

CONTINENTAL MOTORS® AIRCRAFT ENGINE
SERVICE BULLETIN

CATEGORY 3
SB16-3

Contains Useful Information Pertaining To Your Aircraft Engine

TECHNICAL PORTIONS
FAA APPROVED

SUBJECT: Turbocharger Check Valve Inspection and Cleaning

PURPOSE: To require an inspection and cleaning procedure for the turbocharger check valve (P/N 646717)

COMPLIANCE: At the next 50-hour "Engine Inspection" and at each 50-hour inspection thereafter. Also, whenever a turbocharger oil leak is detected, or immediately following an engine test run after cylinder(s) replacement, or after replacing lubrication system components.

MODELS

AFFECTED: All Continental Motors (CM), TSIO520-BE, LB, UB, WB; TSIO550-B, C, E, G, K, N; TSIOF550-D, J, K, P; and TSIOL550-B, C aviation gasoline (AvGas) engines using check valve (P/N 646717)

I. GENERAL INFORMATION

Specific turbocharger oil supply systems referenced within this Service Document employ a spring loaded check valve to service oil flow through the turbocharger system. The check valve prevents oil flow from the engine oil cooler to the turbocharger when the engine is shut down.

If the check valve (Part Number (P/N) 646717) does not close properly, or becomes blocked with foreign matter, the check valve may remain open, allowing oil to continuously flow to the turbocharger (after the engine is shut down and the oil scavenge pump is no longer actively returning oil to the engine oil sump).

Characteristic symptoms associated with a blocked check valve are:

- turbocharger oil leakage
- oil leakage through the tailpipe or induction system.

NOTE: Do not assume an oil leak from the turbocharger is simply an incorrectly operating check valve - thoroughly troubleshoot for causes of all turbocharger oil leaks.

II. SCOPE

Action required to comply with this Service Document:

1. This Service Document creates a mandatory preventive maintenance procedure for check valves (P/N 646717) at every 50-hour "Engine Inspection" or following maintenance of the lubrication system (see COMPLIANCE section above for complete description).
2. Add this procedure as an additional inspection item to each "50-Hour Engine Inspection Checklist" for all Continental Motors (CM) models affected.
3. Replace all unserviceable check valves (P/N 646717).

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III. INSPECTION & CLEANING

Perform a “50-hour Engine Inspection” and “Oil Change” according to your engine’s Maintenance and Overhaul Manual. Perform the following post lubrication maintenance procedure on the check valve **before** replenishing engine oil:

CAUTION: If this maintenance is not concurrent with an oil change, take appropriate cautions to prevent oil spillage and oil system contamination. Cap oil hoses to prevent oil spillage.

1. Disconnect oil hose from the oil cooler at the check valve.
2. Disconnect check valve (where applicable) from:
 - a. hose servicing turbocharger (see Figure 1), or
 - b. tee fitting (Figure 2).
3. To disassemble the check valve (see Figure 3), unscrew the check valve cap from the check valve body. Remove the sealing ball, spring cage, and spring.

CAUTION: Do not use metal cleaning tools such as brass or wire brushes or steel wool to clean the check valve.

4. In a clean container, clean check valve and all components with mineral spirits.
5. Completely dry with compressed air.
6. Inspect the check valve and all components for debris, corrosion, or physical damage. If damage is found, replace the entire check valve according to the Maintenance and Overhaul Manual instructions. If no damage is found, proceed to next step.
7. Apply a light coating of 50-weight aviation oil to all components and threads of check valve body and cap.

CAUTION: Do not force or cross-thread the check valve cap into the check valve body. Misaligning the internal components could cause the check valve to malfunction and hinder turbocharger lubrication.

8. Assemble the check valve (see Figure 3, for correct orientation):
 - a. Stack the spring, spring cage, and sealing ball and properly seat these internal components in the check valve body.
 - b. Insert the check valve cap squarely over the check valve body and tighten until the sealing surfaces make finger tight contact.

CAUTION: Do not use sharp metal tools to verify movement of internal components, as it may damage the check valve’s operation.

- c. Carefully insert a clean 3/16” nylon (or equivalent) drift tool into the check valve (as shown in Figure 4). Use light pressure to verify free, unobstructive movement of the internal components. Normal travel is approximately 0.06 inch.
 - d. Torque the check valve cap and body to 100-150 in.-lbs and repeat Step 8, c.

*CAUTION: Check valve must be installed with the **check valve arrow** pointing towards the turbocharger (see Figures 1 and 2). If the check valve is installed improperly it will cause the check valve to malfunction and prevent turbocharger lubrication.*

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9. Connect check valve (with the check valve arrow pointing towards the turbocharger) to:
 - a. hose servicing turbocharger and torque to 150-195 in.-lbs. (reference Figure 1), or
 - b. tee fitting and torque to 150-195 in.-lbs. (reference Figure 2).
10. Connect the oil hose from the oil cooler to the check valve and tighten nut finger tight. Torque hose fittings to 150-195 in.-lbs.
11. Replenish engine oil levels according to the Maintenance and Overhaul Manual instructions.
12. Perform a “Ground Run-up”; check for oil leaks and correct any discrepancies.
13. Return to service.

