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# 24207  
24208

## SPORTSTER EVOLUTION ENGINE CAM INSTALLATION INSTRUCTIONS

**IMPORTANT NOTE:** 1991 (and later) EV Sportster cams are not interchangeable with earlier EV XL cams. For this reason, Andrews Products 1991 EV Sportster cams are marked with letter "N" instead of "V". The lobe angles and the overall length of the parts are different for 1991 and later cam gears.

1. Remove fuel tank and engine rocker box top covers. Each rocker arm must be removed in order to remove the pushrod. If you intend to reuse stock pushrods, mark them for reinstallation later.
2. Remove ignition parts and stock cam gears. New cams can now be installed. Reinstall gear cover. Make sure that each cam gear has correct end play as per H/D service manual.
3. The following cam grinds are made with stock size base circles so stock pushrods will fit back into original locations. (Stock pushrods are non-adjustable): V2, N2, V4, N4, V6, N6, V8, AND N8.
4. Cam grinds V9, N9, BV, and NV are ground with smaller base circles so cam lobe tips will clear engine cases. Therefore pushrod length for these 4 cam grinds need to be .035"/.040" longer than stock for the intakes and .015"/.020" longer for the exhausts.
5. Andrews Products makes adjustable aluminum pushrods which will simplify this installation. Adjustable pushrods are made in sets of 4 identical length rods. To install, adjust to shortest length, then position in engine with rocker installed. Next, adjust pushrod longer until all freeplay is gone. Then turn adjuster out 4-4.5 full turns (24-27 flats) and tighten locknut. Wait until hydraulic unit bleeds down and repeat procedure on next pushrod. Adjustable black aluminum pushrod kits (4 pushrods) are available as part# 292020. For super rigidity, adjustable steel pushrods are also available (part # 292090, 4 pushrods).
6. 1991 engines REQUIRE fixed length pushrods (as of February, 1991). Andrews Products makes both steel and aluminum fixed length pushrods for the 1991 EV Sportsters. (Steel pushrods: part #292095, Aluminum: #292025).
7. New EV hydraulic lifters are capable of 6000+ RPM without floating. We are recommending that solid lifters not be used with any cam grinds **below the V80 series**. Also, V2 or N2 cams will bolt in without head work. V4, N4, V6, N6, V8 or N8 cams need .530 as minimum valve travel. Checking valve travel and piston-valve clearance is recommended on all but V2 and N2 cams.
8. Andrews Products makes Titanium upper spring collars for Evolution Sportsters (part# 293110, 4 Pcs). Titanium collars are light, strong and will add .050 extra spring travel to stock valve springs. With titanium collars, V4, N4, V6, N6, V8 or N8 cams can be installed without any additional head work. (But piston clearances still must be checked on V6, V8, N6, N8 cams).

9. Final tuning of carburetors with bigger cams sometimes requires richer jetting. For stock H/D Keihin butterfly type carbs, #65 slow jets and #170 main jets work well. An Andrews Products High-Flow Accelerator Pump kit will also improve low speed and mid range throttle response. (Part# 269050).
10. Constant velocity type Keihin carburetors may run better if the piston return spring force is reduced slightly by removing 1/2 to 1 full spring coil and raising the metering rod up .030 " by installing a .030 shim under the rod snap ring (at the top of the rod). The slow jet can be richened 3 or 4 sizes.
11. **Warning: When upgrading 883 engines to 1200cc, valve clearance pockets in the new 1200 pistons may not match the valves in 883 heads!! (These clearances must be checked! Valves on 883 heads are closer together than 1200 heads and therefore require checking of clearances.)**

### EVOLUTION SPORTSTER CAM TIMING

| GRIND      | TIMING         | DUR        | LIFT         | SPRING TRAVEL      | SPRINGS              | LIFT @ IDC   |
|------------|----------------|------------|--------------|--------------------|----------------------|--------------|
| STK D      | 02/41<br>41/02 | 223<br>223 | .458<br>.458 | COMPARISON<br>DATA | STOCK<br>-           | .094<br>.094 |
| V2<br>N2   | 22/38<br>46/18 | 240<br>244 | .465<br>.440 | .495<br>.470       | STOCK<br>-           | .180<br>.155 |
| V4<br>N4   | 30/46<br>52/24 | 256<br>256 | .490<br>.490 | .530<br>.530       | STOCK<br>-           | .216<br>.189 |
| V6<br>N6   | 34/50<br>56/28 | 264<br>264 | .500<br>.500 | .530<br>.530       | STOCK<br>-           | .241<br>.212 |
| V8<br>N8   | 32/44<br>56/28 | 256<br>264 | .490<br>.500 | .530<br>.530       | STOCK<br>-           | .226<br>.212 |
| V9<br>N9   | 33/53<br>53/33 | 266<br>266 | .555<br>.555 | .600<br>.600       | ANDREWS<br>-         | .240<br>.240 |
| BV<br>NV   | 35/59<br>59/35 | 274<br>274 | .590<br>.590 | .640<br>.640       | ANDREWS<br>-         | .260<br>.260 |
| V80<br>N80 | 32/60<br>66/30 | 272<br>276 | .600<br>.600 | .650<br>.650       | HI-LIFT<br>(160 LBS) | .264<br>.244 |
| V83<br>N83 | 32/64<br>70/30 | 276<br>280 | .630<br>.630 | .680<br>.680       | HI-LIFT<br>(160 LBS) | .267<br>.248 |
| V87<br>N87 | 34/70<br>76/32 | 284<br>288 | .670<br>.670 | .720<br>.720       | HI-LIFT<br>(160 LBS) | .283<br>.269 |

1. All "N" grinds are for engines (1991 - up) only !
2. Timing specs taken @ .053 cam lift in crank degrees.
3. Spring travel figures minimum for setting coil bind.
4. Valve lift calculated by multiplying max camlift by 1.633 rocker ratio.

Specifications are subject to change without notice (12/94)