



TECH TIPS

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Designation	Model Name
ELECTRA GLIDES	
FLT	Tour Glide
FLH	Electra-Glide
FLHS	Electra-Glide Sport
FLHT	Electra-Glide Standard
FLHTC	Electra-Glide Classic
FLHTCU	Electra-Glide Ultra Classic
FLTR	Road Glide
FLHR	Road King
FLHRC	Road King Classic
FLHRS	Road King Custom
FLTC	Tour Glide Classic
FLTCU	Tour Glide Ultra Classic
FLTRSEI	Screamin' Eagle Classic
FLHX	Street Glide

SOFTAILS

FXCW	Softail Rocker
FXCWC	Softail Rocker Custom
FXST	Softail Standard
FXSTC	Softail Custom
FXSTS	Springer Softail
FXSTD	Softail Deuce
FXSTB	Night Train
FXSTSB	Bad Boy
FLST	Heritage Softail
FLSTF	Fat Boy
FLSTC	Heritage Softail Classic
FLSTS	Heritage Springer Softail
FLSTSC	Softail Springer Classic
FLSTN	Heritage Softail Special - Nostalgia, Deluxe

DYNAS

FXD	Dyna Super Glide
FXDB	Dyna Glide - Street Bob
FXDB-D	Dyna Glide Daytona - Belt
FXDB-S	Dyna Glide Sturgis - Belt
FXDC	Dyna Glide Custom
FXDF	Dyna - Fat Bob
FXDG	Dyna Glide Sturgis
FXDX	Dyna Super Glide Sport
FXDS-CONV	Dyna Glide Convertible
FXDXT	Dyna Super Glide T Sport
FXDL	Dyna Low Rider
FXDX	Dyna Super Glide Sport
FXDWG	Dyna Wide Glide

SUPER GLIDES

FXS	Super Glide Low Rider
FXSB	Super Glide Low Rider - Belt
FXB	Super Glide - Sturgis
FXEF	Super Glide Fat Bob
FXR	Super Glide Rubber Mount
FXRP	Super Glide Police
FXRS	Super Glide Rubber Mount - Sport
FXRS-SP	Low Rider Sport
FXRS-CONV	Low Rider Sport Convertible

Designation	Model Name
SUPER GLIDES Cont.	
FXRC	Low Glide Custom
FXRD	Sport Glide Grand Touring
FXRDG	Disc Glide
FXRT	FXR Touring - Sport Glide
FXRT/P	Sport Glide Police
FXLR	Low Rider Custom
FXLR-FX	Lower Rider - Evolution
FXWG	Wide Glide

SPORTSTERS

XL	4-Speed 883 Sportster
XL883	883 Hugger
XL883C	883 Custom
XL883L	883 Low
XL1100	Standard 1100
XL1200	Standard 1200
XL1200C	1200 Custom
XL1200L	1200 Low
XL1200N	1200 Nightster
XL1200R	1200 Roadster
XL1200S	1200 Sport
XLCH	4-Speed 883 Kick Start
XLCR	Café Racer 1000
XLH	4-Speed 883 Electric Start
XLH883	883 Hugger
XLH1200	Standard 1200
XLH1200S	Sport
XLS	4-Speed Roadster
XLX	4-Speed 1000
XR1000	1000 with Competition Heads

V - RODS

VRSCA	V-Rod with more options
VRSCB	Basic V-Rod
VRSCAW	V-Rod
VRSCR	Street Rod
VRSCD	Night Rod
VRSCDX	Night Rod Special

THE BASICS FROM THE PAST

E	Basic version of the Big Twin
EL	E with more power
F	Basic Big Twin enlarged from 61 to 74 c.i.
FL	F with more power
FLH	Pan, Shovel, Evolution more power
K	Sidevalve (flathead) middleweight
KK	K with more power
KH	K enlarged from 45 to 54 c.i.
KHK	KH with more power
XL	Basic Sportster
XLC	Stripped Competition Sportster
XLH	XL with more power - Electric start
XLCH	XL with more power - Kick start
FX	Original Super Glide - Kick start
FXE	Original Super Glide - Electric start

NOTE: Any Big Twin model designation with the letter "I" at the end indicates a fuel injected model.

