

1. Can I re-grind or lap the closed end of a KPMI® tappet and recondition/re-use them?

KPMI® does not advise reconditioning (re-grinding of the cam contact surface) of their tappets for re-use. KPMI® tappets undergo a proprietary heat treatment process and reconditioning can remove the hardened surface of the tappet. In the event the surface on which the cam-lobe makes contact is visibly free of wear and scuff-marks, then the tappet can be re-used with the same camshaft that it has been running against.

2. When should I replace my tappets?

KPMI® recommends replacing tappets whenever a new camshaft is being introduced, or contact surface shows signs of wear. When replacing tappets KPMI® recommends the use of cam brake-in lube.

3. Can I grind a KPMI® Valve-Adjustment-Shim to be thinner?

KPMI® valve shims can be ground as long as they are kept parallel and perpendicular to the outer diameter. "Professionally" lapping a shim or Blanchard grinding shims are acceptable options. Additionally, a device/fixture that has been designed to locate a shim to produce parallel surfaces that are perpendicular to the OD by way of a butt-grinding on a valve facer or similar equipment is also acceptable.

4. My retainer is hitting the roof of the tappet; can I modify the retainer to provide clearance?

Many times this type of interference is created when the valves have been sunk into the head and the tips of the valves have been "excessively" ground (shortened) and thin shims are being used, to achieve recommended lash. In this condition KPMI® recommends either replacing the valve seats or using custom valves that are designed with the corrected overall length and the factory groove location. KPMI® does not advise retainer modification for this type of condition.

5. My retainer is hitting the valve-guide-seal; can I grind the bottom of the retainer?

KPMI® makes both standard and custom guides that allow for more clearance for these types of conditions. KPMI® also advises moving any guides already in place further into the head, when a retaining ring or a guide shoulder is not present. Be sure to check all clearances when moving the stock guide into the port. Bear in mind that a valve job will be required when altering the guide location. KPMI® does not advise modifying the retainer for this condition.

6. When I install valve guides how much interference should I allow between the OD of the guide and the valve guide hole in the cylinder head?

KPMI® recommends that all valve guide hole(s) prior to guide installation be free of gall-marks and are round and parallel. Professional inspection devices are required to perform these determinations. Additionally, Honing, reaming and or boring a valve guide hole may be necessary operations when a valve guide hole needs to meet this criterion. The following recommendation(s) are for any combination of bronze or cast guides and aluminum or cast iron heads.

- .0015" to .0025" - Intake and Exhaust
- KPMI® does not agree that an o-ring can allow for the necessary fit required to create optimum heat transfer and or fitment.

Always consult with qualified professionals suited to inspect and repair your engine.

7. I have installed my KPMI® valve guides and want to know how much ID clearance I should provide?

When installing in an Aluminum or Cast Iron cylinder head, any combination of the following: Black Diamond®, White Diamond® or Tensilite® valves, cast iron or bronze guides, KPMI® recommends the following ID clearances:

Aluminum cylinder head recommended valve stem-to-guide clearance is as follows:

- Intake: .0008" to .0012"
- Exhaust: .0012" to .0015"

Cast Iron cylinder head recommended valve stem-to-guide clearance is as follows:

- Intake: .0010" to .0015"
- Exhaust: .0015" to .0020"

Note: KPMI® does not recommend clearances for Nitrous or blown applications. The recommendations above are offered in conjunction with the use of a thin film of Paste-Type, Molly-Based assembly lube, applied to the stem of the valve prior to installation.

8. How do I size the inside diameter of KPMI® cast Iron or Bronze guides?

KPMI® recommends honing the ID of guides prior to installation to a slip fit to the valve stem diameter, using the valve as a gage or a seat and guide machine pilot as your gage. Cast iron guides are easily reamed and KPMI® then recommends honing them to achieve a surface finish of RMS-32 or better. Bronze guides can be difficult to ream unless in well secured and accurately aligned conditions and preferably with the use of coolant. KPMI® recommends rigid type mandrel hones or diamond hones for controlled ideal results, when honing cast iron or bronze guides.

9. What are the best type valve stem seals to use?

KPMI® only offers high quality long lasting valve stem seals. KPMI® believes that Teflon® and Viton® are the two best materials available for valve stem seals. KPMI® has developed a proprietary line of Red-Viton® seals and offers black Viton® and Teflon seals as well. The only difference in the red and black Viton® is the physical outer seal dimensions.

10. Should I face my new KPMI® valves, (Black Diamond™, White Diamond® or Tensilite®)?

KPMI® has designed all but specific titanium valve applications to be faced and or serviced. KPMI® strives for quality and durability when it comes to designing any valve. That being said, it should be noted that for titanium applications that are supplied by KPMI® with coated faces, KPMI® recommends not facing these valves. The special coatings on the face of these valves will enhance the durability of the valve face.

11. Can I tip the end of my KPMI® valve to achieve factory stem protrusion measurements?

Tipping a valve to achieve factory stem protrusion can create an undesirable effect. KPMI® recommends that a trained and experienced professional determine the amount of material that can or should be removed.

12. Can I tip the end of my KPMI® valve to achieve personally deemed proper valvetrain geometry?

In rocker arm type applications KPMI® does allow the tipping of valves not to exceed as follows:

- 0.020" to 0.030" - Maximum
- Whenever tipping a valve in this condition, check to make sure the rocker arm(s) will not interfere with the retainer.

