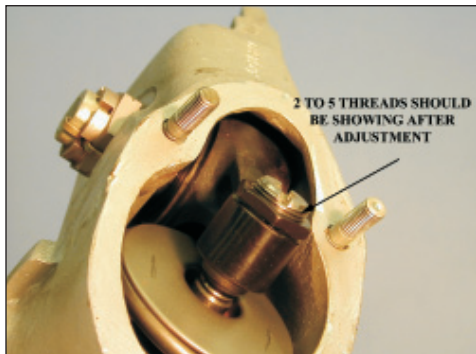


## TECHtimes TECH TIP | Importance of Proper Valve Adjustment

By Don McIntosh, Aero Recip (Canada) Ltd.

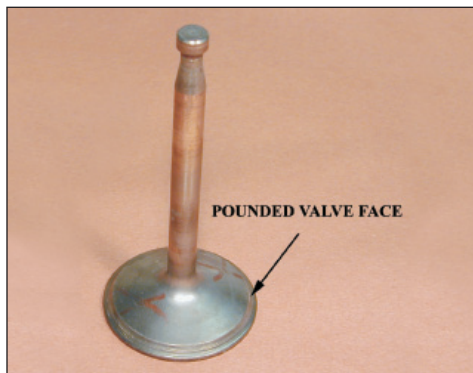
Both radial and opposed engines must have the proper running clearance between the valve stem and the rocker arm. Most opposed engines have hydraulic lifters therefore the correct push rod length must be selected to maintain the proper running clearance. At overhaul, the correct push rod length is installed for each cylinder. When a cylinder is changed in the field, the replacement cylinder may have a different valve seat depth or valve seat width than the cylinder removed therefore it may be necessary to change the push rod in order to get the correct clearance. It is very important to collapse the hydraulic lifters by bleeding all the oil out, then check the clearance and select the proper push rod by part number. Before setting the valves, be sure that the proper torque and tightening sequence was used during the cylinder installation.



Pratt and Whitney R985, R1340 and R1830 radial engines are the same principle but have solid lifters therefore have an adjusting screw and lock nut on the rocker arm. Different push rod lengths are also required on these engines only the push rod length is adjusted by adding or removing different thickness washers from under the push rod socket. This procedure is also done during overhaul to obtain the correct valve clearances. If the rods are the correct length, the adjusting screw should also be within limits, no less than 2 threads and no more than 5 threads showing on the end of the adjusting screw after the lock nut has been tightened.

CAUTION There is a removal and inspection procedure and a special tool is required for

installing a push rod socket. The installation of the push rod socket without the correct interference fit can cause damage to the push rod and socket. In some instances the socket can come off. An improperly installed socket causes the rocker arm valve adjustment screw to be out of limits or worse yet, allowing the jam nut on the adjusting screw to come loose and pound a hole in the rocker cover. After adjusting the valve clearance to the proper limits, make sure you have at least 10 thou clearance between the valve spring outer washer and the rocker arm even though you have clearance between the valve stem and the rocker adjustment screw. We have seen evidence where the rocker arm comes in contact with the valve spring washer putting pressure to one side of the valve and valve keepers causing the keepers and valve stem to wear until the valve and valve guide fails. When this happens, the valve breaks loose and pounds a hole in the piston and usually exits through the cylinder head. This also causes damage to the link rod as well as filling the engine with metal. Radial engines will quit in flight as a result of a broken push rod, rocker arm or a loose or broken adjustment screw. If this occurs in any one cylinder, the valves won't open, especially the exhaust valve. The combustion fires back through the intake into the supercharger, disturbing the fuel distribution to the rest of the cylinders. Any pilot that has had this experience will tell you that it is almost impossible to keep the engine running. By close inspections and working to the proper manuals and table of limits this type of failure can be avoided. ✈



**SPECIAL OFFER**

**TEMPEST** excellence  
**HAS ARRIVED!**

**Buy 6 oil filters  
get one FREE!**

Tell us your story  
**WIN an iPod Touch** [Learn how](#)

View latest  
Tempest ad  [Download now](#)

### TELL US

the latest news and industry information and we'll post it in the next edition of TAKE OFF. Click on **Register** at:  
[GregorashAviation.com/ozzmedianetwork/](http://GregorashAviation.com/ozzmedianetwork/)

### Register Here Save a Tree

Aero Recip has distributed a printed version of TAKEoff Magazine for many years and we're going electronic. Save a tree! [Register here](#) to stay informed of the latest in aviation.



### The Gregorash Aviation Family of Companies

