

*Campagnolo*<sup>®</sup>

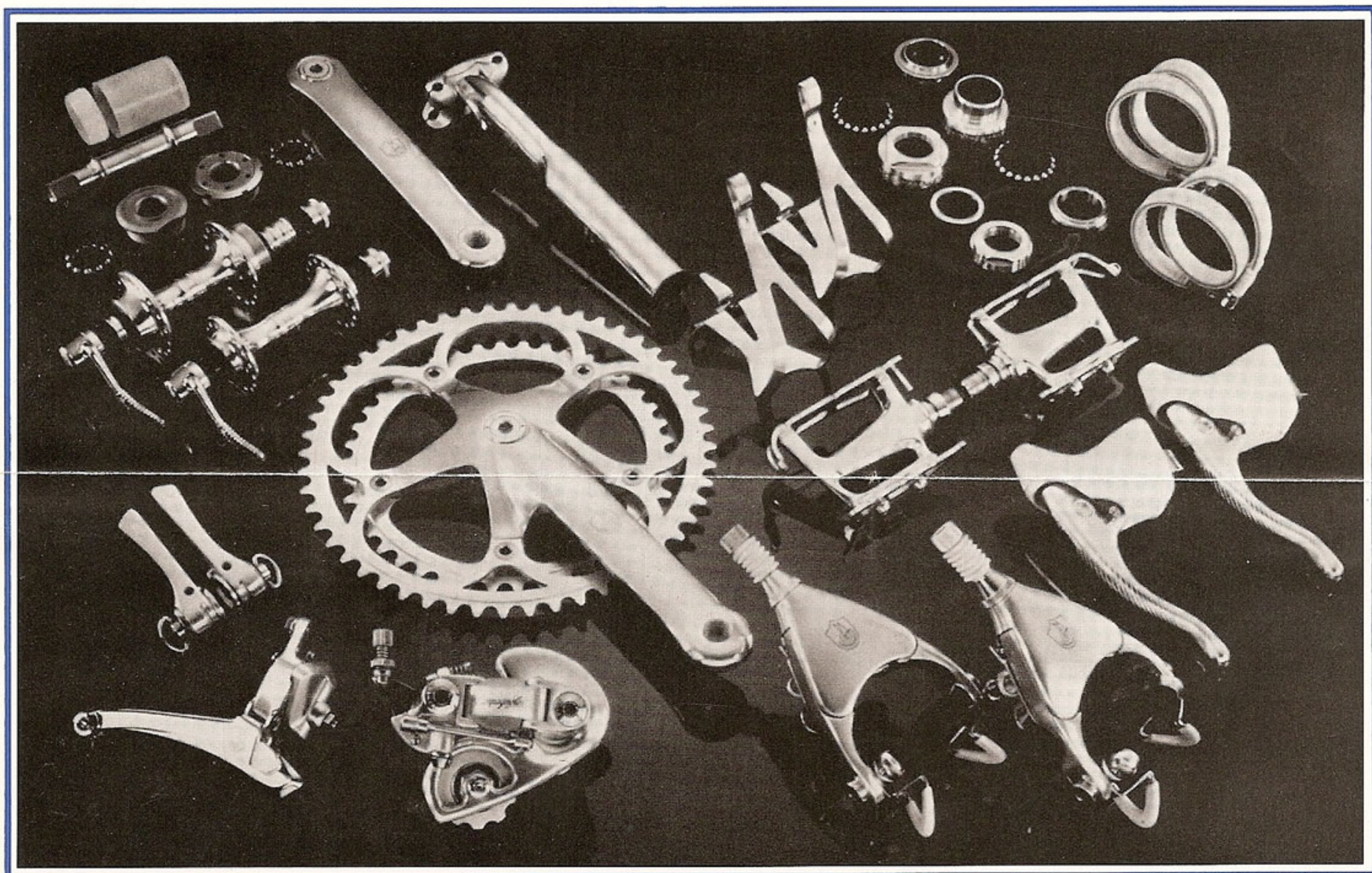


# Record News

SUMMER 1988

Vol. 2 No. 6

## The Campagnolo "Croce D'Aune Gruppo" Campagnolo establishes new standards in component technology!



On November 11, 1927, while racing up the Croce D'Aune mountain pass in Italy, Tullio Campagnolo suffered a flat tire. Replacing the tire was impossible—the axle nuts were locked in place because of the ice—and Tullio could only watch his competitors ride away.

But the loss stayed with him and Tullio went home to ponder this mechanical problem. To prevent such problems in the future, he invented the quick release skewer. The quick release became the first Campagnolo patent and the standard for the bicycling industry. The **Croce**

**D'Aune Gruppo** is one more series of patents that will continue our history of setting standards for the industry.

No other components have a more distinguished parentage, and none can stand so firmly on their own. The Croce D'Aune gruppo will move the racer even closer to the supreme precision and race-winning performance found in the state-of-the-art Campagnolo Record gruppo.

The name Croce D'Aune is pronounced Crow-ehy-down-aye.

