J230-SP and J250-SP

Special Light-Sport Aircraft

Aircraft Service Manual

Publication No. JSA SM230SP-A1

Jabiru USA
Sport Aircraft, LLC

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JSA SM230SP Record of Revisions

Revision	Date	Section	Description	Signature
Original	1-April-2010	ALL	Initial Release	Jabiru USA Sport Aircraft, LLC
A1	16-May-2011	1-3, 5-9, 11-12, Appendix	Periodic Update; See Revision Summary	

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JSA SM230SP Revision Summary

Section	Pages Affected	Revision	Description	Date
ToC	All	A1	Updated Table of Contents	16-May-2011
1-7	1-6	A1	Added GRT/Garmin Combo Panel	16-May-2011
1-9	1-9	A1	Corrected air filter part number	16-May-2011
1-15	1-12	A1	Revised approved fuels—ethanol prohibited	16-May-2011
2-1	2-1	A1	Added towbar information	16-May-2011
2-7	2-8	A1	Added parking/tiedown information	16-May-2011
2-10.9	2-12	A1	Reversed steps 6 and 7	16-May-2011
2-11.1	2-13	A1	Added window buffing information	16-May-2011
2-11.3	2-14	A1	Clarified paragraph	16-May-2011
3-8.2	3-13	A1	Added horizontal stabilizer replacement	16-May-2011
3-9.2	3-13	A1	Added vertical stabilizer replacement	16-May-2011
5-7.1	5-8	A1	Added brake O-ring fluid compatibility caution	16-May-2011
5-7	5-8 to 5-10	A1	Removed owner authorization for main wheels	16-May-2011
5-11	5-21 to 5-22	A1	Removed owner authorization for nose wheel	16-May-2011
5-11.5	5-22	A1	Removed reference to brake assembly	16-May-2011
6-4	6-7 to 6-9	A1	Added flap position sensor information	16-May-2011
7-19	7-30	A1	Removed owner authorization for head torque; Changed head torque value to 20 ft-lbs	16-May-2011
8-1	8-1	A1	Updated fuel system description	16-May-2011
8-3	8-2	A1	Updated fuel vent line description	16-May-2011
8-7	8-6	A1	Added G3X information to fuel gauge description	16-May-2011
8-8	8-9 to 8-10	A1	Added fuel system schematic diagrams	16-May-2011
9-1	9-1	A1	Removed owner authorization for spinner removal; Added spinner replacement information; Added note on over-tightening spinner screws	16-May-2011
9-8.2	9-9	A1	Removed owner authorization for wood prop torque	16-May-2011
9-8.3	9-10	A1	Removed owner authorization for carbon prop clamp bolt torque	16-May-2011
11-3.3	11-2	A1	Added instructions for recharging dead battery	16-May-2011
11-10.5	11-11 to 11-12	A1	Added instructions for GRT map features update	16-May-2011
11-10.6	11-13	A1	Added text to include Garmin magnetometer	16-May-2011
11-10.8	11-15	A1	Added note on WxWorx radio static	16-May-2011
11-11	11-16	A1	Added note on WxWorx radio static	16-May-2011

Section	Pages Affected	Revision	Description	Date
11-14	11-21	A1	Added PM3000 to intercom description	16-May-2011
11-15.1	11-21	A1	Added autopilot pitch cable note	16-May-2011
12-1	12-1	A1	Added note about structural repair authorization	16-May-2011
12-3	12-2	A1	Revised structural fiberglass repair section	16-May-2011
12-4	12-4 to 12-6	A1	Added paint codes for base white	16-May-2011
7-16	7-25	A2	Added reference to rotor service bulletin, JSA-009	28-Feb-2013

JSA SM230SP-A1 List of Effective Sections

The table below shows the effective sections and dates for the most current revision of this manual. Appendices are issued and controlled separately by the Appendix Log. The revision number is found in the footer of each page after the document number. For example, Revision A1 would look like JSA SM230SP-A1. A list of affected pages is found in the Revision Summary in the front of this manual.

Section	Revision	Date
Table of Contents	A1	16-May-2011
Foreword	A0	1-April-2010
Section 1	A1	16-May-2011
Section 2	A1	16-May-2011
Section 3	A1	16-May-2011
Section 4	A0	1-April-2010
Section 5	A1	16-May-2011
Section 6	A1	16-May-2011
Section 7	A2	28-Feb-2013
Section 8	A1	16-May-2011
Section 9	A1	16-May-2011
Section 10	A0	1-April-2010
Section 11	A1	16-May-2011
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Foreword

This manual contains recommended procedures and instructions for ground handling, servicing and maintaining the Jabiru J230-SP and J250-SP Special Light-Sport Aircraft (S-LSA). This manual is provided by Jabiru USA Sport Aircraft, LLC to owners, operators, and maintenance technicians as required by the applicable ASTM standards.

The Jabiru J230-SP and J250-SP comply with the following ASTM standards for design, construction, and continued airworthiness:

- F2245— Standard Specification for Design and Performance of a Light Sport Airplane
- F2279— Standard Practice for Quality Assurance in the Manufacture of Fixed Wing Light Sport Aircraft
- F2295— Standard Practice for Continued Operational Safety Monitoring of a Light Sport Aircraft
- F2483— Standard Practice for Maintenance and the Development of Maintenance Manuals for Light Sport Aircraft

Should certification documentation need to be recovered for this aircraft, please contact the manufacturer.

This handbook includes the material required to be furnished to the owner/operator by ASTM Standard F2483. The information in this manual is based upon data available at the time of publication, and is supplemented and kept current by Service Bulletins and Air Safety Alerts published by Jabiru USA Sport Aircraft, LLC. These are posted on the Jabiru USA website www.usjabiru.com and are available through local authorized Jabiru dealers.

In addition to the information in this service manual, installation and maintenance publications are available from component manufacturers which describe disassembly, overhaul and parts breakdown of some of the various vendor equipment items. A listing of vendors, their contact information, and available user documentation is published in the Appendix of this manual.

Owner/Operator Responsibility

To maintain compliance with ASTM Standard F2295, the owner or operator of this aircraft must follow six rules that are listed below and specified in Section 5.4 of F2295. Failure to comply with these responsibilities could result in an aircraft that may be out of compliance with the ASTM standards and could lead to revocation of the aircraft airworthiness certificate. It is the owner's responsibility to become fully aware of the particular maintenance requirements and limitations applicable to the LSA airworthiness certification.

1. Each owner/operator of this aircraft shall read and comply with the maintenance and continued airworthiness information and instructions provided by the manufacturer.
2. Each owner/operator of this aircraft shall be responsible for providing the manufacturer with current contact information where the manufacturer may send the owner/operator supplemental notification bulletins.
3. The owner/operator of this aircraft shall be responsible for notifying the manufacturer of any safety of flight issue or significant service difficulty upon discovery.

4. The owner/operator of this aircraft shall be responsible for complying with all manufacturer notices of corrective action and for complying with all applicable aviation authority regulations in regard to maintaining the airworthiness of this aircraft.

5. The owner/operator of this aircraft shall ensure that any needed corrective action be completed as specified in a notice, or by the next scheduled annual inspection.

6. Should an owner not comply with any mandatory service requirement, the aircraft shall be considered not in compliance with applicable ASTM standards and may be subject to regulatory action by the presiding aviation authority.

Handbook Revisions

It is the responsibility of the owner to maintain this manual in a current status when it is being used for maintenance purposes. For the convenience of owner/operators and mechanics, the most current version of the manual is now available for download in the LSA Owners section of the Jabiru USA website, www.usjabiru.com.

A major release of the handbook is called an “Issue,” while a section release is called a “Revision.” This manual utilizes section-level revision control; revision indicators are consistent throughout an entire section, but may vary among sections as they are revised. Owner/operators and mechanics may replace the entire section or only the affected pages when updating printed manuals. Individual pages affected by revisions are listed in the Revision Summary at the front of this manual and are available for download as a batch PDF file at www.usjabiru.com.

Each page of the manual lists the document number with an issue letter and change indicator suffix. For example, “JSA SM230SP-A0” is the original release of a section in Issue A of JSA SM230SP. “JSA SM230SP-B3” is the third revision of a section in Issue B of JSA SM230SP.

Section revisions are listed on the List of Effective Sections page near the front of the manual. Appendix documents are controlled separately by the Appendix Log located immediately after the last section of the manual. Owners are responsible for keeping the List of Effective Sections, Appendix Log and the Record of Revisions updated when handbook revisions are issued. A current List of Effective Sections and the Appendix Log may be found at the Jabiru USA website, www.usjabiru.com.

Revisions to this Aircraft Service Manual are available for download on the Jabiru USA website. Revisions on paper or CD are available for a fee upon request. Distribution will include new pages for the sections that have changed, a new List of Effective Sections or Appendix Log, and any necessary instructions. Revisions should be examined immediately upon receipt and incorporated into this handbook per the instruction provided. Owners should contact Jabiru USA whenever the revision status of their service manual is in question.

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Section 1: General Description

1-1 Aircraft Description

The Jabiru J230-SP and J250-SP aircraft described in this manual are 2-seat, high-wing aircraft of fiberglass composite monocoque construction. Each model is equipped with fixed tricycle landing gear. The main gear is composite construction. The steerable nose gear is a welded metal, trailing link assembly with rubber springs.

Each aircraft is equipped with one Jabiru 6-cylinder 4-stroke engine driving a Sensenich wooden fixed-pitch propeller or a Sensenich carbon fiber ground-adjustable propeller.

1-2 Aircraft Specifications

	J230-SP	J250-SP
Engine	Jabiru 3300 120 HP	
Standard Propeller	Sensenich Wood	
Height	7' 10"	
Length	21' 5"	
Width (tail plane)	7' 10"	
Cabin Width Hip	44"	
Elbow	44.9"	
Shoulder	43.4"	
Wing Span	32' 5”	30 ft
Wing Chord	39"	48”
Wing Area	105 sq. ft.	120 sq. ft.
Wing Load @	12.5 lbs/sq. ft.	11.0 lbs/sq. ft.
Aspect Ratio	9.5:1	7.5:1
Empty Weight	800 lbs	840 lbs
Gross Weight	1320 lbs	
Useable Load	520 lbs	480 lbs
Structural Loading	+4.0G -2.0G	
Usable Fuel	35.4 gal.	36 gal.
Range	800 nm	
Endurance	6.5 hours with reserve	
Fuel Consumption @ Cruise	4.5 – 5.5 gallons/hour	

Table 1-1: J230-SP / J250-SP Specifications

1-3 Three-View Drawings

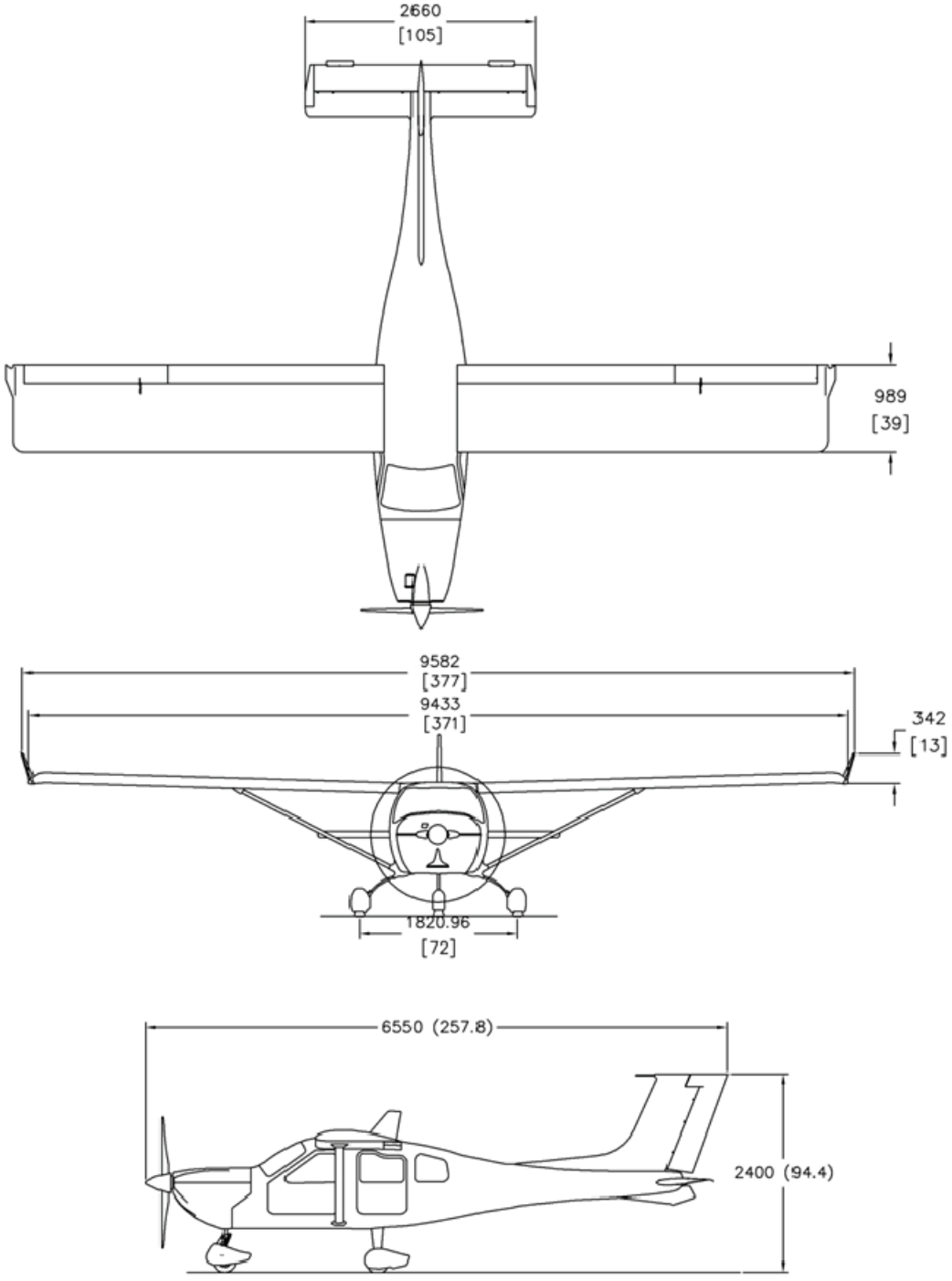

Figure 1-1: Three View Drawing, J230-SP

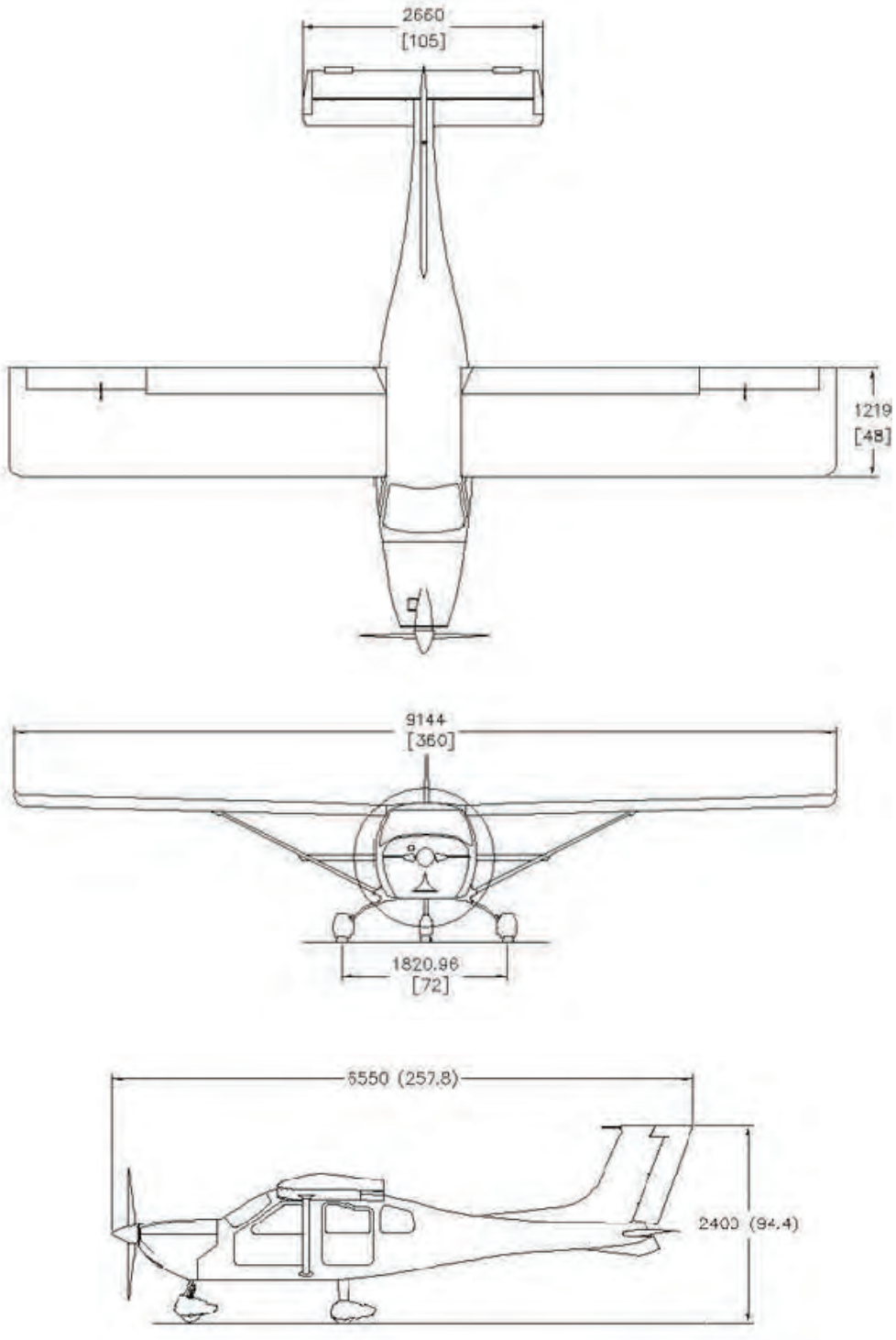

Figure 1-2: Three View Drawing, J250-SP

1-4 Engine Specifications

Manufacturer.....Jabiru Aircraft Pty, Ltd, Aero Engines Division

Type.....3300A Air Cooled

Power Rating.....112 hp @ 2850 RPM

.....120 hp @ 3300 RPM

Torque.....228 ft lb @ 2500 RPM

Displacement.....3300 cc / 202 cu. in.

Rotation.....Clockwise when viewed from aft end of engine

Prop Hub, wood propeller.....SAE 1 -- 4.375 inch radius bolt pattern

Prop Hub, carbon propeller.....4.0 inch radius bolt pattern

1-5 Weight & Balance Information

The JABIRU is a very light aircraft. The installation of equipment may significantly alter the center of gravity of the aircraft. Therefore, all proposed fixed installations must be approved by Jabiru USA Sport Aircraft, LLC. Refer to Section 2 of this manual for weighing procedure and Section 4 of the Pilot's Operating Handbook for center of gravity calculation instructions and limitations.

J230-SP

Datum.....Leading Edge of Wing

Most Forward C.G. Location.....3.89 inches aft of datum

Most Aft C.G. Location.....11.10 inches aft of datum

J250-SP

Datum.....Leading Edge of Wing

Most Forward C.G. Location.....6.89 inches aft of datum

Most Aft C.G. Location.....13.30 inches aft of datum

1-6 Tire Inflation Pressures

Standard Mains.....35-40 PSI

Nose.....25 PSI

1-7 Equipment List

The following is a list of all available equipment that affects aircraft weight and balance. Each aircraft is equipped with one of the four instrument panel packages and may include upgrades or substitutions listed in the Panel Upgrades section of Table 1-2.

S– Standard on all aircraft

O– Optional equipment on all aircraft

S/O– Standard on some aircraft— see note in parentheses

S	**Instrument Panel Package "0"**
	3 1/8" Airspeed Indicator
	3 1/8" Altimeter
	3 1/8" Vertical Speed Indicator
	3 1/8" Pictorial Pilot Turn & Bank
	EIS 6000 Engine Monitor
	Garmin SL40 Com Radio
	PM1000II Intercom

O	**Instrument Panel Package "1"**
	GRT Sport EFIS PFD
	EIS 6000 Engine Monitor
	Garmin SL40 Com Radio
	Garmin GTX327 Mode C Transponder
	PM1000II Intercom
	2 1/4" Airspeed Indicator

O	**Instrument Panel Package "2"**
	Dual GRT Sport EFIS displays (PFD and MFD)
	EIS 6000 Engine Monitor
	Garmin SL40 Com Radio
	Garmin GTX327 Mode C Transponder
	PM1000II Intercom
	2 1/4" Airspeed Indicator

1-7 Equipment List (continued)

O	**Instrument Panel Package "3"**
	Dual GRT Sport EFIS Displays (PFD and MFD)
	EIS 6000 Engine Monitor
	XM Weather (WxWorx)
	Garmin SL30 Nav/Com Radio
	Garmin GTX330 Mode S Transponder
	PM1000II Intercom
	2 1/4" Airspeed Indicator

O	**Instrument Panel Package "G2" Garmin G3X**
	Garmin GDU370 PFD
	Garmin GDU375 MFD with Internal XM Weather
	PM3000 Intercom
	Garmin SL30 Nav/Com
	Garmin GTX330 Mode S Transponder
	2 1/4" Airspeed Indicator

O	**Instrument Panel "4" Combo Panel**
	Grand Rapids 8.4" SuperSport PFD
	Garmin GDU375 MFD with Internal XM Weather
	PM3000 Intercom
	Garmin SL30 Nav/Com
	Garmin GTX330 Mode S Transponder
	2 1/4" Airspeed Indicator

	Instrument Panel Upgrades
O	Garmin 696 Swivel Mount
O	Garmin GTX327 Transponder (upgrade for Panel 0 only)
O	Garmin GTX330 Transponder (replaces GTX327 in Panel 1 or 2)
O	TruTrak Altrak Pitch-Only Autopilot
O	TruTrak Digiflight IIG Two-Axis Autopilot
O	Garmin SL30 Nav/Com (replaces SL40 in Panel 0, 1 or 2)
O	Grand Rapids GRT Sport SX EFIS unit (replaces GRT Sport)

	Airframe Equipment Options and Upgrades
S	Ameri-King AK-450 ELT w/ Panel Remote (2008 and older aircraft)
S/O	Kannad 406 MHz ELT w/ Panel Remote (2009 and newer aircraft)
S	12V Accessory Charging Outlet
S	Music Input Jack
O	GS-Air Wingtip Nav/Strobe Lighting Package with strut-mounted recognition light
O	AeroLED Pulsar Wingtip Nav/Strobe LED Lighting Package
O	Wing-Mounted AeroLED MicroSun LED Landing Light
S	Straight Control Stick (standard on 2008 and older aircraft)
S/O	Y-Control Stick (aircraft with new style center console only)
O	Adjustable Rudder Pedals
S	Matco Wheels and Brakes
S	Tinted Windshield
O	Clear Windshield

	Exterior Paint and Fairings
S	Wheel Pants
S	Wing Strut Fairings (upper and lower)
S	Wing Root Fairings
S	Ventral Fairing (rear tie-down anchor)
S	Standard Paint—White base with two horizontal stripes of same color
O	Paint Scheme 1— White base, two horizontal stripes, two colors
O	Paint Scheme 2— White base, up to three colors on belly and tips w/ accent striping

	Interior Amenities and Safety Equipment
S	Cabin Heat
S	Fully-Carpeted Interior
S	Cloth Interior Package
O	Vinyl Interior Package
O	Leather Interior Package
S	Three-point safety harness, pilot and passenger
O	Oxygen Bottle Mount
O	Fire Extinguisher

	Powerplant and Accessories
S	Jabiru Aircraft PTY LTD 3300A six-cylinder engine with Bing 64 carburetor
S	Carburetor Heat
S	Six EGT probes
S	Six CHT probes
S	Sensenich Wood Propeller, painted white or varnished (see Section 9 for approved diameter/pitch options)
S/O	Sensenich Fiberglass Sheathed Wood Propeller (standard 2010 and newer)
O	Sensenich Ground-Adjustable Carbon Propeller
S/O	Aluminum Spinner (standard on most aircraft built after 2005)
S/O	Fiberglass Spinner (standard on some early J250s)
O	Tanis Engine Heater
S/O	External Power Booster Plug (all J230s, some late J250s)
S	Odyssey PC625 Sealed Dry-Cell Battery
S/O	Fuel Pressure Sender (discontinued in 2009)
S/O	Fuel Flow Sender (2009 and newer– Replaces Fuel Pressure Sender)

Table 1-2: Standard and Optional Equipment

1-8 Sources to Purchase Parts

All airframe and engine parts are available from any Jabiru USA full service distributor. As of this printing those distributors are:

Jabiru USA Sport Aircraft, LLC
2842 Highway 231 N
Shelbyville, TN 37160
(931) 680-2800
www.usjabiru.com

Jabiru Pacific, LLC
255 W. Fallbrook, Ste 202B
Fresno, CA 93711
(559) 431-1701
www.jabirupacific.com

1-9 Disposable Replacement Parts

Some disposable airframe and engine parts can be sourced from automotive parts and other local retail stores. Items marked with an asterisk (*) may be difficult to find locally but are readily available from Jabiru USA Sport Aircraft, LLC.

Part	Manufacturer	Part #
Air Filter	NAPA	6016
	K&N	33-2031-2
Fuel Filter	Fram	G1
Oil Filter	NAPA Gold	1394
Spark Plug	NGK	D9EA
Distributor Cap*	Bosch	GB74
Rotor*	Bosch	GB73
Voltage Regulator	Kubota	RP501-7211
Tire, Main	Various	5.00 x 5 Ribbed Six Ply Aircraft Tires
Tire, Nose*	Trelleborg or equivalent	13x5.00-6, 6-ply
Inner Tube, Main	Michelin or equivalent	092-308-0 (Michelin) 500-5, TR67A 90° valve stem
Inner Tube, Nose*	Toptyres or equivalent	13x5.00-6, TR87 90° valve stem (short)

Table 1-3: List of Disposable Replacement Parts

1-10 Approved Oils and Capacities

Oils developed and branded for use in air-cooled aircraft piston engines which conform to the requirements of SAE J-1899 (formerly MIL-L-22851D), Textron Lycoming Specification No. 301F, or Teledyne-Continental Motors MHS-24B are approved.

Oils meeting these requirements include, but are not limited to, AeroShell W100 and AeroShell part synthetic 15W-50, **with Aeroshell 15W-50 being the preferred oil**. Aeroshell 15W-50 is the recommended oil for all temperatures after the initial break-in period.

Oil additives of any type are NOT recommended for use in Jabiru aircraft engines.

▽ ***CAUTION:*** ***DO NOT USE oil or additives containing LinKite, as this will damage the engine and void the engine warranty.***

Oil Sump Capacity ..... 3.7 US Quarts

1-11 Recommended Fastener Torque Values

Bolt Size	Torque (inch-lb)
AN3	20 - 25 (2 ft-lb)
AN4	50 - 70 (4-5 ft-lb)
AN5	100 – 140 (8-12 ft-lb)
AN6 Propeller	180 – 228 (17-19 ft-lb)

Table 1-4: Torque Values

A. These values relate only to steel nuts on oil-free cadmium plated threads.

B. For Engine Bolt Torque Values see Engine Instruction & Maintenance Manual.

C. Except where other values are specified, the above values are recommended for all installation procedures contained in this manual.

1-12 General Safety Information

Safety information will be maintained by Jabiru USA Sport Aircraft, LLC and will be made available to interested parties.

1-13 Reporting Safety of Flight or Service Difficulties

Report any maintenance difficulty or safety of flight concerns to Jabiru USA Sport Aircraft, LLC on form JSA501, *Malfunction or Defect Report*, found in the Appendix of this manual. The form may be downloaded online at www.usjabiru.com in the LSA Owners Info section.

1-14 Extreme Climatic Conditions

A. Dust inducted into the carburetor air intake system is probably the greatest single cause of early engine wear. When operating under high dust conditions, the carburetor air filters should be serviced daily as outlined in Section 7-11.

B. In saltwater areas, special care should be taken to keep the engine and accessories clean to prevent oxidization.

C. In humid areas, fuel should be checked frequently and drained of condensed moisture.

D. The maximum ambient outside air temperature for aircraft operation is 104°F.

1-14.1 Cold Weather Engine Operation

Before starting engine in temperatures below 32°F, preheating is recommended. A warm air source should be directed through the rear opening in the lower cowling to warm the carburetor, intake manifold, and engine oil sump.

Once the intake area is sufficiently warm, start engine using the Cold Engine Start procedure found in the Pilot's Operating Handbook. LET ENGINE WARM ITSELF to normal operating oil temperature and CHT with not more than 1200 rpm.

Installation and use of a Tanis® engine heater is recommended for frequent operation in cold weather. They are available through Jabiru USA Sport Aircraft.

▽ ***CAUTION:*** ***Use caution when preheating engine to avoid directing extremely hot air onto SCAT hoses, cowling skins, or other materials that may be damaged by heat.***

1-15 Approved Fuels

The recommended fuel for Jabiru S-LSA aircraft is 100LL. Approved fuels are limited to 100LL aviation gasoline or fresh automotive gasoline (MOGAS) of 93 octane and higher. The Jabiru is a high-compression engine which may be damaged by detonation of low-octane or degraded fuel. Jabiru has not tested and does not recommend use of any fuel additives, including octane boost or stabilizers.

Use of ethanol or other alcohol-based additives is prohibited in all Jabiru aircraft manufactured by Jabiru USA Sport Aircraft. See Service Bulletin JSA-006 for more information.

▽ ***WARNING:*** ***Gasoline with an octane rating of less than 91 may cause engine damage due to detonation.***

▽ ***WARNING:*** ***Auto fuel degrades quickly with age. Use of auto fuel more than 60 days old may damage engine and fuel system.***

♦ ***CAUTION:*** ***Use of any unauthorized fuel additives will void the engine and aircraft warranty.***

Section 2: General Care & Inspection

2-1 Ground Handling

The Jabiru aircraft is very light and should always be moved by hand. Press down lightly on the joint between the rear fuselage and the horizontal and vertical stabilizers to raise the nose wheel. When the nose wheel is not touching the ground, the aircraft may be pivoted on the main wheels and pushed in any direction. Use the wing struts, prop hub or inboard leading edge of the horizontal stabilizer as push points. The aircraft may be moved from the front by placing the propeller in the horizontal position and then placing one hand on the propeller on either side of the spinner. The aircraft can then be pulled forward and nose wheel lifted off the ground if necessary. See figure 2-1 for approved push-pull points.

Jabiru USA offers a towbar kit which utilizes a Bogi-Bar towbar and pins that screw into the existing nose pant/nose fork hold down screws on most Jabiru aircraft. Contact Jabiru USA for more information.

WARNING!

- ***Do not use control surfaces to move the aircraft, as damage to the control system may result.***
- ***Do not push on the tips of the propeller, as damage may result.***
- ***When moving the aircraft, never turn the nose wheel more than 15 degrees either side of center or nose gear may be damaged.***
- ***Always remember the rudder is connected to the nose gear. Keep hands clear of the rudder hinge line during ground handling or pinched fingers may result.***
- ***Never move the propeller when the engine is hot, as it may fire unexpectedly and result in severe injury.***
- ***Always ensure that the Master and Ignition switches are OFF before touching the propeller.***
- ***Never approach the propeller when anyone is in the aircraft.***
- ***Always treat the propeller as LIVE!***

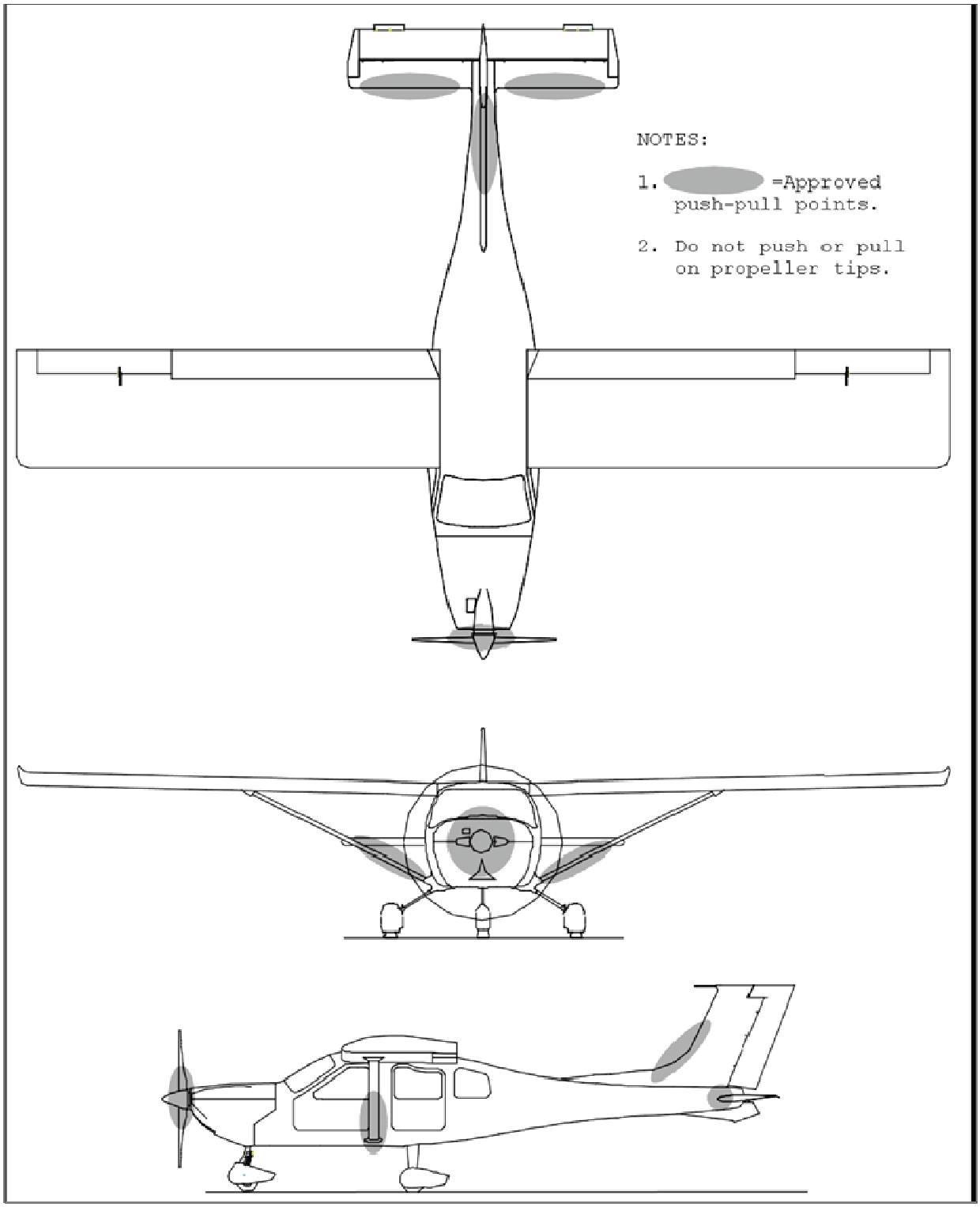

Figure 2-1: Approved Push-Pull Areas

2-2 Jacking the Aircraft

The easiest way to jack the aircraft for access to the main wheels is to lift up on the wing spar, just outboard of the wing strut attach point (NOT at the wing tip). The procedure used at Jabiru USA is as follows:

1. Empty the aircraft of excess cargo to make the lift easier. Shut off main fuel valves to avoid fuel cross-feeding out of the wing to be jacked.

2. Find an engine hoist with enough height to raise the wing a few inches. Make a flat lifting platform to fit securely to the tip of the hoist arm. The platform used at JSA is made from 3/4" plywood and straddles the top of the hoist arm, as shown in Figure 2-2. The platform should be wide enough to distribute the weight of the aircraft across about 2 square feet of wing surface.

3. Pad the platform with a folded shipping blanket, piece of carpet, or other soft material. Place the hoist into position under the wing tip and raise it so the platform lifts the wing underneath the spar, just outboard of the wing strut attach point. The hoist needs to point toward the fuselage as shown in Figure 2-3 so the platform can remain squarely under the wing and pivot with the wing undersurface as it tilts upward.

4. Raise the aircraft up as necessary for the job to be performed. For longer-term repairs involving removal of the main gear legs, the fuselage may be blocked up with a padded sawhorse or crate (minimum 24 square inches of surface area) under the lower wing strut carry-through beam and under the tail boom.

5. Lower the hoist to lower the aircraft back down.

Figure 2-2: Plywood Jacking Platform on Engine Hoist

Figure 2-3: Jacking Aircraft with Engine Hoist

2-3 Jacking Nose Gear

1. Place a cushion on the floor under the ventral fin.
2. Press down on the root of the horizontal stabilizer until nose gear is off the ground and set the rear fuselage down gently on the cushion.
3. Weigh down the inboard half of the horizontal stabilizer with a sandbag or similarly heavy and cushioned material. The aircraft should remain in a three-point stance without much added weight.

▽ ***CAUTION: Do not press or lift on the control surfaces. Damage to the control surface or control system may result.***

2-4 Hoisting

This procedure should not be necessary for most service or maintenance procedures. Should hoisting be necessary:

1. Drain fuel from both wings & remove wings. See Sections 8-8 and 4-1.
2. Fit shackles to the four wing support brackets.
3. Fit cables/rope to shackles and to a center lift shackle.
4. Hoist only from this point ensuring that cables/ropes do not damage the top of the fuselage at corners above wing support brackets.

2-5 Leveling

1. Place a spirit level on the trim control lever decal and make adjustments as necessary to level the aircraft in the longitudinal direction.

2. Place a spirit level across the fuselage between the door sills (use blocking of equal height on each side to clear seats and obstructions) and make adjustments as necessary to level the aircraft in the lateral direction.

2-6 Weighing the Aircraft

Tools Required	3 aircraft weighing scales, spirit level, plumb bob, tape measure
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	Owner, A&P, LSA R/M

2-6.1 Preparation

1. Thoroughly clean aircraft and remove all baggage, tools, and personal items.

2. Drain all fuel.

3. Confirm that oil level is full.

4. Inflate tires to recommended operating pressures.

5. Raise flaps to the fully retracted position.

6. Place all control surfaces in neutral position.

Weighing Point	Scale Reading (lbs)	- Tare (lbs)	= Net Weight (lbs)	x Arm (in.)	= Moment
L Main					
R Main					
Nose					
Total As Weighed					

Table 2-1: Aircraft Empty Weight and Moment Determination

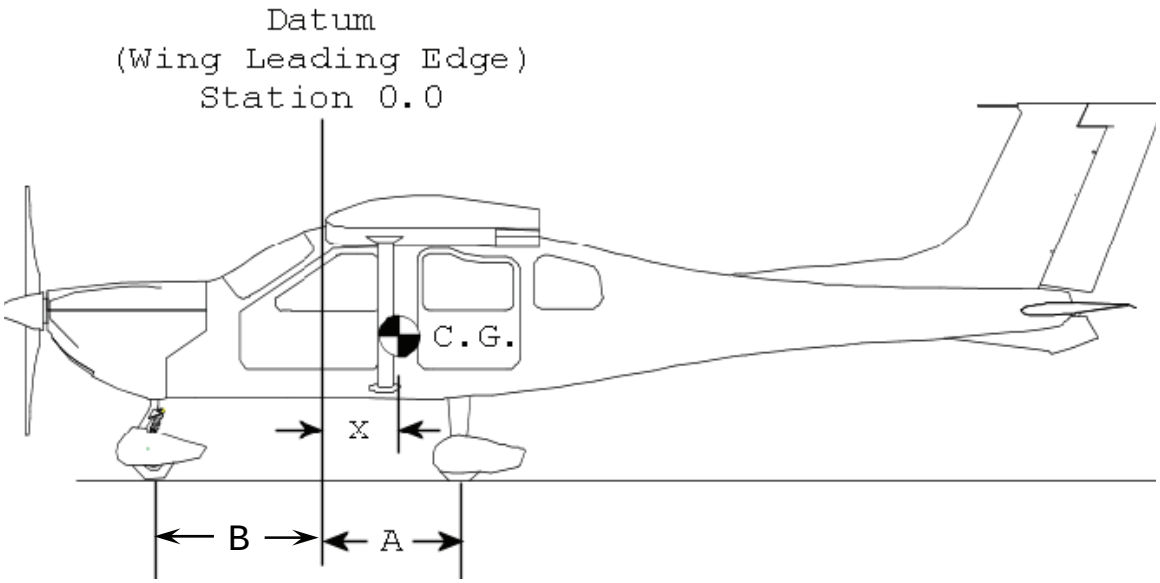

Figure 2-4: Aircraft Moment Arm Measurements

2-6.2 Weighing Aircraft

1. Place scales under each wheel.
2. Level aircraft as described in Section 2-5.
3. With the airplane level and brakes released, record the weight shown on each scale in the appropriate places on Table 2-1. Deduct the tare, if any, from each reading.

2-6.4 Determine Moment Arms

Refer to Figure 2-4. To find empty moment of aircraft, measure distance from datum (wing leading edge) to center of wheel axles while the aircraft is level.

1. Measure from the center of each main wheel axle to a plumb bob dropped from the wing leading edge to obtain Distance A. Measurement must be parallel to aircraft centerline.
2. Measure from the plumb bob to the center of the nose wheel axle to obtain Distance B, keeping measurement parallel to aircraft centerline.
3. Record the measurements in Table 2-1.
4. To find the moments of the weighing points, multiply net weight by the arm of each weighing point. Add all weights to calculate Basic Empty Weight of aircraft. Add all moments to find Empty Moment of aircraft. To find empty Center of Gravity (CG), divide the Total Moment by the Basic Empty Weight.

2-6.5 Aircraft Empty Weight Record

Use Table 2-2 to maintain a continuous history of changes and modifications to the aircraft structure or equipment affecting weight and balance.

Airframe Serial No:			Registration No:				Page ____ of ____	
Date	Item		Description of Item, Modification or Repair	Change in Weight and Moment			Running Basic Empty Weight and Moment	
	In	Out		WT (lbs)	Arm (in)	MOM /1000	WT (lbs)	MOM /1000

Table 2-2: Aircraft Empty Weight Record

2-7 Parking and Tie-Down

Parking precautions depend principally on local conditions.

1. When mooring the aircraft in the open, head into wind if possible and set the parking brake. The ailerons may be secured by tying the control yoke to one side with a seat belt.
2. Attach ropes to the tie down rings on each wing strut. If the tie down rings are too small for the available ropes, a high-quality carabineer or D-ring may be installed through the ring to provide a wider opening for the rope. Secure the opposite end of the ropes to ground anchors located at approximately 30 degrees to the vertical, outboard of the top wing attachment point. Ensure that the ropes have sufficient slack to not strain the wing attachments should a tire deflate while the aircraft is tied down.
3. Tie a third rope to the tail tie-down hole in the ventral fin and secure to ground anchor.
4. To keep rain water, animals and curious onlookers out of the aircraft, always use a Jabiru USA/Bruce's Custom Covers aircraft cabin cover and close all fresh air vents when parking the aircraft outside. Make sure the cover's under-wing straps are snugged-up tight to seal the wing roots from rainwater entry. Cowl, pitot/static and fuel vent plug cover sets are also available from Jabiru USA and recommended for outdoor tie-down.

2-8 Storage

2-8.1 Placing Aircraft in Flyable Storage

Flyable storage is defined as a maximum of 30 days non-operational storage.

1. Ensure that the engine has been stopped by turning off the fuel valve and running the engine until it quits to remove the fuel from the carburetor bowl. **Remember to turn OFF the Master and Ignition switches.**

2. Every 7th day the propeller should be rotated through 5 revolutions, without running the engine. Leave the propeller in the horizontal position to ensure even distribution of moisture in the wood. If left in the vertical position, moisture will drain to the lower tip resulting in an unbalanced propeller.
3. In ideal conditions, the aircraft should be stored away from direct sunlight. At a minimum, the cabin area should be covered with a cotton-lined canvas cover. Fitted J230 and J250 covers are available through Jabiru USA Sport Aircraft, LLC. DO NOT use a tarp or unlined canvas cover, as these may scratch the windows.
4. In addition, the pitot tube, static vent, air vents, openings in the engine cowl and other similar openings should have protective covers fitted to prevent entry of water, foreign materials and insects (especially wasps). Cover fuel vents for protection, but do not seal completely, as the system must be allowed to breathe. Cowl plug and cover sets are available through Jabiru USA Sport Aircraft, LLC.

2-8.2 Returning Aircraft to Service after Flyable Storage

After flyable storage, returning the aircraft to service is accomplished by performing a thorough pre-flight inspection. Ensure all protective covers are removed.

2-8.3 Temporary or Indefinite Storage

Temporary storage is defined as aircraft in non-operational status for a maximum of 90 days; any storage period over 90 days is considered indefinite storage. Treat as for flyable storage (see Paragraph 2-8.1), plus:

1. For temporary storage, fill fuel tank with 100LL aviation fuel to prevent moisture accumulation. DO NOT store aircraft for any length of time with auto fuel of any grade in the tanks, as fuel degradation may occur, causing engine damage when aircraft is removed from storage.
2. For indefinite storage, drain fuel tanks and ensure carburetor bowl is empty by running engine with fuel valve off until it stops, or by draining carburetor bowl.
3. Clean aircraft thoroughly.
4. Clean any dirt, oil or grease from tires and coat tires with a tire preservative. Cover tires to protect against dirt and oil.
5. Either block up undercarriage/fuselage to relieve pressure on tires or rotate wheels every 30 days to prevent flat spotting the tires.
6. Remove battery and store in a cool dry place. Charge as required or place on a battery maintainer. NOTE: It is recommended that a battery which is not used should be charged every 30 days.
7. Disconnect spark plug leads and remove spark plugs from each cylinder. Using an oil can or spray atomizer, spray preservative oil through a spark plug hole of each cylinder with the piston in the down position. NOTE: Use AeroShell fluid 2UN (MIL-C-6529C Type 1) or similar engine corrosion inhibitor.
8. *CAUTION: Ensure that the Master and Ignition Switches are OFF!* Rotate the propeller 10 – 12 times, leaving it in the horizontal position.
9. Install spark plugs and connect leads.
10. Seal exhaust pipes. Attach a red streamer to each. DO NOT seal fuel tank vents. Cover the vents to prevent bugs and dirt from accumulating, but still allow the system to breathe.
11. Place protective covers over pitot tube, static source vents, air vents and openings in engine cowl to prevent the entry of foreign material or insects (especially wasps).
12. Attach a warning placard to the propeller stating that vents and breathers have been sealed. The engine must not be started with the seals in place.
13. Every 7 days the propeller should be rotated. *CAUTION: Ensure that the Master and Ignition Switches are OFF!*

2-8.4 Inspection During Temporary or Indefinite Storage

1. Generally inspect airframe and clean as necessary.
2. Inspect the interior of at least one cylinder through the spark plug hole for corrosion at least once a month.
3. At the end of an initial 90 day temporary storage period, if the aircraft is to be continued in non-operational storage, repeat the process in Paragraph 2-8.2 (most will only need to be checked).

2-8.5 Returning the Aircraft to Service after Temporary or Indefinite Storage

After temporary storage, the procedures for returning the aircraft to service are as follows:

1. Remove aircraft from blocks and check tires for proper inflation.
2. Check battery, charge if needed, and install.
3. Check carburetor air filter and service if necessary.
4. Remove materials used to cover openings.
5. Remove warning placard from propeller.
6. Remove, clean and gap spark plugs.
7. While spark plugs are removed, rotate propeller several revolutions to clear excess preservative oil from cylinders.
8. Install spark plugs – torque to 8 ft-lbs or 96 in-lbs.
9. Check fuel filter – replace if necessary.
10. Check brake fluid level.
11. If returning to service after indefinite storage, fill fuel tanks with correct grade of fresh fuel.
12. Check fuel tank and fuel lines for moisture and sediment. Drain enough fuel to eliminate any moisture and sediment.
13. Check fuel tank vents are clear.
14. Perform a thorough pre-flight inspection.
15. Start and warm engine.

2-9 Inspection Intervals

Refer to Jabiru J230-SP/J250-SP S-LSA Maintenance Schedule, found in the Appendix of this manual, for detailed schedule of service and inspections. All 25, 50-hour, 100-hour and Annual inspections must follow the guidelines set in the appropriate maintenance checklists (Doc. No. JSA-50HR, JSA-100HR) also found in the Appendix of this manual.

The Engine Instruction Manual also details engine inspection schedules and should be consulted in addition to this manual.

2-10 General Inspection Guidelines

2-10.1 Moveable Parts

Inspect for adequate lubrication, security of attachments, binding, excessive wear, safety, proper operation, proper adjustment, correct travel, cracked fittings, security of hinges, defective bearings, cleanliness, corrosion, deformation, sealing and tension.

2-10.2 Fluid Lines and Hoses

Check for leaks, cracks, kinks, chafing, proper radius, security, corrosion, deterioration, obstruction and foreign matter.

2-10.3 Metal Parts

Check for security of attachment, cracks, metal distortion, broken welds, corrosion, and any other apparent damage.

2-10.4 Wiring

Check for security, chafing, burning, defective insulation, loose or broken terminals, heat deterioration and corroded terminals.

2-10.5 Bolts in Critical Areas

Correct torque in accordance with torque values given in the chart in Table 1-4: Torque Values, when installed or when visual inspection indicates the need for a torque check.

NOTE: Torque values listed in Table 1-4 are derived from oil-free cadmium-plated threads, and are recommended for all installation procedures contained in this manual except where other values are stipulated. They are not to be used for checking tightness of installed parts during service.

2-10.6 Filters, Screens and Fluids

Check for contamination and condition. Replace at specified intervals or when condition warrants.

2-10.7 Lubrication

There are no special lubrication requirements for Jabiru aircraft other than those listed below. Reference Undercarriage and Controls sections for lubricating instructions.

1. Wheel Bearings
2. Nose Gear Leg Housing
3. Control Stick Housing
4. Trim Spring Assembly

2-10.8 Aircraft Documents

To be displayed in the aircraft at all times:

a. Placards as detailed in Pilot's Operating Handbook
b. Airworthiness Certificate
c. Aircraft Registration

To be carried in the aircraft at all times:

a. Current version of Pilot's Operating Handbook
b. Operating Limitations
c. Weight and Balance

2-10.9 Engine Run-Up

Before beginning the step-by-step inspection; start, warm, run-up, and shut-down the engine in accordance with instructions in the Pilot's Operating Handbook. During the run-up, observe the following, making note of any discrepancies or abnormalities:

1. Engine temperatures and pressures
2. Static RPM (also refer to Engine Instruction Manual)
3. Magneto drop (also refer to Engine Instruction Manual)
4. Engine response to changes in power
5. Any unusual engine noises
6. Idle RPM
7. Fuel shut-off valve; operate engine in ON position and in OFF position long enough to ensure shut-off functions properly.

After the inspection has been completed, an engine run-up should again be performed to determine that any discrepancies or abnormalities have been corrected and to check engine for oil leaks.

2-11 Cleaning

Keeping the aircraft clean is important. Besides maintaining the appearance of the aircraft, cleaning makes inspection and maintenance easier.

2-11.1 Exterior

The exterior finish used on Jabiru aircraft is a two-part automotive-type paint system that utilizes a base and clear-coat. For optimum performance and aesthetics, the exterior surfaces of the aircraft should be kept clean and free of bugs and grease.

The painted surfaces and windows of Jabiru USA factory demonstrator airplanes are routinely cleaned and polished with Turtle Wax® Express Shine, a spray-type cleaner that leaves a thin protective coating. This coating aids in removal of dirt and bugs if kept up regularly. It is applied directly to the surface with the spray bottle and simply wiped dry with a clean microfiber cloth. When cleaning windows, always use a new, clean cloth and avoid swirling motions.

Heavy accumulation of bugs and grease on painted surfaces should be removed with a light mixture of soap and water and then rinsed. The TurtleWax® may then be applied for a smooth protective shine.

Specialty plastic cleaners such as Plexus® will also work on the windows, which are acrylic-based Perspex®. If tape or sticker residue gets on the windows, GooGone® citrus stain remover dabbed onto a soft microfiber cloth will remove it without harming the windows. Light scratches and swirl marks may be buffed out using a Plexiglas window buffing system such as Scratch-Off©, available through Aircraft Spruce and Specialty.

▽ ***CAUTION:*** ***Use only cleansers approved for acrylic-based plastics on and near the windows.***

▽ ***CAUTION:*** ***Do not use silicone-based cleansers, as these may soak through the finish and into the fiberglass and affect future reparability of the components.***

▽ ***CAUTION:*** ***DO NOT use glass window cleaning spray, gasoline, alcohol, benzene, acetone, carbon tetrachloride, fire extinguisher fluid, de-icer fluid, or lacquer thinner. These solvents will soften and craze the plastic.***

▽ ***CAUTION:*** ***DO NOT use a canvas cover on the windshield or windows as the cover may scratch the plastic. Factory-issued aircraft covers have a cotton inner layer to protect the windows.***

2-11.2 Interior Surfaces and Upholstery

The interior may be cleaned using standard automotive upholstery cleaners made for the particular type of covering (carpet, leather, vinyl or cloth).

EFIS screens and instruments may be cleaned using a soft cloth and a cleanser made for LCD screens.

▽ ***CAUTION:*** ***Do not use silicone-based cleansers, as these may soak through the carpet and into the fiberglass, affecting future reparability of the components.***

Volatile substances such as those mentioned in Paragraph 2-11.1 must never be used. Interior painted surfaces may be cleaned using the same automotive cleaning materials as the exterior surfaces.

2-11.3 Aluminum Surfaces

The aluminum surfaces require a minimum of care, but should not be neglected. Wash and clean as detailed in paragraph 2-11.1 above. Scratches in the spinner may be removed using an aluminum-polishing compound such as Flitz or Nuvite.

Jabiru aircraft are designed for minimum maintenance. However, special attention should be applied when the aircraft has been used in extremely corrosive conditions, e.g. beach landings with sand and salt. Always ensure the aircraft is thoroughly hosed and washed immediately after such use. Pay particular attention to wheels and external controls. Always hose down wheels and wheel fairings after landings in mud or sand to ensure brakes, wheels and fairings are free of dirt build-up. For regular landings on soft conditions, removal of wheel fairings is recommended.

2-11.5 Engine and Engine Compartment

The engine should be kept clean since dirty cooling fins and baffles can cause overheating of the engine. Also, cleaning is essential to minimize any danger of fire and provide easy inspection of components. Recommended cleaning procedure is spray lightly with degreasing fluid – after sealing coils and starter motor. WIPE clean with brush and cloth.

▽ ***CAUTION:*** ***DO NOT hose engine. Electrical components may be damaged by moisture. Ensure electrical components are protected against moisture. Caustic cleaning solutions should not be used.***

2-11.6 Propeller

Wash with soap and water, rinse with clean water and dry with cloth or chamois. Wax the propeller with automotive wax (for best results, use a paste wax as opposed to a spray wax) to help preserve the finish. Empty the spinner of all water.

2-11.7 Wheels

The wheels should be washed at least annually (more frequently if used in harsh environments) and examined for corrosion, cracks or dents in the wheel halves or in the flanges or hubs. If defects are found, remove and repair in accordance with Section 5. Discard cracked wheel halves, flanges or hubs and install new parts.

Section 3: Fuselage Structure

3-1 Description

The fuselage is a composite monocoque (self-supporting) structure and includes both the horizontal stabilizer and vertical fin.

All repairs to structural components must be approved by Jabiru USA Sport Aircraft, LLC or approved local representative.

3-2 Windows

3-2.1 Description

The windshield is a one-piece acrylic plastic Perspex® panel bonded into a joggle with epoxy resin & fiber flock and secured to the fuselage with screws and nuts.

Windows are one-piece acrylic plastic Perspex® panels bonded into a joggle with epoxy resin & fiber flock.

NOTE: In the event of a bird strike, the windshield is the only protection for the crew and therefore must be maintained in excellent condition. Cracks up to 25 mm in length should be stop drilled; those longer than 25 mm should NOT be repaired – the windshield must be replaced.

3-2.2 General Upkeep

3-2.2.1 Waxing

Waxing will fill in minor scratches in clear plastic and help protect the surface from further abrasion. Use a good grade of commercial wax (NOT SILICON BASED) applied in a thin, even coat. Bring wax to a high polish by rubbing lightly with a clean, dry flannel cloth. See Section 2 for more information on cleaning and maintaining windows.

▽ ***CAUTION:*** ***Silicon based waxes and polishes are not recommended as silicon may be absorbed into the glass fiber laminate around the windows and affect reparability due to impairing bonding.***

3-2.2.2 Scratches

Scratches on clear plastic surfaces can be removed by buffing and polishing using plastic polish available from most aircraft supply companies.

NOTE: Rubbing plastic surface with a dry cloth will build up an electrostatic charge which will attract dirt particles and may eventually cause scratching of the surface. After applying polish, dissipate this charge by rubbing surface with a slightly damp chamois. This will also remove dust particles which have collected while wax is hardening.

3-2.3 Window Crack Repair

Tools Required	1/16” drill
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

Damaged window panels and windshield may be removed and replaced if damage is substantial. However, certain minor repairs as prescribed in the following paragraphs can be made successfully without removing the damaged part from the aircraft.

The procedure for repairing cracks is only recommended for low stress areas. No repairs of any kind are recommended on highly stressed or compound curved areas or where repair would be likely to affect the pilot’s field of vision.

NOTE: Cracks up to 25 mm in length should be stop drilled; those longer than 25 mm should NOT be repaired – the windshield or window must be replaced .

If a crack appears, drill a hole at the end of the crack to prevent further spreading. Hole should be approximately 1/16 inch in diameter, depending on length of crack and thickness of material. An unfluted drill should be used.

3-2.4 Window Removal

Tools Required	Small grinder, 7mm socket, #2 Phillips screwdriver
Parts Required	None
Level of Maintenance	Heavy
Level of Certification Required	A&P or LSA R/M-M

As the windscreen and windows are bonded into the fuselage, it is not possible to remove them without destroying them. Use the grinder to score the window near the paint line. Once the window has been broken out, any screws used in the original installation (screws in windscreen only) should be removed and old epoxy removed by grinding it out of the joggle. After removing the nuts from the screws the screw may have to be heated with a soldering iron to soften any epoxy that might hold it in the windshield.

▽ ***Caution: When grinding out the old epoxy and flock, do not grind through the fiberglass of the joggle joint.***

3-2.5 Window Inspection

Inspect windows for scratches and cracks. If cracks are greater than 25mm long, replacement is necessary.

Cracks in the body filler along the edge of the windscreen may occur due to rapid temperature changes and expansion of the Perspex windshield. Sand and repair filler using basic bodywork/paint procedures in Section 12.

3-2.6 Repair

Repair is limited to scratch polishing as outlined in Paragraph 3-2.2, or crack repair outlined in Paragraph 3-2.3. Otherwise, repair is limited to replacement.

3-2.7 Replacement of Windscreen and Side Windows

Tools Required	File or small grinder, drill with 1/8" unfluted drill bit, 7mm socket, #2 Phillips screwdriver, small flat clamps, sandpaper, 24-hour epoxy, cotton flock
Parts Required	Windscreen or window, M4X12 countersunk screws and nuts, hardware to make window clamps (see Figure 3-1)
Level of Maintenance	Heavy
Level of Certification Required	A&P or LSA R/M-M

Windscreen

1. Fabricate about 20 small, simple clamps as shown in Figure 3-1. One small piece of sheet metal stock with one small sheet metal screw will suffice for each clamp. These will be used to hold the windshield in place while the epoxy cures.
2. Ensure all old epoxy resin has been removed from the fuselage sealing strips (around the window frames).
3. Peel away the plastic coating on the inside of the windscreen only, about 2" back from the edge. Check new windscreen for fit inside the joggle. File or grind away any excess windscreen material to ensure a close fit. Do not attempt to cut with any type of saw, file only.
4. Fit windscreen in the joggle. Trace the edge of the fiberglass with a marker, then tape 1/8" inside the line on both outside and inside with painter's tape to protect the windscreen from glue. Be sure all surfaces of windscreen inside the line are covered.
5. Rough up the edge (about ¾ inch wide) of the windscreen with 220 grit sandpaper then again with 80 grit.
6. Wet the window frame joggle and the outer edge of the windscreen with a light coat of epoxy.
7. Mix cotton flock with epoxy to the consistency of soft peanut butter.
8. Apply a bed of epoxy & flock in the joggle to form a bed for the windscreen about 1/8" thick.
9. Place windscreen accurately onto the joggle. Secure in place with the clamps shown in Figure 3-1. Install the first clamp above the top-center of the windscreen, and the second bottom center. Install all clamps in a zig-zag pattern radiating out from the center so the windscreen does not get pushed to one side or the other (see Figure 3-2).
10. Clean up excess epoxy/flock and allow it to cure for 24 hours. Be sure to clean off all epoxy that overlaps the tape inside the windscreen, as the tape may become

Figure 3-1: Window clamps made from 0.125” aluminum stock and sheet metal screws (left). Clamp in position holding upper portion of windshield to fuselage (right).

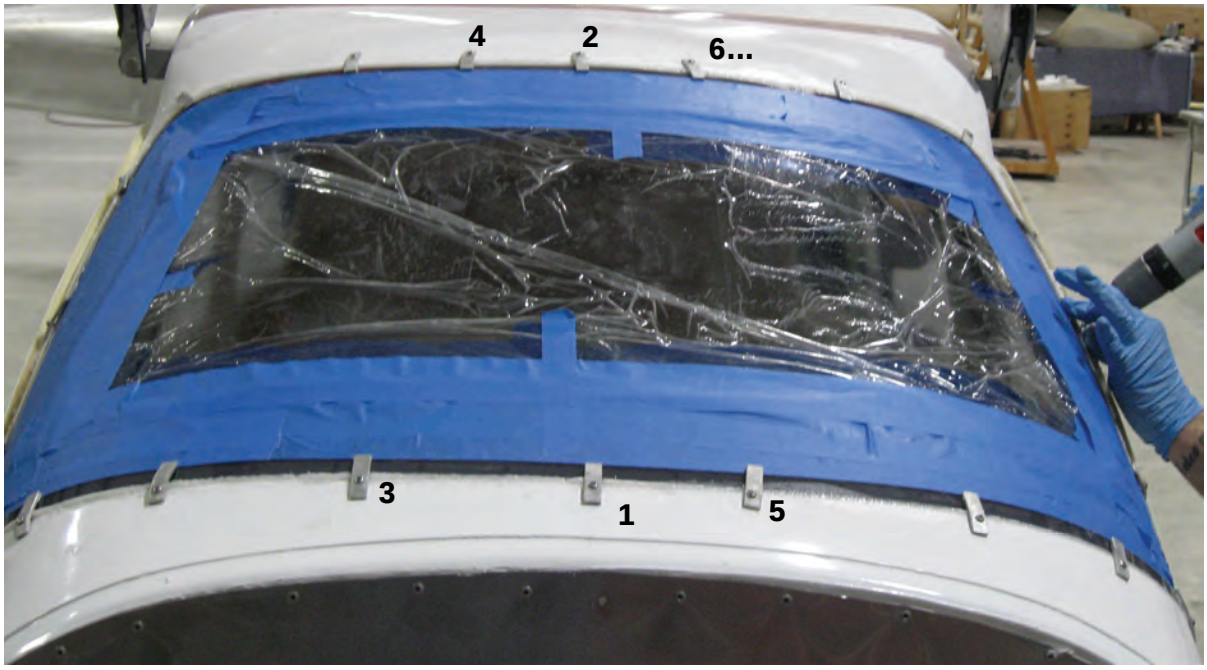

Figure 3-2: Window clamps in position. Install following the pattern shown, working from the center outward and checking alignment frequently.

permanently bonded and visible from outside the aircraft when the installation is finished.

