

Chapter 12

Servicing

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12-00-00

GENERAL

This chapter describes the procedures and precautions necessary for proper servicing of the EXTRA 200. The specified intervals (refer to Chapter 05) are considered adequate to meet average requirements under normal operating conditions.

It is advisable, however, to shorten service and maintenance intervals when operating under abnormal conditions, such as extreme temperature ranges, dusty atmospheric conditions, high humidity and moisture, unimproved airport facilities, or unusual operating requirements.

12-10-00

REPLENISHING

The replenishing procedures contained in this section provide the proper methods for replenishing consumed fuel, engine oil and brake fluid. Also included are methods for inflation of tires.

12-10-01

Refueling

Refueling is accomplished by pumping or pouring fuel into the two wing tanks and the center tank through their respective filler caps. When fueling the aircraft, the following safety precautions must be followed:

DANGER

- * **Never refuel the aircraft with the engine running.**
- * **Always ensure that the aircraft is grounded before refueling.**
- * **Ensure that no one is smoking within 100 feet of the aircraft.**
- * **Ensure that all aircraft electrical systems are deenergized while refueling.**
- * **Ensure that no aircraft radar or powerful transmitters are operating within 100 feet of the aircraft during fueling.**
- * **If fuel is spilled, ensure that the area of spillage is thoroughly flushed with water and that all residual fuel and vapor have dissipated or neutralized prior to starting the aircraft engine.**

Fuel Grade and Limitations

The recommended minimum aviation grade fuel for the AEIO-360-A1E engine is AVGAS 100 or 100LL.

IMPORTANT

Under no circumstances should fuel of lower octane rating or automotive fuel (regardless of octane rating) be used. It is recommended that personnel be familiar with Service Instruction No.1070 regarding specified fuel for Lycoming engines.

Fuel System Capacities

The EXTRA 200 fuel system capacities are as follows:

Wing tank LH	43 l	(11.3 US Gallons)
Wing tank RH	43 l	(11.3 US Gallons)
Center and acro tank	36 l	(9.5 US Gallons)
Total fuel capacity	122 l	(32.1 US Gallons)

The usable fuel capacities are as follows.

Wing tank LH	42,5 l	(11.2 US Gallons)
Wing tank RH	42,5 l	(11.2 US Gallons)
Center and acro tank	32 l	(8.5 US Gallons)
Total fuel capacity	117 l	(30.8 US Gallons)

IMPORTANT

After refueling, it has to be ensured that both fuel tank caps are securely installed prior to flight.

Additionally one has to wait at least five minutes for moisture and sediment to settle before draining and checking the fuel drain valves.

12-10-02**Defueling****DANGER**

During the aircraft defueling observe the safety precautions specified in section "12-10-01 Refueling".

Using appropriate containers, defuel the aircraft by pumping or by siphoning off fuel through the filler ports (only for the wing tanks) and by opening the gascolator and center tank drain valves.

12-10-03

Fuel Drains

The EXTRA 200 has three fuel drain valves to provide for drainage of moisture and sediment. Two fuel drain valves are located under the fuselage in the area of the landing gear; the third fuel drain which is interconnected to the fuel gascolator is located in the lowest point at the right side of the firewall.

DANGER

Do not drain the fuel system when the engine or the exhaust is hot or while the wind is strong.

A quantity of fuel must be drained prior to the first flight of the day and at least five min. after refueling to inspect for water and/or contamination. Continue draining until free of water or contamination.

IMPORTANT

After draining, you have to be sure that the fuel drain valve is returned to the closed position and the valve is not leaking outside the aircraft.

12-10-04

Replenishment of Engine Oil

The engine oil replenishment is accomplishment by pouring oil into the oil filler spout. The oil quantity can be conveniently checked by use of the dipstick attached to the oil filler spout cap.

Oil quantity

The oil quantity is checked as follows:

- 1 Check oil level after engine has been stopped long enough for oil to drain back into sump.
- 2 Open the hatch on the upper part of the cowling.
- 3 Unscrew oil filler cap and dipstick from engine oil filler spout.
- 4 Remove cap and dipstick from engine and wipe oil from dipstick with a clean cloth or paper towel.