### **Croce D'Aune Crankset**

The Croce D'Aune crank arms, with their beautifully unique geometry, are designed to have exceptional shear strength, enhanced rigidity and durability.

The Croce D'Aune crankset has been designed by Campagnolo Research and Design Engineers using computers and full field stress analysis. This method determined how the cranks would transmit as much of the cyclist's energy as possible through the full rotation of the chainwheel.

The curvature of the arms constrains the degree of bottom bracket frame twist and flex by reducing the length of the bottom bracket axle. When the lateral line of action is longer than necessary, it causes the frame to twist, thus wasting the cyclist's power. The mounting tapers are set as close as possible to the bottom bracket center line. A short axle saves energy by reducing the length of the lateral arm of leverage.



During the full-field studies, the Campagnolo Engineers examined—in both the laboratory and racing settings—the tensile properties of the Avional aluminum alloy (the same that is used in the Record) in the crank arms. As a result of this research, they developed and are using a new molding process in current production. This new technique provides a more thoroughly integrated fibral structure of the alloy.

The analytic studies also helped produce the best ergonomic profile of the crank arms. The expanding radial curve of the arms gives the pedals suitable spread for proper positioning of the feet with appropriate chainstay clearance and increased ankle clearance for those who ride in a substantial toe-out position. The crank arms are 11% further apart at the pedals than at the tapers.

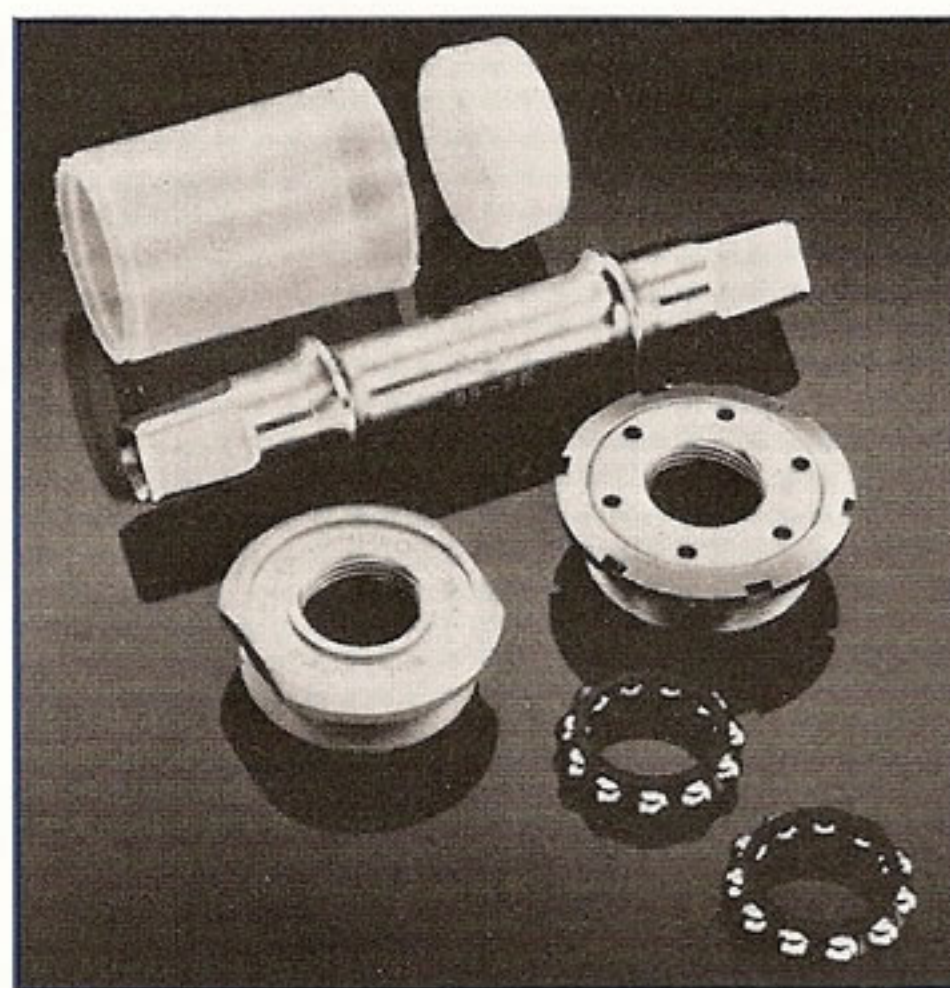
The crank arms are held in place on the bottom bracket axle with the Campagnolo 7mm allen bolt incorporated extractor. Croce D'Aune crank arms can be attached and removed with a 7mm allen wrench and the Campagnolo 7mm allen wrench stabilizer (no. 1203003). This is the same as the system used on the Record and Victory cranks.

The crank arms feature a contact collar at the pedal hole. This collar helps improve the power transfer from the pedal to the crank arm. The improved transfer is especially important for sprinting and climbing.

The Croce D'Aune chainrings are made from the same wear resistant alloy, Avional, as all Campagnolo chainrings. Every chainring is cut tooth by tooth by a computer controlled gear cutting machine using the standard Campagnolo tooth profile that has proved to extend the life of the chainrings and the chain.