11. Carefully drill holes for M4x12 countersunk mounting screws with dull drill or Permagrit 1/8" bit. Holes should be 3-4" apart, centered on the joggle. Countersink holes so screw heads are slightly below surface.
12. DO NOT over tighten screws – cracking will result. Tighten until snug only.
13. See Section 12-4 for paint/bodywork procedures to finish the repair.

Side Windows

1. Install side windows in the same manner as the windshield, except that no screws will be driven through the plastic. The simple clamps are screwed to the door frame alongside the window plastic to hold it in place while the epoxy cures.
2. After epoxy cures, see Section 12-4 for paint/bodywork procedures to finish the repair.

Inspection of Finished Window/Windscreen Installation

1. All clamps removed
2. Excess epoxy and flock removed from underneath clamped area and all window/ windscreen edges
3. Windscreen screws countersunk below surface with no cracks
4. Window/windscreen surfaces free of scratches, cracks, gouges, and excess epoxy/ flock
5. See Section 12-4 for paint/bodywork procedures to finish the repair.

3-3 Doors

3-3.1 Description

Cabin doors are composed of a fiberglass sandwich skin bonded to a molded fiberglass frame on the interior side of the skin. A simple spring / bolt latch system is used as a door latch and a spring ball upper latch is used to secure the upper door frame. Hinges are machined aluminum or molded fiberglass. A hinge stop or nylon strap is used to prevent damage from doors opening too far.

3-3.1.1 Cabin Door Latches

There is one main latch on each door of a simple spring bolt type. This is complemented by a spring ball latch at the top front quadrant of each door. An assembly drawing of the latch mechanism is provided in Figure 3-3, Door Latch Mechanism Assembly.

Door latches or their component parts must be replaced if worn or damaged.

3-3.1.2 Locks

A cylinder and key lock is installed at each door. The keyed barrel lock is located in the fuselage at the rear of the left, right and rear doors. Spare keys are available to Jabiru registered owners by quoting the aircraft serial number.

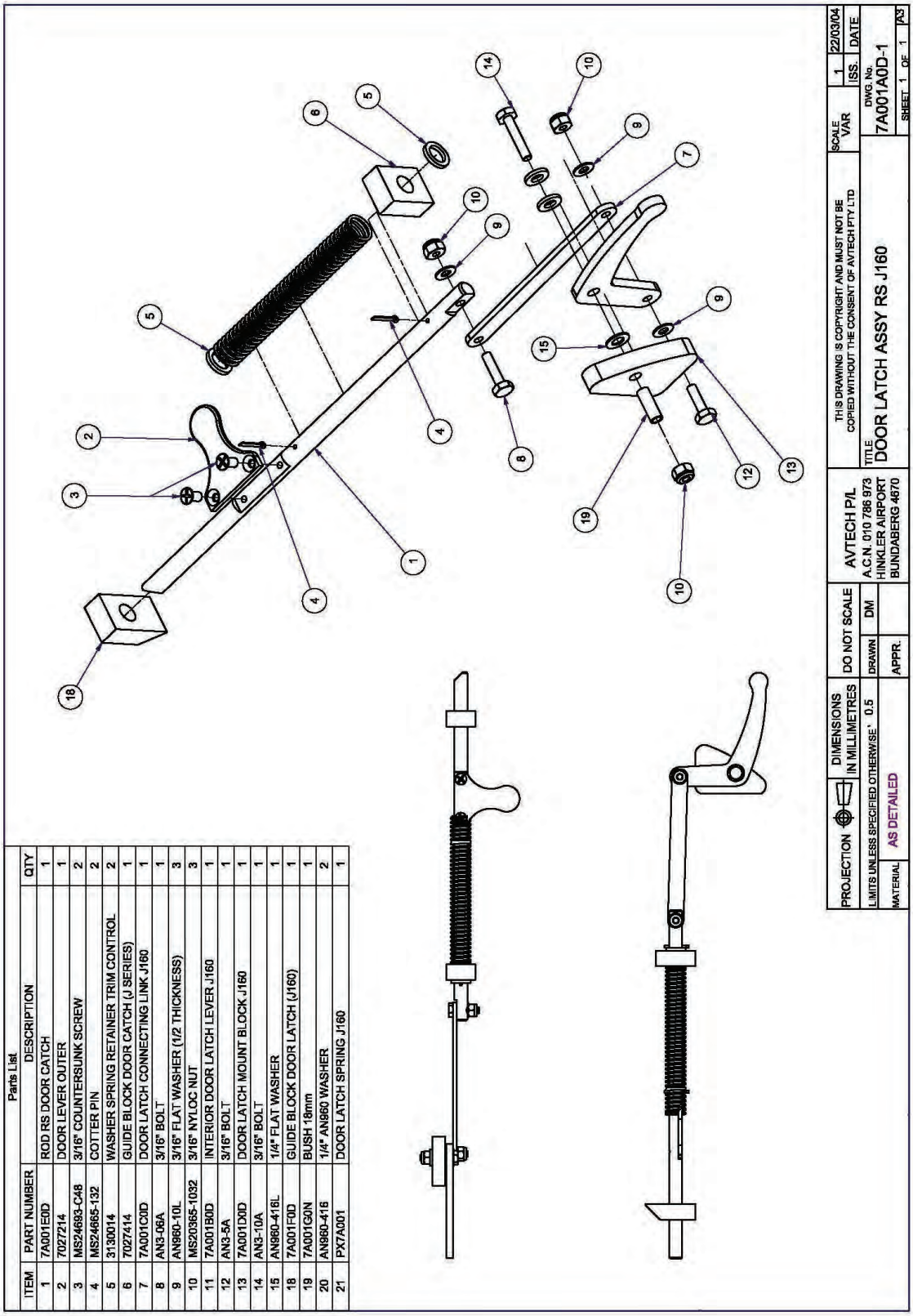

Figure 3-3: Door Latch Assembly

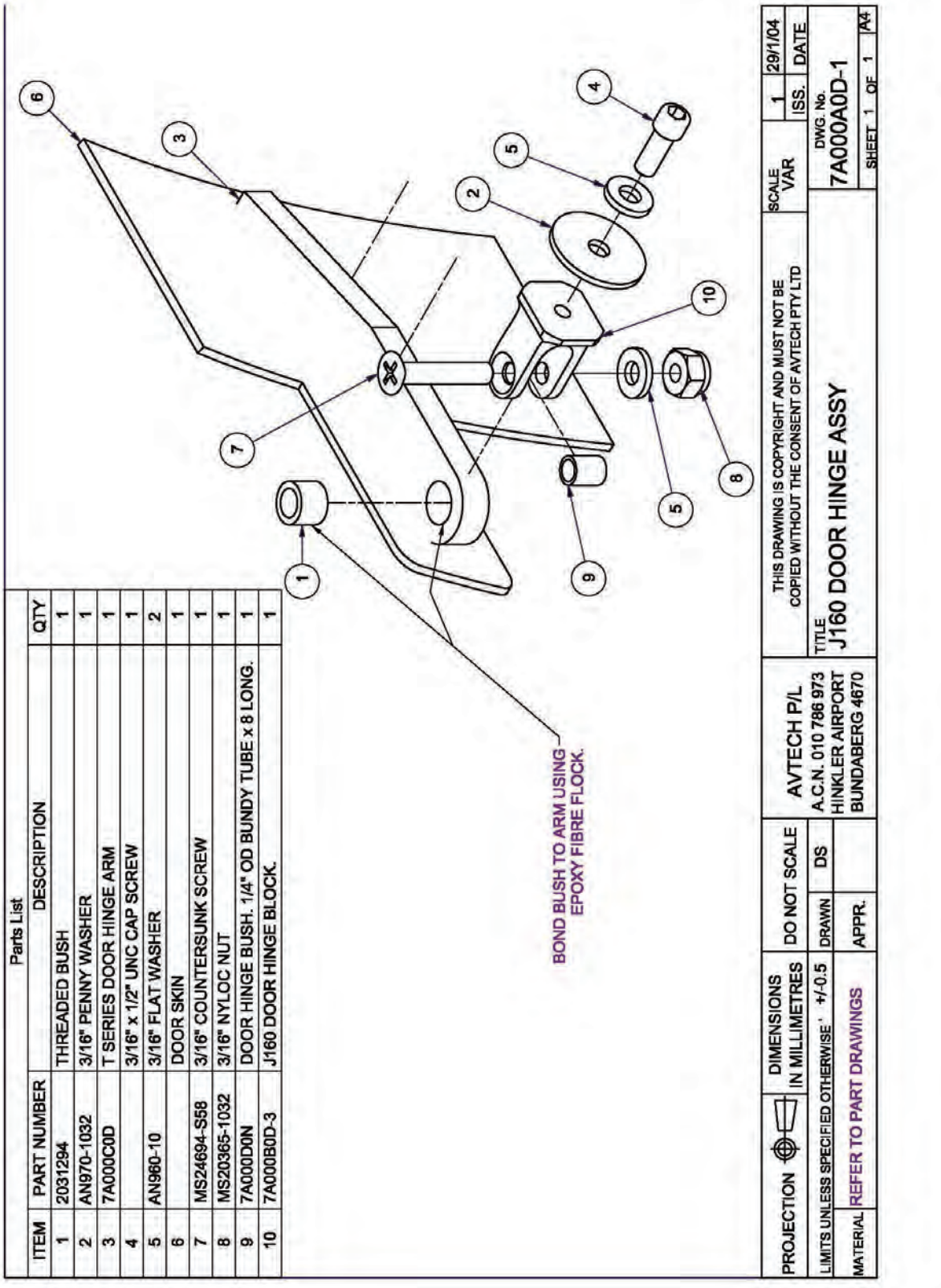

Figure 3-4: Door Hinge Assembly, J160/170/230/250

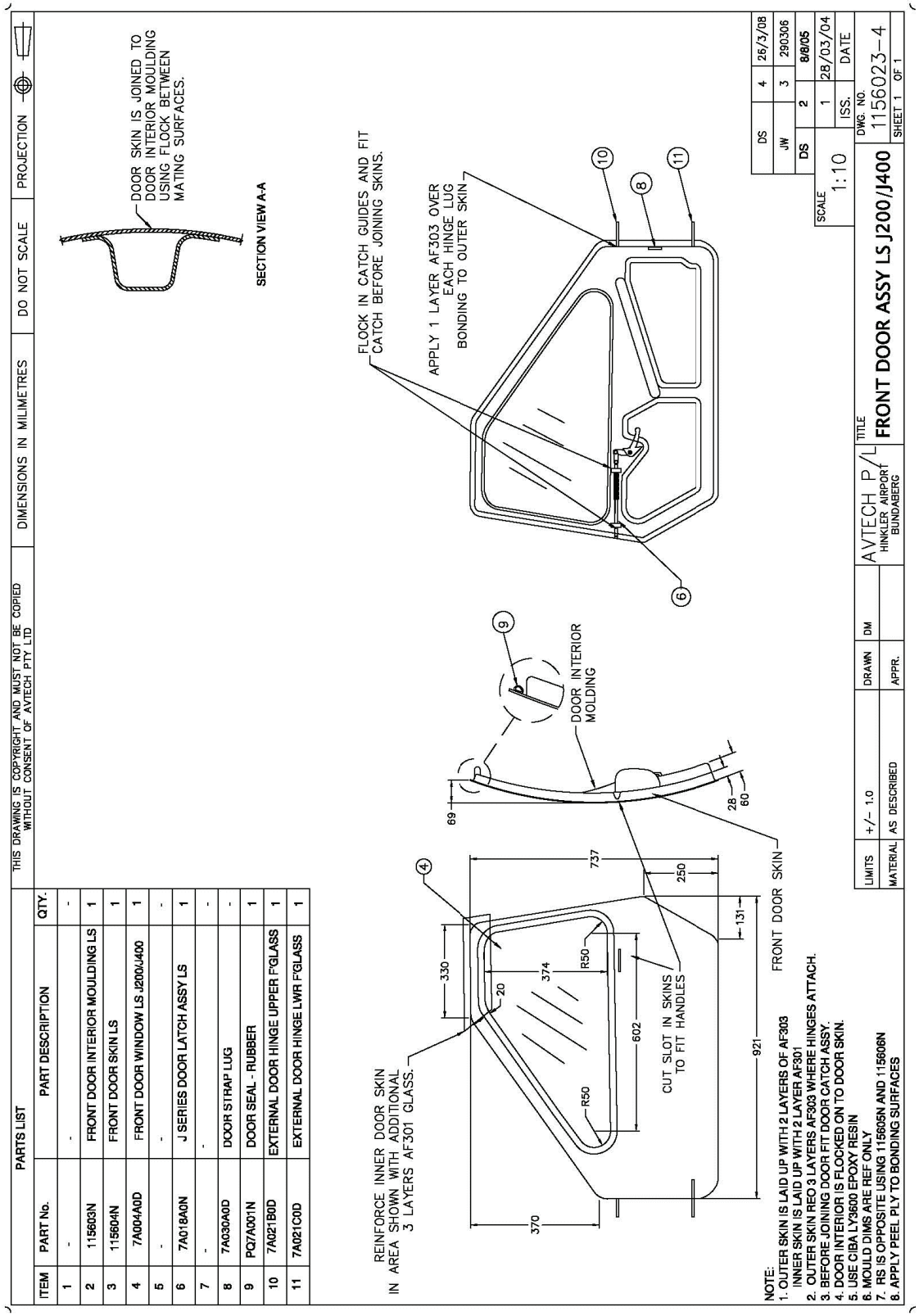

Figure 3-5: Door Structure

3-3.1.3 Door Seals

Weather strip is glued around all edges of the door and door sill. Apart from excluding wind and water, the weather strip is important in minimizing exhaust fume entry to the cabin. It should be maintained in good condition and fit at all times.

To replace the weather strip, use household door & window EDPM rubber weather seal, 7/16" thick x 3/8" wide, for gaps 1/8" to 7/32". It may be found at major hardware stores. Make sure surfaces are clean, dry and free from oil and grease. Use superglue to reinforce the bond of the self-adhesive backing.

3-3.2 Door Removal

Tools Required	7/16 wrenches (old style) or 5/32 hex (new style)
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

The "old style" door hinges are not visible from the outside of the aircraft. They are simple to remove, however, they sag over time and are damaged easily, so the hinge design was changed to create a tougher door in 2008 (see Figures 3-6 and 3-7).

Figure 3-6: "Old" style door hinge, pilot's side.

Figure 3-7: "New" style door hinge, passenger side.

Removal of "Old" Style Door

1. Open door. Have a helper support the door until hinge bolts are removed.
2. Remove the hinge bolts that attach the hinges to the door frame.
3. Remove the door.

Removal of "New" Style Door

1. Access the hinge bolts by gently peeling back the upholstery adjacent to the door hinge. See Figure 3-8 for a view of the bolts before the fuselage is upholstered.
2. Open the door. Have a helper support the door until it is removed.
3. Remove the cap screws that hold the hinge into position (labeled "1" in Figures 3-8 and 3-9). Some filing of the fiberglass door frame or the lower fairing may be required to remove the hinge hardware, as shown by the dashed line in Figure 3-9. Avoid filing outer fuselage skin.
4. Remove door.

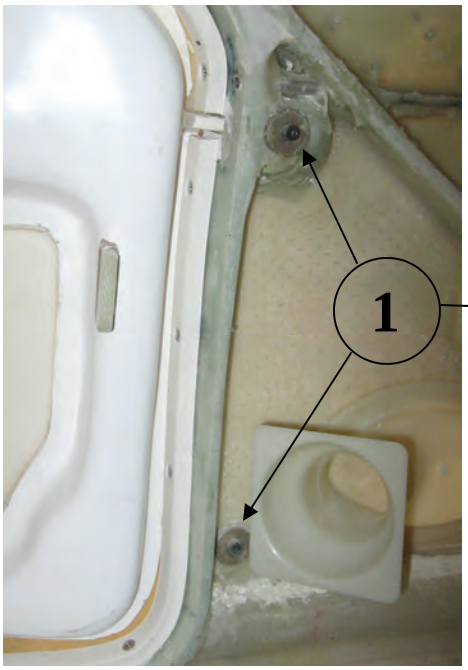

Figure 3-8: Interior door hinge bolts, new style (pilot's side)

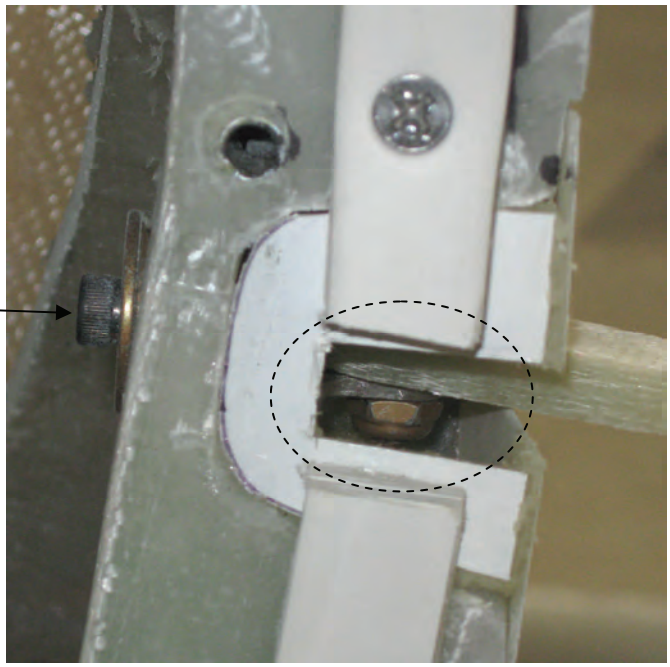

Figure 3-9: Upper door hinge, new style (passenger side). File fiberglass as needed from dashed area to remove hinge hardware.

3-3.3 Inspection

Inspect door for cracks and latch alignment. Inspect hinges for signs of cracks due to over extension. Inspect upper ball latch for spring effectiveness. Replace if necessary.

Slight inward bowing of the door skin is normal in Jabiru models from early 2009 and older, especially when parked in the hot sun. This is due to tension on the skin from the upholstery panels. It may be corrected by removing the upholstery panel and installing additional padding between the skin and the upholstery.

3-3.4 Repair

Repair of fiberglass cracks or delamination in the doors can be done by following the general fiberglass repair procedures or door hinge and lock slot repair supplement in Section 12. For repairs to windows, see Section 3-2.

3-3.5 Reinstallation

Reverse the steps in Paragraph 3-3.2. Follow the steps in 3-3.6 for adjustment if necessary after reinstallation.

3-3.6 Adjustment

Cabin doors should be adjusted by shims at the hinge attach points so that the door skin fairs with the fuselage skin and the door latch pin lines up with the hole in the door frame.

3-4 Seats

3-4.1 Description

The Jabiru seats are an integral part of the structure of the aircraft; they are therefore fixed in position.

▽ ***WARNING: DO NOT MODIFY SEATS.***

3-4.2 Removal

Seats may not be removed.

3-4.3 Inspection

Inspect fiberglass layups in the seat structure for cracking and delamination.

3-4.4 Repair

Seats are a structural element in the fuselage and the manufacturer must approve all repairs to the seats.

3-4.5 Adjustment

Forward and upward adjustment can be achieved by placing a cushion behind and/or under the occupant. Rudder pedal extensions may be installed as an option.

3-5 Upholstery

Seat upholstery is provided through removable cushions. These are easily removed for cleaning and inspection of the seat structures. Upholstery is available in automotive cloth, vinyl or leather. Cabin lining is standard, together with door pockets.

3-6 Baggage Area

The baggage area is the floor directly behind the front seats. All baggage must be secured before flight. Tiedown rings are installed in the floor of the baggage area and may be used with cargo nets or straps as appropriate. The rear baggage bulkhead is velcroed to the fuselage frame and may be pulled forward and removed for access to controls and electronics in the rear fuselage.

3-7 Seat Belts

3-7.1 Description

One aircraft grade seatbelt and shoulder harness is provided for each occupant and is bolted to the fuselage structure. Belts are rated to 9G and have metal-to-metal buckles.

3-7.2 Removal

Tools Required	3/8 wrenches
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M

Belts are attached in three places and can be removed by removing the AN3 attach bolts at the belt anchor locations.

3-7.3 Inspection

Belts should be replaced if frayed or cut, latches are defective or stitching is broken.

3-7.4 Repair

Repair is limited to replacement. Belts should be replaced if frayed or cut, latches are defective or stitching is broken. Attachment parts should be replaced with equivalent grade parts if excessively worn or defective.

3-7.5 Reinstallation

Reinstall belts as described in 3-7.2 using all-new AN hardware.

3-8 Horizontal Stabilizer

3-8.1 Description

The horizontal stabilizer is a molded monocoque structure of rigid cellular polystyrene bonded to a fiberglass skin and rear spar. The stabilizer is bonded into a flange and slot molded into the aft fuselage with epoxy and cotton flock. The bond joint is overlaid

with multiple layers of fiberglass extending several inches either side of the joint. Hinges attach the rear horizontal spar to the elevator.

3-8.2 Removal and Installation

The horizontal stabilizer is permanently bonded to the fuselage and is an integral part of the fuselage. If the stabilizer structure is damaged, the entire stabilizer may be removed and replaced. Contact Jabiru USA Sport Aircraft for further instructions.

3-8.3 Inspection

Check for cracks or breaks in the skin. Look carefully at the joint area between fuselage and horizontal for cracks or delamination. If cracks in paint are found, sand into the paint and body filler to determine whether the crack penetrates a layer of fiberglass or just through the body filler. Cracks only involving body filler may be repaired using paint and finishing procedures in Section 12.

3-8.4 Repair

The horizontal stabilizer is a composite monocoque structure. All damage involving a break or deformation in the skin or damage to the spar must be referred to JABIRU USA SPORT AIRCRAFT, LLC for an appropriate repair procedure. Repair must be made before the next flight.

Dents, crush damage or tears in the fiberglass end caps of the stabilizer are in a non-structural area and can be repaired using the standard fiberglass repair procedures in Section 12.

3-9 Vertical Stabilizer

3-9.1 Description

The vertical stabilizer is a molded composite structure supported by ribs and a rear spar. The vertical stabilizer is bonded to a raised ridge on the aft fuselage with epoxy and cotton flock. The bond joint is overlaid with three layers of fiberglass extending two inches either side of the joint. Hinges attach the rear vertical spar to the rudder.

3-9.2 Removal and Installation

The vertical stabilizer is permanently bonded to the fuselage and is an integral part of the fuselage structure. If the vertical stabilizer structure is damaged beyond repair, the entire stabilizer may be removed and replaced. Contact Jabiru USA Sport aircraft for further instructions.

3-9.3 Inspection

Inspection is limited to inspection of the stabilizer skin for cracks or delamination and inspection of the vertical spar for cracking or delamination or other damage.

3-9.4 Repair

All damage involving a break or deformation in the skin or damage to the spar or ribs must be referred to JABIRU USA SPORT AIRCRAFT LLC for an appropriate repair procedure. Repair must be made before the next flight.

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Section 4: Wing Structure

4-1 Wings

4-1.1 Description

Each composite wing is a semi-cantilever, monocoque type with a main spar. The wing is a molded structure with a series of ribs that are bonded through the molding process to the fiberglass skin, fuel tanks and to the spar.

The forward wing attachment is an extension of the forward sub-spar. The rear attachment is a composite block heavily bonded to the reinforced wing skin and attaches to the main spar through the Wing End Plug. Both attachments are through stainless steel threaded bushings bonded into the attachment blocks.

4-1.2 Removal

Tools Required	Screwdriver set, 1/2 and 7/16 wrenches, tall padded sawhorse or wing stand
Parts Required	None
Level of Maintenance	Heavy
Level of Certification Required	A&P or LSA R/M-M

The Jabiru aircraft is designed with wings that are removable for storage or transport. Wing removal is most easily achieved if two people are available to handle the wing.

1. Remove wing root fairings.
2. Drain fuel out of quick drain (Note: This will take some time.)
3. Remove wing strut fairings – top and bottom.
4. Disconnect pitot tube – RH wing only. Pitot connection is under lower strut fairing.
5. Disconnect landing light wires. Wire connection is under lower strut fairing.
6. Making sure the flap is supported, unbolt flap control rods – 1 each wing.
7. Remove flap from wing so it does not crush the fuselage when lowering down.
8. Unbolt aileron control cables (2) from rear of control stick horn inside cabin.
9. Remove clamp block or cable clamps from aileron control cable clamps at rear of seat – 1 each seat.
10. Loosen hose clamps from fuel lines and vent lines. If removing the left wing, remove stall warning reed bell.
11. Disconnect wiring to strobes and wingtip lighting.
12. With one person supporting wing tip, unbolt top wing strut bolt and lower the wing strut to the ground.

13. Lower wing tip toward the ground making sure you do not crush the underside of the wing on the fuselage wing root. Rest the wing tip on a sawhorse or other suitable stand.

14. Unbolt and remove front wing attachment bolt.

15. Unbolt and remove rear wing attachment bolt. *NOTE: It may be necessary to rock the wing slightly while pulling attaching bolt, or carefully use a long drift punch to drive out attaching bolt.*

16. Carefully remove wing by moving it outward to clear the aileron cable from the fuselage.

17. Place wing on cushioned structure to avoid damage to wing skin and strut attachment.

18. Unbolt lower wing strut bolt and remove wing strut.

19. Repeat Steps 1-18 to remove other wing, if necessary.

4-1.3 Inspection

Inspect wing skin for cracks, breaks or delamination. Check closely around flap and aileron hinges for signs of stress. Look for signs of leaking fuel from the wing fuel tank or tank fittings.

4-1.4 Repair

The wing is a composite monocoque structure. All damage involving a break, delamination or deformation in the wing skin must be referred to Jabiru USA Sport Aircraft, LLC or an approved local agent for an appropriate repair procedure.

4-1.5 Reinstallation

Tools Required	Screwdriver set, 1/2 and 7/16 wrenches, tall padded sawhorse or wing stand
Parts Required	None
Level of Maintenance	Heavy
Level of Certification Required	A&P or LSA R/M-M

▽ ***WARNING!*** ***Do not tighten wing attach nuts or damage to wing attach hardware may result. Washer must be free to rotate.***

1. Fit the lower strut attach bolt, leaving the top end of the strut on the ground.

2. Fit wing to fuselage, leaving wing tip on the saw-horse and routing aileron cable, fuel lines and wiring through holes in fuselage wing root.

3. Install front and rear wing attach bolts/nuts.

4. Put top wing strut attach bolt in your pocket.

5. Lift wing tip and install wing strut to wing strut attachment with bolt from pocket.
6. Install nut. **DO NOT tighten** nut or damage to strut attach hardware may result.
7. Connect all fuel and vent lines to wing making sure there are no lines that have kinked. Reinstall stall warning reed bell.
8. Reconnect electrical wires to strobes and wingtip lights.
9. Put about 3 gallons of fuel in each tank & check for any leaks.
10. Attach flap to wing ensuring all bushings are in place.
11. Install bolt/nut in flap control rod.
12. Install bolt/nut in aileron control cable on main control stick horn.
13. Install clamp on aileron control cable clamp between the seats.
14. For RH wing, reconnect pitot tube.
15. For LH wing, reconnect recognition light.
16. Replace wing strut fairings – top and bottom.
17. Replace wing root fairings.
18. Perform a fuel flow test. Disconnect the fuel line from the mechanical fuel pump in the engine compartment. Have a second person catch any fuel that flows out of the line in a container with accurate volume marks. Turn electric fuel pump on and pump fuel through the lines into container. Ensure there is a minimum of 0.25 gallon per minute flow rate.
19. After carrying out the fuel flow test, check that both wing tanks are feeding fuel: Turn off both of the doorpost fuel valves, pump about a quart out of the header tank, and then turn the left wing valve on. The wing tank will gravity feed to the header tank, and it should re-fill within approximately 1-2 minutes. This must be repeated for the right wing. If a wing is not flowing correctly, check lines for kinks, blockages & airlocks.

4-2 Wing Struts

4-2.1 Description

Each wing strut is a single lift strut which transmits a part of the wing load to the lower portion of the fuselage. The strut consists of a streamlined tube bolted to two end fittings which attach to the fuselage and wing.

▽ ***WARNING!*** ***Do Not Tighten Strut Attachment Bolts. Damage to wing attach hardware may result. Bolt must be free to rotate.***

4-2.2 Removal

Tools Required	Screwdriver set, 1/2" wrenches, tall padded sawhorse or wing stand
Parts Required	None
Level of Maintenance	Heavy
Level of Certification Required	A&P or LSA R/M-M

1. Remove wing root fairings.
2. If planning to leave the wing blocked up more than a few minutes, drain fuel out of the wing tank to lighten it up. (Note: This will take some time.)
3. Remove wing strut fairings – top and bottom.
4. Disconnect pitot tube – RH wing only. Pitot connection is underneath lower strut fairing.
5. Disconnect the recognition light wires— LH wing. Rec. light connection is underneath lower strut fairing.
6. Making sure the flap is supported, disconnect flap control rods – 1 each wing. Flap may be supported by using generous amounts of masking tape to hold in the "up" position.
7. Support the wing using a padded sawhorse or brace structure just outside the strut attach point, with the lowest amount of wing tip droop as possible.
8. Remove the bolts from the top attachment and the bottom attachment. These are NAS close tolerance bolts and may be difficult to remove.
9. Pull strut away from the fuselage attachment while moving the strut up and down.

▽ ***WARNING!*** ***DO NOT put fore and aft pressure on the strut or strut attachment while removing, as this may damage strut attach points.***

4-2.3 Inspection

Check for any loose or damaged bolts at each end of the strut. Check for nicks, cracks or dents in the strut body. Check to see that struts are straight and not twisted.

4-2.4 Repair

Wing struts are structural components and repairs are mostly limited to replacement. The strut bolts that attach the ends to the main body of the strut may be replaced if the strut itself shows no signs of other damage. Nicks, cracks, and other damage must be referred to Jabiru USA Sport Aircraft, LLC for determination of reparability and issuance of repair instructions.

A dented, cracked, or deformed wing strut must be replaced prior to next flight.

4-2.5 Reinstallation

▽ ***WARNING!*** ***Do not apply any fore and aft force to the strut during the installation, as this may damage strut attach points.***

1. Place inboard end of strut onto the fuselage strut attachment lug.
2. Insert a new AN5 NAS bolt through the strut and the lug bushing.
3. Install the washer and nut and tighten carefully to the point where the washer cannot be rotated. Then loosen the nut slightly until the washer will rotate. The washer must be free to rotate.
4. Install the outboard end or the strut onto the wing spar strut fitting. Attach lug and line up the hole.
5. Install the AN5 NAS bolt, washer and nut.
6. Tighten the nut in the same manner as the lower strut attach bolt making sure the bolt is just free enough for the washer to rotate.
7. Reconnect the flaps and remove supporting tape.
8. Reconnect recognition light wires and/or pitot tube.
9. Reinstall upper and lower strut fairings by installing the self tapping screws.
10. Look over the fuel lines and stall warning tube (LH wing only) in the wing root to check for kinks or pinches.
11. Reinstall upper and lower wing root fairings.

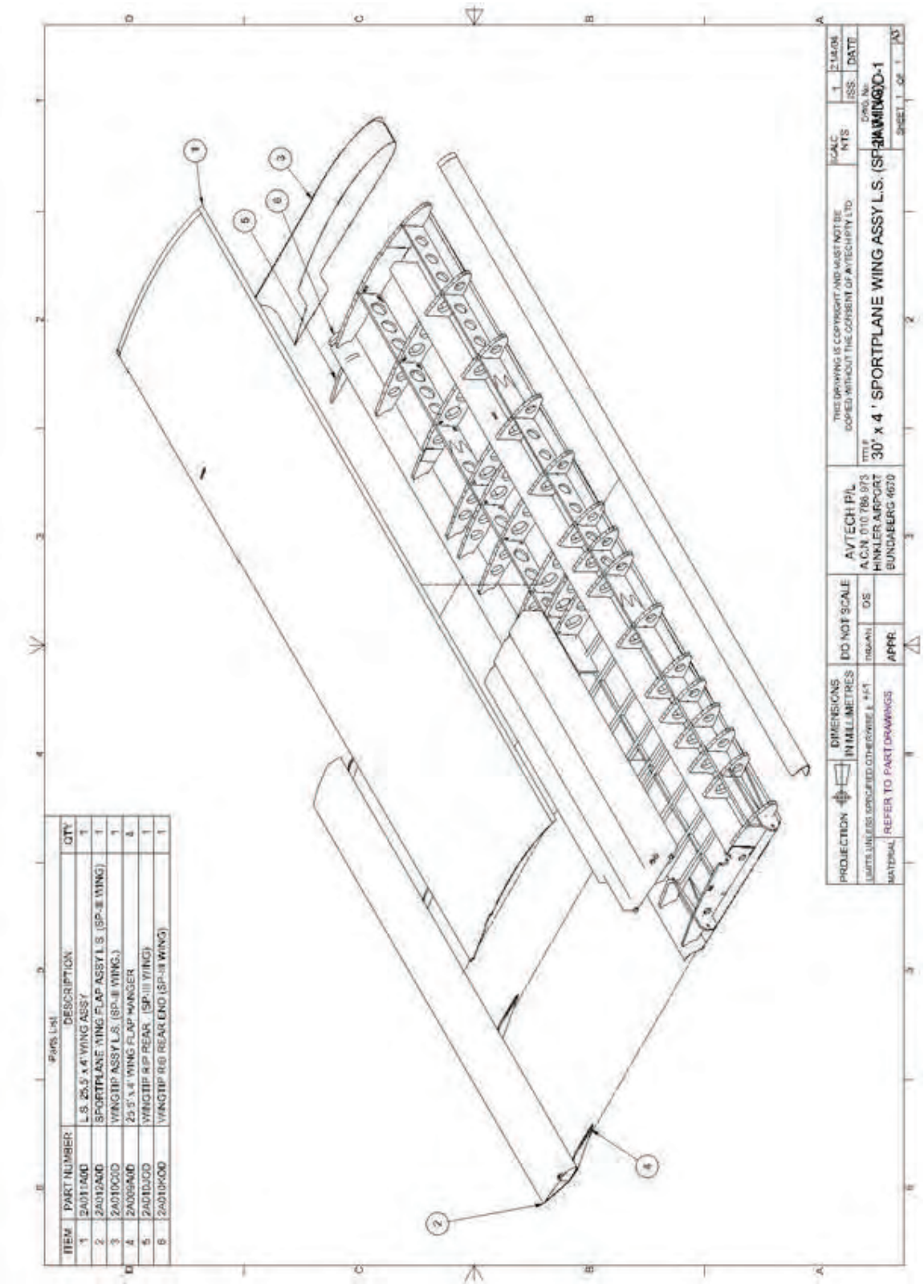


Figure 4-1 Wing Assembly, J250-SP

Section 5: Landing Gear and Brakes

5-1 General Description

The main landing gear legs consist of two separate composite beams which are bolted to the fuselage at the top and center, and to the wheel stub axle at the bottom. The main wheels are Matco aircraft wheels, and brakes are Matco aircraft hydraulic brakes. Wheel pants are standard equipment.

5-2 Landing Gear Troubleshooting Chart

Trouble	Probable Cause	Remedy
Aircraft leans to one side on level ground with equal amounts of fuel in each tank	Incorrect tire inflation	Inflate or deflate main tires to 35-40 psi
	Landing gear attaching hardware not tight	Check and tighten (Section 5-5.5); replace hardware if damaged or beyond 500-hours of life (JSA Service Bulletin JSA-003-1, Undercarriage Bolt Replacement)
	Stretched or cracked fiberglass gear leg (hard landing)	Inspect gear leg for cracks; replace a cracked or delaminated leg before next flight
	Bent axle stub	Replace axle stub (Section 5-6)
Main tires wear excessively (It is normal for tires to wear on outboard side—regular rotation is recommended)	Incorrect tire inflation	Inflate or deflate main tires to 35-40 psi
	Main wheels out of alignment	Install axle shims to realign wheels (see Section 5-6)
	Bent axle stub	Replace axle stub (Section 5-6)
	Dragging or skidding tires with brakes on	Avoid locking brakes on taxi and landing; use less engine rpm during run-up
Nose wheel shimmy after rotation/liftoff	Improper takeoff technique; holding nose wheel on runway too long	See J230 Flight Training Supplement for normal takeoff technique description
	Loose nose strut bolts or steering link	Inspect nose strut assembly for loose, worn or defective parts (Section 5-10)
	Wheel out of balance	Balance nose wheel/tire assembly (5-9.5)
	Worn wheel bearings	Replace nose wheel bearings (5-9.3)
Main gear legs shimmy when brakes applied heavily	Uneven runway surface	Some brake shimmy is normal during heavy braking on rough or uneven surfaces.
	Warped brake disc (severe shimmy cases)	Inspect brake disc and replace or resurface as necessary (Section 5-7.5)

5-3 Main Wheel Fairings

5-3.1 Description

The wheel fairings are single-piece fiberglass, finished with the same type of automotive paint and clear coat as the rest of the airframe. The main fairings are attached to the main landing gear legs using aluminum brackets, screws and plastic spacers. See Paragraph 5-9.2 for information regarding removal and reinstallation of the nose wheel fairing.

5-3.2 Removal

Tools Required	#2 Phillips screwdriver
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	Owner, A&P, LSA R/M-M

1. Remove the screw on the outboard side of the fairing.

2. Remove the small machine screws (2) on the inboard side of the leg.

3. Lift fairing from its mounting brackets.

5-3.3 Inspection

Check for cracks or worn areas inside the fiberglass pant. Check for elongation of screw holes and loose nutplates. Check that clearance between wheel and pant is at least ½ inch. Check security of inboard and outboard mounting brackets. Check that outboard main wheel pant brackets are updated and installed as per Service Bulletin JSA-004-1, Wheel Pant Bracket Replacement.

5-3.4 Repair

Tools Required	220-grit aluminum oxide sandpaper, basic epoxy-mixing supplies, fiberglass cutter
Parts Required	9-oz fiberglass cloth, 24-hr Aeropoxy or equiv.
Level of Maintenance	Line
Level of Certification Required	A&P, LSA R/M-M

Field repair of wheel fairings is authorized.

1. Sand off the paint and gel coat 2 inches each side of the crack or tear with 220 grit aluminum oxide sandpaper.

2. Overlay with two layers of 9 oz fiberglass cloth and wet out with 24 hour epoxy. Allow to cure.

3. Fill and sand until smooth. See Section 12-4 for body filler information.

4. Repaint. See Section 12-4 for paint details. Jabiru USA Sport Aircraft, LLC will repaint damaged wheel pants upon request.

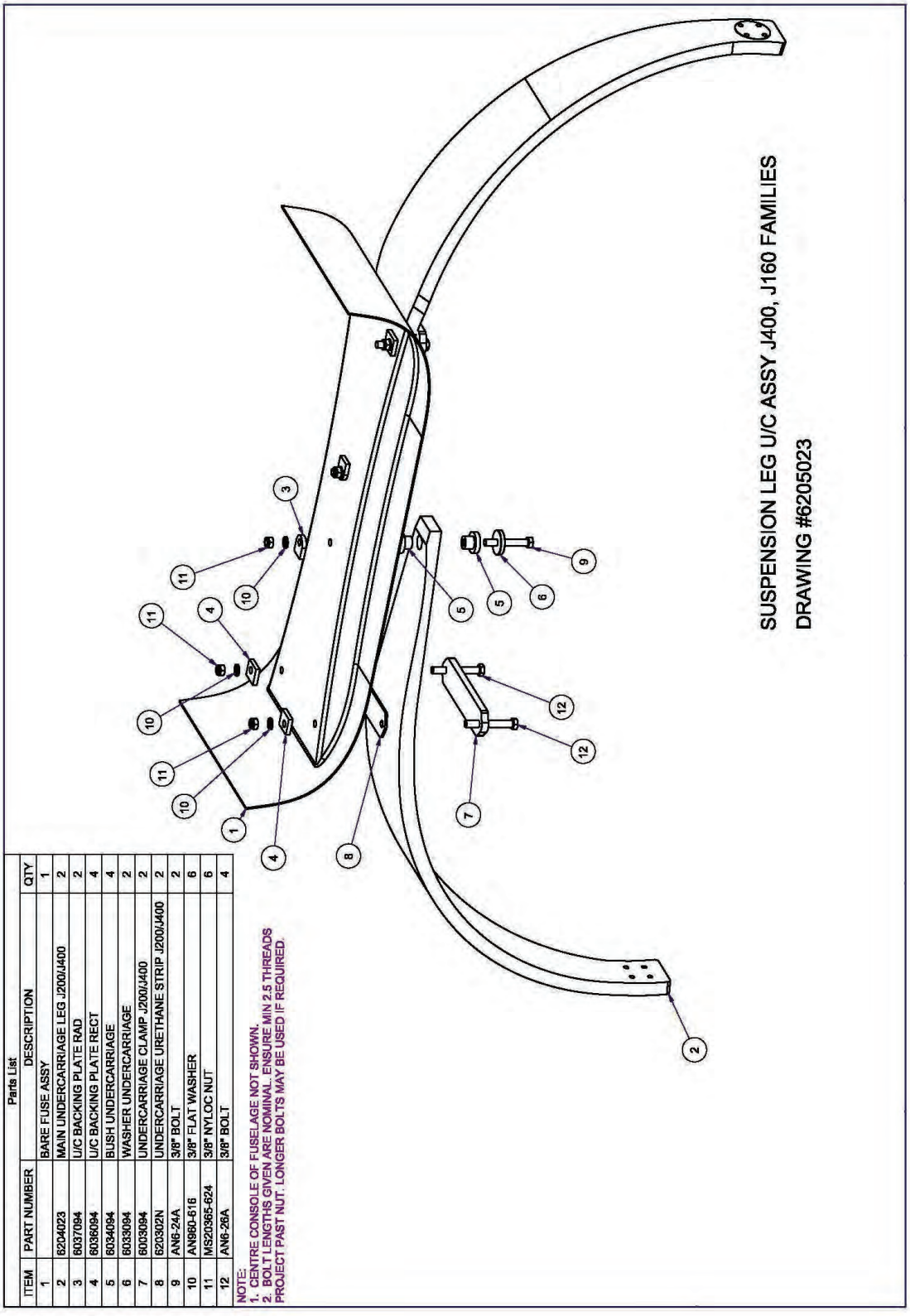


Figure 5-1: Main Landing Gear Assembly

5-3.5 Reinstallation

Reverse the steps in 5-3.2 for reinstallation of main wheel fairings.

5-4 Main Gear Top Fairing/Lower Strut Fairing

5-4.1 Description

The main gear leg top fairing is a molded fiberglass part laminated from three layers of 9 oz fiberglass cloth. It also functions as the lower strut fairing. There is one fairing on each side of the aircraft.

5-4.2 Removal and Installation

Tools Required	Phillips screwdriver
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	Owner, A&P, LSA R/M-M

1. Remove the screws.
2. Remove the fairing carefully so the paint is not cracked or the edges damaged.
3. To reinstall the fairing, carefully work the fairing around the gear leg and strut mount until it is back in place. Take care not to pinch any wires, brake lines, or pitot/static lines that may run underneath the fairing.
4. Reinstall the screws.

5-4.3 Inspection

Check for cracks, tears or delamination in the fiberglass.

5-4.4 Repair

Repair cracks or tears by overlaying with fiberglass, as in the procedure for wheel fairing repair. See Paragraph 5-3.4.

5-5 Main Gear Leg Assembly

5-5.1 Description

The main gear leg is a molded fiberglass lamination of 10 oz unidirectional fiberglass. Figure 5-1, Main Undercarriage Assembly, illustrates the main landing gear.

5-5.2 Removal

Tools Required	Screwdriver set, 7/16, 1/2, and 9/16" wrenches
Parts Required	None
Level of Maintenance	Heavy
Level of Certification Required	A&P or LSA R/M-M

The following procedural steps involve removal of one side of the landing gear as a complete assembly. Refer to applicable paragraphs for removal of the individual components.

1. Peel back the carpet in the baggage area to reveal the main landing gear mounting bolts.

2. Jack the aircraft in accordance with the details given in Section 2.

3. Disconnect the top end of flexible brake hose, catching brake fluid in a container. Take care to avoid dripping brake fluid onto the center console, as it will damage the finish.

4. Remove bolt and nut from top inboard end of undercarriage beam. Remove rubber bushings (2).

5. Remove bolts/nuts (2) from the clamp at the bend in undercarriage beam.

6. Remove clamp and main landing gear leg assembly.

5-5.3 Inspection

NOTE: Gear leg attach bolts must be replaced every 500 hours total time. Refer to Jabiru USA Service Bulletin JSA-003-1 for more information.

1. Check for looseness of main gear legs by lifting each wing and trying to move gear legs fore and aft (with main gear still installed).

2. If movement beyond normal flexing of the leg is observed:

    A. Tighten clamp bolts (2) evenly to take beam movement out. **Do not over tighten.** Add washers if necessary (max. 4) until between 3 and 5 threads show on the bolt. If more washers are necessary, use a shorter bolt.

    B. Over-tightening AND failure to tighten both bolts adequately can cause bolt failure. See Table 1-4: Torque Values for proper bolt torque.

3. Inspect composite beam for damage indicated by cracks or delamination. Pay particular attention to the area around the center bend and to areas around drilled holes.

4. Inspect main gear mounting hardware for wear, bending, and signs of damage. Replace hardware if necessary.

5. Inspect bolt seats in fuselage for signs of damage or wear.

5-5.4 Repair

All damage involving cracking or delamination must be referred to Jabiru USA Sport Aircraft, LLC or an approved local agent for an appropriate repair procedure. Repair is generally restricted to replacement of the gear leg.

5-5.5 Reinstallation

Tools Required	Screwdriver set, 7/16, 1/2 and 9/16" wrenches
Parts Required	New AN bolts and nuts as required (length varies with thickness of fiberglass mounting areas)
Level of Maintenance	Heavy
Level of Certification Required	A&P, LSA R/M-M

The following procedural steps install the landing gear as a complete assembly. Refer to applicable paragraphs for installation of the individual components.

With aircraft jacked:

1. Position the main gear leg under the fuselage and install clamp, rubber cushion, and bolts/nuts (2 OFF) – Do not tighten at this stage.
2. Locate inboard bolt, install and tighten nut (See Table 1-4, Torque Values).
3. Tighten the two clamp bolts/nuts (See Table 1-4 – Torque Values).
4. Connect flexible brake line.
5. Fill brake master cylinder with fresh brake fluid and bleed brakes – see Paragraph 5-8.7.
6. Lower aircraft to the ground.

5-6 Main Wheel Stub Axle

5-6.1 Description

The main stub axle, Matco part number WHLA3A, is a machined aluminum axle 1.25 inches in diameter. It is designed to accept the Matco wheel & brake system and features machined bearing stops to ensure brake caliper alignment.

5-6.2 Removal

Tools Required	Screwdriver set, 7/16, 1/2 and 9/16" wrenches
Parts Required	None
Level of Maintenance	Heavy
Level of Certification Required	A&P or LSA R/M-M

1. Remove speed fairing (if installed) in accordance with Paragraph 5.3.2.

2. Remove wheel in accordance with Paragraph 5-7.2.

3. Note number and position of the wheel alignment shims (if any) between the axle flange and composite leg. If shims are not epoxied in place, mark them or tape them together carefully so that they can be installed in exactly the same position, to ensure that wheel alignment is not disturbed.

4. Remove 4 bolts/nuts/washers securing axle to main gear leg.

5-6.3 Inspection

1. Check to see if axle is bent or cracked.

2. Check for gouges or scratches in bearing seat areas.

5-6.4 Repair

Repair is limited to replacement with new part.

5-6.5 Reinstallation

1. Secure axle and brake assembly to composite leg with the proper AN4 bolts, making sure that any wheel alignment shims are installed in their original position.

2. Install wheel assembly on axle in accordance with Paragraph 5-7.7.

5-6.6 Main Wheel Realignment

Tools Required	7/16 wrenches
Parts Required	AN washers, 5-min epoxy and cotton flock
Level of Maintenance	Heavy
Level of Certification Required	A&P, LSA R/M-M

1. Main wheel axles must be aligned for proper ground tracking. Refer to Figure 5-3.

2. Axles must be parallel, with no toe-in or toe-out. Positive camber is acceptable; amount of camber is not critical to handling but may affect tire wear.

3. Very small adjustments can be made by sanding the fiberglass gear leg as shown in Figure 5-3. Adjustments more than 1/32” must be accomplished using shims.

4. Shim with AN-4 washers on bolts between gear leg and axle as necessary. Epoxy and flock washers into place when proper alignment is established.

5-7 Main Wheels and Brakes

For more detailed information on Matco components, refer to the Matco Mfg. Technical Service Bulletin for MHE51 Series wheels and brakes, which can be found on the Matco website. A link to the website is located in the Appendix of this manual.

5-7.1 Description

All Jabiru LSA aircraft utilize Matco MHE51J "E" series 5" aluminum alloy wheels and single-piston, external-caliper brakes for ease of maintenance and availability of parts. The master brake cylinder is a Jabiru product. See Section 5-8 for information on the master cylinder and brake bleeding procedures.

♦ **CAUTION: When replacing a brake caliper assembly, the brake piston BUNA N O-ring MUST be replaced with a VITON O-ring compatible with DOT 4 fluid (p/n 1201T71).**

5-7.2 Removal and Disassembly

5-7.2.1 Wheel Removal

Tools Required	Wire cutter, Phillips screwdriver, needle-nose pliers, 7/16 wrenches
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

1. Remove wheel pant as described in Section 5-3.
2. Remove outer wheel pant bracket by cutting the safety wire and removing the two bolts.
3. Remove the brake caliper bolts by cutting the safety wire and removing the two bolts.
4. Support the airframe using the jacking procedure in Section 2-2.
5. Remove cotter pin from axle nut.
6. Remove axle nut.
7. Support wheel as it comes off.

5-7.2.2 Wheel Disassembly

▽ ***WARNING! Do not attempt to separate wheel halves with tire inflated, as injury may result. Avoid damaging wheel flanges when breaking beads loose as a scratch, nick or gouge may cause wheel failure.***

1. Deflate tire and break tire beads loose from tire rims.
2. Remove brake disc.
3. Remove through-bolts/nuts and separate wheel halves, removing tire, tube and wheel hub.

5-7.3 Wheel Inspection

1. Clean all metal parts in solvent and dry thoroughly.

2. Inspect wheel halves for cracks. Cracked wheel halves should be discarded and new parts used. Sand out nicks, gouges and corroded areas.

3. Carefully inspect bearings for damage and discoloration.

4. Repack bearings as needed. *NOTE: Bearing cleaning solvents will remove the packing grease, therefore, bearings must be repacked after cleaning*.

5-7.4 Brake Inspection

1. Check assembly and fittings for evidence of leaks.

2. Check safety wire and security of caliper bolts.

3. Look for the half-moon shaped wear mark on the fore and aft faces of the brake pads. If the mark is not visible, the pads are worn beyond service limits and must be replaced.

4. Check disks for wear, grooves, deep scratches, pitting or coning. Isolated grooves up to 0.030 inch deep are acceptable, but any grooving will reduce service life of the pads. Coning beyond 0.015 in. in either direction requires disk replacement. Minimum serviceable disk thickness is 0.167 inches.

5. Excessive rust not removable by normal braking should be cleaned using a wire brush followed by 220-grit sandpaper. Take care not to remove plating from areas not contacted by brake pads.

5-7.5 Replacement of Brake Pads

Contact Matco Mfg. for replacement brake shoes with pads already installed for a fast replacement. Follow instructions below to replace the pads (linings) on the existing shoes.

From Matco Mfg. Technical Service Bulletin for MHE51 Series Wheels and Brakes, Revision D, June2007:

1. Remove the caliper from the wheel by removing the two MSCAN4H9-16A bolts that hold it on.

2. Remove old linings by drilling the crimped side of the rivet (Do not use a punch & hammer). Using a #25 drill (0.1495 diameter), drill through rivet taking care to avoid damaging the rivet hole. After drilling crimped edge off rivets, lift old lining and remaining rivet pieces from the brake shoe.

3. Inspect the brake shoe for any bending or other damage that may have occurred during service. A shoe with more than 0.010 bend should be replaced. Inspect rivet holes to ensure that no damage has occurred during removal.

4. Using a brake relining tool (*MATCO recommends a Threaded Screw Action such as the W404 from Aircraft Tool Supply Co.)* or pneumatic press, replace the lining using the brass rivets shown on the illustrated parts list and install the hub.

5-7.6 Wheel Reassembly

Refer to the Matco Service Instructions located in the Appendix of this manual for additional information regarding wheel assembly.

Tools Required	7/16 wrenches, tire pressure gauge
Parts Required	Wheel rim lubricant, new inner tube if necessary
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

1. Apply automotive tire mounting lubricant to the tire bead areas of the rim halves.
2. Position tire and tube between wheel halves with tube inflation valve through hole in outside wheel half.
3. Mate wheel halves. While holding halves together, assemble a washer and nut on one through-bolt and tighten snugly.
4. Assemble the remaining washers and nuts on the through-bolts and torque to 16 ft-lbs.

▽ ***CAUTION: Ensure tube is not pinched between wheel halves during assembly. Uneven or improper torque of through-bolt nuts can cause bolt failure and subsequent wheel failure.***

5. Insert through-bolts through brake disc and position disc on the inner wheel hub flange.
6. Inflate tire to seat tire beads, then adjust to correct tire pressure – Refer to Paragraph 1-6.

5-7.7 Reinstallation of Wheel/Brake onto Axle

Tools Required	Screwdriver, 7/16 wrenches, safety wire pliers, adjustable wrench
Parts Required	New 1/8” by 2” cotter pin if necessary, .032 safety wire
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

Refer to the Matco Service Instructions located in the Appendix of this manual for more information regarding wheel and bearing installation.

1. Lightly coat axle with “Anti-Seize” or a waterproof grease.
2. Install the inboard tapered bearing to the axle.

3. Place wheel assembly on axle.

4. Install outboard tapered bearing to the axle.

5. Install washer and axle nut. Tighten until the outer part of the bearing does not spin, but everything else does. Some drag force is normal for the roller bearings to work properly.

6. Install cotter pin to axle nut.

7. Place outboard brake pad plate and spacer in position and secure with bolts. Replace safety wire. *Note: Newer J230-SP models use lock washers in lieu of safety wire on the brake pad plates.*

8. Install wheel pant (if used) as outlined in Paragraph 5-3.

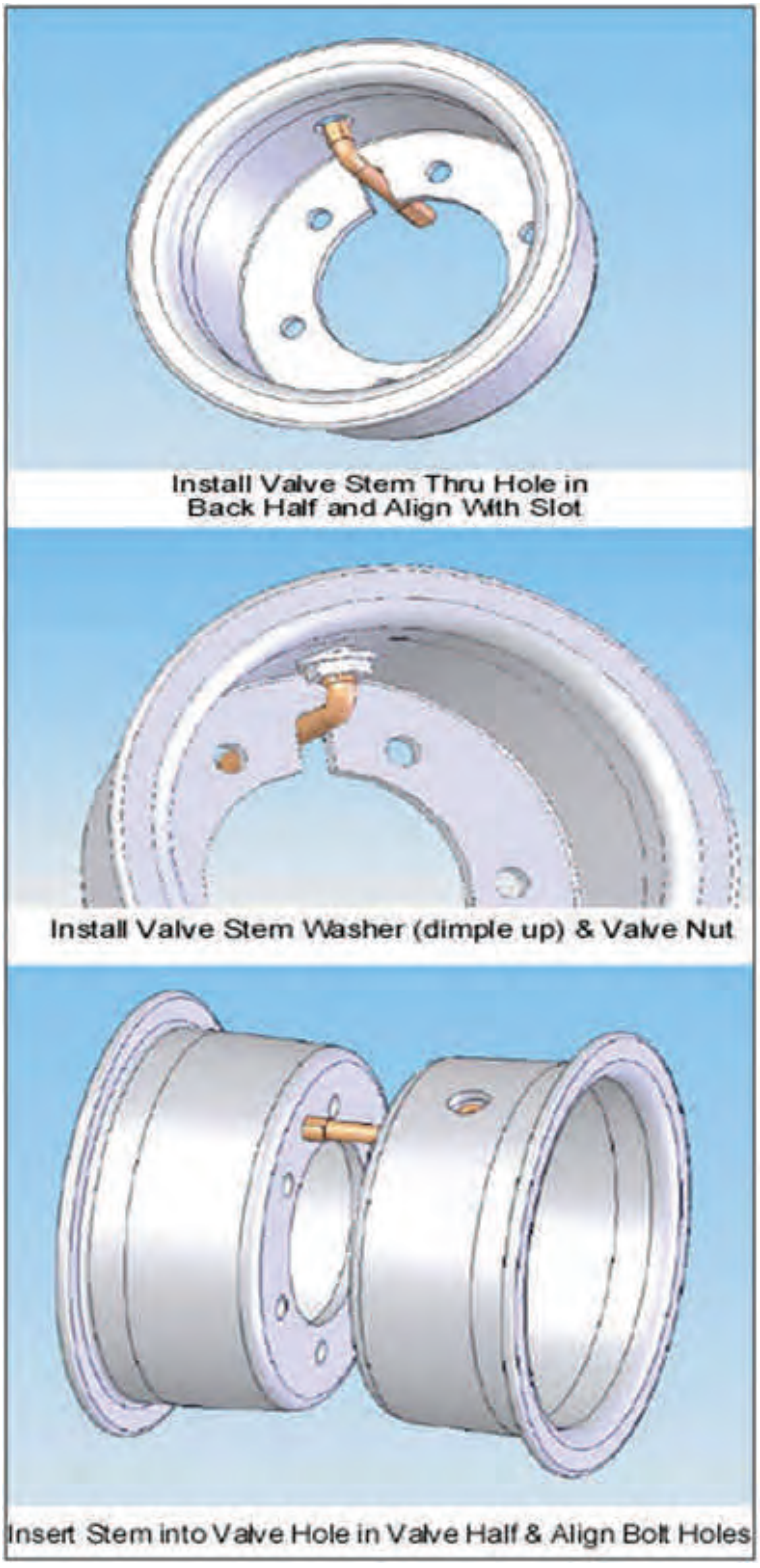


Figure 5-2: Assembly of Matco Wheel Halves

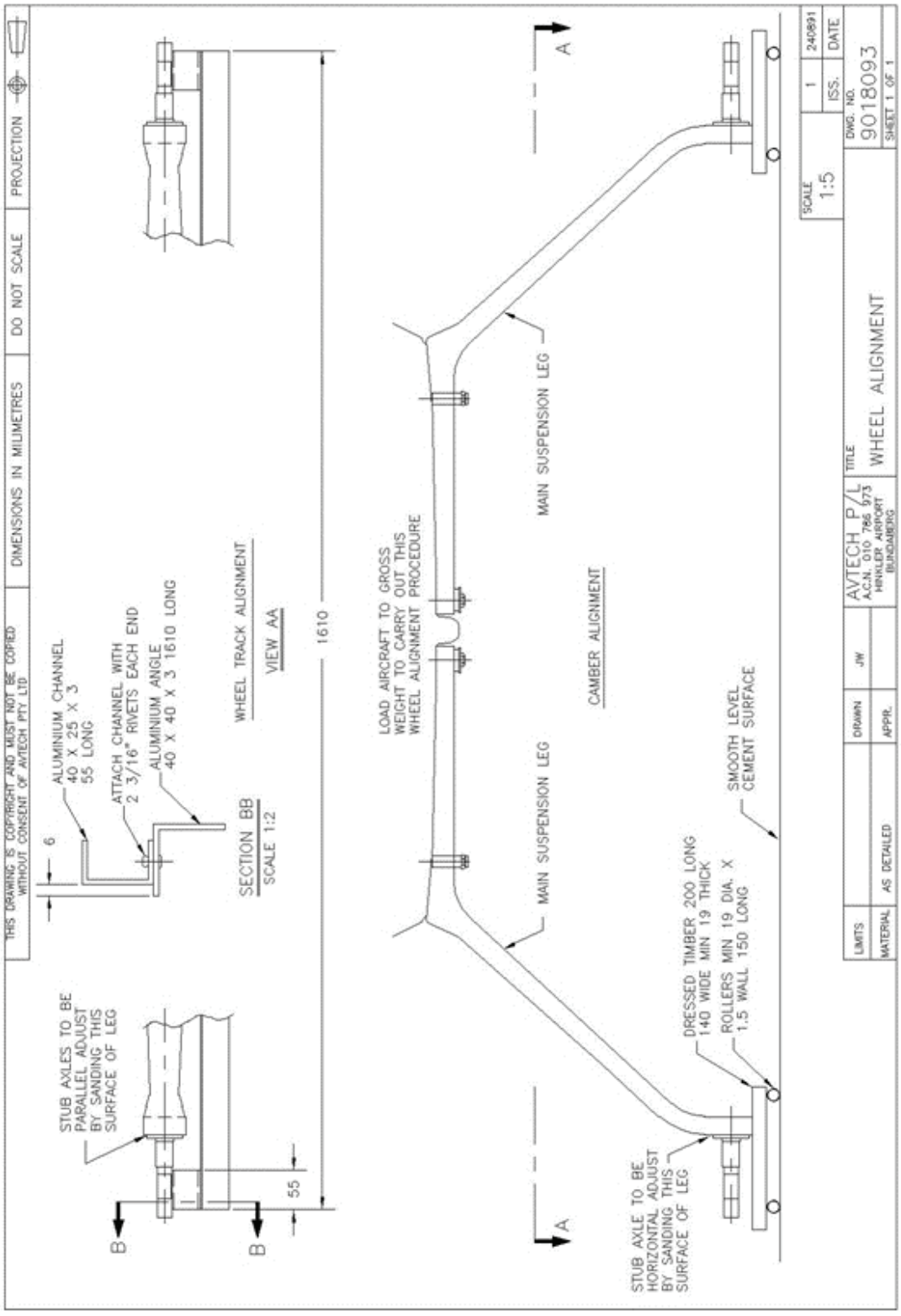


Figure 5-3: Axle Alignment

(Note: Drawing refers to Jabiru UL model, but alignment procedure is the same.)

5-8 Master Cylinder/Parking Brake Assembly

5-8.1 Description

The brake master cylinder, located between the seats on the front of the main longitudinal beam, is actuated by applying rearward pressure to the brake handle. A small reservoir is incorporated into the master cylinder for the fluid supply. The parking brake consists of an over center cam on the brake handle. Flexible lines carry fluid from the master cylinder through the belly of the aircraft, inside the trailing edges of the main landing gear legs, and into the Matco wheel cylinders.

