

Section 2

Ground handling, servicing, lubrication and inspection

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2.1 Ground Handling

2.2 Towing the aircraft

Moving the aircraft by hand is done by using the wing struts and landing gear struts as push points. Since there is no tow bar applicable at the nose gear, you have to press down and hold on the left side of fuselage adjacent to the fin to raise the nose wheel off the ground. With the nose wheel clear of ground, the aircraft can be turned by pivoting it about the main wheels.

2.3 Hoisting

The aircraft may be lifted by points designed for this purpose - the aircraft rear section may be lifted by hand by use of the grip rail on the left side of the fuselage, or by the underside of the rear fuselage lattice-work, preferably by use of tube gussets if possible, so that the fuselage part being lifted can be supported with a soft pad on the lattice-work tubes of the fuselage, or on a stand under the tail-wheel landing gear. The aircraft must be chocked on all wheel to prevent any undesirable movement. Load relief of landing gear one side. To relieve the load on one side of the landing gear, lift that side of the aircraft by the wing strut attachments points to the required height. This method cannot be applied for a long-term aircraft supporting, it may be used for a momentary, short-term lifting of the aircraft only. When jacking the whole of the aircraft firstly make ready a block padded on one side with a soft material. We will use this block to support transversely the front part of the fuselage and, using two jacks, jack the aircraft fuselage up to the required height. Furthermore, prepare a fixing stand to be located underneath the aircraft, thus assuring stable support and positioning for the whole aircraft. To jack-up the aircraft, you can also use special jacking stands designed for large aircraft if the size and frame configurations are appropriate.

2.4 Jacking

Refer to paragraph 2.3. The aircraft does not feature further jacking points except for changing main wheels. Doing so requires one person to lift the aircraft by pushing up at the points where the struts connect to the wing, while a second person has to put a jack beneath the main wheel axle. A piece of foam must be inserted between the jack and the wheel axle so that no damage will occur to the paint.

2.5 Parking

Parking precautions depend principally on local conditions. As a general precaution, apply the parking brake or chock the wheels and lock the controls. It is often found a safe precaution to tie down the aircraft as outlined in paragraph 2.6. if a hangar is not available even in weather not deemed a threat to the aircraft. Weather conditions often change rapidly and many aircraft have been saved by the use of tie downs.

Caution

Do not apply the parking brakes during cold weather (when accumulated moisture may freeze the brakes) or when brakes are overheated.

2.6 Tie-down

When parking the aircraft in the open, point the aircraft into wind if possible. Secure control surfaces by using suitable locks or clamps and set brakes.

After completing this procedure, proceed to tie the aircraft down as follows:

Tie ropes to the wing tie-down fittings (strut-wing attachment point). Secure the opposite ends of ropes to the ground anchors.

Secure a tie-down rope (no chains or cables) to the exposed propeller shaft (between the cowling and the spinner) and secure the opposite end of the rope to a ground anchor.

Secure the middle of a rope to the tail tie-down ring. Pull each end of rope away at a 45-degree angle and secure to ground anchors at each side of tail.

Secure controls to the rearward position by using the seat belts.

2.7 Flyable storage

Flyable storage is defined as a maximum duration of 30 days non-operational storage and/or the first 20 hours of intermittent engine operation.

During the 30 day non-operational storage or the first 20 hours of intermittent engine operation, every seventh day the propeller should be rotated through 10 revolutions, without running the engine. If the aircraft is stored outside, tie-down in accordance with paragraph 2.6. In addition, the pitot tube, static airvents, air vents, openings in the engine cowling, and or similar openings should all have protective covers installed to prevent entry of any foreign material. After 30 days, aircraft should be flown for 30 minutes or ground run-up until oil has reached operating temperature.

2.8 Returning aircraft to service

After flyable storage, returning the aircraft to service is accomplished by performing a thorough pre-flight inspection. At the end of the first 20 hours of engine operation, drain engine oil and replace external oil filter element. Service engine with correct grade and quantity of engine oil. Refer to figure 1-3. and paragraph 1.6 for correct grade of engine oil.