- 5 Return dipstick into filler spout and tighten finger tight.
- 6 Unscrew and remove dipstick. Check oil level on dipstick versus the markings stamped on the dipstick.
- 7 If replenishment is required see "Replenishment of Engine Oil" below.
- 8 Return dipstick into filler spout and tighten cap finger tight.

CAUTION

When tightening the filler spout cap ensure that is secure. But do not overtighten, as this may damage the "O" ring seal in the cap.

- 9 Close the hatch on the upper part of the cowling.

Replenish engine oil

Replenish engine oil using oil of the following specification:

Aviation Grade Straight Mineral oil

MIL-L-6082 or SAE J1966 Aviation Grade Straight Mineral oil shall be used to replenish oil supply during the first 25 hours of operation and at the first 25-hour oil change. Continue to use this grade of oil the first 50 hours of operation or until oil consumption has stabilized. The aircraft is delivered from EXTRA-Flugzeubau with proper break-in oil (MIL-L-6082 Aviation Grade Straight Mineral oil).

Ashless Dispersant Oil

MIL-L-22851 or SAE J1899 Ashless Dispersant Oil shall be used after the first 50 hours of the engine operation.

Additive Oil

If an engine has been operating on straight mineral oil for several hundred hours, a change to additive oil should be undertaken with caution. If the engine is in an extremely

dirty condition, the switch to additive oil should be deferred until after engine has been overhauled.

When changing from straight mineral oil to additive oil take the following precautionary steps:

IMPORTANT

- 1 Do not mix additive oil and straight mineral oil. Drain straight mineral oil from engine and fill with additive oil.**
- 2 Do not operate engine longer than five hours before again changing oil.**
- 3 Check oil screen for evidence of sludge.**

Change oil and clean oil screen element every 10 hours if sludge is evident. Resume normal oil drain periods after sludge conditions improve.

Recommended Viscosity of Engine Oil:

Average Ambient Temperature	Air	MIL-L-6082 or SAE J1966 Spec. Mineral Grades	MIL-L-22851 or SAE J1899 Spec. Ashless Dispersant Grades
All Temperature		-----	SAE 15W50 or SAE 20W50
Above 27°C (80°F)		SAE 60	SAE 60
Above 16°C (60°F)		SAE 50	SAE 40 or SAE 50
-1°C (30°F) to 32°C (90°F)		SAE 40	SAE 40
-18°C (0°F) to 21°C (70°F)		SAE 30	SAE 30, SAE 40 or SAE 20W40
-18°C (0°F) to 32°C (90°F)		SAE 20W50	SAE 20W50 or SAE 15W50
Below -12°C (10°F)		SAE 20	SAE 30 or SAE 20W30

NOTE

Refer to latest revision of Lycoming Service Instruction No. 1014 for further information.

Replenish engine oil as follows:

- 1 Open the hatch on the upper part of the cowling and unscrew oil filler cap.
- 2 Using a clean paper towel wipe any oil foreign material from the edges of the filler spout opening. Also wipe oil from the dipstick.
- 3 Pour oil of proper specification and viscosity into filler spout to achieve desired oil level.
- 4 Replace oil filler spout cap/ dipstick and tighten finger tight. Close the hatch on the upper part of the cowling and secure engine cowling.

Oil System Capacities:

	U.S. Quarts	Liters	Imp. Quarts
Total Engine Capacity	8	7,6	6,7
Minimum Safe Quantity Acrobatic:	6	5,7	5
Minimum Safe Quantity Normal:	4	3,8	3,3

12-10-05

Oil Change

The engine oil must be changed after the first 25 hours of operation and then after intervals of 50 hours. It should be refilled in accordance with section "12-10-04 Engine Oil Replenishing" and the latest revision of Lycoming Service Instruction No. 1014.

Change engine oil as follows:

- 1 Remove the cowlings of the aircraft.
- 2 Cut the safety wire securing the oil drain plug and remove.
- 3 Place a suitable container under the oil drain.