5-8.2 Troubleshooting

Trouble	Probable Cause	Remedy
Dragging brakes	Brake handle binding	Check and adjust
	Worn or broken master cylinder piston return spring	Repair or install new master cylinder
	Restriction in brake lines or in master cylinder	Drain brake line, clear with compressed air. If cleaning lines fails, inspect and repair or replace master cylinder.
Brakes fail to operate	Worn brake pads	Replace with new parts
	Leak in system	Check for leaks and repair or install new parts
	Air in system	Bleed system
	Lack of fluid in master cylinder	Fill and bleed system; check for leaks
	Defective master cylinder	Repair or install new parts
Shimmy or chatter when brakes applied heavily	Rough or uneven runway surface	Some main gear chatter is normal during heavy braking on rough surface
	Warped or worn brake disks (severe chatter)	Inspect disks for wear; resurface or replace as necessary

5-8.3 Removal

Tools Required	Allen key set, 1/2 and 7/16 wrenches
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

Refer to Figure 5-4: Brake Master Cylinder Assembly. Take care to avoid dripping brake fluid onto interior surfaces of cabin, as this may damage the finish.

1. Remove the flexible hose from one wheel brake assembly and drain the hydraulic fluid from the brake system.
2. Remove brake handle.
3. Disconnect flexible hose at master cylinder.
4. Plug or cap hydraulic fittings and hoses to prevent the entry of foreign material.
5. Unbolt master cylinder retaining bolts (2).

5-8.4 Inspection

Inspect for leaks at fittings. Check for damage to brake piston and diaphragm.

5-8.5 Repair

Hydraulic Brake Lines

Repair is limited to replacement.

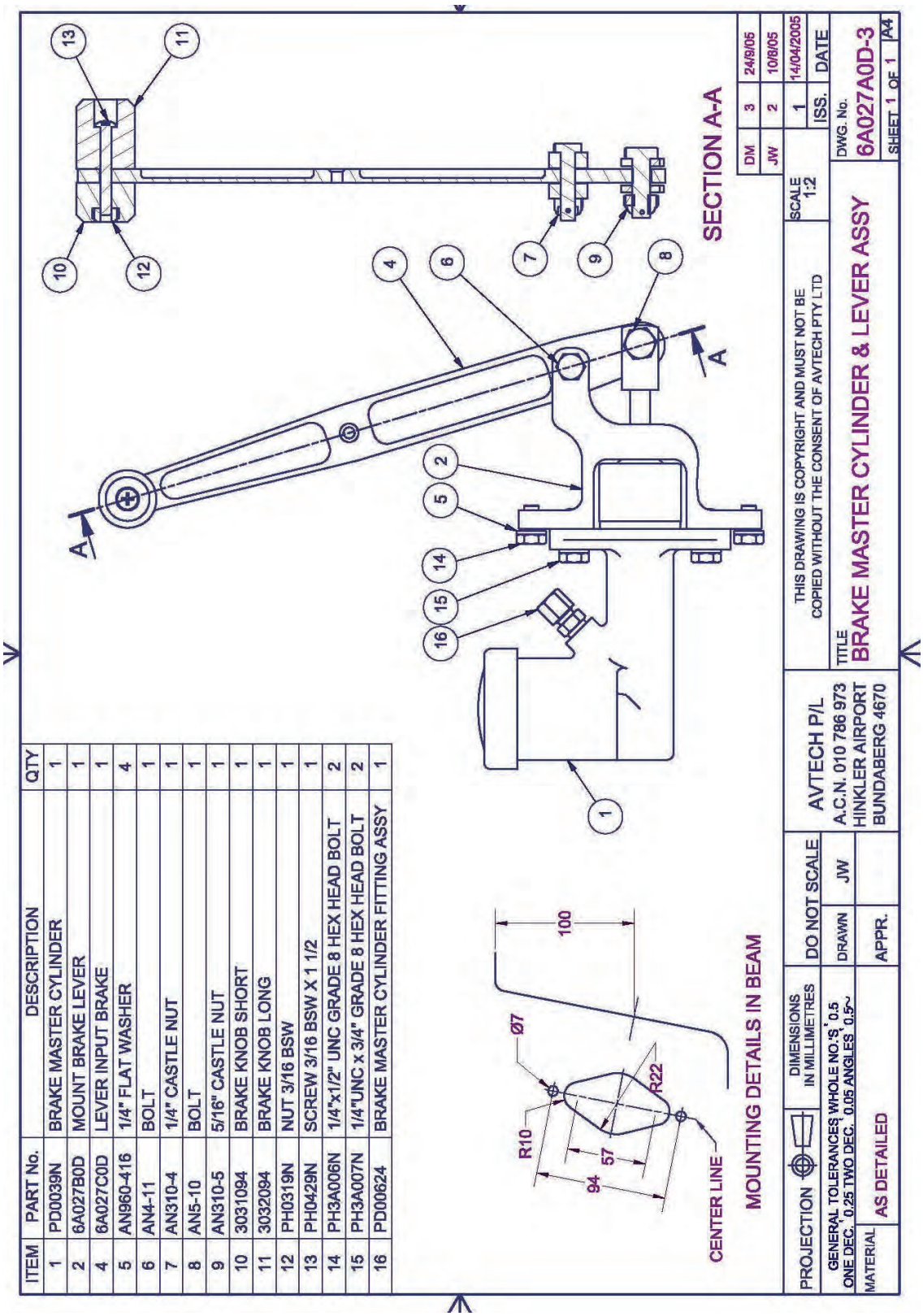
Master Cylinder

Figure 5-4, Brake Master Cylinder Assembly, may be used as a guide during disassembly, repair and reassembly of the brake master cylinder.

Repair is limited to installation of new parts, cleaning and adjustment.

Master cylinder replacement may be the least expensive method of repair. Replace with Wilwood Master Cylinder model 950-260-1304.

▽ ***WARNING:*** ***Use only automotive DOT 4 brake fluid. DO NOT use aircraft grade hydraulic fluid or damage will result.***



ITEM	PART No.	DESCRIPTION	QTY
1	PD0039N	BRAKE MASTER CYLINDER	1
2	6A027B0D	MOUNT BRAKE LEVER	1
4	6A027C0D	LEVER INPUT BRAKE	1
5	AN960-416	1/4" FLAT WASHER	4
6	AN4-11	BOLT	1
7	AN310-4	1/4" CASTLE NUT	1
8	AN5-10	BOLT	1
9	AN310-5	5/16" CASTLE NUT	1
10	3031094	BRAKE KNOB SHORT	1
11	3032094	BRAKE KNOB LONG	1
12	PH0319N	NUT 3/16 BSW	1
13	PH0429N	SCREW 3/16 BSW X 1 1/2	1
14	PH3A006N	1/4"x1/2" UNC GRADE 8 HEX HEAD BOLT	2
15	PH3A007N	1/4"UNC x 3/4" GRADE 8 HEX HEAD BOLT	2
16	PD00624	BRAKE MASTER CYLINDER FITTING ASSY	1

Figure 5-4: Brake Master Cylinder Assembly

5-8.6 Reinstallation of Master Cylinder

Tools Required	Allen key set, 1/2 and 7/16 wrenches
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P, LSA R/M-M

1. Connect the master cylinder using the retaining bolts (2).
2. Remove plug or cap from hydraulic fittings and hoses.
3. Reconnect the flexible hose at the master cylinder.
4. Reinstall the brake handle.
5. Reconnect the flexible hose to the wheel brake assembly.
6. Fill and bleed brake system in accordance with Paragraph 5-8.7.

5-8.7 Bleeding Brake System

Tools Required	1/4 wrenches, brake fluid injector
Parts Required	Dot 4 automotive brake fluid
Level of Maintenance	Line
Level of Certification Required	A&P, LSA R/M-M

▽ ***WARNING: Use only automotive DOT 4 brake fluid. DO NOT use aircraft grade hydraulic fluid or damage will result.***

1. Open the brake bleeder valve slightly to facilitate bleeding of air from the system.
2. Attach a tube from the nozzle of a squirt can of brake fluid to the top of the brake bleeder valve. Pump the handle until fluid flows bubble free from service hose before attaching.
3. Make sure that the master cylinder shaft is fully extended to open up the internal bypass valve.
4. Inject brake fluid (DOT 4) or equivalent, into the puck housing and continue injecting until the fluid travels through the system in to the master cylinder.
5. Air in the system will be pushed up and out in to the master cylinder ONLY IF the master cylinder or remote reservoir is at the highest point in the system, and there are no loops in the brake lines.
6. Fluid should be pushed through the system until it reaches approximately ¼ inch from the top of the master cylinder.
7. Close the brake bleeder valve, and remove the service hose.

8. If the brake system is free of air, the brake lever should feel firm and not spongy. If not, repeat steps 1 through 7 until the system is free of trapped air.

9. Fluid leakage from the top of the master cylinder during operation indicates too high a fluid level.

10. Ensure that all drilled bolts are properly safety wired.

NOTE: The Master Cylinder is NOT approved for inverted flight.

5-8.8 Matco Mfg. Brake Conditioning Procedure

It is important to condition the new linings after installation to obtain maximum service life and performance. Conditioning removes high spots and creates a layer of glazed material at the lining surface. Normal braking will produce enough heat to maintain glazing during the life of the lining. Glazing can be worn off during light use such as taxiing.

1. After the linings have been installed, apply brake pressure during high throttle static run-up. Note RPM at creep if any occurs.

2. Perform two or three high speed taxi runs. Apply firm braking at 30-40 mph down to 5 mph to generate the necessary 300 – 400 degree temperatures at the brake pads. DO NOT bring the aircraft to a complete stop during taxi runs, and continue to roll aircraft until reaching the tie down area. Release brake pressure at tie down area as soon as practical and park with brake pressure released. Allow brakes to cool for 10-15 minutes.

3. Repeat step one and note RPM at creep if any occurs. There should be a noticeable increase in holding torque.

4. If properly conditioned, the pads will have a uniform shiny appearance (glaze) on the surface. Repeat steps 1-3 if necessary to produce glaze.

NOTE: Forward movement of the aircraft during static run up could be caused by the wheels skidding and not brake malfunction.

5-9 Nose Wheel Fairing

5-9.1 Description

Wheel fairings (pants) are standard equipment on Jabiru J230 and J250 aircraft. The nose wheel fairing is composed of two pieces for easy installation and removal.

5-9.2 Removal and Installation

Tools Required	Phillips screwdriver, 7/16 wrenches
Parts Required	Loctite 242 (for installation)
Level of Maintenance	Line
Level of Certification Required	Owner, A&P or LSA R/M-M

1. Weight down tail of aircraft to raise nose wheel off floor as described in Section 2.
2. Remove the machine screws that join the forward and rear sections of the fairing and remove the rear section.
3. Use a set of 7/16 wrenches to remove the nose wheel axle bolt. Support the nose wheel as it falls from the nose fork and take care that it does not catch on the edge of the fairing.
4. Remove the upper screw and washer from each side of the forward half of the wheel fairing and nose gear fork, and remove the front half of the fairing.
5. If returning the aircraft to service without the nose wheel fairing, reinstall wheel and axle bolt. Add spacers to each side of the nose wheel yoke to take up the extra space.
6. Reverse the preceding steps for installation, using Loctite 242 on the screws that attach to the aluminum nose wheel fork to keep them from coming loose.

5-9.3 Inspection and Repair

See Section 5-3 for information regarding inspection and repair of nose wheel fairing. The procedure is the same as for the main wheel fairings.

5-10 Nose Gear Leg

5-10.1 Description

The nose gear is a welded steel and aluminum trailing arm assembly with a rubber spring cushion system. The nose wheel is mounted in an aluminum yoke which is bolted to the steerable welded steel tube nose leg. Two aluminum brackets and Delrin bushings form a housing which attaches the steel tube nose leg to the firewall.

Nose wheel steering is achieved by connecting the rudder pedal assembly to the nose wheel steering link by push rods. The nose wheel is centered by springs attached to the pedals and a bracket on the center console inside the cockpit. The springs extend and contract as the nose leg is moved left and right and are critical to the rudder rigging and handling characteristics of the aircraft.

5-10.2 Removal

Tools Required	Screwdriver set, 7/16 wrenches and/or sockets, pliers
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

Refer to Figures 5-5 to 5-8.

1. Remove engine cowlings as described in Section 7.
2. Weigh down tail of aircraft to raise nose wheel off floor as described in Section 2.
3. Disconnect nose wheel steering pushrods from steering cross beam.
4. Unbolt steering cross beam.
5. Remove upper collar / steering yoke (dependant on aircraft serial number) from the top of the leg.
6. Pull the nose wheel strut assembly down from the bushings in the fuselage.

5-10.3 Inspection and Repair

1. Inspect steel tube and attachments for dents and straightness. If bent or dented, replace steel nose leg assembly. Repair is limited to replacement.
2. Inspect rubber suspension assembly for damage or cracking of the rubber, or delamination of the rubber from the aluminum spacers between the rubber blocks. If weather-checked, cracked, or otherwise damaged replace rubber suspension spring assembly.
3. Inspect aluminum wheel yoke for damage or bending. If cracked, bent, or otherwise damaged replace the yoke.
4. Check bolt/nut tension on entire assembly – see Table 1-4, Torque Values.
5. Inspect steering rod connections and rudder springs for security and condition. Replaced if bent, sprung, or otherwise damaged.
6. Check for bending or deformation of nose leg housing assembly. Check Delrin bushes for wear or breakage. Repair of nose leg housing is limited to straightening or replacement of aluminum brackets and replacement of Delrin bushes.

5-10.4 Reinstallation

1. Reverse the steps in Paragraph 5-10.2 for reinstallation.
2. When replacing Delrin bushings, install with a mixture of epoxy and cotton flock and bed in place.

5-11 Nose Wheel

5-11.1 Description

The nose wheel is a Jabiru cast aluminum wheel with sealed bearings. The wheel is in two halves which are joined by through-bolts to the wheel hub as shown in Figure 5-8: Nose Wheel Assembly.

5-11.2 Removal and Installation

Tools Required	Phillips screwdriver, 7/16 wrenches
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	Owner, A&P or LSA R/M-M

1. Weight down tail of aircraft to raise the nose wheel off the floor as described in Section 2.
2. Remove wheel fairing and axle bolt as described in Section 5-9.
3. Pull nose wheel from yoke. Take note of position of spacers.
4. Reverse the preceding steps to install nose wheel.

5-11.3 Disassembly

Tools Required	Phillips screwdriver, 7/16 wrenches
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

▽ ***WARNING:*** ***Do not attempt to separate wheel halves with the tire inflated, or injury may result. Avoid damaging wheel flanges when breaking beads loose as a scratch, nick or gouge may cause wheel failure.***

1. Completely deflate tire and break tire beads loose at wheel rim. Refer to Figure 5-8: Nose Wheel Assembly.
2. Remove through-bolts and separate wheel halves.
3. Remove wheel hub.
4. Remove tire and tube from wheel halves.

NOTE: The bearings are "press-fit" in the wheel hub and should not be removed unless a new part is to be installed.

5-11.4 Nose Wheel Inspection and Repair

1. Clean metal parts in mineral spirits and dry thoroughly. NOTE: Bearings are pre-packed. Avoid cleaning with solvents as they will remove the packing.

2. Inspect wheel halves for cracks. Cracked wheel halves should be discarded and new parts used. Sand out nicks, gouges and corroded areas. Clean thoroughly. Inspect bearings for damage and discoloration.

3. Refit bearings or replace if necessary.

5-11.5 Nose Wheel Reassembly

1. Ensure bearings are properly reinstalled in wheel hub.

2. Apply automotive tire mounting lubricant to the tire bead faces on the inside of the wheel rims.

3. Position tire and tube between wheel halves with tube inflation valve through hole in outside wheel half.

4. Mate wheel halves. While maintaining a light force, assemble a washer and nut on one through-bolt and tighten snugly. Assemble the remaining washers and nuts on the through-bolts and torque to the value specified in Table 1-4, Torque Values.

▽ ***WARNING:*** ***Ensure tube is not pinched between wheel halves during assembly. Uneven or improper torque of through-bolt nuts can cause failure of bolts with resultant wheel failure.***

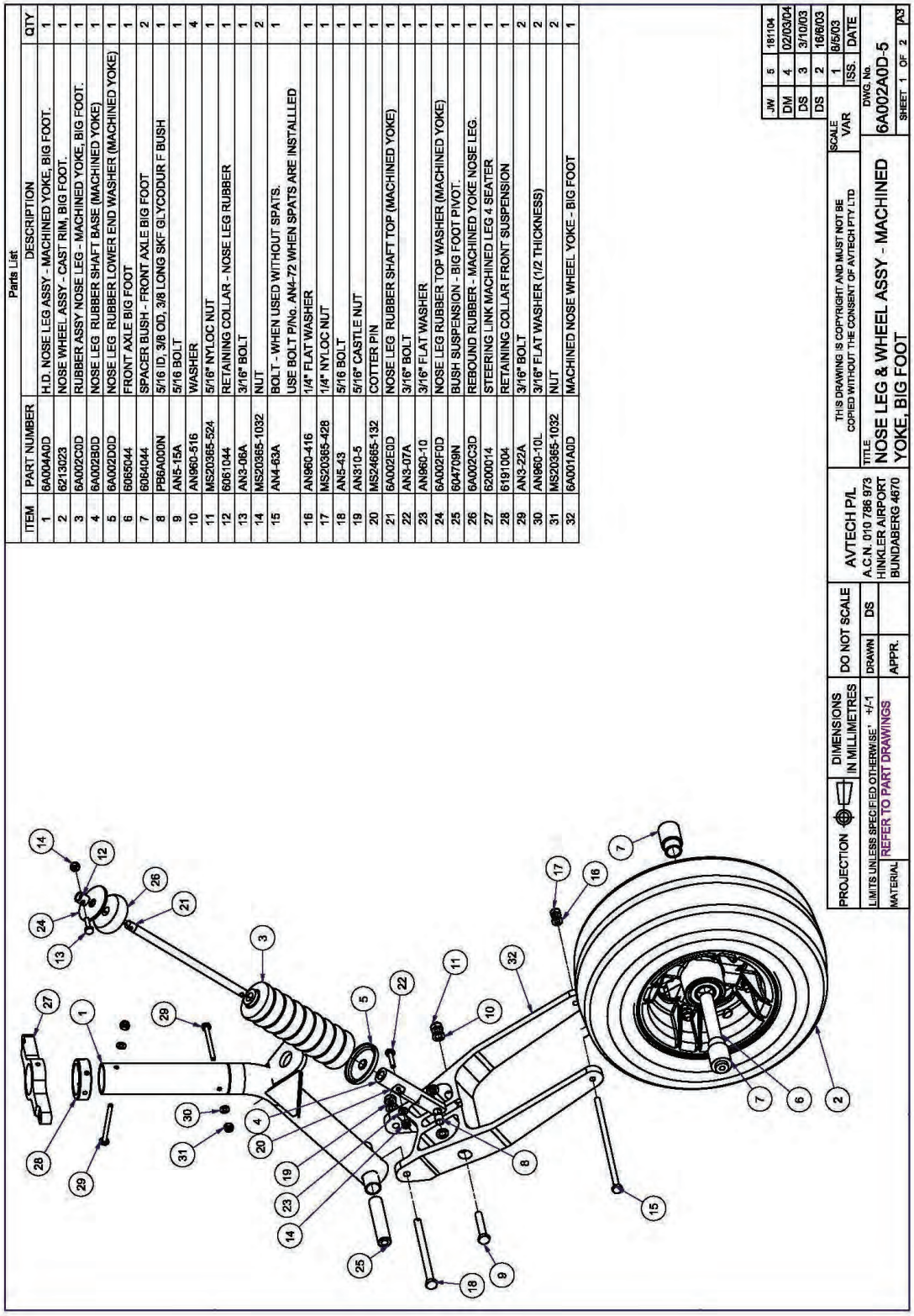
5. Inflate tire to seat the tire beads. Adjust to correct tire pressure. Refer to Section 1-6.

5-9.5 Nose Wheel Balancing

Tools Required	Phillips screwdriver, 7/16 wrenches
Parts Required	Wheel weights—various sizes
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

Since uneven tire wear is usually the cause of tire imbalance, replacing the tire will probably correct this condition. Slight shimmy felt after takeoff is usually a result of tire imbalance. If a wheel shows evidence of imbalance during service, it may be statically balanced.

NOTE: Takeoff technique also affects nose wheel shimmy. See *J230 Flight Training Supplement,* available in the LSA Owners section of www.usjabiru.com, for more information.



Parts List

ITEM	PART NUMBER	DESCRIPTION	QTY
1	6A004A0D	H.D. NOSE LEG ASSY - MACHINED YOKE, BIG FOOT.	1
2	6213023	NOSE WHEEL ASSY - CAST RIM, BIG FOOT.	1
3	6A002C0D	RUBBER ASSY NOSE LEG - MACHINED YOKE, BIG FOOT.	1
4	6A002B0D	NOSE LEG RUBBER SHAFT BASE (MACHINED YOKE)	1
5	6A002D0D	NOSE LEG RUBBER LOWER END WASHER (MACHINED YOKE)	1
6	6065044	FRONT AXLE BIG FOOT	1
7	6064044	SPACER BUSH - FRONT AXLE BIG FOOT	2
8	PB6A00DN	5/16 ID, 3/8 OD, 3/8 LONG SKF GLYCODUR F BUSH	1
9	AN5-15A	5/16 BOLT	1
10	AN960-516	WASHER	4
11	MS20365-524	5/16" NYLOC NUT	1
12	6061044	RETAINING COLLAR - NOSE LEG RUBBER	1
13	AN3-06A	3/16" BOLT	1
14	MS20365-1032	NUT	2
15	AN4-63A	BOLT - WHEN USED WITHOUT SPATS. USE BOLT P/No. AN4-72 WHEN SPATS ARE INSTALLLED	1
16	AN960-416	1/4" FLAT WASHER	1
17	MS20365-428	1/4" NYLOC NUT	1
18	AN5-43	5/16 BOLT	1
19	AN310-5	5/16" CASTLE NUT	1
20	MS24665-132	COTTER PIN	1
21	6A002E0D	NOSE LEG RUBBER SHAFT TOP (MACHINED YOKE)	1
22	AN3-07A	3/16" BOLT	1
23	AN960-10	3/16" FLAT WASHER	1
24	6A002F0D	NOSE LEG RUBBER TOP WASHER (MACHINED YOKE)	1
25	6047098N	BUSH SUSPENSION - BIG FOOT PIVOT.	1
26	6A002C3D	REBOUND RUBBER - MACHINED YOKE NOSE LEG.	1
27	6200014	STEERING LINK MACHINED LEG 4 SEATER	1
28	61910O4	RETAINING COLLAR FRONT SUSPENSION	1
29	AN3-22A	3/16" BOLT	2
30	AN960-10L	3/16" FLAT WASHER (1/2 THICKNESS)	2
31	MS20365-1032	NUT	2
32	6A001A0D	MACHINED NOSE WHEEL YOKE - BIG FOOT	1

JW	5	18/1/04	
DM	4	02/03/04	
DS	3	3/10/03	
DS	2	16/6/03	
	1	8/5/03	
	ISS.	DATE	

PROJECTION | DIMENSIONS IN MILLIMETRES | DO NOT SCALE

LIMITS UNLESS SPECIFIED OTHERWISE: +/-1

MATERIAL: REFER TO PART DRAWINGS

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APPR.:

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SCALE: VAR

TITLE: NOSE LEG & WHEEL ASSY - MACHINED YOKE, BIG FOOT

DWG. No. 6A002A0D-5

SHEET 1 OF 2 A3

Figure 5-5: Nose Leg Assembly

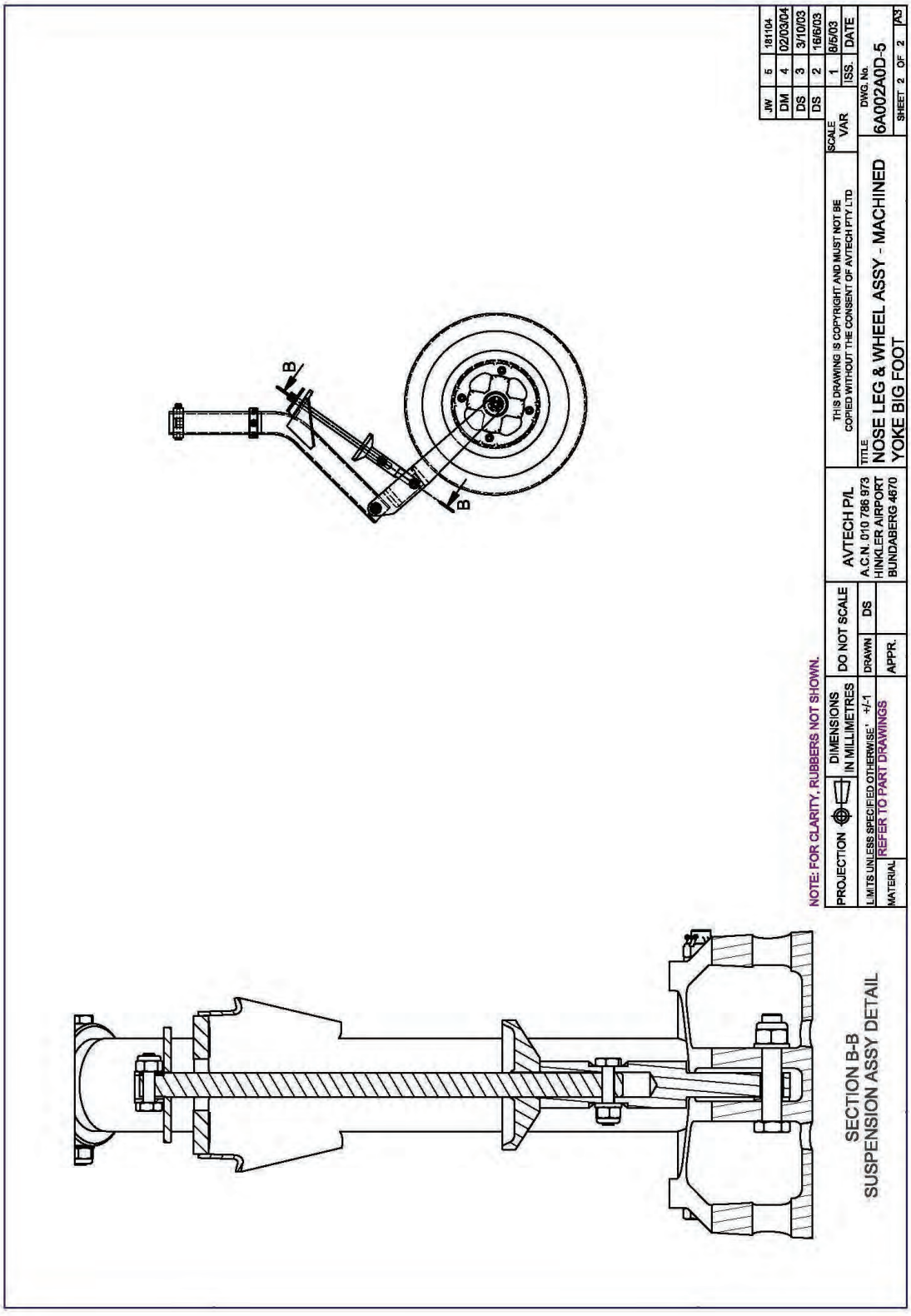

Figure 5-6: Nose Leg Suspension Detail

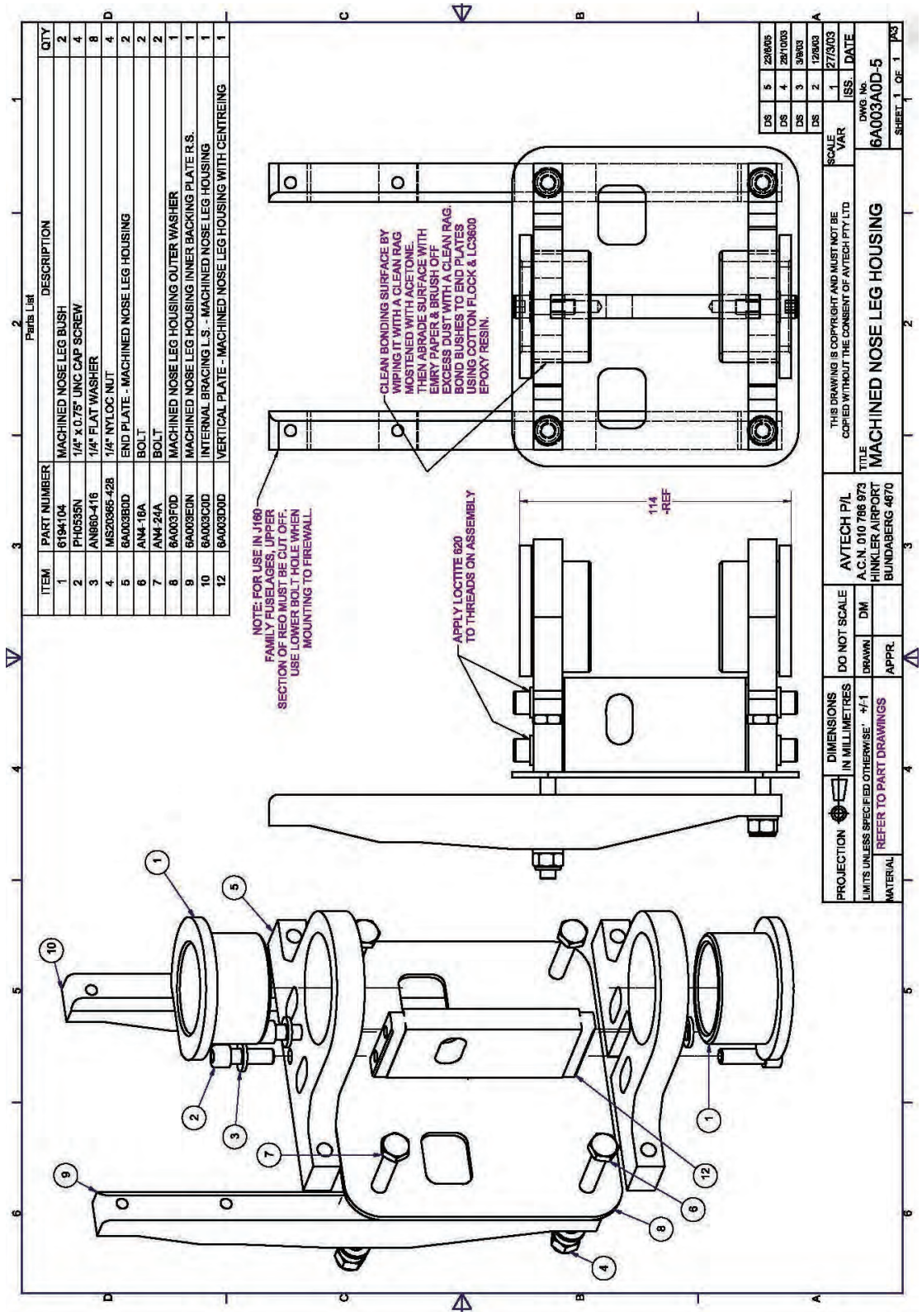

Figure 5-7: Nose Leg Housing

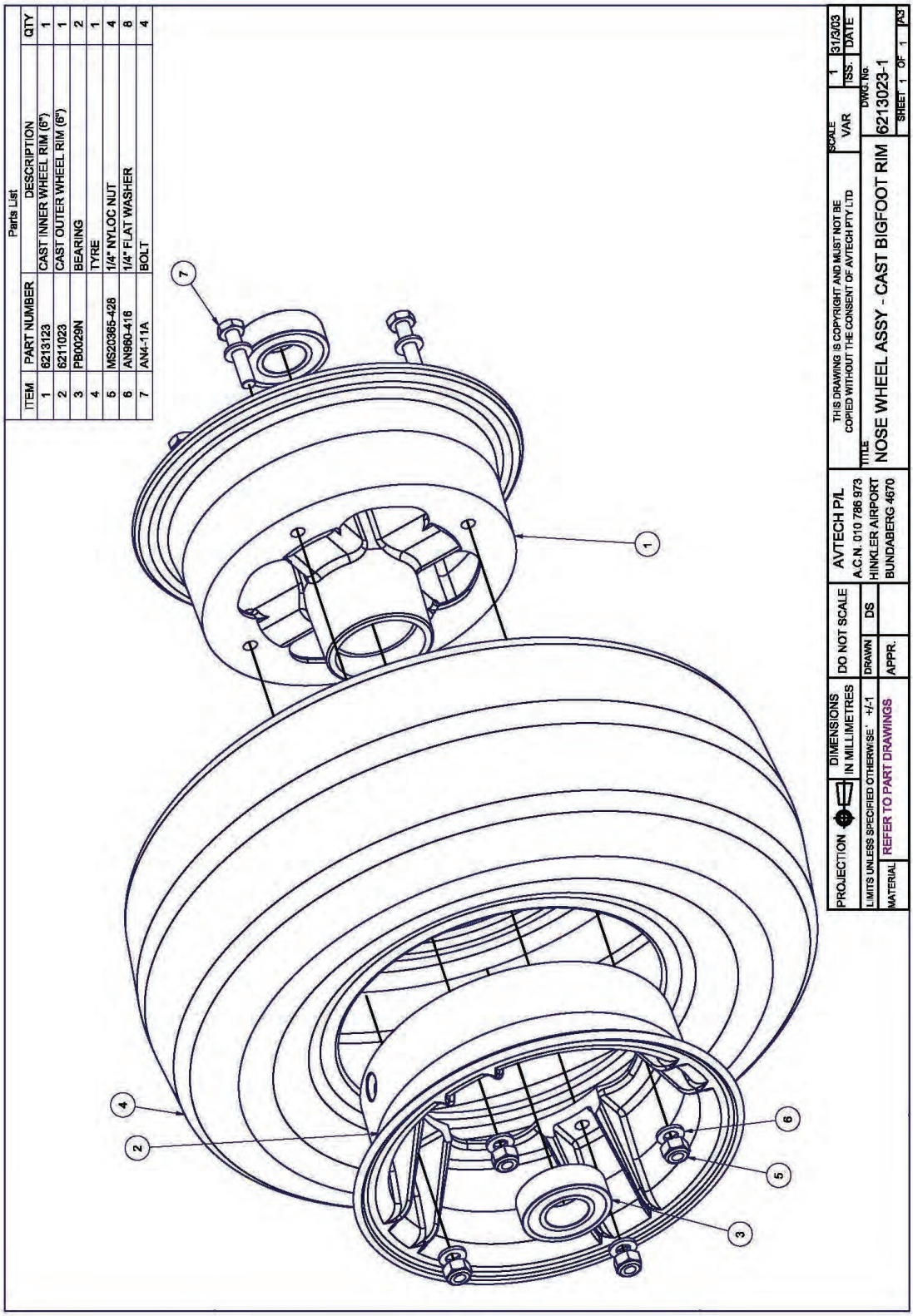

Figure 5-8: Nose Wheel Assembly

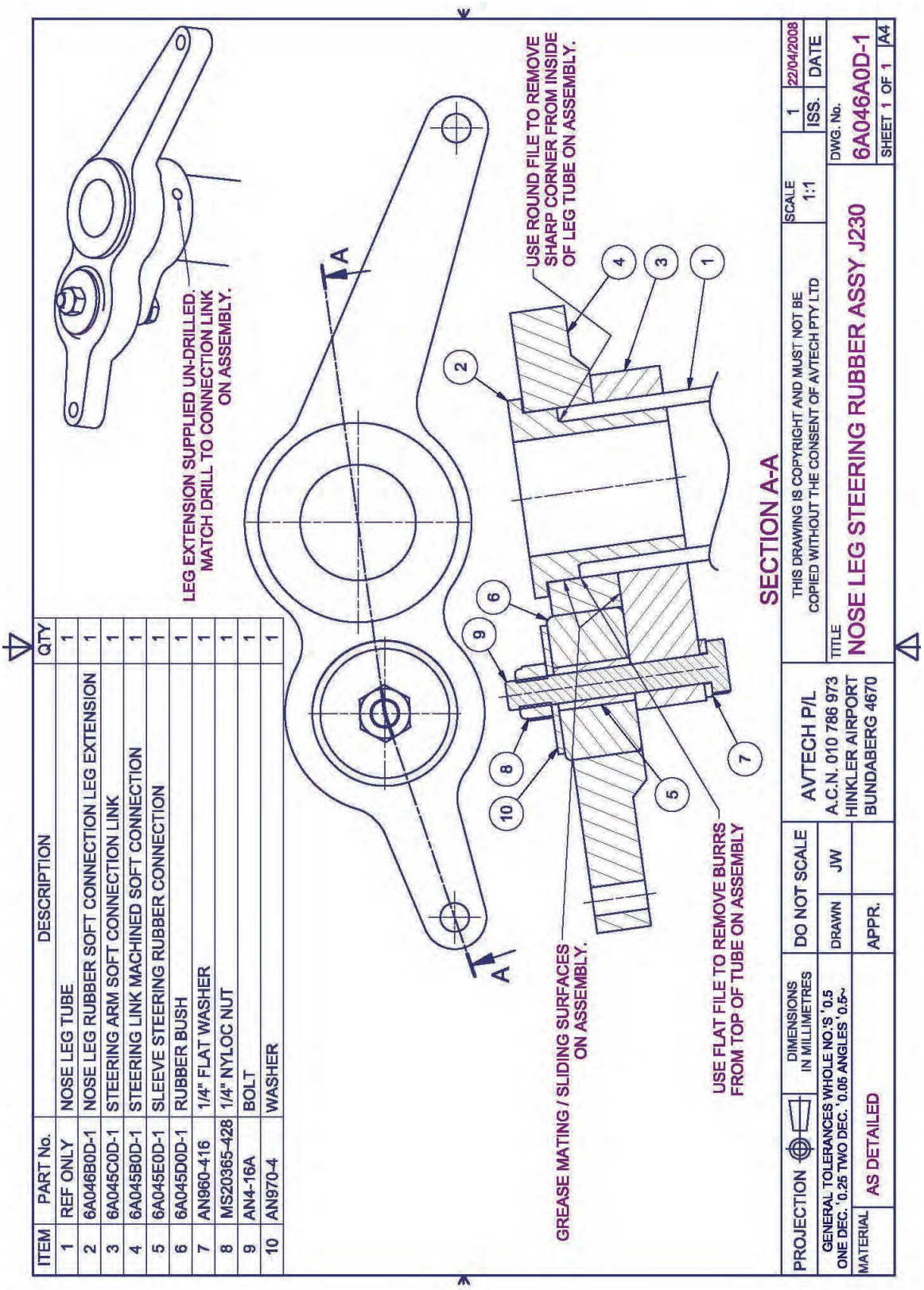

Figure 5-9: Nose Wheel Shimmy Dampener (Serial no. 665 and later)

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Section 6: Flight Controls

6-1 Control Column

6-1.1 Description

The control column is a machined aluminum assembly mounted in the center console of the cockpit that directly controls the ailerons and elevator. It has a machined aluminum hand grip and lower lever arm that attaches to the elevator control cable on the front end. The hand grip is hinged to move fore and aft for elevator control. It rotates around a horizontal column that extends rearward through the center console and exits out the back, where a mixer horn attaches to the Teleflex aileron cables between the seat backs. The column rotates along the longitudinal axis of the aircraft inside a pair of nylon bushings that are epoxied and flocked permanently into the fiberglass center console. Refer to Figure 6-1 or 6-2, Control Column Assembly.

6-1.2 Removal and Reinstallation

The control column is a primary control and may not be removed or repaired without reference to Jabiru USA Sport Aircraft, LLC or a local approved agent.

6-1.3 Inspection

Check for worn nylon bushings. Replace as needed.

6-1.4 Repair

Replace all worn or damaged parts.

6-2 Control Cables

6-2.1 Description

All control cables used in Jabiru aircraft are of the enclosed push-pull type with the cable bolted directly to the control surface horn at one end and to the pilot control at the other end. To operate correctly, outer covers of the cable must be clamped firmly at both ends.

▽ ***WARNING:*** ***All spherical bearings on control cable ends must be fitted with a large washer on the outside of the through-bolt to prevent the bearing case and cable releasing in the event of a bearing failure.***

6-2.2 Removal

The control cables are primary controls and may not be repaired or removed without reference to Jabiru USA Sport Aircraft, LLC or our approved local agent for an appropriate procedure.

6-2.3 Inspection

Check for broken sheaths, broken or frayed cables, and loose fittings. Make sure the cable sheath is clamped securely in the correct position at each end.

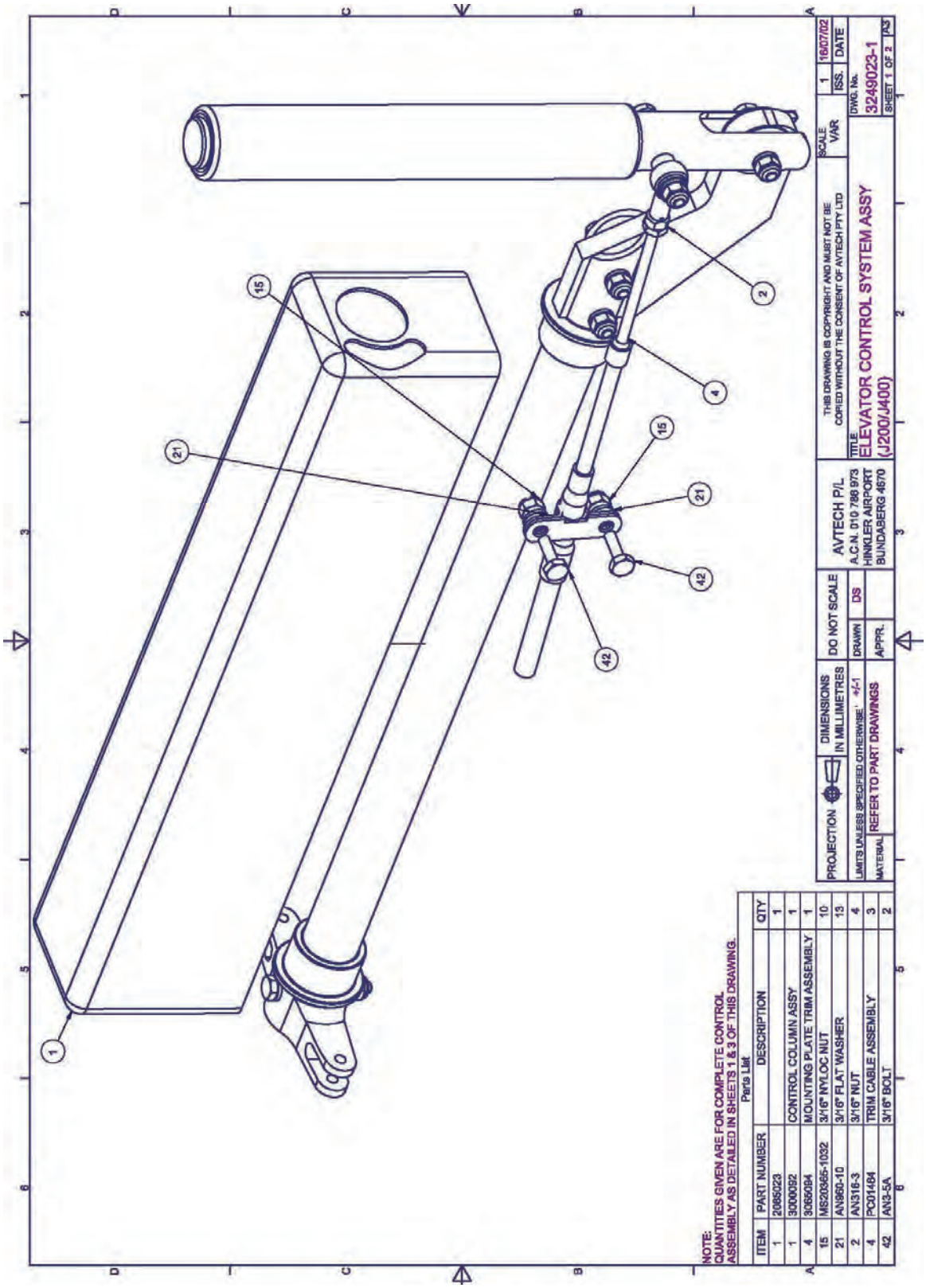


Figure 6-1: Control Column—Old Style

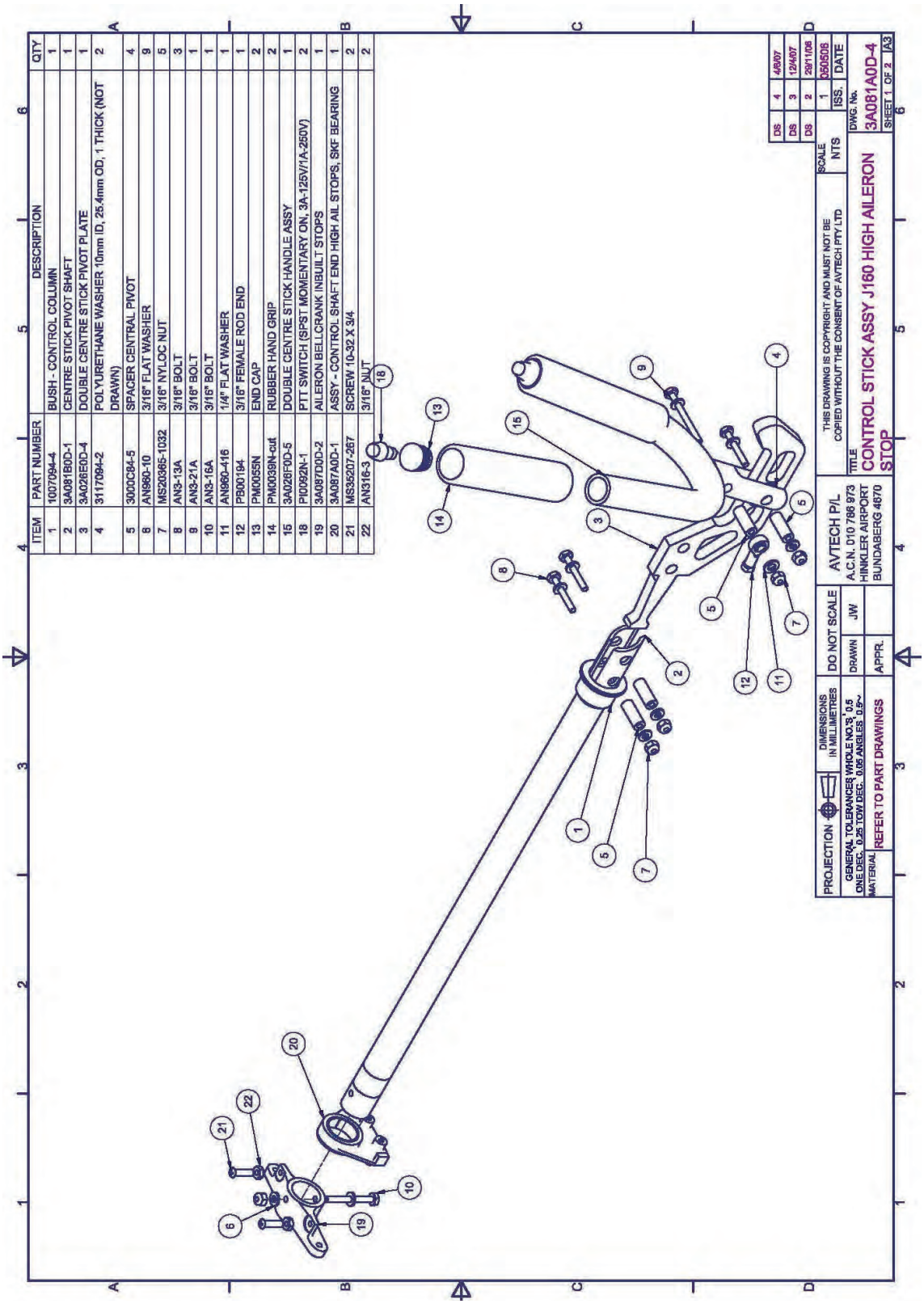


Figure 6-2: Control Column—New Style

6-2.4 Repair

Repair is limited to the replacement of defective parts. Because control cables are considered primary controls, they may not be repaired without reference to Jabiru USA Sport Aircraft, LLC or our approved local agent for the appropriate repair procedure.

6-3 Aileron Control System

6-3.1 Description

The aileron control system consists of one movable control surface on the trailing edge of each wing tip, control cables and the control column. The control surface is a molded and bonded monocoque fiberglass structure incorporating a composite control horn 10" from the inboard end.

The aileron control cables are of the enclosed push-pull type, fitted with spherical bearings at both ends as described in Section 6-2.

NOTE: Control column and control cables are primary controls and may not be removed or repaired without reference to Jabiru USA Sport Aircraft, LLC or our approved local agent.

6-3.2 Removal of Aileron

Tools Required	Screwdriver set, pliers, 3/8 wrenches
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

For aircraft with multiple hinge pins (2008 models and older):

1. Loosen screws in hinge pin retainers and lift hinge pin retainer away from the hinge pin. It is not necessary to completely remove these parts.
2. Unbolt cable from aileron control horn.
3. With the aileron supported, remove hinge pins.

For aircraft with a single hinge pin (2009 models and newer):

1. Remove hinge pin retaining screw.
2. Unbolt cable from aileron control horn.
3. With the aileron supported, remove hinge pin.

6-3.3 Inspection

Inspect ailerons for any signs of delamination or cracking. Pay particular attention to the control horn and hinges and their surrounding fiberglass areas. See Section 6-2 for inspection of control cables.

6-3.4 Repair

All damage involving cracking, delamination, or hinge damage must be referred to Jabiru USA Sport Aircraft, LLC or approved local agent for an appropriate repair procedure.

6-3.5 Reinstallation

Reverse the removal processes of Paragraph 6-3.2 for reinstallation.

▽ ***WARNING: All spherical bearings on control cable ends must be fitted with a large washer on the outside of the through-bolt to prevent the bearing case and cable releasing in the event of a bearing failure.***

6-3.6 Aileron Rigging

Tools Required	Screwdriver set, 7/16 and 3/8 wrenches, 36" straightedge, Aileron Rigging Template (see Appendix) or angle finder
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

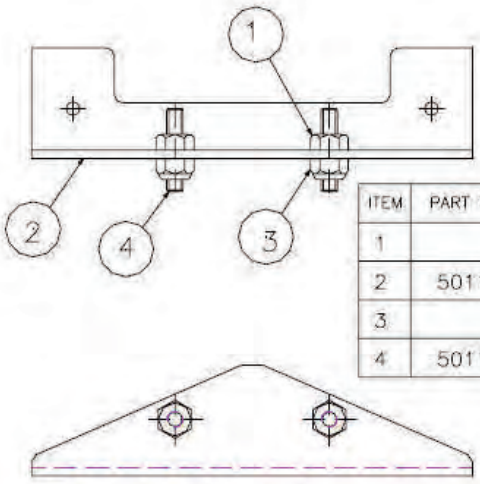
1. Park aircraft on a level surface. With the control stick in the neutral position, use a straightedge not less than 1 meter long. Hold the straightedge flush on the underside of the wing airfoil and adjust aileron to sit on the straightedge. Make this adjustment with the cable rod-ends, ensuring that on completion the locknut is tight on the rod-ends and the cable is visible through the inspection hole in the rod-end.

2. Check UP travel on both ailerons. Up travel should be 18 - 20 degrees. Down travel should equal 10 degrees or more.

3. Use the aileron control stop adjustment (see Figure 6-3: Aileron Rigging) to adjust the total aileron movement (i.e. UP travel) and use cable adjustment as previously described to proportion UP and DOWN travel. The aileron control stop should engage before the aileron arm hits the UP travel stop at the wing tip.

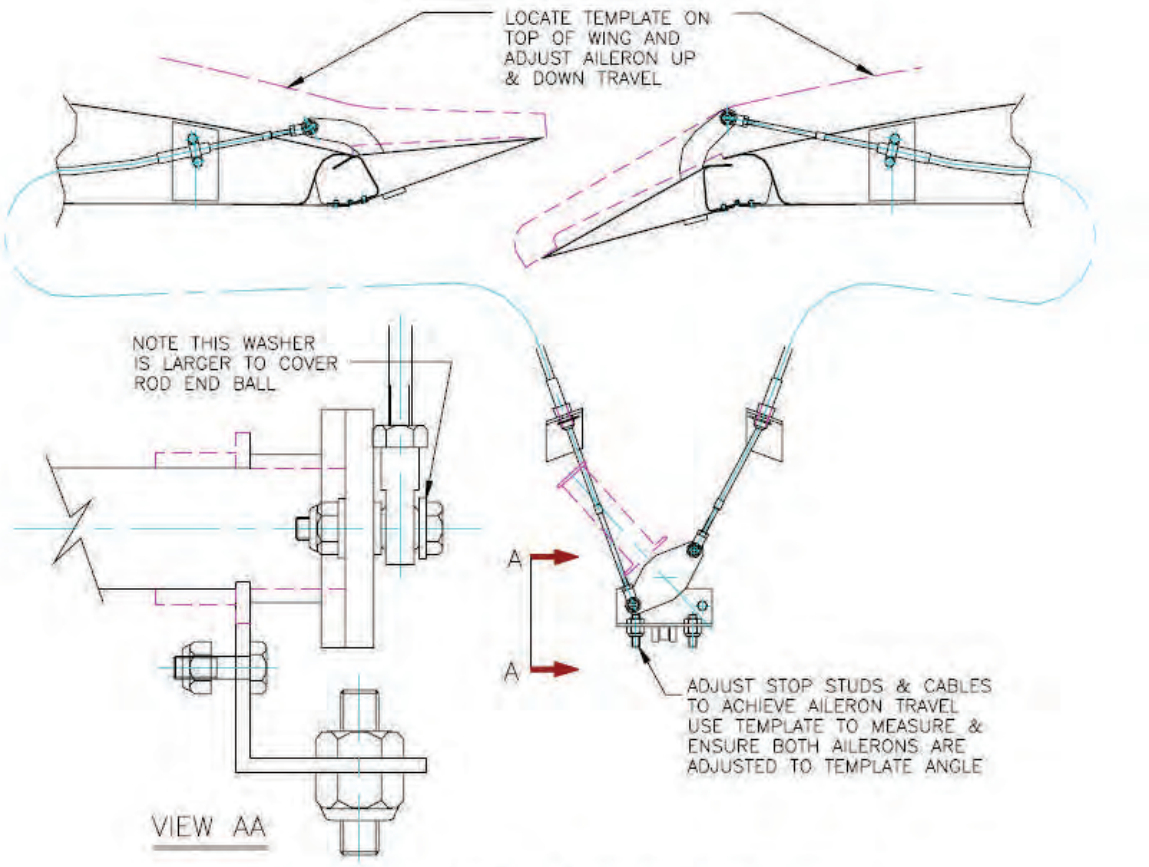
4. DO NOT move the cable anchors – these positions have been set using a jig.

▽ ***WARNING: Aileron cable must be connected to the same side of the control column bell crank as the wing to which the aileron is fitted; otherwise control surface reversal will result. DO NOT CROSS CABLES!***



ITEM	PART No.	DESCRIPTION	QTY.
1		NUT HEX. 1/4" BSW	2
2	5011194	PLATE AILERON CONTROL	1
3		NUT HEX. NYLOC 1/4 BSW	2
4	5011294	STUD AILERON CONTROL	2

Drawing 5011094/2 AILERON CONTROL STOP ASSEMBLY



Drawing 9014093/1 AILERON RIGGING INSTRUCTIONS

Figure 6-3: Aileron Control Stop and Rigging

6-4 Wing Flap Control System

6-4.1 Description

The electric wing flap control system consists of one fiberglass control surface on each wing driven by a single linear actuator. The flaps are operated by one (pre-2010) or two manual toggle switches on the instrument panel. Position is indicated with a flap position sensor in the left wing root and an LED position indicator mounted on the instrument panel (GRT and analog panels) or a display on the primary EFIS (G3X). The linear actuator is 12-volt DC with a 2-inch stroke and drives a common shaft assembly with pushrods connecting the shaft to the flap surface control horns. Each flap control surface is a molded and bonded monocoque fiberglass structure incorporating a composite control horn at the inboard end.

6-4.2 Operational Check

Make sure baggage door is closed and latched. Operate flaps through their full range of travel, observing for uneven or jumpy motion or binding in the system. Ensure flaps move together through their full range of travel and do not interfere with wing fairings or fuselage structure.

6-4.3 Removal of Flap Components

6-4.3.1 Flap Control Surface

Tools Required	Screwdriver set, 3/8 wrenches
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

1. Remove wing root fairings.
2. Support the flap so it will not fall against the fuselage.
3. Unbolt rod end from flap control arm.
4. Remove each flap hinge bolt and spacer bushing.
5. Remove flap.

6-4.3.2 Flap Switch Assembly

Tools Required	Screwdriver set, 7/16 wrenches
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

1. Remove switch jam nut.
2. Disconnect wires.
3. Remove switch assembly.

6-4.3.3 Flap Control Rod

Tools Required	Screwdriver set, 3/8 wrenches
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

1. To remove, clamp flaps in position so they do not fall against the fuselage.
2. Unbolt control rod at both ends and remove.

6-4.3.4 Flap Motor Assembly

Tools Required	Screwdriver set, 7/16 wrenches
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

1. Remove wing root fairings.
2. Support the flaps in the UP position so they do not fall against the fuselage.
3. Disconnect electrical wires.
4. Remove the bolt in each end of the flap motor.
5. Reverse procedure to install.

6-4.3.5 Flap Position Sensor

Tools Required	Screwdriver set
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

1. Remove upper wing root fairing from left wing.
2. Disconnect pushrod clevis and electrical connector from sensor.
3. Remove mounting screws from nutplate bracket and remove sensor.

6-4.4 Inspection of Flap Components

1. Inspect flaps for any signs of delamination or cracking. Pay particular attention to the control horn and hinges and their surrounding areas.
2. Check for continuity in all switch positions and proper flap angle indication.

3. Check for cracks and twists in the control rods. Check for oblong bolt holes.

4. Check for chafed wires near motor, switch and position sensor.

5. Check position sensor clevis for binding, wear and proper connection.

6-4.5 Repair of Flap Components

1. All control surface damage involving cracking, delamination, or hinge damage must be referred to Jabiru USA Sport Aircraft, LLC or approved local agent for an appropriate repair procedure.

2. Repair of switch, motor, indicator or potentiometer is limited to replacement.

3. Replace worn or damaged control rods and fittings.

6-4.6 Reinstallation of Flap Components

Tools Required	Angle finder, 3/8 or 7/16 wrenches
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

▽ ***WARNING:*** ***All spherical rod end bearings must be fitted with a large washer on the outside of the through-bolt to prevent the bearing case and cable from releasing in the event of a bearing failure.***

1. Reverse the steps in 6-4.3.1 for installation of flap control surface. Replace all four nyloc nuts. Torque only until the flap hinge begins to bind, then loosen slightly.

2. Reverse the steps in 6-4.3.2 for flap switch installation.

3. Reverse the steps in 6-4.3.3 for flap control rod installation.

4. Reverse procedure in 6-4.3.4 for flap motor assembly installation.

5. Reverse procedure in 6-4.3.5 for flap position sensor installation.

6-4.7 Flap Rigging

1. Ensure the flap motor is in the full UP position. Park the aircraft on a level surface. Hold a protractor flush on the underside of the wing airfoil and note the angle of the bottom wing surface. Adjust each flap so that it sits with a 2-degree droop in the full-UP position.

2. Adjust flap position with the rod ends. Ensure the lock nut is tight on the control ends and the thread is visible through the hole in the rod.