2.9 Temporary storage

Temporary storage is defined as an aircraft in a non-operational status for a maximum duration of 90 days. The aircraft is made from metal material, composite materials and a fabric surface. This construction will allow the aircraft to be stored for long periods of time without damage to the airframe. Nevertheless we recommend to store the aircraft in a dry hanger to keep paintwork and metal parts in good condition. For storage periods not exceeding 90 days, the following methods of treatment are suggested:

- a. Fill fuel tank with correct grade of gasoline.
- b. Clean and wax aircraft thoroughly.
- c. Clean any oil or grease from tires and coat tires with a tire preservative. Cover tires to protect against grease and oil.
- d. Rotate wheels every 30 days to change supporting points and prevent flat-spotting the tires.
- e. Seal or cover all openings which could allow moisture and/or dust to enter.
- f. Remove battery (see paragraph 15.17) and store in a cool dry place, charge battery as required.
- g. Seal all engine openings exposed to the atmosphere using suitable plugs or none-hygroscopic tape. Attach a red streamer at each point that a plug or tape is installed.
- h. If the aircraft is to be stored outside, perform the procedures outlined in paragraph 2.6. In addition, the pitot tube, static ports, air vents, openings in the engine cowling and other similar openings should have protective covers installed to prevent entry of foreign material.
- i. Attach a warning placard to the propeller to the effect that the propeller should not be moved while the engine is in storage state.

2.10 Inspection during storage

Remove dust accumulations from airframe as frequently as possible, clean and wax as required.

2.11 Returning aircraft to service

After temporary storage, use the following procedures to return aircraft to service:

- a. Check tires for proper inflation.
- b. Check battery and install.
- c. Check the oil sump has proper quantity of engine oil (Refer to Pilot Operating Handbook and/or Rotax Operator's Manual for instructions).
- d. Service induction air filter and remove warning placard from propeller.

- e. Remove materials used to cover openings.
- f. Check fuel tank and fuel lines for moisture and sediment, drain enough fuel to eliminate any possible moisture and sediment within the fuel system.
- g. Perform a thorough pre-flight inspection, then start and warm-up engine.

2.12 Servicing

Servicing requirements are shown in figure 2-2. The following paragraphs supplement this figure by adding details not included in the figure.

2.13 Fuel

Fuel tank should be filled immediately after flight to lessen moisture condensation. Tank capacity is listed in Section 1. The recommended fuel grade to be used is given in figure 2-2.

2.14 Fuel drains

A fuel drain is located at the bottom of the fuselage. The drain valve is accessed from beneath the fuselage adjacent to the main left-hand undercarriage leg. To activate the drain, push the metal tube upwards.

2.15 Engine oil

To check the engine oil, use the oil dipstick located in the oil tank on the right hand side of the firewall. The level should be checked immediately after the engine has been stopped and the propeller turned in the operational direction until a bubbling noise can be heard from the oil expansion tank. **PLEASE ENSURE THAT THE IGNITION SWITCHES ARE DOWN AND THE KEY IS REMOVED BEFORE TURNING THE PROPELLER!** This is the only way to check the engine oil level correctly. (Refer also to the ROTAX Engine Operator's Manual).

Engine oil should be drained while the engine is still hot so that more positive draining is obtained. Refer to the inspection charts for required intervals for oil and filter changes. Change oil at least every 12 months even if less than the specified hours have accumulated. Reduce this period for prolonged operation in dusty areas, in cold climates where sludging conditions exist, or where short flights and long idle periods are encountered, which cause sludging conditions.

Caution

Never operate with less than the minimum engine oil level on the dipstick marking.

2.16 Engine induction air filter

The induction air filter keeps dust and dirt from entering the induction system. Maintaining the air filter in a good clean condition is extremely important as contaminated air is responsible for considerable amounts of wear on the engine. The filter should be removed, inspected and cleaned as necessary at least every 50 hours and more frequently if warranted by use in non-ideal operating conditions. Due to reasons of flight safety the filter should be replaced after using 100 hours of engine operation time or one year, whichever should occur first.

Caution

The filter has to be replaced if damaged, if in doubt, the filter has to be replaced as a precaution to flight safety. Be sure air box is clean before installing a new filter.