The chainrings are cut in an asymmetrical pattern. The center lines of the teeth are closer together than the center lines of the chainring bolting seats. This prevents narrow chains from falling between the chainrings during shifts from the large to small chainwheel.

The chainring bolt circle (135mm) is the same as Record and Chorus. Chainrings are available in sizes from 39 to 57 teeth. The chainrings from 48 to 57 teeth come with a pin to prevent the chain from being caught between the crank arm and the chainring. Croce D'Aune and Chorus chainrings are interchangeable with one another.



The bottom bracket is similar to other Campagnolo bottom brackets. The symmetrical axle is case-hardened steel. Both axle and cups are precision ground and rotary polished for use with Campagnolo high precision bearings.

The 1/4" hardened chrome-steel bearings come in matched sets with a tolerance of .001 mm (1 micron). The ball bearings are held in a special resin retainer, which helps retain and

spread Campagnolo lubricants around the bearings and over the races.

The axle opening in the cups has the special helical channel to prevent contaminants from infiltrating and impairing the action of the bearings and races. Bottom bracket cups and bearings are interchangeable with Nuovo Record.

Crank arms are available in lengths of 167.5, 170, 172.5 and 175 mm. Pedal threads 9/16 x 20.

Inner chainrings are available from 39 to 47 teeth.

Outer chainrings are available from 48 to 57 teeth.

Bottom brackets are available in French, English and Italian threads.

All bottom brackets include a dust sleeve. Bottom bracket overall length: 111 mm

## Croce D'Aune Headset

The Croce D'Aune headset is manufactured with the general aesthetics of the Record headset. The four faced wrench flats, for more positive wrench support, is a shared feature. These four flats are found on the adjusting cup and the locknut. The lockwasher, that is recessed inside the locknut for improved locking action, is another shared feature.

But it possesses some internal innovations. The lower headcup race is supported and cushioned by the material we call SELFORM, a semi-elastic polymer that helps reduce the effect of road shock. The SELFORM liner helps disperse fork loads—from both the rider and the road—across a larger bearing area through self-aligning deformation. This avoids single points of high stress and brinnelling of the headsets.

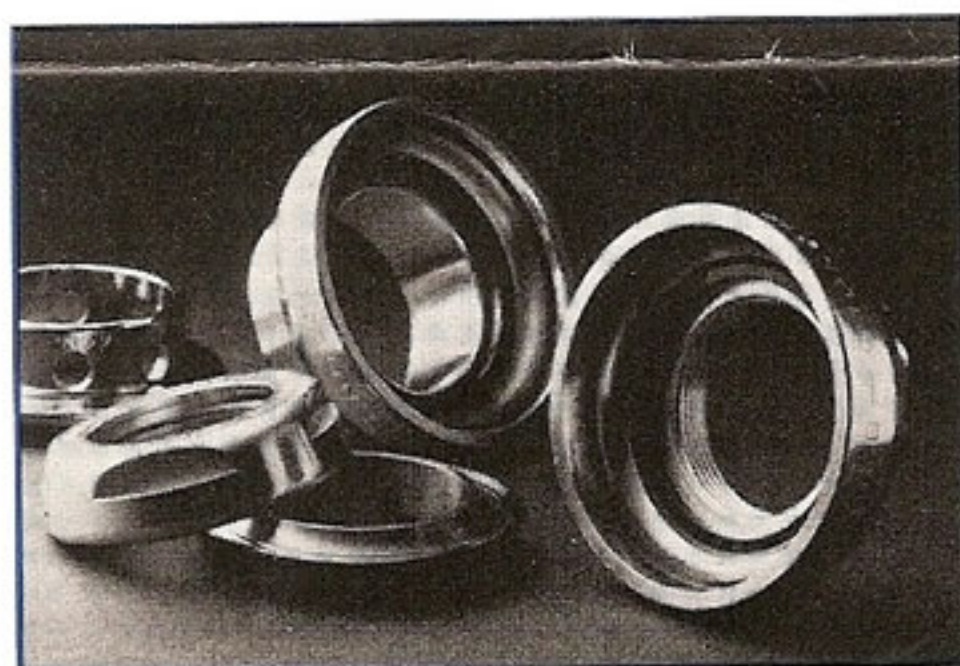
The lower race has a non-contact nylon shield to keep road contaminants from penetrating and adversely affecting the lower races and the bearings.

To help ensure proper control of the steering action and uniform load dispersion, the headset bearings (3/16") are supplied in matched sets consisting of bearings that are all within a .001 mm (one micron) tolerance. The bearings are caged in a special resin retainer. This



retainer helps retain and spread Campagnolo lubricants around the bearings and over the races.

The headset race and cone surfaces are hardened steel that has been specially cut and rotary polished to ensure proper contact and load dispersion. The expected life of this headset is double that of conventional designs.