JIMS® TIPS

Pushrod adjustment. For reference only.

Note: Use instructions that came with your tappets. This chart is for information only; It is not an adjustment guide.

Threads Per In.	Wrench Flats	Total Travel Distance	Distance Per Turn	Distance Per Flat	Pushrod Mfg/N	Threads Per In.	Pushrod Mfg/N	Threads Per In.
24	15	.1042"	.01417"	.0069"	JIMS Pro Lite	24	Crane	32
28	17	.1011"	.0357"	.0059"	Slim JIMS	32	H-D	32
32	18	.0937"	.0313"	.0052"	Andrews	28	S&S	32
36	21	.0965"	.0275"	.0045"	Andrews	32	Screamin Eagle	32
40	24	.100"	.025"	.0042"	Crane	28	Rivera	40
52	30	.0962"	.0192"	.0032"	Crane	24	Rev Tech	36

S&S TIPS

CALCULATING HEAD BOLT LENGTH

Add: A - cylinder length (gasket surface to gasket surface measurement)

+ B - base gasket thickness

+ C - head gasket thickness

+ D or E - cylinder head thickness (gasket surface to head bolt washer pad measurement: D (short side) for S&S & L85-90 H-D = 1.207", 91-99 H-D = 1.405"; E (long side) for S&S & all H-D = 2.700")

+ F - desired thread engagement (.563" - usually 1 1/2 times diameter;

stock studs are 3/8")

Subtract: G - cylinder stud install height (crankcase deck to top of stud measurement)

STOCK CYLINDER LENGTH

Engine Style	Year	Length
Knucklehead 61"	36-47	5.405"
Knucklehead 74"	36-47	5.530"
Panhead 61"	48-52	5.205"
Panhead 74"	48-65	5.330"
Shovelhead 74" & 80"	66-84	5.330"
Evolution 80"	84-99	5.550"
Twin Cam 88"	99-03	4.937"
Ironhead Sportster 900cc & 1000cc	57-85	5.330"
Evolution Sportster & Buell	86-03	4.650"

FLYWHEEL IDENTIFICATION CHART

Stroke code	Year Stroke	Engine Code	Year	Sprocket Shaft	Pinion Shaft	Crankpin Type	Dia. Code	Flywheel Dia.
1	4-3/8"	E	36-54	Stock	Stock	41-81	-	8-1/2" stock
2	4-1/2"	L	55-71	Stock	Stock	41-81	A	8-3/8"
3	4-3/4"	AL	72-E81	Stock	Stock	41-81	X	8-1/4"
4	5"	SE	55-E81	S&S	Stock	41-81	-	-
5	4-1/4" (stock 80")	BL	L81-99	Stock	Stock	81-99	-	-
6	4-5/8"	SL	L81-99	S&S	Stock	81-99	-	-
9	Special Order	Y	74"/80" in dia.	Stock	Stock	Stock	-	-
12	5-1/14"	-	-	-	-	-	-	-
13	3-1/2" (stock 61")	-	-	-	-	-	-	-
14	3-31/32" (stock 74")	-	-	-	-	-	-	-
16	5-1/18"	-	-	-	-	-	-	-
17	4"	-	-	-	-	-	-	-

