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S w e e t P a r t s

Sweet (swēt) *adj.* 1. distinctly pleasing to the senses. 2. A quality close to perfection. 3. innovative or cutting edge. 4. A product that outperforms all others.

[See also: **bitchin'**, **trick**, **cool**, **kick-ass.**]

Sweet Wings™



The Sweet Wings™ integrated crankset and bottom bracket is an innovative and totally unique component. A departure from inefficient conventional cranksets, Sweet Wings™ utilizes a radical 2-piece design that brings the highest level of performance to drivetrain components.

At slightly over 500 grams, Sweet Wings™ is the lightest complete system (crankset and bottom bracket) available and is unmatched in stiffness. A test published in *Winning Magazine* found Sweet Wings™ to be the lightest and stiffest (over three times stiffer than popular "billet" cranks). Several features make Sweet Wings™ biomechanically efficient, a breeze to install and unsurpassed in durability . . .

The tubular chromoly arm and spindle provide the most efficient transfer of leg power to the road or trail. The oversized spindle minimizes torsional windup of the non-drive crankarm, and prevents lateral movement and rubbing of chainrings on the front derailleur. Chain line and spindle length are fully

adjustable. And the super-low-profile arm design and low Q-factor provide exceptional heel and cornering clearance.

Sweet Wings™ is the easiest crankset and bottom bracket to install in the world. You don't need a mechanic. There are three essential steps:

1. Thread and tighten the bearing cups into the bottom bracket shell.
2. Slide the left and right halves of the Sweet Wings™ crankset/bottom bracket through the bearings.
3. Join them at the center with a single bolt.

That's it! You no longer need a crankarm puller. The dedicated bottom bracket system with precision sealed cartridge bearings does not require tricky bottom bracket bearing adjustments, a typically time-consuming procedure. And because the Sweet Wings™ are so easy to install and remove, you can regularly clean and maintain your crankset in just a few quick and simple steps.

"...the hottest crank on the market, at any price."

"World's Sweetest Crank"

"Light, strong, durable and cool."

— *Mountain Bike*, October 1995

"Rating: ★★★★★"

"Sweet Wings could be the definitive crankset..."

"an exotic crankset that is super-light, very trick..."

"Crowd stopper...an instant hit with all who saw them."

— *Mountain Bike Action*, October 1995

Crankset: Us vs. Them

How Do We Make Ours So Light and Stiff?

Crankarms and spindles are subject primarily to bending and torsion. The optimum structural shape to resist bending and torsion places material as far away from the center (neutral axis for bending and centroid for torsion) of the member shape as possible.

The large diameter butted elliptical tube of the Sweet crankarm is the ideal shape. It is the perfect marriage of a beam for exceptional resistance to bending and a circular tube for superior torsional rigidity. Solid crankarms place material in the most inefficient location—at the shape's center. Material in this area does virtually nothing—*except add weight*.

The large diameter butted circular tube of the Sweet spindle is the optimum shape for a bottom bracket spindle. Most of the load the spindle carries is torsional, and, as mentioned, the most efficient shape for torsion is a large diameter circular tube. The Sweet spindle is the largest possible diameter circular tube that will fit inside a bottom bracket shell. Result—the most efficient section for the job. Typical spindle tubes are thick-walled with small diameters, which are *not stiff, just heavy*.

Arm deflection testing proves that the radical Sweet Wings™ works. It is superior in stiffness, as well as in balanced energy transmission. In tests of competitive cranksets, we had the least amount of deflection (bending). Comparisons of our drive and non-drive deflections show they are nearly equal. Testing of the competition's cranksets consistently showed non-drive arm deflection was over twice as much as that of the drive arm.

Sweet Triangulated Truss Spider

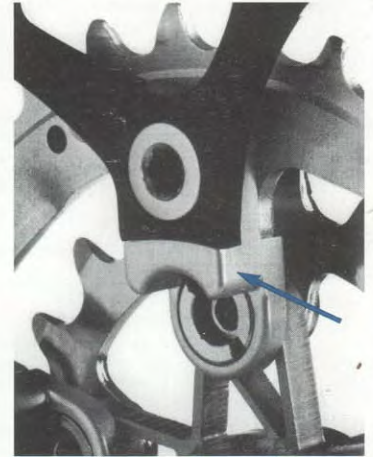
The lasercut triangulated truss configuration in our chainring spider is strong, stable and structurally efficient. The

Sweet chainring spider places material only where it's needed, making our steel spider as light as aluminum spiders. The spider is welded to the crankarm, eliminating problems associated with mechanical connections like loosening, squeaking and dissimilar metal corrosion.

