VALVE ADJUSTMENT ON AIR-COOLED OHV ENGINES

Caution: These procedures should be done by an engine manufacturers' service dealer, unless you have the proper tools and are mechanically proficient. Refer to the engine shop manual for service procedures.

Why is this important?

You need to check and adjust valve clearance because these components wear slightly with use and the clearance may fall out of the specified range resulting in excessive wear (not enough clearance) or lost performance and noisy engine (too much clearance).

Proper valve adjustment is an important maintenance requirement on small OHV engines. Failure to adjust the valve clearance as required can cause poor engine performance and may result in MAJOR ENGINE DAMAGE OR FAILURE.

REFER TO YOUR ENGINE OPERATORS MANUAL FOR THE VALVE ADJUSTMENT INTERVAL. MOST MODELS ARE EVERY YEAR OR 200 TO 300 HOURS. YOU WILL ALSO NEED TO KNOW THE VALVE TOLERANCES.

A summary of most maintenance schedules and valve clearance specifications are at the end of this instruction sheet.

The following video is for adjusting the valve tolerances.

http://www.youtube.com/watch?v=xmXr4U5R8ak

BRIGGS & STRATTON OHV ENGINES

How to Set Valves in Small Engines

This valve adjustment procedure is for the Briggs and Stratton single OHV model with overhead valves. The OHV model came in the twin-cylinder engine as well, and both are used in bigger equipment like garden tractors, riding lawnmowers and generator sets.

Instructions

1. Adjusting The Valves

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Before dismantling your engine, remove the spark plug. Set your piston at top dead center at compression. This can be done by plugging the spark plug hole with your finger. As you slowly click the engine with your ignition key, you will be able to feel compression build up in the cylinder. At this point the piston should be at top dead center.

0 2

Take the valve cover off. By now, both valves should be exposed. When attempting to do a valve adjustment on a small engine you always start with the intake valve first, followed by the exhaust. The intake valve should be in the closed position. The cam lobe and tappet, also known as the rocker arm, should be in the downward position. Loosen the lock nut on the tappet by turning it counterclockwise. Set your feeler gauge at the recommended setting. Insert the feeler gauge between the tappet and the cam lobe to start the adjustment. Use a screwdriver to turn the center adjusting screw clockwise in the tappet arm until it sits firmly on the feeler gauge. Hold the screwdriver in place, and then tighten the lock nut. Don't over-tighten it.

0 3

Use the same procedure to set the exhaust valve. The settings may be different. Check the Operators Manual for specifications. Both valves are now adjusted.

BELOW IS THE SECTION FROM THE VANGUARD V-TWIN OHV REPAIR MANUAL.

NOTE: ALWAYS OBTAIN THE PROPER VALVE CLEARANCE FROM YOUR MODELS OPERATORS AND MAINTENANCE MANUAL.

Valve Clearance Adjustment

- 1. Set No. 1 cylinder at 1/4" (6 mm) past TDC, compression stroke.
- Use a feeler gauge (1) to measure the valve clearance. Valve clearance should be 0.005" (0.13 mm) for the intake and exhaust valve.

NOTE: Measure valve clearance with the engine COLD.

- 3. If the valve clearance requires adjustment, loosen the lock nut (2) with a wrench (4). Use a hex wrench (5) to turn the adjusting screw (3) to adjust the valves, **Fig. 49**.
- 4. With the valve clearance correctly adjusted, hold the adjusting screw. Torque the lock nut to **70 in. lbs. (8 Nm)**.
- 5. Repeat for No. 2 cylinder.

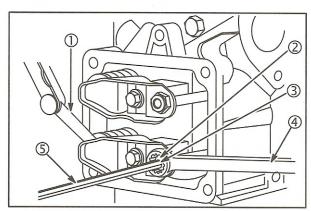


Fig. 49

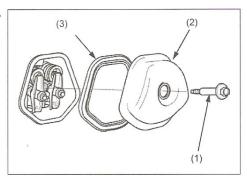
HONDA OHV ENGINES

BELOW IS THE SECTION FROM THE HONDA GX270 & GX340 OHV REPAIR MANUAL.

NOTE: ALWAYS OBTAIN THE PROPER VALVE CLEARANCE FROM YOUR MODELS OPERATORS AND MAINTENANCE MANUAL.

