24 months[1)]	
3.	Electrical bonding check - Perform an electrical bonding check of the SAI 340 / KI 300 in accordance with SAI 340 / KI 300 installation manual.	SAI 340 IM 2.3.9 KI 300 IM 4.3	2000h 10 years	
4.	SAI 340 / KI 300 battery - Perform full duration load test: This test performs a full-discharge cycle to ensure that proper capacity is available. A degraded or aged battery will be detected by this procedure. - This test is to be done at ambient temperature ranging from 10°C (50°F) to 26°C (90°F). The unit must be fully thermally stabilized in this range. - Ensure battery is fully charged by verifying that a charge of 100% is shown. If not, charge as follows: a) Place the aircraft on ground-power and turn the unit on. b) Allow the battery to fully charge to 100% and verify that the battery charging symbol is no longer presented. (Battery charging may continue for a short duration even though 100% is shown). - Set the display to full-intensity by pressing the rotary knob and rotating clockwise as needed. Press the knob again to dismiss the brightness menu. - Remove power to the unit by pulling the corresponding circuit breaker and cancel the power-down sequence by pressing the knob. - Note the current time and allow unit to operate for 2 hours. At the end of the 2 hour period, if the unit has shut-down, or on-screen parameters are red-X'ed, the battery must be replaced.	SAI 340 IM 4.3 KI 300 IM 5.3	24 months	
5.	SAI 340 / KI 300 battery - Replace battery if: - power-on self-test failed (red-X over on-screen battery icon) - battery fails to charge during normal operation - battery fails full-duration load test - battery pack is over 5 years old (battery installation date)	SAI 340 IM 4.3 KI 300 IM 5.3	on condition	

1) National regulation may require shorter interval.

INDEPENDENT POSITION DETERMINING – MAINTENANCE

1. General

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

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

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

2. GPS Antenna Removal/Installation

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

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

INDEPENDENT POSITION DETERMINING – MAINTENANCE

1. General

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

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

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

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

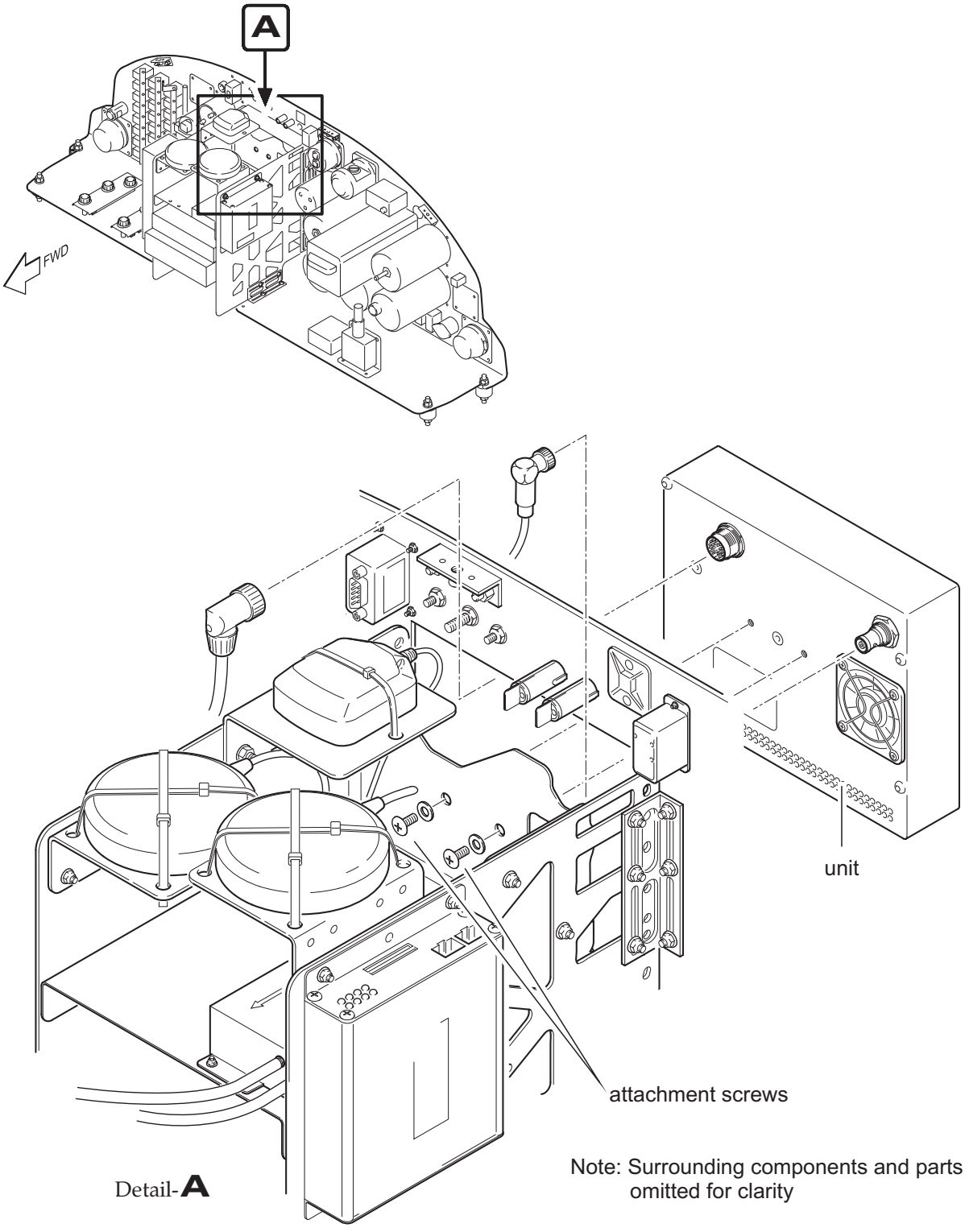
2. FlymapL Unit Removal/Installation (Ref. Fig. 201)