3. Check for FULL DOWN travel using a protractor. Full travel should be 30 degrees +/- 1.5 degrees.

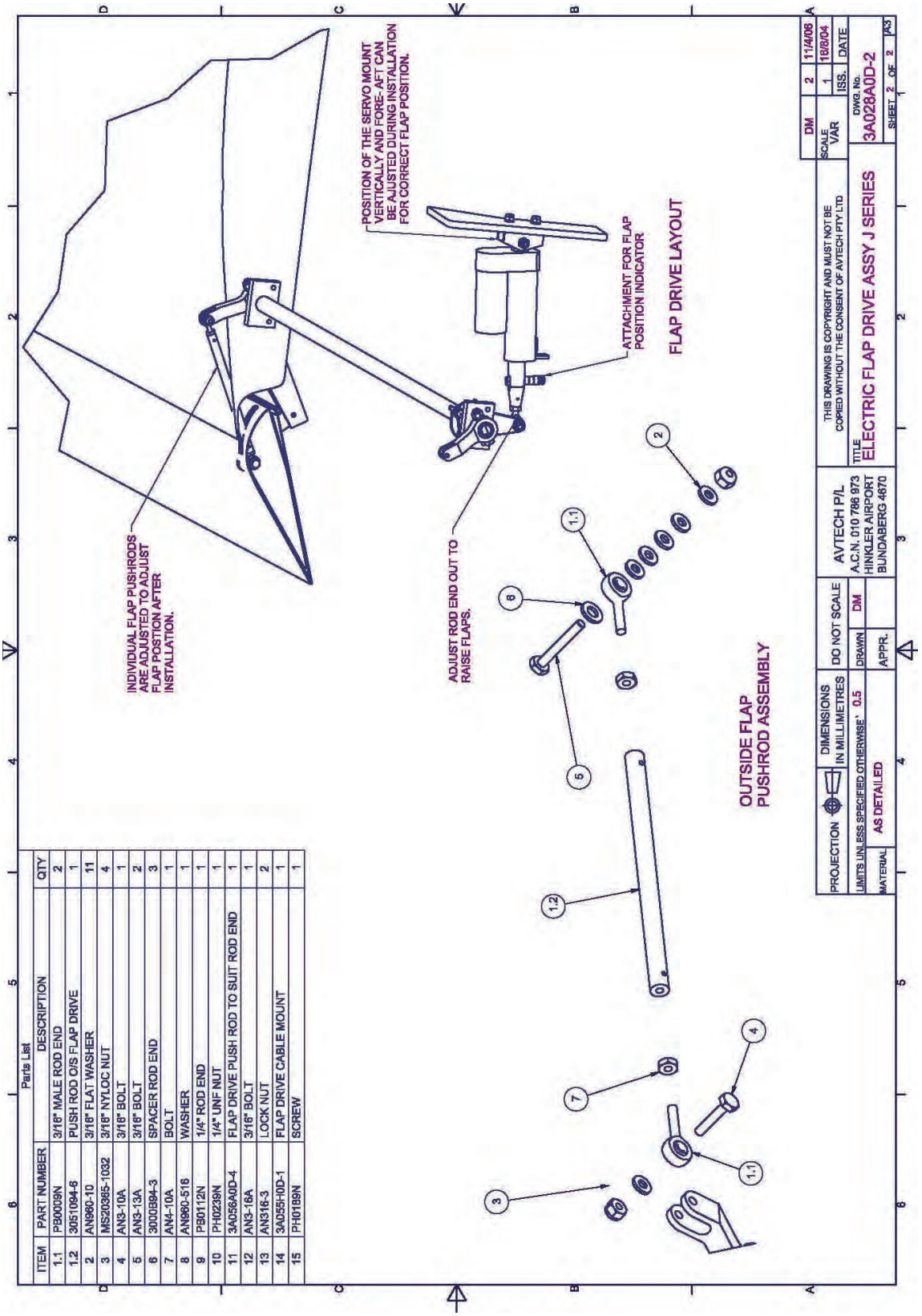


Figure 6-4: Flap Drive System

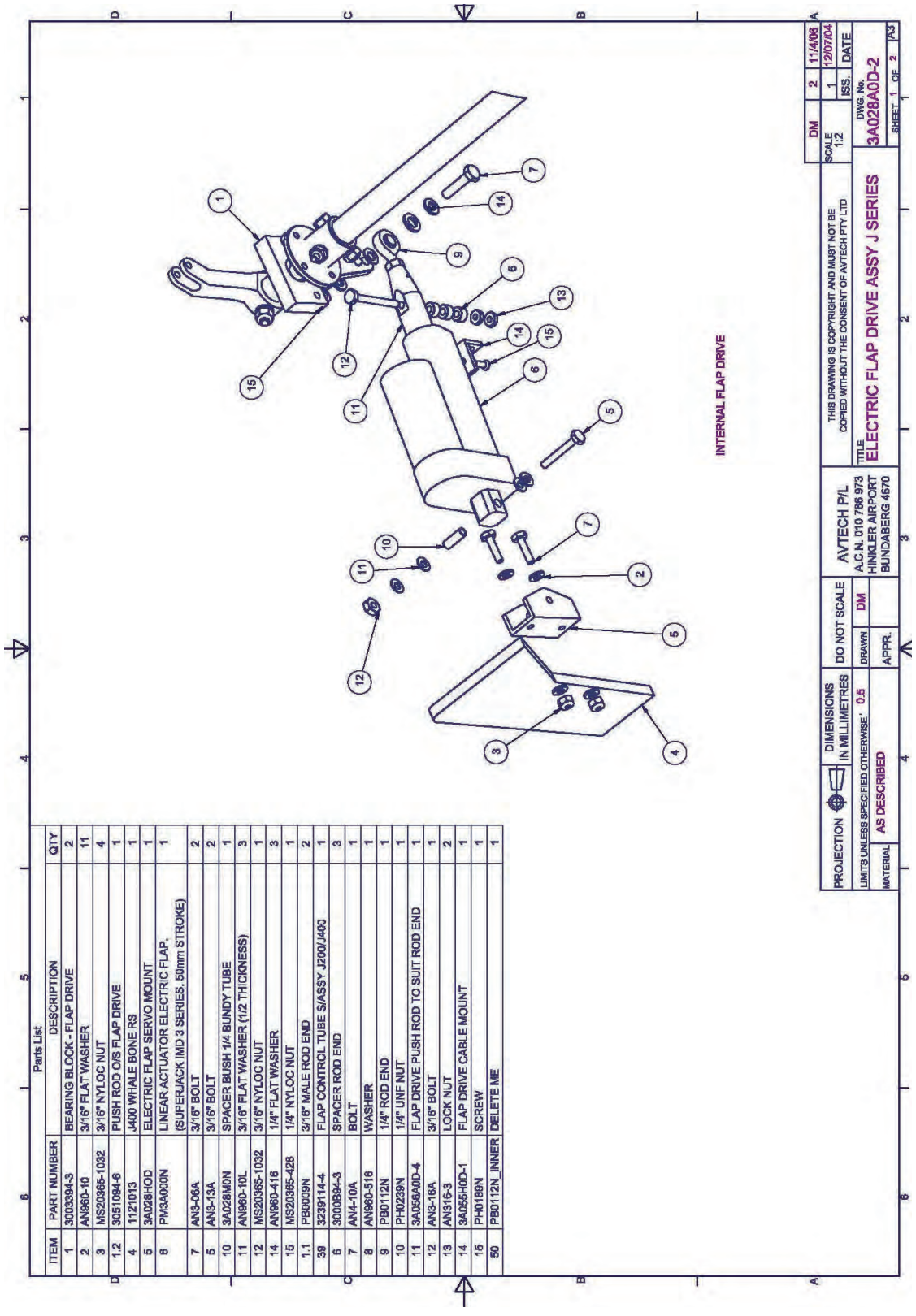


Figure 6-5: Flap Control Tube Assembly

6-5 Elevator Control System

6-5.1 Description

The elevator control system is comprised of the elevator control surface, the control column described in Section 6-1, and one enclosed push-pull cable fitted with rod bearings at both ends as described in Section 6-2. The elevator control surface consists of a rigid cellular polystyrene core molded and bonded to a composite skin, incorporating a composite control horn at the center. An elevator trim system is attached and described in Section 6-6.

NOTE: Control column and control cables are primary controls and may not be removed or repaired without reference to Jabiru USA Sport Aircraft, LLC or our approved local agent.

6-5.2 Troubleshooting

Operate the elevator control while observing for friction and interference. The trim spring mechanism places some tension on the control, however the elevator should move stop to stop with no rubbing, scraping, or other mechanical interference. If interference is detected, isolate problem and correct. Sudden onset of friction or strange interference in the elevator control may be due to a damaged autopilot servo.

6-5.3 Removal of Elevator

Tools Required	Screwdriver set, 7/16 wrenches
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

1. Remove ventral fairing from lower rear fuselage.
2. Unbolt elevator cable from control horn.
3. Unbolt trim linkage from control horn.

For aircraft with six hinge pins in the elevator (2008 models and older):

4. Loosen screws in hinge pin retainers and lift hinge pin retainers from hinge pins. It is not necessary to remove these parts.
5. Remove hinge pins.
6. Remove elevator.

For aircraft with two elevator hinge pins (2009 models and newer):

4. Remove hinge pin retaining screws.
5. Supporting elevator, remove hinge pins.
6. Remove elevator.

6-5.4 Inspection

Inspect elevator for any signs of delamination or cracking. Pay particular attention to the control horn and hinges and their surrounding areas.

See Section 6-1 for inspection of control column and 6-2 for inspection of control cable.

6-5.5 Repair

All damage involving cracking, delamination, or hinge damage must be referred to Jabiru USA Sport Aircraft, LLC or an approved local agent for an appropriate repair procedure.

6-5.6 Reinstallation

Reinstall by reversing steps in Paragraph 6-5.3.

▽ ***WARNING:*** ***All spherical bearings on control cable ends must be fitted with a large washer on the outside of the through-bolt to prevent the bearing case and cable from releasing in the event of a bearing failure.***

6-5.7 Rigging the Elevator Control

Tools Required	Screwdriver set, 3/8 wrenches, Elevator Rigging Template (see Appendix) or angle finder
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

Refer to Figure 6-7.

1. Using the factory-set cable anchor points, make sure each end of the cable is secure.

2. Set the full up travel first using the factory templates. Make sure the control column is hard back. Adjust the female ball ends in or out if adjustment is needed. Refer to Figure 6-2 for an illustration of the elevator cable/control stick connection.

3. To establish the neutral position, align elevator counterbalance with horizontal stabilizer.

4. Adjust cable rod ends to achieve UP and DOWN travel using the Elevator Rigging Template (see Appendix). If template not available set up-travel to a minimum +18 degrees from neutral and down-travel to at least -7 degrees from neutral.

5. DO NOT move the cable anchors – These are factory set.

6. Ensure lock nut is tight on rod ends and that cable is visible through hole in spherical bearing.

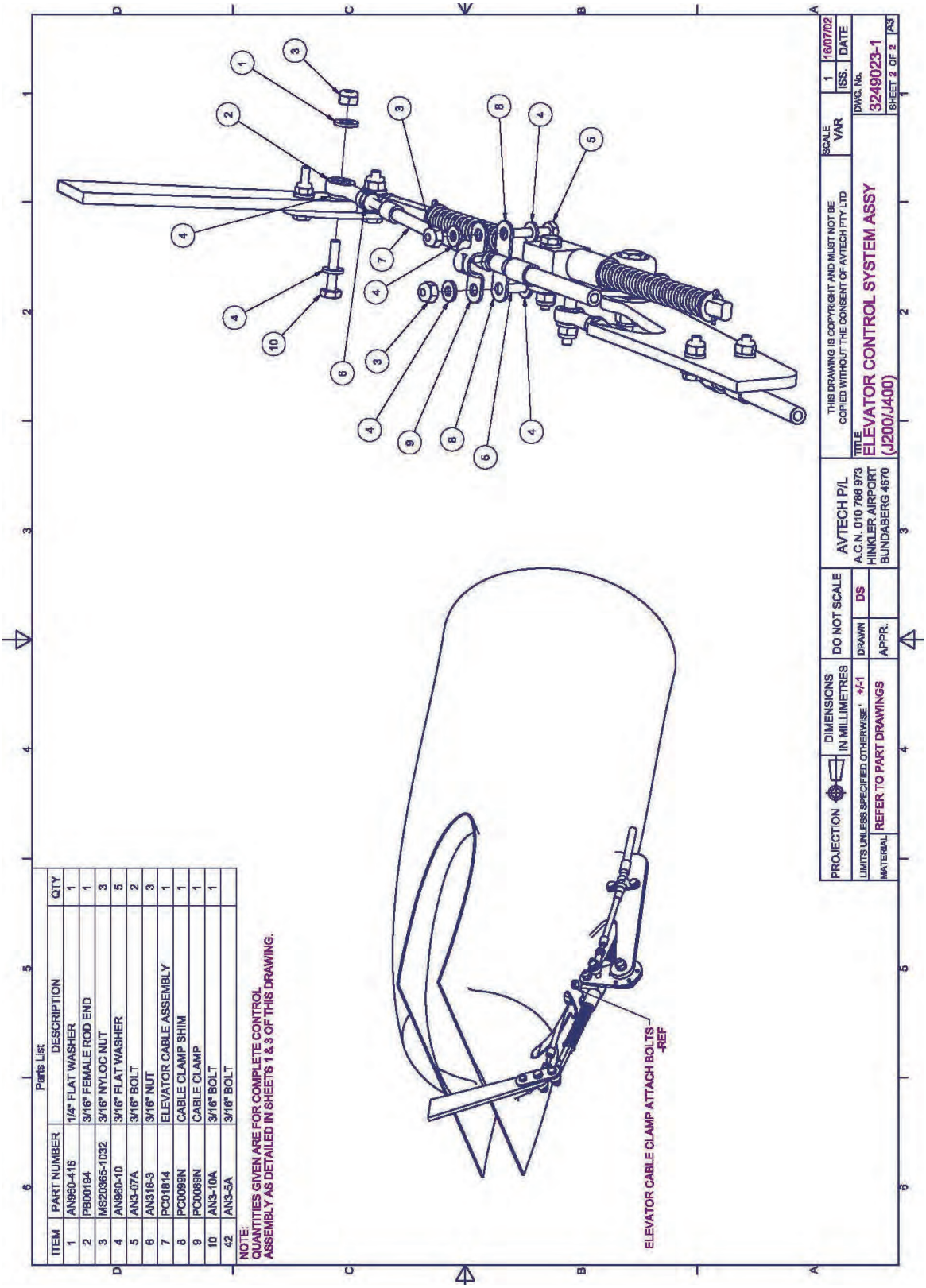


Figure 6-6: Elevator Control System

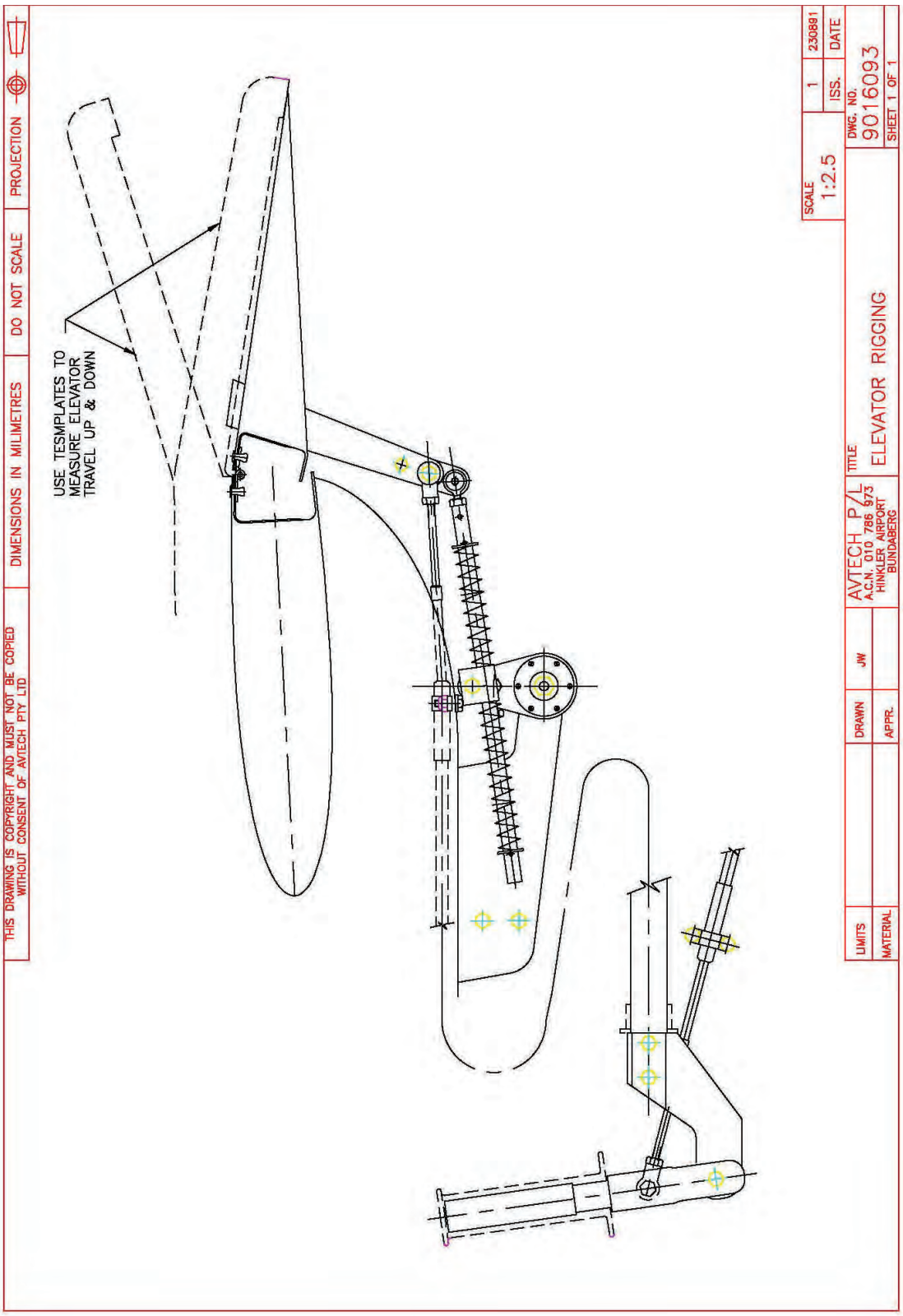


Figure 6-7: Elevator Control Rigging

6-6 Elevator Trim Control System

6-6.1 Description

Refer to Figures 6-8, 6-9 and 6-10 for illustrations of the trim system.

The elevator trim control system consists of a covered cable running from the trim handle in the cockpit to a spring mechanism in the tail that is connected to the elevator. The cable is connected to a lubron block, so that the cable can move the block fore and aft approximately 35mm. An aluminum rod is free to slide through this lubron block and is centered by 2 compression springs. The output end of the rod is connected to the elevator horn.

To operate, outer covers of the cable must be clamped firmly at both ends.

NOTE: Control cables may not be removed or repaired without reference to Jabiru USA Sport Aircraft, LLC or our approved local agent for an approved repair procedure.

6-6.2 Operational Check

Movement of the trim control lever FORE and AFT should result in movement of the control column FORE and AFT and movement of the Elevator DOWN and UP, respectively.

▽ ***WARNING!*** ***This operational check MUST be performed whenever the trim cable has been disconnected to ensure it has been correctly installed.***

6-6.3 Removal

The trim control cable is a primary control and may not be removed or repaired without reference to Jabiru USA Sport Aircraft, LLC or our approved local agent for an approved repair procedure.

6-6.4 Inspection

The trim mechanism must be kept clean and periodically lubricated with graphite. See Annual Inspection Checklist in the Appendix for more information.

Inspect trim system generally for security and any signs of wear. Pay particular attention to the bearing blocks, friction plates, bearing, springs, cable and attachments. The spring rod can be lubricated with a graphite lubricant if any friction is observed during operation of trim or elevator.

6-6.5 Repair

Repair is limited to the replacement of defective parts. As the trim control cable is a primary control, it may not be repaired without reference to Jabiru USA Sport Aircraft, LLC or our approved local agent for the appropriate repair procedure.

6-6.6 Reinstallation

Trim cable reinstallation requires a special procedure from the manufacturer. Therefore, it may not be reinstalled without reference to Jabiru USA Sport Aircraft, LLC or our approved local agent for the appropriate reinstallation procedure.

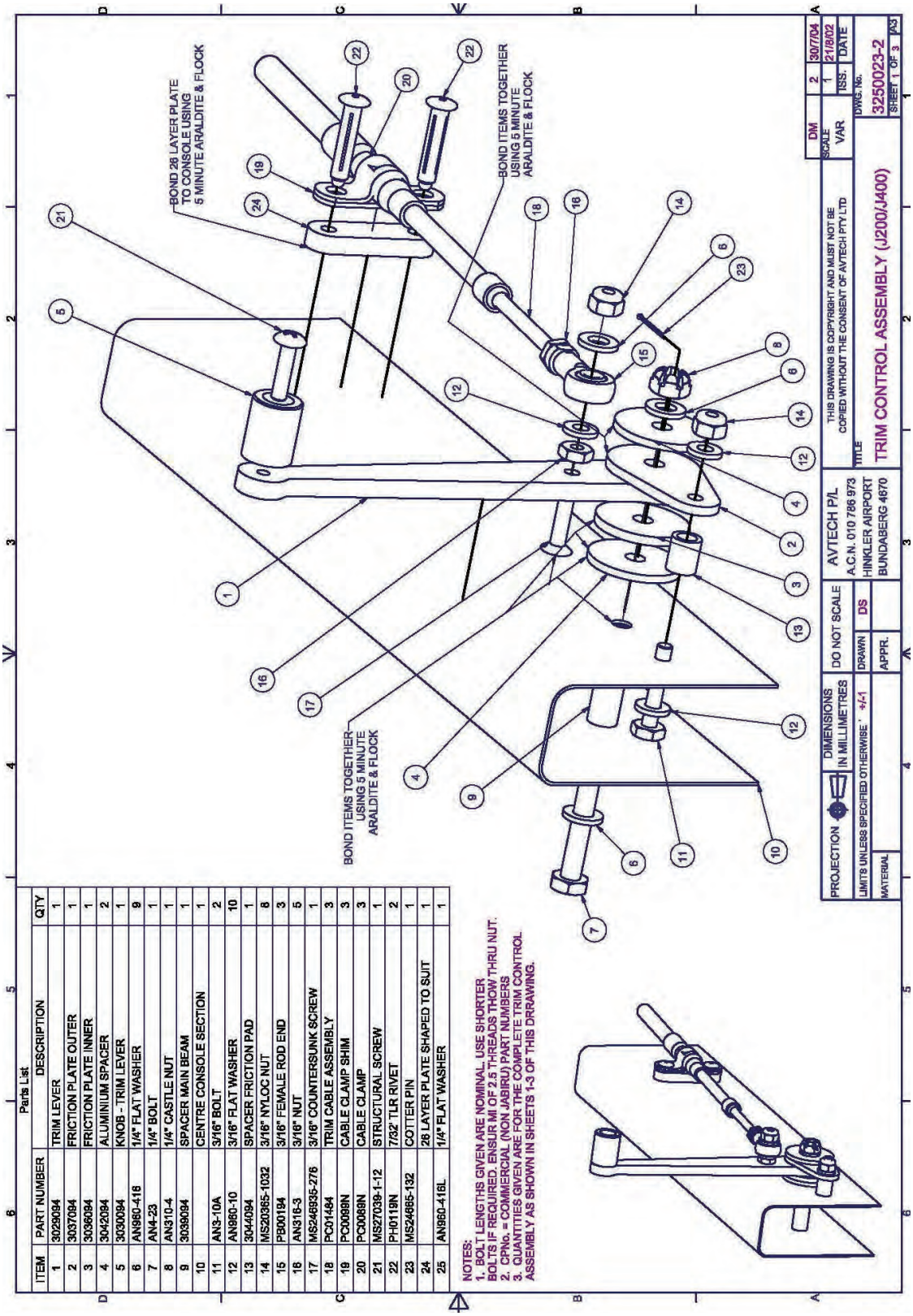


Figure 6-8: Trim Control Assembly (old

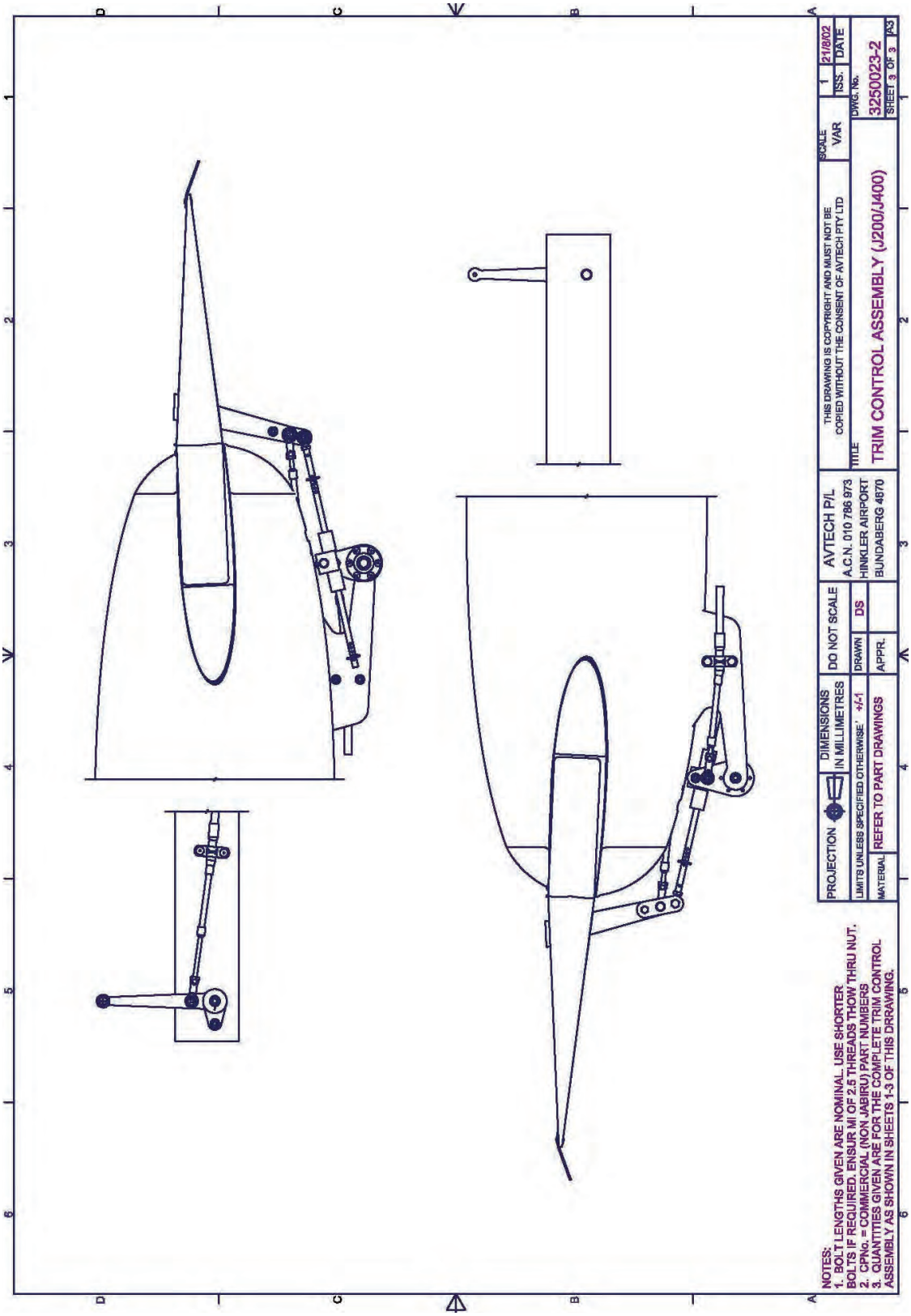


Figure 6-9: Trim Control Assembly, Side

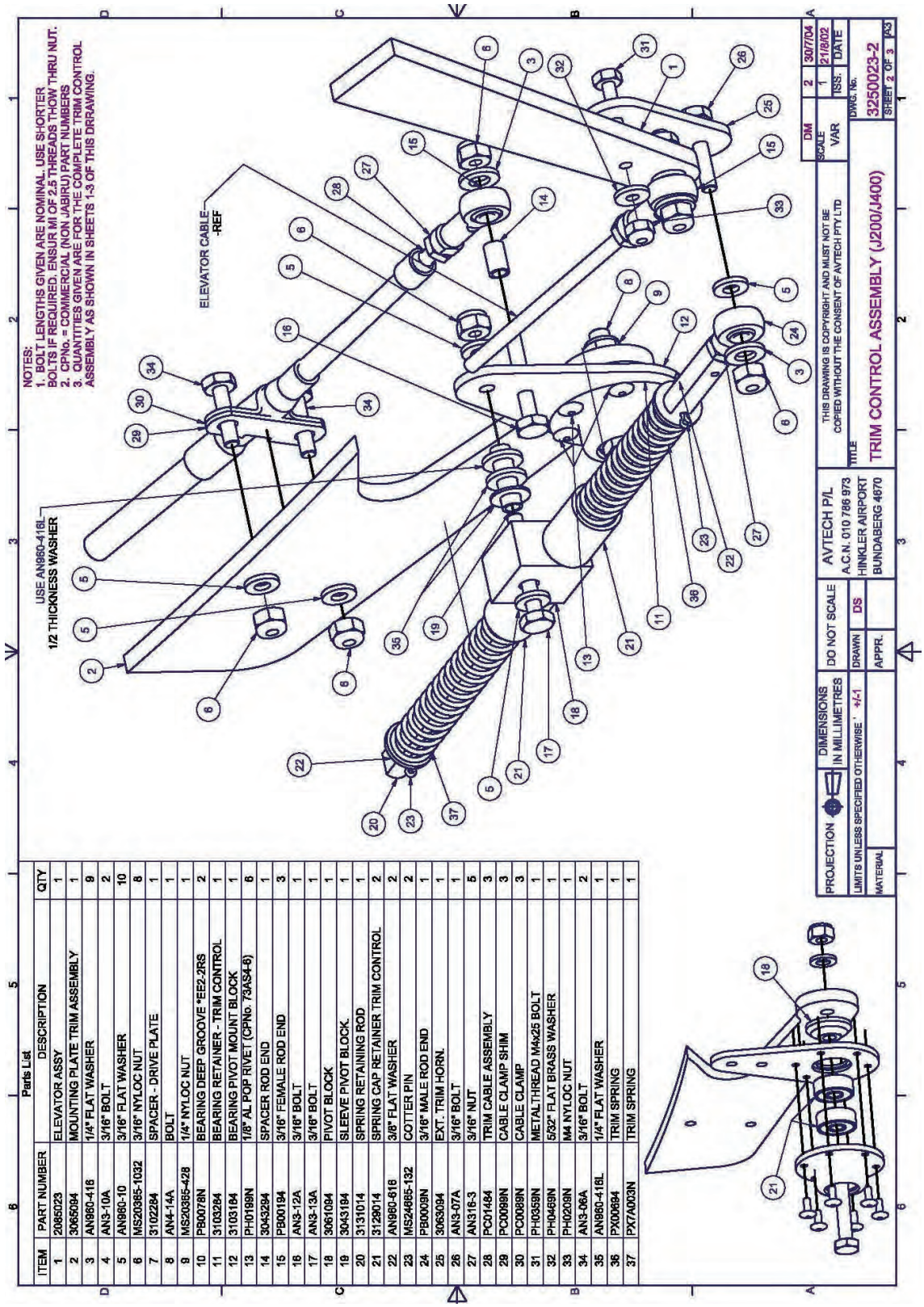


Figure 6-10: Rear Trim Assembly

6-7 Rudder Control System

6-7.1 Description

The rudder system is made up of one rudder, hinged to the vertical stabilizer, which is controlled by two sets of rudder pedals, two push rods, a centering mechanism and an enclosed push-pull cable. The rudder pedals also control the nose wheel via direct-link steering pushrods.

The rudder consists of a molded and bonded monocoque fiberglass structure with a front spar that is attached to the rear spar of the vertical stabilizer via three hinges. It incorporates a composite control horn on the lower right side.

The rudder control cable is of the enclosed push-pull type, fitted with spherical bearings at both ends as described in Section 6-2.

The nose wheel steering pushrods are solid aluminum with ball-link ends. See Section 5, Landing Gear, for more information.

NOTE: Rudder control cables are primary controls and may not be removed or repaired without reference to Jabiru USA Sport Aircraft, LLC or our approved local agent.

6-7.2 Troubleshooting

Have an assistant push the tail down until the nose wheel is off the ground. Operate the rudder pedals. Rudder & steering should operate smoothly without mechanical interference. Isolate the cause of any interference.

The aircraft is rigged at the factory to fly hands-off in level flight, at 2850 RPM, wings level, with one 200-lb pilot in the left seat. If the aircraft sideslips or flies “crooked” in this configuration with equal amounts of fuel in each tank, the rudder may be out of rig. Inspect the rudder pedal springs for correct placement and/or adjust the rudder control deflection as described in 6-7.7.

6-7.3 Removal of Components

6-7.3.1 Rudder Control Surface

Tools Required	Screwdriver set, 7/16 wrenches
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

For aircraft with three rudder hinge pins (models 2008 and older):

1. Unbolt push-pull cable from rudder horn.
2. Loosen screws in hinge pin retainers & lift retainer from hinge pin. It is not necessary to remove these parts.
3. Remove hinge pins and remove rudder.

For aircraft with a single hinge pin (models 2009 and newer):

1. Unbolt push-pull cable from rudder horn.
2. Loosen hinge pin retainer screw on top of vertical fin beneath rudder counterbalance.
3. Remove hinge pin and remove rudder.

6-7.3.2 Rudder Pedals

Tools Required	Screwdriver set, 7/16 wrenches
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

1. Unbolt push-pull cable.
2. Unbolt both steering push rods.
3. Unbolt rudder pedal bearings.
4. Remove cover plates and nylon bearings.
5. Remove both pedal bars.
6. Reverse the preceding steps for installation

6-7.4 Inspection of Components

6-7.4.1 Rudder Control Surface

Inspect rudder for any signs of delamination, cracking or warping. Pay particular attention to the control horn and hinges and their surrounding areas. Inspect hinge pin anchor(s) and pushrod connections for security.

6-7.4.2 Rudder Pedals

1. Inspect nylon bearings for wear. Replace if worn.
2. Inspect pedal bars for wear around bearing area and for distortion.
3. Inspect pedals for distortion or loose rivets in end stops.
4. Inspect bolt holes for wear and elongation.
5. Inspect bolts and nuts for distortion and wear.

6-7.4.3 Rudder Cables

See Section 6-2 for inspection of control cables.

6-7.5 Repair of Components

1. All damage involving cracking, warping, or delamination of the rudder control surface or hinge damage must be referred to Jabiru USA Sport Aircraft, LLC or our approved local agent for an appropriate repair procedure.

2. Replace any distorted or worn parts of the rudder pedal assembly.

6-7.6 Reinstallation of Components

▽ ***WARNING:*** ***All spherical bearings on control cable ends must be fitted with a large washer on the outside of the through-bolt to prevent the bearing case and cable releasing in the event of a bearing failure.***

1. Reverse the steps of Paragraph 6-7.3.1 for reinstallation of the rudder. Be sure rudder cable is attached to TOP of rudder horn, otherwise rudder will be out of rig.

2. Reverse the steps of Paragraph 6-7.3.2 for reinstallation of the rudder pedal assembly.

6-7.7 Rigging the Rudder

1. To establish the neutral position, raise the nose wheel off the ground by having a helper press down on the rear fuselage near the joint of the vertical and horizontal stabilizers.

2. Allow the nose wheel (and therefore the rudder pedals) to neutralize.

3. Align the rudder 5mm to the right of center.

4. Adjust the rod ends on the cable so that the hole in the rear rod end aligns with the hole in the control horn.

5. Fit bolt, nut and washers.

6. Mark or tape a line from the center of the rudder trailing edge onto the fuselage. Displace the right rudder pedal to the rudder pedal stop. Measure the rudder displacement at the rudder trailing edge with reference to the previously marked line. It should be 98mm +/- 2mm.

7. Repeat Step 6 for left pedal and adjust rudder pedal stops as required.

8. Test fly the aircraft, noting any slip or skid tendencies in level flight as described in 6-7.2. Adjust length of the rudder control cable in 1/2 turn increments to achieve coordinated wings-level flight.

▽ ***WARNING:*** ***The rudder pedal stops must engage BEFORE the control surface stops on the tail.***

▽ ***WARNING:*** ***DO NOT move the cable anchor points or adjust control surface stops – These are factory set.***

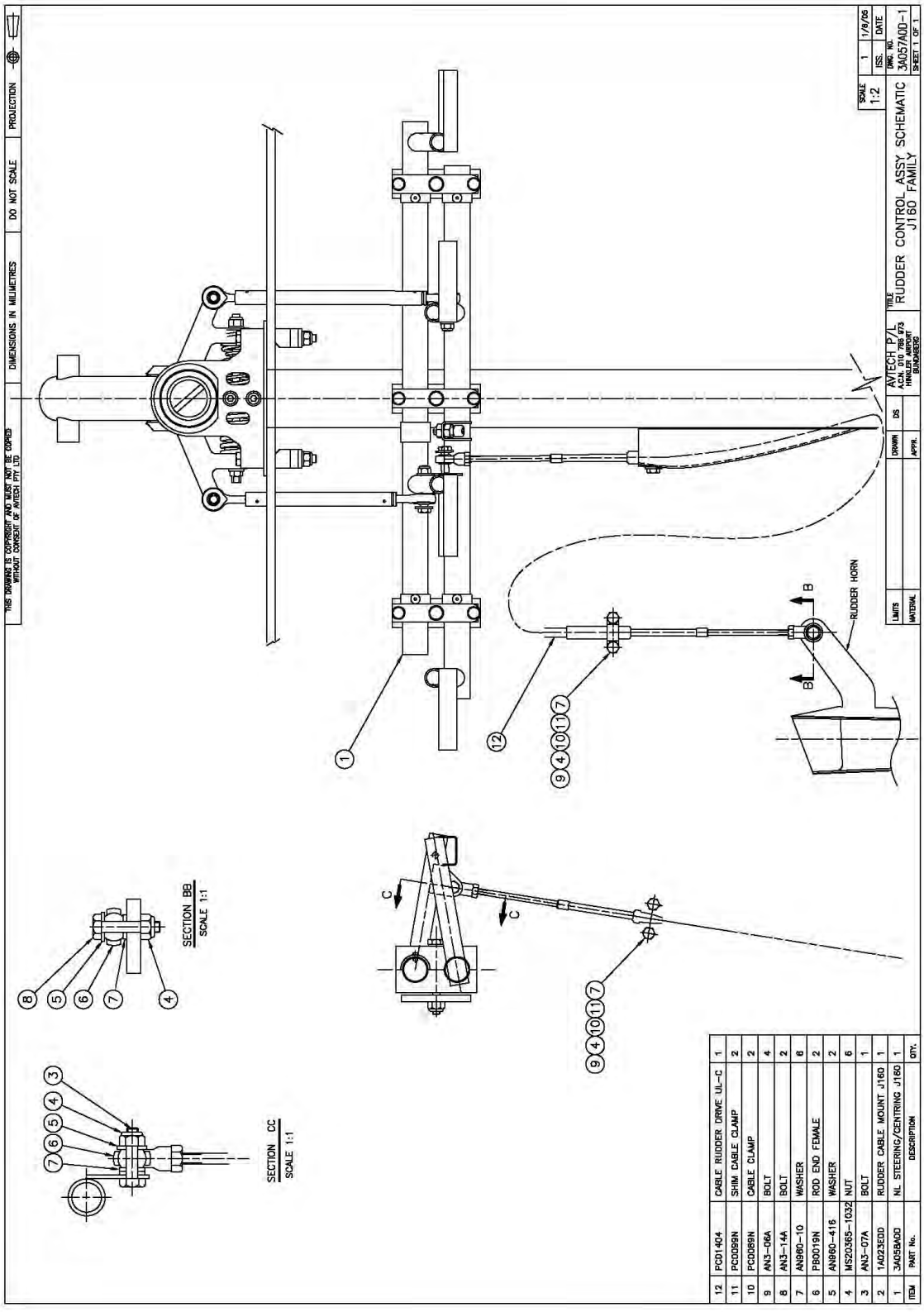


Figure 6-11: Rudder Cable Schematic

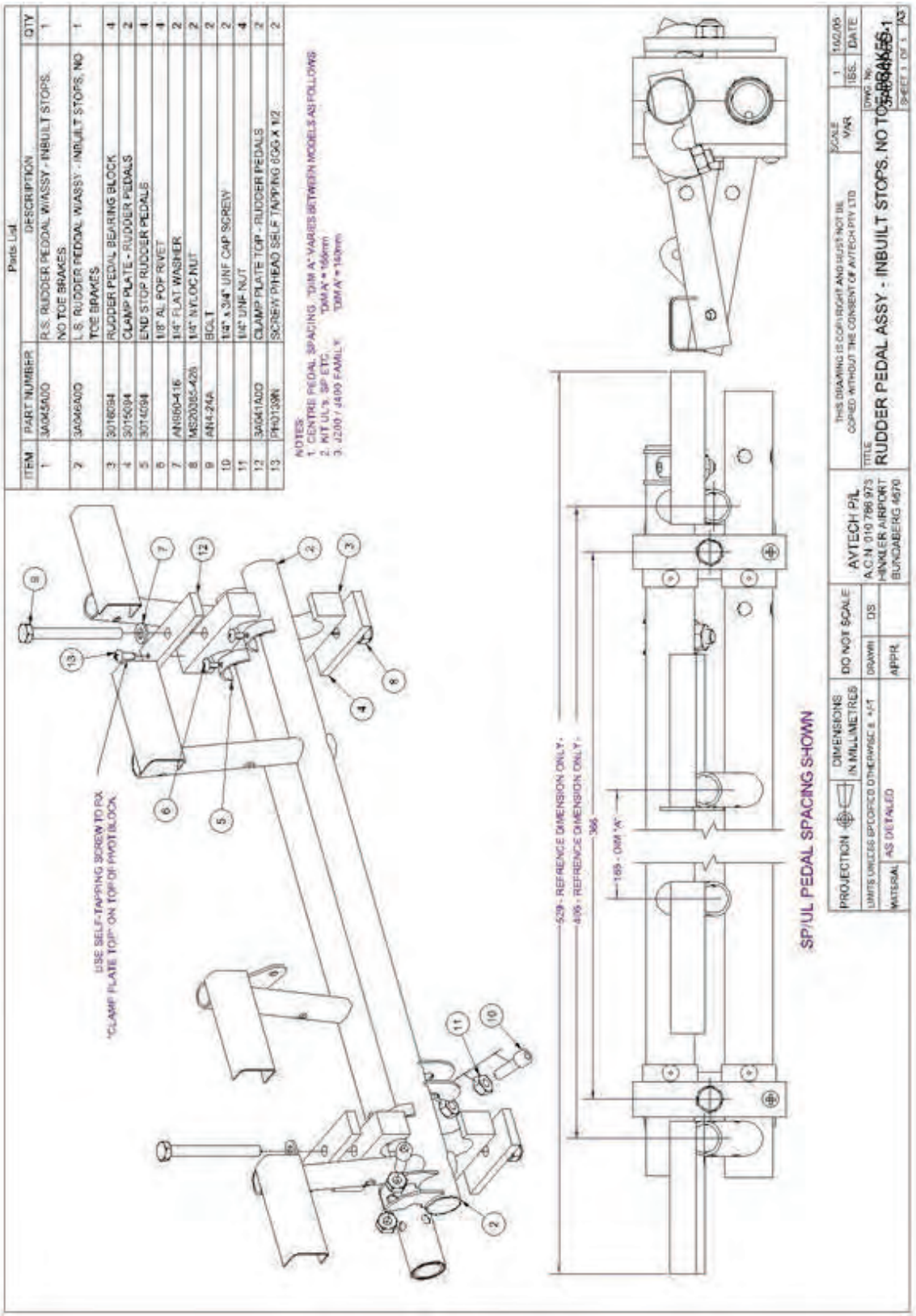


Figure 6-12: Rudder Pedals

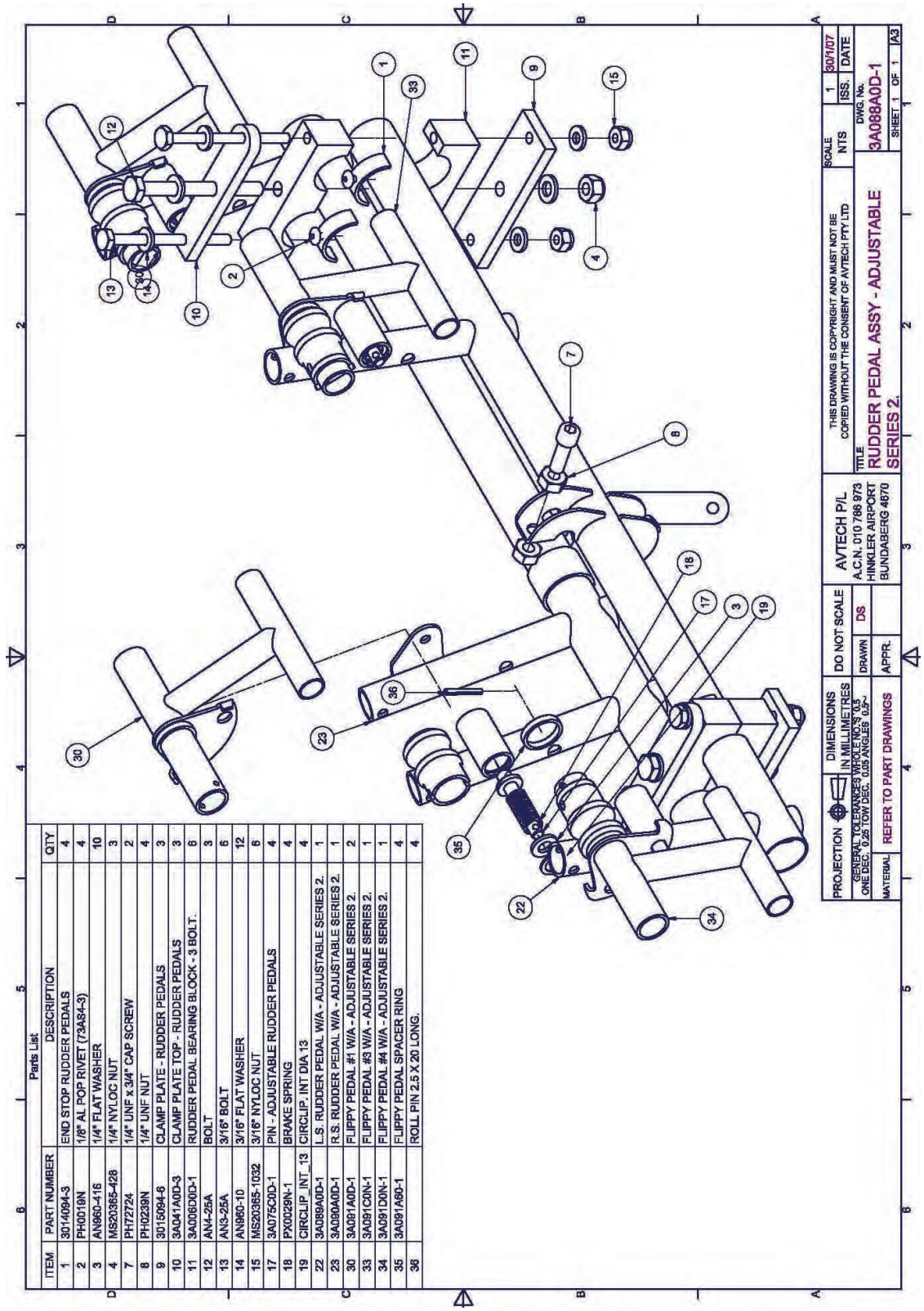


Figure 6-13: Adjustable Rudder Pedals

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Section 7: Engine Systems

7-1 Engine

7-1.1 Description

Both the J230-SP and J250-SP are powered by the Jabiru 3300A engine equipped with hydraulic lifters. It is a 6-cylinder, 4-stroke, direct-drive, air-cooled engine driving a fixed-pitch wood or ground-adjustable carbon propeller. When viewing the engine in a tractor configuration from the pilot's seat, cylinders 1,3, and 5 are on the right side of the case, and cylinders 2, 4 and 6 are on the left. Cylinders 1 and 2 are the closest to the propeller flange, 3 and 4 are in the middle, and 5 and 6 are at the accessory end. The firing order is 1-4-5-2-3-6.

For repair & overhaul of the engine, refer to *Instruction & Maintenance Manual for Jabiru 3300 Aircraft Engine.*

7-1.2 Engine Data

Refer to *Instruction & Maintenance Manual for Jabiru 3300 Aircraft Engine.*

7-1.3 Engine Troubleshooting

Refer to *Instruction & Maintenance Manual for Jabiru 3300 Aircraft Engine.*

7-1.4 Engine Cleaning

See Section 2 of this manual for cleaning instructions.

7-1.5 Engine Removal

Tools Required	Phillips screwdriver, straight screwdriver, 3/16 Allen key, 3/8, 7/16, 9/16, & 10mm wrenches, 3/8 & 9/16 regular socket, 7/16 deep well 1/4" drive socket with ratchet, wire cutter, pliers, engine hoist with lifting strap
Parts Required	None
Level of Maintenance	Heavy
Level of Certification Required	LSA R/M-M with Jabiru USA Engine Seminar Task-Specific Training or A&P

1. Support tail of aircraft with a sturdy tail stand or padded sawhorse set just forward of the ventral fin.
2. Remove engine cowling as described in Section 7-3.
3. Remove cooling air ducts from engine as described in Section 7-4.
4. Remove spinner and propeller as described in Section 9.
5. Disconnect main ground cable from battery.

6. Shut main fuel valve off. Drain fuel from carburetor bowl and main fuel line.

7. Disconnect fuel line from mechanical fuel pump.

8. Loosen carburetor coupling clamp and remove carburetor from intake manifold.

9. Disconnect oil temperature, oil pressure, CHT, and EGT sender wires, starter ground cable, and starter wire off starter contactor. Clip cable ties as necessary to move wiring out of the way.

10. Cut alternator wires at one of the connections.

11. Remove all SCAT hoses.

12. Remove muffler by disconnecting springs. Use flat screwdriver and take care not to gouge or damage exhaust.

13. Attach engine hoist to the engine by running a cargo strap around rearmost intake and exhaust pipes, up to the hook on the engine hoist, and back down around the crankshaft. Support engine with hoist.

14. Remove two LOWER engine mount bolts.

15. Remove two upper engine mount bolts.

16. Pull engine out of area using hoist.

7-1.6 Engine Installation

1. Align engine with airframe using hoist. Install engine mounts and bolts as described in Section 7-6.

2. Reinstall exhaust, carburetor, SCAT hose, wiring and fuel lines by reversing description in 7-1.5.

3. Rewire alternator using a soldered butt splice.

4. Reconnect all engine sensors.

5. Tie all wires neatly using cord or zip ties to avoid interference with moving or hot parts and airflow.

6. Reconnect starter and aircraft ground cables.

7. Check security of all spark plug wires on both ends.

8. Reinstall cooling baffles as described in 7-4.

9. Reinstall propeller and spinner as described in Section 9 using all new propeller nuts and correct propeller torque values.

10. Ensure crankcase is filled with proper amount and kind of engine oil.

11. Turn main fuel valve ON.

12. Start engine as described in POH and check for correct oil pressure, oil temperature, and other engine vital signs.

13. Adjust carburetor as necessary—refer to *Instruction & Maintenance Manual for Jabiru 3300 Aircraft Engine.*

14. Shut down engine and check for oil and fuel leaks.

15. When satisfied with engine operation, reinstall cowlings as described in Section 7-3.

16. Consult *Instruction & Maintenance Manual for Jabiru 3300 Aircraft Engine* for new or rebuilt engine break-in schedule if necessary.

7-1.6 Engine Accessories Removal

Removal of engine accessories for inspection involves stripping the engine of parts, accessories & components as appropriate. During removal of all parts, carefully examine & tag defective parts for repair or replacement with a new part.

NOTE: All openings exposed by the removal of an item should be closed by installing a suitable cover or cap over the opening. This will prevent the entry of foreign particles. If suitable covers are not available, tape may be used to cover the opening.

7-2 Basic Engine Compartment Inspection

For specific items to be inspected and for periodic inspection details, refer to *Instruction & Maintenance Manual for Jabiru 3300 Aircraft Engine.*

1. Visually inspect the engine for loose bolts, nuts, cracks, leaks & cooling fin damage. Blistered paint around the base of the cylinders may indicate an overheating issue.

2. Inspect baffles, baffle seals & brackets for cracks, deterioration or damage.

3. Inspect all control linkages for security and operation.

4. Inspect wiring for chafed areas and security.

5. Inspect hoses for internal swelling, chafing, cuts, breaks, stiffness or loose connections. Excessive heat on hoses will cause them to become brittle & easily broken. Hoses are most likely to crack or break near the ends & at support points. Check fire sleeves on fuel lines within the engine compartment. *NOTE: Avoid excessive flexing & sharp bends when examining hoses for stiffness.*

6. All flexible hoses in the engine compartment should be replaced at engine overhaul or every 2 years whichever comes first. Hoses which show visible deterioration (cracking, excessive hardening) should be replaced immediately, regardless of age.

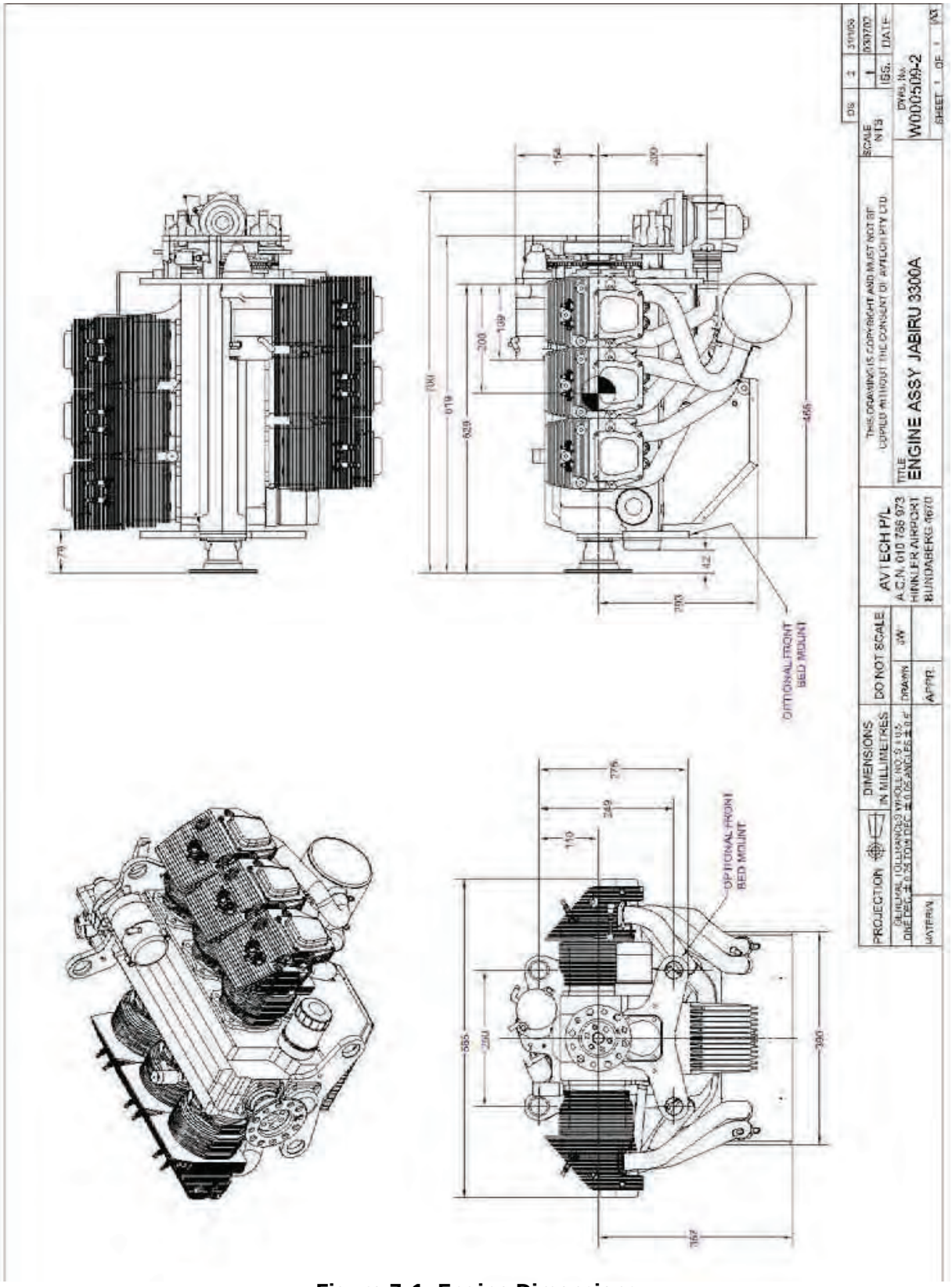

Figure 7-1: Engine Dimensions

7-3 Engine Cowls

7-3.1 Description

The engine cowls consist of one upper and one lower composite structure. The upper cowl is fitted with three cam locks in the rear and two machine screws in the front, one inside each air inlet. The lower cowl is attached to the fuselage with 10 machine screws mounting into anchor nuts with Tinnerman washers. One long hinge pin connects the two cowls together along each side, with the hinge pin entering and exiting the hinge through the cabin door frame.

7-3.2 Removal

Tools Required	Phillips #2 screwdriver
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	Owner, A&P or LSA R/M-M

Upper Cowl:

1. Remove the three cam locks from the rear of the top cowling and the two screws from the nose cone of the cowl.
2. Remove hinge pin located in the door frame on each side.
3. From the side of the aircraft, grasp the front edge of the cowl with one hand and slide fingers of the other hand under the rear edge. Pull carefully upward until the lower edge of the cowl clears the upper edge of the spinner, then lift the cowl off.
4. Replace the cam locks in the cowling to ensure they are not misplaced.

NOTE: Always ensure that the cowl is placed in a position where it cannot be damaged by people walking around the aircraft or by wind.

Lower Cowl:

1. Remove the upper cowl.
2. Disconnect the engine air inlet SCAT hose and cabin heat inlet hose.
3. Remove screws at rear of cowl. Support the lower cowl as screws are being removed. It helps to have an assistant while removing lower cowl.

7-3.3 Inspection and Cleaning

Inspect upper and lower cowls for cracks, tears in the fiberglass or delamination. Inspect cowling camloc mounts for rigidity, bonding and wear. Inspect locking pins for damage. Inspect rubber grommets in firewall for wear or damage.

1. Wipe the inner surfaces of the cowlings with a cloth saturated with mineral spirits.

2. Wash with a solution of mild soap and water and rinse thoroughly. After cleaning, inspect for dents, burns, rubbing marks, cracks and any signs of delamination.

7-3.4 Repair

Repair of cracks or tears can be made using the general fiberglass repair procedure outlined in Section 12.

Replace damaged or worn cam locks and anchor lugs with new parts. Repair is limited to replacement cam locks. Rivets fixing cam lock anchor lugs must be backed with washers.

7-3.5 Reinstallation

1. Install the lower cowl before the upper. Reverse the removal steps for reinstallation.

2. Do not fully tighten the lower cowl screws until after the top cowl has been installed

▽ ***WARNING: Ensure the cam locks are properly engaged before starting engine.***

7-4 Cooling Air Baffles

7-4.1 Description

The fiberglass baffles installed on top of the engine direct the cooling air flow to the cylinder heads and to other engine components to provide optimum engine cooling.

▽ ***Caution: The baffles, air inlets, outlets and scoops are accurately positioned to maintain engine cooling efficiency. Their removal or modification may cause improper air circulation and engine overheating.***

7-4.2 Removal

Tools Required	3/16” Allen key, needle nose pliers, rag or container to catch oil
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	Owner, A&P or LSA R/M-M

1. Be prepared to catch oil that may leak from the valve covers when removing bolts.

2. Remove the necessary valve cover bolts from the engine and the tension spring from the inboard side.

3. Carefully lift the baffle off the cylinders.

4. Move the baffle back along the spark plug wires to get it out of the way for head torque or other maintenance. To remove baffle entirely, thread spark plug wires through the grommet hole and remove.

7-4.3 Inspection and Cleaning

Engine baffles should be cleaned with detergent and water or a suitable solvent (mineral spirits) to remove dirt and oil. Inspect baffles for wear marks, cracks, splits or other damage.

7-4.4 Repair

1. Rubber seals may be replaced by removing the existing rubber seals, sanding back the bonding face of the fiberglass baffles to bare glass (using 80 grit sandpaper or similar) and bonding new rubber strips in place with 5-Minute epoxy.

2. Repair of cracks or tears can be made using the general fiberglass repair procedure outlined in Section 12.

3. Replace defective parts if worn beyond reasonable repair.

7-4.5 Reinstallation

1. Reinstall the spark plug leads through the grommet in the aft portion of the baffle. Slide the baffle forward along the spark plug leads.

2. Reinstall or check security of all spark plug leads.

3. Set the baffle down on top of the cylinder heads, taking care to install the edge of the fiberglass without crossing over one or more cooling fins.

4. Reinstall spring and bolts.

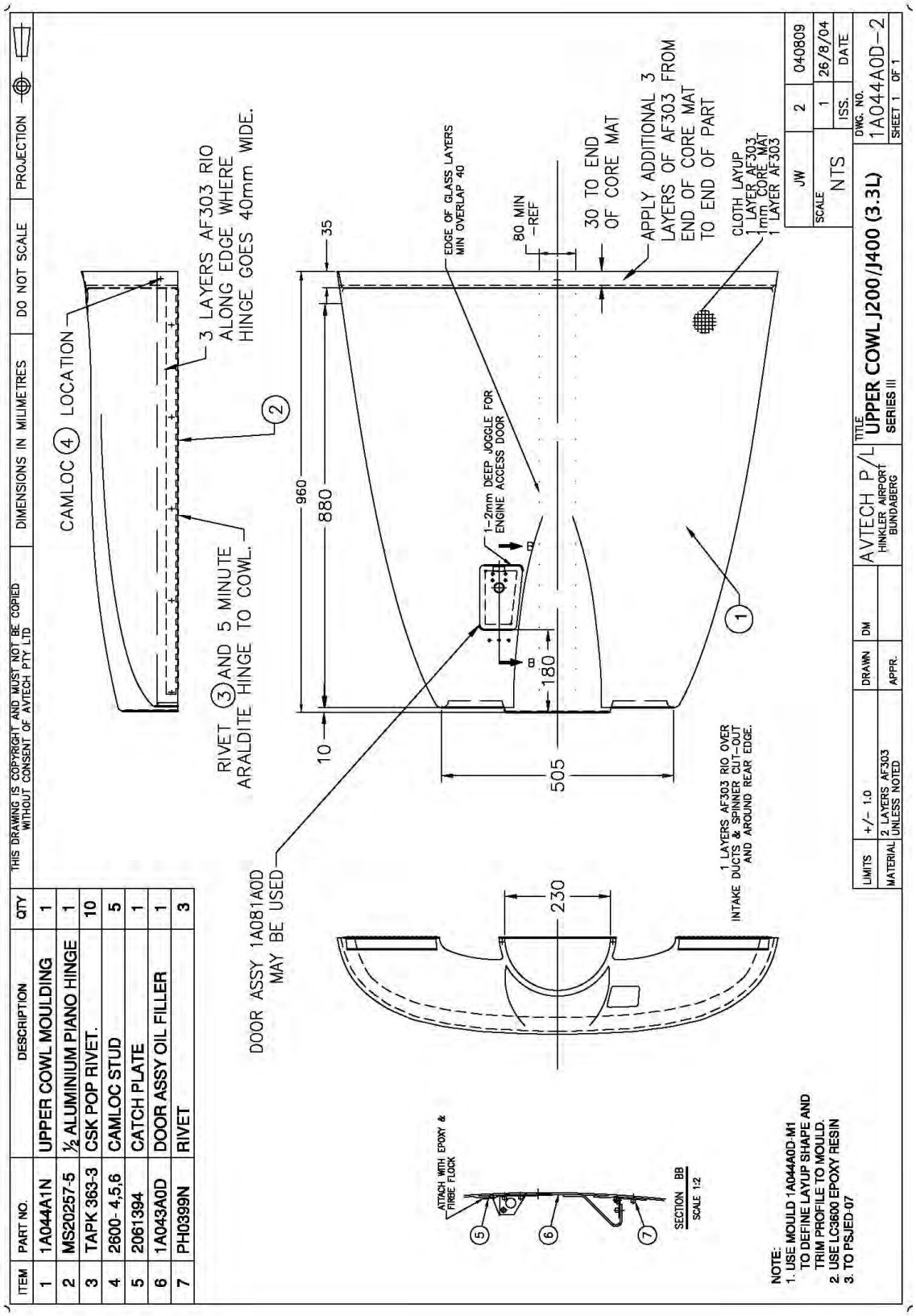

Figure 7-2: Upper Engine Cowl

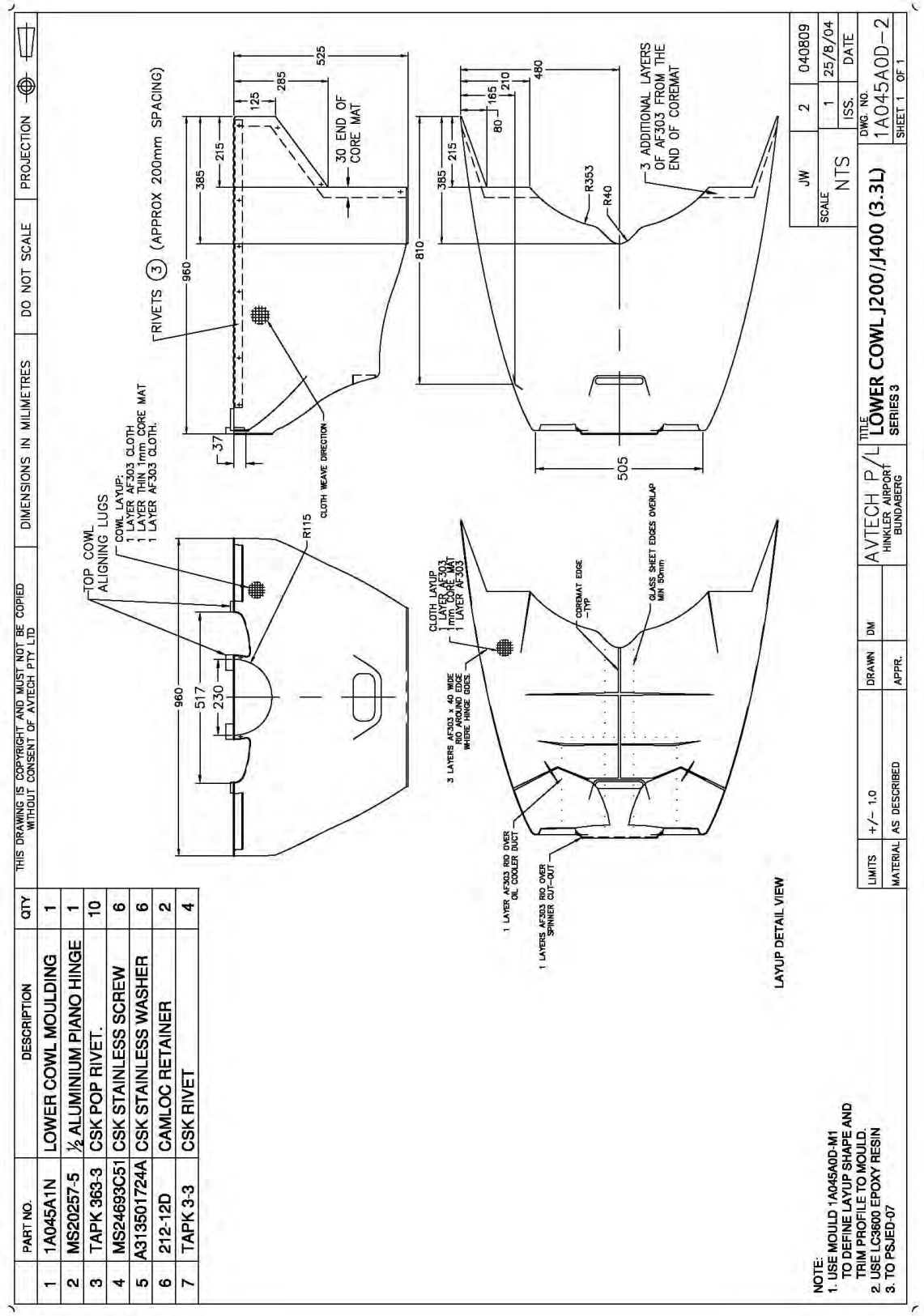

Figure 7-3: Lower Engine Cowl

7-5 Engine Mount

7-5.1 Description

The engine mount is a welded assembly. Its purpose is to support the engine and attach the engine to the airframe. The engine is attached to the mount with rubber lord mounts that absorb engine vibration.

