Klein Technical Manual

This manual covers all Klein models to August 1996

KLEIN
Handcrafted Science™

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MOUNTAIN FRAME GEOMETRY
1994 - 1996

MODEL SIZE (cm / inch)	Top Tube Height (inch)	Top Tube Length (cm)	Top Tube Angle	Seat Tube Angle	Head Tube Angle	Chain Stay Length (inch)	BB Height (inch)	Wheel Base (inch)	Head Tube Length (mm)	Steerer Tube Length (mm)	Fork Rake (inch)
ADROIT / ATTITUDE											
46 / 18	27.42	55.9	15.4	73.2	71	16.4	11.4	40.07	92	178	1.38
48 / 19	28.21	57.9	10.5	73.2	71.5	16.4	11.5	40.67	92	178	1.38
53 / 20	29.62	59.4	8.2	73.2	72	16.4	11.7	41.21	119	205	1.38
55 / 21	30.66	60.2	8.4	73.2	72.2	16.4	11.8	41.64	147	233	1.5
57 / 22	31.76	61.1	8	73.2	72.2	16.4	11.9	42.04	178	264	1.5
PULSE II											
46 / 18	27.78	55.4	17.2	73.2	71	16.4	11.4	40.07	95	n/a	1.38
48 / 19	28.58	57.4	12.5	73.2	71.5	16.4	11.5	40.67	95	n/a	1.38
53 / 20	29.62	59.4	8.27	73.2	72	16.4	11.7	41.21	101	n/a	1.38
55 / 21	30.68	59.9	8.47	73.2	72.2	16.4	11.8	41.64	129	n/a	1.5
57 / 22	31.78	61.1	8.07	73.2	72.2	16.4	11.9	42.04	158	n/a	1.5
PULSE COMP											
46 / 18	27.78	55.4	17.2	73.2	71	16.4	11.4	40.07	95	n/a	1.38
48 / 19	28.58	57.4	12.5	73.2	71.5	16.4	11.5	40.67	95	n/a	1.38
53 / 20	29.62	59.4	8.27	73.2	72	16.4	11.7	41.21	101	n/a	1.38
55 / 21	30.68	59.9	8.47	73.2	72.2	16.4	11.8	41.64	129	n/a	1.5
57 / 22	31.78	61.1	8.07	73.2	72.2	16.4	11.9	42.04	158	n/a	1.5

ROAD FRAME GEOMETRY
Discontinued Models

MODEL SIZE (cm / inch)	Top Tube Height (inch)	Top Tube Length (cm)	Top Tube Angle	Seat Tube Angle	Head Tube Angle	Chain Stay Length (inch)	BB Height (inch)	Wheel Base (inch)	Head Tube Length (mm)	Steerer Tube Length (mm)	Fork Rake (inch)
PERFORMANCE											
52 / 20.5	30.1	54.2	0	74	72	18	10.2	40.7	90	130	1.75
54 / 21.3	31	55.2	0	74	72	18	10.3	41.1	114	154	1.75
56 / 22.0	31.8	56.2	0	74	72.5	18	10.4	41.2	133	173	1.5
58 / 22.8	32.7	57.2	0	74	72.5	18	10.5	41.6	157	197	1.5
60 / 23.6	33.6	58.2	0	74	72.5	18	10.6	42.2	180	220	1.5
62 / 24.4	24.4	59.2	0	74	72.5	18	10.7	42.6	200	240	1.5
KIRSTEN / PANACHE											
47 / 18.5	27.3	51.3	14	74	71	16.77	10.1	38.4	80	120	2.0
50 / 19.7	27.3	51.3	14	74	71	16.77	10.1	38.4	103	143	2.0
CUSTOM STAGE / ADVANTAGE											
*46 / 18.1	27	51.2	0	74	72	16.5	9.6	38.2	63	103	1.5
*48 / 18.9	28	52.2	0	74	72	16.5	9.8	38.7	88	128	1.5
*50 / 19.7	29	53.2	0	74	72	16.5	10	39.2	115	195	1.5
52 / 20.5	30.1	54.2	0	74	72	18	10.2	40.7	90	130	1.75
54 / 21.3	31	55.2	0	74	72	18	10.3	41.1	114	154	1.75
56 / 22.0	31.8	56.2	0	74	72.5	18	10.4	41.2	133	173	1.5
58 / 22.8	32.7	57.2	0	74	72.5	18	10.5	41.6	157	197	1.5
60 / 23.6	33.6	58.2	0	74	72.5	18	10.6	42.2	180	220	1.5
62 / 24.4	34.4	59.2	0	74	72.5	18	10.7	42.6	202	242	1.5
64 / 25.2	35.2	60.2	0	74	72.5	18	10.8	43	223	263	1.5
66 / 26.0	36.1	61.2	0	74.5	72.5	18	10.8	43.6	246	286	1.5
68 / 26.8	36.8	62.2	0	74.5	72.5	18	10.8	44.1	269	309	1.5
70 / 27.6	37	63.2	0	74.5	72.5	18	10.8	44.5	285	325	1.5
* = 24" wheels											
CUSTOM TEAM SUPER / CRITERIUM											
51 / 20.1	29.8	53.5	0	74	73.5	16.3	10.5	38.1	90	130	1.5
53 / 20.9	30.6	54.7	0	74	73.5	16.3	10.6	38.6	109	149	1.5
55 / 21.7	31.5	55.9	0	74	73.5	16.3	10.7	39.1	133	173	1.5
57 / 22.4	32.4	57.1	0	74	74	16.3	10.8	39.4	153	193	1.5
59 / 23.2	33.2	58.3	0	74	74	16.3	10.9	40	179	219	1.5
61 / 24.0	34.1	59.5	0	74	74	16.3	11	40.4	200	240	1.5
63 / 24.8	34.8	60.7	0	74	74	16.3	11	40.9	219	259	1.5
65 / 25.6	35.6	61.9	0	74	74	16.3	11	41.4	240	280	1.5
68 / 26.8	36.7	63.7	0	74	74	16.3	11	42.1	268	308	1.5

ROAD FRAME GEOMETRY
Through 1996

MODEL SIZE (cm / inch)	Top Tube Height (inch)	Top Tube Length (cm)	Top Tube Angle	Seat Tube Angle	Head Tube Angle	Chain Stay Length (inch)	BB Height (inch)	Wheel Base (inch)	Head Tube Length (mm)	Steerer Tube Length (mm)	Fork Rake (inch)
QUANTUM / QUANTUM II											
51 / 20.1	29.8	53.5	0	74	73.5	16.3	10.5	38.1	90	130	1.5
53 / 20.9	30.6	54.7	0	74	73.5	16.3	10.6	38.6	109	149	1.5
55 / 21.7	31.5	55.9	0	74	73.5	16.3	10.7	39.1	133	173	1.5
57 / 22.4	32.4	57.1	0	74	74	16.3	10.8	39.4	153	193	1.5
59 / 23.2	33.2	58.3	0	74	74	16.3	10.9	40	179	219	1.5
61 / 24.0	34.1	59.5	0	74	74	16.3	11	40.4	200	240	1.5
63 / 24.8	34.8	60.7	0	74	74	16.3	11	40.9	219	259	1.5
QUANTUM PRO											
51 / 20.1	29.8	53.5	0	74	73.5	16.3	10.5	37.98	90	184	1.375
53 / 20.9	30.6	54.7	0	74	73.5	16.3	10.6	38.48	113	207	1.375
55 / 21.7	31.5	55.9	0	74	73.5	16.3	10.7	38.98	135	229	1.375
57 / 22.4	32.4	57.1	0	74	74	16.3	10.8	39.28	156	250	1.375
59 / 23.2	33.2	58.3	0	74	74	16.3	10.9	39.88	179	273	1.375
61 / 24.0	34.1	59.5	0	74	74	16.3	11	40.28	201	295	1.375
63 / 24.8	34.8	60.7	0	74	74	16.3	11	40.78	221	315	1.375
AEOLUS											
51 / 20.1	29.36	53.5	0	78	72	14.73	10.3	38.59	129	169	1.375
53 / 20.9	30.14	54.7	0	78	72	14.73	10.4	39.18	150	190	1.375
55 / 21.7	30.91	55.9	0	78	72	14.73	10.5	39.78	171	211	1.375
57 / 22.4	31.69	57.1	0	78	72	14.73	10.6	40.37	191	231	1.375
59 / 23.2	32.51	58.3	0	78	72.5	15.5	10.7	41.41	165	205	1.5
61 / 24.0	33.28	61.5	0	78	72.5	15.5	10.8	42.79	185	225	1.5
63 / 24.8	33.46	62.7	0	78	72.5	15.5	10.8	43.35	203	243	1.5

ROAD FRAME WEIGHTS
(in pounds)

Size	QUANTUM	QUANTUM II	QUANTUM PRO	AEOLUS
51	3.3	2.76	2.66	2.75
53	3.48	2.88	2.87	2.81
55	3.65	2.89	2.94	2.84
57	3.74	2.96	3.05	2.91
59	3.91	3.04	3.09	3.01
61	4.32	3.18	3.19	3.12
63	4.38	3.23	3.25	3.17

Discontinued

Size	PERFORMANCE	Size	KIRSTEN / PANACHE	Size	ADEPT
52	3.49	47	3.14	17	3.53
54	3.66	50	3.25	19	3.73
56	3.79			21	3.81
58	3.91			23	4.02
60	4.11				
61	4.36				

MOUNTAIN FRAME WEIGHTS
(in pounds)

1994 - Present

Size	ADROIT	ATTITUDE	PULSE / PULSE II	PULSE COMP
18	3.08	3.11	2.86	n/a
19	3.15	3.18	2.93	n/a
20	3.3	3.33	3.13	n/a
21	3.31	3.34	3.15	n/a
22	3.34	3.37	3.27	n/a

Pre 1994

Size	ADROIT	ATTITUDE	FERVOR / RASCAL	PINNACLE
18	3.54	3.98	3.87	3.84
19	3.63	4.1	4.02	4.01
20	3.74	4.2	4.17	4.15
22	3.94	4.2	4.36	4.37

FRAME DETAILS

DROPOUTS

	Model	Model Year	Drive Side Width	Non-Drive Side Width	Eyelets (#)
Micro Rear Entry					
	Adroit, Attitude	94-96	8.3mm	7.6mm	
	Q-Pro, Q II, Aeolus	93-96	7.6mm	7.6mm	
Rear Entry	(Mtn.)				
	Adroit, Attitude	Pre 1994	.325”	.300”	
	Fervor, Rascal	All	.325”	.300”	
Conventional					
	Quantum	All	.300”	.300”	none
	Performance	All	.325”	.300”	2
	Kirsten / Panache	All	.300”	.300”	2
	Pinnacle	All	.325”	.300”	2
	Adept (Hybrid)	All	.325”	.300”	2

CABLE GUIDES

All mountain except Gradient tubed frames.
Gradient tubed mountain frames use a screw to secure the BB cable guide.

	BB	Seat Stay	Top Tube	Down Tube	Chain Stay
Mountain2 - 1/8 rivets 18”	SPIKE	Exit hole #3 (Tube)	Entrance .270	Exit hole #3	Entrance .270
Mountain2 - 1/8 rivets 19”, 20”, 21”, 22”	GUMBY	Exit hole #3 (Bridge)	Entrance .270	Exit hole #3	Entrance .270
Road (non-Gradient)	1 - 1/8 rivet		Guide hole #33 Rivet size 7/64		Exit hole #3 Entrance .270
Road (Gradient)	1 - 1/8 rivet	Entrance .270	Exit hole #3 4 x 15 brl adjust	4.5mm Riv-nuts Entrance .270	Exit hole #3

BRAKE STUDS

Material: Stress-proof steel

Mountain	Total Length	32.2mm
	Outer Diameter	7.96mm
	Outside Threads	5/16 x 18
	Inside Threads	6mm x 1mm

SHIFTER MOUNTS

Road	Hole Size	.257
(non-Gradient)	Stud Size	5mm x .8mm

SEAT BINDER

Mountain	Road
Hole Size	Bolt
1/4	6mm x 1mm

FRAME DETAILS (cont.)