2.17 Battery

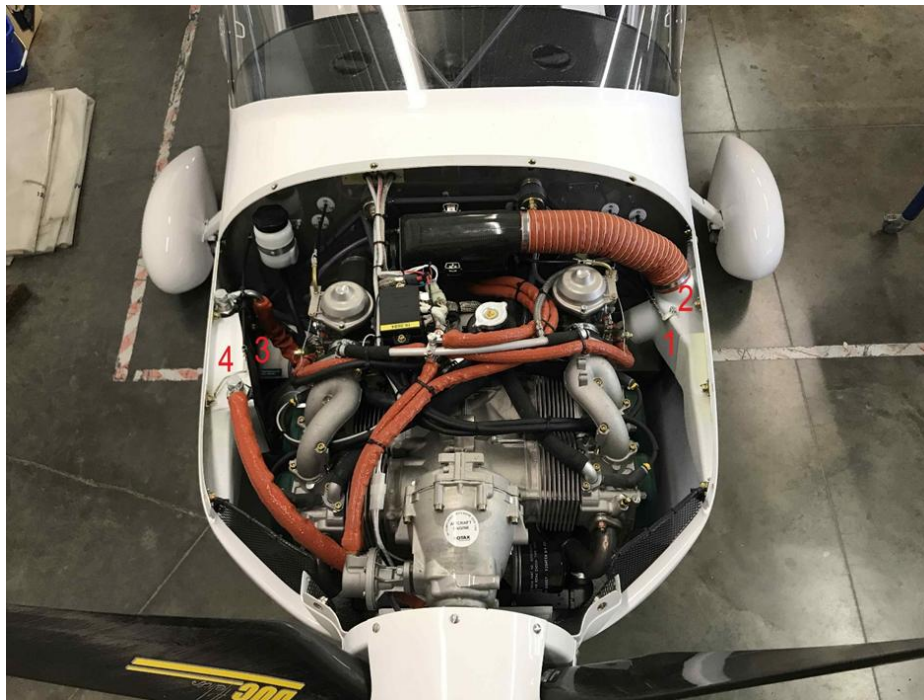
The installed battery needs no further servicing, except checking cable connections. It is important to check battery voltage when the aircraft is out of service for more than two weeks. Battery voltage has to maintain at least 12.0 volts without engine running and all equipment switched off and master switch in "off" position (regular voltage 12.5 volts). If voltage does indicate 12.2 volts or less it has to be charged. Charging instructions can be found on the battery. If battery voltage is less than 11.8 volts a replacement battery may be required.

2.18 Tires

Maintain the tire pressures at the air pressure specified in figure 1-1. When checking tire pressure, examine tires for wear, cuts, bruises and spillage. Remove oil, grease and mud from tires with soap and water.

Note	Recommended tire pressures should be maintained. Especially in cold weather, remember that any drop in temperature of the air inside a tire causes a corresponding drop in air pressure.
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Figure 2-1 - Rotax 912ULS engine installation



