



Eco-3M Piston Air Engine™ Series III



Piston Air Engine™ Installation and Operating Instructions

 **WARNING****EQUIPMENT MISUSE HAZARD**

Equipment misuse can cause the equipment to rupture or malfunction and result in serious injury.

- This equipment is for professional use only.
- Read all instruction manuals, tags, and labels before operating the equipment.
- Use the equipment only for its intended purpose. If you are not sure, call your Autoquip distributor.
- Do not alter or modify this equipment. Use only genuine Autoquip parts.
- Check equipment daily. Repair or replace worn or damaged parts immediately.
- Use fluids and solvents that are compatible with the equipment wetted parts. Refer to the **Technical Data** section of all equipment manuals. Read the fluid and solvent manufacturer's warnings.
- Always wear protective eyewear, gloves, clothing, and respirator as recommended by the fluid and solvent manufacturer.
- Comply with all applicable local, state, and national fire, electrical, and safety regulations.
- Rotating parts may cause injury potential.

Piston Air Engine Installation and Operating Instructions

Operating Recommendations

1. Autoquip Piston Air Engines™ are designed and built to be safe and reliable when properly used. Advice and approval should be sought from authorized Autoquip Automation personnel before any of our products are used in circumstances other than recommended herein.
2. Compressed air is the only medium to be used.
3. Air pressure should not exceed 6.9 bar (100 psi)
4. Each engine should be supplied with air that is adequately filtered to remove fluids and particles above 40 microns.
5. An operating temperature range of -10°C to +80°C (14°F to 176°F) is recommended.
6. Engines should be sited and mounted to avoid excessive vibration.
7. Safety or system integrity should not depend upon the assumption that leakages cannot or will not occur.
8. Actual response times for air engines can vary according to ambient conditions and service life.
9. Adequate regular maintenance is essential to ensure continuous satisfactory and safe performance.

Installation

1. Autoquip Piston Air Engines™ are precision machines and are susceptible to damage by dirt particles. Cleanliness is essential during installation and servicing.
2. To prevent ingress of dirt or grit do not remove the red protective caps (10) from the ports until installed.
3. When the engine has been mounted and the shaft connected, air supply tubes should be fitted to the ports ensuring that no dirt or grit can enter the ports

Start-Up

1. Set air pressure to zero.
2. Set any speed restrictor valves to the fully open position
3. Slowly increase air pressure until the shaft rotates under load.
4. For low load applications, increase air pressure by a further 1 – 1.25 bar (15 – 20 psi). This may not be necessary for high load applications.
5. Adjust the speed restrictor to give the required speed.
6. The air engine will now be running at the optimum and most efficient setting.

Note: It is bad practice to apply excessive line air pressure and then have a tight restriction on the exhaust port. This can cause excessive wear on the base of the pistons.

Recommended Lubricants

Shell Gadus S2 V100 3

Maintenance Procedures

Autoquip Piston Air Engines™ are precision engineered and are designed for a long working life. The wearing parts are the pistons, cylinder liners and seals, which can be replaced as part of a routine maintenance schedule.

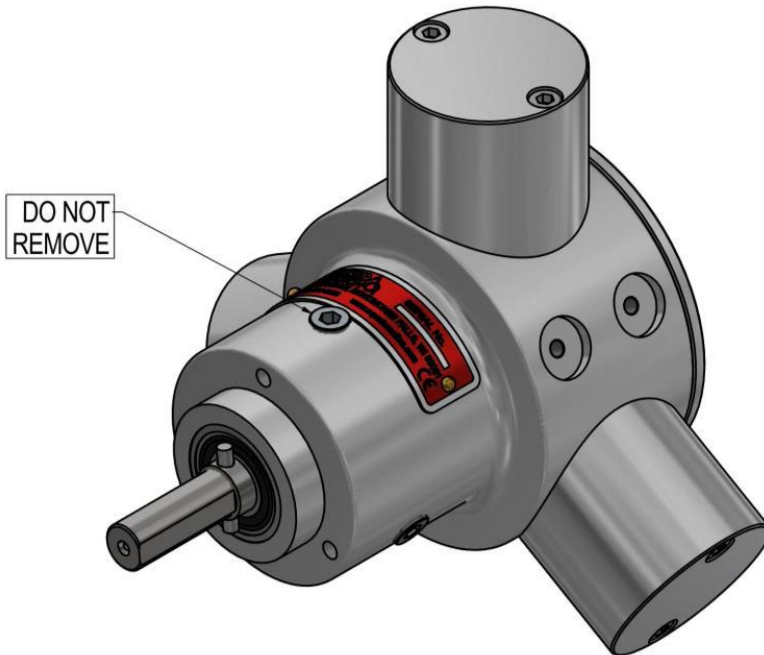
For this purpose, spare parts kits can be purchased from Autoquip Automation or our authorized distributors, comprising three pistons, three liners, three piston seals and three O Rings.