SPORTSTER

Stroke Code	Stroke	Year Code	Engine Year	Sprocket Shaft	Pinion Shaft	Crankpin Type	Rod Bearing Type	Dia. Code	Flywheel Dia.
1	4-1/16"	None	57-76	Stock	Stock	Stock	Stock	None	7-7/8"
2	4-3/16"	B	57-E81	Stock	Stock	Stock	Stock	A	7-3/4"
3	4-5/16"	SB	57-E81	S&S	Stock	Stock	Stock	X	7-5/8"
4	4-7/16"	BD ¹	57-E81	Stock	-	Stock	Stock	-	-
6	4-5/8"	SBD ¹	57-E81	S&S	-	Stock	Stock	-	-
7	4-13/16"	C	L81-85	Stock	Stock	Stock	Stock	-	-
8	5"	SC	L81-85	S&S	Stock	Stock	Stock	-	-
9	Special Order	SCD ¹	L81-85	S&S	-	Stock	Stock	-	-
11	4-1/2"	SCR	L81-85	S&S	Stock	Stock	87-02	-	-
12	5-1/4"	SCDR ¹	L81-85	S&S	Stock	Stock	87-02	-	-
15	3-13/16" (stock)	D ¹	L86-02	S&S	S&S	S&S	S&S	-	-
16	5-1/8"	DR ¹	L86-02	S&S	S&S	S&S	87-02	-	-
17	4"	-	-	-	-	-	-	-	-
-	-	KRS	45" WR/KR	Stock	Stock	Stock	57-81XL	-	-
-	-	YS	45" Indian	Stock	Stock	Stock	Stock	-	-

¹ Sportster-style flywheel machined to work with either 77-86 or 87-02 style pinion main bearing assembly.

ANDREWS TIPS

Cam Gear Changing

Remove the stock cam gear and press it onto the new camshaft. Stock gears will work with Andrews Products camshafts. To press a new gear onto camshaft the center of the 1/4" keyway (in the camshaft) must be exactly 180° (21 teeth) from the pinion timing mark on the drive gear.

Measuring Cam Gears

1. Measure the stock cam gear and pinion gear (over the pins). Write down the measurements.
2. Now measure the new gear (over the pins) and write down that number also.
3. Subtract the new gear size from the stock gear size.
4. If the new cam gear is smaller than the stock gear (for clicking), add the difference (from 3) to the size of the pinion gear to obtain a new (larger) pinion gear size.
5. If the new cam gear is larger than the stock gear (for whining), subtract the difference (from 3) from the size of the pinion gear to obtain a new (smaller) pinion gear size.
6. Match new size to a new pinion gear part number in the H-D manual and install it.
7. Remember to use the same size pins as the manual lists for measuring your gears (.108" or .105" dia.).

How To Check For Possible Valve To Valve Interference

1. You must know what TDC (Top Dead Center) is; It should be listed on the instruction sheets of all cams.
Write down the number for the cam you are using. For example, for an EV51 cam, the TDC lift = .223"
2. Minimum valve to valve clearance should be .060".
3. Calculate the minimum valve separation distance as follows: Minimum Valve Separation Distance = TDC lift + clearance.
4. For EV51 cams, Minimum Valve Separation Distance = .233" + .060" = .293".
5. Measure the separation between the two valves when they are seated. If actual measurement is not at least .293", modifications will be necessary to avoid valve to valve interference. (Cut seats deeper or back cut valves.)
6. Remember, this technique is not for piston to valve clearance.

How To Figure Out What The Installed Spring Height Should Be

1. Using both top and bottom collars, place spring assembly in a small vise and close vise until the outer spring is compressed solid. Be careful when compressing springs in a vise.
2. Now measure the distance between spring lands and write down the number for later use. This is the Solid Height.
3. Calculate INSTALLED SPRING HEIGHT (minimum) as follows: INSTALLED HEIGHT=SOLID HEIGHT + .060" + MAXIMUM VALVE LIFT.
5. For an EV51 cam using Andrews Products springs and collars, INSTALLED SPRING HEIGHT=1.190" + .060" + .510" =1.760".
6. This technique will work for any cam and spring system as long as measurements are carefully made.
7. At time of installation, make sure that .050" (minimum) clearance is present between top of valve and bottom of upper spring collar at maximum cam lift.
8. Solid height + .560" refers to spring forces when the valve is seated (.560" is assumed spring travel).