1. Controls lever for carburetor heat
2. Clip for elastic air tube
3. Holder for oil cooler –one screw M5
4. Oil cooler

Figure 2-2

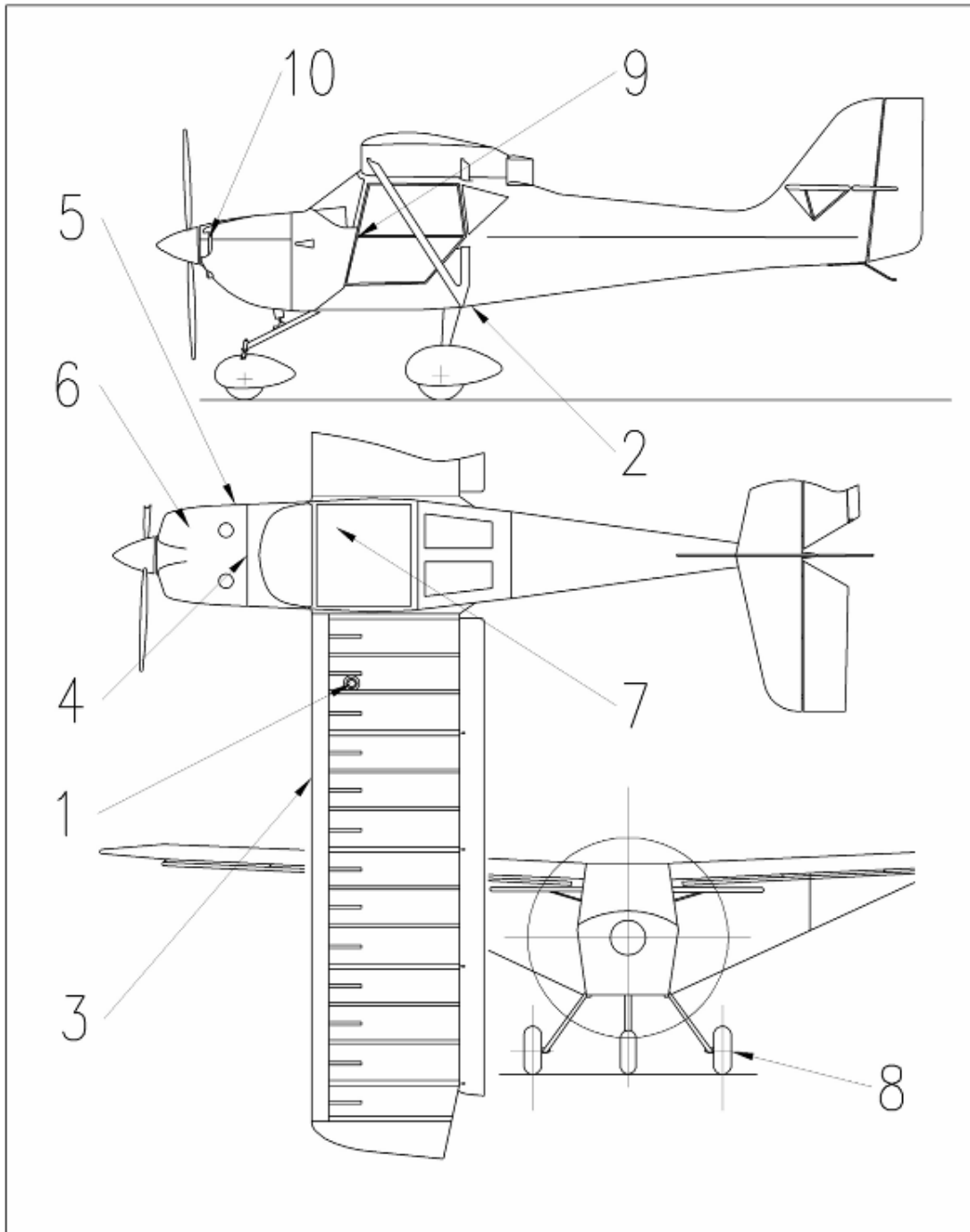


Figure 2-2

Daily	
1	Fuel tank filler Service after each flight. Keep full to reduce the possibility of condensation in the fuel tank. Refer to paragraph 2.13.
2	Fuel tank sump drain Drain off sufficient amount to test for water or sediment contamination before first flight of the day.
3	Pitot port Check for damage, alignment and blockages before first flight of the day.
4	Induction air filter Inspect and service regularly, give extra consideration when in dusty conditions. Refer to paragraph 2.16 for details.
5	Oil dipstick and oil filler cap Check oil during pre-flight. Add oil if necessary. Check base of cap for water contamination. Refer to paragraph 2.15 for details
10	Engine cooling system Check water level on preflight. Add specified coolant as required. Refer to the POH and latest engine manufacturer's manual for details.
First 25 hours	
6	Engine oil system Drain and refill Oil with recommended engine oil grade, replace oil filter.
100 hours	
4	Induction air filter Clean filter per paragraph 2.16, replace as required.
7	Battery Check for correct voltage level. Charge or replace if required. Refer to paragraph 2.17 for details.
8	Tires Maintain correct tire inflation as listed in figure 1-1. Also refer to paragraph 2.18 for details.
200 hours	
9	Brake master cylinder Check fluid level and refill as required with DOT 4 automobile brake fluid. Refer to paragraph 2.19 for details.
2	Fuel tank sump drain Drain sufficient amount to check for trances of water or sediment, refer to paragraph 2.14 for details.

2.19 Hydraulic brake system

Check brake master cylinder and refill with correct grade of brake fluid. To refill, DOT 4 automobile brake fluid is required, as specified in the inspection chart, and no aircraft hydraulic fluid should ever be used. Bleed the brake system to remove entrapped air whenever there is a spongy response to the brake lever. Refer to paragraph 5.40 for filling and bleeding the brake system.

2.20 Cleaning

Keeping the aircraft clean is important. Besides maintaining the appearance of the aircraft, cleaning makes inspection and maintenance easier and in some occasions may highlight defects missed in a pre-flight inspection.

2.21 Windshield and windows

Windows should be cleaned carefully with plenty of fresh water and a mild detergent, using the palm of the hand to feel and dislodge any caked dirt or mud. A soft cloth, or microfiber towel may be used, but only as a means of carrying water to the acrylic. Rinse thoroughly, then dry with a clean moist chamois. Do not rub the acrylic with a dry cloth as this builds up an electrostatic charge which attracts dust. Oil and grease may be removed by rubbing lightly with a soft cloth moistened with a suitable solvent. Always use vertical strokes to prevent glare scratches.