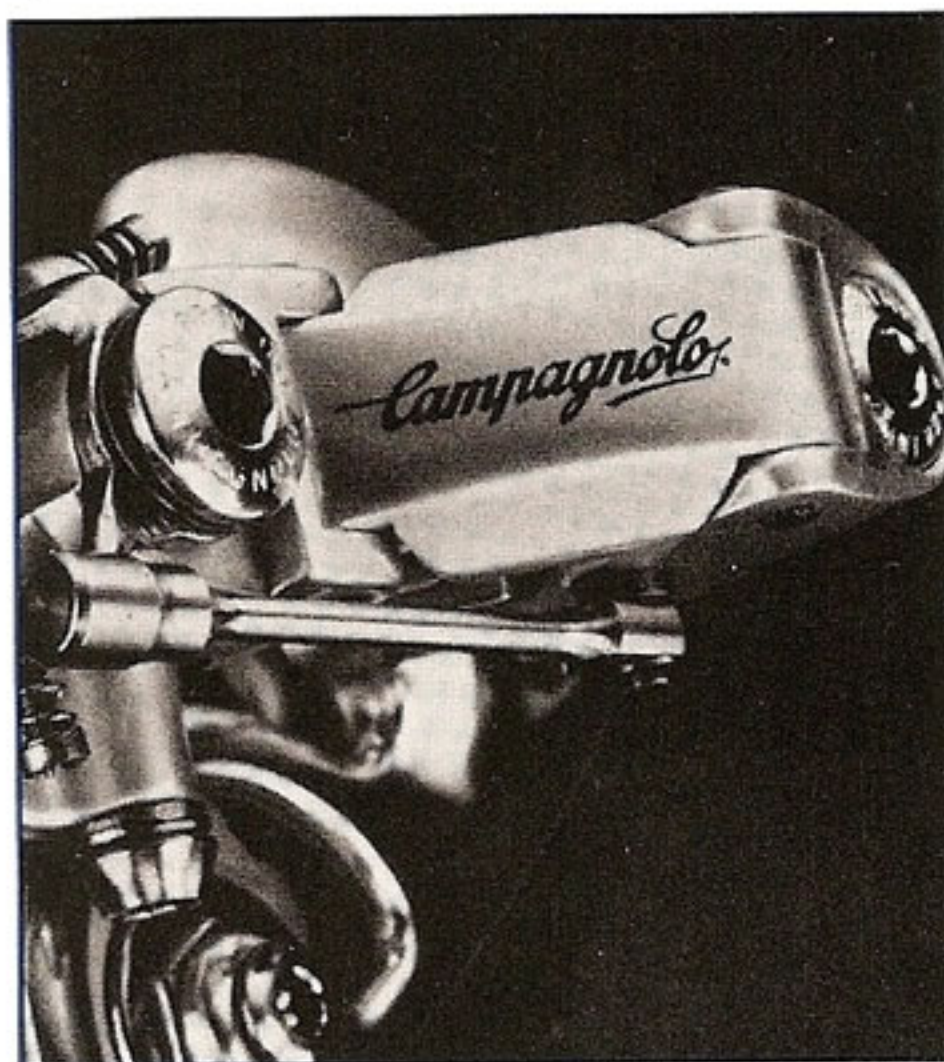


## Rear Derailleur

The basic problem a derailleur has to solve is that of moving its jockey pulley so that it consistently tracks the geometry of the freewheel. Traditional derailleurs use a vertically hung, jointed parallelogram to move the jockey pulley and cage on an axis that is almost parallel to the axle of the wheel. This system utilizes the overshift and return technique used by most cyclists.

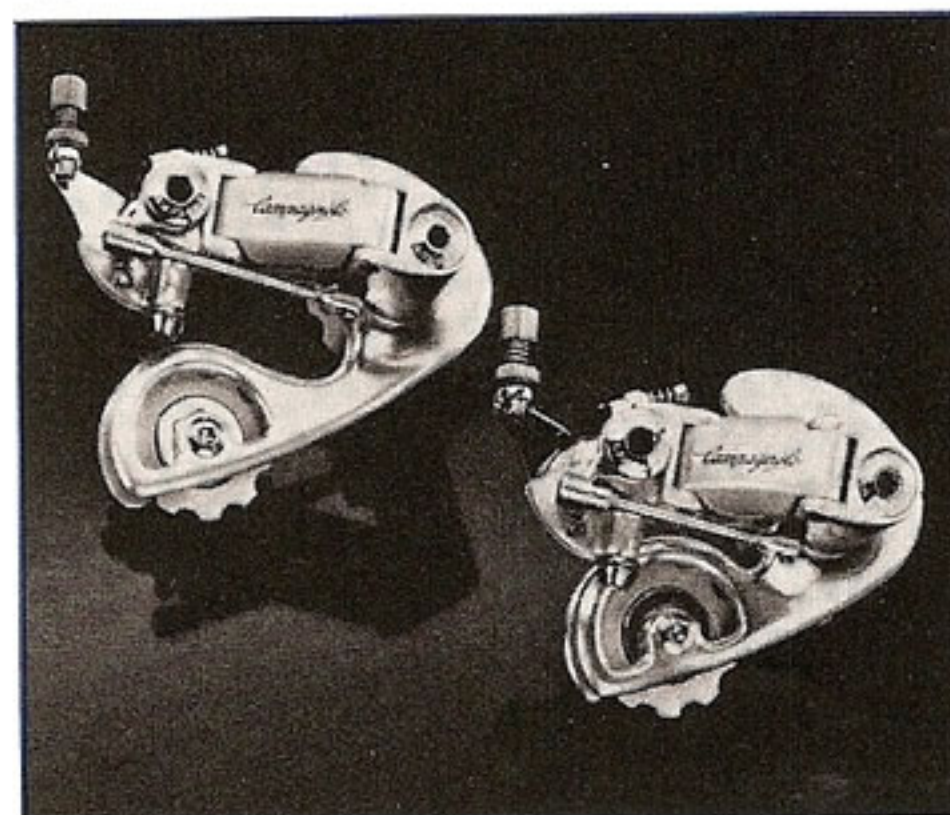
The Croce D'Aune rear derailleurs have a new system that allows the shifting to take place in an exceptionally fast and smooth action even when it must guide the chain across a wide spread of freewheel cogs.

