

**V-Twin MFG.  
ANDREWS PB+GRIND CAM SET  
VT Part No.10-4045**

**IRON HEAD SPORTSTER & XR CAM INSTALLATION INSTRUCTIONS**

**This is a custom application and rider safety depends on proper installation. This product should only be installed by a knowledgeable and trained motorcycle technician. V-Twin Mfg. accepts no responsibility for improper installation.**

Remove pushrods, ignition parts and right side engin cam gear cover. Note whether shims are present on any of the stock cam gears when removing them. Cam kits for 1984 and 1985 engines with alternators require a #4 cam gear which looks like the #1 and #3 cam gears but unlike earlier Sportster cam gear sets, does not have the generator drive gear.

For cams with .490 lift or higher, chamfering top of roller tappet bodies and/or replacing cork seals with o-rings may provide better oil sealing at base of pushrod covers.

Install all 4 new cam gears in the outer gear cover and turn them with your fingers to make sure that they turn freely without binding. You can also install the stock cam gears in the outer cover for a comparison test. Both sets of cam gears should feel about the same when turned by hand. If there is any binding or tightness when performing this test, the new cam gears can be removed (one at a time) and the stock cam gear for that location can be installed until the cam gear (or gears) which cause the tightness or binding are identified. If there is binding in any cam gear, Andrews Products can reduce the size of the cam gear teeth with a National Broach gear tooth honing machine. If there is a question on this point, call our tech line (773-992-4014) for a return RMA and further instructions.

Andrews Products does NOT recommend installing needle bearings in outer cam covers as replacements for stock bushings. They will not result in more HP and they MIGHT cause cam bearing failure.

After installing new cams and reinstalling the cam gear cover for a final fit, remove tappet blocks so that cam gear end play can be checked. It is important that positive end play exists. Correct end play should be from .010 to .020 inches. If shims are needed to adjust end play, they are available as standard H/D parts. VT Part numbers are 12-0705 for .007" shim and 12-0706 for a .005" shim.

With end play on all 4 cam gears set correctly and the cover installed, rotate the engine to make sure that engine rolls freely. Engines from 1977 and later will require additional clearance for both the #2 and #3 intake cam lobe tips for cams with .490 or higher lift. The pinion bearing housing must be relieved at two points to clear the tips of the #2 and #3 cam lobe. This operation can be done with a rotary file (taking care not to throw metal chips into the engine).

Andrews Products makes high lift lower spring collars which will increase spring travel .060 overstock lower collars used on early Sportsters (through 1980). Cams with .450 lift (or less) will bolt in with these collars and stock springs. (Part # 277160).

PB+ and Y cams should bolt in without resetting valve spring travel using stock upper spring collars. Alloy collars may require machine work for adequate clearance. For ALL other grinds spring travel must be set to figures listed on the back side of this page as minimums.

For PB+, R5, Y, and X cams, stock springs are recommended and should be used! For V9 and BV cams, Manley .500 springs can be used and for AX and DX cams, long stem valves (XR style) and Branch springs are recommended. Andrews Products makes light weight ground steel pushrods for all Sportsters. They are .030 shorter than stock pushrods so re-installation can be done without "levering in" exhaust rods. Adjust pushrods to "finger Spin snug" and then tighten lock nuts. Part numbers for steel pushrods are 240040.

Andrews Products also makes super light weight aluminum pushrods especially for street motors where quiet operation is important, Part # is 240060. Aluminum pushrods are coated red for easy identification.

Final tuning of carburetors with performance cams sometimes requires richer jetting. For stock Keihin carbs, #65 slow jets and #170 main jets are good starting points. An Andrews Products High Flow Accelerator Pump kit will significantly improve low speed and mid range throttle response. Part # is 269050 and it installs easily on 1980-1988 Keihin carbs. Iron Head Sportster & XR Cam Timing Specifications

Grind	Timing (*)	Dur (.053)	Dur (.020)	Max Valve Lift	Springs (1)	TDC Lift (2)
Stock Q (1976-85)	10/32	222	262	.400	.440	.114
	35/07	222	262	.380	.440	.114
Stock P (note 3) PB+ (4/1 kit)	34/40	254	294	.400	.440	.200
	43/31	254	298	.410	.440	.192
PB+	34/40	254	298	.410	.445	.208
	43/31	254	298	.410	.445	.208
Y	35/47	262	310	.425	.450	.206
	53/29	262	310	.425	.450	.182
R5	33/41	254	306	.445	.470	.209
	43/31	254	306	.445	.470	.200
X	35/55	270	314	.450	.470	.210
	57/33	270	314	.450	.470	.206
V9	32/52	264	311	.490	.520	.207
	52/32	264	311	.490	.520	.207
AX	29/57	266	310	.550	.580	.197
	57/29	266	310	.550	.580	.197
BV	34/58	272	318	.520	.550	.224
	57/29	272	318	.520	.550	.224
DX	38/66	284	333	.550	.580	.241
	66/38	284	333	.550	.580	.241
XR#1	46/58	284	368	.560	.600	.280
	66/38	284	368	.560	.600	.240
XR#2	32/44	256	298	.486	.530	.227
	52/44	256	298	.486	.530	.189

**Notes:**

1. Minimum spring travel to coil bind.
2. Top Dead Center lift (for checking valve to valve clearance).
3. (PB+ Cam note): 4/1 Kit consists of #1 and #4 exhaust cams and should be used only with stock P intakes. If your engine has stock Q cams all 4 Q cams should be replaced with PB+ cams.