7-5.2 Removal

Tools Required	7/16 and 3/8 wrenches, screwdriver set
Parts Required	New AN4-21A bolts and AN363-428 nuts for reinstallation
Level of Maintenance	Heavy
Level of Certification Required	A&P or LSA R/M-M

1. Remove engine and accessories from the mount as described in 7-1.
2. Spacers may be used to correctly align the engine. Ensure that they are correctly marked on removal and correctly reinstalled during reassembly.
3. Remove nuts and bolts attaching mount to firewall.
4. Remove mount.

7-5.3 Inspection

Inspect engine mount for cracks and rub & abrasion marks.

7-5.4 Repair

▽ ***CAUTION:*** ***The engine mount should not be repaired. Repair is limited to replacement.***

7-5.5 Reinstallation

Use new AN4-21A bolts and AN363-428 nuts to install the engine mount. Tighten to standard torque.

▽ ***WARNING!*** ***The bolts on the engine mount must only be fitted with high temperature nuts. DO NOT USE NYLOC NUTS as the nylon insert may melt, causing failure.***

7-6 Shock Mounts

7-6.1 Description

The engine is mounted to the welded engine mount using rubber lord mounts for reducing engine vibration. Each shock mount consists of one male and one female part.

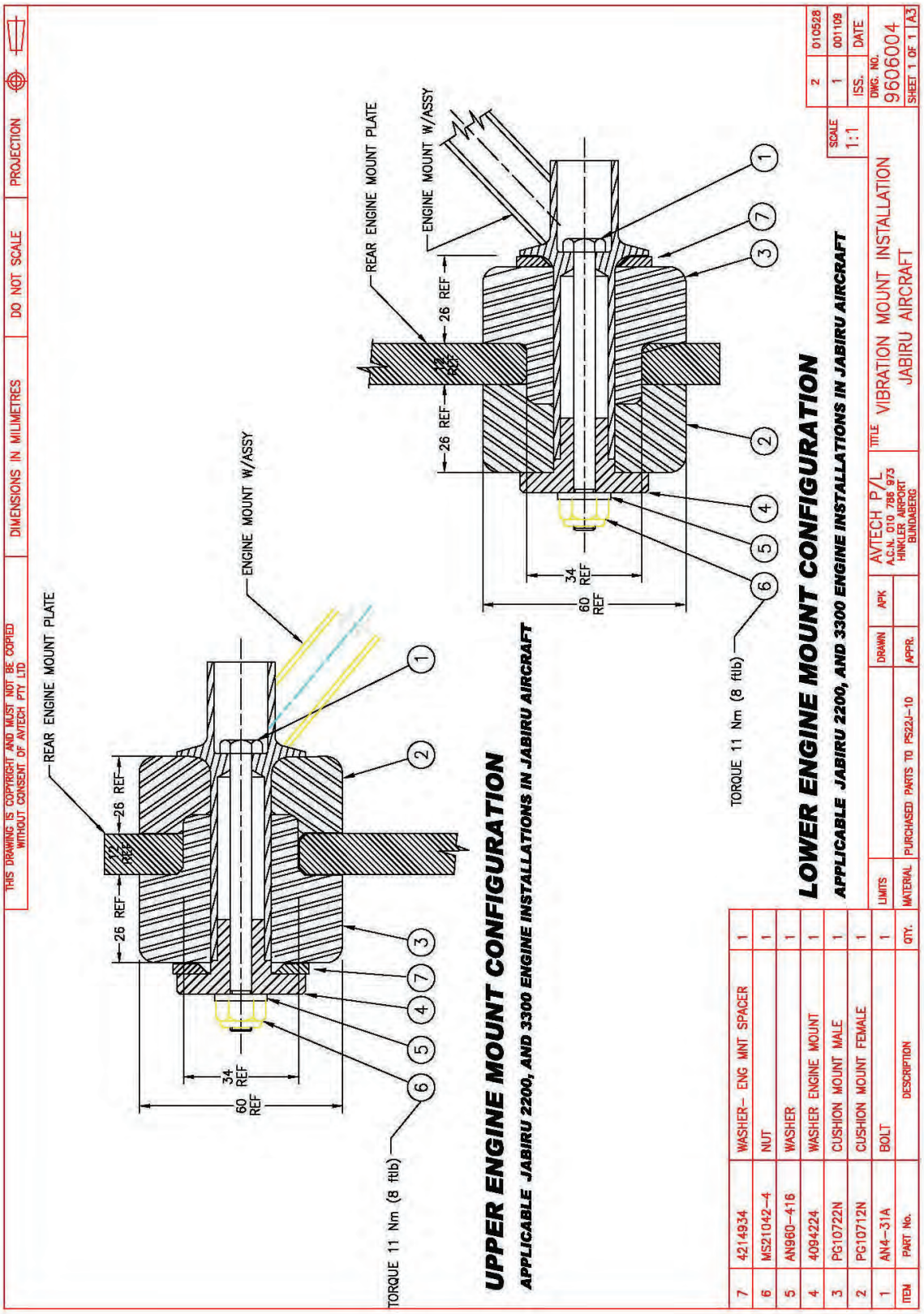

Figure 7-4: Shock Mounts

7-6.2 Removal

Tools Required	See Engine Removal, 7-1.5.
Parts Required	New mounts if necessary, AN4-31A bolts and AN363-428 nuts for reinstallation
Level of Maintenance	Heavy
Level of Certification Required	A&P or LSA R/M-M

Remove engine as described in 7-1.5, then remove mounts.

7-6.3 Inspection

Inspect for cracking, checking or deformation. Check for excessive engine sag (evident when spinner and cowl no longer align). Replace shock mounts if indicated. See Figure 7-4.

7-6.4 Repair

Repair is limited to replacement. Replace worn or damaged shock mounts with new parts.

7-6.5 Reinstallation

Refer to Figure 7-4. Install female mounts in the rear on top and males in the rear on the bottom. Lift engine into place on the mount. Install the males in the front on the top and the females in the front on the bottom. This arrangement is necessary to limit the sagging of the engine over time due to gravity.

Tighten the AN4-31A bolts with AN363-428 nuts and one washer to 8 ft-lbs.

7-7 Oil System

7-7.1 Description

This manual details the oil cooler and oil recovery systems because their installation is unique to Jabiru S-LSA aircraft. Refer to *Instruction & Maintenance Manual for Jabiru 3300 Aircraft Engine* for other oil system details.

The engine oil pump is located at the end of the cam shaft. Oil is pumped out the side of the crankcase, through an oil cooler adapter and oil cooler radiator and then through the oil filter. Oil is then fed under pressure to the interior of the engine and returns to a wet sump at the bottom of the engine. Oil pressure is monitored just before the oil leaves the crankcase on the way to the cooler. Oil temperature is measured in the sump. A pressure regulating valve is under the oil cooler adapter.

7-7.2 Oil and Oil Filter Change

Tools Required	Phillips screwdriver, oil filter wrench, oil collection pan, of at least 1 gal. capacity
Parts Required	4 quarts oil and new filter (see Section 1-9)
Level of Maintenance	Line
Level of Certification Required	Owner, A&P or LSA R/M-M

1. If possible, run engine until oil is up to normal operating temperature.
2. Remove upper and lower engine cowl as described in Section 7-3.
3. Open quick-drain valve if installed in bottom of oil sump and let oil drain. If no quick -drain valve is installed, remove plug.
4. Empty oil breather vent collector bottle as described in Section 7-9.
5. Remove left-side cooling baffle as described in Section 7-4.
6. Using the oil filter wrench, turn the filter counter-clockwise to remove the oil filter.

Oil Filter Inspection (optional)

Using an oil filter cutter, open the filter can and remove the filter paper. Carefully wash the paper in gasoline or similar solvent. Inspect the filter media for metal debris. Some amount of non-magnetic aluminum particles is to be expected. Fine, rusty bronze-colored particles that look the size of squashed sugar grains indicate rocker bushing wear. Larger copper or bronze colored particles indicate main or rod bearing wear. Excessive amounts and/or size of these particles may indicate need for further engine inspection or repair.

Reinstallation of Oil and Filter

1. Lubricate the rubber seal of the new filter with engine oil.
2. Screw the filter onto the threaded adapter and turn clockwise until the filter contacts the cooler adapter. Continue clockwise for 2/3 turn. There is no need to lock wire the filter in place.
3. Reinstall cooling baffle.
4. Refill crankcase with appropriate amount and type of oil. Total oil capacity is 3.7 quarts, but 3.5 quarts is typically the amount added during an oil change.
5. To check oil quantity, screw dipstick cap all the way into the case, then unscrew, lift out and check. Normal oil level range is depicted by the cross-hatched area on the dipstick. Do not overfill.
6. Clean all excess oil from exterior surfaces of engine, especially around the filter area and quick-drain.
7. Run engine for at least 30 seconds to check oil pressure and other engine vitals.

8. Shut engine down and check for oil leaks. Investigate source of any leaks and correct.

9. Reinstall engine cowls as described in Section 7-3.

7-8 Oil Cooling System

7-8.1 Description

An oil cooling radiator is mounted at the bottom front of the oil sump. Hoses route the oil from the oil cooler adapter under the filter to the cooler and back. See Figure 7-5.

7-8.2 Removal

1. Disconnect braided hoses from oil cooler and oil cooler adapter.

2. Remove cooler from engine by removing attachment bolts. See Figure 7-5.

7-8.3 Inspection

Tools Required	3/8, 7/16, 11/16 wrenches, Phillips #2 screwdriver
Parts Required	Permatex No. 2 gasket sealant for reinstallation
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

1. Inspect hoses for kinks, leaks, cracks or loose fittings.

2. Inspect radiator for leaks, bent fins, impacted debris, damaged fittings or damaged attachment brackets.

7-8.4 Repair

1. Repair of hoses is limited to replacement of the stainless braided hose. The AN fittings are removable and can be reused if not damaged.

2. Repair of radiator should be referred to a qualified radiator repair facility for inspection, testing and repair. Repair is usually limited to replacement.

3. Fittings are standard AN flare fittings.

7-8.5 Reinstallation

1. See Figure 7-5. Reinstall fittings into radiator using Permatex #2 gasket sealant.

2. Reinstall radiator onto sump.

3. Reconnect braided hoses to cooler and adapter.

4. Run engine for at least 30 seconds, verifying that it has at least the minimum oil pressure in the system. Shut down and inspect for leaks.

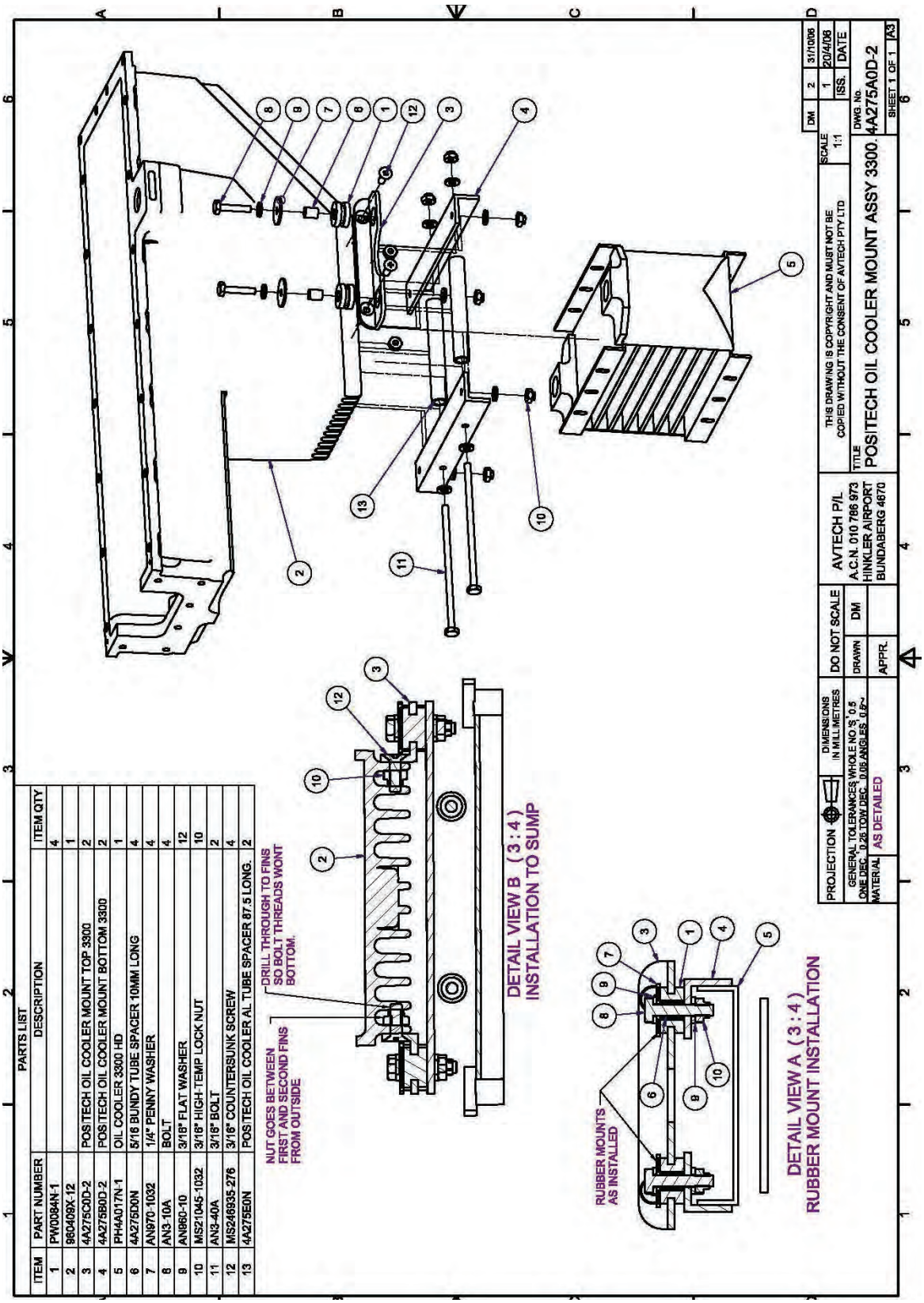

Figure 7-5: Oil Cooler

7-9 Oil Recovery System

7-9.1 Description

The primary purpose of the oil recovery system is to collect excess oil thrown out of the crankcase breather vent. The oil line is connected to the engine crankcase filler neck and deposits excess oil into a bottle mounted on the firewall. The bottle will also collect excess fuel in the event of a fuel pump failure. Fluid level is visible through the side of the bottle. It should be emptied at each oil change or when oil is seen dripping from the overflow tube.

7-9.2 Removal

Tools Required	Flat-head screwdriver
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	Owner, A&P or LSA R/M-M

1. Loosen the clamps around the hoses on top and on the side of the oil bottle.
2. Pull the clear tube out of the top.
3. Lift the bottle from the clamp on the firewall.
4. Dispose of collected oil.
5. Clean bottle and mount area as necessary and reinstall to firewall. Be sure to reconnect breather hose and fuel pump vent line.

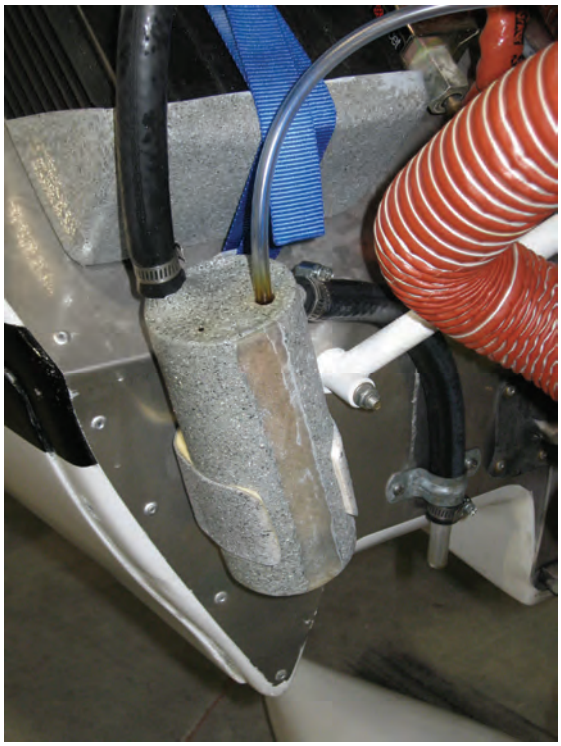

Figure 7-6: Oil Recovery Bottle

7-9.3 Inspection

Clean bottle and mounting area if necessary. Look the bottle over for cracks or blockages. Check for kinks in the lines.

The oil breather vent line may become saturated after one or two years or several hundred hours of operation and “weep” oil. Replacement of a weepy oil breather line is recommended every 24 calendar months or as needed to keep a clean engine compartment.

7-9.4 Repair

Repair is limited to replacement of components. See Table 7-1 for replacement hose information.

7.9.5 Reinstallation

1. Secure the bottle inside the firewall clamp.

2. Reconnect the hoses.

7-10 Carburetor

7-10.1 Description

The Jabiru 3300 utilizes a Bing 64 altitude-compensating carburetor. Refer to the *Instruction & Maintenance Manual for Jabiru 3300 Aircraft Engine* for detailed carburetor data. See Section 7-13 of this manual for information on the carburetor heat system.

7-10.2 Removal

Tools Required	5/16 wrenches, screwdriver set, needle-nose pliers
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

▽ ***WARNING:*** ***Fuel lines within the engine compartment are fitted with fireproof sleeves. If removed, the sleeves must be reinstalled before the aircraft is returned to service.***

1. Disconnect fuel line from carb.

2. Disconnect throttle cable from carb.

3. Disconnect choke cable from carb.

4. Disconnect ground strap from carb.

5. Loosen clamp on rubber carb adapter.

6. Pull the carb to the rear and down to remove.

7-10.3 Inspection and Repair

1. Inspect rubber carb connector for cracks or deformation. Repair is limited to replacement.

2. Remove carb dome and inspect diaphragm for cracks or breaks. Replace if damage is observed.

3. Inspect the needle for damage or deformation. Repair is limited to replacement.

4. Inspect floats for damage or fuel saturation. Repair is limited to replacement.

5. Inspect float valve for rubber tip damage or deformation. Repair is limited to replacement.

6. Inspect all o-rings and seals for evidence of leaking or damage. Repair is limited to replacement.

7-10.4 Reinstallation

Follow the instructions in section 7-10.2 in reverse order for reinstallation.

7-10.5 Idle Speed Adjustment

Tools Required	2-foot long flat-head screwdriver or 5/16” wrench
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

Refer to *Instruction & Maintenance Manual for Jabiru 3300 Aircraft Engine* for detailed carburetor jet removal, idle adjustment and carburetor bowl cleaning procedures.

▽ ***WARNING:*** ***A qualified person must be in the cockpit of the aircraft at all times the engine is running.***

▽ ***WARNING:*** ***BEWARE OF PROPELLER AT ALL TIMES!***

1. Run engine until warmed to operating temperature.
2. Turn idle limit screw until an idle rpm of 800 – 850 is achieved with throttle closed.

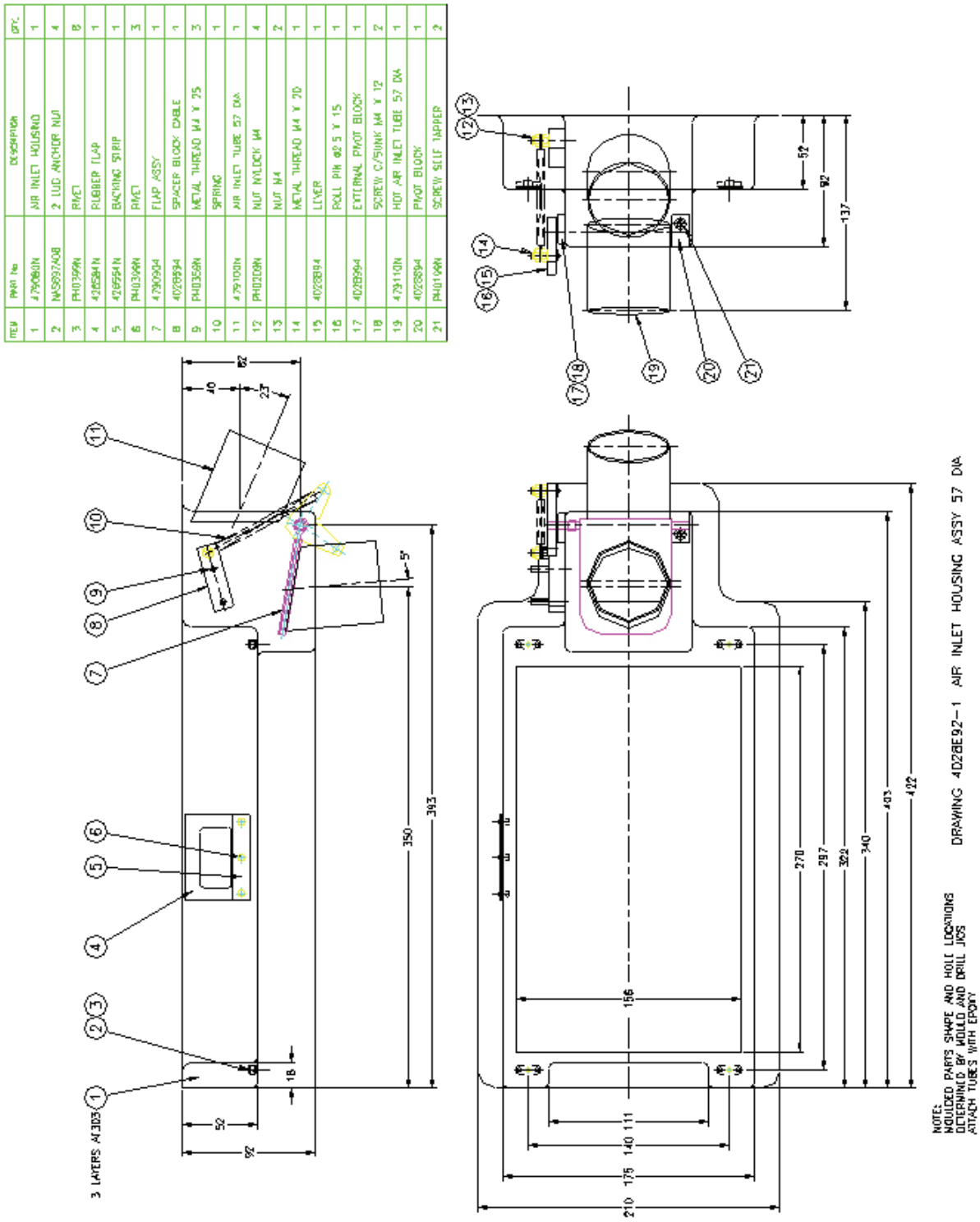

Figure 7-7 Air Mixer Box

7-11 Induction Air System

7-11.1 Description

The engine air intake system includes a cold air inlet in the lower cowl, a hot air muff attached to the exhaust system, and a mixer assembly mounted on the firewall and connected to the carburetor. The mixer box incorporates the air filter and a pressure relief dump valve. For information on the carburetor heat system, see Section 7-13.

The air filter should be cleaned every 100 hours or more regularly if the engine is operated in dusty conditions. Refer to Paragraph 7-11.2 and Figure 7-7.

7-11.2 Removal and Replacement of Air Filter

Tools Required	Screwdriver set, compressed air blower
Parts Required	Replacement air filter (See Section 1-9)
Level of Maintenance	Line
Level of Certification Required	Owner, A&P or LSA R/M-M

1. Disconnect SCAT hose from airbox outlet.
2. Remove screws (4) from corners of filter box.
3. Remove filter.

7-11.3 Inspection and Repair

1. Inspect for breaks in the filter medium by shining a light through. Repair is limited to replacement.
2. Inspect for dirt – clean by blowing air back through the filter. Replace if dirt does not blow away.

7-11.4 Reinstallation

1. Place new filter into airbox base.
2. Position cover in place over the filter.
3. Install screws (4).
4. Reconnect SCAT hose to airbox cover and tighten clamp.

7-12 Flexible Hoses

7-12.1 Description

Fuel lines and SCAT hoses run throughout the engine compartment and should be checked periodically. Replacement of all engine compartment flexible hoses is recommended every 24 calendar months.

7-12.2 Removal

Tools Required	Screwdriver set
Parts Required	Replacement hoses if necessary
Level of Maintenance	Line
Level of Certification Required	Owner, A&P or LSA R/M-M

▽ ***WARNING:*** ***DO NOT substitute SCEET hose for SCAT hose, as the inner lining may pull away from the hose structure and block carburetor or air inlets.***

1. Shut off fuel valves before removing any fuel lines.
2. Loosen clamps and pull to remove lines and hoses from fittings.

7-12.3 Inspection

1. After each 50 hours of operation, flexible hoses should be checked for leaks.
2. Remove fire sleeve from fuel hoses. Examine the exterior of hoses for evidence of leakage or wetness.
3. Replace any worn or cracked hoses.

7-12.4 Repair

Repair of hoses is limited to replacement.

Application	**Type**
Cabin heat & ventilation	2” Aeroduct SCAT hose
Carburetor induction hoses	2 1/4” Aeroduct SCAT hose
Fuel lines	1/4” ID, 1/2” OD, 50 PSI
Firesleeve	1/2” ID fiberglass
Oil breather line	1/2” ID marine fuel line or automotive heater hose
Fuel pump overflow line	General purpose clear PVC tubing, 3/16” ID, 3/8” OD, 3/32” wall

Table 7-1: Replacement Flexible Hoses

7-12.5 Reinstallation

NOTE: Rubber hoses will take a permanent set during extended use in service. Straightening a hose with a bend having a permanent set will result in hose cracking. Care should be taken during removal so that hose is not bent excessively, and during reinstallation to assure hose is returned to its original position.

1. Lines and hoses must not be twisted on installation.

2. Provide as large a bend radius as possible.

3. Lines and hoses must have a minimum of 12mm clearance from other hoses or surrounding objects or be tie-clamped to them to minimize chafing.

▽ ***WARNING:*** ***Fuel lines within the engine compartment are fitted with fireproof sleeves. If removed, the sleeves must be reinstalled before aircraft is returned to service.***

7-13 Throttle Control

7-13.1 Description

A stiff stranded wire throttle cable is attached from carb throttle arm to a cross rod supported in acetal blocks attached to the cabin side of the firewall. Control input is fed to the cross rod from a knob and push-pull rod through the panel face.

7-13.2 Removal

Tools Required	Screwdriver set, 7/16, 3/8 wrenches
Parts Required	None
Level of Maintenance	Heavy
Level of Certification Required	A&P or LSA R/M-M

For aircraft built in 2008 or older:

1. Disconnect throttle cable from carb and from throttle cross rod.

2. Remove the bolts through the firewall that hold the acetal blocks.

3. Disconnect push pull rods from cross rod by loosening jam nut and unscrewing push pull rods.

4. Remove cross rod.

For aircraft built in 2009 or newer, substitute steps 1 and 2 above with:

1. Remove the nut and washer from the actuator arm.

2. Slide the control wire off of the bolt.

7-13.3 Inspection

Inspect all parts for damage or wear. When adjusting any engine control, it is important to check that the control slides smoothly throughout its full range of travel & that the lever or knob moves through its full range of travel.

7-13.4 Repair

Repair is limited to replacement.

7-13.5 Reinstallation

Reverse steps in 7-13.2

7-13.6 Adjustment

1. Adjust cable end connection at firewall and at carb so that the throttle arm at the carb rests against the full-throttle stop when throttle is open and against firewall.

2. Adjust tension on the bolts holding the acetal blocks to the firewall to provide proper throttle friction to hold throttle setting at idle.

7-14 Choke

7-14.1 Description

The choke control is located in the center of the main instrument panel & is connected to the carburetor by a solid wire control cable.

7-14.2 Removal

Tools Required	Screwdriver set, 3/8 and 5/8 wrenches
Parts Required	None
Level of Maintenance	Heavy
Level of Certification Required	A&P or LSA R/M-M

For aircraft built in 2008 or older:

1. Disconnect choke from carburetor by removing the cotter pin from the cable ferrule and pulling ferrule from choke arm.

2. Remove jam nuts from cable end adjuster at the carb bracket.

3. Remove jam nut from back side of instrument panel.

4. Pull cable from the aircraft.

For aircraft built in 2009 or newer, substitute steps 1 and 2 above with:

1. Remove the nut and washer from the actuator arm.

2. Slide the control wire off of the bolt.

7-14.3 Inspection

1. Check for kinks or breaks in the cable sheath.

2. Check for smooth operation.

7-14.4 Repair

Repair is limited to replacement.

7-14.5 Reinstallation

Reverse steps in section 7-14.2.

7-15 Carburetor Heat

7-15.1 Description

The carburetor heat unit consists of an stainless steel heat muff riveted to the cabin heat muff. Carburetor heat is activated by a push-pull knob on the instrument panel which activates a butterfly that closes the opening to ambient induction air, forcing the engine to draw air through a SCAT hose connected to the heat muff.

NOTE: Because the Bing carburetor automatically adjusts mixture with changes in air density, there should be no noticeable change in RPM when carburetor heat is applied on the ground.

7-15.2 Removal

Tools Required	Screwdriver set, 3/8 and 5/8 wrenches
Parts Required	None
Level of Maintenance	Heavy
Level of Certification Required	A&P or LSA R/M-M

For aircraft built in 2008 or older:

1. Disconnect cable from air box by removing the cotter pin from the cable ferrule and pulling ferrule from control arm.
2. Remove jam nuts from cable end adjuster at the butterfly bracket.
3. Remove jam nut from back side of instrument panel.
4. Pull cable from the aircraft.

For aircraft built in 2009 or newer, substitute steps 1 and 2 above with:

1. Remove the nut and washer from the actuator arm.
2. Slide the control wire off of the bolt.

7-15.3 Inspection

Inspect for cracks and loose rivets on muff. Inspect valve for smooth and proper operation. Inspect SCAT hose for damage and replace if necessary.

7-15.4 Repair

Repair is limited to replacement of components.

7-15.5 Reinstallation

Reverse the steps in 7-15.2.

7-16 Ignition System

Refer to Jabiru USA Service Bulletin JSA-009 for important rotor installation information.

7-17 Spark Plugs

7-17.1 Description

Each magneto powers one of the two spark plugs per cylinder. See Section 1-9 for replacement spark plug type.

7-17.2 Removal

Tools Required	18mm deep well socket, 3/16" Allen key, needle nose pliers, spark plug gap tool
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	Owner, A&P or LSA R/M-M

1. Remove cooling air baffles according to Section 7-4.
2. Disconnect the spark plug wires from the plugs.
3. Using an 18mm socket, remove the spark plug and CHT probe if necessary.

7-17.3 Inspection

Check for cracks in the insulator or damage to the electrode. Check the color of the electrode insulator. Medium brown indicates correct mixture. White or light gray color indicates a lean mixture. Black and sooty indicates a rich mixture.

7-17.4 Repair

Repair is limited to cleaning and re-gapping if plug is in good shape. Otherwise repair is limited to replacement.

7-17.5 Installation

1. Adjust plug gap to .022 inch.
2. Apply nickel anti-seize to threads.
3. Install CHT probe on plugs where appropriate by removing the compression washer from the plug, installing the probe washer, and reinstalling the compression washer. Be sure the washers go back on the same way they came off, which is flat-side toward the top of the spark plug.
4. Install the plug into the head and torque to 8 ft-lbs. DO NOT OVERTIGHTEN.
5. Reattach spark plug leads.
6. Replace engine cooling baffles.

7-18 Exhaust System

7-18.1 Description

The exhaust system consists of individual exhaust manifolds attached to the cylinder heads and a muffler assembly that is attached to the bottoms of the manifolds with springs. Refer to Figure 7-8 for more information.

7-18.2 Removal

Tools Required	Screwdriver set, 3/16 hex driver
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

▽ ***WARNING:*** ***Never remove coupling spring with a sharp object or one which can mark the spring material. A rounded screwdriver shank or a hook fashioned from ¼" bar stock is ideal.***

1. Disconnect the carb heat and cabin heat SCAT hoses.
2. Remove muffler springs.
3. Remove muffler assembly. If necessary, loosen exhaust manifold bolts.
4. Remove individual exhaust manifolds as needed.

7-18.3 Inspection

As all exhaust systems are subject to burning, cracking and general deterioration from alternate thermal stress and vibration, inspection is very important and should be carried out every 50 hours of operation. In addition, an inspection of the exhaust system must be undertaken anytime exhaust fumes are noticed in the cabin.

Inspect complete system, starting at the connection to the head. Inspect the securing bolts and move outwards looking for cracks. Especially check areas adjacent to welds. Look for exhaust gas deposits in surrounding areas, indicating that exhaust gas is escaping through a hole or crack.

For a more thorough inspection, the following procedure is recommended.

1. Remove manifolds and/or muffler.
2. Use rubber expansion plugs to seal openings.
3. Using a manometer or gauge, apply approximately 1-1/2 psi (3 inches of mercury) of air pressure while the manifold and/or muffler are submerged in water. All leaks will appear as bubbles and can be readily detected.
4. It is recommended that any exhaust system component found to be defective is repaired or replaced with a new part before the next flight.

7-18.4 Repair

1. Cracks or leaks can be welded by a technician skilled in TIG welding of stainless exhaust pipes.

2. Cracks not suitable for welding require replacement of the exhaust component.

7-18.5 Reinstallation

1. Reverse the steps in 7-16.2 for installation.

2. If reinstalling the exhaust manifold pipes, install bolts hand-tight to allow wiggle room until the muffler is in place, then tighten them the rest of the way.

3. Run engine until it reaches normal operating temperature. Shut it down, and while it is still warm, torque exhaust manifold bolts to final torque value. See *Instruction & Maintenance Manual for Jabiru 3300 Aircraft Engine* for specific torque values.

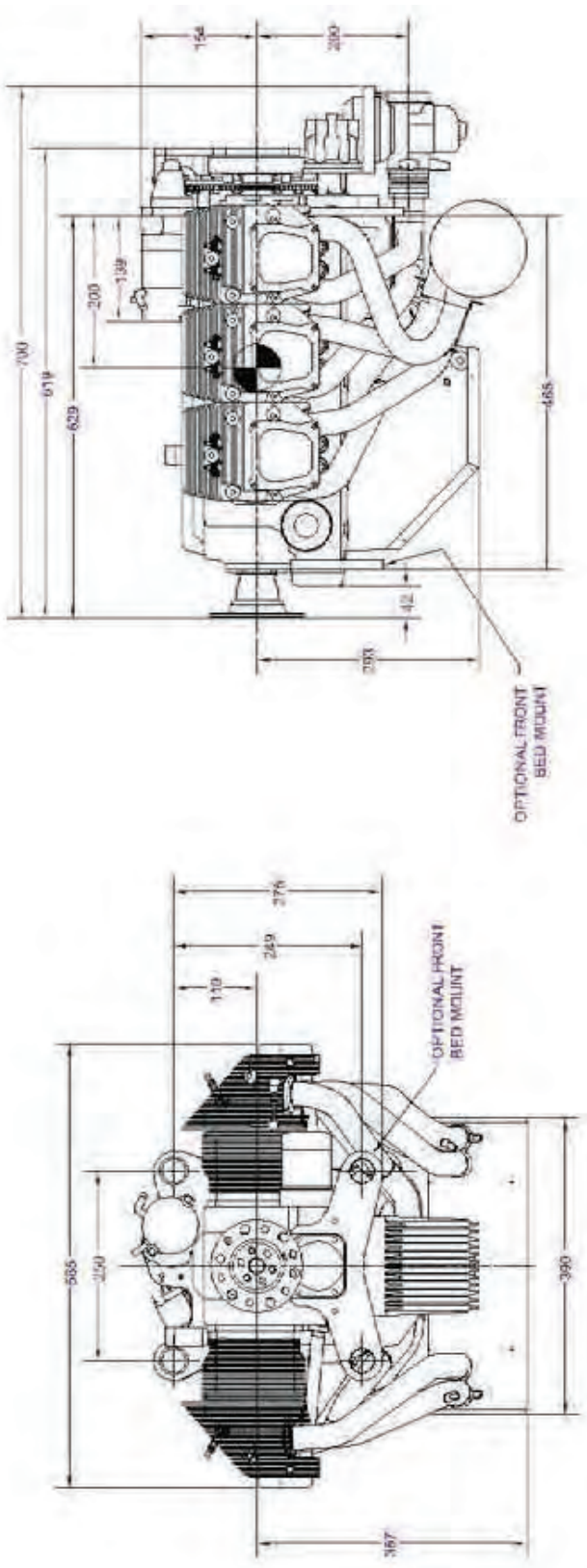

Figure 7-8: Exhaust System

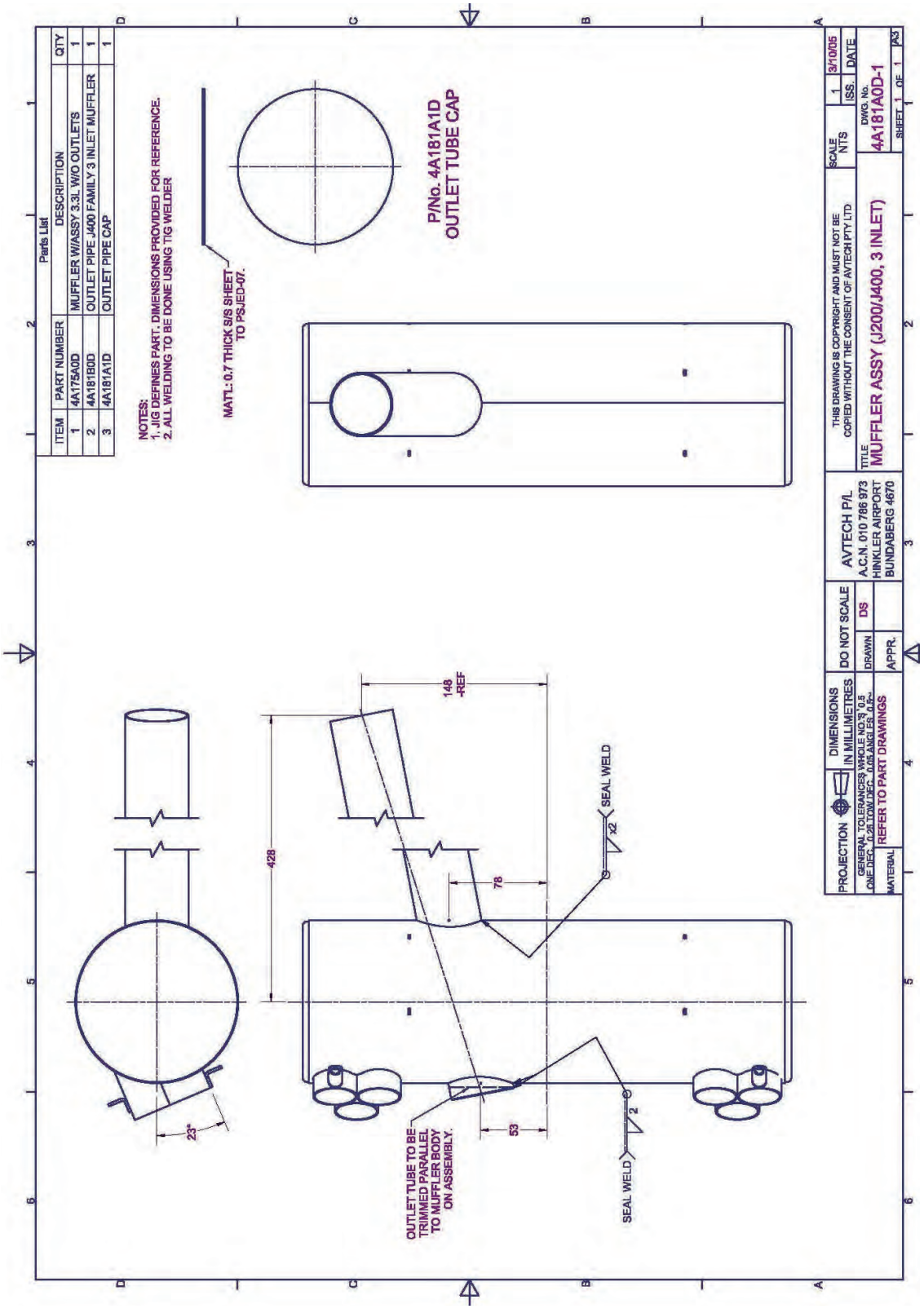

Figure 7-9: Muffler Detail

7-19 Head Bolt Tension Check (Head Torque) Procedure

7-19.1 Description

All Jabiru engines require periodic check of head bolt tension to maintain a proper seal between the heads and the cylinders. New engines require a head bolt tension check at after each 5-hour interval for the first 15 hours of operation, then again at 25 hours. After the 25-hour inspection, Jabiru USA Sport Aircraft, LLC recommends that head bolts are torqued to 20 ft-lbs every 50 hours, usually during the 50-hour inspection. NOTE: Engine must be at room temperature or colder to achieve proper head bolt tension.

7-19.2 Procedure

Tools Required:	Calibrated torque wrench with 4” long 1/4" hex driver and 1/2" deep well socket, 3/16" Allen key, screwdriver set
Parts Required:	None
Level of Maintenance:	Line
Level of Certification Required:	A&P or LSA R/M*

*Owner/Operators of S-LSA aircraft that hold at least a Sport Pilot or Private Pilot Certificate may **only** perform maintenance items listed in FAR Part 43, *Appendix A: Maintenance, Preventive Maintenance, Rebuilding and Alteration,* Section C.

Owners of E-LSA aircraft that hold an LSA Repairman with Inspection Rating (16-hr course) may perform head torques and other maintenance tasks on their own aircraft.

1. Allow engine to cool to room temperature (oil temp less than 100 degrees Fahrenheit) or colder. Plan ahead, as this may take 6 to 8 hours after an engine run.

2. Remove top and bottom engine cowls. Refer to Section 7-3.

3. Remove engine cooling baffles. Note: The bolts that hold the engine cooling baffles in place are also valve cover bolts. Unbolt the cooling baffles, unhook the tension spring on the inboard side of each baffle, and slide the baffles back along the spark plug wires to get them up and out of the way of all the top head bolts. Remove spark plug wires from spark plugs if necessary.

4. Starting with cylinder #1, remove valve cover. Use rag or pan to catch oil that will drip from head.

5. Refer to Figure 7-10, Head Bolt Locations. Note that there are 6 head bolts. Bolt Number 5 is located at the 6 o’clock position of the head, behind the rocker chamber. To access this bolt, the plug must be removed from under the rocker arm shaft center bolt. Use the 3/16 Allen key to remove the plug.

6. Torque head bolts to 20 ft-lbs moving in a criss-cross pattern around the head (see Figure 7-10). Do not loosen bolts first - just apply 20 ft-lbs to the head bolts as they are. A 4" long 1/4 Allen key is needed for the head bolt behind the plug at the 6 o'clock position.

7. Reinstall rocker chamber oil plug. Torque plug to 8 ft lbs. DO NOT over-tighten!

8. Reinstall valve cover, making sure O-ring is seated in the groove on the head.

9. Repeat with all heads.

10. Reinstall spark plug leads and cooling baffles.

11. Make sure all tools are removed from engine compartment and the crankcase contains the proper amount of oil. Run the engine briefly. Test both magnetos to make sure all plug wires are secure on both ends. Check engine compartment for any oil leaks. Complete 50-hour service and inspection as necessary. When satisfied, reinstall engine cowlings.

12. On a new engine, if head bolt tension continues to change after the 10 hour check, investigate whether the heads are receiving enough cooling. Overheated heads will cause head bolt tension to change as the heads expand beyond engineered limits and then contract. Correct the cooling problem ASAP or contact Jabiru USA for assistance.

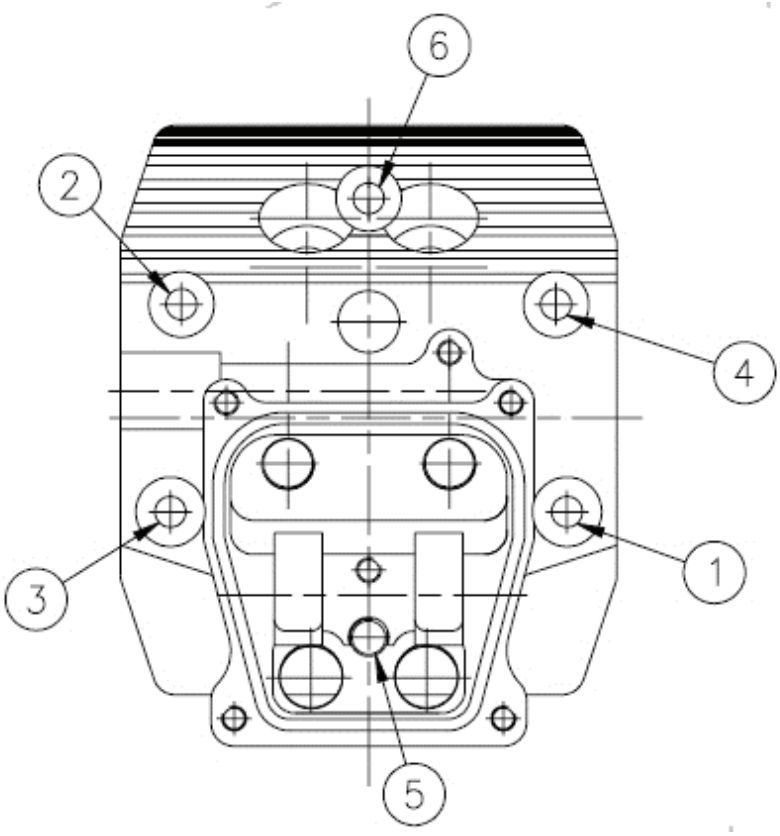

Figure 7-10: Head Bolt Locations. Number 5 is hidden behind rocker chamber oil plug.

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Section 8: Fuel System

8-1 General Description

The engine is equipped with a carburetor (see Section 7-10) mounted behind the engine and a fuel pump at the starboard rear of the engine. There is one fiberglass main fuel tank in each wing. Fuel is routed in automotive ethanol-resistant fuel lines from each wing through a shutoff valve on each side of the cockpit interior, mounted aft of the cockpit doors. It then flows into a header tank located behind or under the passenger seat. Fuel is fed from the header tank to the engine through a filter located between the two sets of rudder pedals.

As long as there is fuel inside the wing tanks, there is enough pressure to force fuel from the header tank through the firewall. An engine-driven mechanical fuel pump helps provide pressure to feed the carburetor. An electric boost pump is available to fill the carburetor bowl with fuel prior to engine start and also to function as a backup in case the mechanical pump fails. There is one main fuel shutoff valve located on the center console between the control stick and the brake handle.

A vent line for each tank runs to the wing tip, where it exits the leading edge of the winglet in the J230 or the trailing edge of the wing tip in the J250. The header tank is vented into both main tanks on aircraft before s/n 795. It vents to the wingtip in s/n 795 and later aircraft. Check valves reduce the amount of fuel allowed to back out of the vents.

Three fuel sumps allow sampling of fuel for water and sediment. There is one sump at the root end of each wing tank and one in the header tank that protrudes out the belly of the fuselage.

8-2 Fuel Tanks

8-2.1 Description

Each fuel tank consists of a fiberglass shell that is internally coated with sealant. There is one main tank in the root end of each wing and one header tank behind or under the passenger seat. The main tanks are an integral part of the wing structure and may not be removed.

8-2.2 Removal of Header Tank

Tools Required	Screwdriver set
Parts Required	None
Level of Maintenance	Heavy
Level of Certification Required	A&P or LSA R/M-M

1. Shut off the Left and Right fuel valves located on the doorposts aft of the cabin doors.

2. Drain the fuel out of the header tank into an approved container by following the procedure in Paragraph 8-8.

3. Mark the fuel lines “upper” and “lower” to avoid getting vent lines and fuel lines mixed up during reassembly.

4. Unbolt the header tank.

5. When all fuel is drained from the header tank, remove the hose clamps to disconnect the fuel and vent lines.

8-2.3 Inspection

1. Inspect header tank for evidence of fuel leakage. Inspect fuel lines and fittings for cracks.

2. Check for fuel stains on the bottom of the wing near the inboard rib. If stains are evident, determine whether stains come from leaking fittings or from the tank itself.

8-2.4 Repair

1. Repair of header tank is limited to replacement.

2. Wing tanks can be resealed (sloshed) if a leak appears. Contact the aircraft manufacturer for procedure and materials.

8-2.5 Reinstallation

Reverse steps in 8-2.2 for reinstallation of header tank. Be sure to reconnect fuel and vent lines to the correct fittings.

8-3 Fuel and Vent Lines

8-3.1 Description

The fuel and vent lines are made from 1/4" I.D. rubber hose and held in place with hose clamps. There is a check valve in each vent line that allows air into each fuel tank. The check valves are bleed valves which restrict some fuel from escaping out of the vent, but allow for the release of air pressure inside the tanks; therefore, it is normal for small amounts of fuel to reach the fuel tank vents. The header tank vent is independent of the main tanks, exiting the right wing tip, beginning with aircraft serial number 795.

8-3.2 Removal

Tools Required	Screwdriver set
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

Consult Jabiru USA Sport Aircraft, LLC for any necessary removal of vent lines, as they are built into the wing structure.

▽ ***WARNING: Make sure all fuel is drained from system before removing fuel lines.***

To remove or inspect fuel lines and check valves:

1. Remove the top and bottom wing root fairings to access the fuel lines and check valves in the wing roots.

2. To access fuel lines and valves inside the cabin doorposts, remove the nut from each doorpost fuel valve. Carefully pull the upholstery panel from the doorpost around the valve. Some aircraft utilize screws and Velcro to keep the upholstery in place, while others use only Velcro.

3. Remove lines or valves as necessary by loosening hose clamps.

8-3.3 Inspection

1. Remove the caps from the wing root check valves to avoid building pressure in the tanks. Then blow air through the vent lines to make sure they are clear. Replace the caps.

2. Inspect the fuel lines for cracks or leaks.

3. Inspect all three fuel valves for smooth operation and full fuel flow/shutoff.

8-3.4 Repair

1. Fuel line repair is limited to replacement.

2. Fuel valve and check valve repair is limited to replacement.

8-3.5 Reinstallation

1. Follow steps in 8-3.2 for reinstallation of fuel lines. Make sure they are reconnected to the correct fittings.

2. Reinstall the interior door post covers and the nut on each shut-off valve.

3. Reinstall the wing root fairings, bottom fairing first.

8-4 Fuel Pumps

8-4.1 Description

The mechanical fuel pump is mounted to the passenger side of the engine. See *Instruction and Maintenance Manual for Jabiru 3300 Aircraft* for information about servicing the mechanical fuel pump.

The electric fuel pump is mounted in series with the mechanical pump. It is bolted to the firewall inside the engine compartment.

8-4.2 Removal

Tools Required	3/8 wrench, wire cutter, screwdriver set
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

1. If possible, run engine. Shut off by turning fuel valve in the center console to OFF position and waiting for engine to quit from fuel starvation.

2. Make sure master and ignition switches are OFF.

3. Disconnect electrical wire.

4. Unbolt pump from firewall.

5. Remove safety wire and pull back firesleeve to access fuel pump fittings.

6. Remove fuel lines from pump.

8-4.3 Inspection

Check electrical connector for corrosion, cracks or frays. Replace connector if necessary.

8-4.4 Repair

Electric fuel pump repair is limited to replacement.

8-4.5 Reinstallation

1. Reverse the steps in 8-4.2 for installation.

2. To test pump function, turn master switch ON (engine not running), and then turn fuel pump ON. There should be an audible tapping sound. The frequency of the taps will change slightly when the carburetor bowl is filled with fuel.

▽ ***WARNING:*** ***All fuel line firesleeve removed during maintenance must be reinstalled before the aircraft is returned to service.***

8-5 Fuel Filters

8-5.1 Description

There is one removable brass finger filter in each fuel tank exit line (two in each main tank and one in the header tank) to filter large particles exiting the fuel tanks. There is one automotive-type main fuel filter located between the center console shutoff-valve and the firewall, between the rudder pedal units.

8-5.2 Removal of Finger Filters

Tools Required	Screwdriver set
Parts Required	None
Level of Maintenance	Heavy
Level of Certification Required	A&P or LSA R/M-M

1. Drain fuel from the affected fuel tank using procedure outlined in Paragraph 8-8.

2. Remove wing root fairings or header tank as necessary (see Paragraph 8-2 of this section for removal of header tank).

3. Remove hose clamp and fuel line. Remove finger filter using deep-well socket.

8-5.3 Removal of Main Fuel Filter

Tools Required	7/16 deep-well socket, flat screwdriver, fuel line pliers
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

1. Run engine if possible. Empty fuel from the main fuel line by turning the main fuel valve to the OFF position and letting the engine quit due to fuel starvation. **Turn master and ignition switches to the OFF position after the engine quits.**

2. Remove fuel filter by loosening the hose clamps and pulling the lines off of the filter fittings.

8-5.4 Inspection

1. Inspect finger filters by looking for blockages. Clean if necessary.

2. If the main fuel filter is housed in clear plastic, visually inspect by checking for dirt, particles or blockages.

8-5.5 Repair

1. Repair of finger filters is limited to cleaning.

2. Repair of main fuel filter is limited to replacement. See Section 1-9 for part number.

8-5.6 Reinstallation

1. Reverse instructions in 8-5.2 for finger filters or 8-5.3 for main fuel filter.

2. Reinstall wing root fairings according to the appropriate section of this manual.

8-6 Fuel Sump Drains

8-6.1 Description

Three spring-loaded fuel sump drains allow pilot or mechanic to drain fuel from the tanks for daily sample or fuel removal. There is one sump drain in the rear root end of each wing tank and one in the bottom of the header tank which protrudes from the belly of the aircraft.

8-6.2 Removal

Tools Required	5/8 wrench
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

1. Drain fuel from the affected fuel tank as described in Paragraph 8-8.

2. Turn sump drains out of the bottom of the tank with the wrench.

8-6.3 Inspection

Inspect sump drains for proper seating. If a sump drain sticks or drips fuel, there is probably debris in the seat that needs to be washed away.

8-6.4 Repair

Repair of sump drains is limited to cleaning or replacement.

8-6.5 Reinstallation

Reverse the steps in 8-6.2 for installation. Add a small amount of fuel to tank, then check drain for leaks.

8-7 Fuel Gauges

8-7.1 Description

There is one resistive float-type fuel quantity sender in the root end of each main wing tank. Each sender is wired to its own set of LED fuel gauge indicator lights on the instrument panel in GRT EIS- equipped aircraft. In Garmin G3X aircraft, the gauges are programmed into the EFIS and the LED lights are omitted.

Each fuel gauge consists of a group of four green LEDs and one red LED. Each LED represents approximately two gallons of fuel. When the corresponding tank contains two gallons or less, the red LED will light, and the four greens will be dark. Because of the shape of the fuel tank, the wing dihedral, and the placement of the sender, anything over 10 gallons will register as four green LEDs. For the same reasons, the G3X fuel level indicator will not read completely full when the tanks are full.

NOTE: When the aircraft is flown in an uncoordinated condition, the fuel gauges may temporarily read inaccurately due to float position and sloshing of fuel in the tanks. The fuel quantity reading should return to normal within several seconds of aircraft stabilization. Pilots are strongly encouraged to visually check fuel quantity before each flight using a calibrated fuel dipstick. Fuel dipsticks are available through Jabiru USA Sport Aircraft, LLC.

Gauge Reading	Fuel Quantity
4 GREEN	8-17 gal.
3 GREEN	6-8 gal.
2 GREEN	4-6 gal.
1 GREEN	2-4 gal.
RED	Less than 2 gal.

8-7.2 Removal of Float Senders

Tools Required	Screwdriver set
Parts Required	None
Level of Maintenance	Heavy
Level of Certification Required	A&P or LSA R/M-M

1. Drain fuel from fuel tank as described in Paragraph 8-8.
2. Remove wing root fairings.
3. Remove wing as described in Section 4-1.
4. Remove the 4 screws that mount the sender in the tank.
5. Remove sender.

8-7.3 Inspection

Inspection is limited to checking the float for pin holes or leaks.

8-7.4 Repair

Repair is limited to replacement of the float sender.

8-7.5 Reinstallation

1. Prior to reinstallation, clean all sealant from the mounting surfaces.
2. Apply a small amount of Permatex #2 gasket sealant to the mating surface of the sender.
3. Install the sender in the wing.
4. Install the four #8 truss head machine screws with a small amount of Loctite 242.
5. Reinstall wing and fairings as described in Section 4.

8-8 Fuel Draining Procedure

From time to time, it may be necessary to drain fuel from the aircraft for disassembly or inspection and repair of fuel system components. Fuel should be drained from the wing tanks before the wings are removed for any reason.

Tools Required	Screwdriver set, long piece of 1/4" ID fuel hose, gasoline-approved & clean fuel containers with enough capacity to hold contents of tank to be drained plus header tank
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	Owner, A&P or LSA R/M-M

To drain fuel from the header tank:

1. Close both left and right fuel valves. Make sure main fuel valve is ON.
2. Disconnect fuel line between the electric and the mechanical fuel pump.
3. Connect a long fuel line from the output fitting on the electric pump to a container approved to hold gasoline.
4. Turn on master switch. Turn on electric fuel pump. Run fuel pump until all fuel is pumped from the header tank.

NOTE: The capacity of the header tank is approx. 1.5 U.S. gallon. Allow extra room for fuel in the lines.

To drain fuel from a wing tank:

1. Make sure the fuel valve appropriate to the tank being drained (left or right) is switched ON, and turn the other one OFF. Make sure the main fuel valve is turned ON.
2. Follow steps 2 through 4 above until fuel is drained from the wing tank.

NOTE: The capacity of each wing tank is approx. 18 U.S. gallons.