RACK MOUNTS

Model	Size	Total	Location
Performance		4	D.O. (2) S.S. (2)
Adept	17	2	D.O. (2) S.S. (*)
Adept Frame	19, 21, 23	4	D.O. (2) S.S. (2)
Adept Fork	Low-rider	4	D.O. (2) Blade (2)
Pinnacle	18, 19	2	D.O. (2) S.S. (*)
Pinnacle	20, 22	4	D.O. (2) S.S. (2)
		Threads	5mm x 0.08
		Size	5mm x 16mm

*use seat binder bolt for top mount

FENDER MOUNTS

Model	Total		Location	
Performance	4	Dropout	S.S. Bridge	C.S. Bridge
Adept	4	Dropout	S.S. Bridge	C.S. Gusset
Pinnacle	3	Dropout	S.S. Bridge	
		Threads	5mm x 0.08	
		Size	5mm x 16mm	

WATERBOTTLE MOUNTS

Model	Size	Total	Location
Quantum, Performance		2	Seat tube & Down tube
Quantum II, Quantum Pro		2	Seat tube & Down tube
Panache		2	Down tube (top & bottom)
Mountain	18	2	Down tube (top & bottom)
	19	3	Down tube (top & bottom), Seat tube
	20	3	Down tube (top & bottom), Seat tube
	21	4	Down tube [top (1), below (2), seat tube (1)]
	22	4	Down tube [top (1), below (2), seat tube (1)]
Adept (Hybrid)		17	2 Down tube (top & bottom)
	19, 21	2	Seat tube & Down tube
	23	3	Down tube [top (2)], Seat tube (1)
		Threads	5mm x 0.08
		Size	5mm x 16mm

ACTUAL SEAT TUBE LENGTHS

QUANTUM, Q II, Q PRO

Frame Size inch / cm	Actual Length inch / cm
20.1 / 51	21.25 / 53.9
20.9 / 53	22.00 / 55.9
21.7 / 55	22.50 / 57.1
22.4 / 57	23.33 / 59.7
23.2 / 59	24.25 / 61.6
24.0 / 61	25.00 / 63.5
24.8 / 63	25.50 / 64.8

AEOLUS
(All Years)

Frame Size inch / cm	Actual Length inch / cm
20.1 / 51	21.00 / 53.3
20.9 / 53	21.75 / 55.2
21.7 / 55	22.25 / 56.5
22.4 / 57	23.00 / 58.4
23.2 / 59	23.75 / 60.3
24.0 / 61	24.50 / 62.2
24.8 / 63	25.25 / 64.1

PERFORMANCE
(All Years)

Frame Size inch / cm	Actual Length inch / cm
20.5 / 52	21.50 / 54.5
21.3 / 54	22.25 / 56.5
22.0 / 56	23.00 / 58.4
22.8 / 58	24.00 / 60.9
23.6 / 60	24.75 / 62.9
24.4 / 62	25.50 / 64.8

KIRSTEN / PANACHE
(All Years)

Frame Size inch / cm	Actual Length inch / cm
18.5 / 47	18.5 / 46.9
19.7 / 50	19.5 / 49.5

ADEPT
(Hybrid)

Frame Size inch / cm	Actual Length inch / cm
17 / 43	17.3 / 44.0
19 / 48	20.0 / 50.8
21 / 55	21.6 / 54.8
23 / 58	23.6 / 60.0

MOUNTAIN BIKES — **Actual Length**

Frame Size inch / cm	1991 inch / cm	1992 inch / cm	1993 inch / cm	1994 inch / cm	1995 inch / cm	1996 inch / cm
18 / 46	17.00 / 43.2	16.00 / 40.6	16.00 / 40.6	16.00 / 40.6	16.00 / 40.6	16.00 / 40.6
19 / 48	18.00 / 45.7	17.00 / 43.2	17.00 / 43.2	17.00 / 43.2	17.00 / 43.2	17.00 / 43.2
20 / 53	19.25 / 49.0	18.25 / 46.4	18.25 / 46.4	18.25 / 46.4	18.25 / 46.4	18.25 / 46.4
21 / 55			19.50 / 49.5	19.50 / 49.5	19.50 / 49.5	19.50 / 49.5
22 / 57	21.5 / 54.6	20.50 / 52.0	20.50 / 52.0	20.50 / 52.0	20.50 / 52.0	20.50 / 52.0

This measurement is taken from the center of the bottom bracket to the top of the seat tube.

NOTICE: All 18" mountain bikes use a Spike (tube) cable guide for the rear brake.

TUBING
ROAD FRAMES

QUANTUM PRO, QUANTUM II, AEOLUS (1994-1996)

All Sizes	Top Tube	Down Tube	Seat Tube	Head Tube	Seat Stay	L Chain Stay	R Chain Stay
	Gradient	Gradient	Gradient	Gradient	Gradient	Gradient	Gradient

QUANTUM, PERFORMANCE, PANACHE (1994-1996)

All Sizes	Top Tube	Down Tube	Seat Tube	Head Tube	Seat Stay	L Chain Stay	R Chain Stay
	Straight	Straight	Straight	Straight	Straight	Straight	Straight

ADEPT (Hybrid)

All Sizes	Top Tube	Down Tube	Seat Tube	Head Tube	Seat Stay	L Chain Stay	R Chain Stay
	Double	Double	Triple	Double	Straight	Single	Single

MOUNTAIN FRAMES

PINNACLE, FERVOR, RASCAL

All Sizes	Top Tube	Down Tube	Seat Tube	Head Tube	Seat Stay	L Chain Stay	R Chain Stay
	Single	Single	Single	Double	Straight	Straight	Straight

ATTITUDE (PRE 1994)

All Sizes	Top Tube	Down Tube	Seat Tube	Head Tube	Seat Stay	L Chain Stay	R Chain Stay
	Straight	Single	Single	Double	Straight	Straight	Straight

ATTITUDE (1994 -1996)

All Sizes	Top Tube	Down Tube	Seat Tube	Head Tube	Seat Stay	L Chain Stay	R Chain Stay
	Gradient	Gradient	Gradient	Gradient	Gradient	Gradient	Gradient

ADROIT (PRE 1994)

All Sizes	Top Tube	Down Tube	Seat Tube	Head Tube	Seat Stay	L Chain Stay	R Chain Stay
	Double	Double	Triple	Double	Straight	Single	Single

ADROIT (1994 - 1996)

All Sizes	Top Tube	Down Tube	Seat Tube	Head Tube	Seat Stay	L Chain Stay	R Chain Stay
	Gradient	Gradient	Gradient	Gradient	Gradient	Gradient	Gradient

BORON / CARBON FIBERS ARE BONDED TO:
chain stays, seat stays, fork crown and fork blades of the Adroit frameset.

BORON FIBERS ARE BONDED TO:
chain stays, seat stays, and fork blades of the Team Super, Stage, Custom framesets.

Single, Double and Triple all represent the butting of the tubing. Straight represents non-butted tubing.

Gradient is Klein Proprietary Variable Wall Thickness tubing.

FRAME SIZING

Klein mountain bikes are engineered with an aggressive sloping top tube. This enables a greater stand over clearance. This engineering has a tendency to be a little confusing when measuring the top tube length and frame size. The following is a quick reference to assist you.

You can quickly determine frame size by measuring the head tube of the frame. To determine if it is an 18" or a 19", please take a look at the brake routing - only the 18" frames have stingers.

RASCAL / PINNACLE / FERVOR

Size	Head Tube Length	Brake Routing
18"	86mm	Stinger
19"	86mm	Gumby
20"	115mm	Gumby
22"	172mm	Gumby

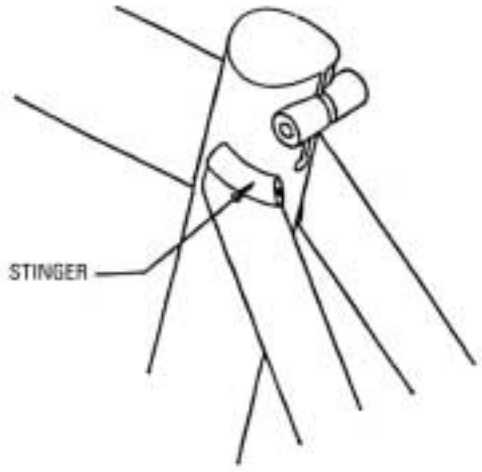
PULSE / ATTITUDE / ADROIT (1994-1996)

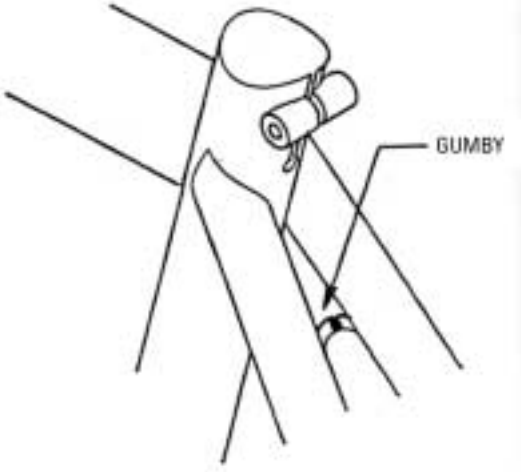
Size	Head Tube Length	Brake Routing
18"	92mm	Stinger
19"	92mm	Gumby
20"	119mm	Gumby
21"	148mm	Gumby
22"	178mm	Gumby

To determine size and top tube measurements for Panache (Kirsten) and mountain frame:

A. The actual frame measurement is determined by measuring the center of the bottom bracket shell up along the seat tube to an imaginary top tube line (this line is parallel to the ground).

B. The top tube measurement is taken from the center of the head tube to the center of the seat tube along the imaginary horizontal line.





MOUNTAIN FORKS

SPINNER CROMOLY RASCAL, PINNACLE (WITH RACK MOUNTS)

Dimensions

Rack Mounts	5mm x .08mm
Blade Width	100mm
Tire Width	2.35”
Blade Length	15.9” from crown race bottom to axle center
Brake Mount Height	255mm
Brake Mount Width	80mm

Frame Size	Steerer Tube	Rake Pinnacle	Rake Rascal	Weight Pinnacle	Weight Rascal
18”	126mm	1.56”	1.44”	1.79 lbs.	1.77 lbs.
19”	126mm	1.56”	1.44”	1.79 lbs.	1.77 lbs.
20”	155mm	1.62”	1.50”	1.85 lbs.	1.84 lbs.
22”	212mm	1.75”	1.63”	2.00 lbs.	1.98 lbs.

UNI-KLEIN ATTITUDE ALUMINUM

Dimensions

Blade Width	100mm
Tire Width	2.35”
Blade Length	16.1” from crown race bottom to axle center
Brake Mount Height	253mm
Brake Mount Width	82mm

Frame Size	Steerer Tube	Fork Rake	Weight Attitude
18”	92mm	1.44”	1.27 lbs.
19”	92mm	1.44”	1.27 lbs.
20”	120mm	1.50”	1.31 lbs.
21”	148mm	1.50”	1.35 lbs.
22”	179mm	1.63”	1.40 lbs.

STRATA ADROIT ALUMINUM / CARBON FIBER / BORON

Dimensions

Blade Width	100mm
Tire Width	2.35”
Blade Length	16.1” from crown race bottom to axle center
Brake Mount Height	253mm
Brake Mount Width	82mm

Frame Size	Steerer Tube	Fork Rake	Weight Adroit
18”	92mm	1.44”	1.77 lbs.
19”	92mm	1.44”	1.77 lbs.
20”	120mm	1.50”	1.19 lbs.
21”	148mm	1.50”	1.22 lbs.
22”	179mm	1.63”	1.26 lbs.

ROAD FORKS

TREK ALUMINUM

Frame Size	Steerer Tube	Fork Rake	Fork Weight
56cm	n/a	n/a	1.28 lbs.

TREK CARBON

Frame Size	Steerer Tube	Fork Rake	Fork Weight
56cm	n/a	n/a	1.15 lbs.

S/R PRISM ALUMINUM
QUANTUM (1994-1996) PERFORMANCE (WITH RACK MOUNTS)

Dimensions

Rack Mounts	5mm x .08mm
Brake Reach	Quantum = 354mm, Performance = 358mm (measured vertically from axle center to brake pivot bolt)
Blade Length	375mm
Tire Width	35mm
Blade Width	100mm

QUANTUM (1994-1996)

Frame Size	Steerer Tube	Fork Rake	Fork Weight
51cm	130mm	1.5”	1.14 lbs.
53cm	149mm	1.5”	1.18 lbs.
55cm	173mm	1.5”	1.22 lbs.
57cm	193mm	1.5”	1.28 lbs.
59cm	219mm	1.5”	1.31 lbs.
61cm	240mm	1.5”	1.37 lbs.
63cm	259mm	1.5”	1.39 lbs.

PERFORMANCE

Frame Size	Steerer Tube	Fork Rake	Fork Weight
52cm	130mm	1.75”	1.16 lbs.
54cm	154mm	1.75”	1.20 lbs.
56cm	173mm	1.5”	1.24 lbs.
56cm	197mm	1.5”	1.29 lbs.
60cm	220mm	1.5”	1.34 lbs.
62cm	240mm	1.5”	1.41 lbs.