13. I want to convert from titanium valves to stainless steel valves...what should I do?

KPMI® builds valvetrain system(s) based on a system approach. KPMI® evaluates cam profile(s) and given harmonics when engineering spring forces, heat treatment and materials for a given application. The weight of each component in a given system is as important as the cam dynamics and engine RPM(s). KPMI® recommends using the complete system approach when converting from titanium to stainless steel valves.

14. When do I need to use lash caps on a valve?

Lash caps are used for a series of conditions. Lash caps can be used to correct valvetrain geometry. They can be used to allow a greater wiping area for aggressive type cam profiles. They can also be used on titanium valves that are paired with a rocker arm. Lash caps are also used in some applications to adjust the valves. When using lash caps always make sure that there is ample clearance between the keepers and the cap. KPMI® recommends a minimum of 0.030" for this type of condition, unless the cap was designed to mate with the keepers.

15. I want to replace my intake valvetrain component(s) only, will my exhaust be ok?

KPMI® does not advise partial conversions on race bike and/or engines that have reached factory advertised service limits. In the event that your engine has reached or exceeded factory service limits, then KPMI® recommends installing a new complete valve spring kit and all new valves. However, on a low hour engines with apparent intake face recession and exhaust components that meet factory specifications, consider a KPMI® Intake Only System, when performing necessary service. Always consult with qualified professionals suited to inspect and repair your machine.

16. Can I modify a KPMI® basewasher?

KPMI® does not recommend making any changes that affect the valve spring contact areas. Modifications that do not affect the valve spring contact areas are allowable. However, each KPMI® basewasher has been designed to a minimum cross sectional area, and any changes could adversely affect the strength of the basewasher. KPMI® recommends basewasher modifications only be performed by experienced engine builders.

17. How much interference do I use when installing KPMI® bronze or Powder Metal valve seats?

KPMI® recommends that when seats are removed, the counter bore in the head is then machined to produce a round accurate and well finished counter bore. KPMI® offers the follow valve seat installation interference fits:

- KPMI® Bronze seat installed into an Aluminum Cyl. Head Min. 0.006" Max 0.008"
- KPMI® Bronze seat installed into a Cast Iron Cyl. Head: Min. 0.005" Max. 0.007"
- KPMI® Powder metal seat installed into Aluminum Cyl. Head: Min. 0.006" Max 0.008"
- KPMI® Powder metal seat installed into Cast Iron Cyl. Head: Min. 0.005" Max 0.007"
- KPMI® recommends heating the head to a minimum of 350° and using nickel based never seize when installing seat(s) with the aid of professional drivers and pilots. KPMI® also recommends the use of Liquid nitrogen when production volumes can offset costs.

18. What valve seat material is best for use with titanium valves?

KPMI® recommends our nickel aluminum bronze seats for maximum performance with titanium valves. The unique alloy blend; 80% copper, 5% nickel, and 10% aluminum, give these seats excellent thermal characteristics, resistance to wear (impact and chemical) and the proper expansion coefficient for use in aluminum heads. For two years KPMI® tested and recorded results with titanium valves. In every one of our tests the machinability, thermal conductivity, and resistance to wear of this nickel aluminum bronze material surpassed the high standards we set for success.

19. How do I look up valve seats by applications?

For optimum fit, stability, and heat transfer, KPMI® recommends that when seats are removed, the counter bore in the head be machined to insure that it is round, accurately sized, and well finished. It is not possible for us to know in every case what the finished size will be before the machining process is completed. Therefore we do not list seats by application, but by size. When an unlisted seat size is required, contact KPMI® directly.

20. What size seat should I use with my oversize valves?

In order to maintain a safe cross-sectional area KPMI® recommends using a seat OD 2.0mm (.080") larger than the head diameter of the valve.

21. Are KPMI® stainless steel valves compatible with the stock valve seats in my head?

Yes, if the seat is iron based.

22. Why are some of your oversize valves shorter than stock?

It is common in performance builds to use a longer duration cam with more overlap in combination with oversize valves. This combination reduces the valve to valve and valve to piston clearance at overlap. A shorter valve allows the builder to "sink" the valves to regain clearance, without creating excessive valves stem protrusion, poor rocker geometry, and other problems associated with excessive valve stem protrusion.

23. Why don't my new valves fit into my new guides?

When guides are installed into a cylinder head, they distort due to interference fit. All KPMI® guides are designed with undersized IDs to allow the builder to true the ID and set the desired valve to guide clearance.

24. Do I have to measure the installed height called out in the spring kit instructions?

Yes. Installed heights and spring pressures are critical to correct operation of the valvetrain system. Only by confirming the specifications can you be sure of a correct installation. Incorrect installation can result in a catastrophic failure. If you are not certain you have achieved the correct installed height you should contact a qualified professional.

25. Should I face my new KPMI® valves, (Black Diamond™, White Diamond® or Tensilite®)?

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KPMI® strives for quality and durability when it comes to designing any valve. Consequently, for all titanium and specific Black Diamond applications (that are supplied by KPMI® with coated faces), KPMI® recommends not facing these valves. The special coatings on the face of these valves will enhance the durability of the valve face.

26. Which way should I install progressively wound springs?

KPMI® designs certain springs with a progressive wind (closely spaced coils on one end) in order to achieve a variable spring rate. This makes the spring less likely to become excited by the harmonics of various camshafts, reducing the chances of spring surge. If your springs have this feature, the tightly spaced coils should be installed down on the basewasher to reduce reciprocating mass.

27. How do I measure the installed height?

To measure the installed height, take a measurement from the surface where the outer spring contacts the retainer to the surface where the outer spring contacts the basewasher. See figure below.