VALVE CLEARANCE CHECK/ ADJUSTMENT

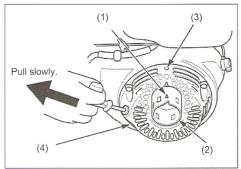
Remove the head cover bolt (1), the head cover (2), and the head cover packing (3).



Disconnect the spark plug cap from the spark plug.

Set the piston near top dead center of the cylinder compression stroke (both valves fully closed) by pulling the recoil starter slowly. When the piston is near top dead center of the compression stroke, the triangle mark (1) on the starter pulley (2) will align with the top hole (3) on the recoil starter case (4).

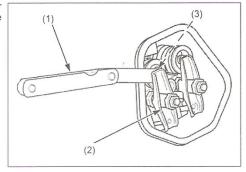
If the exhaust valve is open, use the recoil starter to turn the crankshaft one additional turn and align the triangle mark on the starter pulley with the top hole on the recoil starter case again.



Insert a thickness gauge (1) between the valve rocker arm (2) and valve stem (3) to measure the valve clearance.

VALVE CLEARANCE: IN: 0.15 ± 0.02 mm EX: 0.20 ± 0.02 mm

If adjustment is necessary, proceed as follows.



Hold the rocker arm pivot (1) and loosen the pivot adjusting nut (2).

Turn the rocker arm pivot to obtain the specified clearance.

VALVE CLEARANCE: IN: 0.15 ± 0.02 mm EX: 0.20 ± 0.02 mm

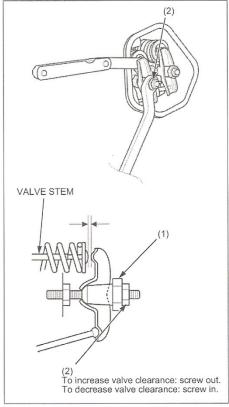
Hold the rocker arm pivot and retighten the pivot adjusting nut to the specified torque.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

Recheck the valve clearance, and if necessary, readjust the clearance.

Check the head cover packing for damage or deterioration, and install it to the head cover.

Attach the cylinder head cover to the cylinder head, and tighten the head cover bolt securely.



MAINTENANCE SCHEDULES

BRIGGS AND STRATTON ENGINE MODEL	WINCO MODELS	SCHEDULED VALVE CLEARANCE CHECK	INTAKE VALVE CLEARANCE	EXHAUST VALVE CLEARANCE
185432-0271-E2	ME 5000 V/A	Annually	0.004 - 0.006 in.	0.004 - 0.006 in.
254422-5070-02	DL 6000/A	Annually	0.004 - 0.006 in.	0.004 - 0.006 in.
250417-1003-E1	DL 6000E/A	Annually	0.004 - 0.006 in. 0.004 - 0.006	0.004 - 0.006 in. 0.004 - 0.006
210412-0150-E1 INTEK 11hp	CSA DL 6000 I/B & I/C	Annually	in.	in.
303447-1042-E2 Vanguard 16hp	DL9000VE/A, DL9000E/B HPS9000E/A, HPS9000E/B	Every 250 Hours or Annually	0.004 - 0.006 in.	0.004 - 0.006 in.
	HP9000E/M, HP9000E/N DX9000E/M, TFLC9000E/M, E/N W9000E/A, WC9000E/A, E/B	BRIGGS & STRATTON		
	WC9000 E/C, WC9000E/D TF9000 E/M, E/N, E/P HPS9000VE/A, HPS9000VE/C		~	
303447-1194-E1 Vanguard 16hp	PSS8000 PSS8000/N, CSA PSS8/N	Every 250 Hours or Annually	0.004 - 0.006 in.	0.004 - 0.006 in.
	PSS8B/N, CSA PSS8B/N PSS8000/P, CSA PSS8000/P			
305447-0301-G1 Vanguard 16hp	HPS9000VE/D	Every 250 Hours or Annually	0.004 - 0.006 in.	0.004 - 0.006 in.
305447-0003-G1 Vanguard 16hp	HPS9000VE/E	Every 250 Hours or Annually	0.004 - 0.006 in.	0.004 - 0.006 in.
359447-0115-E1 Vanguard 16hp	ULPSS8B4W/E, ULPSS8B2W/E	Every 250 Hours or Annually	0.004 - 0.006 in.	0.007 - 0.009 in.
304447-0320-E1 Vanguard 16hp	PSS 8.5/A PSS8B4W/A, PSS8B2W/A PSS8B4W/C, PSS8B2W/C	Every 250 Hours or Annually	0.004 - 0.006 in.	0.007 - 0.009 in.
3566447-0006-G1 Vanguard 18hp	WC10000VE/C, /D, /E	Every 250 Hours or Annually	0.004 – 0.006 in.	0.004 – 0.006 in.