Big Twin 4-Speed Mainshaft Lengths

Year	Length
37-64	11.730"
65-69	11.985"
70-85 (chain)	12.470"
84-86 (belt)	13.725"

BDL TECH TIP

Final Drive Ratio and Belt Lengths

Pulleys	Ratio	Belts	Cen-Cen	Belt	Cen-Cen	Belt	Cen-Cen	Belt	Cen-Cen	Belt	Cen-Cen	Belt	Cen-Cen	Belt	Cen-Cen
70-34	2.05 To 1	136	22.932	135	22.654	133	22.097	132	21.819	130	21.261	128	20.704	126	20.146
70-33	2.12 To 1	136	23.059	135	22.780	133	22.223	132	21.945	130	21.388	128	20.829	126	20.200
70-32	2.18 To 1	136	23.186	135	22.907	133	22.350	132	22.071	130	21.515	128	20.955	126	20.397
70-31	2.25 To 1	136	23.312	135	23.033	133	22.476	132	22.197	130	21.641	128	21.080	126	20.521
70-30	2.33 To 1	136	23.438	135	23.159	133	22.601	132	23.323	130	21.767	128	21.205	126	20.646
70-29	2.41 To 1	136	23.564	135	23.285	133	22.727	132	22.448	130	22.350	128	21.330	126	20.771
65-34	1.91 To 1	136	23.683	135	23.405	133	22.850	132	22.572	130	22.017	128	21.462	126	20.905
65-33	1.96 To 1	136	23.811	135	23.534	133	22.978	132	22.701	130	22.145	128	21.589	126	21.033
65-32	2.03 To 1	136	23.939	135	23.661	133	23.106	132	22.829	130	22.272	128	21.716	126	21.160
65-31	2.09 To 1	136	24.067	135	23.789	133	23.234	132	22.956	130	22.400	128	21.848	126	21.287
65-30	2.16 To 1	136	24.195	135	23.917	133	23.361	132	23.083	130	22.527	128	21.970	126	21.692
65-29	2.24 To 1	136	24.323	135	24.044	133	23.488	132	23.311	130	22.654	128	22.097	126	21.819

HANDY FORMULAS

To Convert C.I. To C.C.:

C.I. ÷ .061 = C.C.

To Convert C.C. To C.I.:

C.C. x .061 = C.I.

To Figure Displacement:

0.7854 x bore x bore x stroke x number of cylinders

To Figure Compression Ratio:

(Cylinder volume + chamber volume)/chamber volume

Cylinder volume = 0.7854 x bore x bore x stroke

Measure chamber volume with piston at top dead center in C.C. and convert to C.I.

H-D ENGINE SPECIFICATIONS

Note: These O.E.M. specifications apply to stock applications only.

1200CC Sportster 2004-2008

Bore	3.50"
Stroke	3.81"
1200CC Evolution Sportster 1986-2003	
Bore	3.498"
Stroke	3.8125"
Piston to cylinder clearance	See HD manual
Piston to side clearance	
Top ring and second ring	.0065"
Oil ring	.0094"

Piston ring gap	
Top ring and second ring	.032"
Oil ring	.065"
Piston pin fit-piston	.001"
Piston pin fit-connecting rod	.00125-.00175"

883CC Sportster 2004-2008	
Bore	3.00"
Stroke	3.81"

883CC Evolution Sportster 1986-2003	
Bore	3.00"
Stroke	3.8125"

Piston to cylinder clearance	See HD manual
Piston ring side clearance	
Top ring and second ring	.0020-.0045"
Oil Ring	.0014-.0074"
Piston ring gap	
Top ring and second ring	.010-.023"
Oil Ring	.010-.053"
Piston pin fit piston	.00005-.00045"
Piston pin fit connecting rod	.00125-.00175"

1100CC Evolution Sportster	
Bore	3.350"
Stroke	3.8125"
Piston to cylinder clearance	See HD manual
Piston ring side clearance	
Top ring	.0020-.0045"
Second ring	.0016-.0041"
Oil ring	.0016-.0076"
Piston ring gap	
Top ring and second	.007-.020"
Oil ring	.009-.052"

1100CC Evolution Sportster Cont.