The drive shaft and rotary valve assembly are matched during manufacture and should not be removed from the engine body. If they are removed, they will require replacement with new parts in our factory.

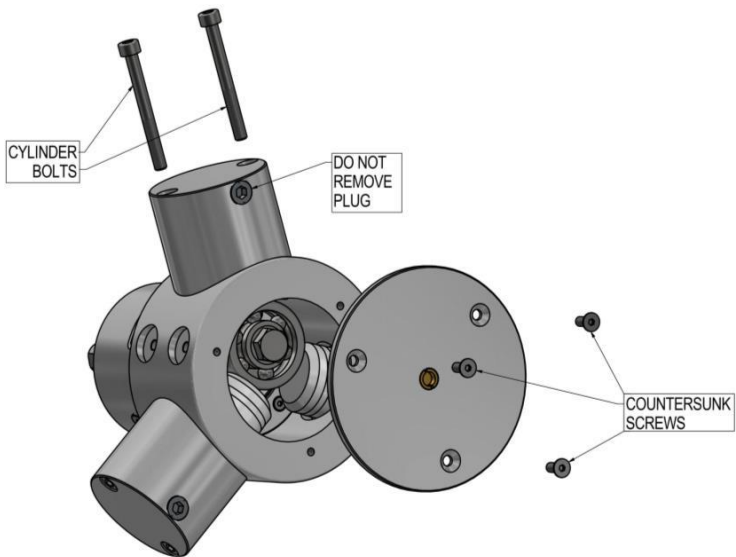
As with all precision engineered machines, cleanliness is essential during dismantling and assembly. Before dismantling, the air supply ports must be covered with plastic caps and the workbench should be clean and free of debris.

Disassembly

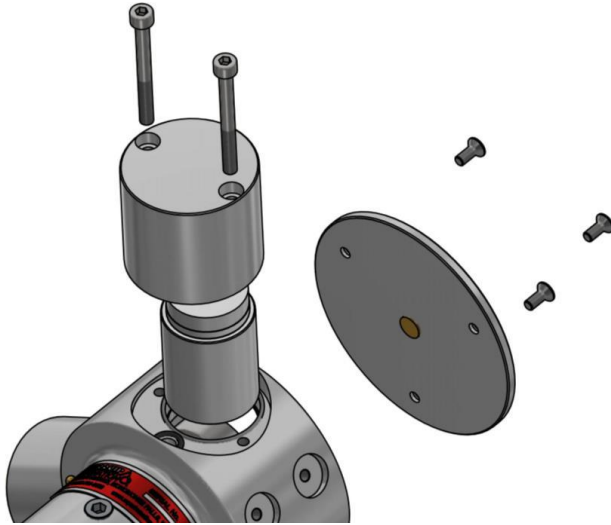
1. Ensure that all air lines are disconnected from the engine