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

B. Install FlymapL Unit

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

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



FlymapL Unit Installation
Figure 201

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

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

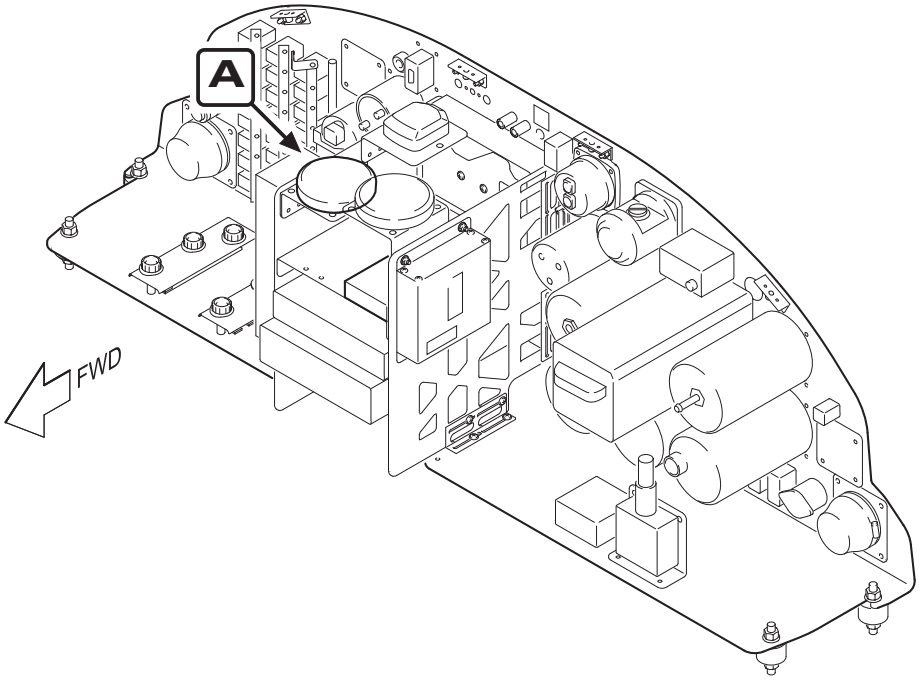
A. Remove FlymapL GPS Antenna
(1) Ensure electrical power to aircraft is OFF.
(2) Remove glare shield (refer to 31-10-00).
(3) Disconnect antenna cable from FlymapL unit and remove cable ties.
(4) Mark installation position and remove cable ties of the antenna attachment.
(5) Carefully remove antenna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

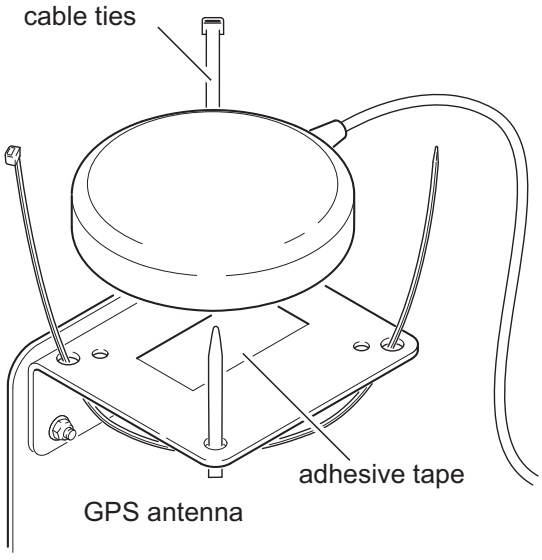
B. Install FlymapL GPS Antenna
(1) Install double-sided adhesive tape on the installation bracket of the GPS antenna and remove the protective film from the adhesive tape.
(2) Attach the antenna to the installation bracket in its correct installation position as previously marked and press it on the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

4. Inspection/Check

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

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





Detail-**A**

FlymapL GPS Antenna Installation
Figure 202

DEPENDENT POSITIONING DETERMINING - MAINTENANCE

1. General

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

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

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

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

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

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

2. Transponder Removal/Installation

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

B. Install Garmin GTX Transponder

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

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

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

3. Transponder Antenna Removal/Installation

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

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

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

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

4. Inspection/Check

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

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

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