This new, patented, **"TWIN-AXLE System"** has improved shifting by moving the jockey wheel and cage through a variable axis that tracks the conical plane of the freewheel cogs. This allows the cage to sit at a constant proximity to all the cogs on a freewheel. By maintaining this alignment, the overshifting necessary with the traditional systems is avoided.



The **Twin-Axle System** of these new derailleurs works this way:

- 1) When the cable is pulled the derailleur's parallelogram body rotates on the upper pivot bolt, swinging back much the same way a Record derailleur would when pulled back for wheel removal.
- 2) When the body swings back, the stainless steel transversal arm pushes the pulley cage inward toward the spokes and away from the axle of the hub, creating the proper spacing for larger freewheel cogs. The pulley cage tracks along the conical plane of the freewheel, guiding the chain from one cog to the next with the jockey pulley remaining equidistant to the cogs.



With this double action and the lack of preset loads, the Croce D'Aune derailleurs feel lighter and smoother during the shift than most other systems.

The lateral limit is set by two screws, which restrict the amount of fore and aft rotation of the main body. These screws are located on the upper body, making them less susceptible to any damage that can occur in an accident. Both screws have heads that allow either a standard flat or phillips screwdriver to be used.

This derailleur also has a forward rotation adjusting screw to finetune the primary angle of the derailleur. This is especially useful when installing the system on bicycles that lack Campagnolo dropouts. It also comes with the double screwdriver fittings.

A built-in cable tensioning barrel adjuster is included with this derailleur and is especially useful with the Syncro system. The parallelogram pivots use Teflon-coated stainless steel pins to ensure long life.

The jockey and idler pulleys are both semi-elastic polymers carried on adjustable cup, cone and ball bearing systems identical to C-Record. This ensures long life, reduced friction and quiet running.

### Gear Capacities:

Small Pulley Cage: as large as a 30 Tooth freewheel cog.

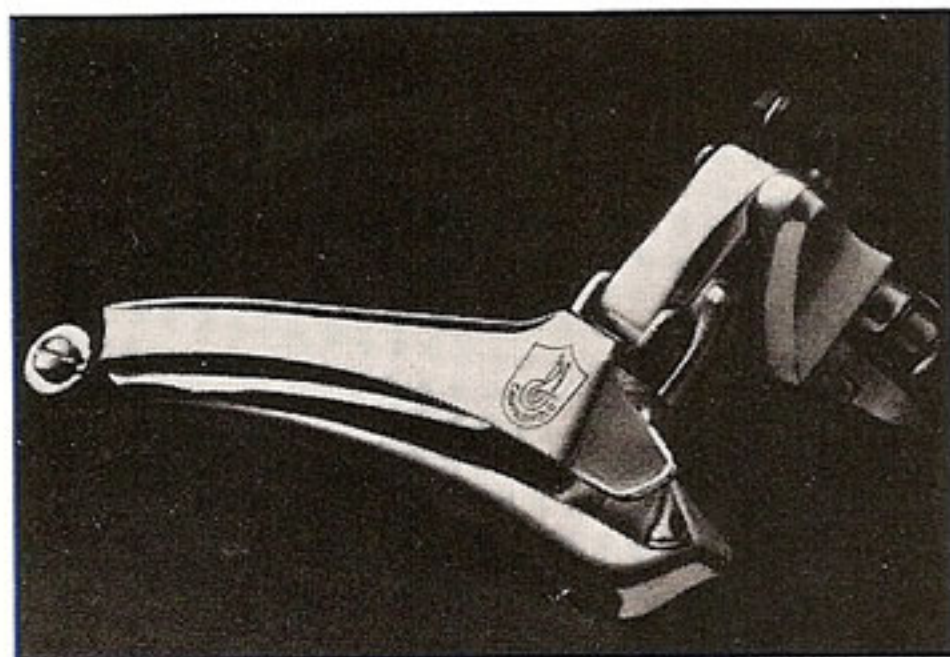
Large Pulley Cage: as large as a 33 Tooth freewheel cog.