PANACHE (WITH RACK MOUNTS)

Dimensions

Rack Mounts	5mm x .08mm
Brake Reach	355mm
Blade Length	375mm
Tire Width	35mm
Blade Width	100mm

Frame Size	Steerer Tube	Fork Rake	Fork Weight
47cm	120mm	2.0”	1.13 lbs.
50cm	143mm	2.0”	1.19 lbs.

ADEPT (Hybrid) (UNI-KLEIN) 6061 ALUMINUM ALCOA

Dimensions

Low Rider Mounts	5mm x .08mm
Brake Mount Height	283mm
Brake Mount Width	80mm
Blade Length	16.5”
Tire Width	41mm
Blade Width	100mm

Frame Size	Steerer Tube	Fork Rake	Fork Weight
17”	92mm	2.00”	1.33 lbs.
19”	92mm	1.88”	1.33 lbs.
21”	92mm	1.63”	1.35 lbs.
23”	148mm	1.75”	1.38 lbs.

KLEIN ACCESSORIES

Stratum 90

Material	Klein Engineered Composite
Length	580mm
Diameter	Clamp - 25.4mm
	Bar End - 22.2mm
Bend	5°
Weight	90g

Stratum 185 (short)

Material	Klein Engineered Composite
Length	540mm
Diameter	Clamp - 25.4mm
	Bar End - 22.2mm
Bend	5°
Weight	185g

Stratum 185 (long)

Material	Klein Engineered Composite
Length	580mm
Diameter	Clamp - 25.4mm
	Bar End - 22.2mm
Bend	5°
Weight	1.90g

Prime Tire

Material	Natural rubber with nylon casing (127 TPI)
Size	700 x 25c
PSI Rating	115
Weight	215g

Deathgrip Tire

Casing	127 TPI
Size	Weight
26 x 2.1	495 - 510g
26 x 2.35	610 - 620g

Instinct Grip

Material	Low density Kraton rubber
Length	125mm
I.D.	22.2mm

Ti Parts

Material	6al4v Titanium	
Brake Boss	19.6g	
BB Spindle	Size (mm)	Weight (g)
	108	76.6
	113	80.6
	117	84
	125	91.5

Cloud Nine Tubes

Material	Butyl rubber
Size	26 x 2.0
Weight	145g

Klein Waterbottle Cage

Material	Composite
Weight	62g

MISSION CONTROL BAR AND STEM

STANDARD 1" RISE (i.e.. PINNACLE, RASCAL, FERVOR)

Size	Degree of Rise	Reach	Rise	Weight
90mm	21.8	A = 90mm	B = 36mm	406g
120mm	17.5	A = 120mm	B = 38mm	423g
135mm	15.7	A = 135mm	B = 38mm	432g
150mm	14.2	A = 150mm	B = 38mm	442g

STANDARD 1" NO RISE (i.e.. PINNACLE, RASCAL, FERVOR)

Size	Degree of Rise	Reach	Rise	Weight
+90mm	21.8	A = 90mm	B = 00	406g
120mm	0	A = 120mm	B = 00	391g
135mm	0	A = 135mm	B = 00	399g
150mm	0	A = 150mm	B = 00	402g

OVERSIZE RISE (i.e.. PRE 1994 ATTITUDE, ADROIT, ADEPT-Hybrid)

Size	Degree of Rise	Reach	Rise	Weight
90mm	21.8	A = 90mm	B = 36mm	368g
120mm	17.5	A = 120mm	B = 38mm	379g
135mm	15.7	A = 135mm	B = 38mm	391g
150mm	14.2	A = 150mm	B = 38mm	395g

OVERSIZE NO RISE (i.e.. PINNACLE, RASCAL, FERVOR)

Size	Degree of Rise	Reach	Rise	Weight
+90mm	21.8	A = 90mm	B = 00	351g
120mm	0	A = 120mm	B = 00	350g
135mm	0	A = 135mm	B = 00	360g
150mm	0	A = 150mm	B = 00	363g

There is a 7° bar bend. Total length of the bar is 580mm end to end.

+90mm no rise bar and stems have the same rise, but the quill is shorter, enabling them to be inserted deeper into the steerer tube (1993 - earlier).

RISE

Size	Degree of Rise	MC2 Reach	Rise	Weight
90mm	21.8	A = 90mm	B = 36	302g
107mm	20	A = 107mm	B = 38	315g
120mm	17.5	A = 120mm	B = 38	317g
135mm	15.7	A = 135mm	B = 38	331g

NO RISE

Size	Degree of Rise	MC2 Reach	Rise	Weight
90mm	0	A = 90mm	B = 00	300g
107mm	0	A = 107mm	B = 00	306g
120mm	0	A = 120mm	B = 00	315g
135mm	0	A = 135mm	B = 00	325g

MC2 weighed without cable hanger.

AIRHEADSET ASSEMBLY AND ADJUSTMENT
MOUNTAIN

Parts Necessary: 1 (one) Airheadset wrench, 3 (three) 6mm spacers, 1 (one) plastic top cap, 1 (one) collet

Determining a Comfortable MC2 Bar Height

In order to properly size the rider, assemble the Airheadset before cutting the steerer tube. This will enable the rider to sit on the bike and determine what MC2 bar height is suitable. It is unsafe to attempt to ride the bike with the excess steerer tube exposed. The maximum steerer tube extension for mountain versions is 86mm.

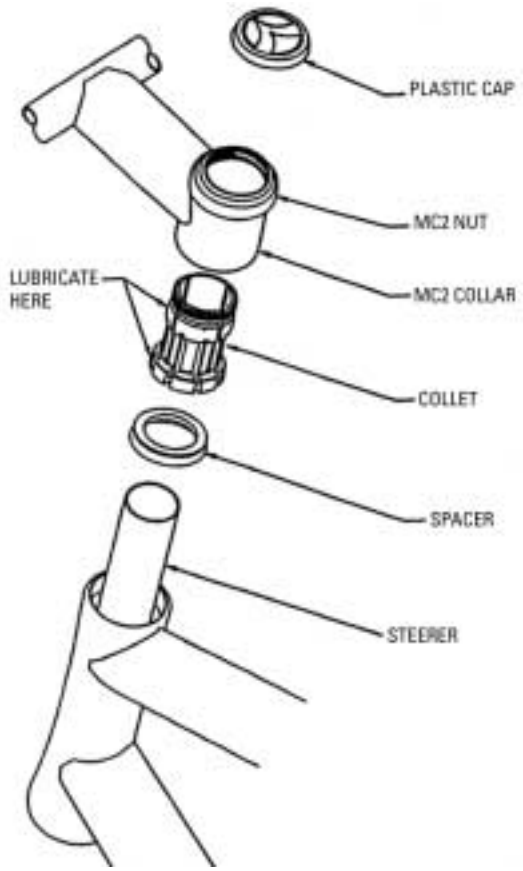
Notice: Klein strongly suggests the rider begins the adjustment process using the highest recommended MC2 adjustment.

Stack the appropriate number of spacers on the steerer with the wide side down, starting with 3 spacers for mountain versions.

Lightly grease the steerer tube and remove the excess with a rag. Apply grease to the collet threads and the outside portion of the collet (depicted on the diagram by arrows).

Place the collet on the steerer tube with the threaded side up. Position the MC2 on the steerer tube, and screw the nut clockwise on the collet until it is snug. Be careful not to cross thread.

Using a Klein Airheadset wrench, tighten to insure a snug fit. You may be required to add additional leverage in order to achieve proper tightness. The MC2 should be tightened to 25-30 foot pounds (300-360 inch-pounds). **Do not over tighten!**



Cutting the Steerer to the Desired Height

After determining the proper MC2 height, use the measured steerer tube chart below. Cut an additional 6mm off of the steerer tube for each spacer you are not using.

Frame Size	Steerer	Measured Steerer Tube Length Using Three Spacers
18" / 19"	Short	86mm from head tube
20"	Short	Pre-cut
21"	Long	86mm from head tube
22"	Long	Pre-cut

Mark or scribe the steerer tube for cutting. Place a rag around the bearing surface to protect from metal debris. Cut steerer tube, using a pipe cutter, at the pre-measured mark. Debur the rough edge with a file.

AIRHEADSET ASSEMBLY AND ADJUSTMENT
ROAD

Parts Necessary: 1 (one) Airheadset wrench, 7 (seven) 6mm spacers, 1 (one) plastic top cap, 1 (one) collet

Determining a Comfortable Bar Height

In order to properly size the rider, assemble the Airheadset before cutting the steerer tube. This will enable the rider to sit on the bike and determine what bar height is suitable. It is unsafe to attempt to ride the bike with the excess steerer tube exposed. The maximum steerer tube extension for road versions is 86mm.

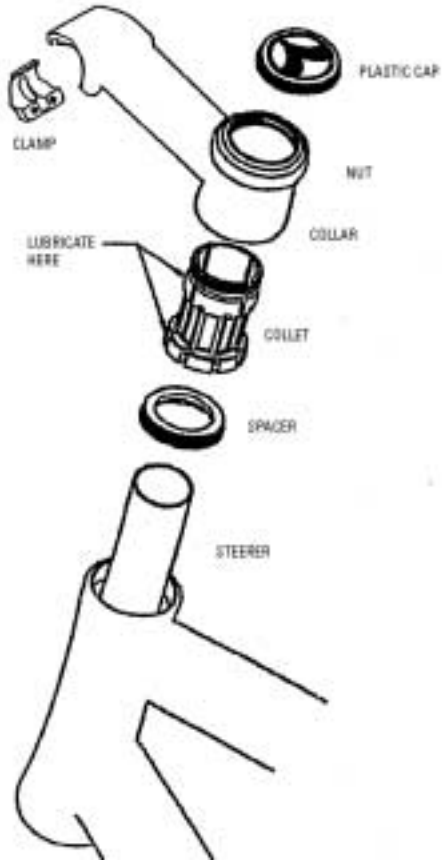
Notice: Klein strongly suggests the rider begins the adjustment process using the highest recommended stem adjustment.

Stack the appropriate number of spacers on the steerer with the wide side down, starting with 7 spacers for road versions.

Lightly grease the steerer tube and remove the excess with a rag. Apply grease to the collet threads and the outside portion of the collet (depicted on the diagram by arrows).

Place the collet on the steerer tube with the threaded side up. Position the neck on the steerer tube, and screw the nut clockwise on the collet until it is snug. Be careful not to cross thread.

Using a Klein Airheadset wrench, tighten to insure a snug fit. You may be required to add additional leverage in order to achieve proper tightness. The neck should be tightened to 25-30 foot pounds (300-360 inch-pounds). **Do not over tighten!**



Cutting the Steerer to the Desired Height

After determining the proper neck height, use the measured steerer tube chart below. Cut an additional 6mm off of the steerer tube for each spacer you are not using.

Frame Size	Steerer	Measured Steerer Tube Length Using Three Spacers
51cm	Short	94mm from head tube
53cm	Short	94mm from head tube
55cm	Short	94mm from head tube
57cm	Short	Pre-cut
59cm	Long	94mm from head tube
61cm	Long	94mm from head tube
63cm	Long	Pre-cut

Mark or scribe the steerer tube for cutting. Place a rag around the bearing surface to protect from metal debris. Cut steerer tube, using a pipe cutter, at the pre-measured mark. Debur the rough edge with a file.

ROAD BARS AND STEMS

This chart represents the most commonly shipped bar and stem sizes according to frame size. Material: Aluminum, O.D. = 25.4

Quantum Pro- 1994-1996

Frame Size	42 Bar / 80 Stem	44 Bar / 100 Stem	46 Bar / 100 Stem
47	•		
50	•		
51	•		
52	•	•	
53	•	•	
54	•	•	
55		•	
56		•	
57		•	
58		•	
59		•	•
60		•	•
61		•	•
62			•
63			•

ZIP GRIP SEATPOST ADJUSTMENT

The Zip Grip is designed to provide seatpost adjustment without the use of tools. You will be able to pre-set your seatpost to a desired height prior to your ride and, if needed, adjust your height during the ride.

