

SV1000S Valve Adjustment PROCEDURE

Writeup from <https://www.sv-portal.com/threads/15k-valve-adjustment.6426/>

Well folks, just did my 15K valve inspection/adjustment (actual odo reading was like 15280). A set of hex keys, 10mm - 17mm sockets, a thickness gauge that can give you a good range between .101mm through .301mm, and the service manual are all you really need....

Tore it apart after failing to shake off the hangover from the previous night. Stayed at my buddies you see; the bike has to be STONE cold when you do it, and he's done a few suzuki valve/cam jobs before. Yanked the tank off (easy to do), yanked the radiator off (easy to do, but next time I won't... just un-bolt it and let the hoses hold it on. It will clear the head with the hoses still attached. The thing is more of a bitch to put back on and refill: the cooling system is a closed loop/sealed system that has to be bled.... just easier not to fuck with IMO). The valve covers pop right off after the plug wires and PAIR tubes come off. *PooF* instant cam access.

Truth be told, this cam design is just art. The cam chain is some sort of 'hybrid' set-up... it never actually touches the cams directly. Meaning: as long as you don't take both cams on the same head out at the same time, you don't have to mess with the chain or tensioner at all. TOO DAMN EASY :headbang:

Both intake valves were in spec. Very nice... I want to say they were .130-ish appiece, well withing the .1-.2 range. The exhaust valves both got tight though, reading .16/.17 on one head, and .17/.18 on the other head. :nutkick: Out come the cams, off come the buckets, out come the shims... then down to the dealer to see if we could get some exchanges. Wierd note though... one set was a 2.95, but the other was a 2.92... not a shim size that's in the SV1000's service manual. WTF, right? Well, down at the dealer I get some drama from the old hag at the service desk, but the nice cuttie on the other side of the shop goes back and exchanges the shims for me... a set of new 2.90's... but couldn't find ANY 2.80's or 2.85's (either would have brought the valve back into spec.. the book referenced the 2.85). Somehow, though, she found a set of 2.82's, and I was back in buisness. That size isn't on the chart anywhere, but they were the right deal. Strange, but they didn't charge me for the exchange :beer: . Picked up some Water Wetter for the radiator and back we went.

Everything went back in smooth as could be. You just have to pay -special attention- to the cam position when you re-install them. It is well addresssed and illustrated in the service manual; but ONE tooth off on the cam is bad news. They're well enough marked to get in with very little drama, however. Used just a -touch- of RTV on the valve cover seals... the big rubber parts that had stock suzuki black RTV on them when it was installed. Not necessary I believe, but better safe than sorry (ie: reassembly). As mentioned, the radiator/cooling system was a bit of a bastard, and a mess, to bleed. The coolant was cavitating at first and not wanting to flow through the thermostat. After some more running and shaking and bleeding, it came back to life. Good as new.

All in all, the job was 100% easier than I thought it was going to be. Attention to detail, soft hands on the wrenches (all that stuff is soft magnesium and aluminum) and torque specs, and adherence to the shop manual is all it takes. My dealer wanted 3 days and over \$200 for the job, PLUS more if any were found out of spec, PLUS parts (the shims are 6 bucks appiece... the 'Shim Set' is \$548!! :blink:). Sod that folks, you can do this one yourself. I can't stress enough how COOL the camshaft set-up is on this machine, and how easily accessible everything is with the tank/radiator removed. Feel free to fire off any questions... this is a great way to get intimate with your machine, and saves you an ass load of money to boot.

Cheers :beer:

2003 SV 1000S VALVE ADJUST

Remove spark plugs, Use 17mm socket to turn crank CCW

Align crank to F/T Mark for Front, R/T mark for rear (TDC)

Exhaust lobes will be just about ready to depress bucket

SPECS COLD INTAKE- .10 -.20mm EX- .20 -.30mm

Install oiled shim with numbers down towards bucket

Rotate crank 2 turns to compress oil before rechecking new shim.