These large capacities are for systems with an 18 tooth difference in the large and small chainwheels.

## Front Derailleur

The front derailleur has been specially designed for today's newest chains. As a result of this design, it shifts accurately and quickly due to the low coefficient of friction.

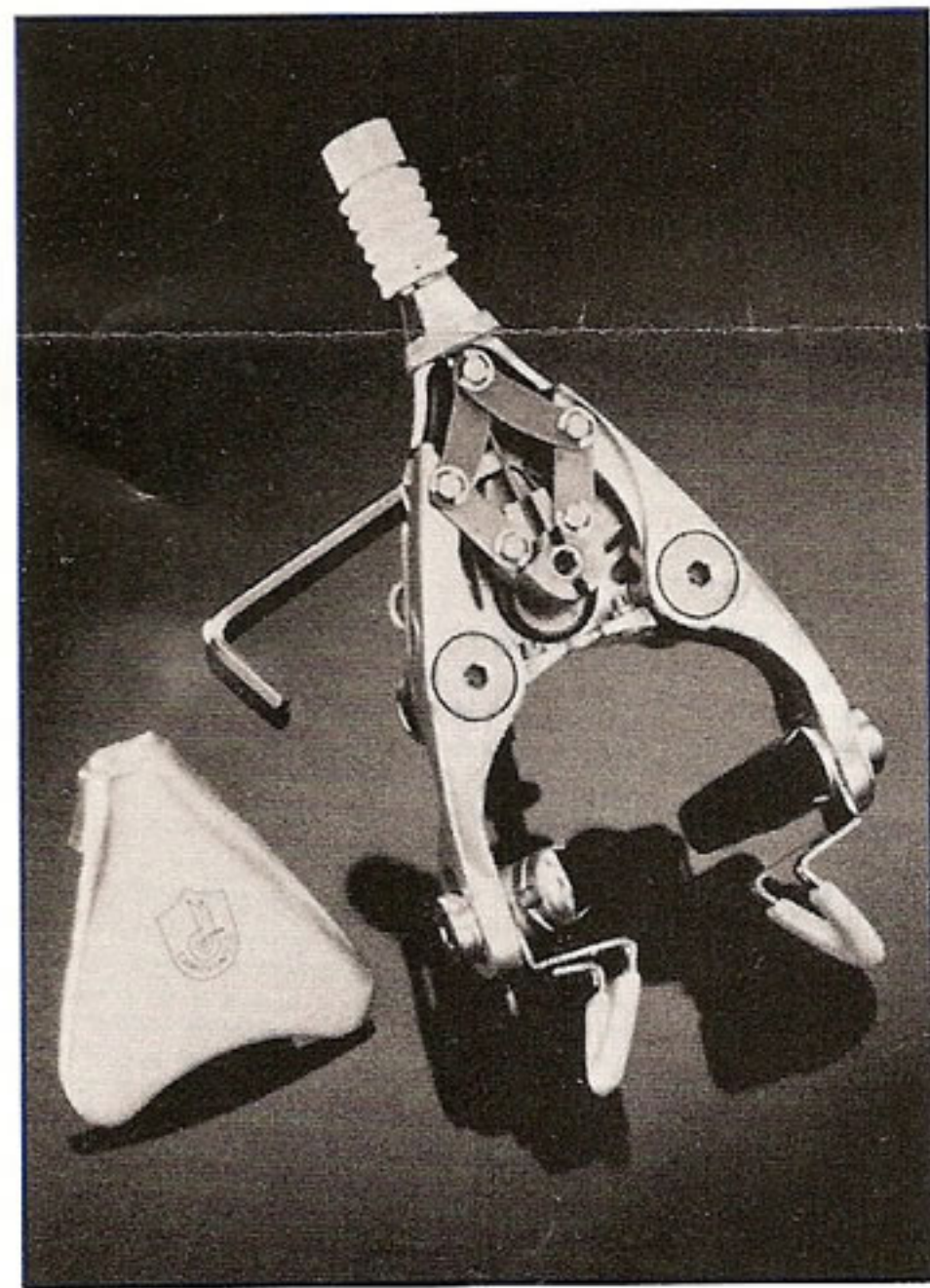
The Croce D'Aune front derailleur is built to withstand the demands of competitive cycling. It features an anodized aluminum body with Teflon-treated, stainless steel pivot pins. The cage is formed from chrome-plated, heat-treated steel. This cage is profiled to provide ultra fast shifts without needing after-shift trims, even if the chain is at the extreme crossover angles.



This front derailleurs is available in a standard sized clamp-on and a braze-on version. It is also available with an adjustable clamp for frames with oversized seat tube diameters from 28 to 33 millimeters.

## Croce D'Aune Brakes

The Croce D'Aune brakes are based on the proven design of the Record Delta brakes and still possess the vitally important "progressive action."