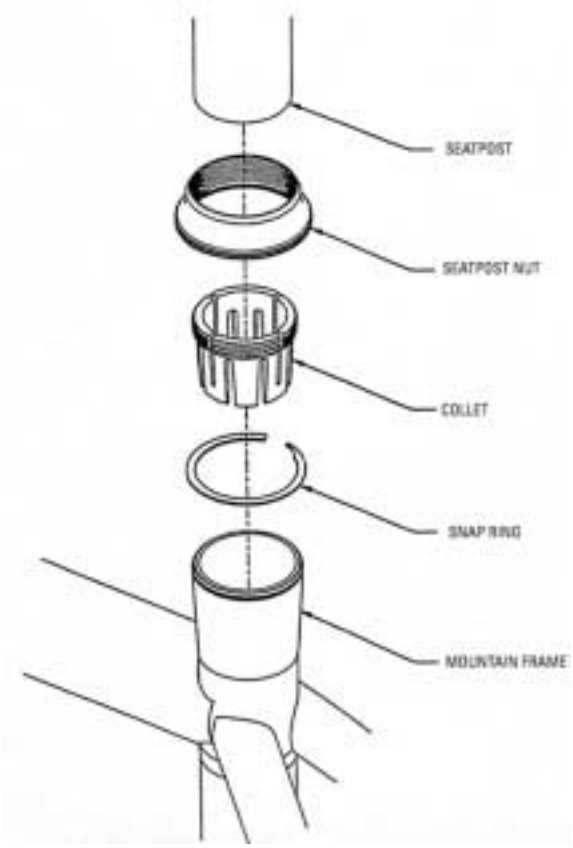
The Zip Grip uses an internal collet system. The exterior and interior gripping surface of this collet piece are coated in rubber. This rubber surface must remain completely free of grease to work properly. It is important that only the threads of the collet are greased. We suggest using only light lubrication on the seatpost and then wiping it off. Excessive grease or lubrication may hinder the performance of the Zip Grip.

If the rubber area of the collet becomes contaminated, it can be cleaned with isopropyl (rubbing) alcohol. To clean the collet, remove the seatpost; hold the collet in place with your fingers while you turn the outside of the Zip Grip counter clockwise. Turn until the collet is completely disengaged.

Remove the rubber coated collet from the rubber seal and clean all surfaces thoroughly. It is important to clean grease from the seat tube, nut and seal.

Put a fresh coat of grease on the external threads of the collet only. Insert the collet into the seat tube with the threads facing upward. Carefully work the collet threads past the upper seal. While holding the rubber coated collet, screw the Zip Grip clockwise until the threads catch. Be sure not to cross thread the collet. Insert your seatpost and tighten the Zip Grip using a clockwise motion (this is achieved with left hand threads). The Zip Grip nut and seal assembly is retained on the frame with a circular clip ring. It is not possible to remove it from the frame without damage to either the frame or the nut and seal assembly.

It is recommended to use a plumbers leather strap pipe wrench in tightening these up. It will allow for better purchase and will not strip the seat post nut.



INSTRUCTIONS FOR KLEIN CHAIN CONTROL DEVICE
FRAMES FACTORY DRILLED:

1. Check the crank and chainring bolts to insure proper tightness.

2. Set the black CCD on the two threaded inserts located on the frame. The teeth of the CCD should locate against the small and middle chainrings.

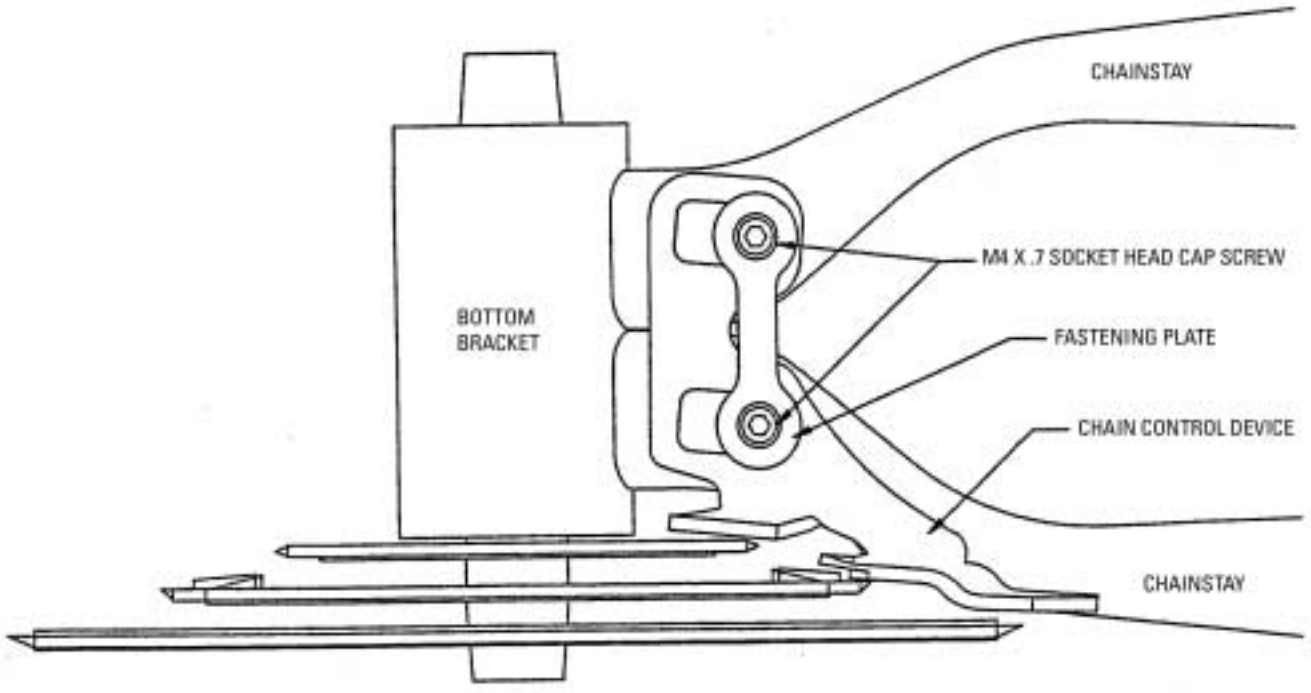
3. Place the fastening plate on top of the CCD with the cable guide hole towards the rear.

4. Install the two 4mm Allen bolts and washers. Tighten the bolts to 15 in.lbs. and carefully rotate the crank to check for rubbing. If necessary, loosen screws and re-adjust. The CCD should be within 1/32 of an inch of the small and middle chainrings without rubbing.

5. Thread the rear derailleur cable through the raised hole on the fastening plate.

The CCD, when properly fitted with the chainrings, is designed to disengage a stuck chain from the chainrings and clean mud and debris away from the chainrings.

The new, re-designed CCD is made of a very high strength aluminum alloy (7075-T6), heat treated to maximum strength. This new design is adaptable to any crank set.



RETROFIT TOOL KIT
KLEIN CHAIN CONTROL DEVICE

This tool kit is intended to be used by Klein dealers for the purpose of retrofitting Klein mountain bikes with the Klein Chain Control Device (CCD). If this tool kit, or the Klein Chain Control Device, is used on bikes other than Klein mountain bikes, Klein Corporation will not be responsible for any damages.

1. Remove rear wheel and right crank arm. Thoroughly clean the bottom bracket spindle and bearing surface.
2. Install the guide bushing (see Fig. 1) on the bottom bracket spindle using the 8mm thread crank bolt supplied. Snug the bolt with a 14mm wrench. **Caution:** over tightening could displace the bearing or bottom bracket spindle.
3. Slide the drill guide jig over the guide bushing (as shown in Fig. 1). The rear derailleur cable might interfere with the positioning of the jig. Remover the cable if this occurs.
4. Hold the jig firmly against the side and bottom of the chain stay. Clamp it into place with the spring clamp provided (see Fig. 2). Drill the 2 holds using the 17/64 inch bit provided. Make sure that the drill only goes through the bottom of the chain stay. Do not drill through the top of the chain stay.
5. Remove the drill guide jig and guide bushing. Shake loose the chips out of the chain stay through the holes.
6. Insert the riv-nut and tool as shown on the riv-nut instructions provided with the kit. Tighten the socket head bolt until the riv-nut is fully compressed. Snug the bolt, but do not over tighten it or the riv-nut thread will strip. This requires about two to three complete revolutions of the bolt after initial resistance is felt.
7. The frameset is now ready to receive a Klein Chain Control Device.

Parts List:

1 - Drill guide jig	1 - Guide bushing
1 - 17/64 inch drill bit	1 - 8mm x 1 x 25mm bolt
1 - Riv-nut installation tool	1 - Spring clamp

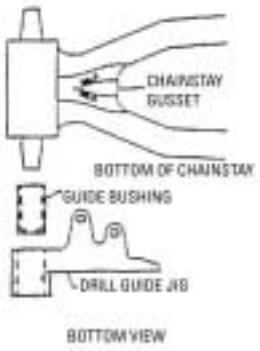


FIGURE 1

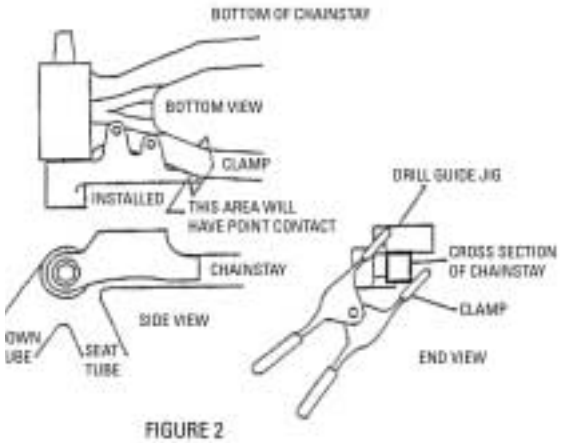


FIGURE 2

RETROFIT CCD INSTALLATION AND ADJUSTMENT

1. Place on right chain stay using the two 4mm socket head cap screws and washers supplied. Position the two raised teeth next to the chainrings as illustrated. The CCD should be resting on the chain stay and the weld between the chain stay and the chain stay gusset. Snug the screws up until the CCD can be moved sideways with a little effort.
2. Adjust the CCD outward until it barely touches the chainring teeth on each scraper tooth. Note: If the CCD is at full extension and cannot reach the chainrings, the bottom bracket spindle is not installed properly. The bottom bracket spindle should either be moved to the left or replaced with a shorter bottom bracket spindle, depending on how much room there is between the left hand crank and chain stay. Attempting to bend the CCD outward to compensate will not solve the problem and may damage the frame.
3. Tighten the two screws firmly. Rotate the crank, checking for rubbing. If necessary, loosen screws and readjust. The CCD should be very close to the smallest and middle chainrings without rubbing. Very slight touching is permissible. A significant gap between the CCD and the chainring will cause the chain to jam badly.

BOTTOM BRACKET SPECIFICATIONS

BOTTOM BRACKET SPINDLE

Material	4340 Steel; hardened to 42 - 47 RC
Taper Length	19.8mm
Taper Square	12.6mm
Thread Size	8 x 1mm, 25mm deep
Outside Diameter	17mm
Lengths Available (mm)	104, 106, 108, 113, 117, 119, 121, 125, 130, 135

BOTTOM BRACKET BEARING

F.A.G. Sealed Bearing

Inside Diameter	17mm
Outside Diameter	34.9mm
Width	10mm

BOTTOM BRACKET SHELL

All Mountain	Pre 1994	Material	Aluminum
Fervor	1994-1995	Shell Length	76.21mm
Quantum, Performance	1994-1996	Shell Outer Diameter	41.28mm
Panache, Pinnacle, Adept	All years	Shell Inner Diameter	35.0mm
Q II, Aeolus	All years		
Adroit, Attitude Pulse	1994-1996	Material	Aluminum
Quantum Pro	1994-1996	Shell Length	72mm
		Shell Outer Diameter	41.28mm
		Shell Inside Diameter	35.0mm