Hot Cams Shim kit HCSHM02 9.48mm dia, Suzuki valve cover gaskets 11173-02F00

TORQUES (From 2003 Manual)

Cam shaft bearing clamp—10 N-M 7.0 ft/lbs

Head cover—14 N-M 10.0 ft/lbs

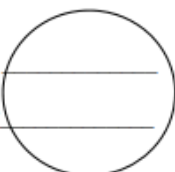
Spark Plug—11 N-M 8.0 ft/lbs

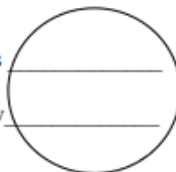
Generator cover plug (center) 15 N-M 11.0 ft/lbs

Generator Inspection plug - 23 N-M 16.5 ft/lbs

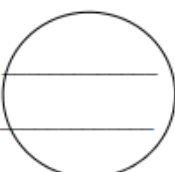
FRONT

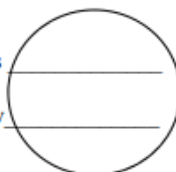
Exhaust

Was  _____ shim
New _____ shim

Was  _____ shim
New _____ shim

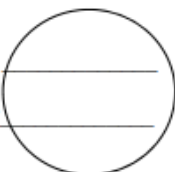
INTAKE

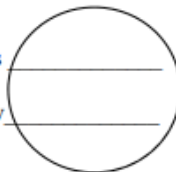
Was  _____ shim
New _____ shim

Was  _____ shim
New _____ shim

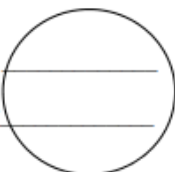
REAR

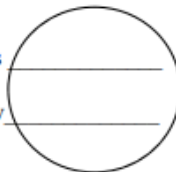
INTAKE

Was  _____ shim
New _____ shim

Was  _____ shim
New _____ shim

Exhaust

Was  _____ shim
New _____ shim

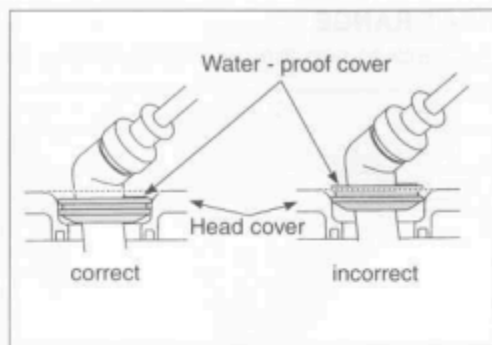
Was  _____ shim
New _____ shim

Other tips:

- ♦ Remove gas tank, unplug vent hoses and wires to pump, squeeze fuel line white tabs to remove—only a few drops will spill.
- ♦ Remove 3 bolts to mount radiator, leave vent hose on, 3 bolts to remove fan, sensor and fan plugs, now radiator will slide down easy to below head. ♦ No need to remove airbox. ♦ put tape on lower front fender to prevent scratch by radiator.
- ♦ Before removing cams to adjust shim, pay attention to scribe marks on cam gear, they may be slightly off the plane of the top of the head.

NOTE:

When installing the spark plug caps, front and rear, face the triangle mark **A** on the water-proof cover to the each cylinder exhaust side. Insert the spark plug cap securely to the dead end.



TAPPET CLEARANCE

Inspect every 24 000 km (15 000 miles, 24 months).

- Remove the seat. (☞ 6-7)
- Lift and support the fuel tank. (☞ 4-65)
- Remove the radiator. (☞ 5-5)
- Remove the spark plugs. (☞ 2-6)
- Remove the cylinder head covers.

The tappet clearance specification is different for intake and exhaust valves.

Tappet clearance must be checked and adjusted, 1) at the time of periodic inspection, 2) when the valve mechanism is serviced, and 3) when the camshafts are disturbed by removing them for servicing.



Tappet clearance (when cold)