Caution	When cleaning the windshields, do NOT use gasoline, alcohol, benzene, acetone, carbon tetrachloride, fire extinguisher fluid, de-icer fluid, laquer thinner, or glass window cleaning spray. These solvents will soften and craze the acrylic windows. After washing, the acrylic windshield and windows should be cleaned with an aircraft windshield cleaner. Apply the cleaner with soft cloths and rub with moderate pressure. Allow the cleaner to dry, then wipe it off with soft flannel cloths. A thin, even coat of special acrylic window polish will fill-in minor scratches and help prevent any further scratching. Do not use a canvas cover on the windshield or windows unless freezing rain or sleet is anticipated since the cover may scratch the acrylic surface.
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Caution	Do not use any laquer polish like carnauba wax on the acrylic windows.
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2.22 Plastic trim

Cleaning the instrument panels plastic trim and control levers need only be wiped with a damp cloth. Oil and grease on the control sticks and control levers can be removed with a cloth moistened with a suitable solvent. Volatile solvents, such as mentioned in paragraph 2.21. should never be used since they soften and craze the plastic.

2.23 Painted surfaces

The painted exterior surfaces of the aircraft, under normal conditions, require a minimum of polishing and buffing. Generally, the painted surfaces can be kept bright by washing with water and mild soap, followed by a rinsing the surfaces with water and drying with cloths or chamois. Harsh or abrasive soaps or detergents which could cause scratches should never be used. After the curing period, the aircraft may be waxed with a good automotive wax. A heavier coating of wax on the leading edge of the wing and tail and on the engine cowling will help reduce the abrasion encountered in these areas.

2.24 Aluminum surfaces

Some aluminum surfaces will require a minimum of care due to their anodized coating, but should never be neglected. Many good aluminum cleaners are available from commercial suppliers of aircraft products. Household type detergent soap powders are effective cleaners, but should only be used very cautiously since many of them are strongly alkaline and will cause damage.

2.25 Engine and engine compartment

The engine should be kept clean since dirty cooling fins may cause engine overheating. Also, cleaning is essential to minimize any danger of fire and provide for easier inspection of components. The entire engine cowling may be removed to facilitate engine and interior cowl cleaning. Wash down the engine and components with a suitable solvent, then dry thoroughly with compressed air if available.

Caution

Particular care should be given to electrical equipment before cleaning. Solvent should not be allowed to enter magnetos, starter, alternator, voltage regulator and the like. Hence, these components should be protected before saturating the engine with solvent. Any fuel, oil and air openings should be covered before washing the engine with solvent. Caustic cleaning solutions should not be used. After cleaning engine re-lubricate all control arms and moving parts.

2.26 Upholstery and interior

Keeping the upholstery and interior clean prolongs upholstery fabric and interior trim life. To clean the interior, proceed as follows:

- a. Brush or vacuum clean the upholstery and carpet to remove dust and dirt.
- b. Clean upholstery with a sponge moistened with fresh water
- c. Wipe plastic trim with a damp cloth.
- d. Oil spots and stains may be cleaned using household spot removers, sparingly. Before using any solvent, read the instructions on the container and test it on an obscure place in the fabric to be cleaned. Never saturate the fabric with volatile solvent; it may damage the padding and backing material. Scrape sticky material from the fabric with a dull knife, then spot clean the area.

2.27 Propeller

Wash hub and blades with a soft cloth and water (and with a mild detergent if necessary), then dry thoroughly.

Caution

Do not use gasoline, alcohol, benzene, acetone, or laquer thinner. These solvents will soften and damage the propeller finish.

2.28 Wheels

The wheels should be washed periodically and examined for corrosion, cracks and dents in the wheel halves or hubs. If defects are found, remove and repair in accordance with Section 5. Discard cracked wheel hubs and install new parts.

2.29 Lubrication

The A240 has been designed to have as few lubrication points as possible. For areas that do require lubrication, regular grease should be used. The following list details the areas that will require occasional lubrication.