BOTTOM BRACKET SETTINGS - MOUNTAIN

Brand	Model	Year	Adroit 1991-1993	Adroit 1994	Attitude 1990-1993	Attitude 1994	Pulse 1994	Rascal 1990-1993	Fervor 1993-1994	Pinnacle 1989-1994	Adept-Hybrid All
Shimano	XTR	- 1996	108 x 18	**108 x 18**	108 x 18	**108 x 18**	**108 x 18**	108 x 18	108 x 18	108 x 18	108 x 18
	XT, DX	1993	125 x 26	125 x 26	125 x 26	125 x 26	125 x 26	125 x 26	125 x 26	125 x 26	121 x 23
	XT, LX	1994-95	108 x 18	**106 x 16**	108 x 18	**106 x 16**	**106 x 16**	108 x 18	108 x 18	108 x 18	108 x 18
	LX	Pre 1993	125 x 26	125 x 26	125 x 26	125 x 26	125 x 26	125 x 26	125 x 26	125 x 26	121 x 23
	DLX		113 x 20	113 x 20	113 x 20	113 x 20	113 x 20	113 x 20	113 x 20	113 x 20	113 x 20
	STX	1993-95	113 x 21	**108 x 18**	113 x 21	**108 x 18**	**108 x 18**	113 x 21	113 x 21	113 x 21	
	700 CX										121 x 17
Suntour	XC Pro, Comp		125 x 26		125 x 26			125 x 26	125 x 26	125 x 26	121 x 22
	XC Pro Micro		113 x 20		113 x 20			113 x 20	113 x 20	113 x 20	
	XC Comp Micro		117 x 24		117 x 24			117 x 24	117 x 24	117 x 24	113 x 20
	XC Expert		113 x 21		113 x 21			113 x 21	113 x 21	113 x 21	
	XC Ltd		125 x 26		125 x 26			125 x 26	125 x 26	125 x 26	
Campy	Record Off Road		113 x 21		113 x 21			113 x 21	113 x 21	113 x 21	
	Euclid		135 x 32		135 x 32			135 x 32	135 x 32	135 x 32	125 x 23
	Centaur		121 x 27		121 x 27			121 x 27	121 x 27	121 x 27	119 x 24
Misc.	Ritchey		125 x 26		125 x 26			125 x 26	125 x 26	125 x 26	
	Grafton Joy Stix		121 x 23		121 x 23			121 x 23	121 x 23	121 x 23	117 x 21
	Specialized ST-4		125 x 26		125 x 26			125 x 26	125 x 26	125 x 26	
	Mavic		132 x 31		132 x 31			132 x 31	132 x 31	132 x 31	
	Cooks	1992	130 x 29		130 x 29			130 x 29	130 x 29	130 x 29	
	Cooks CBR		125 x 24		125 x 24			125 x 24	125 x 24	125 x 24	
	Cooks RSR		117 x 22		117 x 22			117 x 22	117 x 22	117 x 22	
	Cooks E			113 x 21		113 x 21	113 x 21				
	Top Line		125 x 25		125 x 25			125 x 25	125 x 25	125 x 25	
	Kooka			125 x 26		125 x 26	125 x 26				
	Race Face			125 x 25		125 x 25	125 x 25				
	Race Face L.P.			**108 x 18**		**108 x 18**	**108 x 18**				
	Sampson			130 x 30		130 x 30	130 x 30				
	Sampson Stratics										
	Hershey			113 x 23		113 x 23	113 x 23				
	AC			121 x 24		121 x 24	121 x 24				

Bold settings require the drive side bearing to be inset 3mm from the shell edge.
Italicized settings require the non-drive side bearing to be inset 3mm from the shell edge.

BOTTOM BRACKET SETTINGS - ROAD

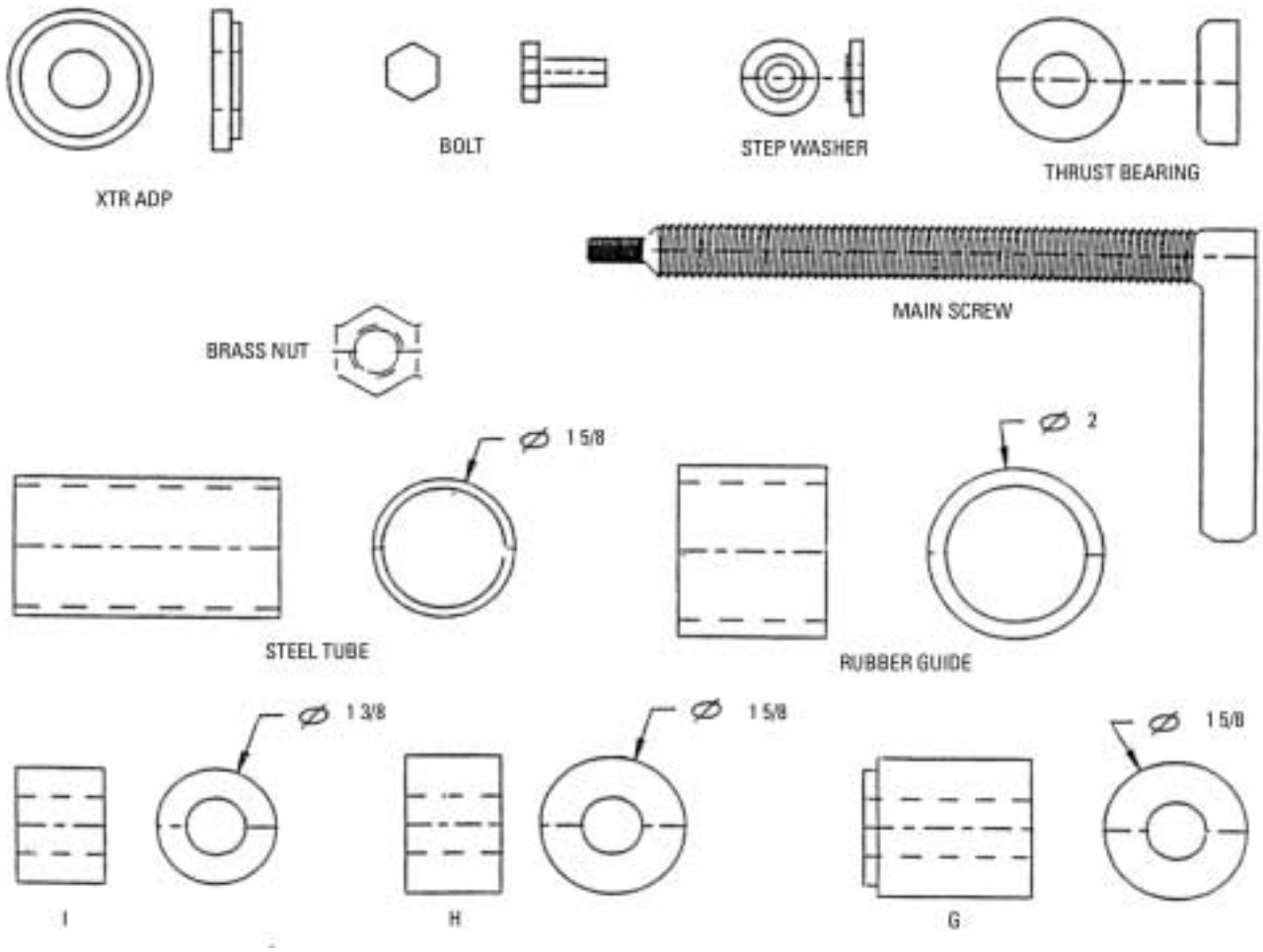
Brand	Model	Year	Quantum 1994-1996	Performance	Panache	Quantum II 1993-1996	Quantum Pro 1994-1996	Aeolus 1993-1996
Shimano	Dura-Ace	1993-95	**108 x 18**	**108 x 18**	**108 x 18**			113 x 20
	Dura-Ace	Pre 1993	119 x 22	119 x 22	119 x 22			117 x 22
	Ultegra		117 x 23	117 x 23	117 x 23	*108 x 14*	**108 x 16**	117 x 22
	105	1993-95	**108 x 18**	**108 x 18**	**108 x 18**			**108 x 18**
	105	Pre 1993	117 x 23	117 x 23	117 x 23			
	RX 100		**113 x 20**	**113 x 20**	**113 x 20**			117 x 22
	RX Touring		121 x 23	121 x 23	121 x 23			
	XT / DX		119 x 22	119 x 22	119 x 22			
	LX		117 x 24	117 x 24	117 x 24			
	RSX		117 x 24	117 x 24	117 x 24			
Suntour	Superbe Pro		113 x 21	113 x 21	113 x 21			
Campy	Record	1995	**108 x 18**	**108 x 18**	**18 x 18**	**108 x 18**	**108 x 20**	
	Chorus	1995	**108 x 18**	**108 x 18**	**18 x 18**	**108 x 18**	**108 x 20**	
	Athena	1995	**108 x 18**	**108 x 18**	**18 x 18**	**108 x 18**	**108 x 20**	
	Veloce	1995	**108 x 18**	**108 x 18**	**18 x 18**	**108 x 18**	**108 x 20**	
	Super Record		121 x 24	121 x 24	121 x 24			
	Nuovo Record		121 x 24	121 x 24	121 x 24			
	Record	Pre 1995	113 x 20	113 x 20	113 x 20	**108 x 18**	**108 x 20**	117 x 22
	Chorus	Pre 1995	113 x 20	113 x 20	113 x 20	**108 x 20**	**108 x 20**	
	Athena	Pre 1995	117 x 25	117 x 25	117 x 25	113 x 23	**108 x 20**	117 x 22
	Veloce	Pre 1995	**108 x 18**	**108 x 18**	**108 x 18**	**108 x 18**	**108 x 20**	113 x 21
Misc.	AC		113 x 20	113 x 20	113 x 20			
	Mavic Double		117 x 23	117 x 23	117 x 23			
	Sachs Double		117 x 24	117 x 24	117 x 24			
	Grafton					119 x 21		
	Top Line							

Bold settings require the drive side bearing to be inset 3mm from the shell edge.
Italicized settings require the non-drive side bearing to be inset 3mm from the shell edge.

KLEIN BOTTOM BRACKET TOOL INSTRUCTIONS

The Klein bottom bracket tool includes:

Main Screw	Thrust Bearing
Driver Nut	Crank Bolt 8 x 1mm
Step Washer	Rubber Guide
Steel Tube	Small Spacer (1)
3mm Adapter (J)	RC 680 Loctite
Medium Spacer (H)	Large Spacer with Shoulders (G)

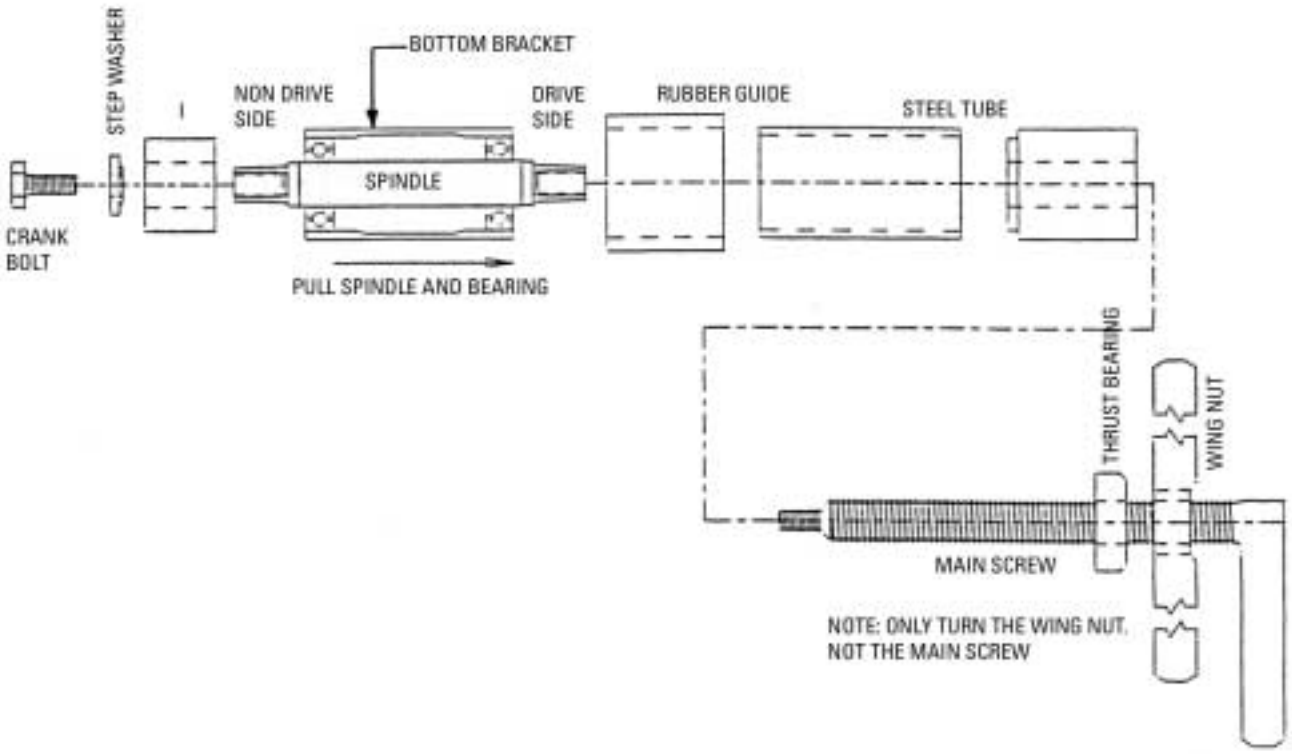


PART A: REMOVAL OF SPINDLE AND BEARINGS

A) 1. Remove the crank arms. Record the current bottom bracket setting by measuring the total spindle length and the non-drive side setting (measured from the bottom bracket shell to the end of the Spindle).