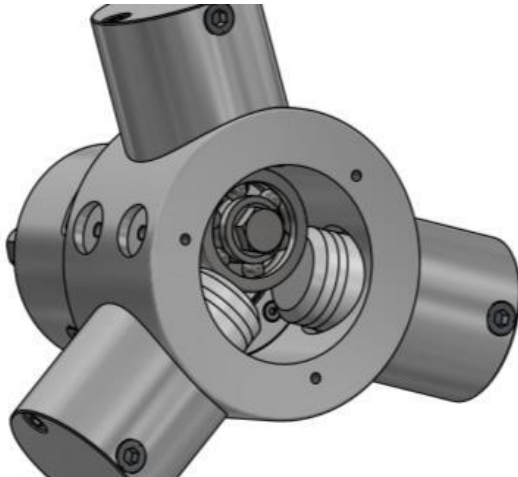
2. Remove the three countersunk screws holding the rear cover to expose the crank area.
Remove the three-cylinders by withdrawing the two bolts on each cap.



3. The three exposed ports of the air flow route (2 on each cylinder cap and 3 on the body) must be protected to prevent any ingress of dirt/grit. This is critical.
4. Push out the three piston/liner assemblies; push outwards from the crankcase with the seals and the O Rings.



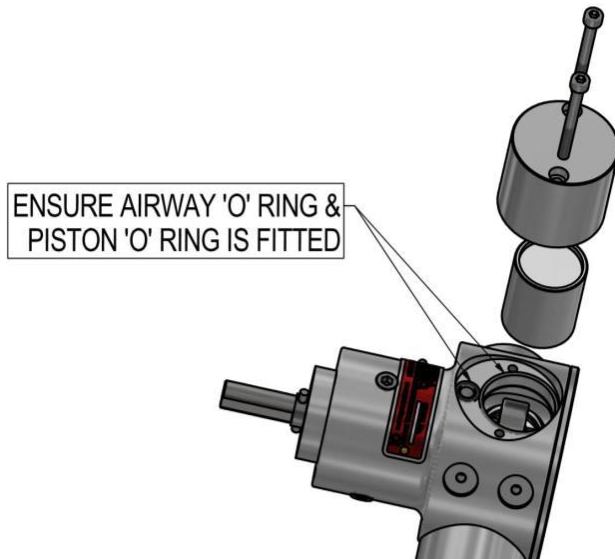
5. Clean the crank area and cylinder bores using a suitable solvent to ensure it is free from dirt particles.



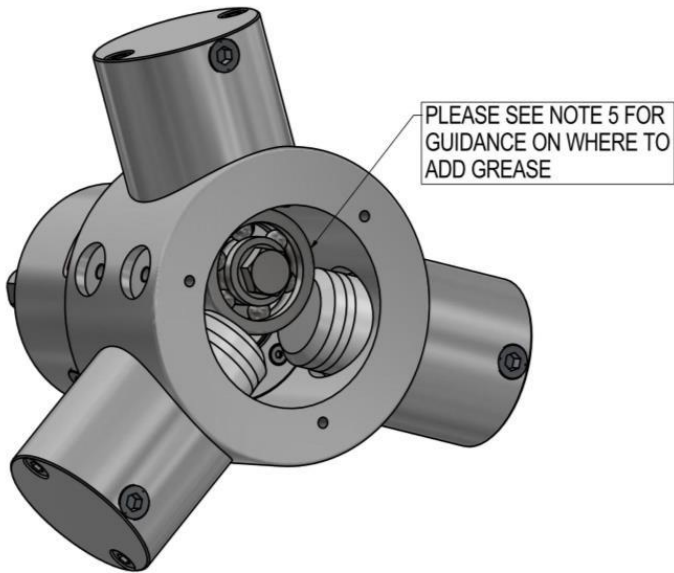
Shaft and bushings are assembled as a unit and should not be removed.
If you find the shaft will not rotate freely, we recommend you contact Autoquip prior to any further work.

Reassembly

1. Ensure all parts are clean and grit free
2. Insert replacement piston/liner/seal assemblies ensuring that the seal is at the cylinder cap end.
3. Fit the O Ring in the groove on cylinder depending on the type.



4. The three exposed ports of the air flow route (1 on each cylinder) must be protected to prevent any ingress of dirt/grit. This is critical.