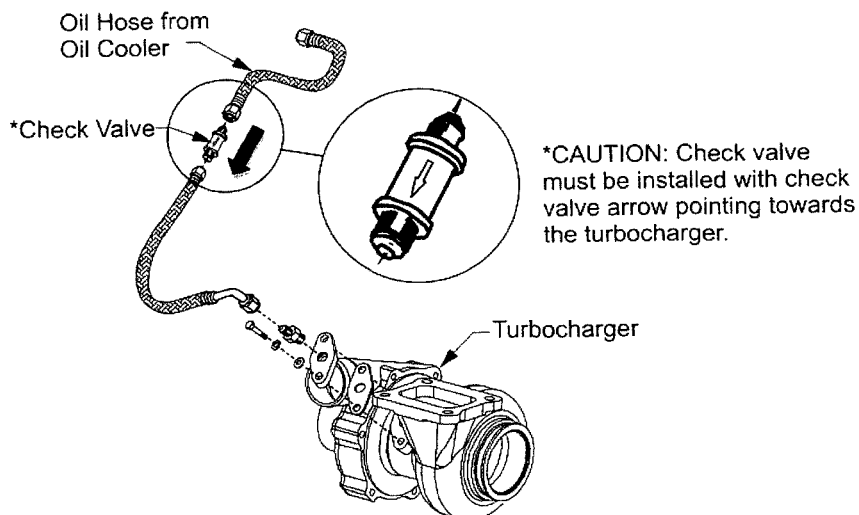


Figure 1. Single Turbocharger Lubrication (check valve location, typical)

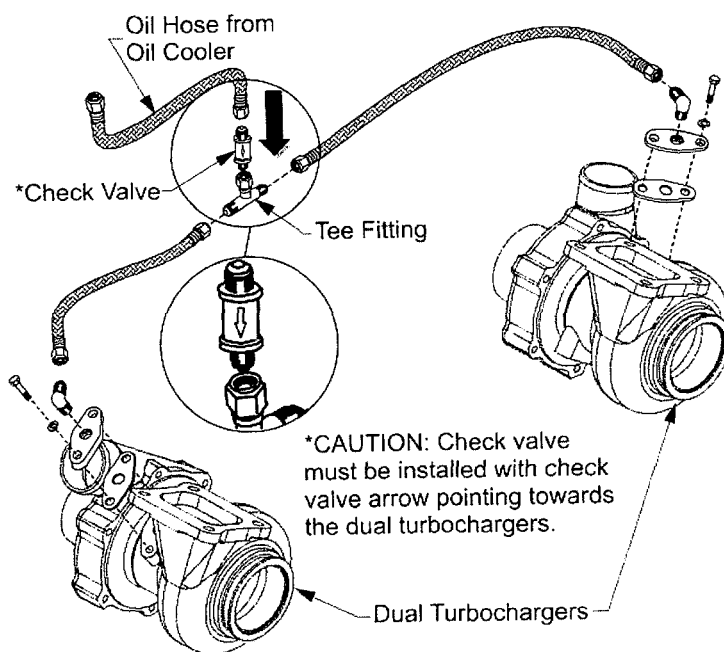


Figure 2. Dual Turbocharger Lubrication (check valve location, typical)

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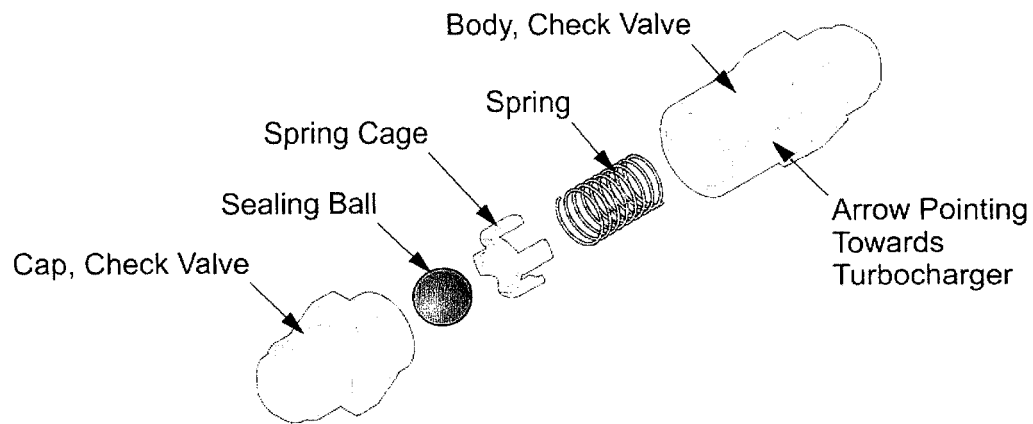
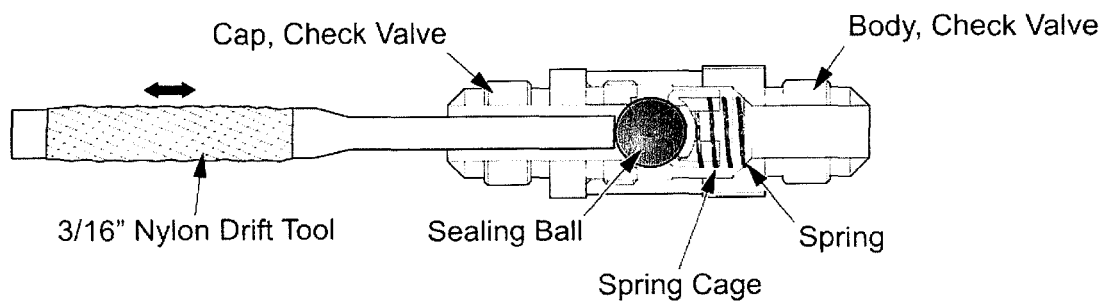


Figure 3. Check Valve, Detail



Note: Gently insert drift tool and verify free movement of internal components

Figure 4. Verify Free Movement of Components

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