A) 2. On the non-drive side, place spacer (1) over the spindle followed by the step washer and crank bolt (tighten crank bolt finger tight).

A) 3. On the drive side, place the rubber guide over the bottom bracket shell. Now, slide the steel tube into the rubber guide until it is up against the bottom bracket shell. While setting up the main screw **(important)**, maintain a well lubricated main screw during the entire procedure (a light penetrating oil is preferred). Thread on the driver nut all the way followed by the thrust bearing. Then place spacer (G) with the shoulders away from the thrust bearing, over the main screw. Now, place the entire assembly into the steel tube and thread the main screw into the spindle (see Fig. 1). Hold the main screw in place and thread the driver nut towards the bottom bracket. This continued action will extract the entire unit.

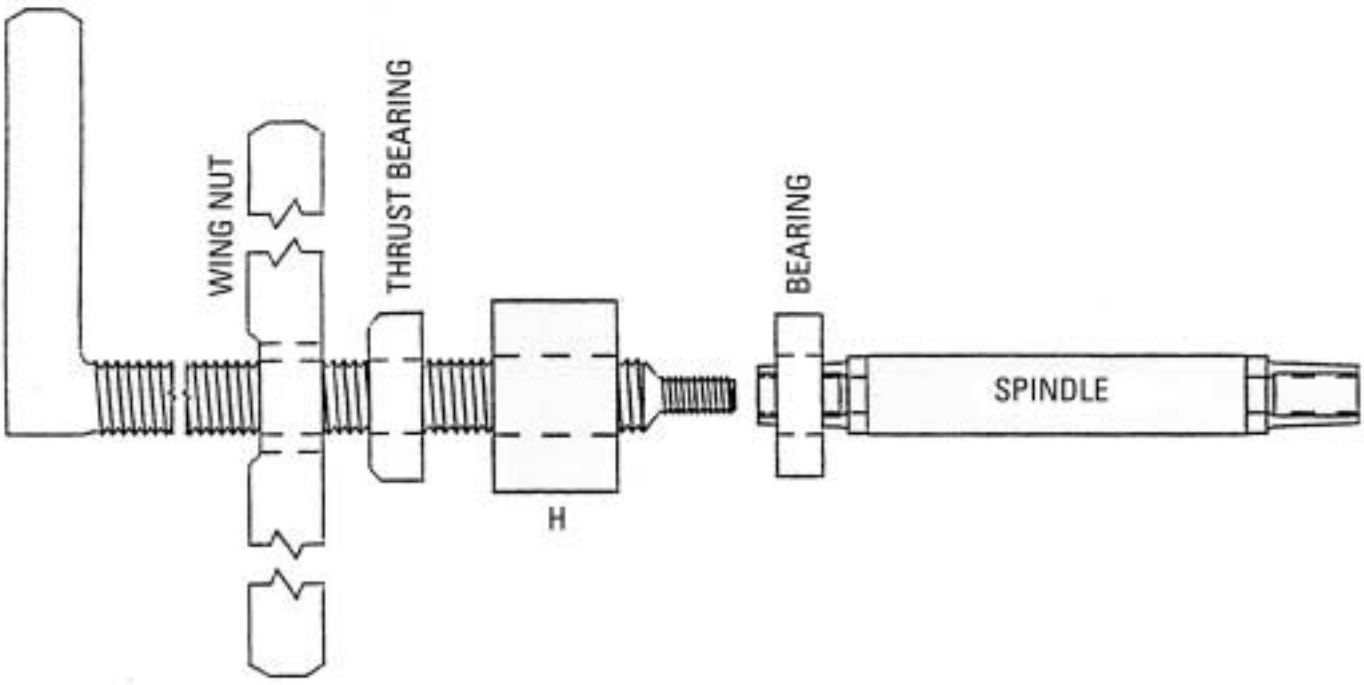


PART B: INSTALLATION OF THE NON-DRIVE SIDE BEARING

B) 1. **We recommend that the bearings be replaced each time the bottom bracket is extracted.

B) 2. Clean the spindle, bearings (inside and outside), and the inside of the bottom bracket shell. For this, we suggest Acetone, Trichlorethylene or similar compound. We do not recommend paint thinner, gasoline or similar compounds. These will leave an oily film. Once clean, avoid any contact with your hands. **Important** - be very careful to avoid any contact of cleaning chemicals with the frame finish.

B) 3. Installing the non-drive side bearing onto the spindle: First, you should know what the non-drive side setting should be (the measurement from the end of the spindle to the outer edge of the bottom bracket shell). Install the driver nut all the way on the main screw followed by the thrust bearing and spacer (H). Place a thin coat of RC 680 Loctite on the I.D. of the bearing. Also coat the spindle where the bearing will seat. Slide the bearing onto the spindle. Thread the main screw into the spindle until snug. Rotate the driver nut and push the bearing onto the spindle to the proper setting (see Fig. 2).



PART C: COMPLETING THE BOTTOM BRACKET INSTALLATION

C) 1. On the non-drive side, place spacer (H) with the step washer and crank bolt (tighten crank bolt until snug). This will ensure that the non-drive setting is maintained during installation.

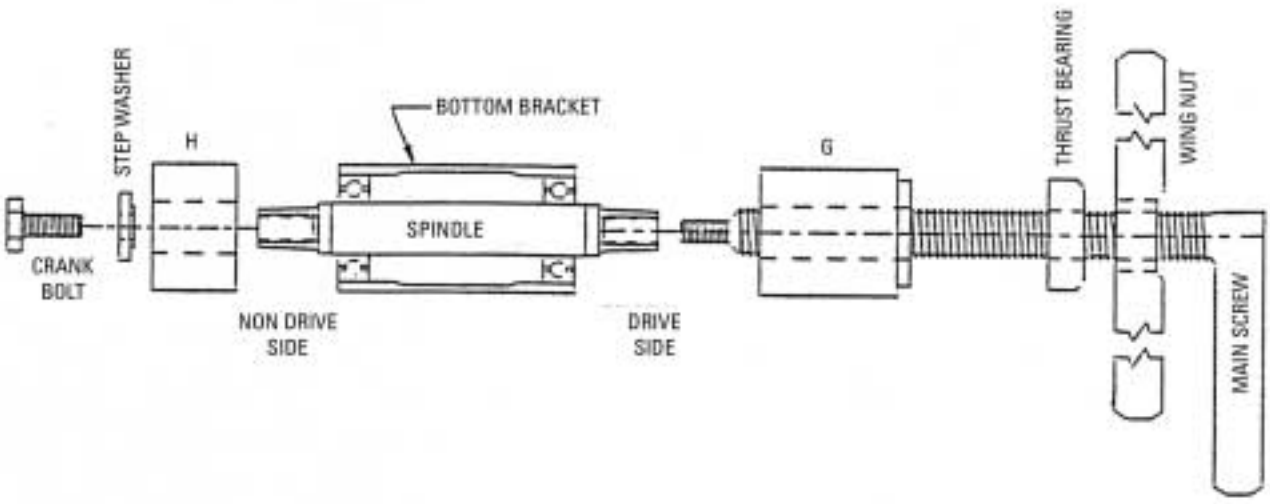
C) 2. Thread the driver nut all the way onto the main screw followed by the thrust bearing. Install (G) with the shoulders away from the bottom bracket shell.

* If you are setting the bottom bracket for Shimano, you may need to place the spacer (J) with the shoulders in, facing the bottom bracket shell. This will inset the drive side bearing 3mm.

Put a thin coat of RC 680 Loctite on all remaining contact areas (i.e. outside non-drive side bearing, inside and outside of drive side bearing, inside edge of the bottom bracket shell, and drive side of the spindle where bearing will seat). From the non-drive side, insert the spindle through the bottom bracket shell. Place the other bearing onto the spindle on the drive side. Install the main screw into the spindle until snug (see Fig. 3). While holding the main screw stationary, rotate the driver nut until both spacers meet the frame. Now, remove the tool.

C) 3. Clean off all excess Loctite. Turn the spindle by hand to insure free rotation.

C) 4. To check proper spacing and chain line, place the cranks on the spindle and tighten. Remove the cranks and allow the Loctite to cure for 24 hours at room temperature (70° F) before installing cranks.



REMOVAL AND INSTALLATION OF THE KLEIN ATTITUDE HEADSET BEARINGS (Original tool design only)

The Klein headset installation tools include the following parts (see Fig. 1 on page 31):

Cage Assembly
The cage assembly consists of a lower ring, in which either end of the head tube seats, connected to the top brace by side rails.

Threaded Rod
This is a 26 inch piece of 5/8-11 threaded rod. It has holes drilled in one end so that a nut can be locked into place by a 3/16 inch hitch pin. The other end has a fixed nut for applying torque.

Fork Pusher
This is a 1/2 inch thick disk with a step in it. It seals on top of the fork and is used to push the fork from the bicycle.

Bearing Puller
This is a 1/4 inch thick u-shaped piece of steel. It sits in the bottom of the cage assembly and is used to remove a bearing from the fork.

Bearing Remover
This part consists of two halves of a hat-shaped piece of steel. It is used to remove bearings from the headset.

Bearing Pusher
This is a 2 inch hollow cylindrical piece of steel which is used to press the bearings into the head tube and pull the fork into place.

Fork Cone
This is a cone-shaped piece of steel about 1.5 inches long. It seals inside the bottom of the steerer and is used to pull the fork into the frame.

Two 5/8-11 Nuts
One nut has a 3/16 hole so that it can be locked into place with a hitch pin to secure the tool being used on the threaded rod.

PART A: REMOVAL OF FORK AND BEARINGS

A) 1. Remove the front wheel, the bar/stem assembly, and the top seal from the fork. Place the bar assembly where it, and the associated cables, are clear of the head tube area.

A) 2. Screw the threaded rod into the cage assembly. Thread the drilled nut onto the threaded rod and secure with the hitch pin at the upper hold position. Slide the fork pusher (part C) onto the threaded rod so that the smaller diameter side faces away from the lock-nut. Screw the second nut on loosely to hold into place (see Fig. 2).

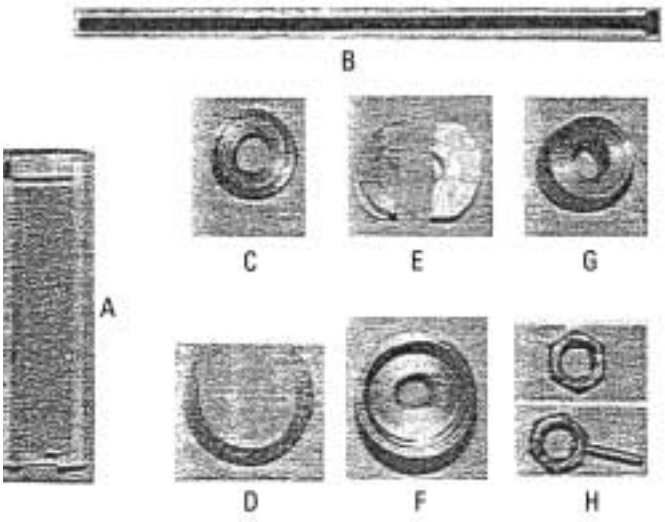


Figure 1: The Klein Attitude headset removal and installation tools

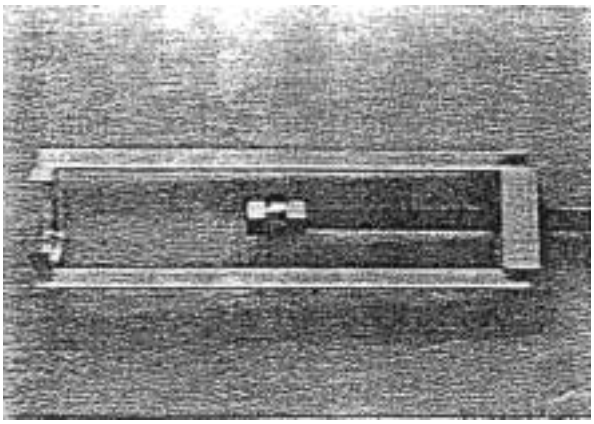


Figure 2: The headset tool with fork pusher installed.

A) 3. Place the cage assembly around the head tube so that the fork pusher faces the top of the fork and the lower edge of the head tube is seated in the lower part of the cage assembly. Tighten the threaded rod until the fork pusher seats into the top fork. Check to see that both the fork pusher and bottom of the cage have seated properly (see Fig. 3).
Caution: Improper alignment of tool at this point may result in a damaged frame and/or fork.