5. Apply a small amount of grease to the crank bearing. Piston kits are supplied greased. Do not fill the crankcase with grease, as this impairs operation. New engines are supplied greased with approximately 16 grams (0.5 oz.)
6. Re-connect the air supply, making sure the pressure is at zero.
7. Slowly increase the air pressure to approx 1 – 1.25 bar (15-20 psi) the engine should start to rotate slowly.
8. Disconnect air supply and replace rear cover.

Eco-3M Piston Air Engines™

Size 3 Engine 3077-HAE3-000

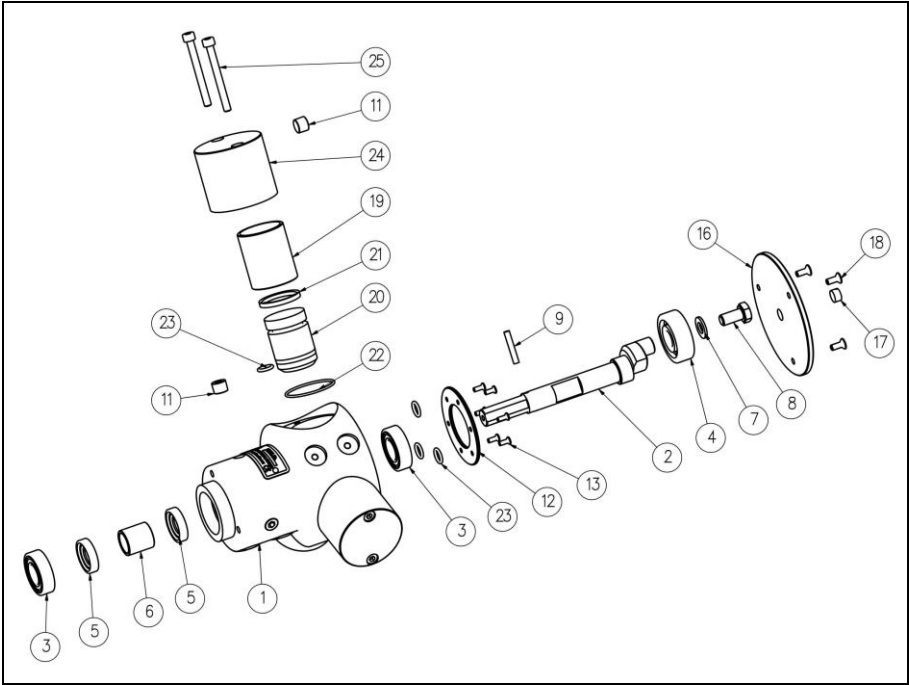
Service Options

Size 3 Engine Body Sub-Assembly Kit 3077-BSA3-000

Size 3 Rebuild Kit 3077-RKT3-000

Recommended Installation Kit

Size 3 Installation Kit = 3077-INST-000



3077-HAE3-000

<i>Item</i>	<i>Description</i>	
1	Body	<p align="center">Body Sub-Assembly. Modification by customer not recommended. Replacement Body Sub-Assembly 3077-BSA3-000</p> <p align="center">Items included: 1-13 and 23</p>
2	Drive Shaft	
3	Ball bearing	
4	Ball bearing	
5	Oilite bush	
6	Air Seal	
7	Washer	
8	Screw hex head	
9	Pin	
10	Dust Cap	
11	Plug	
12	Seal Plate	
13	Screw csk head	
16	Cover	<p align="center">Items 16, 17 & 18 not available for individual purchase</p>
17	Vent air silencer	
18	Screw csk head	
19	Piston Liner	<p align="center">Piston Sub-Assembly, Rebuild Kit 3077-RKT3-000 [3 Pistons]</p> <p align="center">Item included: 19-23</p>
20	Piston	
21	Piston Seal	
22	O ring seal	
23	O ring seal	
24	Cylinder	<p align="center">Items 24 & 25 not available for individual purchase</p>
25	Screw cap head	

#3077 - Rev A