BRIGGS AND		SCHEDULED VALVE	INTAKE	EXHAUST	
STRATTON ENGINE MODEL	WINCO MODELS	CLEARANCE CHECK	VALVE CLEARANCE	VALVE CLEARANCE	
			0.004 - 0.006	0.004 - 0.006	
354447-0331-E1	PSS10/A, PSS10/B	Annually	in.	in.	
Vanguard 18hp					
			0.004 - 0.006	0.004 - 0.006	
384447-0111-E1	PSS12/A	Annually	in.	in.	
Vanguard 23hp					
			0.004 - 0.006	0.004 - 0.006	
543477-0127-E1	PSS15B4W/A	Every 250 Hours or Annually	in.	in.	
Vanguard 31hp	PSS15B4W/B				
543277-0078-E1	PSS15B4W/C, PSS15B2W/C	Every 250 Hours or Annually	0.004 - 0.006 in.	0.004 - 0.006 in.	
Vanguard 31hp	ULPSS15B4W/D	Every 250 Flours of Armaany	111.	111.	
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543477-0140-E1	WL18000 VE/A, WL18000VE/B	Every 250 Hours or Annually	0.004 - 0.006 in.	0.004 - 0.006 in.	
Vanguard 31hp	WL18000VE/C				
	WL18000VE/E, WL18000VE/F				
			0.004 - 0.006	0.004 - 0.006	
543477-2140-G1	WL18000VE/G, WL18000VE/H	Every 250 Hours or Annually	in.	in.	
Vanguard 31hp					
			0.004 - 0.006	0.004 - 0.006	
543477-2141-G1	WL18000VE/L	Every 250 Hours or Annually	in.	in.	
Vanguard 31hp					
			0.004 - 0.006	0.004 - 0.006	
543477-0002-G1	WL18000VE/M, WL18000VE/N	Every 250 Hours or Annually	in.	in.	
Vanguard 31hp					
	ULPSS20B4W/A,		0.004 - 0.006	0.004 - 0.006	
613277-0161-B1	ULPSS20B2W/A	Every 250 Hours or Annually	in.	in.	
Vanguard 35hp					

HONDA ENGINE MODEL	WINCO MODEL #	SCHEDULED VALVE CLEARANCE CHECK	INTAKE VALVE CLEARANCE	EXHAUST VALVE CLEARANCE
HONDA				
ENGINES				
			0.08 (+ or -) 0.02	0.10 (+ or -) 0.02
GX160 K1VW12 5.5 hp	WC3000H	Every Year or 300 Hours	mm	mm
3.3 Hp				
GC160	D3000H	Every 150 Hours	0.15 (+ or -) 0.04 mm	0.20 (+ or -) 0.04 mm
5 hp	5000011	Every 100 Hours		11111
			0.15 (. 05) 0.04	0.20 (
GC160 AVXA	W3000H/C	Every 150 Hours	0.15 (+ or -) 0.04 mm	0.20 (+ or -) 0.04 mm
	WC5000H/A,		0.15 (+ or -) 0.02	0.20 (+ or -) 0.02
GX270 UVW12	WC5000H/B	Every Year or 300 Hours	mm	mm
9 hp	DL5000H, WC4500/A			
			0.15 (+ or -) 0.02	0.20 (+ 0* \ 0.00
GX270 R1VW12	WC5000H/C	Every Year or 300 Hours	mm (+ or -) 0.02	0.20 (+ or -) 0.02 mm
9 hp				
			0.15 (+ or -) 0.02	0.20 (+ or -) 0.02
GX270 RT2VNT2	WC5000H/D DL5000H/C	Every Year or 300 Hours	mm	mm
Code: GCBGT	DL3000H/C			
GX340 U1VW12	WC6000H/A, WC6000H/B	Every Year or 300 Hours	0.15 (+ or -) 0.02 mm	0.20 (+ or -) 0.02 mm
11 hp	DL6000H/A	Every rear or ooo riours		111111
	WC6000HE/A,		0.15 (. 0 .) 0.00	0.20 (
GX340 K1VWE2*	WC6000HE/B	Every Year or 300 Hours	0.15 (+ or -) 0.02 mm	0.20 (+ or -) 0.02 mm
11 hp	WC6000HE/C, DL6000HE/A			
	HPS6000HE/A, /B, /C, /E, /F, /G, /H			
* The GX340 K1VWE2 was replaced with GX340 RT1VWE2.				
OV9 49 DT9 4459	LIBOORS: := "	5 1 1 1 1 1 1 1 1 1 1	0.15 (+ or -) 0.02	0.20 (+ or -) 0.02
GX340 RT2VWE2 11 hp Code: GCBET	HPS6000HE/I	Every Year or 300 Hours	mm	mm
GX340 K1VW12	WC6000H/C, DL6000H/A	Every Year or 300 Hours	0.15 (+ or -) 0.02 mm	0.20 (+ or -) 0.02 mm
11 hp				
	DL6000H/D,		0.15 (+ or -) 0.02	0.20 (+ or -) 0.02
GX340 RT1VDE2	WC6000H/D,	Every Year or 300 Hours	mm	mm
11 hp	WC6000HE/D			
OVO 40 BTOURST	DI 2007-1-		0.15 (+ or -) 0.02	0.20 (+ or -) 0.02
GX340 RT2VWE2	DL6000HE/E	Every Year or 300 Hours	mm	mm
11 hp	<u> </u>		1	1