A) 4. Slowly tighten the threaded rod. You will hear a loud "crack" as the Loctite is broken. Steady the fork and cage assembly as the fork will fall loose after approximately 1/2 inch.

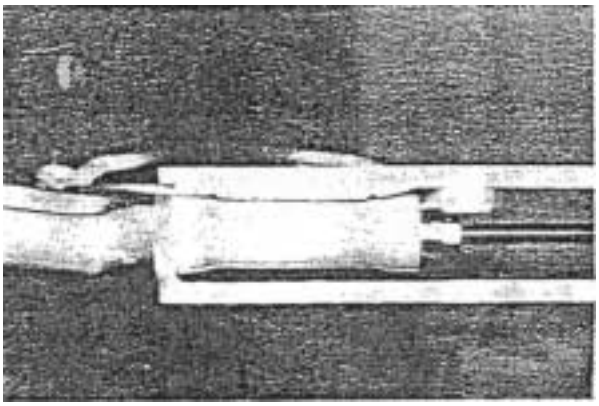


Figure 3: The headset removal tool in place for the removal of the fork.

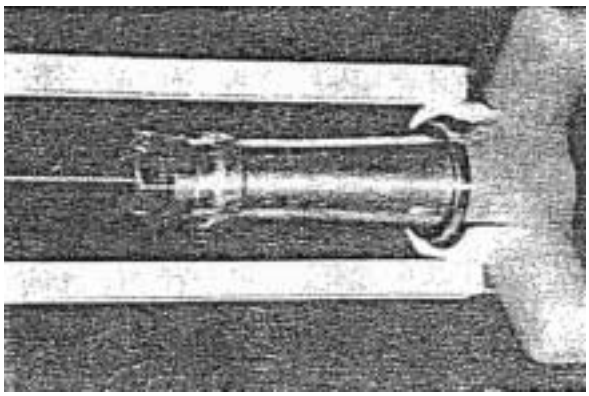


Figure 4: The headset tool in position to remove the lower bearing on the fork.

PART A: REMOVAL OF FORK AND BEARINGS (cont.)

A) 5. If the lower bearing remains in the head tube, proceed to step 7. If the lower bearing remains on the fork, the fork will fall free of the frame. The bearing on the fork is removed with the bearing puller (part D). Insert the bearing puller into the bottom of the cage assembly.

A) 6. Place the bearing puller (part D) underneath the bearing on the fork and reseat the fork pusher into the top of the fork. By screwing the threaded rod, pull the lower bearing over both bearing surfaces (see Fig. 4).

A) 7. If the lower bearing remains in the head tube, the upper fork bearing surface will have to be pushed past the lower bearing. Continue tightening the threaded rod, being careful to keep the fork centered as it is pushed out past the lower bearing. Remove lower head tube seal.

A) 8. The bearings in the head tube are removed with the bearing remover (parts E). Remove all nuts and tools from the end of the threaded rod. Slide the two halves of the bearing remover, one at a time and large side first, through the bearing to be removed. After both sides of the bearing remover are through the lower bearing, separate the halves to that the bearing remover sits on the bearing (see Fig. 5).

A) 9. Place the cage assembly around the head tube as before. Lower the threaded rod until the end of the rod seats between the bearing remover halves. Push the bearing out by tightening the threaded rod; repeat on other bearing if necessary (see Fig. 6).

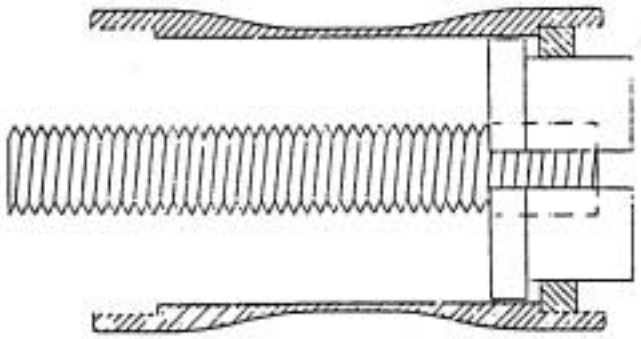


Figure 5: The bearing pusher halves inside the headtube. (Notice how the threaded rod separates the halves.)

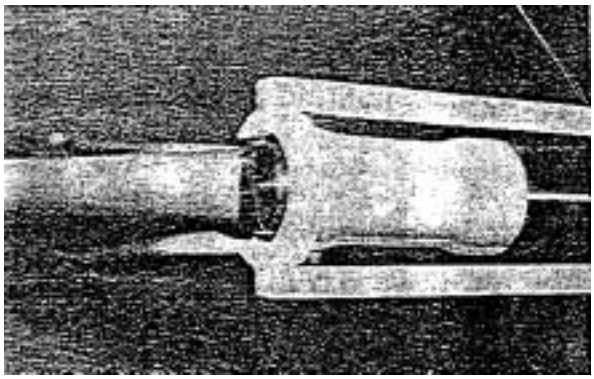


Figure 6: The headset tool in position to remove a bearing from the headtube.

PART B: INSTALLATION OF BEARINGS

B) 1. Carefully clean the parts of the head tube, fork and bearings that will be in contact with each other using the included brush and razor blade knife. All of the mounting surfaces must be completely clean of old Loctite, burrs or any other foreign matter. Rinse all mounting surfaces with Acetone or similar solvent. Do not allow the solvent to penetrate the bearing seals or come in contact with the bicycle's paint. All of the mounting surfaces must be completely clean and free of oil.

B) 2. With the threaded rod still in the cage, thread the drilled nut to the higher hold position and secure the hitch pin. Thread the bearing pusher (part F) onto the rod and snug it against the lock nut (see Fig. 7).

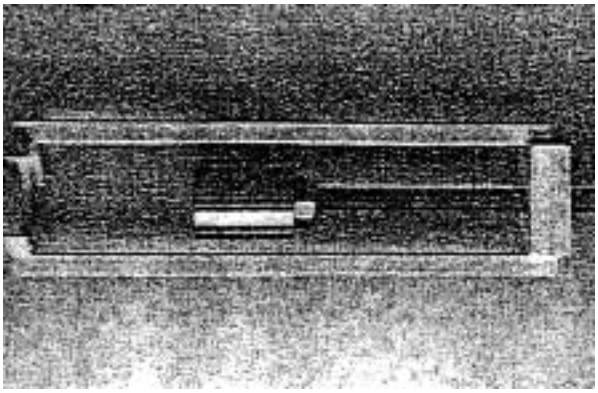


Figure 7: The headset tool set up to push a bearing into the headtube.

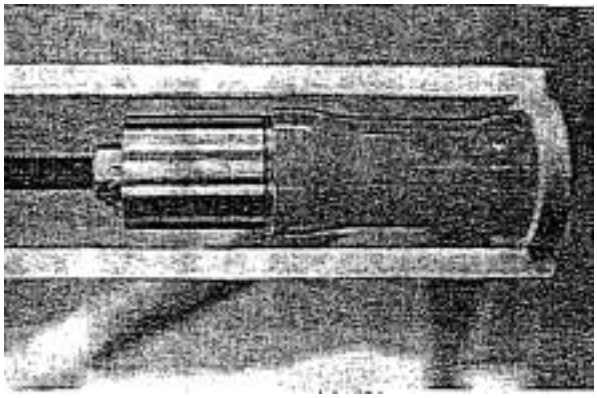


Figure 8: The headset tool installing a bearing into the headtube.

B) 3. Apply a very thin layer of Loctite type RC 680 completely around the outside of the bearing and place it surely on top of the head tube. One side of the bearing has two grooves (one on the inside and one on the outside) in the races. This side should be placed toward the inside of the head tube to help prevent bearing contamination.
Note: The bearing may exhibit a slight slip fit to a slight press fit due to the slight variance in bearing size. In the case of the slip fit, the bearings may slide into the head tube easily, and tools may not be necessary for this step. The bearing will be retained by the Loctite.

B) 4. Place the cage assembly around the head tube as before and begin to press the bearing into place. Be careful to keep the bearing straight as it is inserted (see Fig. 8). The bearing should insert with a minimal amount of force. If the bearing begins to bind, it has become tilted. Loosen the threaded rod, rotate the bearing pusher 180°, and retighten slightly. In most cases, the bearing will now seat properly. If the bearing remains tilted, remove the bearing as in steps A 8 and A 9, and repeat step B 3. Do not force the bearing.

PART B: INSTALLATION OF BEARINGS (cont.)

B) 5. Check above and underneath the bearing to assure that it has seated completely and evenly in the head tube (see Fig. 9). The bearing should be parallel to the top and bottom of the head tube. Run a finger underneath the bearing to check that the bearing is seated flush to the bottom of the bearing surface. If the bearing is seated improperly, remove as in steps A 8 and A 9, and reinstall as in step B 3.

B) 6. Remove excess Loctite and repeat on the other side. Remember to face the grooved side of the bearing towards the center of the head tube.

B) 7. Place a bead of super glue on the part of the lower seal (the smaller one) that comes into contact with the head tube when it is inserted. Place one side of the bottom seal into the bottom of the head tube and run a small screwdriver around the outside edge of the seal, guiding it into the head tube (see Fig. 10).

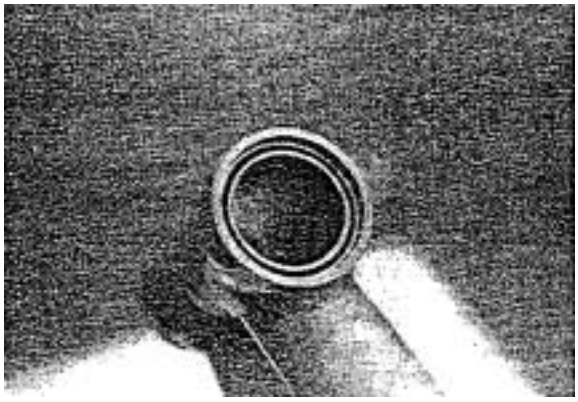


Figure 9: A bearing properly installed into the headtube. (Note that the side of the bearing with the grooved races is facing inward).

Figure 10: Installation of the lower seal into the headtube.

PART C: INSTALLATION OF THE FORK

C) 1. Place a thin layer of Loctite on the inner race of the upper bearing and around the lower bearing surface of the fork.

C) 2. Remove the threaded rod from the cage assembly. Thread the bearing pusher (part F) onto the threaded rod. Insert the threaded rod through the top of the head tube and seat the bearing pusher onto the top bearing.

C) 3. Thread enough rod so that the rod will extend through the head tube and fork held below it. Slip the fork cone (part E) over the end of the threaded rod. Thread the lock nut on the rod and secure it with the hitch pin at the lower hole position.

TOUCH-UP PAINT INSTRUCTIONS

Durethane enamel is a polyurethane paint. Polyurethane paint must be mixed with a catalyst before application. The proper mixture is one part paint, one part catalyst. Once mixed, the paint will not remain stable and can't be used again. In order to achieve the desired color, a two or three coat process is necessary. Each coat should be allowed to dry before applying additional coats.

Small touch-ups may not require the base coat. All coats, including the base coat, must be mixed equally with the catalyst. Each coat of paint should be applied singularly and allowed to dry before the next coat is applied. Touch-up areas will not obtain a glossy finish due to the lack of a clear coat.

The following is a list of past production colors. You must follow the directions in order to obtain a reasonable color match.

DESIRED COLOR	BASE COAT	SECOND COAT	THIRD COAT
Pearl Black	Gloss Black	Pearl Red	None
Bright Green	White	Bright Green	None
Pearl White	White	Pearl	None
Magenta	White	Magenta	None
Ultra Violet	Silver	Ultra Violet	None
Flare	Yellow	Magenta (light)	None
Gloss Black	None	Gloss Black	None
Candy Blue	Candy Blue Base	Candy Blue Top	None
Candy Teal	Candy Teal Base	Candy Teal Top	None
Candy Red	Candy Red Base	Candy Red Top	None
Bright Silver	Bright Silver	None	None
Ice Teal	Candy Green Base	Nebula Blue	None
Sable Haze	Sable	Red Pearl Black	None
Gemstone	Candy Green Base	Candy Green Top	None
Deep Forest Green	Forest Green	None	None
Race Red	Yellow	Race Red Top	None
Sovereign Blue	Sovereign Blue	None	None
Cumulous Grey	Cumulous Grey	None	None
Midnight Blue	Midnight Blue	None	None
White Pearl	White	Platinum Pearl	None
Sovereign Blue Candy	Sovereign Blue	Nebula Blue	None
Ebony Black	Black	None	None
Emerald	Candy Green Base	Nebula Green	None
Horizon			
Pink	White	Pink	None
Pink	White	Pink	Powder Blue
Blue	White	Balloon Blue	None
Gator			
Yellow	White	Yellow	None
Green	White	Yellow	Powder Blue
Blue	White	Balloon Blue	None
Sunburst			
Yellow	White	Yellow	None
Flare	White	Pink	Yellow
Pink	White	Pink	None
Sea & Sky			
Blue	Candy Blue Base	Nebula Blue	None
Green	Candy Blue Base	Indy Green	None
Purple	Candy Blue Base	Nebula Blue	Candy Red Top

TOUCH-UP PAINT (cont.)