Piston pin fit-piston	.00005-.00045"
Piston pin fit-connecting rod	.00125-.00175"
61" Sportster 1979-1985	
Bore	3.188"
Stroke	3.8125"
Piston to cylinder clearance	
1979-E85	.003-.004"
L85	.0025-.0035"

Piston ring side clearance 79-82	
Top ring and second ring	.0035-.005"
Oil ring	.003-.005"
Piston ring gap 79-82	.010-.020"
Piston ring side clearance 83-85	
Top ring and second ring	.005-.006"
Oil ring	.003-.004"

Piston ring gap 83-85	
Top ring and second ring	.008-.009"
Oil ring	.015-.002"
Piston pin-fit connecting rod	.0008-.001"

61" Sportster 1972-1978	
Bore	3.188"
Stroke	3.8125"
Piston to cylinder clearance	.003-.004"
Piston ring side clearance	
Top ring and second ring	.0025-.004"
Oil ring	.003-.005"
Piston ring gap	.015-.025"
Piston pin-fit connecting rod	.0008-.001"

55" Sportster	
Bore	3.000"
Stroke	3.8125"
Piston to cylinder clearance	.0025-.003"
Piston ring side clearance	
Top ring and second ring	.0025-.004"
Oil ring	.003-.005"
Piston ring gap	.010-.020"
Piston pin-fit connecting rod	.0008-.001"

96" Twin Cam A & B

Bore	3.750"
Stroke	4.38"
88" Twin Cam A & B	
Bore	3.750"
Stroke	4.000"

Piston to cylinder clearance	.0006-.0016"
Piston ring side clearance	
Top ring	.002-.0045"
Second ring	.0016-.0041"
Oil ring	.0016-.0076"
Piston ring gap	
Top ring and second ring	.007-.020"
Oil ring	.009-.052"

Piston pin-fit connecting rod	.0001-.0004"
80" Evolution	
Bore	3.500"
Stroke	4.250"

Piston to cylinder clearance	.00055-.00165"
Piston ring side clearance	
Top ring	.002-.0045"
Second ring	.0016-.0041"
Oil ring	.0016-.0076"

Piston ring gap	
Top ring and second ring	.007-.020"
Oil ring	.009-.052"
Piston pin-fit connecting rod	.002-.0006"
80" Shovelhead	
Bore	3.500"
Stroke	4.250"

Piston to cylinder clearance	.0020-.0025"
Piston ring side clearance	
Top ring and second ring	.004-.005"
Oil ring	.003-.005"
Piston ring gap to E83	.008-.015"
Piston ring gap to L83-84	.010-.020"
Piston pin-connecting rod to E83	.0008-.001"
Piston pin-connecting rod to L83-84	.00015-.00065"

74" Panhead & Shovelhead

Bore	3.4375"
Stroke	3.96875"
Piston to cylinder clearance	.001-.002"
Piston ring side clearance	
Top ring and second ring	.004-.005"
Oil ring	.003-.005"
Piston ring gap	.010-.020"
Piston pin fit-connecting rod	.0008-.0012"

61" Knucklehead & Panhead	
Bore	3.4375"
Stroke	3.500"

Piston to cylinder clearance	.001-.002"
Piston ring and ring groove	.004"
Piston ring gap	.010-.020"
Piston pin fit-connecting rod	.001"

80" Flathead	
Bore	3.4375"
Stroke	4.28125"

Piston to cylinder clearance	.001-.002"
Piston ring and ring groove	.004"
Piston ring gap	.010-.020"
Piston pin fit-connecting rod	.001"

74" Flathead	
Bore	3.3125"
Stroke	4.28125"
Piston to cylinder clearance	.001-.002"
Piston ring and ring groove	.004"
Piston ring gap	.010-.020"
Piston pin fit-connecting rod	.0001"

45" Flathead	
Bore	2.750"
Stroke	3.8125"
Piston to cylinder clearance	.001-.002"
Piston ring and ring groove	.004"
Piston ring gap	.010-.020"
Piston pin fit-connecting rod	.001"