"Progressive action" is a new concept developed by Campagnolo. This action is delivered through the "**Penta-Drive System**," a centerpull articulated pentagram. The braking action comes on very quickly, for movement such as maneuvering through a pack of riders. But during the high-speed activation, it has low mechanical leverage to avoid the chance of lock-up. The further the lever is pulled, the clamping action becomes more powerful. For

example, 3 Kg (6.6 lbs.) of force applied to the lever can be transformed to 11 Kg (24.2 lbs.) of brake pad pressure.

The **Penta-Drive System** is made up of a double series of four stainless steel arms and a cable locking pivot. The arms are all connected with five Teflon-treated, stainless steel pivots so that they form a pentagon shape.

When the cable is pulled, the cable anchor pivot slides upward in a guide built into the caliper body. At the same time, the cable anchor seat that holds the cable casing pushes the upper rod down. These two motions cause the interconnected arms to force the caliper to press against the rim.

The force being transferred to the caliper is equally and automatically divided by the contractual and compressive action of the Penta-Drive mechanism. This ensures that the brake will remain centered and that equal force is applied to the brake pads on both sides of the rim.

The design of the brake pad holder allows the surface of the brake pad to be adjusted to match the rim's profile. These pads can be tilted to match a conventional rim, like the Sigma Strada, or the triangular shape of the Omega Strada "V-Profile."

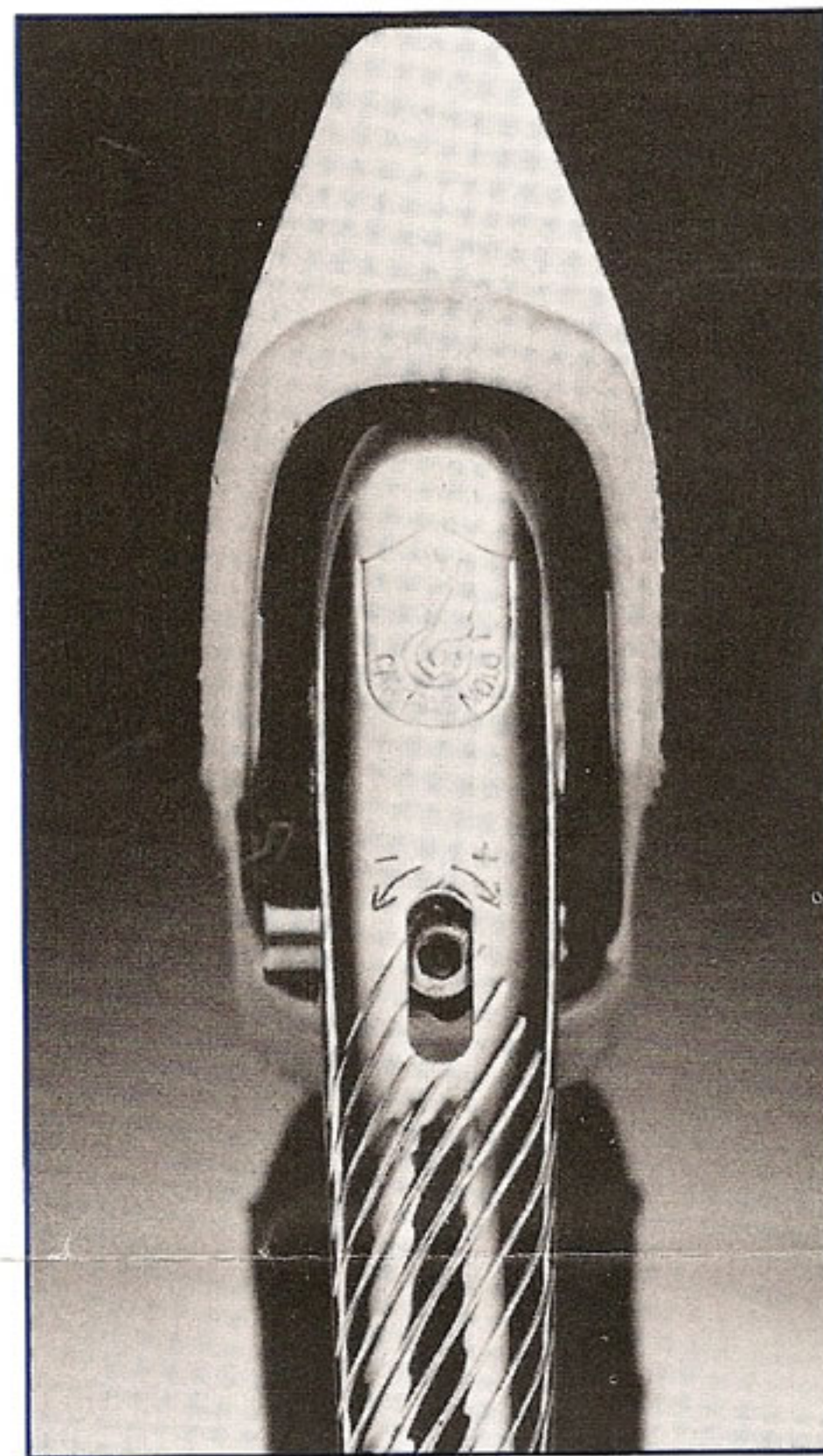
The brake pad holder is also equipped with toe-in adjusting screws that allow the proper degree of angle to be set for the rims being used, a handy way to eliminate brake squeal.