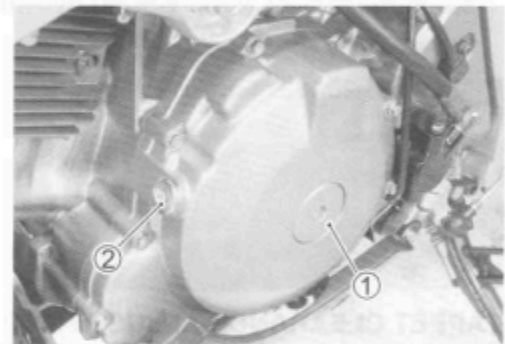
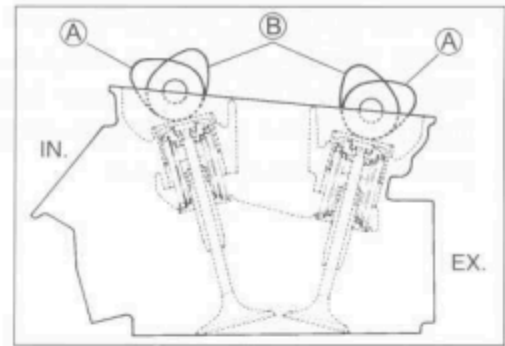
IN. : 0.10 – 0.20 mm (0.004 – 0.008 in)

EX. : 0.20 – 0.30 mm (0.008 – 0.012 in)

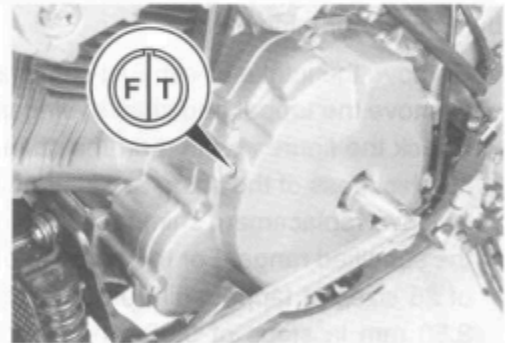


NOTE:


- * The tappet clearance should be taken when each cylinder is at Top Dead Center (TDC) of compression stroke.
- * The cams (IN & EX) on the front cylinder at position (A) show the front cylinder at TDC of compression stroke.
- * The cams (IN & EX) on the rear cylinder at position (B) show the rear cylinder at TDC of compression stroke.
- * The clearance specification is for COLD state.
- * To turn the crankshaft for clearance checking, be sure to use a 17-mm wrench, and rotate in the normal running direction. All spark plugs should be removed.
- Remove the generator cover plug (1) and timing inspection plug (2).

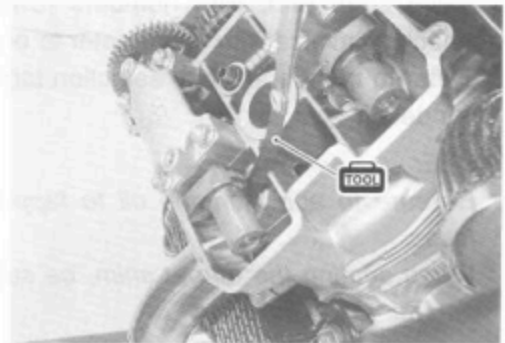


- Turn the crankshaft to set the No. 1 (Front) cylinder at TDC of compression stroke. (Align the "F | T" line on the generator rotor to the index mark of valve timing inspection hole and also bring the camshafts to the position as shown above.)

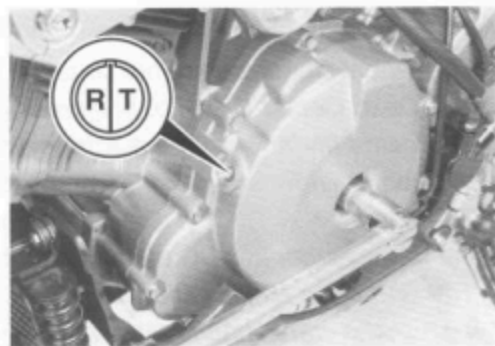


- To inspect the No. 1 (Front) cylinder tappet clearance, use a thickness gauge between the tappet and the cam. If the clearance is out of specification, adjust it into the specified range.

 **09900-20803: Thickness gauge**



- Turn the crankshaft 270 degrees (3/4 turns) to set the No. 2 (Rear) cylinder at TDC of compression stroke. (Align the "R | T" line on the generator rotor to the index mark of valve timing inspection hole and also bring the camshafts to the position as shown in page 2-9.)



- Inspect the No. 2 (Rear) cylinder tappet clearance as the same manner of No. 1 (Front) cylinder and adjust the clearance if necessary.