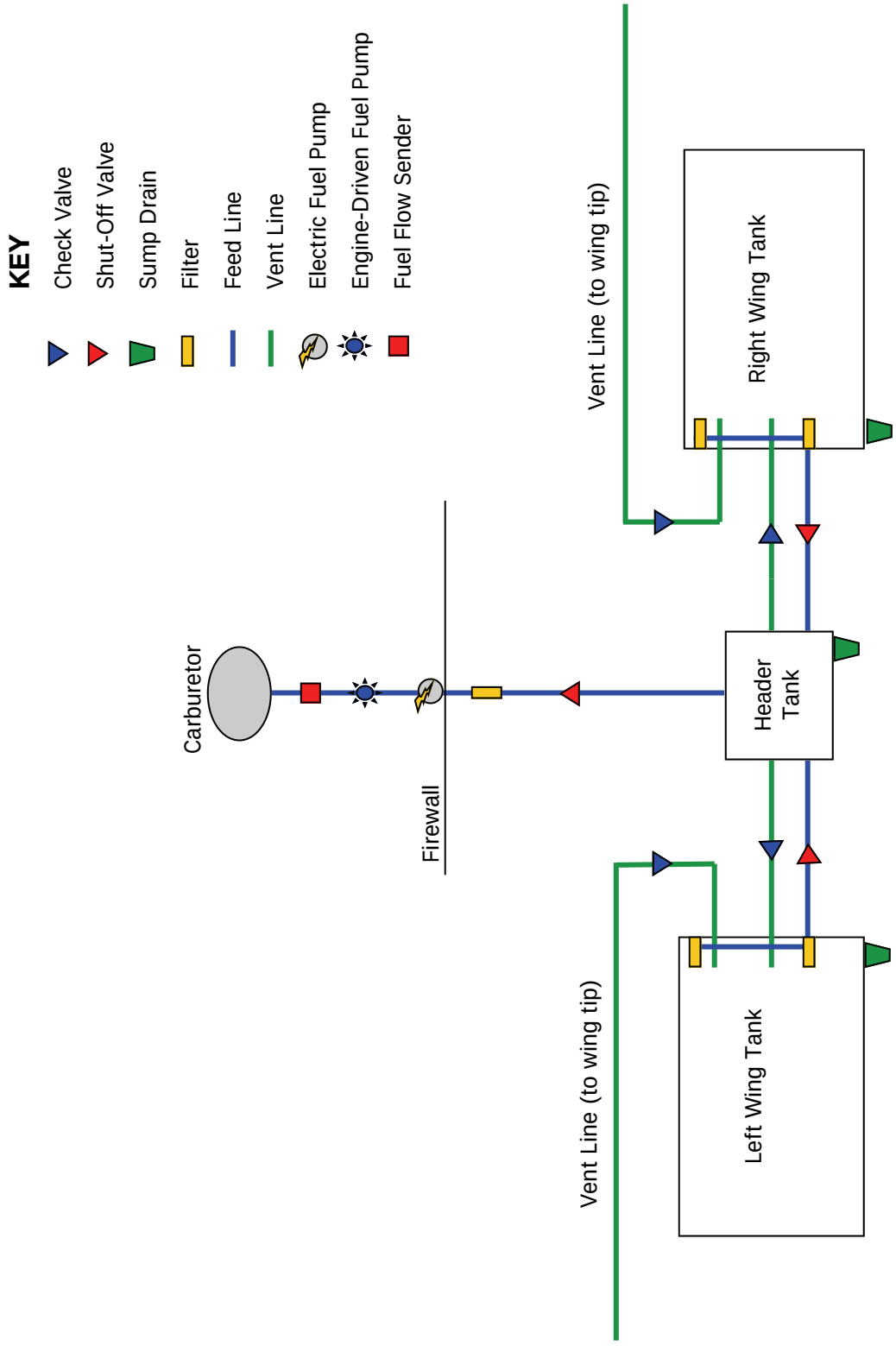

Figure 8-1: Fuel System Schematic Drawing, (aircraft s/n 726 and earlier)

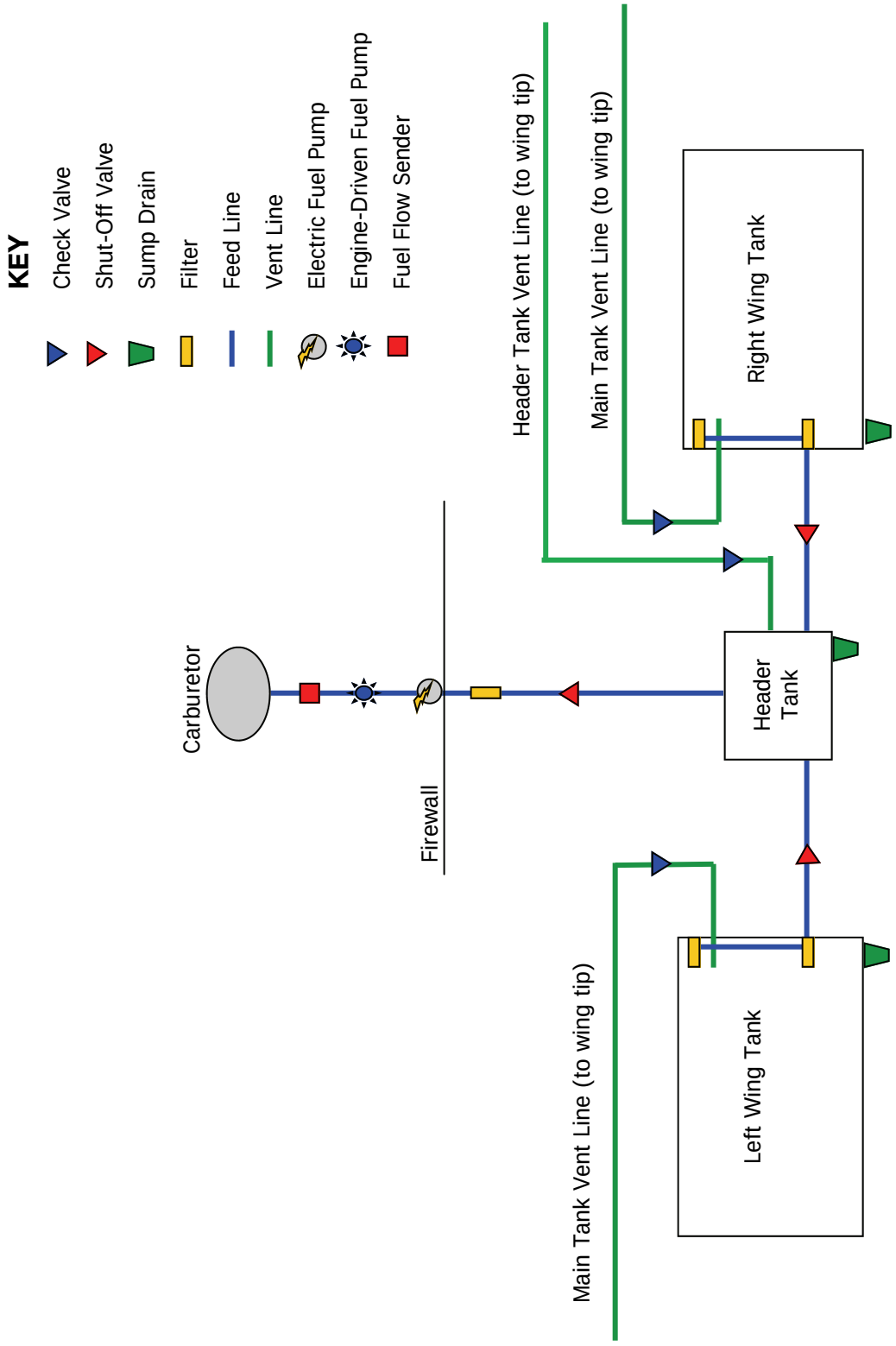

Figure 8-2: Fuel System Schematic Drawing (J230 s/n 795 and newer)

Section 9: Propeller

9-1 Spinner Assembly

9-1.1 Description

Each Jabiru S-LSA aircraft is equipped with a spinner to protect the propeller hub area and help direct cooling air into the cowling inlets. Early models were equipped with a fiberglass spinner, while later models are delivered standard with a Cummins polished aluminum spinner.

9-1.2 Removal

Tools Required	Screwdriver set
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

1. Remove machine screws and nylon washers from spinner.
2. Remove spinner cone.
3. Remove the nuts from the six propeller bolts.
4. Remove the AN960-616 washers, Belleville washers (two per bolt), aluminum crush plate, and propeller.
5. Remove spinner backing plate.

9-1.2 Inspection

1. Inspect spinner for cracks and dents.
2. Inspect spinner back plate for cracks, warps or bends, and loose nutplates.

9-1.3 Repair

1. Dented and/or cracked spinners and damaged back plates must be replaced. Spinner cones and backplates come match-drilled and must be replaced as a set.
2. Replace loose #8 nutplates using solid AD countersunk aluminum rivets.
3. Scratches may be polished from spinner with Flitz, Nuvite or other similar aluminum polishing compounds.

9-1.4 Reinstallation

1. Reverse steps in 9-1.2 for reinstallation of spinner components, using propeller installation procedure in 9-3.5.
2. Reinstall spinner cone. Tighten screws JUST UNTIL SNUG, or until the plastic washers begin to compress slightly. DO NOT OVERTIGHTEN, as this may cause the spinner cone to crack over time.

9-2 Fixed-Pitch Wood Propeller

9-2.1 Description

The wood propeller is constructed from four laminations of approved species timber and is manufactured in accordance with the relevant Sensenich specifications. It is a single-piece, two- blade propeller with polyurethane leading-edge protection.

The propeller finish is a either a clear marine polyurethane varnish or epoxy paint. Propellers with a G suffix in the model number are covered with a layer of fiberglass for extra strength and durability.

9-2.2 Removal

Tools Required	Screwdriver set
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

▽ ***WARNING:*** ***Make sure ignition system is OFF before commencing work on propeller.***

▽ ***WARNING:*** ***Do NOT run engine with propeller disconnected or serious engine damage will result.***

1. Remove spinner as described in Section 9-1.
2. Unbolt the six AN6-45A propeller bolts.
3. Remove the AN960-616 washers, Belleville washers (two per bolt), aluminum crush plate, and propeller.

9-2.3 Basic Inspection

Before each flight and during each scheduled inspection, the propeller should be looked over for damage including, but not limited to, nicks, cracks, and chips in the leading edge and blade surfaces. Nicks in the paint surface are to be expected with age and if the aircraft is flown through heavy rain. Nicks in the wood itself, cracks, splits, or delamination of any composite sheath must be either rejected as unserviceable or returned to Sensenich Wood Propeller Company for assessment and possible repair.

Propeller bolt tension must be periodically checked. Refer to Section 9– 8 for schedule & procedure.

9-2.4 Repair

Any service or repair must take account of the risk of subsequent propeller failure. All propeller repairs must be referred to Sensenich Wood Propeller Company for proper repair procedure.

For reference, the maximum size of nicks that can be approved for repair is:

1. Those in leading edge: 4mm deep x 20mm long

2. Those across the drive face (flat sides): 2mm deep x 6mm diameter or scratches not more than 0.5mm deep.

Repairs must also take account of changes in the balance of the propeller. Therefore, before return to service after any repair, the propeller must be removed in accordance with the procedure described in Paragraph 9-2.2 of this section. It must be checked for balance prior to reinstallation, checked for tracking after reassembly, and the spinner checked for balance after reassembly.

9-2.5 Reinstallation

Tools Required	9/16 wrenches, screwdriver set, calibrated torque wrench
Parts Required	Six new AN365-624 nyloc nuts
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

Propeller installation must be done in accordance with Sensenich Doc. # WOOD-CF-REV -A.DOC, “Wood Propellers: Installation, Operation & Maintenance,” found in the Appendix of this manual. Check the Sensenich website for latest revision to this document.

1. Ensure the propeller drive bushings are in place in the crankshaft propeller flange.

2. Insert the AN6-45A bolts from the rear.

3. Position the spinner back plate on the crankshaft propeller flange with the back plate flange facing aft. Insert the prop drive bushings through the back plate.

4. Install prop over back plate and drive bushings. Make sure the prop and spinner back plate are in the correct position for spinner cone installation.

5. Install crush plate over the bolts.

6. Install two Belleville washers on each prop bolt as shown in Figure 9-1.

7. Install one AN960-616 washer on each bolt.

8. Install AN365-624 nuts on bolts. Use new nuts.

9. Torque to 15-17 ft-lbs in the sequence indicated in Figure 9-1.

10. Check propeller tracking as outlined in Paragraph 9-5 of this section.

9-3 Ground-Adjustable Carbon Propeller

9-3.1 Description

The ground-adjustable carbon propeller consists of a two-piece machined anodized aluminum hub and two carbon fiber composite blades. A nickel steel leading edge protector is bonded to the leading edge of each blade. Each blade is finished in epoxy paint. Carbon propellers require a check of blade clamp bolt tension every 25 hours in accordance with Sensenich Document #COMP-AC-CF-RE-1a, EZ-Pitch Composite Aircraft Propeller Installation and Operation Instructions. A copy of this document dated 11-26-08 found in the Appendix of this manual. Check the Sensenich website for the latest revision.

9-3.2 Removal

Tools Required	1/2” wrenches, screwdriver set, ruler, pencil, propeller protractor
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

1. Lay a ruler on the rear face of one blade. Mark 12” from the tip on the trailing edge of the blade. Repeat for the other blade. Use a propeller protractor to note the prop angle relative to the top of the crankcase when the blades are in a horizontal position.

2. Remove machine screws and fiber or plastic washers from spinner.

3. Remove spinner cone.

4. Remove the six hub bolts from the front half of the hub. Take care to support the prop blades when the bolts are loosened.

5. Remove front half of prop hub. Support the blades when removing the hub half.

6. Remove the center positioning nylon block.

7. Remove the six hub retaining bolts in the rear hub half to completely remove prop, hub, and spinner lockplate.

9-3.3 Inspection

1. Check for nicks and cracks in the leading edge and faces of the blades.

2. Make sure clamping bolts in propeller hub are torqued to correct specifications– See Section 9-8.3.

3. Measure pitch angle of each blade and ensure they are the same. Very slight variations in pitch between blades will cause significant vibration.

9-3.4 Reinstallation

Tools Required	9/16 wrenches, screwdriver set, torque wrench, propeller protractor
Parts Required	New Nyloc propeller hardware
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

1. Refer to Figure 9-2.

2. With the Sensenich prop drive bushings in place, position the spinner backplate and rear hub half on the prop flange and install the six AN5 bolts. Torque to 20 ft-lbs. Make sure to align the spinner backplate correctly, as the spinner cone only fits one way.

3. Position the center nylon block and the two blades in place while setting the front hub half into position.

4. Install the six prop hub bolts with the stepped washers and tighten until just snug.

5. Using the propeller protractor, set each blade to the same angle as they were before disassembly or adjust using Table 9-1. Be precise as a small difference in angle will result in propeller vibration. Place protractor on a line measured 12" inboard from tip of propeller blade and perpendicular to blade centerline. Move protractor to top of engine crankcase to check relative pitch angle. Pitch angle must not exceed limits in Table 9-1.

6. Slowly and evenly tighten the hub bolts to avoid changing the blade angle. Recheck the blade angle often. When the bolts are tight enough that the blades no longer wiggle and both blade angles are correct, torque the front half hub bolts to 20 ft-lbs. Recheck blade angle to make sure there was no change.

7. Install spinner on spinner flange and attach with machine screws through fiber washers.

8. Check propeller tracking as outlined in Paragraph 9-5 of this section.

	Suggested Pitch	Minimum Pitch	Maximum Pitch
Climb Setting	21.0°	21.0°	22.0°
Cruise Setting	22.0°	21.0°	22.0°
Factory Setting	21.5°	21.0°	22.0°
NOTE: Any change made to propeller pitch will likely require carburetor jetting adjustment.			

Table 9-1: Ground-Adjustable propeller blade pitch settings in degrees

9-4 Balancing Procedure

After any repair work is done to a wood or carbon propeller, it must be rebalanced. Refer to Sensenich Wood Propeller Company for approved balancing procedures.

9-5 Propeller Tracking Procedure

Required Tools:	Ruler with mm increments
Required Parts:	None
Level of Maintenance:	Line
Level of Certification Required:	Owner, A&P, LSA R/M

After removing and reinstalling any propeller, the blade tracking must be measured before the aircraft is returned to service.

▽ ***WARNING:*** ***Before handling any propeller, ensure the ignition and master switches are in the OFF position.***

1. Check tracking of propeller by placing a fixed object on the floor in front of the aircraft so that it just clears the propeller tips when rotating the propeller by hand. Ensure the floor is a level surface.

2. Check that each blade clears the object by the same amount. Maximum tracking error tolerance is +/- 2mm. If the propeller is outside the approved tolerance, refer to Sensenich Wood Propeller Company or Jabiru USA Sport Aircraft for service.

9-6 Approved Installations for J230-SP and J250-SP

Manufacturer	Model	Diameter (in.)	Pitch (in.)	Construction
SENSENICH	W64ZK-49	64	49	WOOD
SENSENICH	W60ZK-53	60	53	WOOD
SENSENICH	W60ZK-53G	60	53	WOOD/ FIBERGLASS
SENSENICH	W60ZK-55G	60	55	WOOD/ FIBERGLASS
SENSENICH	2A0J5R64Z-N	64	GROUND-ADJUSTABLE	CARBON
NOTE: Any change in propeller pitch or diameter will likely require carburetor jetting adjustment.				

Table 9-2: Approved Propeller Installations

9-7 Identification Stampings

Each wood propeller is marked with the model number, the diameter and pitch in inches (part of model number), and manufacturer's serial number on the propeller hub.

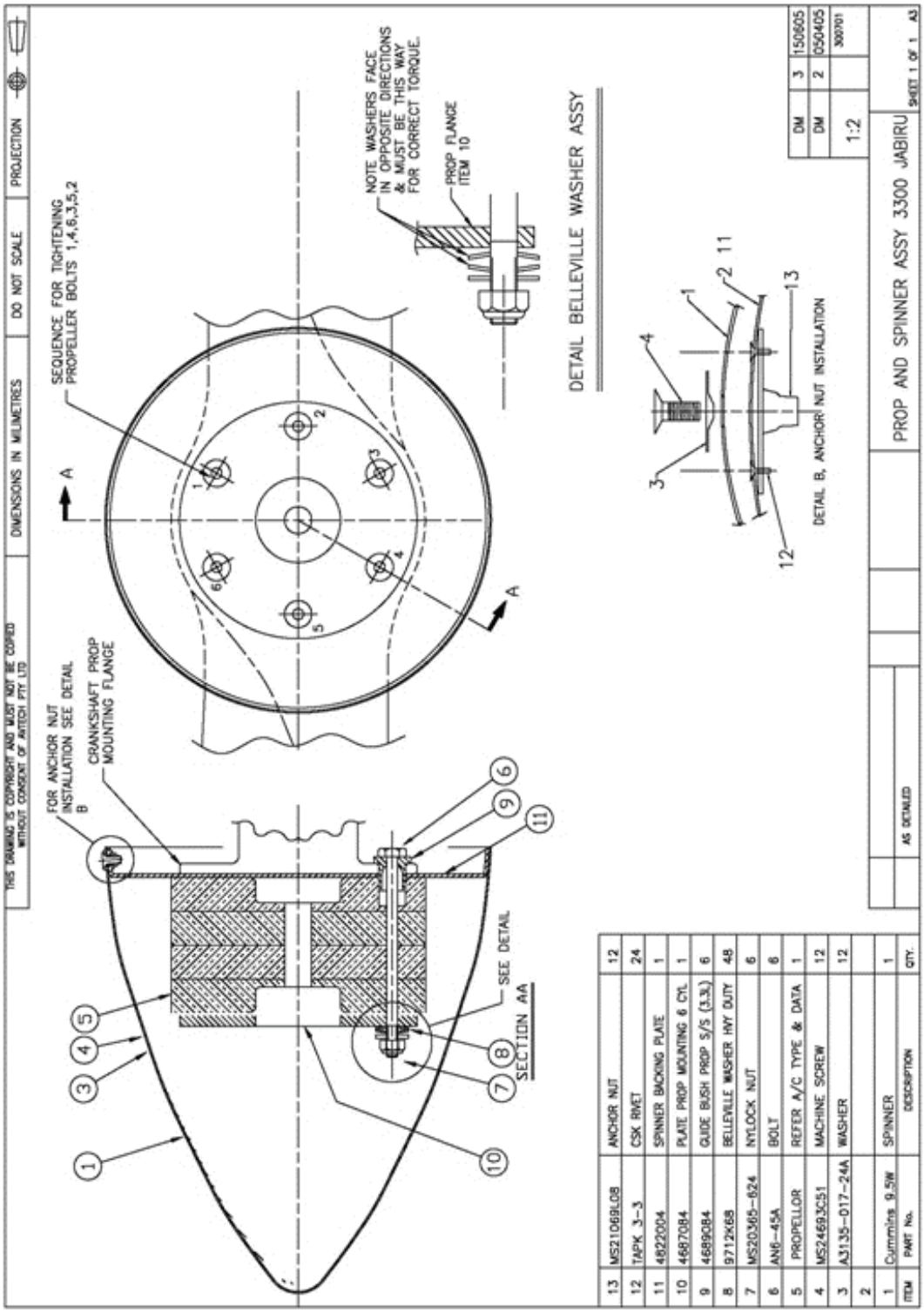

Figure 9-1: Prop Mount Detail

Note: Spinner mount screw (#4 in diagram) has been replaced with #8 truss-head machine screw. Washer (#3 in diagram) has been replaced with one flat Nylon washer.

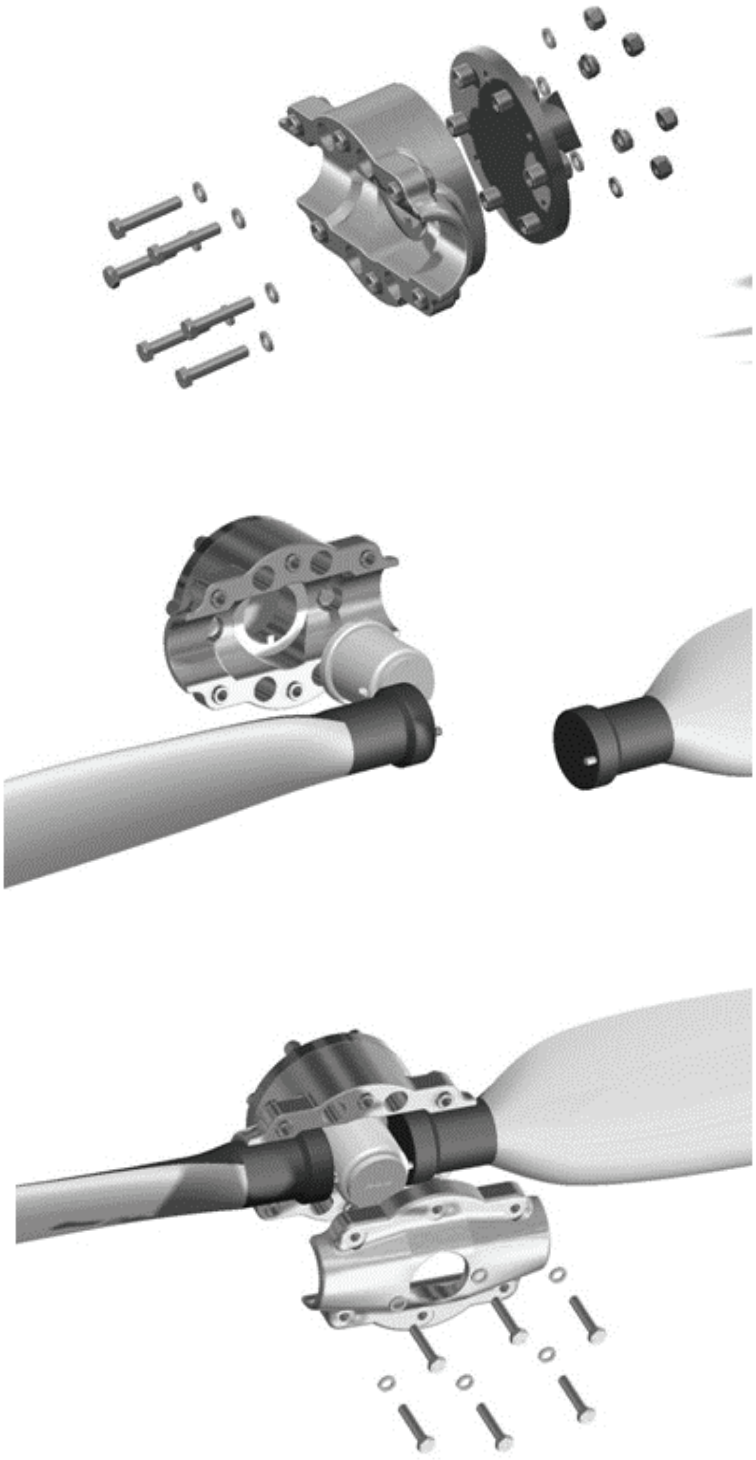

Figure 9-2: Assembly of Ground-Adjustable Propeller

9-8 Propeller Bolt Tension Check

9-8.1 Description

Because of natural expansion and contraction due to normal use and environmental conditions, the hub bolt tension of wood propellers MUST be periodically checked according to the propeller manufacturer's timetable, which is outlined in this paragraph. For detailed information regarding torque procedure and propeller maintenance, refer to Section 9-8 and *Sensenich Propeller Co. Wood Propeller Installation, Operation and Maintenance Guide, Doc. # WOOD-CF-REVC-A.doc,* in the Appendix of this manual. Check the Sensenich website, www.sensenichprop.com, for the latest revision of wood propeller installation and maintenance instructions.

Sensenich Required Propeller Bolt Torque Schedule

1. After First Flight – After the first flight using a new propeller, recheck the bolt torque.

2. After First 25 Hours – After the first 25 hours, recheck the propeller bolt torque.

3. Every 50 Hours – After the first 25 hour recheck, it is MANDATORY that the propeller bolt torque be rechecked every 50 hours.

4. Environmental changes - Should the operating environment change significantly in temperature and/or humidity for a long period of time (i.e. seasonal changes), the propeller bolt torque must be rechecked.

Sensenich Ground-Adjustable Carbon Propellers require a tension check of the blade clamp bolts every 25 hours. See Section 9-8.3 for procedure.

Jabiru S-LSA aircraft use nyloc nuts to attach wood propeller bolts to the hub. No safety wire is needed; however, if the nuts are removed they MUST be replaced with new hardware.

9-8.2 Wood Propeller Bolt Tension Check Procedure

Required Tools:	Calibrated torque wrench with 9/16" socket, 9/16" wrench, screwdriver set
Required Parts:	(6) new AN365-624 nyloc nuts
Level of Maintenance:	Line
Level of Certification Required:	A&P, LSA R/M

1. Ensure ignition switch is in the OFF position and set parking brake.

2. Remove spinner using procedure in Section 9-1.

3. Set torque wrench to 15-17 ft-lbs. Check tension of nuts by moving in a criss-cross pattern around the hub (see Figure 9-1 for torque pattern). Use box-end wrench to hold bolt heads secure.

4. If nuts move during the procedure, this means the propeller has contracted. Finish

tightening nuts to 15-17 ft-lbs of torque and move onto Step 7. If nuts do not move during the procedure, the propeller has expanded. To achieve proper tension, the nuts must be removed and replaced with new hardware. Move on to Step 6.

5. Remove propeller nuts and thread new nuts onto the bolts. Snug lightly into position.

6. Use torque wrench to tighten bolts to between 15 and 17 ft-lbs of torque, moving in a criss-cross pattern around the hub (see Figure 9-1 for torque pattern).

7. Check propeller tracking as described in Section 9-5.

8. Reinstall spinner as described in Section 9-1.

9-8.3 Ground-Adjustable Carbon Propeller Bolt Tension Check

Required Tools:	Calibrated torque wrench with 1/2" socket, screwdriver set, propeller protractor
Required Parts:	None
Level of Maintenance:	Line
Level of Certification Required:	A&P, LSA R/M

1. Ensure ignition switch is in the OFF position and set parking brake.

2. Remove spinner using procedure in Section 9-1.

3. Set torque wrench to 20 ft-lbs and check tension on the six propeller blade clamp bolts. Do not loosen bolts— just apply tightening pressure to the bolts in a criss-cross pattern similar to that shown in Figure 9-1.

4. If any movement in bolts is noted, recheck propeller blade pitch angles as described in Section 9-3.

NOTE: Owners are NOT AUTHORIZED to change propeller blade pitch. If blade angles are outside of limits or do not match, an A&P or LSA RM/M must recalibrate the propeller to proper pitch.

Section 10: Utility Systems

10-1 Cabin Heat

10-1.1 Description

Cabin heat is provided by air from a cowl intake that is warmed over the muffler and delivered to a firewall-mounted mixer box. Hot air is introduced to the cabin through use of a push-pull knob on the instrument panel.

10-1.2 Removal

Tools Required	Screwdriver set
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

1. Disconnect SCAT intake hose from muff and from cowl intake.
2. Disconnect SCAT duct from muff and firewall mixer box.
3. Loosen strap clamps from muffler to remove heat muff.
4. Firewall mixer box is riveted to firewall and can be removed only by drilling out the blind rivets.

10-1.3 Inspection and Repair

1. Check the SCAT for cracks or breaks. Replace if damage found.
2. Check the aluminum muff for cracks or deformation. Small cracks can be repaired by riveting a .025 aluminum patch over the crack. Otherwise repair is limited to replacement.
3. Inspect the firewall mixer box for cracks or damage. Replace mixer box if damage found.
4. Check push-pull cable for smooth operation. Replace cable if damage found or smooth operation cannot be achieved.
5. When heat muff is removed from muffler, inspect muffler for cracks or signs of exhaust leaks.

▽ ***WARNING:*** ***Cracks in exhaust system underneath heat muff may lead to carbon monoxide poisoning. See Section 7-18 for information on exhaust system inspection and repair.***

10-1.4 Reinstallation

Reverse steps in 10-1.2 for reinstallation.

10-2 Cabin Ventilation

10-2.1 Description

Cabin ventilation is provided through aluminum vents bolted to NACA inlets in the cabin side walls.

10-2.2 Removal

Tools Required	Screwdriver set, 11/32 wrench
Parts Required	None
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

1. Remove the vents by unbolting them from the cabin side wall.

10-2.3 Inspection and Repair

1. Check the vents for smooth operation and proper closure.

2. Repair is limited to replacement.

10-2.4 Reinstallation

Reverse steps in 10.2.2 for reinstallation.

10-3 Stall Warning System

10-3.1 Description

The stall warning system is of the suction-reed type. It consists of a screened opening in the leading edge of the left wing, an airflow divider plate, an air line that runs to the cabin, and a reed with an amplifier bell mounted inside the cockpit. The airflow divider plate is calibrated to match the critical angle of attack of the wing. When the wing approaches the critical angle of attack, the divider plate disturbs the airflow in front of the screen, creating a low-pressure area that sucks air from inside the cabin, through the reed, and out the screen. The reed is mounted inside the left doorpost so that it is easily audible from the left seat.

10-3.2 Removal

The reed bell assembly is easily accessible by removing the pilot's side door post cover. The bell is held to the air line with small safety wire (.032").

The screen and divider plate are epoxied into the leading edge of the wing before the wing is painted. To remove them, file away the paint and body filler from around the

opening until the edges of the screen are visible. Pry the screen and divider plate away from the opening. The aluminum funnel may then be removed, allowing access to the air line inside the wing.

10-3.3 Inspection

To check function of the stall warning system on the ground, remove any foreign material from the screen (bugs, dirt, etc.) and then place a suction source (mouth or vacuum) over the opening. Have a helper listen inside the cabin for the stall warning tone. If no tone is observed, remove the reed bell housing from the air line and check to make sure the line is not blocked or kinked. If air flows freely through the line, then the reed should be replaced.

If the stall warning operates on the ground but fails to operate in the air, the airflow divider plate needs to be calibrated. See Paragraph 10-3.6 for calibration instructions.

10-3.4 Repair

Repair of the stall horn is limited to cleaning of the screen, calibrating the divider plate as detailed above, or replacement of the affected part(s).

10-3.5 Reinstallation

To reinstall or replace the reed bell housing:

1. Attach the reed bell housing firmly to the air line using safety wire and superglue. The reed bell housing is simply tucked under the support for the door post cover. Reinstall the door post cover.

To reinstall or replace the aluminum funnel:

1. Attach the aluminum funnel to the air line in the same manner as the reed bell housing. Make sure there is enough extra air line to provide easy access to either end, but not so much that it will kink inside the wing.
2. Prepare the area of the funnel that will contact the wing skin. A new funnel should be scuffed for proper adhesion to the epoxy. Clean up a reused funnel so that it fits nicely within the hole in the wing skin. Recess the surface of the funnel enough that the screen can be laid over the top of it and be flush with the outer surface of the wing skin.
3. When satisfied with the fit, attach the funnel securely to the wing skin using 5-minute epoxy.

To reinstall or replace the air line:

1. Remove the both the reed bell end and the aluminum funnel from the air line, but DO NOT pull the line out of the wing.
2. Thread a long, flexible piece of cord or wire through the air line so that it extends out of both ends of the line.
3. Firmly attach one end of the cord to the new air line. Carefully pull the cord and old line out, threading the new line through the wing.

To reinstall the screen and divider plate:

1. Clean up the edges of the hole and slot for the divider plate as necessary. Mix a batch of 5-minute epoxy and glue screen and divider plate in place, taking care to keep all glue and debris out of the aluminum funnel. The divider plate should protrude out of the leading edge approximately 1/2” and a 30° angle down from the chord line of the wing.

2. After the epoxy cures, touch up the edges of the screen as necessary with body filler and paint. Keep the screen clear of dust and paint.

10-3.6 Calibration of Stall Horn

The default angle of the plate is 30° down from the wing chord line. Bending the divider plate upward will make the stall horn sound at a faster airspeed/lower angle of attack. Bending it downward will make it sound at a slower airspeed/higher angle of attack.

1. Fly the aircraft to a safe altitude and enter slow flight. Note the speed at which the stall horn sounds.

2. Bend the plate up or down as necessary to adjust the warning speed/angle of attack.

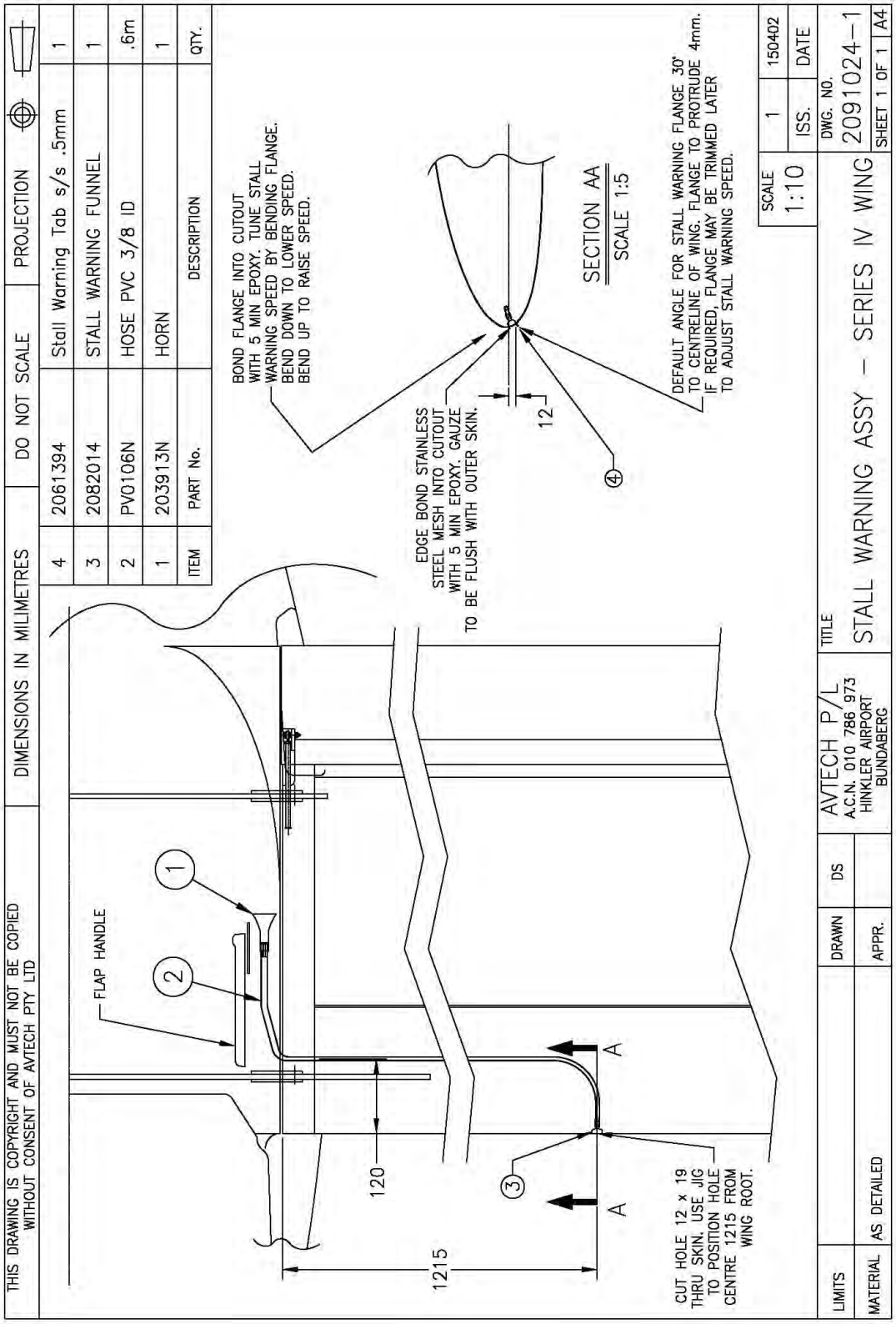

Figure 10-1: Stall Warning System

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Section 11: Electrical System and Instruments

11-1 General Description

The electrical system of the aircraft is supplied by an alternator that is built into the flywheel of the engine. A voltage regulator converts AC from the alternator to 14 volt DC current which is then routed from the regulator/rectifier to the battery.

Aircraft electrical power is conducted to the master switch-breaker and then to the main and instrument buses. Switch-breakers and circuit breakers feed and circuit-protect the electrical appliances in the aircraft.

Electrical circuit diagrams are provided for the three available Grand Rapids panel layouts and other standard and optional electrical devices in this section. Contact Jabiru USA Sport Aircraft, LLC for wiring and electrical information for the Garmin G3X panel option.

Consult the *Engine Instruction & Maintenance Manual for Jabiru 3300 Aircraft Engine* for guidance on removal, inspection, and reinstallation of the electrical generating system.

11-2 Alternator

11-2.1 Description

Electrical power is generated by a 20-amp permanent magnet alternator that is integral to the flywheel. AC current is rectified to DC current and is regulated to 14 volt DC by a solid state regulator mounted on the firewall.

11-2.2 Removal, Inspection, Repair and Reinstallation

Refer to the *Instruction and Maintenance Manual for Jabiru 3300 Aircraft Engine* for information on removal, inspection, repair and reinstallation of the alternator, voltage regulator, and their components.

11-3 Battery

11-3.1 Description

The Odyssey PC625 battery is a 12-volt drycell which is mounted on the firewall.

11-3.2 Removal

Tools Required	10mm wrench or socket
Parts required	None
Level of Maintenance	Line
Level of Certification Required	Owner, A&P or LSA R/M-M

1. Remove battery ground cable and undo strap buckle.
2. Disconnect the battery positive cable.
3. Remove the battery strap.
4. Remove the battery.

11-3.3 Inspection and Repair

Jabiru USA recommends replacing the battery every two years.

The battery is a dry-cell battery, therefore, repair is limited to replacement.

NOTE: If battery is drained completely down (left master on), its ability to hold a full charge may be compromised. Perform the following procedure:

1. Place battery on trickle charge for minimum of one hour.
2. Start aircraft engine. Jump start if necessary.
3. Fly aircraft at cruise power for one hour while operating the minimum electrical equipment required for safe flight. Alternator must run at cruise RPM for proper charge. GROUND RUNNING WILL NOT CHARGE BATTERY.
4. If voltage is not up to normal level after flight, battery may need to be replaced.

11-3.4 Reinstallation

Reverse the steps in 11-3.2 for reinstallation.

11-3.5 Trickle Charger Plug

Newer J250 and J230 aircraft (beginning in 2008) are equipped with a trickle-charger lead accessible through the oil access door in the upper engine cowling. Use the Battery Tender Junior, which is delivered with each new aircraft equipped with the charging lead and available from Aircraft Spruce & Specialty (p/n 11-05164).

11-4 Switches and Breakers

11-4.1 Description

Jabiru S-LSA aircraft utilize 5w toggle-type circuit breaker switches of different sizes. Circuit breakers are either of the flush type (pre-2009 models) or pull-type (2009 and newer).

11-4.2 Removal

Tools Required	1/2 deep-well socket or pliers, Phillips screwdriver
Parts required	None
Level of Maintenance	Heavy
Level of Certification Required	A&P or LSA R/M-M

1. Remove ground wire from aircraft battery.
2. Taking care not to scratch the face of the instrument panel, remove the nut on the front of the switch using the socket, or the thumb screw on the front of the breaker using a pliers.
3. Remove screw from bus bar.

4. Remove screw from accessory that the switch or breaker is attached to.

5. Depending on location along the bus bar, other switches may need to be removed to access the affected switch.

11-4.3 Repair

Repair of switches and breakers is limited to replacement.

11-4.4 Reinstallation

Reverse steps in 11-4.2 for reinstallation.

11-5 Starter

11-5.1 Description

The starter is a Nippon Denso electric motor which is activated with the ignition key and a solenoid. The starter is equipped with a standard Bendix which engages a gear with the teeth on the engine flywheel when activated.

11-5.2 Removal, Inspection, Repair and Reinstallation

Refer to the *Instruction and Maintenance Manual for Jabiru 3300 Aircraft Engine* for information on removal, inspection, repair and reinstallation of the starter.

11-6 Navigation Lights and Strobes

11-6.1 Description

Jabiru S-LSA aircraft are equipped with external navigation and strobe wingtip lighting. Each wingtip light unit consists of one red or green navigation light in the front, one white navigation light in the rear, and one strobe anti-collision light in the center. Aircraft built after May 2009 have either the GS Air unit or an AeroLEDs Pulsar unit.

11-6.2 Removal

Tools Required	10mm wrench, Phillips screwdriver, razor knife
Parts required	None
Level of Maintenance	Line
Level of Certification Required	Owner, A&P or LSA R/M-M

GS-Air

1. Remove ground cable from aircraft battery.

2. Remove the two screws from lens.

3. Cut silicone bead around lens.

4. Pull unit from wingtip and disconnect wires.

AeroLED

1. Remove ground cable from aircraft battery.
2. Loosen set screw at rear of light assembly.
3. Slide unit forward on its mounting track. Light tapping on the set screw may be required.
4. Remove unit from wing and disconnect wires.

11-6.3 Repair

Repair of wingtip lighting is limited to replacement of the unit.

11-6.4 Reinstallation

Tools Required	Phillips screwdriver, RTV silicone
Parts required	None
Level of Maintenance	Line
Level of Certification Required	Owner, A&P or LSA R/M-M

GS-Air

1. Connect wires.
2. Reinstall ground on battery and test light for proper color and operation.
3. Apply a small bead of silicone around the edge of the light unit to form a gasket between the unit and the wingtip.
4. Press the unit into place. Reinstall the two screws to hold it in position.
5. Clean up excess silicone.

AeroLEDs

1. Connect wires.
2. Reinstall ground on battery and test light for proper color and operation.
3. Slide light unit onto mount, making sure O-ring is in place. It may help to apply a small bead of superglue to keep the O-ring in place.
4. Tighten set screw.

11-7 Recognition/Landing Light

11-7.1 Description

The strut-mounted recognition light contains one 50W incandescent bulb. Aircraft built after May 2009 had the option of an AeroLED MicroSun LED landing light mounted in the leading edge of one or both wingtips.

11-7.2 Removal

Tools Required	Phillips screwdriver
Parts required	None
Level of Maintenance	Line
Level of Certification Required	Owner, A&P or LSA R/M-M

Strut-Mounted Recognition Light

1. Disconnect ground wire from aircraft battery.
2. Remove 2 screws from sides of aluminum collar.
3. Slide collar off.
4. Remove and disconnect light bulb.

Strut-Mounted Recognition Light Housing

1. Disconnect ground wire from aircraft battery.
2. Remove #8 screw and nut from rear of housing.
3. Slide housing off wing strut.

AeroLED Landing Light

1. Disconnect ground wire from aircraft battery.
2. Remove 6 screws from clear Lexan lens.
3. Remove 4 mounting screws from LED unit.
4. Slide LED unit out.
5. Disconnect wires.

11-7.3 Repair

Repair of landing and recognition light is limited to replacement of components.

11-7.4 Reinstallation

Reverse steps in 11-7.2 for reinstallation.

11-8 Pitot/Static System

11-8.1 Description

The pitot/static system provides ram-air and ambient air pressure for the Air Data Computer within the EFIS, the backup airspeed indicator and autopilot if installed.

The static vent is located on a probe mounted into the leading edge of the vertical stabilizer. One hole is drilled on each side of the probe, just behind an aluminum bullet. The bullet protects the static port from the relative wind and must be present for the static port to function. The static line is safety-wired and glued to the back of the probe and runs down through the vertical fin, through the fiberglass tunnel on the inside of the lower fuselage skin, through the center console and into the instrument panel. A splice is built into the line just below the vertical stabilizer. If necessary, the static line may be drained of water by disconnecting it from the splice under the instrument panel and blowing through it with compressed air.

The pitot tube is mounted to the right wing strut. The forward portion of the tube is mounted on flexible tubing to prevent damage to the tube and injury to people who bump into it. The aft portion of the tube is welded to a bracket that is pop-riveted to the wing strut. The pitot line runs through the lower half of the strut, into the belly of the fuselage in front of the main gear legs, up through the center console and into the instrument panel. The line is concealed by the lower wing strut fairing.

11-8.2 Removal and Repair

Tools Required	3/16” drill, wire cutter, safety wire pliers
Parts required	Superglue, .032 safety wire
Level of Maintenance	Heavy
Level of Certification Required	A&P or LSA R/M-M

The static probe is bonded permanently to the vertical stabilizer. Contact Jabiru USA Sport Aircraft, LLC for instructions on removal or repair of the static probe and line within the vertical stabilizer structure. Repair of pitot/static lines and probes is limited to replacement.

If replacing pitot or static lines, attach string to one end of the old line prior to removal to aid in re-threading the new lines. The forward portion of the pitot tube may be removed from the strut by pulling it from hose that connects it to the aft portion. To remove the aft portion:

1. Drill out the 3/16” pop rivets that hold the bracket in place.
2. Remove the bracket.
3. If preserving the pitot line, tape it to the outside of the strut so it will not fall back inside. Clip the safety wire that holds the pitot line to the probe.

11-8.3 Reinstallation

Reverse the steps in Paragraph 11-7.2 for reinstallation of pitot/static lines. Superglue and safety wire must be used on all connections to steel tubes.

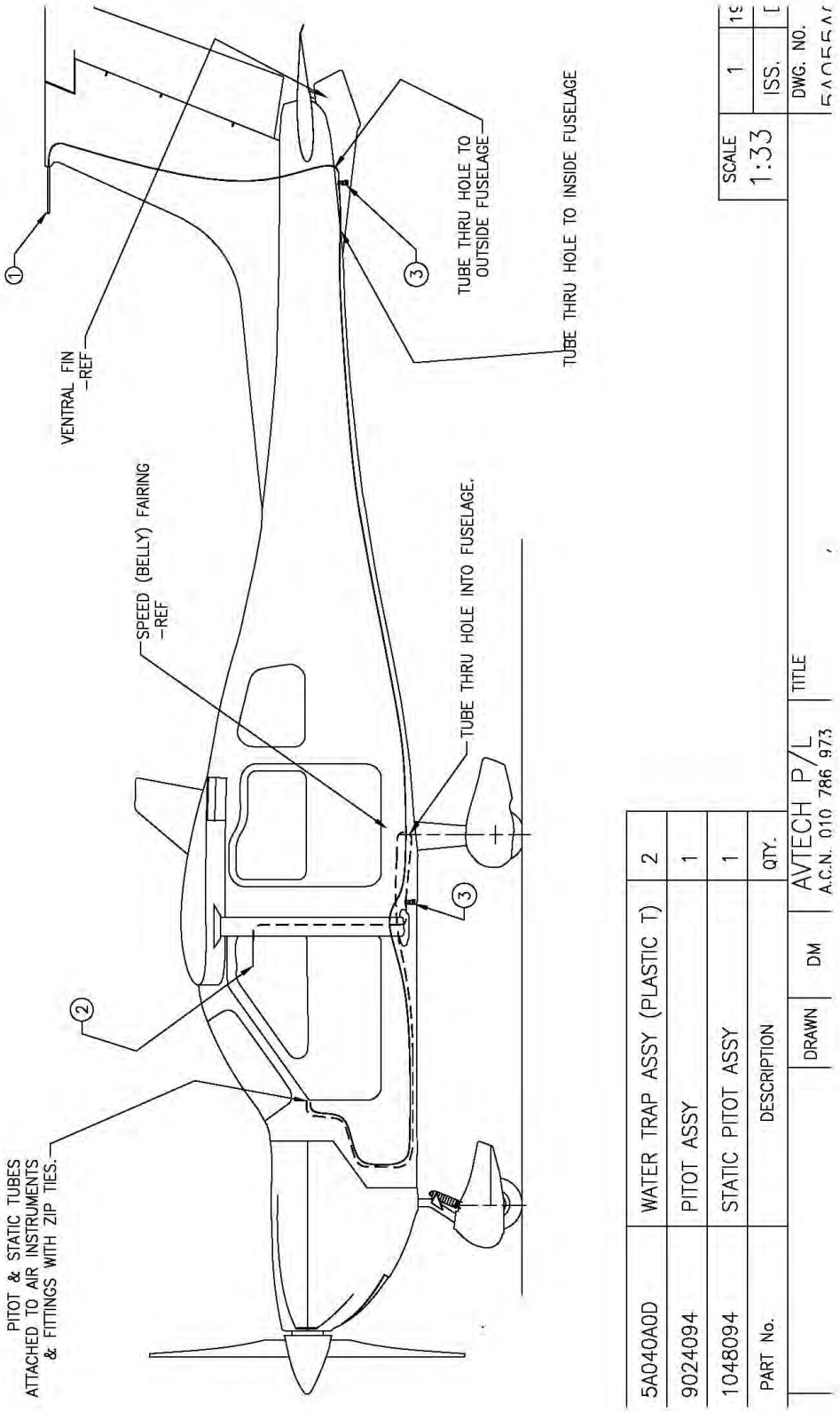

Figure 11-1: Pitot-Static System

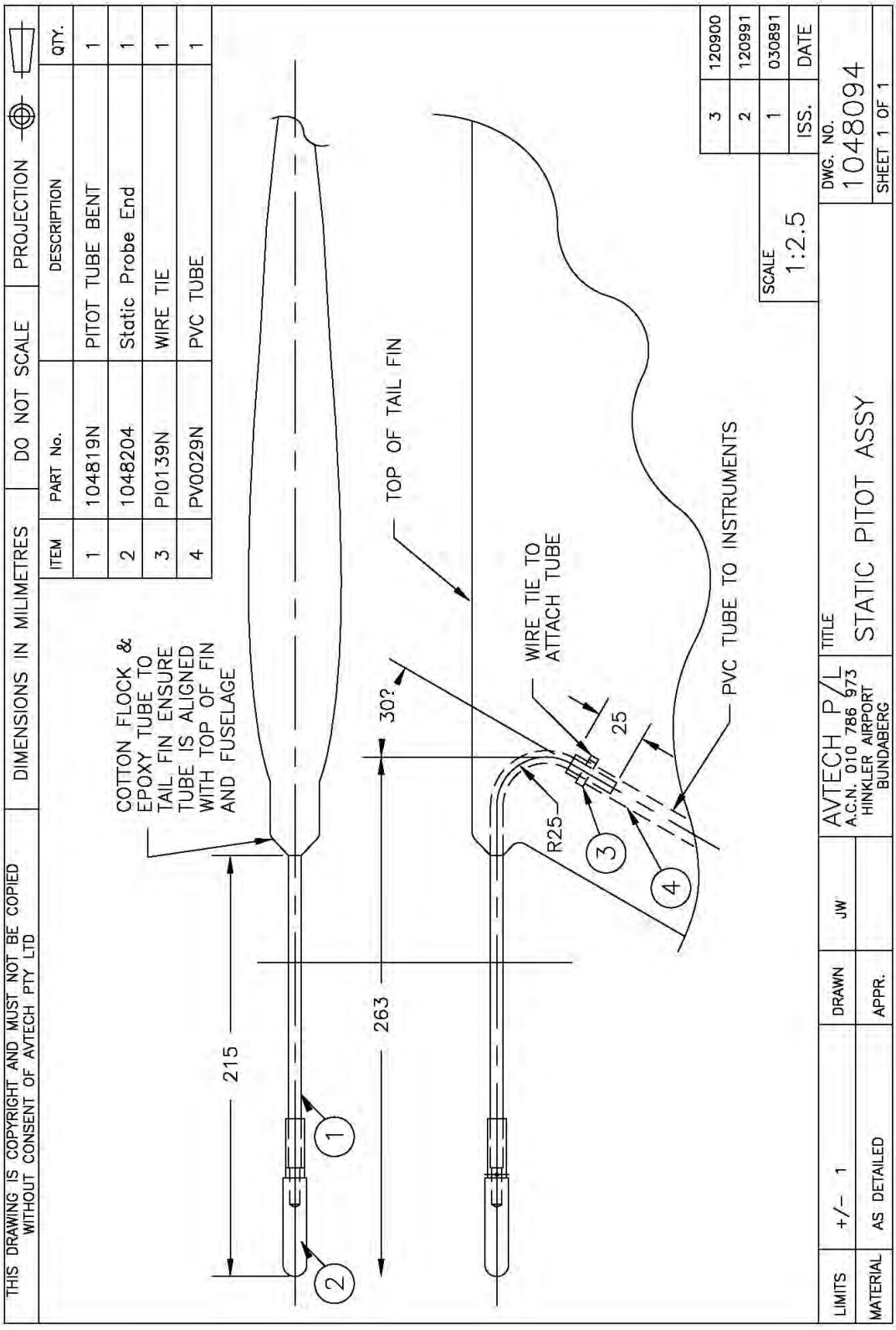

Figure 11-2: Static Vent Detail

11-9 Engine Information System (EIS)

11-9.1 Description

The Grand Rapids Technologies Engine Information System (EIS) Model 6000J is used to monitor all engine parameters. The instrument monitors RPM, OAT, CHT (6), EGT (6), Oil Pressure, Oil Temp, Voltmeter, Flight Timer, and Hobbs Meter. High and low limits are programmed into the unit for all measurable parameters. A warning light and the EIS screen flashes to highlight information sets that are outside of programmed limits.

11-9.2 Removal

Tools Required	9/64 Allen key, screwdriver set
Parts required	None
Level of Maintenance	Line
Level of Certification Required	A&P, LSA R/M-M, or Avionics Repair Station

1. Remove the four screws at the corners of the unit.
2. Pull the unit from the panel and disconnect the D-sub connectors from the rear of the unit.

11-9.3 Inspection and Repair

Inspection is limited to checking the cables and D-sub connectors for damage or bad pins. Any other repair must be done by Grand Rapids Technologies at their facility.

11-9.4 Reinstallation

1. Reverse steps in 11-9.2 for reinstallation.
2. Run engine and check EIS unit for proper operation.

11-9.5 Reprogramming Instructions

1. If default settings in the EIS become corrupted and reprogramming is necessary, contact Jabiru USA Sport Aircraft, LLC for further instructions.

11-10 Electronic Flight Information System (EFIS)

11-10.1 Description

The Jabiru S-LSA instrument panel features a Grand Rapids Technologies Sport EFIS unit for primary flight instrumentation and navigation. The three panel options include: a four-pack of traditional round-dial instruments; one EFIS on the left side only; or two EFIS units, where one is a primary flight display (PFD) and one is a multi-function display (MFD).

Single EFIS units are plumbed to the pitot/static lines and a GPS antenna in addition to the 37-pin D-sub connector. In aircraft equipped with a second EFIS as a multi-function display, the pitot/static lines run to the PFD, while the GPS is part of the MFD.

For detailed EFIS installation and user manuals, refer to the Grand Rapids Technologies website and contact information found in the Appendix of this manual.

11-10.2 Removal

Tools Required	9/64 Allen key, screwdriver set, knife, heat gun (for reinstallation)
Parts required	None
Level of Maintenance	Line
Level of Certification Required	Owner, A&P, LSA R/M-M, or Avionics Repair Station

1. Remove the four screws at the corners of the unit.
2. Pull the unit from the panel and disconnect the D-sub connectors from the rear of the unit.
3. If the unit is a primary flight display, disconnect pitot/static lines. (If lines cannot be pulled, cut them just behind the fitting.) If slave (multi-function display) unit, disconnect GPS antenna.

11-10.3 Inspection and Repair

Inspection is limited to checking the cables and D-sub connectors for damage or bad pins and checking/upgrading software. See 11-10.5 for software upgrade instructions. All repairs must be done by Grand Rapids Technologies at their facility.

11-10.4 Reinstallation

1. Cut away any remaining pitot/static line material from the fittings at the back of the unit. Heat the end of the pitot line until it is soft, then press it onto the fitting. Repeat process for the static line.
2. Reconnect D-sub connector.
3. Reconnect GPS antenna if necessary.
4. Power up unit and check for proper operation. The magnetometer may need to be recalibrated and certain parameters may have to be reset. Consult the GRT Sport installation manual for guidance.

11-10.5 Grand Rapids Software & Database Upgrade

Tools Required	Computer with USB port and Internet access, USB flash drive with at least 256MB
Parts required	None
Level of Maintenance	Line
Level of Certification Required	Owner, A&P, LSA R/M-M, or Avionics Repair Station

Note: For Garmin G3X updates, see www.garmin.com for subscription information.

1. If not already known, determine unit model, EFIS software version, and navigation database date by turning on the MASTER and INST switches and waiting for the unit to power-up. The Power-Up page in Figure 11-3 will display on the PFD and MFD screen if installed. Write down any information needed from both screens and shut off master switch.

2. Insert USB stick into computer. Go to www.grtavionics.com, click Support, then Software. Click the link to load the software appropriate to the EFIS in the aircraft. It will be either the SWS (older version, wide-screen), SHS (most J230s, later J250s— taller high-res screen) or SX (2010 and newer J230s). Save the .dat file to the main root directory of the USB drive (not in a separate folder).

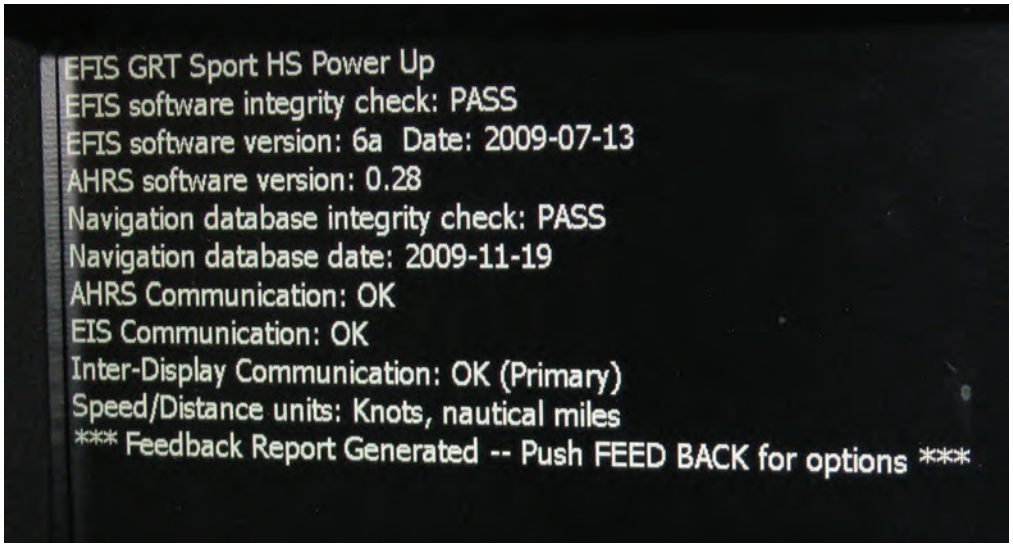

Figure 11-3: GRT Sport HS EFIS unit power-up page

3. Save the newest Navigation Database (NAV.DB) file to the main root directory of the USB drive.

4. Power up the EFIS units by turning on the MASTER and INST switches. Accept the power-up screen.

5. On the PFD or MFD default screen, press the NEXT soft key until SET MENU appears over one of the soft keys. Press that key.

6. Turn the right knob to move the cursor over Display Unit Maintenance, then press the knob to activate.

7. Use the right knob to move the cursor over Load EFIS Software and press the knob to activate.

8. Rotate the same knob clockwise to activate the EFIS upgrade page.

9. Insert the USB drive into the USB port in the back of the unit on the upper co-pilot's side corner. The back of the unit is accessible through the access opening in the bottom of the instrument panel.

10. Wait for the EFIS to detect the USB drive and download the files. The EFIS may take up to one minute to detect the USB drive. The light on the USB drive should blink faster when detected and when data is being copied. The light will blink slower when the operation is complete.

11. When the EFIS has completed copying files from the USB drive, the display unit will reboot. After reboot, verify the power-up page displays the new EFIS software version.

12. Repeat for the MFD OR load navigation database into the PFD as described below.

Update Navigation Database

1. Repeat steps 4-6 above.

2. Use the right knob to move the cursor over Load Navigation Database and press the knob to activate.

3. Wait for the EFIS to detect the USB drive and download the files. The EFIS may take up to one minute to detect the USB drive. The light on the USB drive should blink faster when detected and when data is being copied. The light will blink slower when the operation is complete.

4. When the EFIS has completed copying files from the USB drive, the display unit will reboot. After reboot, verify the power-up page displays the new EFIS software version.

5. Repeat software and/or nav database update for the MFD, if installed.

Add Map Features (Roads, Lakes, State Lines, etc.)

1. Load each of the map features database files onto your USB drive. Install drive in back of EFIS unit as described above.

2. In the SET MENU, Display Unit Maintenance, scroll to Load Navigation Database and select the additional database files from the list. You can load all the map features files as a batch. Push LOAD to start copying the database into the display unit. The display will reboot when the database has finished copying.

3. After loading all the map features files, go to the Moving Map page in the Set Menu. Scroll down to the heading for the database that you want to display. Select it and change to Show On All Maps. (The default setting will show them on the North-UP screen only.) Repeat for other EFIS if desired.

11-10.6 Magnetometer

11-10.6.1 Description

The Grand Rapids Sport and Garmin G3X systems utilize an external magnetometer to sense information about aircraft heading. This information enables the Attitude Heading and Reference System (AHRS) to determine aircraft attitude and other data. The mounting angle of the magnetometer unit and position within the aircraft are critical to the functionality of the unit. It is mounted to a fiberglass pad on the co-pilot's side of the fuselage behind the baggage bulkhead.

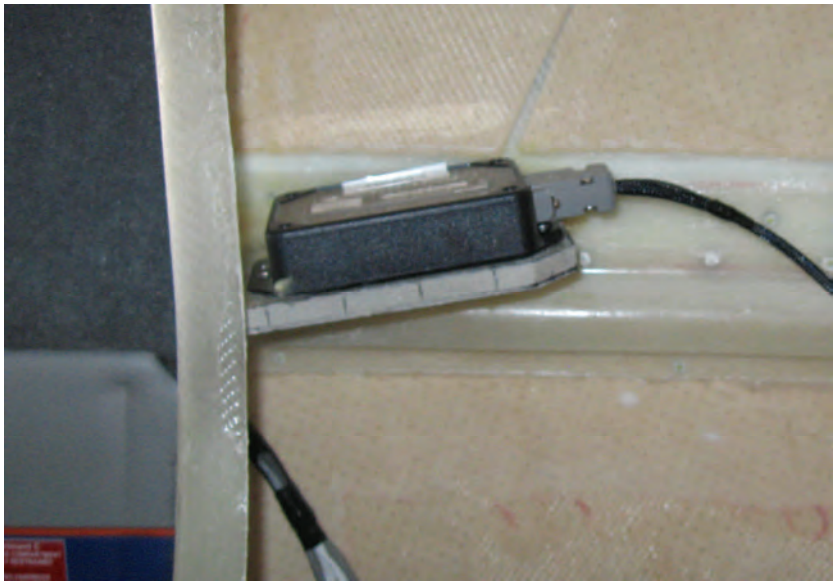

Figure 11-4: Magnetometer Location

11-10.6.2 Removal

Tools Required	Screwdriver set,
Parts required	None
Level of Maintenance	Line
Level of Certification Required	A&P, LSA R/M-M, or Avionics Repair Station

1. Loosen clamp screws of D-sub connector and remove from unit.
2. Remove two mounting screws and remove unit from mount.

11-10.6.3 Repair

Magnetometer must be returned to Grand Rapids Technologies or Garmin, as appropriate, for repair or replacement.

Do not alter mounting pad. If repair of mount becomes necessary, contact Jabiru USA Sport Aircraft, LLC for specific instructions.

11-10.6.4 Reinstallation

Reverse the steps in 11-10.6.2 for reinstallation.

11-10.7 GPS Antenna

11-10.7.1 Description

The GPS antenna may be located above the co-pilot's door or under the instrument panel. It plugs into the rear of the EFIS (MFD, if in a dual-EFIS panel) with a simple push-type connection.

Figure 11-5: GPS Antenna head, over-door location. Door post cover peeled back for clarity.

11-10.7.2 Removal

Tools Required	Small wire cutter
Parts required	None
Level of Maintenance	Line
Level of Certification Required	A&P, LSA R/M-M, or Avionics Repair Station

1. Locate GPS antenna head. Most will be located above the co-pilot's door, Velcroed to the upholstery as shown in Figure 11-5.
2. Gently remove the door post panel cover if necessary (either Velcro, as shown, or small truss-head screws) and fish the antenna down toward the floor.
3. Locate antenna cable. Over-door installations require cable to run alongside the snake-skin wire bundle which is tied underneath the co-pilot doorsill. Clip zip ties as necessary.
4. Follow wire up behind EFIS unit. Pull connecter gently straight back out of unit.
5. Remove antenna from aircraft.

11-10.7.3 Inspection

Inspect wire and connector for condition.