A Revolutionary Bottom Bracket

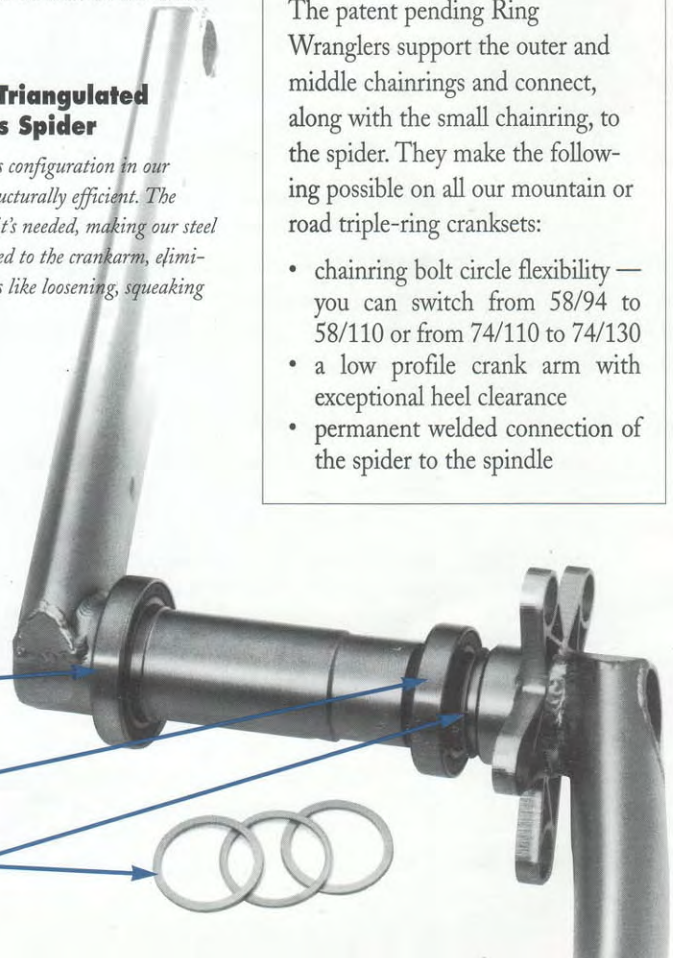
- Two piece bottom bracket with sealed cartridge bearings and spacers.
- Bearing on left is free floating.
- Bearing on right is clamped between two halves of crankset, providing lateral restraint of the system. The clamping force does not add lateral loading to the bearings as many systems do.
- Spacers are provided and can be used for chainline and spindle length adjustments.

The Ring Wrangler



The patent pending Ring Wranglers support the outer and middle chainrings and connect, along with the small chainring, to the spider. They make the following possible on all our mountain or road triple-ring cranksets:

- chainring bolt circle flexibility — you can switch from 58/94 to 58/110 or from 74/110 to 74/130
- a low profile crank arm with exceptional heel clearance
- permanent welded connection of the spider to the spindle



Stems: Us vs. Them & Some Techno Goodies

Sweet Crankarm vs. Conventional Solid Aluminum Arm

Conventional Solid Aluminum



Sweet™

The tubular Sweet crankarm is 325% stiffer in bending, 374% stiffer in torsion and 19% lighter.

Sweet Spindle vs. Conventional Spindles

Conventional B.B. Spindle

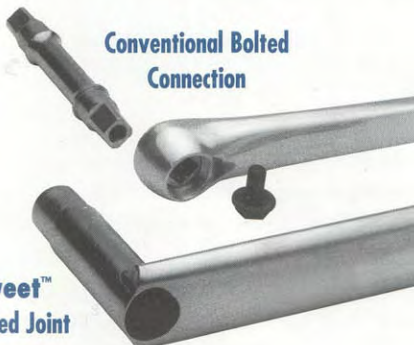


Sweet™

Sweet vs. conventional steel spindle: Sweet is 168% stiffer in bending and torsion, and 43% lighter. Sweet vs. conventional titanium spindle: Sweet is 314% stiffer in bending and torsion, and 22% lighter.

Sweet Welded Joint vs. Conventional Bolted Connection

Conventional Bolted Connection



Sweet™ Welded Joint

Our unique welded arm/spindle connection makes possible the use of our optimized thin-walled, lightweight tubular members. This is far more efficient and lighter than the conventional bolted connection.