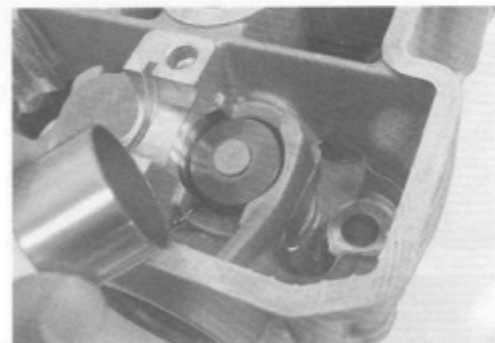
TOOL 09900-20803: Thickness gauge



TAPPET CLEARANCE ADJUSTMENT

The clearance is adjusted by replacing the existing tappet shim by a thicker or thinner shim.

- Remove the intake or exhaust camshafts. (☞ 3-18)
- Remove the tappet and shim by fingers or magnetic hand.
- Check the figures printed on the shim. These figures indicate the thickness of the shim, as illustrated.
- Select a replacement shim that will provide a clearance within the specified range. For the purpose of this adjustment, a total of 25 sizes of tappet shim are available ranging from 2.30 to 3.50 mm in steps of 0.05 mm. Fit the selected shim to the valve stem end, with numbers toward tappet. Be sure to check shim size with micrometer to ensure its size. Refer to the tappet shim selection table (Pages 2-12 and -13) for details.

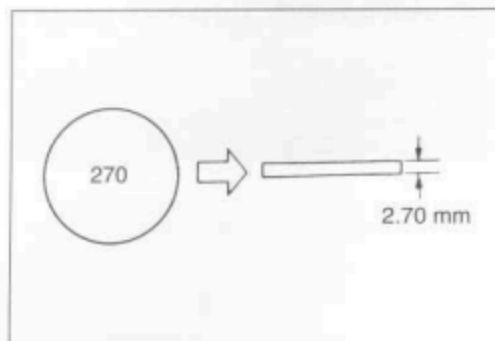


NOTE:

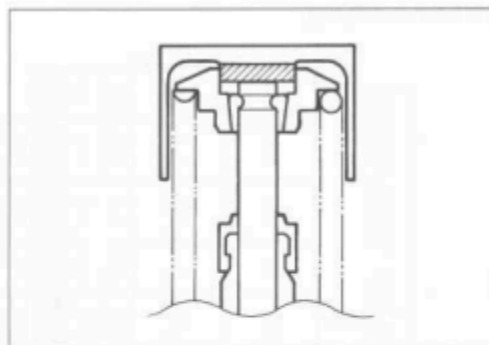
- * Be sure to apply engine oil to tappet shim top and bottom faces.
- * When seating the tappet shim, be sure to face figure printed surface to the tappet.

CAUTION

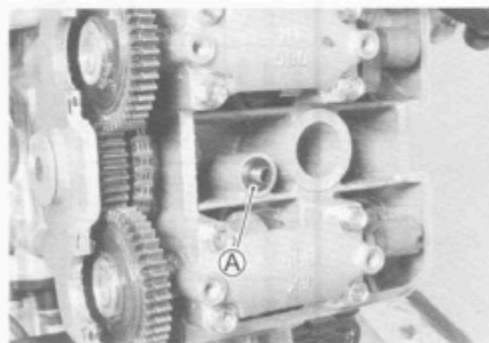
Reinstall the camshafts as the specified manner.
(☞ 3-106)



- After replacing the tappet shim and camshafts, rotate the engine so that the tappet is depressed fully. This will squeeze out oil trapped between the shim and the tappet that could cause an incorrect measurement, then check the clearance again to confirm that it is within the specified range.
- After finishing the tappet clearance adjustment, reinstall the following items.
- When installing the cylinder head cover, do not forget the gas-
ket **A**.