DESIRED COLOR	BASE COAT	SECOND COAT	THIRD COAT
Painted Desert			
Orange	Candy Red Base	Candy Orange	None
Red	Candy Red Base	Candy Red Top	None
Burnt Orange	Candy Red Base	Candy Orange	Candy Red Top
Puget Morning			
Silver	Silver	None	None
Grey	Cumulous Grey	None	None
Sable	Sable	None	None
Coral Reef			
Teal	Teal	None	None
Brown	Teal	Magenta	None
Magenta	Silver	None	None
Nite Storm			
Blue	Candy Blue Base	Nebula Blue Top	None
Gray	Cumulous Grey	None	None
Black	Black	None	None
Team			
Yellow	Yellow	None	None
Red	Yellow	Race Red Top	None
White	White	Platinum Pearl	None
Burgundy / Blue Linear			
Red	UV Base	Candy Red Top	None
Purple	UV Base	Candy Blue Top	Candy Red
Blue	UV Base	Candy Blue Top	None
Teal / Blue Fade			
Teal	Candy Green Base	Nebula Green	None
Blue	Candy Green Base	Nebula Blue	None
New Backfire			
Yellow	Yellow	None	Blue Pearl
Red	Yellow	Magenta	Blue Pearl
Pink	White	Magenta	Blue Pearl
Backfire			
Yellow	Yellow	None	None
Red	Yellow	Magenta	None
Pink	White	Magenta	None

Note: Klein strives to maintain an adequate inventory of touch-up paints for the previous year's colors. Paints are subject to availability.
Please follow all safety precautions on label.

DECALS

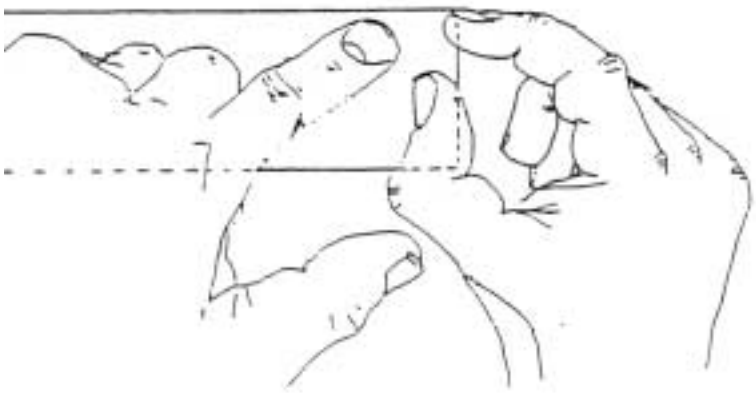
Solution Applied Decals

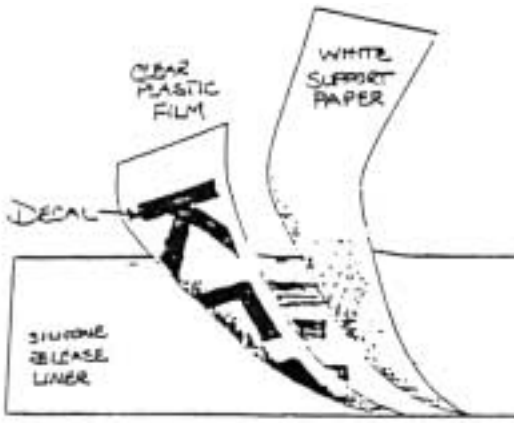
The solution: 1 part isopropyl alcohol mixed with 8 parts water.

1. Warm solution to 100° F.
2. Dip decal in solution for 10 seconds.
3. Apply decal to bike and wipe carefully with a squeegee.
4. Peel paper backing away from decal.
5. Dab off with a paper towel.
6. In order to obtain a more durable decal, clear coating with durethane enamel is recommended.

Pressure Sensitive Decals

1. Remove slip sheet to expose decal and adhesive.
2. Use key lines printed on back of paper to position decal on frame.
3. Gently rub the decal down with your fingers, being careful not to trap air bubbles.
4. Burnish the decal down using a folding bone (available at art supply stores) or a cap from a Bic pen.
5. Wet the paper with water. Let sit for 30 to 60 seconds and remove the paper by sliding it off.
6. Wash the decal with a damp sponge to remove any remaining glue using a gentle motion, being careful not to damage the decal. *If clear coating, excess glue must be removed so as not to cause cracking, bubbling or fish eye effect.*
7. Buff decal with a dry rag.





RACK APPLICATION

	Blackburn Racks (408) 370-1010
Performance 54cm - 60cm	Blackburn SX-1
Performance 52cm and 62cm	Blackburn Mtn-1
Panache 47cm and 50cm	Blackburn Mtn-1
Pinnacle 18", 19" and 20"	Blackburn Mtn-3
Pinnacle 22"	Blackburn Mtn-1
Fervor / Rascal (all sizes)	Blackburn Clamp (available through any Blackburn dealer)

**Some customers may want to drill and tap a hole in the rear dropout in order to mount a rack. This will work; however, any frame failure caused by this modification will not be covered under warranty.

**We do not recommend using clamps on the seat stay of the Adroit, Team Super or Stage due to the addition of boron reinforcements.

The upper attaching arms must be bent into position for correct adjustment of the Blackburn racks.

American Bicycle
7/8" Clamp
(612) 251-1641

Rhode Gear
(401) 941-1700

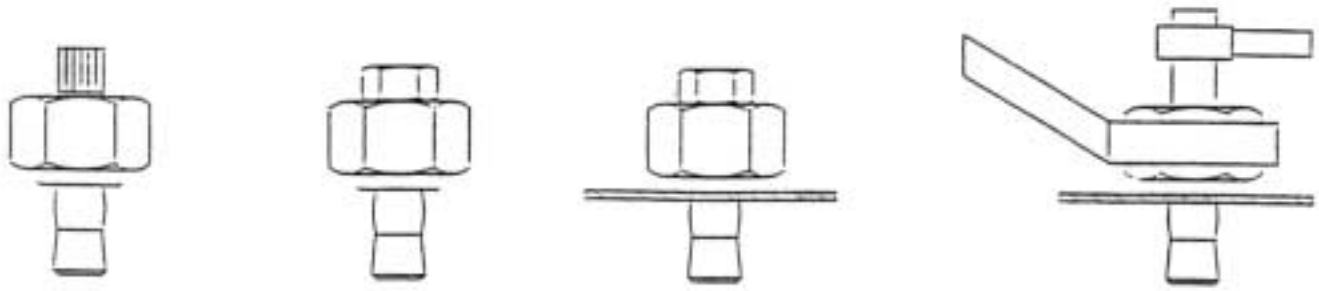
The Rhode Gear VR-100 will fit the Performance using the standard arms and the Pinnacle using the long arms.

INSTALLING RIV-NUT INSERTS

Klein uses two different sizes of riv-nut inserts. The 4mm inserts are used when installing chain control devices (CCD), and the 5mm inserts are used for the waterbottle and rack mounts. Each size insert requires a different size tool.

	4mm	**5mm**
Hole Requirements	17/64	19/64
Thread Size	4 x .7	5 x .8
Insert Tool	Socket head	Hex head
Additional Tool Requirements	Hex key	Socket wrench

1. Thread insert on tool.
2. Position insert into hole.
3. Tool body must be held with a wrench to prevent turning.
4. Socket/Allen wrench should be turned clockwise in order to install insert.
5. To remove tool, turn socket/Allen wrench counter clockwise until tool disengages (continues to immobilize tool body).



S.I.S. UPDATE

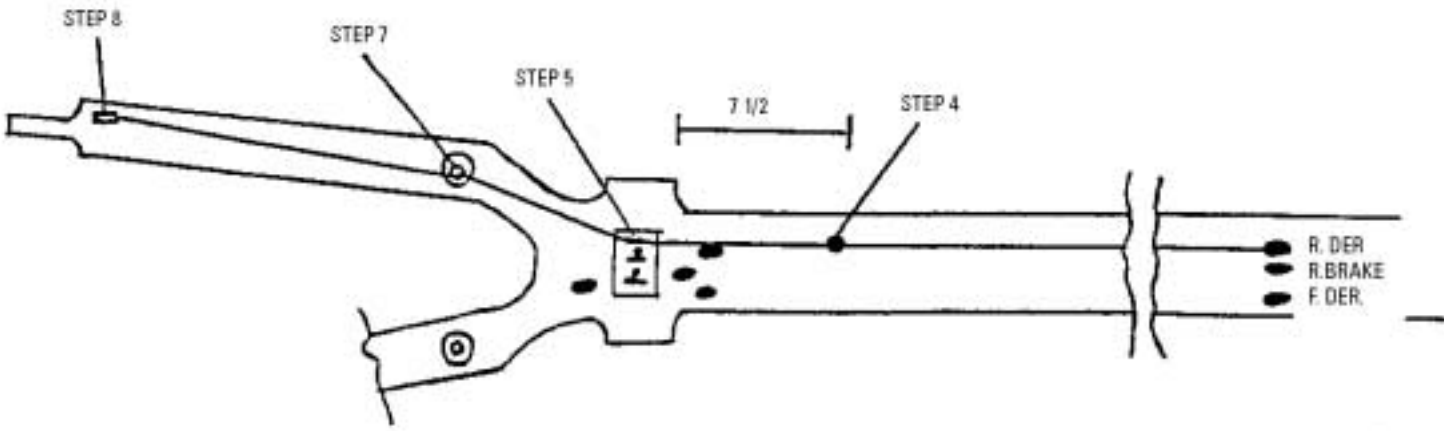
S.I.S. update for u-brake mountain bike frames to re-route the rear cable outside the chain stay.

Tools Needed
#33 drill bit, #30 drill bit, epoxy, pop rivet tool

Material Needed
U-brake S.I.S. cable guide, Two (2) pop rivets - 1/8" or .125, Two (2) brake spacers - 1 slotted, One (1) pop rivet - 7/64" or .109

Directions

1. Place the frame upside down in the repair stand.
2. Remove the rear derailleur cable and housing from the frame.
3. Measure 7 1/2" from the forward edge of the bottom bracket shell along the down tube.
4. Drill a #30 hole angled approximately 40° to the center line of the down tube, so the cable has smooth entrance and exit from the hole.
5. Remove old style cable guide (epoxied in place). Line up new style cable guide with appropriate rear derailleur, rear brake, and front derailleur holes. Note: for best cable guide alignment, it is helpful to establish placement from behind the frame. The cables will be under less friction with the correct cable guide alignment.
6. One positioned, correctly drill #30 holes. Install the cable guide with 1/8" rivets and epoxy.
7. Install rear brake spacers, making sure the slotted spacer is on the drive side and pointing toward the dropout.
8. Place the rear cable stop about 1" from the dropout on the drive side chain stay. Look through the cable stop to align with the slot on the brake spacer. You will want to mount the cable stop to the outside of the stay.
9. Once the cable stop is aligned, mark and drill a #33 hole. Install the cable stop with a 7/64" rivet and epoxy.



PACKAGING

FRAMES

Domestic
Frames are packaged using cardboard to avoid shipping damage. Mission Control bar and stem are shipped with the frame.

Domestic Double
Frames are packaged using foam supports.

International
Frames are packaged using foam to avoid shipping damage.

BOX DIMENSIONS

Frame		
Single	9 x 45 x 31	14 lbs.
Double (Att/Adept only)	11 x 45 x 31	20 lbs.
Double (Other frames)	9 x 45 x 31	16 lbs.
Bottom Bracket Tool	9 x 9 x 6	4 lbs.
Headset Tool	30 x 4 x 3	8 lbs.
Mission Control	12 x 6 x 24	3 lbs.

(Packaged in foam, new version being developed)

BOX SPECIFICATIONS

Frame Boxes	Longview Fiber	275 lb. tested Single B Grade
BB / Hs Tool	Tharco	150 lb. tested Single B Grade
Mission Control	Longview Fiber	175 lb. tested Single B Grade