Binder Bosses

Our binder boss is designed and manufactured by Sweet Parts™ not only to save weight (5 grams versus conventional 15

grams binder bosses), but to create a better binder assembly as well.

Conventional Binder Boss (15 gms)



Sweet™ (5 gms)

The closer a binder bolt is to the bar tube, the more efficient the transfer of clamping force, transmitting the most force through bearing versus bending. Standard binder bosses place the binder bolt far away from the bar tube causing a high bending force on the slotted binder boss. The small size of our binder boss maximizes bearing force, and results in a vise-like handlebar grip. Though the smaller size of our binder boss makes it more difficult to fabricate, the benefits are worth it.

Fixing Bolts

Our patented fixing bolt assembly allows us to use the smallest fixing bolt in the industry, with no reduction in strength or stiffness of the stem. The resulting weight savings are substantial: while conventional bolts weigh 60 grams, ours comes in at only 10 grams.



Conventional Fixing Bolt (60 gms)

Sweet™ (10 gms)

ALUMINUM? TITANIUM?

Why Steel?

Because it's the most efficient material for the job.

Comparing 1½" O.D. tubes of equal weight — steel (0.040" wall thickness), titanium (0.073" wall thickness) and aluminum (0.123" wall thickness) — steel is 12% stiffer than titanium and 23% stiffer than aluminum. In fact, as the tubing diameter becomes smaller — 1" or ¾" — steel has an even greater advantage.

Sweet Stems™

Every one of our stems is designed to minimize weight and maximize stiffness, with no compromises in strength, durability and dependability. Sweet Stems™ feature custom binder bosses, large diameter thin wall butted tubing, strong precision TIG welded joints, shot peening and proprietary heat treatment. Both Quill and Aheadset models are available in road and mountain bike versions.



Sweet Top™

[Aheadset™ compatible, uses cap and internal locking assembly]

The Sweet Top™ is our stiffest road and mountain bike stem. Its clean look and unique design set it apart from other Aheadset™ stems. The patent-pending Sweet Top™ uses a cap and revolutionary internal locking assembly. It also eliminates the need for cumbersome steerer tube binder bosses and makes flawed external wedge clamping mechanisms obsolete.

This resourceful design has many benefits, including greater stiffness and more responsive steering, combined with the light weight (150 grams, 120mm) of our other stems.



Sweet Stem™

Our quill stem model is extremely light, with the road version weighing only 180 grams (120 mm length) and the mountain version only 190 grams (135 mm). Tests show that our quill stem is up to 60% stiffer than a titanium stem of equivalent weight. Our patented concealed fixing bolt helps us achieve our low weight without compromising stiffness or strength.

The 90 degree configuration creates a more direct connection, resulting in less material and increased front-end response. The quill tube is shorter than most conventional stems, yet provides adequate adjustability. Finally, the tube wall thickness is butted (varies along the length), placing material only where it is needed.

The Sweet Top™ cap and internal locking assembly also allows for a stronger connection to the steerer tube than other designs. (Conventional external wedge assemblies apply their clamping force on only one side of the steerer tube, resulting in a stress concentration and a fastening system that is not as secure.) The expansion of the Sweet Top™ assembly sandwiches the steerer tube between the assembly and the vertical tube of the stem. The result is a more uniform load distribution around the perimeter of the steerer tube for the most secure and rigid fastening system available. Also, the internal locking system is totally protected from the environment and is a snap to install.

*Aheadset™ is a trademark of Dia-compe USA.

What Makes a Sweet Part?

- ◆ All Sweet Parts™ components are manufactured in the U.S.A. utilizing the highest-quality materials.
- ◆ We use advanced computer modeling and stress analysis to assist us in placing material where it's needed and eliminating it where it's not. This allows us to create components with the lightest possible weight and the greatest possible strength and stiffness.
- ◆ We prove our parts through extensive destructive testing in the laboratory, and with heavy use and abuse on the road and trail. This insures that each Sweet Part™ is built to handle the toughest real world conditions.
- ◆ Regarding our finish... We shot-peen our products to increase fatigue strength (this creates our satin finish). The surface coating on our components is a proprietary polymer-enhanced plating that will not chip or flake like powdercoat finishes, and is 12 times more corrosion resistant than Electroless nickel plating. Sweet plating has a surface hardness five times greater than aluminum, making our components virtually immune to scratches, bumps and bangs. And the permanent non-stick property of this superior finish facilitates clean-up from the worst off-road conditions.