	Page
* Cylinder head cover	3-112
* Spark plug and plug cap.....	2-8
* Radiator.....	5-5
* Seat.....	6-7



TAPPET SHIM SELECTION TABLE [INTAKE]
TAPPET SHIM NO. (12892-41C00-XXX)

TAPPET SHIM SET (12800-41810)

		OPTION										TAPPET SHIM SET (12892-41C00-XXX)																										TAPPET SHIM SET (12800-41810)									
MEASURED TAPPET CLEARANCE (mm)	SUFFIX NO.	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320	325	330	335	340	345	350																					
	PRESENT SHIM SIZE (mm)	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50																					
0.00-0.04				2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50																			
0.05-0.09			2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50																				
0.10-0.20		SPECIFIED CLEARANCE/NO ADJUSTMENT REQUIRED																																													
0.21-0.25		2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																						
0.26-0.30		2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																							
0.31-0.35		2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																								
0.36-0.40		2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																									
0.41-0.45		2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																										
0.46-0.50		2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																											
0.51-0.55		2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																												
0.56-0.60		2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																													
0.61-0.65		2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																														
0.66-0.70		2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																															
0.71-0.75		2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																																
0.76-0.80		2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																																	
0.81-0.85		3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																																		
0.86-0.90		3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																																			
0.91-0.95		3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																																				
0.96-1.00		3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																																					
1.01-1.05		3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50																																						
1.06-1.10		3.25	3.30	3.35	3.40	3.45	3.50	3.50																																							
1.11-1.15		3.30	3.35	3.40	3.45	3.50	3.50																																								
1.16-1.20		3.35	3.40	3.45	3.50	3.50																																									
1.21-1.25		3.40	3.45	3.50	3.50																																										
1.26-1.30		3.45	3.50	3.50																																											
1.31-1.35		3.50	3.50																																												
1.36-1.40		3.50																																													

HOW TO USE THIS CHART:

I . Measure tappet clearance. "ENGINE IS COLD"

II . Measure present shim size.

III . Match clearance in vertical column with present shim size in horizontal column.

EXAMPLE

Tappet clearance is 0.23 mm

Present shim size 2.70 mm

Shim size to be used 2.80 mm

HOW TO USE THIS CHART:

- Measure tappet clearance. "ENGINE IS COLD"
- Measure present shim size.
- Match clearance in vertical column with present shim size in horizontal column.

EXAMPLE

Tappet clearance is 0.23 mm
Present shim size 2.70 mm
Shim size to be used 2.80 mm

(TAKE SIDE)

TAPPET SHIM SELECTION TABLE [EXHAUST]
TAPPET SHIM NO. (12892-41C00-XXX)

TAPPET SHIM SET (12800-41810)

OPTION

TAPPET SHIM NO. (12892-41C00-XXX)

TAPPET SHIM SET (12800-41810)

MEASURED TAPPET CLEARANCE (mm)	SUFFIX NO.	PRESENT SHIM SIZE (mm)	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320	325	330	335	340	345	350		
0.00-0.04							2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30		
0.05-0.09					2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40		
0.10-0.14				2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45		
0.15-0.19			2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50		
0.20-0.30		SPECIFIED CLEARANCE/NO ADJUSTMENT REQUIRED																											
0.31-0.35		2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50	3.50	3.50		
0.36-0.40		2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50	3.50	3.50	3.50		
0.41-0.45		2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50	3.50	3.50	3.50	3.50		
0.46-0.50		2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50	3.50	3.50	3.50	3.50	3.50		
0.51-0.55		2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50		
0.56-0.60		2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50		
0.61-0.65		2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50		
0.66-0.70		2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50		
0.71-0.75		2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50		
0.76-0.80		2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50		
0.81-0.85		2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50		
0.86-0.90		2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50		
0.91-0.95		3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50		
0.96-1.00		3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50		
1.01-1.05		3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50		
1.06-1.10		3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50		
1.11-1.15		3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50		
1.16-1.20		3.25	3.30	3.35	3.40	3.45	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50		
1.21-1.25		3.30	3.35	3.40	3.45	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50		
1.26-1.30		3.35	3.40	3.45	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50		
1.31-1.35		3.40	3.45	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50		
1.36-1.40		3.45	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50		
1.41-1.45		3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50		
1.46-1.50		3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50		

HOW TO USE THIS CHART:

- Measure tappet clearance, "ENGINE IS COLD"
- Measure present shim size.
- Match clearance in vertical column with present shim size in horizontal column.

EXAMPLE

Tappet clearance is	0.38 mm
Present shim size	2.90 mm
Shim size to be used	3.05 mm

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3/15/24 Checked valves at 52, 432 no adjustment needed and no setting changed more than .005 mm (2 tenth's).