11-10.7.4 Repair

Unit must be sent to Grand Rapids Technologies for repair or replacement.

11-10.7.5 Reinstallation

Reverse steps in 11-10.7.2 for reinstallation. Replace zip ties as necessary.

11-10.8 WxWorx XM Weather Module

11-10.8.1 Description

EFIS-equipped aircraft have the option of a WxWorx XM Weather module that can show radar, METARs, TAFs, etc. on the EFIS screens depending on subscription level.

NOTE: See Section 11-11 for more information on radio static caused by the WxWorx module.

11-10.8.2 Removal

Tools Required	Tail stand, screwdriver set
Parts required	None
Level of Maintenance	Line
Level of Certification Required	Owner, A&P, LSA R/M-M, or Avionics Repair Station

The weather module is located on the back of the pilot's seat or behind the baggage compartment on the floor.

1. Brace the tail of the aircraft with a tail stand or padded sawhorse to allow entry of personnel into the baggage compartment.
2. Remove the screws from the mounts.
3. Disconnect the power wire from the unit.
4. Disconnect the 9-pin connector.

11-10.8.3 Inspection

Inspect the wires and connections.

11-10.8.4 Repair

Any unit repairs should be referred to Grand Rapids Technologies. See Appendix for vendor information.

11-10.8.5 Reinstallation

Reverse steps in Paragraph 11-10.8.2 for reinstallation.

11-11 Garmin Nav/Com Radio

11-11.1 Description

Each Jabiru S-LSA aircraft is equipped with one Garmin communications radio, either an SL-40 (com only) or SL-30 with built-in VOR navigation capability.

The radio antenna is attached to the aft face of the vertical stabilizer spar. See Section 11-11.6 for information on the antenna.

For specific technical information about the radios, refer to the Garmin website or contact information located in the Appendix of this manual.

NOTE: The WxWorx XM weather module may cause random, intermittent radio static on isolated frequencies in the SL30 or SL40. To troubleshoot, pull the WX circuit breaker or disconnect power from the WxWorx module, and see if the static disappears. A WxWorx hardware upgrade is available to fix this problem. Contact Grand Rapids Technologies for more information.

11-11.2 Removal

Tools Required	7/64 Allen key, screwdriver set
Parts required	None
Level of Maintenance	Line
Level of Certification Required	A&P, LSA R/M-M, or Avionics Repair Station

1. Using the 7/64 Allen key, loosen the retaining screw through the radio face.
2. Turn counterclockwise until it stops.
3. Pull radio from tray.

11-11.3 Inspection

1. Check pin connections at rear of radio for damage.
2. Inspect tray for bent pins or loose connections.
3. Inspect antenna coax for damage.

11-11.4 Repair

1. Repair of bent pins can be made by standard radio repair procedures.
2. Repair of the radio itself is limited to sending the radio to an approved repair center.

11-11.5 Reinstallation

Reverse steps in Paragraph 11-11.2 for reinstallation.

11-11.6 Radio Antenna Balance Balun Installation

Some Jabiru aircraft exhibit pitch changes when the autopilot is engaged and the push-to-talk switch is pressed. The manufacturer of the autopilot has determined this is due to interference from the communications radio antenna.

Jabiru USA now installs ferrite baluns onto each aircraft's radio antenna to protect the avionics from radio interference. This paragraph outlines the balun installation procedure.

Tools Required	Electrical pliers, screwdriver set, heat gun, tools required for rudder removal (Section 6-7)
Parts required	20 ferrite single-hole baluns, 1 double-hole ferrite balun, 2 ring terminals, 14" of 1/2" dia. heat shrink tubing
Level of Maintenance	Heavy
Level of Certification Required	A&P, LSA R/M-M, or Avionics Repair Station

1. Refer to Figure 11-6 for more information.
2. Remove the rudder as outlined in Section 6-7.
3. Disconnect the antenna ground from the bottom of the antenna.
4. Disconnect the antenna center conductor from the top of the antenna.
5. Pull the antenna cable out of the vertical stabilizer about 18". Cut the frayed end of the antenna cable off.
6. Slide the single-hole baluns onto the cable. Be sure they do not slide into the vertical stabilizer.
7. Slide the large heat shrink over the baluns.
8. Carefully strip the end of the antenna cable to expose the shield and the center conductor. DO NOT remove the clear plastic from the center conductor.
9. Install the two-hole balun on the center conductor.
10. Install the ring terminal on the center conductor as close to the two-hole balun as possible.
11. Slide the single-hole baluns and heat shrink up next to the two-hole balun. Heat the heat shrink to secure the string of baluns as shown in Figure 11-6.
12. Install the ring terminal on the shield wires.
13. Reinstall the ring terminals onto the antenna.
14. Reinstall the rudder and control cable as outlined in Section 6-7.

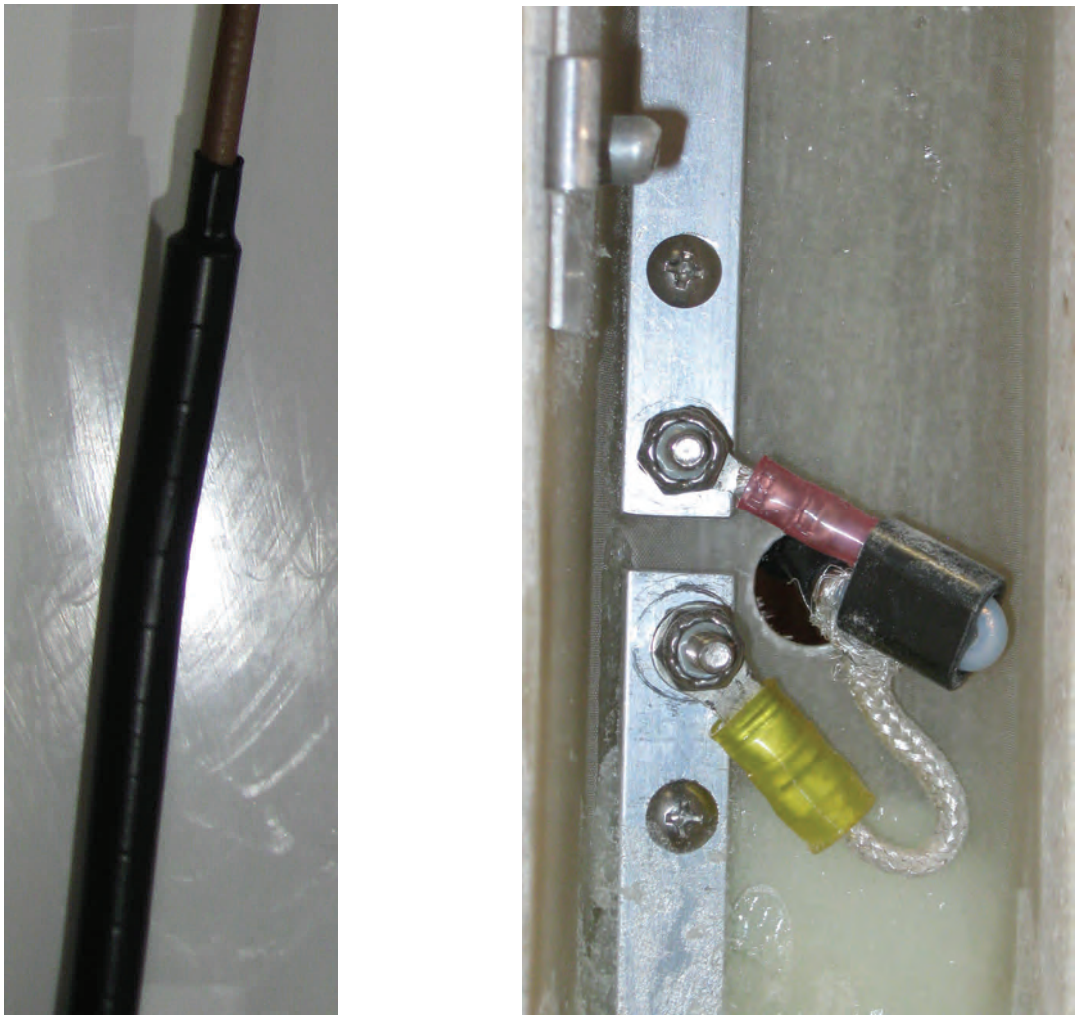

Figure 11-6: Ferrite baluns sealed onto antenna cable with heat-shrink tubing (left) and finished antenna wiring showing double-holed balun (right).

11-12 Garmin Transponder

11-12.1 Description

Both Garmin transponder options, the GTX327 and GTX330, are capable of Mode C altitude encoding. The GTX330 is also capable of Mode S communication, which enables traffic information to be displayed on the EFIS within airspace supported by Traffic Information Service (TIS).

Transponders in aircraft equipped with at least one GRT EFIS get their altitude information from the EFIS and do not need a separate altitude encoder for the transponder. If the aircraft is not equipped with a GRT EFIS or GDU 375, the encoder box is located under the panel and is plumbed into the aircraft's static system.

11-12.2 Removal

Tools Required	7/64 Allen key
Parts required	None
Level of Maintenance	Line
Level of Certification Required	A&P, LSA R/M-M, or Avionics Repair Station

1. Using the 7/64 Allen key, loosen the retaining screw through the transponder face.
2. Turn counterclockwise until screw stops turning.
3. Pull transponder from tray.

11-12.3 Inspection

1. Check pin connections at rear of transponder for damage.
2. Inspect tray for bent pins or loose connections.
3. Inspect antenna coax for damage.
4. The transponder must be tested as required by FAR 91.413.

11-12.4 Repair

1. Repair of bent pins can be made by standard radio repair procedures.
2. Repair of the transponder itself is limited to sending it to an approved repair center.

11-12.5 Reinstallation

Reverse the steps in Paragraph 11-12.2 for reinstallation.

11-13 Emergency Locator Transmitter

11-13.1 Description

All Jabiru S-LSA aircraft are equipped with an Emergency Locator Transmitter. The unit is located on the floor of the fuselage behind the baggage area. A remote switch is located in the instrument panel for testing the unit.

Aircraft built prior to 2009 are equipped with an AmeriKing AK-450 VHF radio-based ELT. Aircraft built in 2009 and newer are equipped with a Kannad AF-Compact 406 MHz satellite-based ELT.

11-13.2 Removal

Tools Required	7/64 Allen key, screwdriver set
Parts required	None
Level of Maintenance	Line
Level of Certification Required	A&P, LSA R/M-M, or Avionics Repair Station

1. Turn off the ELT.
2. Disconnect remote cable.
3. Disconnect antenna coax cable.
4. Loosen hold-down clamp or undo the Velcro strap, as appropriate.
5. Remove unit.

11-13.3 Inspection

1. Both models of ELT must be inspected according to FAR 91.207(d).
2. For inspection of Kannad 406 AF-Compact, refer to Installation/Operation Manual for Kannad 406 AF-Compact, DOC06006E. Initial battery replacement timeline is found in the aircraft logbook and documents provided with the ELT.
3. DO NOT shock-test Kannad ELT.

11-13.4 Repair

1. Cable connections can be replaced with standard radio connection procedures.
2. Repair of batteries is limited to replacement.
3. Further repairs of ELT unit must be referred to ELT manufacturer.

11-13.5 Reinstallation

Reverse steps of Paragraph 11-13.2 for reinstallation.

11-14 PS Engineering PM1000II or PM3000 Intercom

11-14.1 Description

The PM1000II is a four-place mono intercom. The PM3000 is a stereo intercom used in aircraft equipped with a Garmin MFD.

11-14.2 Removal

Tools Required	Small Phillips screwdriver
Parts required	None
Level of Maintenance	Line
Level of Certification Required	A&P, LSA R/M-M, or Avionics Repair Station

1. Ensure the master switch is off.
2. Remove the pilot and copilot knobs by gently pulling them.
3. Remove the two small mounting screws from the front of the unit.
4. Disconnect the 25-pin D sub plug from the rear of the unit.

11-14.3 Inspection

Inspection is limited to the pins and wiring.

11-14.4 Repair

Repairs to the intercom must be referred to PS Engineering.

11-14.5 Reinstallation

Reverse the steps in Paragraph 11-14.2 for reinstallation.

11-15 TruTrak DigiFlight IIG Autopilot

11-15.1 Description

The DigiFlight IIG autopilot is a two-axis autopilot with an altitude hold, heading hold, and GPS steering capabilities.

The pitch servo is mounted behind the baggage bulkhead on the pilot's side floor. It is attached to the elevator through the use of a captured cable system. NOTE: Most aircraft have the pitch control cable installed at the factory regardless of whether the aircraft is ordered with an autopilot. This makes retrofit of a new autopilot much easier. For retrofit instructions, please contact Jabiru USA Sport Aircraft, LLC.

In airplanes with the new-style center console (generally 2008 and newer), the aileron servo is mounted to the plate between the seats used to anchor the aileron cables and is connected to the aileron system via a control rod directly to the aileron mixer at the rear of the control stick. In aircraft with the old-style center console, the roll servo was mounted on the floor behind the passenger seat, and connected to the aileron mixer using a push-pull rod.

Figure 11-7: Autopilot servos. Pitch servo installation, all years (top left). New style roll servo viewed from front, between seats (top right). New style roll servo installation from rear (bottom right). Old style roll servo installation (bottom left).

11-15.2 Removal

Programmer (Autopilot Head)

1. Disconnect battery ground.
2. Remove the four mounting screws.
3. Disconnect the pitot and static lines at the rear of the unit.
4. Disconnect the 25-pin sub d plug from the rear of the unit.

Roll servo

1. Disconnect battery ground.
2. Remove the control rod from the servo and aileron mixer.
3. Disconnect the 15-pin sub d plug from the rear of the servo.
4. Remove the servo mounting bolts.

Pitch servo

1. Disconnect battery ground.
2. Support the tail of the aircraft with a tail stand to allow entry into tail of aircraft.
3. Loosen the jam nut on the control cable.
4. Remove the screw at the center of the torque arm and remove the arm.
5. Remove the four nuts from the servo mount base and lift the servo.
6. Remove the 15-pin sub d plug from the servo.

11-15.3 Inspection

1. Inspect pins and wiring.
2. Inspect servo mounts and brackets for cracking or looseness.
3. Inspect servo arms for condition.

11-15.4 Repair

Refer to TruTrack Flight Systems for any repairs to the programmer or servos.

11-15.5 Reinstallation

1. Reverse applicable steps in Section 11-15.2 for reinstallation of components.
2. When installing the torque arm on the roll servo, use Loctite 242 on the mounting screw.

11-16 External Power Booster Cable

11-16.1 Description

An External Power booster cable comes standard with new J250 and J230 aircraft. It enables the operator to use an external battery to start the engine without removing the cowlings. The following describes the installation procedure for retro-fit kits available through Jabiru USA Sport Aircraft, LLC for aircraft built before the plug became standard.

11-16.2 Installation

Tools Required	Ruler, marker, 3/16” drill, 3/8 and 10mm wrenches
Parts required	Booster plug kit, part no. JU-46
Level of Maintenance	Line
Level of Certification Required	A&P, LSA R/M-M, or Avionics Repair Station

1. Remove upper and lower engine cowlings.
2. Make sure receptacle mounting area (see Figure 11-6) is free of grease and dirt.
3. The receptacle must be mounted slightly off-center so the bolts clear the rudder pedal assembly inside the cabin. To find the proper location for the receptacle:
    A. Using a ruler, make a mark in the center of the recessed area under the passenger side of the firewall.
    B. From the center mark, measure 1” toward the pilot’s side of the aircraft and make another mark.
    C. Draw a line from that mark aft 3 or 4” and parallel to the centerline of the aircraft.
4. Hold the receptacle in place centered on the line with its flat side against the fuselage skin, and its forward edge about 1 1/4” inches aft of the lower edge of the firewall. The exact placement is not critical, but the receptacle should sit as flat as possible on the surface of the fuselage and be far enough forward that the bolts are accessible from behind the rudder pedal assembly. (See Figure 11-6.).
5. Carefully drill through one of the bolt holes in the receptacle into the bottom skin of the fuselage—be prepared to stop the drill as soon as it breaks through so that it does not tear up the interior carpet. Place one bolt through the hole, square the receptacle into final position, and drill the second hole.

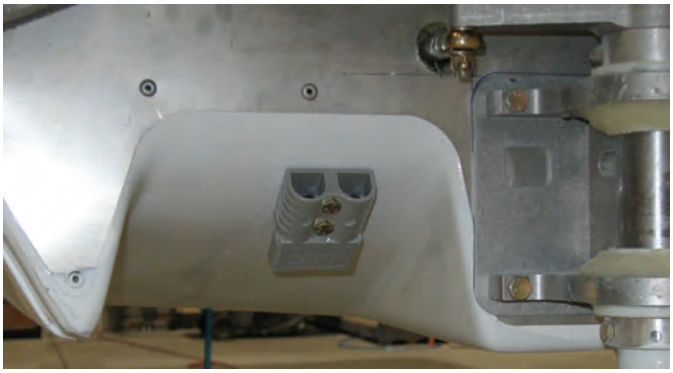

Figure 11-8: Booster Receptacle Position

6. Attach the nuts to the bolts inside the cabin, under the rudder pedal assembly.

7. Plug the lower portion of each cable into the receptacle. Black goes to the negative (-) terminal and red goes to the positive (+) terminal.

8. Ensure Master switch is OFF. Using the 10mm wrench, disconnect the aircraft ground cable (black) from the battery, followed by the power cable (red). Install the red jumper cable end to the positive terminal of the battery, followed by the power cable and nut. Last, install the black jumper cable end to the negative terminal of the battery, followed by the aircraft ground cable and nut.

9. Make sure the cables do not contact any part of the exhaust system. Tie the two jumper cables together using zip ties or other acceptable wire-tie method to finish up the installation.

10. Reinstall the cowls.

11-16.3 Removal

Reverse steps in 11-16.2 for removal.

11-16.4 Repair

Repair is limited to replacement of components.

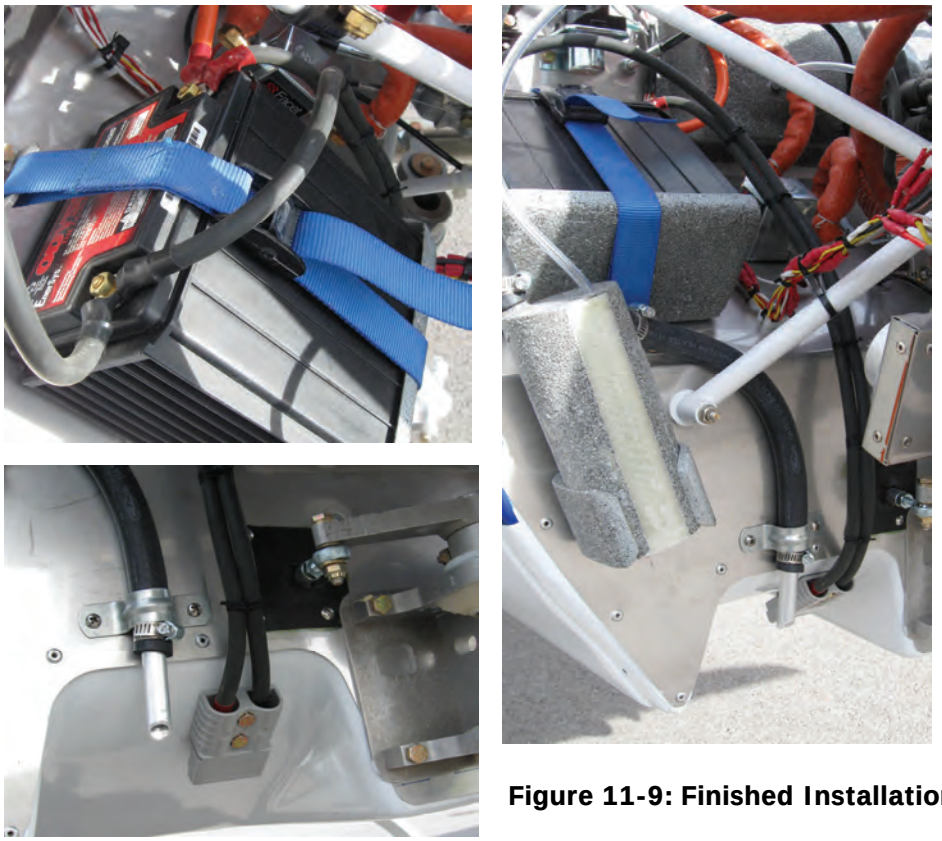

Figure 11-9: Finished Installation

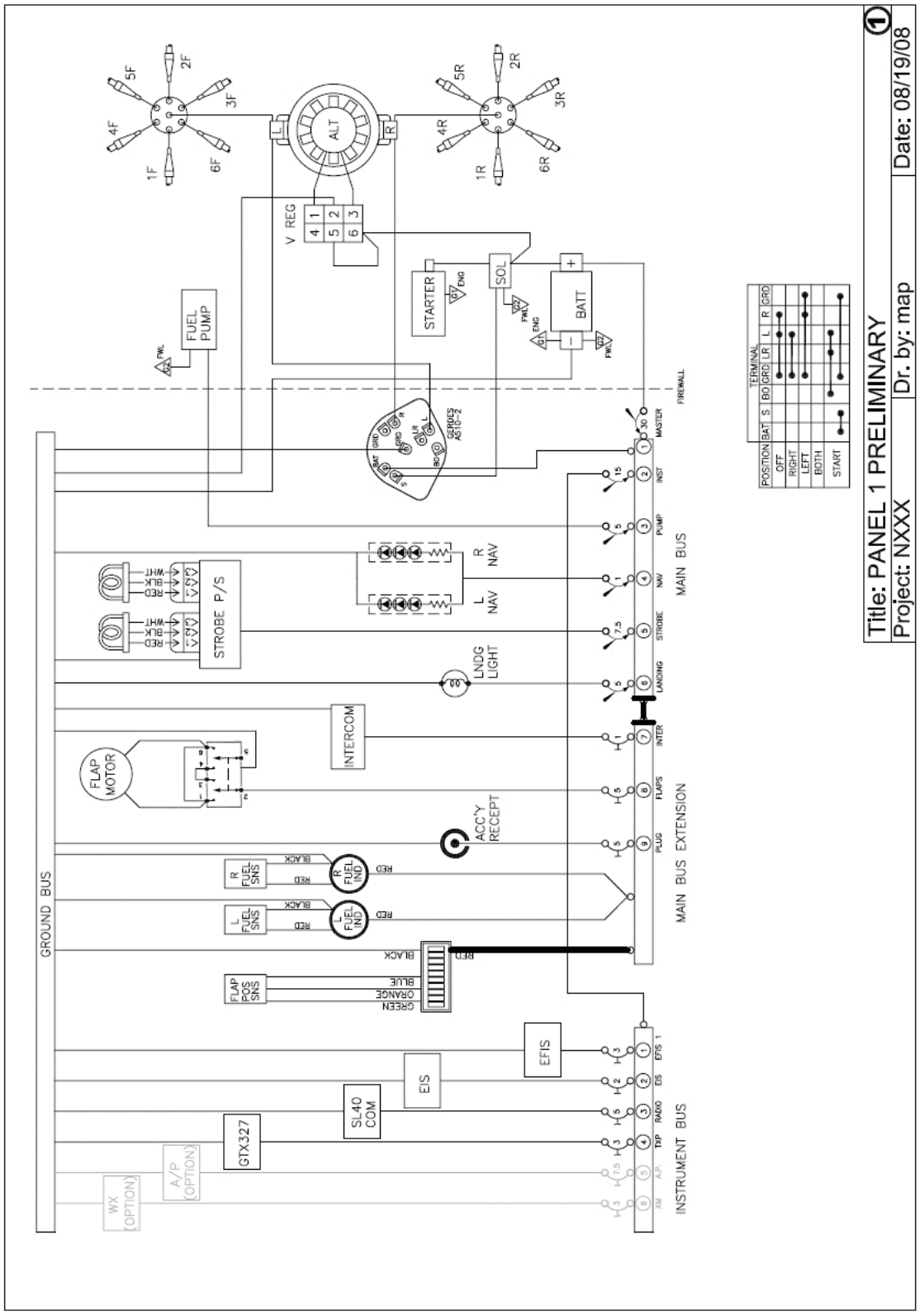

Figure 11-10: Panel 1 Electrical Diagram (typical)

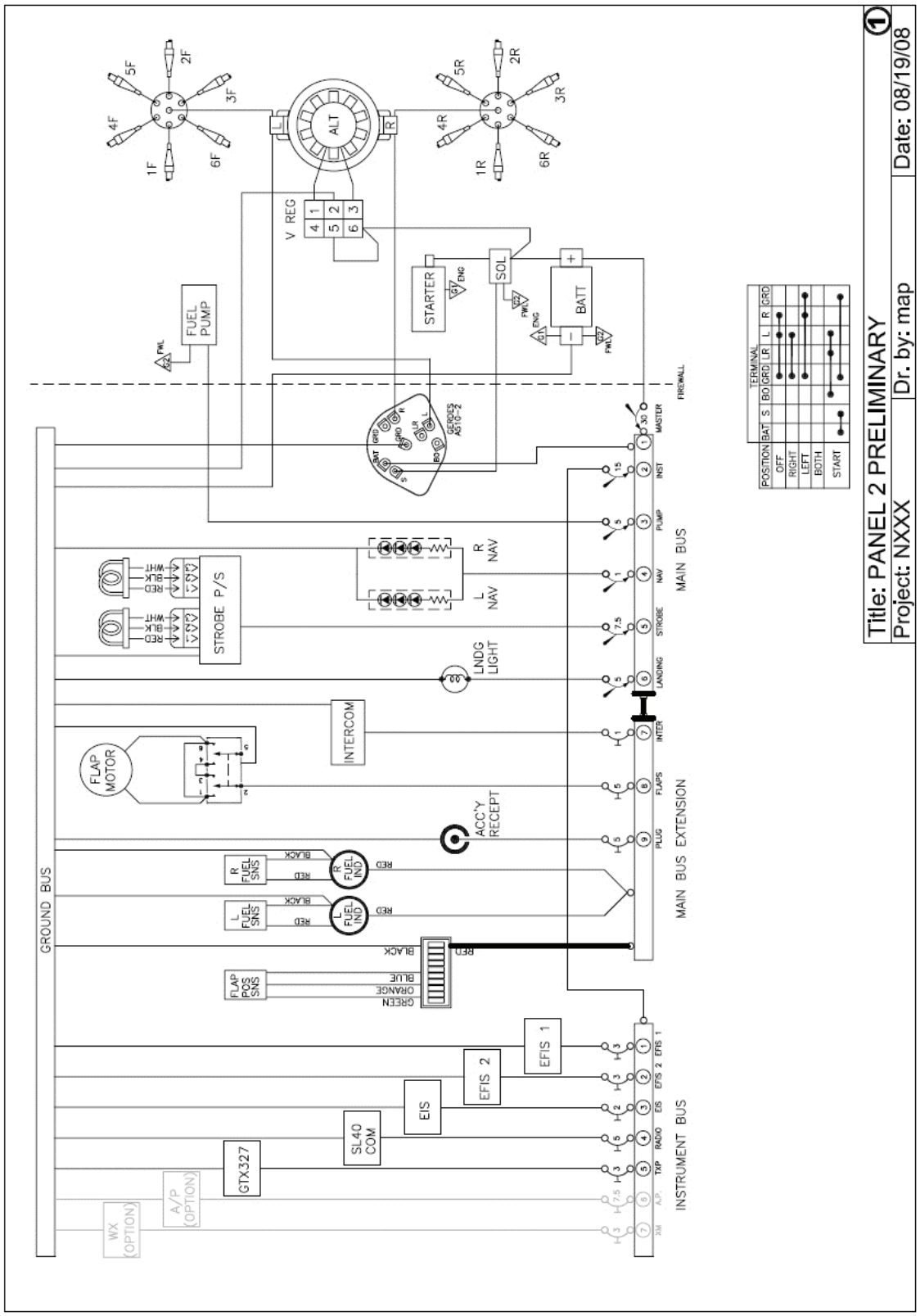

Figure 11-11: Panel 2 Electrical Diagram (typical)

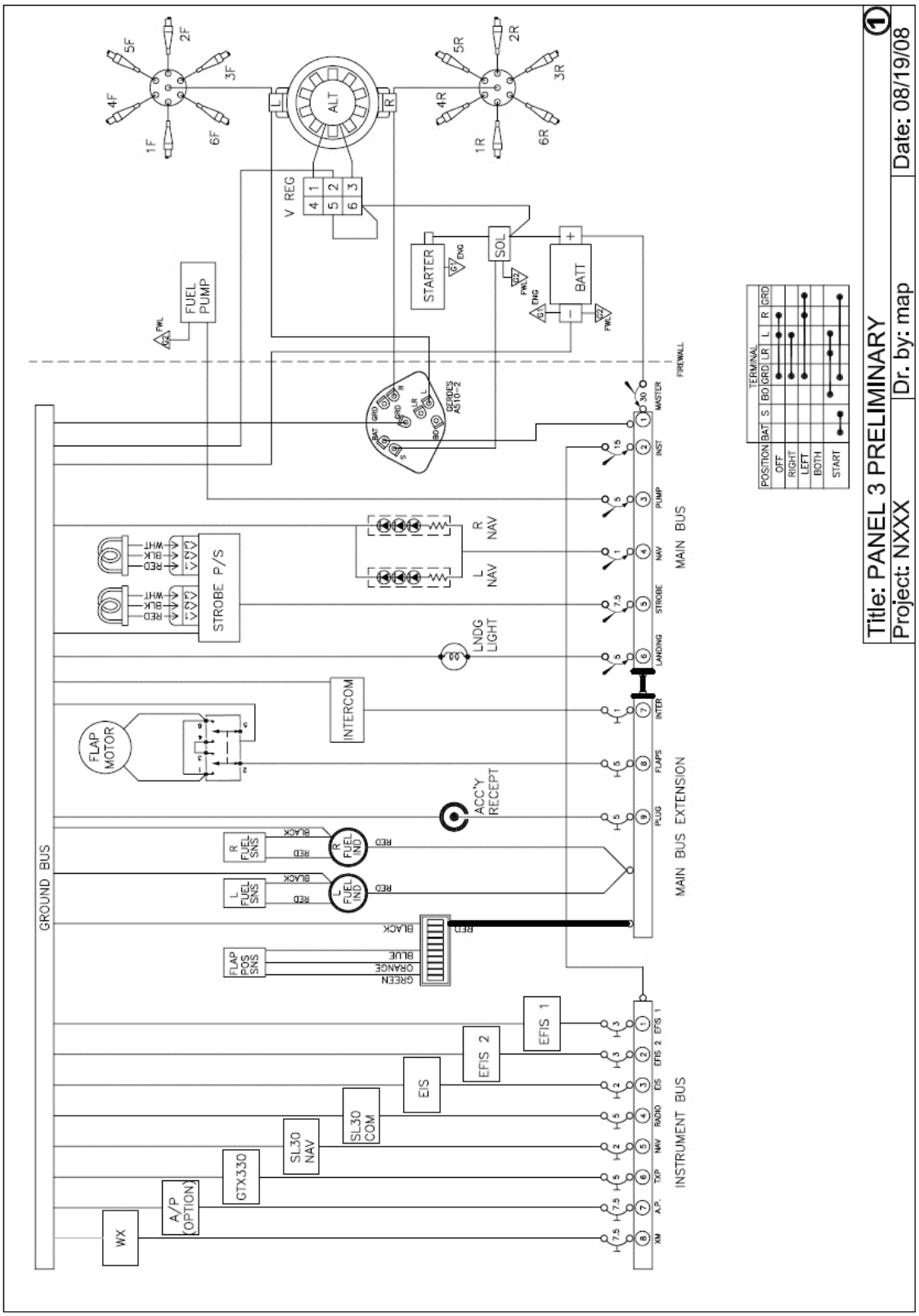

Figure 11-12: Panel 3 Electrical Diagram (typical)

Section 12: Fiberglass Repair

12-1 Description

Structural repairs beyond those listed in this manual are not authorized without the consent of the manufacturer. Jabiru USA will provide specific procedures for repair or replacement of damaged airframe components after receipt of full details of the extent of the damage. **Structural repairs that do not exactly follow the manufacturer's approved procedures may result in revocation of the S-LSA airworthiness certificate.**

Non-structural repairs or minor structural repairs described in this section are authorized if completed according to the procedures in this section.

12-2 General Non-Structural Fiberglass Repair

Tools Required	220-grit aluminum-oxide sandpaper (NOT silicon-based), epoxy brush, mixing cups, stir sticks
Parts Required	9-oz fiberglass cloth, System 2000 epoxy, Aero-poxy or other aircraft laminating epoxy
Level of Maintenance	Line
Level of Certification Required	A&P or LSA R/M-M

Most non-structural fiberglass is in wing tips, horizontal stabilizer end caps, cowls, fairings or wheel pants. These parts are generally made from three layers of 9 oz fiberglass or from a sandwich of two layers glass, one layer of Cormat, and another two layers of glass. Repair of breaks, delaminations or tears can easily be made by applying fiberglass cloth to one or both sides of the damaged area.

The epoxy used in Jabiru aircraft manufacture is System 2000 from Fiberglast Developments Inc. System 2000 is the preferred repair epoxy. Other laminating epoxy resins can be used if they have similar properties.

Procedure

1. Remove paint and gel coat from the damaged area extending to an area approximately two inches beyond the damage area. Take care to sand only paint and gel coat – not into the glass fiber.

2. To prep non gel coated areas, rough up the fiberglass and epoxy coat with 220 grit sandpaper to allow mechanical adhesion of the repair epoxy.

3. After sanding, clean with acetone or water to remove all dust. DO NOT use soap or silicone-based cleaners.

4. Apply a light coat of epoxy to the repair area. Align the broken parts. Apply two layers of 9 oz fiberglass cloth to the area and wet out. Apply two layers of cloth to the other side if necessary.

5. Allow to cure. Finish as described in 12-4.

12-3 Structural Fiberglass Repair

Structural fiberglass repair should only be attempted by personnel with previous fiberglass experience.

Structural repairs beyond those listed in this manual are not authorized without the consent of the manufacturer. Jabiru USA will provide specific procedures for inspection, repair or replacement of damaged airframe components after receipt of full details of the extent of the damage. **Structural repairs that do not exactly follow the manufacturer's approved procedures may result in revocation of the S-LSA airworthiness certificate.**

12-3.1 Fuselage Skin Repair Procedure

Tools Required	220-grit aluminum-oxide sandpaper, epoxy brush, mixing cups, stir sticks, adequate lighting
Parts Required	9-oz fiberglass cloth, System 2000 epoxy, Aero-poxy or other aircraft laminating epoxy, Dacron peel-ply
Level of Maintenance	Heavy
Level of Certification Required	A&P or LSA R/M-M

NOTE: This procedure applies only to minor skin cracks that are further than 2" from any structural member. Consult Jabiru USA Sport Aircraft for procedures to inspect and repair all other damage.

1. Glass cloth must be applied to both sides of the skin for an effective repair.

2. Remove paint and gel coat from the damaged area extending to an area approximately three inches beyond the damaged area. Take care to sand only paint and gel coat – not into the glass fiber as well. To prep non gel coated areas rough up the fiberglass and epoxy coat with 220 grit sandpaper to allow mechanical adhesion of the repair epoxy.

3. Remove any carpet from the area affected at least six inches in all directions. If the carpet is difficult to remove, acetone may be used to dissolve the contact cement.

4. Sand all carpet glue residue from the affected area at least three inches in all directions. Do not sand into the fiberglass structure.

5. Cut two pieces of AF303 fiberglass cloth that will cover the affected exterior area plus 2 inches in all directions on a bias. Cut three pieces of AF303 on a bias to cover the affected interior area by two inches in all directions.

6. Mix an amount of 24-hour epoxy sufficient to wet out the fiberglass cloth.

7. Using a 1" paint brush, apply a thin coat of 24-hour epoxy on the affected area of the exterior.

8. Lay the first piece of cloth on the area.

9. Finish wetting out the first piece of fiberglass cloth with a generous amount of epoxy.

10. Apply the second piece of fiberglass cloth over the first on a bias.

11. Using the paint brush, press the second piece of fiberglass into the first. Don't add any additional epoxy until the excess from the first application has been soaked into the second layer. If there are any dry spots in the second layer, add only the amount needed to fully wet the cloth. Ideally, there should be no need to add any additional epoxy unless all the excess is soaked up; however, do not leave any dry spots or air bubbles inside the layup. Any areas that appear whitish will become a weak area in the repair.

12. Cut a piece of Dacron peel ply to cover the entire affected area. Peel ply will make the finishing and paint process easier. Multiple pieces may be used to cover compound curves.

13. Using the paint brush, press the peel ply into the fiberglass cloth. No additional epoxy is needed.

14. Set up a light inside the cabin so that dry areas will be visible during the application of the glass layers.

15. Repeat steps 7-10 above to begin the interior repair.

16. Apply a generous amount of epoxy to the second layer of glass. If there are any dry spots in the second layer, add the amount needed to fully wet the cloth. Applying "too much" is ok.

17. Apply the third piece of fiberglass on a bias. Press it into the second piece using the paint brush. Soak the third layer in the excess from the second layer. Ideally, there should be no need to add any additional epoxy unless all the excess is soaked up; however, do not leave any dry spots or air bubbles inside the layup. Any areas that appear whitish will become a weak area in the repair.

18. Apply peel ply to the interior as in steps 12 and 13.

19. Allow 24 hours to cure.

20. Remove peel ply. Carefully sand any rough areas.

21. Refer to Paragraph 12-4 for prep and paint instructions.

22. If necessary, reinstall the carpet that was pulled up in the first step using contact cement or upholstery glue. If the carpet was destroyed during removal, contact Jabiru USA for replacement pieces.

12-3.3 Damage to Wing or Horizontal Tail

Damage to skin may be repaired using the procedures in this manual as long as there is no delamination or damage to underlying structures.

Damage to leading edge skin:

1. Cut out damaged area. Prep area as described in Paragraph 12-3.1(1).

2. Carve a Styrofoam block insert to fit the contour of the leading edge. Insert Styrofoam into leading edge area to maintain shape. Cover with four layers of 9 oz cloth as detailed in Paragraph 12-3.1. Overlap damaged area by two inches. Apply peel ply. Finish and repaint according to Section 12-4, Paint and Refinishing.

12-3.4 Damage to Underlying Structure

Damage of any kind to structures that support the skin of any of the aircraft structural components must be reported to the manufacturer. The manufacturer must evaluate the damage and in consultation with Jabiru Aircraft Pty, Ltd will make a determination of whether the damage is repairable. The manufacturer will then issue an appropriate repair procedure or will specify that components must be replaced.

The integrity of the underlying structure is critical to the structural integrity of the aircraft. Any damage to any of the underlying structure is considered major damage and careful application of specific repair procedures provided by the manufacturer is required.

12-4 Paint and Finishing

12-4.1 Description

The paint finish is an automotive base coat / clear coat system similar to modern automobiles, using either PPG or Matrix systems. Paint codes for the base white are:

Aircraft s/n prior to 702: PPG WA8624, GM Olympic White (Fleet White)

Aircraft s/n 702 and later: Matrix MT-84 (pure white toner)

12-4.2 Repair

Repair procedures are similar to those used in auto body shops.

12-4.3 Paint Repair

Paint repairs are the done the same way whether over a fresh fiberglass repair or simply over a scrape or mar.

Sand off existing clear coat and base color coat over and around the repair area. Extend the surface prep about 2 inches from the damage. Sand off the sealer / primer as well. Be careful to not remove the underlying gel coat and use extreme caution to avoid sanding into or cutting any fiberglass strands.

Fill and smooth the area with Evercoat Lightweight Fiberglass body filler or equivalent. Apply a coat of automotive primer sealer primer over the damage area. When dry fol-

low with a base color coat and clear coat. Jabiru USA uses PPG or Matrix brand but any compatible automotive base coat / clear coat is acceptable. After paint cures use a buffer to blend the repair area into the rest of the paint.

12-4.4 Complete Repaint

For a complete repaint of the airframe, the clear coat and most of the base coat and primer sealer should be removed. Wet sanding is the preferred method to remove paint. Take care not to sand through gel coat or fiberglass strands.

Repaint with a quality brand of primer sealer that includes a UV barrier , base color coat, and finally a clear coat following the paint manufacturer's instructions.

12-5 Door Repair Supplement

The following procedure should be used in cases where the door has been overextended by force (wind gust, etc.) and suffered a broken door frame near the hinge points. It also covers damage due to a locked door being pried open. This non-structural procedure may be used to repair cracks and breaks in any portion of the door frame.

The hinge structures are bonded to the inside of the door frame and door skin. When damage to the hinge structure or door frame occurs, it is necessary to drill or cut an access hole big enough to inspect the damage and add epoxy and flock to repair the broken area. The inspection hole will later be covered up with two or more layers of 10 oz. glass cloth, filled, and painted to match.

1. Remove all door upholstery and set aside to protect it from epoxy and paint. Unbolt and remove restraint strap from forward edge of door to access stress cracks in that area. Remove weather stripping from door edges near repair areas. Remove door if necessary by following procedure in Section 3-3.

2. Sand away the paint and gel coat at least 2" around the damaged area, or to the edge of the structure.

3. Carefully remove broken skin pieces or drill a hole into the door frame near the damaged area for inspection and application of epoxy and flock. For example, to repair a broken lower hinge, drill near the area shown in Figure 12-1. Use a step drill or file to enlarge the hole big enough to inspect and repair the damage.

4. Thoroughly inspect the damage and determine amount of epoxy and flock needed to repair the joint. Mix up a batch of 24-hour epoxy and cotton flock to the consistency of mayonnaise.

5. Using a popsicle stick or other application tool, thoroughly coat the cracked surfaces. Cover as much of the cracked surface as possible and be generous with the epoxy mixture. Fillet the flock into the inside of the door frame and skin to add reinforcement to the broken areas. Clean up all epoxy that drips on the outside surfaces of the door with acetone.

6. When satisfied with an internal hinge repair, shut the door, latch it, and let it sit untouched overnight inside a heated hangar or with an external heat source that will heat the repaired area to at least 60ºF. With the door shut, proper hinge alignment will be assured.

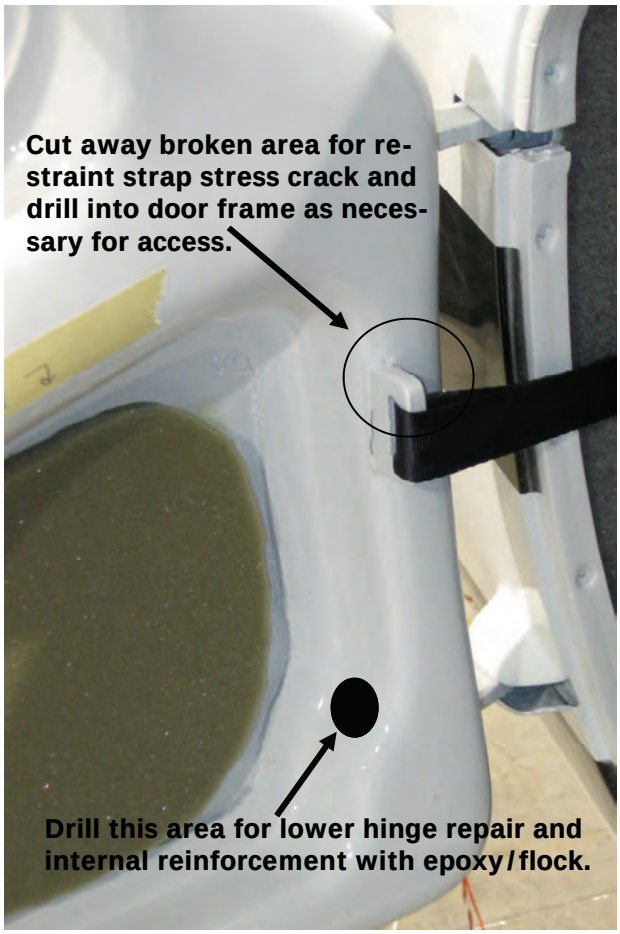

Figure 12-1: Hinge repair

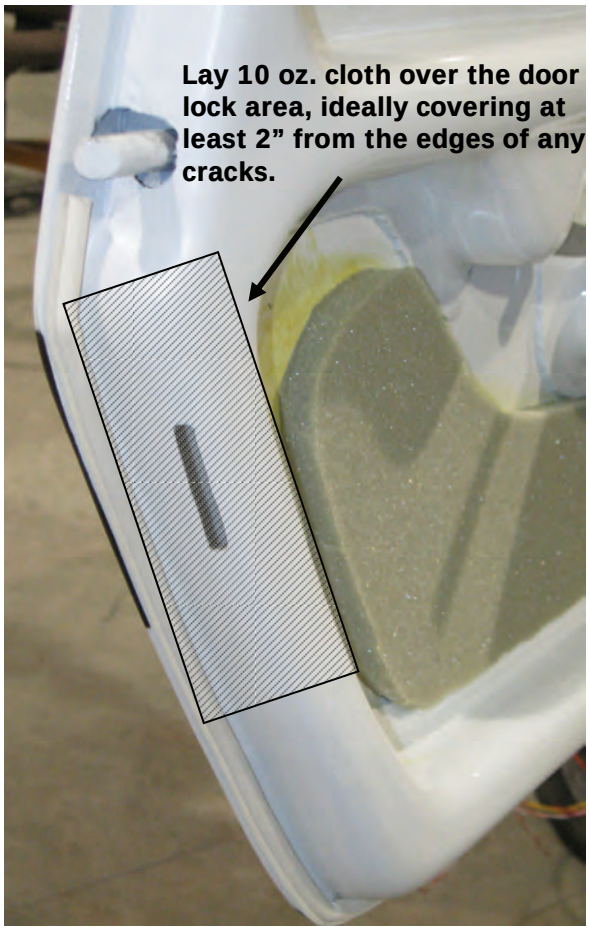

Figure 12-2: Door lock slot repair

7. If door frame pieces were removed during inspection and internal repair, carefully glue them back into place with 5-minute epoxy. If small pieces were crushed be-yond repair, the hole may be filled using an epoxy/flock mixture.

8. After the epoxy has cured, sand away any rough edges or excess epoxy from the repair area.

9. Lay at least 2 layers of 10 oz. cloth over the hole, taking care to avoid sags and wrinkles. Use 2 layers for cosmetic areas and 3 layers for stressed areas such as the restraint strap attach point and the area around the door lock slot. Let the epoxy cure fully.

10. Follow the instructions in 12-4 to fill, sand, and paint the affected area.

11. When paint has fully cured, reinstall door restraint strap, upholstery panels, and weather stripping as necessary. Upholstery should be glued in place with contact cement. See Section 3-3 for information on replacing door seals.

12. Re-cut the door lock slots as necessary.

Appendix Log

The table below shows the current effective appendices and revision dates. Appendices must be kept updated to ensure use of the most current inspection checklists and service information. A current Appendix Log with the latest change notices may be found on the manufacturer's website, www.usjabiru.com.

Current instructions and maintenance documents for components such as the propeller, wheels and avionics are usually available through the part vendor's website. Specific components may have previously issued Service Bulletins that are not published in this manual or on Jabiru USA's website. **It is the responsibility of the mechanic and owner/operator to ensure that all documents used during maintenance are current and that all applicable Service Bulletins and Air Safety Alerts are complied with.**

Document	Pages Affected	Revision	Date
J230-SP/J250-SP S-LSA Service Schedule	All	A1	16-May-2011
25 and 50-Hour Inspection Guide	All	A1	16-May-2011
100-Hour/Annual Inspection Guide	All	A1	16-May-2011
Jabiru J230-SP & J250-SP Quick Reference Maintenance Guide	All	A1	16-May-2011
JSA 501-1 Malfunction or Defect Report	N/A	A0	1-April-2010
Service Letter JSL 007-3 Fuel Guidance	1 and 9 Ethanol Warning	A1	16-May-2011
Control Surface Throw Templates	N/A	A0	1-April-2010
Vendor Contact Information	1 Jabiru PTY LTD website added	A1	16-May-2011

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Jabiru J230-SP/J250-SP S-LSA Maintenance Schedule

	Task	Reference	Min. Qualification	Aircraft Affected	Required By
25 Hours Total Time	Initial oil change and 25-Hour Inspection	JSA-50HR	A&P or LSA R/M-M	All	Engine manufacturer
Each 25-Hour Interval	Carbon Propeller Clamp Bolt Tension Check	Aircraft Service Manual or Sensenich Doc. # COMP-AC-CF	A&P or LSA R/M-M	Only aircraft equipped with Sensenich Ground-Adjustable Carbon Prop	Propeller manufacturer
Each 50-Hour Interval	50-Hour Service and Inspection	JSA-50HR	A&P or LSA R/M-M	All	Aircraft manufacturer
Each 100-Hour Interval	100-Hour Inspection	JSA-100HR	A&P or LSA R/M-M	Commercial Operators	FAA Order 8130.2F, Change 3, Section 126
Each 200-Hour Interval	Replacement of Engine Ignition Wires, Caps and Rotors	Jabiru 3300 Installation and Instruction Manual	A&P or LSA R/M-M	All	Recommended by aircraft manufacturer
Each 500-Hour Interval	Landing Gear Bolt Replacement	JSA-003-1	A&P or LSA R/M-M	All	Aircraft manufacturer
Each 1000-Hour Interval	Engine Top Overhaul	Jabiru 3300 Overhaul Manual	A&P or LSA R/M-M	All	Recommended by engine manufacturer
Each 2000-Hour Interval	Engine Complete Overhaul	Jabiru 3300 Overhaul Manual	A&P or LSA R/M-M	All	Recommended by engine manufacturer
Significant temp/humidity change over several weeks or months	Propeller Hub Bolt Tension Check	Aircraft Service Manual or Sensenich Doc. # WOOD-CF-REV-A.DOC 5-20-04	A&P or LSA R/M-M	All aircraft except those equipped with ground-adjustable carbon propeller	Propeller manufacturer
Every 12 Calendar Months	Annual Inspection	JSA-100HR	A&P-IA or LSA R/M-M	All	FAA Order 8130.2F, Change 3, Section 126
	ELT Inspection	ELT operation manual	A&P, LSA R/M-M, or rated avionics technician	All	FAR 91.207(d)
Every 24 Calendar Months	Transponder Inspection	Transponder operation manual	A&P, LSA R/M-M, or rated avionics technician	All	FAR 91.413(a)
	Aircraft Battery Replacement	Aircraft Service Manual	Owner/Operator	All	Recommended by aircraft manufacturer
	Replacement of Engine Compartment Flexible Hoses	Aircraft Service Manual	A&P or LSA R/M-M	All	Recommended by aircraft manufacturer
Every 24 Calendar Months and at change of ownership	ELT Registration Renewal	1-800-212-SAVE or www.beaconregistration.noaa.gov	Owner/Operator	Aircraft equipped with 406 MHz satellite ELT	Title 47 - Parts 80, 87, and 95 of U.S. Code of Federal Regulations
Every 72 Calendar Months	406 MHz ELT Six-Year Inspection and Battery Replacement	Kannad ELT Installation/Operation Manual, DOC06006E	FAR Part 145 Repair Station	Aircraft equipped with 406 MHz satellite ELT	FAR 91.207

Owner/Operators of S-LSA aircraft that hold at least a Sport Pilot or Private Pilot Certificate may only perform maintenance items listed in FAR Part 43, *Appendix A - Maintenance, Preventive Maintenance, Rebuilding and Alteration, Section C.* Owner/operators performing preventive maintenance must return the aircraft to service by endorsing the aircraft or engine logbook as specified in FAR 43.9. **All other maintenance tasks must be performed by an A&P, LSA Repairman with Maintenance Rating or FAA-certified repair station.**

Owner/operators of E-LSA aircraft that hold a minimum maintenance certification of LSA Repairman with Inspection Rating are authorized under FAR 43.1(b)(2) to perform maintenance as permitted in the Aircraft Service Manual on E-LSA aircraft that they own and make the logbook endorsement for return to service as specified by FAR 43.9.

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25 and 50-Hour Inspection Guide

For Jabiru J170, J230, and J250 Models

The 25-hour service and inspection is done only one time, at the end of the engine break-in period at 25 hours total time. The break-in oil and filter must be removed and replaced, head bolts torqued to proper tension (cold engine), and a general inspection logged.

At each 50-hour interval after the initial 25-hour inspection, the oil must be changed and the 50-hour inspection must be completed and logged. Owner/Operators of S-LSA aircraft that hold at least a Sport Pilot or Private Pilot Certificate may perform maintenance items listed in FAR Part 43, Appendix A - *Maintenance, Preventive Maintenance, Rebuilding and Alteration, Section C.* Owner/operators performing preventive maintenance must return the aircraft to service by endorsing the aircraft or engine logbook as specified in FAR 43.9. All other S-LSA maintenance tasks must be performed by an A&P, LSA Repairman with Maintenance Rating or FAA-certified repair station.

Owner/operators of E-LSA aircraft that hold a minimum maintenance certification of LSA Repairman with Inspection Rating are authorized under FAR 43.1(b)(2) to perform maintenance as permitted in the Aircraft Service Manual, JSA SM170SP, on E-LSA aircraft that they own and make the logbook endorsement for return to service as specified by FAR 43.9.

Owner's Name: _____

Address: _____

City/State/Zip: _____

Registration Number: _____

Airframe Serial Number: _____

Engine Serial Number: _____

Hours: _____

Date Inspection Completed: _____

Servicing Agency: _____

Address: _____

City/State/Zip: _____

Phone Number: _____

Name of Repairman: _____

Inspection Intervals: The time periods for the inspections noted in this schedule are based on normal usage under average environmental conditions. Airplanes operated in humid tropics, cold damp climates, etc. may need more frequent inspections for wear, corrosion, lubrication, and or lack of maintenance. Under these adverse conditions, perform periodic inspections in compliance with this guide at more frequent intervals undil the owner or operator can set his or her own inspection periods based on the contingencies of experience.

Airplanes operated commercially less than 100 hours per year must have a 100-hour inspection performed no later than 12 months following the date of the preceeding 100-hour inspection. The 100--hour interval between performances of the procedures specified herein should NEVER be exceeded by more than 10 hours which can be used only if the additional time is required to reach a place where the inspection can be satisfactorily accomplished. However, any extension of the 100-hour interval must be subtracted from the following 100-hour interval, with no time extension permitted. For example, if an inspection is done at 110 hours, the next inspection is due 90 hours later with no extension allowed.

In addition to the inspections prescribed by this schedule, the altimeter, static system and ATC transponder MUST be tested and inspected at 24-month intervals in compliance with the requirements specified in FAR Part 91.

Placards: Ensure that all placards are in place and legible whenever the airplane has been repainted or touched up after repairs. Replace any placards that have been inadvertently defaced or removed.

Airworthiness Responsibility: Jabiru USA Sport Aircraft's recommended inspection program in accordance to FAR Parts 43 and 91 consists of, but is not limited to, inspection items listed in this Inspection Guide, any applicable Service Bulletins or Air Safety Alerts issued against the airframe or any equipment installed therein.

The owner or operator is primarily responsible for maintaining the aircraft in an airworthy condition, including compliance with all applicable Service Bulletins and Air Safety Alerts issued by the manufacturer. It is further the responsibility of the owner or operator to ensure that the airplane is inspected in conformity with the requirements of Parts 43 and 91 of the Federal Aviation Regulations. Jabiru USA Sport Aircraft, LLC, has prepared this inspection guide to assist the owner or operator in meeting the foregoing responsibilities. This inspection guide is not intended to be all-inclusive, for no such guide can replace the good judgment of a certified airframe and powerplant mechanic in the performance of his or her duties. As the one pimarily responsible for the airworthiness of the airplane, the owner or operator should select only qualified personnel to maintain the aircraft.

Jabiru USA Sport Aircraft, LLC issues service and safety information for the benefit of owners and operators. It is the responsibility of the owner/operator to review and comply with each Service Bulletin and Air Safety Alert.

While this guide may be used as an outline, detailed information of the many systems and components in the airplane will be in the various section chapters of its service manual and the pertinent vendor publications. It is also recommended that reference be made to the applicable airframe and engine service manuals, previously issued Service Instructions, Jabiru Service Bulletins, applicable FAA regulations and publications, Vendors Bulletins and specifications for torque values, clearances, settings, tolerances, and other requirements. It is the responsibility of the owner or operator to ensure that the airframe and powerplant mechanic inspecting the airplane has access to the previously noted documents as well as this inspection guide. These documents may be downloaded from the manufactuer's website, www.usjabiru.com.

1. Operational Inspection

		Starter – Check for proper operation, unusual noises and dragging.
Pass	**Fail**	**Comments:**
❑	❑	

		Fuel Pressure or Fuel Flow – Check within normal limits (if installed).
Pass	**Fail**	**Comments:**
❑	❑	

		Cylinder Head Temperature – Check for proper operation, temperatures and fluctuations.
Pass	**Fail**	**Comments:**
❑	❑	

		Alternator – Check for proper output.
Pass	**Fail**	**Comments:**
❑	❑	

		Propeller – Check for smoothness of operation.
Pass	**Fail**	**Comments:**
❑	❑	

		Oil Pressure and Temperature – Check for proper pressure, temperature limits and unusual fluctuations.
Pass	**Fail**	**Comments:**
❑	❑	

		Magnetos – Check the performance of the magneto as outlined under the heading NORMAL PROCEDURES in the appropriate Pilot's Operating Handbook.
Pass	**Fail**	**Comments:**
❑	❑	

		Auxilliary Fuel Pump-- Check for proper operation, unusual noise and fluctuations.
Pass	**Fail**	**Comments:**
❑	❑	

		All Lights--Check function, condition, attachment, cracked or broken lenses. Check switches, knobs and circuit breakers for looseness and operation.
Pass	**Fail**	**Comments:**
❑	❑	

		Brakes--Check for condition and wear, ease of operation and proper release of parking brake. Check for unusual brake chatter.
Pass	**Fail**	**Comments:**
❑	❑	

		Flight and Trim Controls--Check freedom of movement and proper operation through full travel with and without flaps extended. Check trim controls for proper operation.
Pass	**Fail**	**Comments:**
❑	❑	

2. Powerplant: Refer to *Instruction & Maintenance Manual for Jabiru 3300 Aircraft Engine*

		Spinner and Spinner Flange: Check for deformation, security and cracks.
Pass	**Fail**	**Comments:**
❑	❑	

		Propeller and mounting bolts: Check tension on all propeller bolts. Check propeller for condition and security. Inspect blades for cracks, dents, nicks, scratches, erosion, delamination (in the case of fiberglass sheathed propellers), security and movement in hub.
Pass	**Fail**	**Comments:**
❑	❑	

		Induction Air Filter: Check for condition, cleanliness and security. Replace if necessary.
Pass	**Fail**	**Comments:**
❑	❑	

		Induction System: Check the SCAT hose for damage and wear. Check the carburetor heat box for blockage, security, cracks, operation and wear.
Pass	**Fail**	**Comments:**
❑	❑	

		Cooling Baffles: Check for cracks, worn areas and security.
Pass	**Fail**	**Comments:**
❑	❑	

		Cylinders: Check cylinders and exhaust manifold for obvious leaks, security and cracks. Check cylinders for broken cooling fins and loose or missing base nuts.
Pass	**Fail**	**Comments:**
❑	❑	

		Exhaust: Check for deformation, security, cracks, leaks, loose or missing nuts, springs and clamps. Check for thin wall condition which may occur due to nromal internal erosion on stacks which have long service time.
Pass	**Fail**	**Comments:**
❑	❑	

		Ignition System: Clean, inspect, regap, test and replace spark plugs as necessary. Tighten spark plugs to proper torque. Check condition and attachment of all ignition leads at plug and distributor.
Pass	**Fail**	**Comments:**
❑	❑	

		Battery: Inspect, clean and tighten connections. Check for security and proper attachment. Check for corrosion. Make certain battery is clean. Water or dirt on battery surfaces can cause battery to discharge.
Pass	**Fail**	**Comments:**
❑	❑	

		Engine Controls and Linkages: Check controls and associated equipment for condition, attachment, alignment and rigging. Check control operation.
Pass	**Fail**	**Comments:**
❑	❑	

		Carburetor: Check overall condition. Inspect for leaks.
Pass	**Fail**	**Comments:**
❑	❑	

		Engine Sump: Check for cracks, leaks, proper fluid level, and security.
Pass	**Fail**	**Comments:**
❑	❑	

		Oil Service: Remove and replace oil filter. Drain and replace engine oil. Empty the oil overflow bottle.
Pass	**Fail**	**Comments:**
❑	❑	

		Oil Cooler: Check oil cooler, lines and fittings for condition, security, chafing and leaks.
Pass	**Fail**	**Comments:**
❑	❑	

		All Drains and Plugs: Check for condition, cleanliness and security. Check for leaks and correct tension.
Pass	**Fail**	
❑	❑	

		Cowling skin: Check for deformation, delamination and obvious damage or cracks. Check for rub points on the interior surfaces.
Pass	**Fail**	**Comments:**
❑	❑	

		Cowling structure: Check for cracks and delamination. Check hinge pin structure for loose rivets or deformation.
Pass	**Fail**	**Comments:**
❑	❑	

		Head Bolt Tension: Torque head bolts to proper tension.
Pass	**Fail**	**Comments:**
❑	❑	

3. Cabin and Baggage Compartment

		Rudder Pedals: Check for freedom of movement. Check push/pull cables for proper routing, condition and security. Check rudder pedal springs for condition and correct placement. Check pedal extensions for security if installed.
Pass	**Fail**	**Comments:**
❑	❑	

		Instruments and Instrument Panel: Inspect instrument panel, placards and instruments for condition and attachment. Check all knobs for security.
Pass	**Fail**	**Comments:**
❑	❑	

4. Wings and Carry-Through Structure

		Skin: Check for deformation and obvious damage. Check for cracks. If damage is found, check adjacent structure. Check for indications of excessive flight loading.
Pass	**Fail**	**Comments:**
❑	❑	

		Wing Bolts: Check wing bolts for security. DO NOT overtighten.
Pass	**Fail**	**Comments:**
❑	❑	

		Fuel Vents, Pitot Tube, and Stall Warning: Check for condition and obstructions.
Pass	**Fail**	**Comments:**
❑	❑	

5. Nose Gear

		Wheel and Tire: Check wheel for cracks and tire for wear, damage, condition and proper inflation. Check wheel bearings for condition and wear.
Pass	**Fail**	
❑	❑	

6. Main Gear and Brakes

		Wheels and Tires: Check wheels for cracks and tires for wear, damage, condition and proper inflation. Check and repack wheel bearings.
Pass	**Fail**	**Comments:**
❑	❑	

		Landing Gear Legs: Inspect legs for cracks, overextension or signs of delamination.
Pass	**Fail**	**Comments:**
❑	❑	

7. Rear Fuselage and Empennage

		Skin: Check for deformation, cracks and obvious damage. If damage is found, check adjacent structure.
Pass	**Fail**	**Comments:**
❑	❑	

		Control Surfaces: Check for deformation, cracks, security of hinges, freedom of movement and travel limits.
Pass	**Fail**	**Comments:**
❑	❑	

		Static Port: Check for blockages. Check static probe for condition.
Pass	**Fail**	**Comments:**
❑	❑	

8. General

		Airplane cleaned and serviced.
Pass	**Fail**	**Comments:**
❑	❑	

		Inspect all placards to assure they are easily readable and securely attached.
Pass	**Fail**	**Comments:**
❑	❑	

		Ensure that all Service Bulletins, Air Safety Alerts and previously issued Service Instructions are reviewed and complied with as required.
Pass	**Fail**	**Comments:**
❑	❑	

Annual or 100-Hour Inspection Guide
For Jabiru J170, J230, and J250 Models

A&P or LSA Repairman with Maintenance Rating Required

Owner's Name: _____

Address: _____

City/State/Zip: _____

Registration Number: _____

Airframe Serial Number: _____

Engine Serial Number: _____

Hours: _____

Date Inspection Completed: _____

Servicing Agency: _____

Address: _____

City/State/Zip: _____

Phone Number: _____

A&P/Repairman Name: _____

Inspection Intervals: The time periods for the inspections noted in this schedule are based on normal usage under average environmental conditions. Airplanes operated in humid tropics, cold damp climates, etc. may need more frequent inspections for wear, corrosion, lubrication, and or lack of maintenance. Under these adverse conditions, perform periodic inspections in compliance with this guide at more frequent intervals undil the owner or operator can set his or her own inspection periods based on the contingencies of experience.