HONDA ENGINE MODEL	WINCO MODEL #	SCHEDULED VALVE CLEARANCE CHECK	INTAKE VALVE CLEARANCE	EXHAUST VALVE CLEARANCE
GX610 VZANH1	HP9500HE/Q, LLC9500HE/N	Every Year or 300 Hours	0.15 (+ or -) 0.02 mm	0.20 (+ or -) 0.02 mm
18 hp	DL 9500HE/A, W9500HE/A & B			
	W9500HE/C			
GX620 R1VXE2	HPS12000HE/A, /B, /C WC12000HE/B, /C,	Every Year or 300 Hours	0.15 (+ or -) 0.02 mm	0.20 (+ or -) 0.02 mm
20 hp	/D, /E			
GX620 K1VXE2*	WC12000HE/A	Every Year or 300 Hours	0.15 (+ or -) 0.02 mm	0.20 (+ or -) 0.02 mm
20 hp * The GX620 K1VXE2 was changed to GX620 R1VXE2 in Feb. 2009.				
GX620 K1VXC2 20 hp	PSS10H/B	Every Year or 300 Hours	0.15 (+ or -) 0.02 mm	0.20 (+ or -) 0.02 mm
	PSS10H/A,		0.15 (+ or -) 0.02	0.20 (+ or -) 0.02
GX620 K1VXA1	WL12000HE/A	Every Year or 300 Hours	mm	mm
20 hp				
GX630 RVXE2	WC12000HE/H, /I	Every Year or 300 Hours	0.08 (+ or -) 0.02 mm	0.10 (+ or -) 0.02 mm
20 hp				
GX630 RVXE1 20 hp	HPS12000HE/E WL12000HE/D, /H, /I, /J, /K	Every Year or 300 Hours	0.08 (+ or -) 0.02 mm	0.10 (+ or -) 0.02 mm
20 110	/1, /3, /K			
GX630RH VXE1 NH1	HPS12000HE/F	Every Year or 300 Hours	0.08 (+ or -) 0.02 mm	0.10 (+ or -) 0.02 mm
Code: GCAMH 20 hp	HT12000HE/B			
GX670 VXC2	PSS12H/A, PSS12H4W/A	Every Year or 300 Hours	0.15 (+ or -) 0.02 mm	0.20 (+ or -) 0.02 mm
24 hp	PSS12H4W/A, /B, /C, /D PSS12H2W/A, /B, /C, & /D			
GX690 VXC2	ULPSS12H4W/E	Every Year or 300 Hours	0.08 (+ or -) 0.02 mm	0.10 (+ or -) 0.02 mm
Code: GDACK 18 hp	ULPSS12H2W/E			
r				