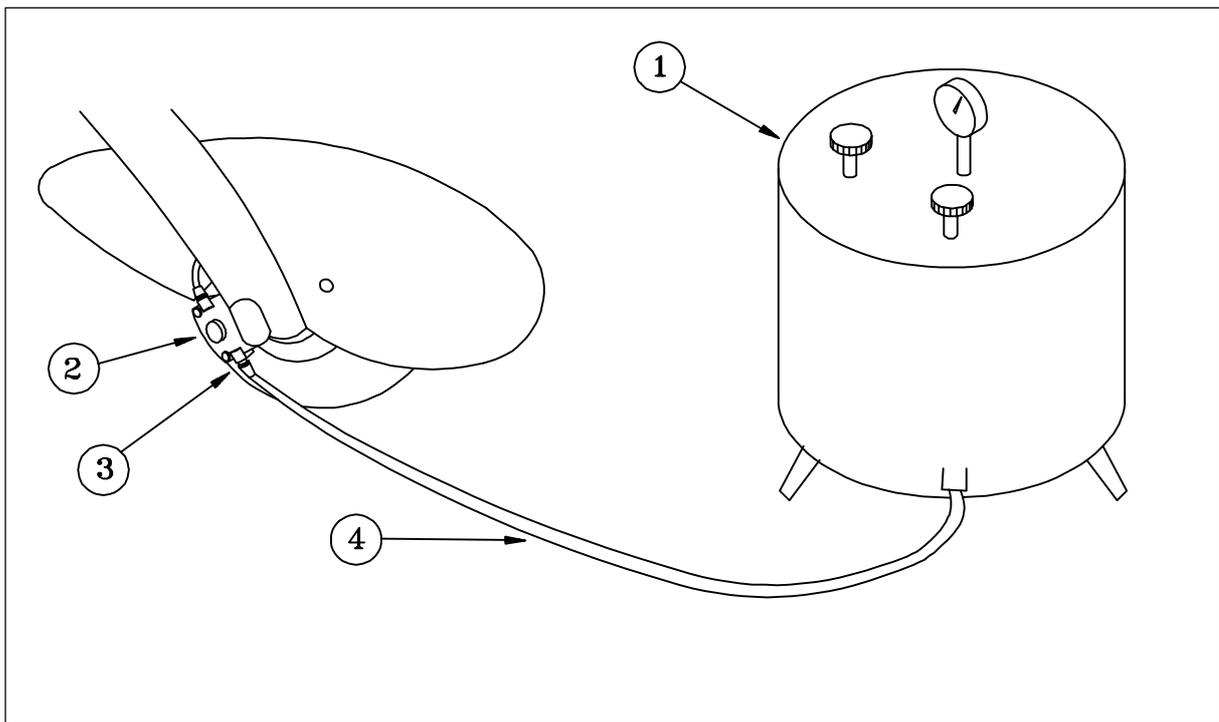
- 4 Unscrew engine oil drain plug and allow the oil to drain thoroughly.
- 5 Using a clean rag or paper towel, wipe drain plug clean and area on engine around oil drain.
- 6 Reinstall drain plug and safety wire.
- 7 Remove and inspect oil filter for metal particles and install new oil filter in accordance with Lycoming Operating Manual.
- 8 Replenish engine oil as per Chapter 12-10-04.
- 9 Reinstall and secure engine cowlings.

12-10-06

Replenishment of Brake Fluid

In order to assure proper brake action, it is necessary to have positive transfer of hydraulic pressure through the system. Any air trapped in the system must be removed. Follow the procedure described below using a bleed tank (1, Figure 1):

- 1 Remove engine cowlings as per Chapter 51-00-01.
- 2 Remove fluid reservoir filler plug and screw a clear plastic hose with appropriate fitting into the filler hole at the top of the fluid reservoir.
- 3 Remove bleeder fitting cap (3) of the wheel brake assembly (2).
- 4 Be certain that the bleeding equipment to be used is absolutely clean and is filled with brake fluid that conforms to Specification MIL-H-5606, (refer to Chapter 05-20 Lubrication Charts) and is uncontaminated.
- 5 Maintain an adequate supply of fluid during the entire operation. A low fluid supply will allow air to be drawn into the system.