The 100-hour inspection is required ONLY for aircraft used in commercial operations. Airplanes operated commercially less than 100 hours per year must have a 100-hour inspection performed no later than 12 months following the date of the preceeding 100-hour inspection. The 100--hour interval between performances of the procedures specified herein should NEVER be exceeded by more than 10 hours which can be used only if the additional time is required to reach a place where the inspection can be satisfactorily accomplished. However, any extension of the 100-hour interval must be subtracted from the following 100-hour interval, with no time extension permitted. For example, if an inspection is done at 110 hours, the next In addition to the inspections prescribed by this schedule, the ATC transponder must be tested and inspected at 24-month intervals in compliance with the requirements specified in FAR Part 91.

Placards: Ensure that all placards are in place and legible whenever the airplane has been repainted or touched up after repairs. Replace any placards that have been inadvertently defaced or removed.

Airworthiness Responsibility: Jabiru USA Sport Aircraft's recommended inspection program in accordance to FAR Parts 43 and 91 consists of, but is not limited to, inspection items listed in this Inspection Guide, any applicable Service Bulletins or Air Safety Alerts issued against the airframe or any equipment installed therein.

The owner or operator is primarily responsible for maintaining the aircraft in an airworthy condition, including compliance with all applicable Service Bulletins and Air Safety Alerts issued by the manufacturer. It is further the responsibility of the owner or operator to ensure that the airplane is inspected in conformity with the requirements of Parts 43 and 91 of the Federal Aviation Regulations. Jabiru USA Sport Aircraft, LLC, has prepared this inspection guide to assist the owner or operator in meeting the foregoing responsibilities. This inspection guide is not intended to be all-inclusive, for no such guide can replace the good judgment of a certified airframe and powerplant mechanic in the performance of his or her duties. As the one pimarily responsible for the airworthiness of the airplane, the owner or operator should select only qualified personnel

Jabiru USA Sport Aircraft, LLC issues service and safety information for the benefit of owners and operators. It is the responsibility of the owner/operator to review and comply with each Service Bulletin and Air Safety Alert.

While this guide may be used as an outline, detailed information of the many systems and components in the airplane will be in the various section chapters of its service manual and the pertinent vendor publications. It is also recommended that reference be made to the applicable airframe and engine service manuals, previously issued Service Instructions, Jabiru Service Bulletins, applicable FAA regulations and publications, Vendors Bulletins and specifications for torque values, clearances, settings, tolerances, and other requirements. It is the responsibility of the owner or operator to ensure that the airframe and powerplant mechanic inspecting the airplane has access to the previously noted documents as well as this inspection guide. These documents may be downloaded from the manufactuer's website, www.usjabiru.com.

1. Operational Inspection

		Starter – Check for proper operation, unusual noises and dragging.
Pass	**Fail**	**Comments:**
❑	❑	

		Fuel Pressure or Flow – Check within normal limits (if installed).
Pass	**Fail**	**Comments:**
❑	❑	

		Cylinder Head Temperature – Check for proper operation, temperature and fluctuations.
Pass	**Fail**	**Comments:**
❑	❑	

		Alternator – Check for proper output and unusual noises.
Pass	**Fail**	**Comments:**
❑	❑	

		Propeller – Check for smoothness of operation.
Pass	**Fail**	**Comments:**
❑	❑	

		Oil Pressure and Temperature – Check for proper pressure, temperature limits and unusual fluctuations.
Pass	**Fail**	**Comments:**
❑	❑	

		Magnetos – Check the performance of the magneto as outlined under the heading NORMAL PROCEDURES in the appropriate Pilot's Operating Handbook.
Pass	**Fail**	**Comments:**
❑	❑	

		Power Check – Refer to NORMAL PROCEDURES in the appropriate Pilot's Operating Handbook.
Pass	**Fail**	**Comments:**
❑	❑	

		Voltmeter – Check for proper indication and unusual fluctuations.
Pass	**Fail**	**Comments:**
❑	❑	

		Heating and Ventilating System – Check for proper operation, heat and airflow output. Check controls for freedom of operation.
Pass	**Fail**	**Comments:**
❑	❑	

		Front Console Main Fuel Shutoff Valve – Check for proper operation and freedom of movement.
Pass	**Fail**	**Comments:**
❑	❑	

		Induction Airbox, Valve, Doors, and Controls – Remove air filter and inspect hinges, doors, seals, and attaching parts for wear and security. Check operation.
Pass	**Fail**	**Comments:**
❑	❑	

		Oil Cooler - Check for obstructions, leaks, and security of attachment.
Pass	**Fail**	**Comments:**
❑	❑	

		Doors--Check latches, hinges, and seals for condition, operation, and security of attachment.
Pass	**Fail**	**Comments:**
❑	❑	

		Idle RPM and Mixture Settings – Check for both proper RPM and mixture settings. Check controls for freedom of operation.
Pass	**Fail**	**Comments:**
❑	❑	

		Ignition switch-- Rotate the ignition switch through the OFF position to the extreme limit of switch travel. If the engine stops firing, the switch is normal. If the engine continues to run with the switch held in the past OFF position, it is an indication that the magneto is still "hot" or ungrounded. When the switch is released from the past OFF position, it should automatically return to normal OFF and the engine should stop running. However, any ignition switch exhibiting this abnormal condition should be replaced.
Pass	**Fail**	**Comments:**
❑	❑	

		All Engine Controls--With the engine running, check for proper operational limits, engine response and rigging. Check friction locks for proper operation.
Pass	**Fail**	**Comments:**
❑	❑	

		Fuel Quantity Gauges--Check for proper operation and unusual fluctuation.
Pass	**Fail**	**Comments:**
❑	❑	

		Auxilliary Fuel Pump-- Check for proper operation, unusual noise and fluctuations.
Pass	**Fail**	**Comments:**
❑	❑	

		Fuel Tank Selector Valves--Check for smooth operation and proper placarding.
Pass	**Fail**	**Comments:**
❑	❑	

		All Lights--Check function, condition, attachment, cracked or broken lenses. Check switches, knobs and circuit breakers for looseness and operation.
Pass	**Fail**	**Comments:**
❑	❑	

		Stall Warning System--Check for proper operation.
Pass	**Fail**	**Comments:**
❑	❑	

		Radio Operation-- Check for proper operation, security of switches and knobs.
Pass	**Fail**	**Comments:**
❑	❑	

		Flaps--check for noisy operation, full travel and proper installation.
Pass	**Fail**	**Comments:**
❑	❑	

		Flight Instruments--Check for condition and proper operation.
Pass	**Fail**	**Comments:**
❑	❑	

		Brakes--Check for condition and wear, ease of operation and proper release of parking brake. Check for unusual brake chatter.
Pass	**Fail**	**Comments:**
❑	❑	

		Emergency Locator Transmiter--Check for proper operation and ensure the ELT is armed when the airplane is returned to service. Check ELT battery expiration date and replace batteries if necessary.
Pass	**Fail**	**Comments:**
❑	❑	

		Switches, Circuit Breakers--Check for proper operation.
Pass	**Fail**	**Comments:**
❑	❑	

		Flight and Trim Controls--Check freedom of movement and proper operation through full travel with and without flaps extended. Check trim controls for proper operation.
Pass	**Fail**	**Comments:**
❑	❑	

2. Powerplant: Refer to *Instruction & Maintenance Manual for Jabiru 3300 Aircraft Engine.*

		Spinner and Spinner Flange: Check for deformation, security and cracks.
Pass	**Fail**	**Comments:**
❑	❑	

		Propeller and mounting bolts: Check tension on all propeller bolts. Check propeller for condition and security. Inspect blades for cracks, dents, nicks, scratches, erosion, delamination (in the case of fiberglass sheathed propellers), security and movement in hub.
Pass	**Fail**	**Comments:**
❑	❑	

		Spinner/Propeller Tracking: Check that propeller blade and spinner tracking is in alignment.
Pass	**Fail**	**Comments:**
❑	❑	

		Propeller Hub Flange: Check for cracks and condition.
Pass	**Fail**	**Comments:**
❑	❑	

		Leak Check: Check for oil, fuel and induction leaks, then clean entire engine and compartment before inspection.
Pass	**Fail**	**Comments:**
❑	❑	

		Flywheel Screw Tension: Check 24 ft-lbs.
Pass	**Fail**	**Comments:**
❑	❑	

		Induction Air Filter: Check for condition, cleanliness and security. Replace if necessary.
Pass	**Fail**	**Comments:**
❑	❑	

		Induction System: Check the SCAT hose for damage and wear. Check the carburetor heat box for blockage, security, cracks, operation and wear.
Pass	**Fail**	**Comments:**
❑	❑	

		Cooling Baffles: Check for cracks, worn areas and security.
Pass	**Fail**	**Comments:**
❑	❑	

		Cylinders: Check cylinders and exhaust manifold for obvious leaks, security and cracks. Check cylinders for broken cooling fins and loose or missing base nuts.
Pass	**Fail**	**Comments:**
❑	❑	

		Crankcase: Check for security of crankcase half bolts. Check front seal for leaks.
Pass	**Fail**	**Comments:**
❑	❑	
		Hoses and Ducts: Check all fuel, oil and SCAT hose or duct for leakage, cracks, deterioration and damage. Check fittings for security.
Pass	**Fail**	**Comments:**
❑	❑	

		Intake and Exhaust: Check for deformation, security, cracks, leaks, loose or missing nuts and clamps. Check for thin wall condition which may occur due to normal internal erosion on exhaust stacks which have long service time.
Pass	**Fail**	**Comments:**
❑	❑	

		Ignition: Check for proper connection, security and fraying. Check gap between coil and flywheel magnets--should not exceed .010"
Pass	**Fail**	**Comments:**
❑	❑	

		Distributor Caps & Rotors: Check for wear at the contact points. Replace every 200 hours.
Pass	**Fail**	**Comments:**
❑	❑	

		Spark Plugs & Ignition Leads: Clean, inspect, regap, test and replace spark plugs as necessary. Tighten spark plugs to proper torque. Check ignition harness condition and for proper attachment.
Pass	**Fail**	**Comments:**
❑	❑	

		Compression: Perform differential compression test.
Pass	**Fail**	**Comments:**
❑	❑	

		Electrical Wiring and Equipment: Inspect electrical wiring and associated equipment and accessories for fraying and attachment.
Pass	**Fail**	**Comments:**
❑	❑	

		Battery: Inspect, clean and tighten connections. Check for security and proper attachment. Check for corrosion. Make certain battery is clean. Water or dirt on battery surfaces can cause battery to discharge.
Pass	**Fail**	**Comments:**
❑	❑	

		Fuel Pump: Inspect fittings and pump for leaks.
Pass	**Fail**	**Comments:**
❑	❑	

		Engine Controls and Linkages: Check controls and associated equipment for condition, attachment, alignment and rigging. Check control operation.
Pass	**Fail**	**Comments:**
❑	❑	

		Engine Mounts: Check for cracks, corrosion and security. Inspect rubber cushions, mount bolts and nuts and grounding straps for condition and security.
Pass	**Fail**	**Comments:**
❑	❑	

		Starter and Solenoid: Check for condition, attachment and chafed or loose wires.
Pass	**Fail**	**Comments:**
❑	❑	

		Alternator and Electrical Connections: Check for condition and attachment. Check wiring for proper attachment and possible chafing. Check for unsusual noise.
Pass	**Fail**	**Comments:**
❑	❑	

		Carburetor Heat System: Check for blockage, security, operation and wear.
Pass	**Fail**	**Comments:**
❑	❑	

		Carburetor: Check overall condition. Inspect for leaks. Remove bowl and check for sediment. Check condition of floats.
Pass	**Fail**	**Comments:**
❑	❑	

		Plumbing: Inspectall hoses, lines and clamps for condition and attachment. Check plumbing clearance and secure against possible chafing.
Pass	**Fail**	**Comments:**
❑	❑	

		Engine Sump: Check for cracks, leaks, proper fluid level, and security.
Pass	**Fail**	**Comments:**
❑	❑	

		Oil Service: Remove oil filter. Inspect oil sump drain and install new filter. Drain and replace crankcase oil. Empty oil overflow bottle.
Pass	**Fail**	**Comments:**
❑	❑	

		Oil Cooler: Check oil cooler, lines and fittings for condition, security, chafing and leaks.
Pass	**Fail**	**Comments:**
❑	❑	

		Firewall: Check for wrinkles, damage or cracks. Check all electrical and control access holes for proper sealing.
Pass	**Fail**	**Comments:**
❑	❑	

		Engine Accessories: Check for condition, security and leaks. Check wiring, hoses and tubes for chafing, security and leaks.
Pass	**Fail**	**Comments:**
❑	❑	

		Cabin Heat System: Check for cracks, distortion, corrosion, leaks and obstructions.
Pass	**Fail**	**Comments:**
❑	❑	

		All Drains and Plugs: Check for condition, cleanliness and security. Check for leaks and correct tension.
Pass	**Fail**	
❑	❑	

		Cowling skin: Check for deformation, delamination and obvious damage or cracks. Check for rub points on the interior surfaces.
Pass	**Fail**	**Comments:**
❑	❑	

		Cowling structure: Check for cracks and delamination. Check hinge pin structure for loose rivets or deformation.
Pass	**Fail**	**Comments:**
❑	❑	

		Head Bolt Tension: Torque head bolts to proper tension.
Pass	**Fail**	**Comments:**
❑	❑	

3. Cabin and Baggage Compartment

		Skin: Inspect skins for deformation or cracks. If damage is found, check adjacent structure.
Pass	**Fail**	**Comments:**
❑	❑	

		Structure: Check for cracks and deformation. Check for concealed damage.
Pass	**Fail**	**Comments:**
❑	❑	

		Teleflex cables: Check the flight control components. Replace control system components that have bulges, splits, bends or cracks. Check control cables and associated equipment for condition, attachment, alignment, clearance and proper operation.
Pass	**Fail**	**Comments:**
❑	❑	

		Aileron Quadrant: Inspect for condition, attachment and proper operation. Check for binding.
Pass	**Fail**	**Comments:**
❑	❑	

		Flap Motor and Shafts: Check for condition, security and wear at all points.
Pass	**Fail**	**Comments:**
❑	❑	

		Brake Master Cylinder: Check for condition, security and leaks. Check lines for signs of chafing or cracks.
Pass	**Fail**	**Comments:**
❑	❑	

		Rudder Pedals: Check for freedom of movement. Check push/pull cables for proper routing, condition and security. Check rudder pedal springs for condition and correct placement. Check pedal extensions for security if installed.
Pass	**Fail**	**Comments:**
❑	❑	

		Control Column: Check for freedom of movement. Inspect rod ends for condition, security and operation.
Pass	**Fail**	**Comments:**
❑	❑	

		Trim Control: Check for freedom of movement. Inspect rod ends for condition, security and operation.
Pass	**Fail**	**Comments:**
❑	❑	

		Engine Controls: Check for ease of operation through full travel.
Pass	**Fail**	**Comments:**
❑	❑	

		Plumbing: Check all plumbing and connections for security, leakage and general condition.
Pass	**Fail**	**Comments:**
❑	❑	

		Windows and Doors: Inspect windows for scratches, crazing and general condition. Inspect doors for security and attachment. Check latching mechanism for proper engagement and ease of operation.
Pass	**Fail**	**Comments:**
❑	❑	

		Seats, Seat Belts and Shoulder Harnesses: Inspect cabin seats, seat belts, and shoulder harnesses for proper operations, condition, and security of attachment.
Pass	**Fail**	**Comments:**
❑	❑	

		Ventilation System: Check all fresh air vents for obstructions, proper movement and operation.
Pass	**Fail**	**Comments:**
❑	❑	

		Fuel System: Inspect for leakage, security, freedom of movement, and condition. Inspect fuel filter and replace if necessary. Check security of all fuel line hose clamps. Check for proper placarding.
Pass	**Fail**	**Comments:**
❑	❑	

		Headset Jacks: Inspect for cleanliness, security, and evidence of damage.
Pass	**Fail**	**Comments:**
❑	❑	

4. Wings and Carry-Through Structure

		Skin: Check for deformation and obvious damage. Check for cracks. If damage is found, check adjacent structure. Check for indications of excessive flight loading.
Pass	**Fail**	**Comments:**
❑	❑	

		Access Panels: Inspect for cracks, proper fit and attachment.
Pass	**Fail**	**Comments:**
❑	❑	

		Control Cables: Check aileron controls for smoothness and ease of operation. Check aileron cable clamps for security and proper placement. Check control cable ends for security, alignment, corrosion, and binding.
Pass	**Fail**	**Comments:**
❑	❑	

		Ailerons: Check control surfaces for proper clearance and freedom of movement. Check hinges and hinge pins for security. Check aileron skin and visible structure for cracks.
Pass	**Fail**	**Comments:**
❑	❑	

		Fuel Tanks, Caps and Vents: Inspect bottom of wing for evidence of fuel tank leakage. Inspect vents for blockages. Check filler caps for ease of operation.
Pass	**Fail**	**Comments:**
❑	❑	

		Plumbing: Check for leakage, chafing, condition and security.
Pass	**Fail**	**Comments:**
❑	❑	

		Electrical Wiring and Equipment: Inspect for chafing, damage, security and attachment.
Pass	**Fail**	**Comments:**
❑	❑	

		Flaps and Actuators: Check for condition, security, binding or chafing of actuator rods. Check flap skin and visible structure for cracks.
Pass	**Fail**	**Comments:**
❑	❑	

		Flap Position Indicator: Check for security and operation.
Pass	**Fail**	**Comments:**
❑	❑	

		Wing Bolts: Check wing bolts for security. DO NOT overtighten.
Pass	**Fail**	**Comments:**
❑	❑	

		Fuel Vents, Pitot Tube, and Stall Warning: Check for condition and obstructions.
Pass	**Fail**	**Comments:**
❑	❑	

		Drain Ports: Check drain holes in wing and surfaces to assure they are free of obstructions.
Pass	**Fail**	
❑	❑	

5. Nose Gear

		Wheel and Tire: Check wheel for cracks and tire for wear, damage, condition and proper inflation. Check sealed bearings for condition and wear.
Pass	**Fail**	
❑	❑	

		Landing gear strut: Inspect rubber shock strut and components for cracks, wear and attachment. Inspect wheel yoke and strut for straightness and security.
Pass	**Fail**	**Comments:**
❑	❑	

		Actuating Linkages: Check for wear at attach points. Check for cracks and security.
Pass	**Fail**	**Comments:**
❑	❑	

		Nose Gear Steering Linkage: Inspect linkages for tightness, condition and security.
Pass	**Fail**	**Comments:**
❑	❑	

		Nose Gear Operation: Check for condition, smooth operation, and security.
Pass	**Fail**	**Comments:**
❑	❑	

6. Main Gear and Brakes

		Brakes, Lines, Lining and Discs: Check for condition, wear and security. Check lines for chafing and signs of leakage and cracks. Check brake discs for cracks.
Pass	**Fail**	**Comments:**
❑	❑	

		Wheels and Tires: Check wheels for cracks and tires for wear, damage, condition and proper inflation. Check and repack wheel bearings.
Pass	**Fail**	**Comments:**
❑	❑	

		Landing Gear Legs: Inspect legs for cracks, overextension or signs of delamination.
Pass	**Fail**	**Comments:**
❑	❑	

7. Rear Fuselage and Empennage

		Skin: Check for deformation, cracks and obvious damage. If damage is found, check adjacent structure.
Pass	**Fail**	**Comments:**
❑	❑	

		Internal Fuselage Structure: Check for cracks and deformation. Check bulkheads, door posts, and center tunnel for cracks or delamination.
Pass	**Fail**	**Comments:**
❑	❑	

		Control Cables: Check elevator and rudder push-pull cables for condition, attachment, alignment, clearance and proper operation. Check cable clamps on both ends for proper attachment and placement. Check rod ends for security and freedom of motion.
Pass	**Fail**	**Comments:**
❑	❑	

		Control Surfaces: Check for deformation, cracks, security of hinges, freedom of movement and travel limits.
Pass	**Fail**	**Comments:**
❑	❑	

		Fixed Trim Tabs: Check for security and obvious damage.
Pass	**Fail**	**Comments:**
❑	❑	

		Static Port: Check for blockages. Check static probe for condition.
Pass	**Fail**	**Comments:**
❑	❑	

		Antennas: Check for condition and security.
Pass	**Fail**	**Comments:**
❑	❑	

8. General

		Airplane cleaned and serviced.
Pass	**Fail**	**Comments:**
❑	❑	

		Inspect all placards to assure they are easily readable and securely attached.
Pass	**Fail**	**Comments:**
❑	❑	

		Ensure that all Service Bulletins, Air Safety Alerts, and previously issued Service Instructions are reviewed and complied with as required.
Pass	**Fail**	**Comments:**
❑	❑	

		For a complete annual or 100-hour inspection of the airplane, all items on the airplane that are noted in this guide must be inspected.
Pass	**Fail**	**Comments:**
❑	❑	

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Jabiru J230-SP & J250-SP Quick Reference Maintenance Guide

Oil Type	AeroShell 15W-50*
Oil Quantity	3.7 US Quarts
Oil Filter	NAPA Gold 1394
Fuel Filter	Fram G1
Air Filter	NAPA 6116 or K&N 33-2031-2
Spark Plug	NGK D9EA
Spark Plug Gap	.022"
Spark Plug Tension	8 ft-lbs or 96 in-lbs
Ignition Coil Gap	.010"
Head Bolt Tension	20-22 ft-lbs*
Prop Bolt Tension	17-19 ft-lbs
Main Tire Pressure	35-40 psi
Nose Tire Pressure	25 psi
** After initial 25-hour engine break-in period*	

NOTE: All S-LSA aircraft must have a logbook endorsement for return to service by an A&P or LSA Repairman with Maintenance Rating after performance of any preventive maintenance tasks not listed under FAR Part 43, *Appendix A: Maintenance, Preventive Maintenance, Rebuilding and Alteration, Section C.*

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Jabiru USA Sport Aircraft, LLC

MALFUNCTION OR DEFECT REPORT

OPER. Control No.			
ATA Code			
1. A/C Reg. No.	N-		

Enter pertinent data	MANUFACTURER	MODEL/SERIES	SERIAL NUMBER
2. AIRCRAFT			
3. POWERPLANT			
4. PROPELLER			

5. SPECIFIC PART *(of component)* CAUSING TROUBLE

Part Name	MFG. Model or Part No.	Serial No.	Part/Defect Location.

6. APPLIANCE/COMPONENT *(Assembly that Includes part)*

Comp/Appl Name	Manufacturer	Model or Part No.	Serial Number

Part TT	Part TSO	Part Condition	7. Date Sub.

8. Comments *(Describe the malfunction or defect and the circumstances under which it occurred. State probable cause and recommendations to prevent recurrence.)*

Optional Information:

Check a box below, if this report is related to an aircraft

☐ **Accident; Date** _____ ☐ **Incident; Date** _____

DISTRICT OFFICE ▪ | OPERATOR DESIGNATION

OTHER | COMMUTER | FAA | MFG. | AIR TAXI | MECH. | OPER. | REP.STA.

SUBMITTED BY:

TELEPHONE NUMBER ( ) —

JSA-501

Use this space for continuation of Block 8 *(if required).*

Return this form with any additional information to:

Jabiru USA Sport Aircraft, LLC
2842 Highway 231 North
Shelbyville TN 37160
931-680-2800

JABIRU AIRCRAFT PTY LTD

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Email: info@jabiru.net.au

SERVICE LETTER: JSL 007-3

Issue: 3

Date: 5th Nov 2009

WARNING: All Jabiru aircraft manufactured by Jabiru USA Sport Aircraft, LLC are PROHIBITED from using any concentration of alcohol in the fuel. 100LL is recommended for all operations.

Subject: Alcohol, Lead, Compression Ratio: Fuel Guidance

Issue	Reason for Issue	Revision Status
1	Original Issue	CANCELLED
2	New Information Added	CANCELLED
3	Title changed, "High Lead" Avgas notes added	CURRENT

1 Applicability

All Jabiru Aircraft and Engines.
Note: for LSA category aircraft, this Letter is equivalent to a Manufacturer's Safety Direction.

2 Background

2.1 Issue Notes

- Originally this Service Letter was intended to provide operators with basic guidance information for operating their aircraft and engines on fuels containing alcohol.
- Issue 2 was produced to include additional information about the combustion chamber, compression ratio and suitable fuels.
- Issue 3 includes operating information on fuels with a higher lead content. At the same time, the technical content of the letter has now moved so far beyond alcohol limits that the title of the Service Letter has been changed to better reflect it's content.

2.2 General

- Current Jabiru 2200 and 3300 engines are designed to use Australian Aviation Gasoline (AVGAS) or Australian Premium Unleaded Motor Spirit (MOGAS) of at least 95 octane RON.

- Over time Jabiru Engines have used several different compression ratios and combustion chamber arrangements. Section 3 gives details on the different combinations produced and discusses suitable fuels for each.

- Worldwide, the most common type of AVGAS is 100LL – where "LL" means "Low Lead. In some areas AVGAS 100 - which contains significantly more tetraethyl lead – is also available. Section 4 gives details of the different fuels and discusses their different operating and maintenance effects.

- Recently it has become common for automotive fuels to contain alcohol. Many automotive fuels now contain 5, 10 or higher percentages of alcohol – typically Ethanol. Octane boosters also often contain alcohol. Section 5 has been prepared to guide owners and operators on some of the effects of using a fuel containing alcohol in a Jabiru Aircraft or Engine.

- An automotive fuel's anti-detonation performance is usually measured in Australia using RON (Research Octane Number). MON (Motor Octane Number) or AKI (Anti-Knock Index) are sometimes also used. RON is always a higher number than both MON and AKI. As a general rule, RON can be estimated by adding 5 to a fuel's AKI (i.e. a fuel with an AKI of 89 will have a RON of approximately 94, and so must not be used.).
- The recommendations given in this letter are applicable for Jabiru Aircraft and Engines as noted – including older variants. While older Jabiru Engines have a different combustion chamber shape which demands the use of a fuel with 100 Octane RON or higher the presence of alcohol in the fuel (within the limits noted) is not a problem for these engines.

3 Compression Ratio / Combustion Chamber Shape

3.1 Compression Ratio

- At Manufacture the compression ratios of Jabiru Engines were as listed:
  - 1600 All S/No. 9.3:1
  - 2200 S/No. 1 – 106 9.3:1
  - 2200 S/No. 107 – 127 9.3:1
  - 2200 S/No. 128 – 831 7.8:1 or 8.3:1
  - 2200 S/No. 832 – 1003 7.8:1 or 8.3:1
  - 2200 S/No. 1004 Onwards 8:1
  - 3300 S/No. 1 – 223 7.8:1 or 8.3:1
  - 3300 S/No. 224 Onwards 8:1
  - 5100 All S/No. 8.5:1
- Where two ratios are listed those engines fitted with shims between the cylinder barrel and the crankcase have the lower ratio, engines without shims the higher.
- Note that the details given above apply to each engine as it was produced. As many of the older engines are now more than 10 years old and have been overhauled in the meantime, operators must be aware that the engine's current configuration may be different from that given here.

3.2 Combustion Chamber Shape

- Older Jabiru Engines had a combustion chamber shape which demands the use of AVGAS or 100 Octane RON fuel. Details are given below.
- Note that the details given above apply to each engine as it was produced. As many of the older engines are now more than 10 years old and have been overhauled in the meantime, operators must be aware that the engine's current configuration may be different from that given here.
- The following engines were manufactured with combustion chamber as shown in Figure 1.
  - 2200 S/No. 1 - 1003.
  - 3300 S/No. 1 - 223
  - All Jabiru 1600 engines.

Figure 1 – Early "High Octane" Combustion Chamber

- The “High Octane” chamber can be modified as shown in Figure 2.

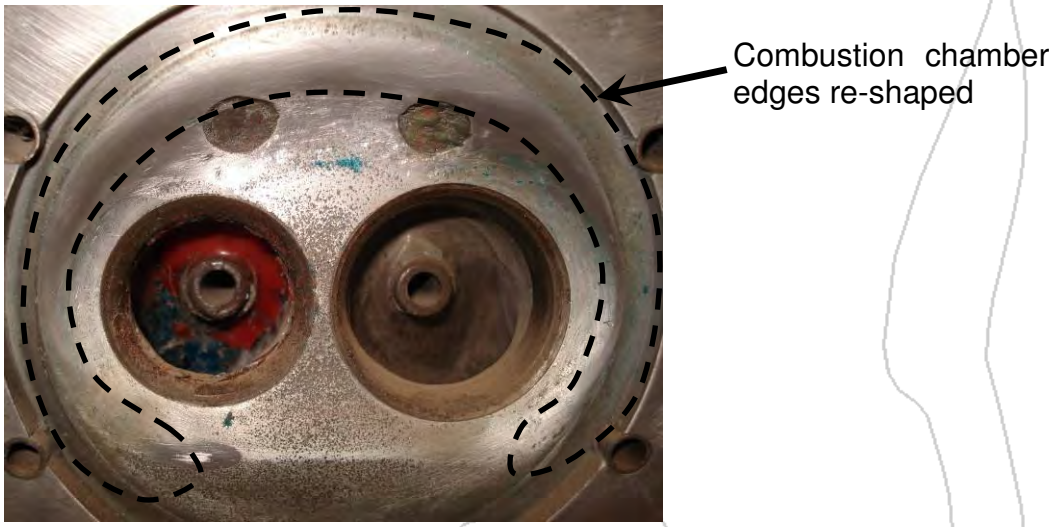

Figure 2 – Re-Worked “High Octane” Combustion Chamber

- Engines with Serial Numbers higher than the range listed above were manufactured using variations of the combustion chamber shown in Figure 3.

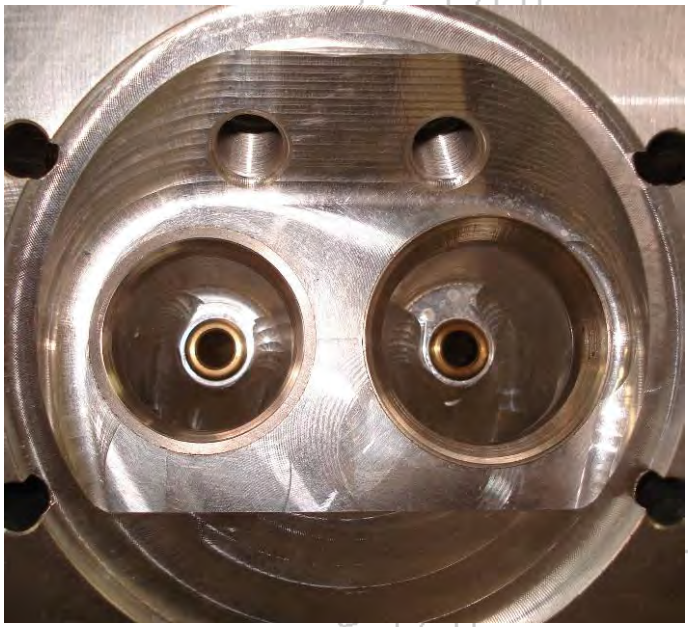

Figure 3 – Current “Wedge” Combustion Chamber

3.3 Fuel Octane Rating Requirements

- All 2200B, 2200C and 3300L engines may be operated using 95 Octane RON (or higher) MOGAS or AVGAS fuels. The fuels may contain alcohol to the limits listed in Section 6.6.
- Table 1 can be used to find which fuels should be used for a given engine. Example: 2200 engine, S/No. 800 with no shims fitted and therefore compression ratio of 8.3:1 (Section 3). Combustion chambers have been re-worked to Figure 2. Read the table as marked with the arrows, to the grey-shaded cell: the engine may use 95 Octane MOGAS.

Table 1 – Chamber / Compression Matrix

Compression Ratio:	"High Octane" Chamber	Modified "High Octane" Chamber	"Wedge" Chamber
9.3:1	100 RON or higher	100 RON or higher	N/A
8.5:1	N/A	N/A	100 RON or higher
8.3:1	100 RON or Higher	95 RON or higher	N/A
8:1	N/A	N/A	95 RON or higher
7.8:1	95 RON or Higher	95 RON or higher	N/A

- Any of these engines may use fuels containing alcohol up to the limits given in Section 6.6.

4 Fuel Containing Tetraethyl-Lead

4.1 General

- As noted above, worldwide AVGAS 100LL is the most common grade of aircraft fuel available.
- The "LL" designation indicates that the fuel contains a "Low Lead" level when compared to AVGAS 100 (which may also be known as AVGAS 100/130). Typically, AVGAS 100LL contains less than 0.56grams/litre while AVGAS 100 contains less than 0.85g/L. AVGAS 100LL is dyed blue while AVGAS 100 is dyed green.
- Generally, AVGAS blends store well and do not tend to degrade to a lower octane value over time.

4.2 Tetraethyl Lead – Good Points

- Tetraethyl Lead is an additive which is included in fuels to help suppress knock or detonation. Generally, detonation is the name given to a process where the fuel / air mix in the cylinder ignites too early. It produces very high pressures inside the engine which can easily cause severe damage. Aircraft engines are particularly vulnerable knock because they operate at higher power settings and temperatures than most other types of engine.
- Tetraethyl Lead also has some lubrication properties which helps to reduce wear to valve guides etc.
- The combination of benefits given by tetraethyl lead have proven to be hard to produce any other way which has made it difficult to develop a replacement fuel which will operate correctly in aircraft engines – particularly older types or high-powered turbo types.

4.3 Tetraethyl Lead – Bad Points

- By-products produced when a fuel containing tetraethyl lead is burnt are well known pollutants. Because of this, automotive fuels etc are now "unleaded" types – AVGAS is the only fuel containing lead still available in most parts of the world.
- High tetraethyl lead levels in a fuel can produce combustion chamber deposits. These deposits can affect piston ring sealing and valve sealing and also inhibit heat transfer from the combustion chamber to the head. They can also cause detonation – small pieces can become very hot and act like a glowing ember inside the combustion chamber. This "ember" then ignites the fuel before the spark plug has discharged.

4.4 The effect of Lead Content

- Modern, high-octane MOGAS burns very cleanly in a Jabiru engine. It leaves no or minimal deposits inside the combustion chamber. A fuel containing lead will leave deposits approximately proportional to it's lead content – i.e. higher lead equals more deposits.
- Compared to AVGAS 100/130, AVGAS 100LL produces around 25% less combustion chamber deposits. This reduction in deposits can significantly improve overhaul life in certain engines by reducing valve and cylinder head deposits and well as reduce spark plug fouling.
- Note that there is generally a maximum practical limit for the thickness of lead deposits inside a combustion chamber – they do not keep on growing thicker and thicker indefinitely. This means that when using AVGAS 100 the deposits reach this thickness and then stabilise more quickly than when using AVGAS 100LL.

4.5 Lead Content Recommendations

- Jabiru Aircraft have no objection to operators using AVGAS 100/130 or AVGAS 100LL.

5 MOGAS

5.1 MOGAS – Good Points

- MOGAS is cheaper than AVGAS and is more widely available
- MOGAS burns cleanly and produces combustion chamber deposits at a much slower rate than AVGAS.
- Fresh MOGAS of the correct octane rating produces the same engine performance as AVGAS.

5.2 MOGAS – Bad Points

- The single biggest drawback with MOGAS is Quality Control – quality control for MOGAS is very much poorer than for AVGAS. Fuel sold from automotive service stations may often be stale, contaminated or diluted. The busiest service station in town is most likely to have fresh, clean fuel and getting to know the station operators is also a good idea.
- Many automotive MOGAS blends rely on highly volatile components to produce the proper power etc. During storage these volatiles can be lost rapidly and the fuel's performance can degrade significantly in a relatively short period of time. Always using fresh fuel is strongly recommended.
- This needs to be stressed to operators as it is entirely possible for MOGAS loose several points from it's Octane rating while stored, leaving the engine vulnerable to detonation. In addition, long-term storage of MOGAS in an open-vented fuel system like a Jabiru's can encourage the formation of gums and other varnishes or solids which can then block the lines or filters.
- Automotive fuels are generally more prone to vapour-lock than AVGAS. Testing has shown that Jabiru Aircraft meet certification requirements for the prevention of vapour-lock when using MOGAS, however issues can be provoked by poor operational procedures. The following are recommended when operating on MOGAS:
  i. Avoid running the engine for extended periods on the ground – this causes heat-soak into the engine bay which increases vapour-lock risk.
  ii. Use the back-up electric fuel pump for all critical modes of flight – generally any time the aircraft is on the ground or within 1500 feet of the ground. Jabiru Aircraft have no objection to operators running the electric boost pump continuously.

5.3 MOGAS Usage Recommendations

- Use fuel which is as fresh as possible.
- Be aware of the potential issues arising from using MOGAS
- Follow the storage recommendations given below.

5.4 MOGAS - Storage

- Do not leave small amounts of MOGAS in the tank as it will be relatively highly exposed to air and may form gums, varnishes or other solids. Gum formation is caused by a chemical reaction within the fuel. The reaction speeds up as temperature increases so it is a particular problem in warmer climates. Aside from gum formation, the fuel's octane rating will also drop with time.
- Do not leave a tank full of MOGAS as it will loose volatiles over time, reducing it's octane rating. A full tank is somewhat less prone to forming solids than a nearly empty one because a smaller percentage of the fuel is exposed to the air, but after a month or two the entire contents may have lost so many octane points that it should not be used in the aircraft. Disposing of a large quantity of stale fuel then becomes a major problem.

- Do not drain the tank but leave MOGAS in the carburetor – as the fuel evaporates from the carburetor it will tend to form varnishes which will block jets etc.
- Do not block the tank vents to prevent evaporation: as the temperature around the aircraft rises and falls during the day and night the contents of the tank expand, contract and give off gases. If the vents are blocked these effects can easily rupture the tank.

5.5 MOGAS Storage recommendations:

- Leaving the tank and carburetor full of AVGAS or
- Running the carburetor dry by turning off the fuel tap and running the engine until it stops, then draining all MOGAS from the tanks.
- Note that the storage methods currently outlined in Jabiru Technical Manuals generally presume that the aircraft is being operated on AVGAS – which generally suffers far less from the problems noted above. The "safe" amount of time that MOGAS may left in the tank depends on the exact recipe of the fuel, where the aircraft is stored and ambient conditions like temperature etc.
- Commercial fuel additives and stabilizers are available which are designed to allow MOGAS to be stored for longer, however Jabiru Aircraft have not tested their efficacy or their effects on other parts of the fuel system. Jabiru Aircraft does not currently endorse or approve their use.
- Several different fuel blends are sold at the bowser throughout the year. "Winter" fuel, "Summer" fuel and "Alpine" fuel (and many other sub-divisions) are sold depending on the time of year and the location of the fuel station. These fuels all have slightly different recipes designed to provide the right vaporization, octane number etc for an engine operating in the given environment. Fuel bought at the top of a snow-covered mountain in winter is not suitable for use at sea level during a summer heat wave. This is another reason why long-term storage of MOGAS for aircraft use is not recommended.

6 Alcohol

WARNING: Use of alcohol in any Jabiru aircraft manufactured by Jabiru USA Sport Aircraft, LLC is PROHIBITED. See Service Bulletin JSA-006 for more information, available on www.usjabiru.com.

6.1 General

- Worldwide, debate on using Ethanol as an aircraft fuel continues. The problem is that while it is a good fuel while the engine is running, it becomes a significant maintenance and storage issue whenever the aircraft is parked. These issues must be addressed if an aircraft is to operate safely on a fuel containing alcohol.

6.2 Alcohol – Good Points

- Alcohol is a renewable fuel which (arguably) produces less carbon dioxide than fossil fuel.
- Alcohol burns cleanly and has an octane boosting effect.

6.3 Alcohol – Bad Points

- Ethanol is hygroscopic (i.e. it will mix with water). This can be water vapour from the air, condensation inside tanks or free water. While very small amounts of water can be absorbed without significantly affecting combustion, at higher levels the mixture will not be combustible. In addition, because this incombustible fuel is formed from a mixture of the Ethanol in the fuel and the water it can have a large volume – so a small amount of water will result in a much larger amount of incombustible Ethanol/water mix. This may give false readings in the fuel tank sumps or exceed the volume of the sump altogether.
- As noted above, Ethanol is an Octane booster and can be absorbed by water. Because of this, mixing a fuel with water can effectively wash the Ethanol out of the fuel resulting in a significant drop to the remaining fuel's Octane rating.
- If an Octane Booster containing alcohol is used the operator must ensure that the maximum alcohol content of the resulting fuel / booster mix does not exceed the limits given below. Due to the fact that their composition varies widely between brands Jabiru Aircraft recommend avoiding the use of octane boosters wherever possible.
- The engine will use slightly more fuel as the percentage of added alcohol increases. As an approximate rule of thumb the engine must burn 3% more fuel to give the same power output if the fuel contains 10% Ethanol.
- Ethanol mixed with water is somewhat corrosive and may attack parts of the fuel system.
- In long-term storage, Ethanol may oxidise with exposure to air. This process produces a mild acid solution (effectively vinegar – the effect is the same as when the seal fails on a bottle of wine) which can attack fuel system fittings.
- Long term exposure to Ethanol damages some types of plastics. The flexible fuel lines used by Jabiru Aircraft have been chosen with Ethanol use in mind and are designed to be safe when replaced at the intervals specified in the aircraft Maintenance Manuals. However increased monitoring during servicing is recommended when using an Ethanol blend.
- **Note** that flexible fuel lines are available in a wide range of colours. Generally the colour of the line is a dye only and has no bearing on the line's ability to operate in contact with alcohol – though some fuel line manufacturers use different colours to designate different products. Jabiru Aircraft have used blue fuel lines and (at the time of writing) orange lines. Both are acceptable for use with fuels containing alcohol.
- Some fuel testers (including the type supplied by Jabiru Aircraft at the time of writing) have a scale on their side which allows the Ethanol content of a fuel to be checked & assessed.
- Several Australian Civil Aviation Safety Authority (CASA) documents discuss Ethanol use in aircraft. Jabiru Aircraft strongly recommend that owners considering using an Ethanol fuel

blend read and understand this information before using a fuel of this type. The following CASA document is current at the time of writing: Airworthiness Bulletin AWB 2828-003003

- **Important Note For Jabiru Aircraft:** Only aircraft with white coloured fuel tank sealant can use fuel containing alcohol. Earlier tanks use a caramel coloured sealant – this sealant is soluble in alcohol & must not be used with an alcohol blend fuel. Fuel tanks with caramel-coloured sealant may be re-sealed with white sealant – contact Jabiru Aircraft or our local representative for details. Figure 4 shows the sealant colour as seen through the filler.

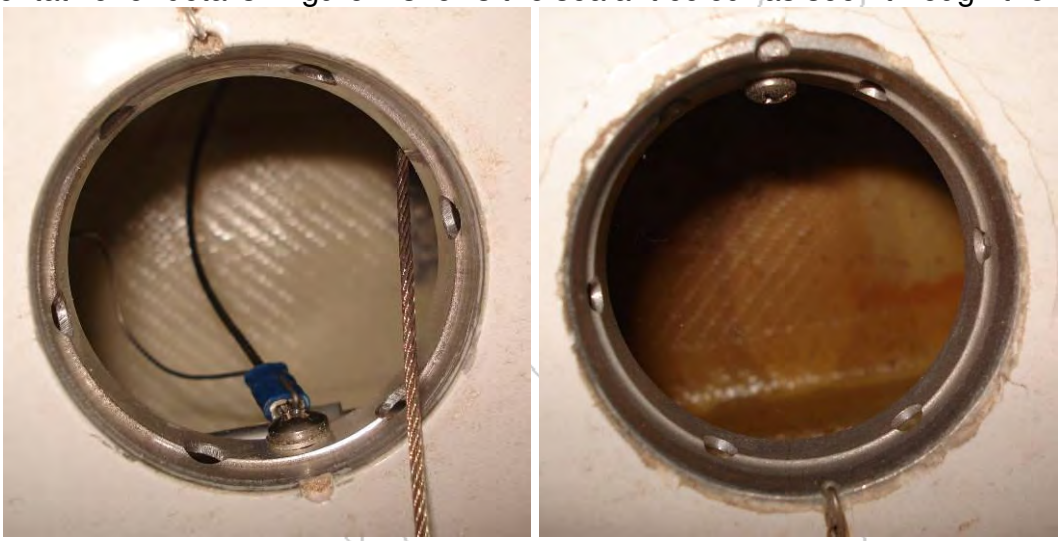

Figure 4 – Fuel Tank Sealant Colours (White on Left)

6.4 Individual Items[1]:

- **Carburettor:** Suitable for use with fuels containing alcohol.
- Carburettor inspection recommended after 200hrs (or 6 months) using fuel containing alcohol
- **Mechanical Fuel Pump**: Suitable for use with fuels containing alcohol.
- No additional maintenance required for up to 10% alcohol
- The pump manufacturer does not recommended using fuels containing more than 10%.
- Operational experience with fuels containing higher percentages has shown that the mechanical fuel pump is tolerant of higher levels of alcohol.
- **Carburettor Connection:** Suitable for use with fuels containing alcohol.
- **Electronic Fuel Pump:** Suitable for use with fuels containing alcohol.
- **O-Rings:** Suitable for use with fuels containing alcohol.
- **Black Fuel Hose:** Suitable for use with fuels containing alcohol.
- **Blue Fuel Hose:** Suitable for use with fuels containing alcohol.
- Maintenance & inspection requirements increased for fuel containing more than 10% alcohol.
- **White Coloured Fuel Tank Sealant:** Suitable for use with fuels containing alcohol.
- **Caramel Coloured Fuel Tank Sealant:** Unsuitable for use with fuels containing alcohol.
- **Combustion Chamber Shape:** All combustion chamber shapes are compatible with fuels containing alcohol. However, the Octane rating of the fuel used must be selected to suit the combustion chamber design.

6.5 Testing for Alcohol

- Using a clear jar of about 100-200 ml capacity (ideally a long and narrow jar) add about 10% by volume of water and mark the level of the water on the jar.
- Add a sample of the fuel to be tested to the jar so that the relative volumes are about 10% water/90% fuel

[1] Details applicable for OEM parts from Jabiru Aircraft Australia only

- Shake the sample vigorously and then allow the sample to settle
- Check the level of the "water"
- If the level is the same as previously marked on the jar, no alcohol is present in the fuel.
- If the level of "water" increases, alcohol is present in the fuel

6.6 Alcohol Usage Recommendations

6.6.1 General:

- Where possible Jabiru Aircraft recommend using AVGAS. This is a fuel specifically designed for aircraft use and is subject to very strict documentation and quality assurance. This is simply the safest fuel available.
- Because it has a higher compression ratio the Jabiru 5100 engine must be operated using AVGAS or other fuel with a RON of 100 or higher.
- Where a Jabiru Engine is installed in a non-Jabiru airframe the operator must comply with the airframe manufacturer's approved fuel recommendations.

6.6.2 Automotive Gasoline:

- Jabiru Aircraft has no objection to operators using automotive gasoline in Jabiru Aircraft or Jabiru Engines. For most engines the use of fuel with RON of 95 or above is adequate, however older engines must use a fuel which meets the Octane rating requirements of their combustion chamber (See Section 3 above).
- Note that different Jabiru Airframes can have different maintenance requirements. For example, the CASA-Certified J160-C must be operated and maintained in accordance with the CASA-Approved procedures given in it's Flight and Maintenance manuals – which do not allow the use of fuels containing alcohol (but do approve the use of suitable MOGAS).
- Operators wishing to use automotive gasoline but wishing to avoid using alcohol should obtain Technical Data Sheets for the Gasoline they are using. Regular testing as detailed above should also be carried out to ensure the fuel does not contain alcohol.
- Operators using Octane Boosters and wishing to avoid introducing alcohol to their fuel systems must ensure that their chosen octane booster does not contain alcohol.
- Maintenance for the engine and airframe is to be carried out in accordance with the standard schedules detailed in the Instruction and Maintenance Manuals of the engine and airframe manufacturers.

6.6.3 Use of Automotive Gasoline Containing Up to 10% Alcohol:

- Jabiru Aircraft has no objection to operators using gasoline containing up to 10% alcohol in Jabiru Aircraft or Jabiru Engines except as limited by the aircraft's certification basis. For most engines the use of fuel with RON of 95 or above is adequate, however older engines must use a fuel which meets the Octane rating requirements of their combustion chamber (See Section 3 above).
- **Only those Jabiru Aircraft with white coloured fuel tank sealant can use fuel containing alcohol.**
- No modifications are required for Jabiru Engines to use fuel containing 10% alcohol.
- Where a Jabiru Engine is installed in a non-Jabiru airframe the operator must comply with the airframe manufacturer's approved fuel recommendations.
- Clear fuel hose should be monitored for hardness, brittleness and loss of colour. Lines must be inspected regularly and renewed if any sign of deterioration (such as brittleness or cracking) is found. In addition, at the time of writing Jabiru Aircraft recommend that all flexible fuel lines be replaced at 2 year intervals. While this is considered adequate while

using a fuel containing alcohol, operators choosing to use these fuels are encouraged to be especially pro-active and exacting in their fuel system maintenance.

- It is recommended that after the first 200hrs (or 6 months) of operation on fuel containing alcohol the carburettor be disassembled for a one-off inspection. Components must be checked for damage, i.e. excessively soft or hard rubber parts, swelling of rubber components, corrosion of metal components. Replace parts if damaged or in doubt.

6.6.4 Use of Automotive Gasoline Containing Between 10% and 20% Alcohol:

- Jabiru Aircraft does not recommend that operators use any fuel containing between 10% and 20% alcohol in Jabiru Aircraft or Jabiru Engines.
- Operational experience has shown that operating Jabiru Aircraft and Engines with a fuel containing 10% – 20% alcohol is safe and does not introduce excessive maintenance requirements. However, formal testing has not been carried out and this level of alcohol content exceeds the maximum safe recommendations for some fuel system components.
- Operators using such fuel must understand that they operate entirely at their own risk. Clearly such operations can only occur in categories such as the "Experimental" category where all aircraft occupants & operators fly at their own risk.
- **Only those Jabiru Aircraft with white coloured fuel tank sealant can use fuel containing alcohol.**
- No modifications are required for Jabiru Engines run using fuel with 10% - 20% alcohol.
- Where a Jabiru Engine is installed in a non-Jabiru airframe the operator must comply with the airframe manufacturer's approved fuel recommendations.
- The ongoing maintenance requirements of a Jabiru aircraft or engine using this level of alcohol are currently unknown. The following points are recommended, however they are intended as a basic guide for operators and may not address all issues found when operating on these fuels. Operators must develop their own ongoing maintenance and inspection scheme suitable to their fuel and useage.
  i. Clear fuel hose should be monitored for hardness, brittleness and loss of colour. Lines must be inspected regularly and renewed if any sign of deterioration (such as brittleness or cracking) is found. It is recommended that all flexible fuel lines be replaced at 1 year intervals when using fuels containing 10% – 20% alcohol.
  ii. At every 200hrs (or 6 months) of operation the carburettor be disassembled and all components checked for damage, i.e. excessively soft or hard rubber parts, swelling of rubber components, corrosion of metal components. Replace component if in damaged or in doubt.
  iii. At every 200 hours (or 6 months) of operation the mechanical fuel pump be disassembled and all components checked for damage, i.e. excessively soft or hard rubber parts, swelling of rubber components, corrosion of metal components. Replace component if in damaged or in doubt.

6.6.5 Use of Automotive Gasoline Containing More Than 20% Alcohol

- Use of fuel containing more than 20% alcohol is not recommended.

6.7 Checks When Changing to a Fuel Containing Alcohol

- Fuel filter and carburettor bowl should be checked for sediment and clogging after 10 hrs (or 1 month) of use.
- It is recommended that fuel lines be renewed before switching to a fuel containing alcohol.

7 Fuel Summary

★★★★★ The Perfect Fuel (mythical beast – does not exist)

★★★★☆ The State of the Art (best fuel available for Jabiru Engines)

★★★☆☆ Quite Suitable (A good fuel with some relatively minor negatives)

★★☆☆☆ Suitable (A good fuel but which has operational, maintenance and legal requirements the operator must be aware of)

★☆☆☆☆ Marginal. (Should only be used when the operator has no other suitable choice)

☆☆☆☆☆ UNSUITABLE for use with Jabiru Engines.

Fuel	Pro	Con	Rating
AVGAS 100LL	- Availability (varies) - Quality assurance - Designed for aircraft. - Ease of storage	- Availability (varies) - Lead content - Price	★★★★☆
AVGAS 100	- Availability (varies) - Quality assurance - Designed for aircraft. - Ease of storage	- Availability (varies) - Lead content - Price - Maintenance may be higher	★★★★☆
Other AVGAS Blends with Higher Lead Levels	- Availability (varies) - Quality assurance - Designed for aircraft. - Ease of storage	- Availability (varies) - Lead content - Price - Maintenance may be higher	★★★☆☆
95+ Octane RON MOGAS	- Availability (varies) - No lead - Price - Clean burn - Good Octane when fresh	- Availability (varies) - Does not store well - Lower quality controls - Not designed for aircraft	★★★☆☆
95+ Octane RON MOGAS Containing Alcohol	- Availability (varies) - No lead - Price - Clean Burn - Good octane when fresh	- Availability (varies) - Does not store well - Lower quality controls - Extra alcohol-related maintenance required. - Not designed for aircraft	★★☆☆☆
Lower Octane Fuels with Octane Booster Added	- Availability (varies) - Price - No lead - Clean burn	- Availability (varies) - Unknown octane rating - Lower quality controls - Does not store well - Unknown octane booster content - Extra alcohol-related maintenance required. - Not designed for aircraft	★☆☆☆☆
Lower Octane fuels	- None Applicable	- Unsuitable - Will damage engines - May write engine off completely.	☆☆☆☆☆

Jabiru Service Letter: Alcohol, Lead, Compression Ratio: Fuel Guidance	
JSL 007-3	5th Nov 2009

8 Contact Information:

Preferred Method of Contact: email info@jabiru.net.au

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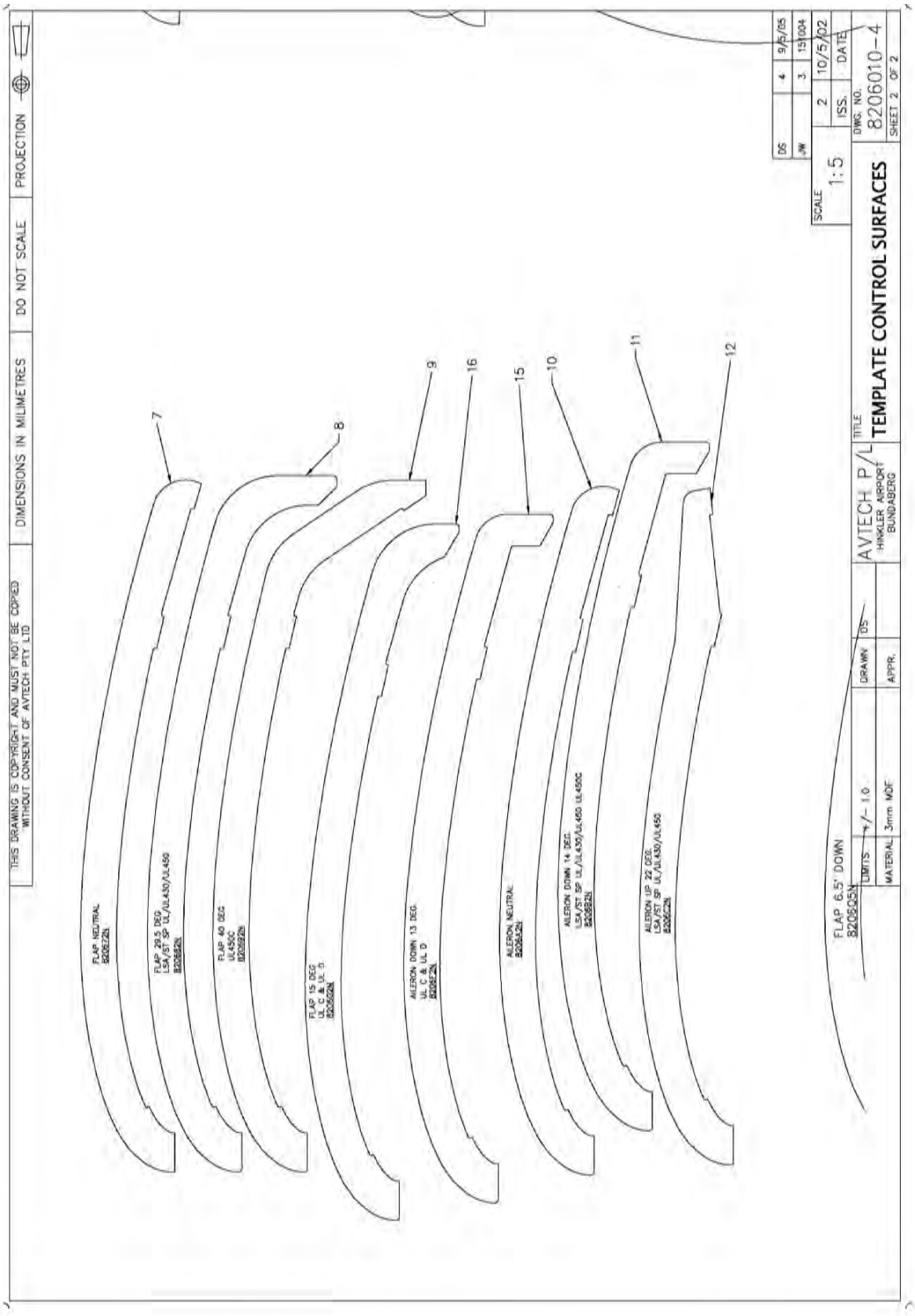
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PROJECTION
FLAP NEUTRAL 8206J2N
FLAP 29.5 DEG LSA/ST SP UL/ULA30/ULA50 8206J2L
FLAP 40 DEG UL450C 8206J2R
FLAP 15 DEG UL C & UL D 8206J2K
AILERON DOWN 13 DEG. UL C & UL D 8206F2N
AILERON NEUTRAL 8206L2N
AILERON DOWN 14 DEG. LSA/ST SP UL/ULA30/ULA50 UL450C 8206B2N
AILERON UP 25 DEG. LSA/ST SP UL/ULA30/ULA50 8206C2N
FLAP 6.5° DOWN 8206D5N
7
8
9
16
15
10
11
12
UNITS +/- 1.0
MATERIAL 3mm MDF
DRAWN DS
APPR.
AVTECH P/L
HINKLER AIRPORT BUNDABERG
TITLE
TEMPLATE CONTROL SURFACES
SCALE 1:5
DS 4 9/5/05
JW 3 15/1/04
2 10/5/02
ISS. DATE
DWG. NO. 8206010-4
SHEET 2 OF 2

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Fax: (931) 680-1817
http://www.usjabiru.com/

Engine Information

For all correspondence regarding Jabiru S-LSA aircraft engines, please contact
Jabiru USA Sport Aircraft, LLC.
All engine manuals are available for free download from Jabiru Aircraft PTY LTD at their web-site: http://www.jabiru.net.au/

Propeller Information

Sensenich Wood Propeller Co., Inc.
2008 Wood Court
Plant City, FL 33563
Phone: (813) 752-3711
Fax: (813) 752-2818
http://www.sensenichprop.com
Wood Propellers: Installation, Operation, & Maintenance
Available for free download in PDF format:
http://www.sensenichprop.com/sen_html/aircraft_cet/install/cf-a.pdf

Wheels and Brakes

Matco Manufacturing
2361 South 1560 West
Woods Cross, UT 84087
Phone: (801) 335-0582
Fax: (801) 335-0581
www.matcomfg.com
MHE51 Technical Manual available for free download in PDF format:
http://www.matcomfg.com/TechnicalManualsServiceBulletins-tp2-23.html

Electronic Flight Information System (EFIS) and Engine Information System (EIS)

Grand Rapids Technologies, Inc.
3133 Madison Ave.
Wyoming, MI 49548-1211
Phone: (616) 245-7700
Fax: (616) 245-7707
Free user manuals available for download in PDF format:
http://www.grtavionics.com

XM Weather

WxWorx receiver provided and supported by Grand Rapids Technologies, Inc.
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Radio and Transponder

Garmin Aviation Support
USA Phone: (913) 397-8200
USA Toll Free: 1-866-739-5687
Canada: 1-866-429-9296
http://www.garmin.com

Free user manuals are available for download in PDF format:
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Intercom

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9800 Martel Rd.
Lenoir City, TN 37772
Technical Support: (865) 988-9800
Fax: (865) 988-6619
E-Mail: contact@ps-engineering.com
http://www.ps-engineering.com/
Free user manuals available for download in PDF format:
http://www.ps-engineering.com/downloads.shtml

Autopilot

TruTrak Flight Systems, Inc.
1500 South Old Missouri Road
Springdale, AR 72764
Phone: 1-866-TRUTRAK or (479) 751-0250
Fax: (479) 751-3397
http://www.trutrakflightsystems.com/

Free user manuals available for download in PDF format:
http://www.trutrakflightsystems.com/docs2.htm

Emergency Locator Transmitter

Aircraft manufactured before 2009: AK-450 121.5 /243 MHz ELT

Ameri-King Corporation
17881 Sampson Lane
Huntington Beach, CA 92648
Phone: (714) 842-8555
Fax: (714) 842-4235
Email: ameriking9@aol.com
http://www.ameri-king.com/
Free manual in PDF format available for download in Manuals section of website.

Aircraft manufactured in 2009 and newer: Kannad 406 AF Compact

KANNAD
Z.I des 5 Chemins BP 23
56520 GUIDEL - France
Phone: +33 2 97 02 49 49
Fax : +33 2 97 65 00 20
http://www.kannad.com/index.php
Free manual available in PDF format for download:
http://www.kannad.com/upload/contenu/fichier/78fichier2.pdf

Navigation / Anti-collision Lights

Aircraft manufactured prior to June 2009:

GS-AIR--A Division of GS Developments, LLC
130 Cheval LN NE
Rochester, MN, 55906 - USA
E-mail : support@gs-air.com

www.gs-air.com

Aircraft manufactured June 2009 and newer:

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967 East Park Center Boulevard
Suite # 381
Boise, ID 83706-6700
Phone - (208) 850-3294
Fax - (208) 246-0552
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