- a. wing main bolts
- b. wing folding mechanism hinge
- c. wing flap push-pull rods connection and hinges
- d. stabilizer mounting bolts
- e. all control surface hinges in general
- f. undercarriage bearing and movable holder

Caution

Do not lubricate pulleys and bushings of control surface cables and rods. When changing wheels it is recommended to lubricate wheel axles before reassembling to prevent them from corrosion and keep wheel changing easier.

2.30 Inspection

I. Inspection requirements

As required by Federal Aviation Regulations, all civil aircraft of U.S. registry must undergo a complete inspection (annual) each twelve calendar months. In addition to the required Annual Inspection, aircraft operated commercially (for hire) must also have a complete aircraft inspection every 100 hours of operation.

II. Inspection charts

The latest-version AEROPRO INSPECTION CHECKLIST is always available at no charge from the U.S. Aeropro distributor – contact the distributor for the latest-version which is normally available on the distributor's web page at... www.aerotrek.aero/aerotrek-tips.htm

As shown in the charts, there are items to be checked after the first 25 hours of service, each 100 hours and 200 hours, etc.

To conduct these inspections it is mandatory to use the factory inspection form (**AEROPRO INSPECTION CHECKLIST**) **note:** Latest-version checklist always available on the web page at... www.aerotrek.aero/aerotrek-tips.htm

- a. When conducting the initial 25 hour inspection, all items marked as 25 hour service would be inspected, serviced or otherwise accomplished as necessary to insure continued airworthiness.
- b. At each 100 hours, the 25 hour items would be accomplished in addition to the items marked as 100 hour service as necessary to insure continued airworthiness.
- c. At each 200 hours, the 100 hour items would be accomplished in addition to the items marked as 200 hour service as necessary to insure continued airworthiness.
- d. The numbers appearing in the "special inspection item" (S.i.i.) column refer to data listed at the end of the inspection charts. These items should be checked at each inspection interval to insure that applicable servicing and inspection requirements are accomplished at the specified intervals.
- e. A complete aircraft inspection includes all 25, 100 and 200 hour items plus those special inspection items which are due at the time of the inspection.

III. Inspection guidelines

- a. Moveable parts for: lubrication, servicing, security of attachment, binding, excessive wear, safety, proper operation, proper adjustment, correct travel, cracked fittings, security of hinges, defective bearings, cleanliness, corrosion, deformation, sealing and tension.
- b. Fluid lines and hoses for: leaks, cracks, dents, kinks, chafing, proper radius, security, corrosion, deterioration, obstruction and foreign matter.
- c. Metal parts for: security of attachment, cracks, metal distortion, broken spotwelds, corrosion, condition of paint and any other apparent damage.
- d. Composite parts for: cracks, dents and de-lamination.
- e. Wiring for: security, chafing, burning, defective insulation, loose or broken terminals, heat deterioration and corroded terminals.
- f. Bolts in critical areas for: correct torque in accordance with torque values given in the chart in Section 1, when installed or when visual inspection indicates the need for a torque check.

Caution

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

- g. Filters and fluids for: cleanliness, contamination and/or replacement at specified intervals.
- h. Aircraft file: Miscellaneous data, information and licences are a part of the aircraft file. Check that the following documents are up-to-date and in accordance with current Federal Aviation Regulations. Most of the items listed are required by the United States Federal Aviation Regulations.

To be displayed in the aircraft at all times:

1. Aircraft Airworthiness Certificate
2. Aircraft Registration Certificate

To be carried in the aircraft at all times:

1. Weight and Balance and associated papers (latest copy of the Repair and Alteration Form if applicable)
2. Aircraft Equipment List

To be available upon request:

1. Aircraft Log Book

i. Engine run-up

Before beginning the step-by-step inspection, the pilot should start, run-up and shut down the engine in accordance with instructions in the Pilot Operating Handbook. During run-up, observe the following, making note of any discrepancies or abnormalities. It is strongly recommended that the “static-test-report form” included in the **AEROPRO Checklist – B Service/maintenance** form is used during any run up inspection.

1. engine temperatures and pressures
2. static rpm
3. magneto drop
4. engine response to changes in power
5. any unusual engine noises
6. fuel shut-off valve function
7. idling speed
8. charge control and battery voltage

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

IMPORTANT

These charts may only be used accompanied by the latest-version special factory inspection form: AEROPRO Inspection Checklist

**for the latest-version AEROPRO INSPECTION CHECKLIST contact the U.S. Aeropro distributor
or
see the latest-version checklist available on the web page... www.aerotrek.aero/aerotrek-tips.htm**