*Replenishment of Brake Fluid
Figure 1*

- 6 Ensure master cylinders are in neutral position.
- 7 Attach the connector hose (4) to the bleeder fitting.
- 8 Turn the bleeder fitting 1/2 rotation to the left for opening.
- 9 Slowly pump clean hydraulic fluid in the system. Bleeding should continue until no more air bubbles are expelled from the system (observe the immersed end of the clear hose), and a firm brake pedal is obtained (fill each side of the system with min. 0.33 ltr (0.1 U.S Gallons) for complete change).
- 10 Fill the fluid reservoir up to full reservoir capacity.
- 11 Reinstall fluid reservoir filler plug.
- 12 Close bleeder fitting.
- 13 Disconnect the connector hose.
- 14 Reinstall bleeder fitting cap.
- 15 Check the brake operation.

12-10-07

Tire Inflation

For the EXTRA 200 the required tire pressure is 2.6 bar (38 Psi) for both main wheels. When inflating tires, it has to be used regulated air pressure through valve stems.

12-20-00

SCHEDULED SERVICING

12-20-01

Exterior Cleaning

The painted surface of the aircraft have a long lasting, all-weather finish and should require no buffing or rubbing out in normal conditions. However, it is desirable to wash and polish it to preserve the outstanding exterior. Cleaning is best accomplished with cool water, mixed with a mild aircraft detergent, if required.

CAUTION

Do not use so called "mild" household detergents to wash aircraft exterior. Such detergents may damage finish and corrode aluminum components.

In order to remove especially heavy dirt from the wing leading edges due to insect splatter and the like, it is good practice to undertaken cleaning immediately after the flight, since deposits of this kind are more difficult to remove when dry. All lubricated components are to be covered before cleaning.

Roughly twice a year, the complete surface should be treated with a non-silicone car polish and repolished to high gloss. But do not apply wax or use pre-wax cleaners during initial paint curing period. Use only mild aircraft detergent and cool water when washing exterior during the first 90 days after repainting.

CAUTION

Never use cleaning agents containing silicone!

In order to maintain good visibility at all times, the canopy Plexiglas should be given good care and kept clean at all times. Techniques and materials used to clean glass should be avoided since Plexiglas is softer than glass and subject to damage by solvents and abrasive glass cleaning agents.

Therefore it should be pay particular attention to using ample water applied with clean sponges and leather, otherwise even the smallest dust particles will tend to scratch the glazing.

CAUTION

Never polish plexiglass dry!

Dull or scratched canopy sections can be returned to their transparent state by treating with especially formulated plexiglass cleaning agents.

12-20-02

Interior Cleaning

Prior to the first acrobatic flight of the day it is recommended to clean the interior with a vacuum cleaner to remove dust and loose dirt. If liquid is spilled on the cockpit floor, blot it up promptly with cleansing tissue or rags. Continue blotting until no more liquid is taken up.

CAUTION

Never use gasoline, benzine, alcohol, acetone, carbon tetrachloride, fire extinguisher fluid, anti-ice fluid, lacquer thinner, or glass cleaner to clean the canopy. These materials will damage the canopy and may cause severe crazing.

12-20-03

Engine Cleaning

Accumulation of dirt and oil within the engine compartment creates a fire hazard and hampers inspection. All cleaning operations have to be performed in well ventilated work areas, and it is ensure that adequate fire-fighting and safety equipment is available.

The engine is cleaning as follows:

1 Allow the engine after running to cool before cleaning.

CAUTION

2 The magnetos, alternator, starter, the air inlets and the engine cowling (the inside of the engine cowling is covered with water soluble fire protection paint) must be protected against cleaning agents.

3 Wash down engine compartment using a nonflammable engine cleaning agent.

- 4 Thoroughly rinse with clean, warm water to remove all traces of cleaning agents.
- 5 It is very important not to start the engine before the cleaning agent has been completely removed or has evaporated.

12-30-00

UNSCHEDULED SERVICING

12-30-01

Removal of Snow and Ice

After snowfall, the snow should be removed immediately from surface of the aircraft. Otherwise the water formed from melted snow will freeze on the surface or in slots and gaps of fairings.

CAUTION

Do not use sharp tools for removing the snow.

If the aircraft shows sign of ice formation, it is recommended to defrost in a room. Remove as much snow as possible with a soft bristle boom, make sure the wheels and brakes are clear, and tow the aircraft into a room with elevated temperature. This method is particularly desirable, since it will melt any undetected ice and snow that could constitute a flight hazard.