Comparative Crankset Test

Make & Model	Material & Construction	Weight in Grams: Crankset, Chainrings and Bottom Bracket	Deflection in Inches: Due to 150 lb. load. (More deflection means less stiffness)*
★ ★ Sweet Road/Wings	Chromoly (Tubular) with Integrated Tubular Steel BB/Welded & Heat Treated	696.0	0.121 0.177
★ ★ Sweet Mountain/Wings	Chromoly (Tubular) with Integrated Tubular Steel BB/Welded & Heat Treated	722.0	0.121 0.177
Sampson Road	Aluminum (Solid) with Conventional Steel BB/CNC Machined	759.5	0.196 0.429
Shimano Road/Dura Ace	Aluminum (Solid) with Cartridge Steel BB/Cold-Forged	814.5	0.149 0.328
Magit Motorcycle Mountain	Aluminum (Tubular) with Integrated Aluminum BB/CNC Machined & Boreed	827.0	0.118 0.226
Topline Mountain	Aluminum (Solid) with Conventional Steel BB/CNC Machined	845.3	0.195 0.421
Cook Brothers Mountain/E	Aluminum (Solid) with Conventional Steel BB/CNC Machined	864.0	0.166 0.418
Shimano Mountain/XT	Aluminum (Solid) with Conventional Steel BB/Cold-Forged	895.0	0.149 0.325

- ★ Stiffest
- ★ Lightest

Notes:

* Total crankset deflection at point of load application (against solid steel pedal stud, 5 cm from face of arm). 175 mm cranks tested. Using a conventional titanium bottom bracket in place of a conventional steel bottom bracket yields the following results: Weight will decrease by approximately 60 grams. Deflection will increase by approximately 16% (drive) and 49% (non-drive).

Comparative Stem Test

Make & Model	Material & Construction	Weight in Grams	Deflection in Inches: Due to 150 lb. load. (More deflection means less stiffness)*
★ ★ Sweet Road	Chromoly (Tubular)/Welded & Heat Treated	188.5	0.177
Lightspeed Road	Titanium (Tubular)/Welded	200.5	0.226
Ibis Road	Titanium (Machined Billet)/Welded	215.3	0.253
Controltech Road	Aluminum (Tubular)/Welded	236.5	0.220
Ritchey Road/Force Comp	Chromoly (Tubular)/Welded & Heat Treated	261.0	0.186
Cinelli Road/XA	Aluminum/Cold-forged	330.1	0.240
Modelo Road/X Tenos	Aluminum/Cold-forged	347.7	0.305

- ★ Stiffest
- ★ Lightest

Notes:

* Total stem deflection at point of load application (against solid steel bar, 22 cm from centerline of stem). 130 mm quill stems tested.

Product Specifications

	Steerer Diameter O.D.	Handlebar Diameter	Rise	Lengths	Weight
Sweet Stem™					
Mountain:	1" (25.4 mm) & 1 1/8" (28.6 mm)	25.4 mm	0° & 10°	120, 135 & 150 mm	170 to 195 gms
Road:	1" (25.4 mm) & 1 1/8" (28.6 mm)	26.0 mm	0°	100 to 140 mm (in 5 mm increments)	170 to 195 gms
Sweet Top™ (Aheadset™ compatible, uses internal cap and internal locking assembly)					
Mountain:	1" (25.4 mm) & 1 1/8" (28.6 mm)	25.4 mm	0° & 10°	120, 135 & 150 mm	150 to 180 gms
Road:	1" (25.4 mm) & 1 1/8" (28.6 mm)	26.0 mm	0°	100 to 140 mm (in 5 mm increments)	150 to 180 gms
Sweet Wings™ (Integrated crankset/bottom bracket without chainrings)					
Mountain:	Chainring Dia. = 58/94 mm (Compact), 58/110 mm (Compact/Std.) 74/110 mm (Std.) & 74/130 mm (Std./ Rd.)			170.0, 172.5, 175.0, 177.5 & 180.0 mm	520 gms
Road:	Bolt Circle = 130 mm (Shimano)			170.0, 172.5, 175.0, 177.5 & 180.0 mm	520 gms
Track:	Bolt Circle = 144 mm			165.0, 167.5, 170.0, 172.5 & 175.0 mm	520 gms
B.B. Threads:	1.370x24 (English) & 36x24 (Italian)				