The Croce D'Aune brake levers can be used with the cables being run through the handlebars, under the tape or in the traditional open loop. They also feature the patented "**Power Grade System**," which offers the possibility of micro-metric adjustment between the rate of power applied to the lever and the speed of delivery to the calipers.

A 2mm allen screw, accessible through a small slot in the front of the lever, allows degree-of-cam angle and the rate of lift to be adjusted to suit the requirements of the rider, the wheels and the environment.

The quick-release mechanism is located in the brake lever. This push-button type quick-release allows the lever to rotate further. The extra rotation, approximately 12mm, feeds more cable

to the caliper and allows it to open more. If more wheel clearance, via the quick-release, were needed to prevent rim drag, this would give the wheel clearance without affecting either the braking power or the full-on position of the lever.



The result of this innovation in the lever and the caliper is a smooth, powerful, consistently predictable, progressive braking action. This eliminates slipping and lack of precision in braking.

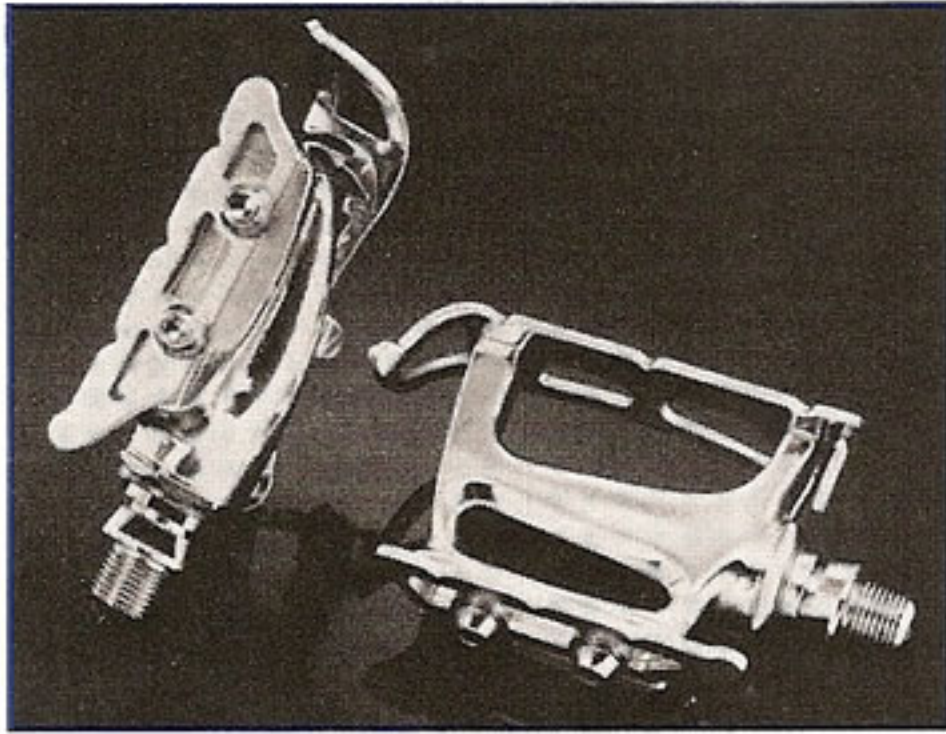
Caliper Drop Range: 39-49mm.  
Handlebar Diameter: 23.8-24.2mm.

## Croce D'Aune Pedals

The Croce D'Aune pedals are based on the same design parameters of ergonomic balance as the Record pedals. The result provides better balance and transfer of energy as the foot moves through the stroke of the pedal.

This pedal uses the "**Triple Bearing System**" patented by Campagnolo. This special system reduces axle length producing a more efficient transfer of energy and increases the angle of lean for better cornering than standard pedals.

The axle has been reduced to 60mm in length. It has eliminated the need for standard spherical ball bearings at the outer end of the axle. A set of roller bearings has been incorporated to carry the vertical load in this area, while a double series of 1/8" bearings is at the other end of the pedal body to carry the inner vertical load and maintain lateral stability.



With the reduced overall diameter of the roller bearings at the outer end of the axle and the tapered pedal body, the inclination angle has been significantly improved. Standard pedals are limited to 28 degrees of inclination in a corner. The Croce D'Aune can pass through the corner at 34 degrees. This means higher speeds through the sharp corners of both criteriums and mountain descents.

The inner two sets of bearings can be adjusted to eliminate play without introducing excessive friction. A grease injection port is located in the pedal body that allows fresh grease to be injected into the bearings which flushes out the old grease without a complete overhaul of the pedal.



The pedal axle's inner shoulder, near the crank arm threads, has a conically expanded profile that results in a wider area of contact between the pedal and the crank arm for more efficient power transfer.

### Croce D'Aune Hubs

The hubs, which follow the Campagnolo Record hub profile, are available in 28, 32 and 36 hole, small flange configuration with 6 or 7 speed axles. All come with the patented Campagnolo quick release.

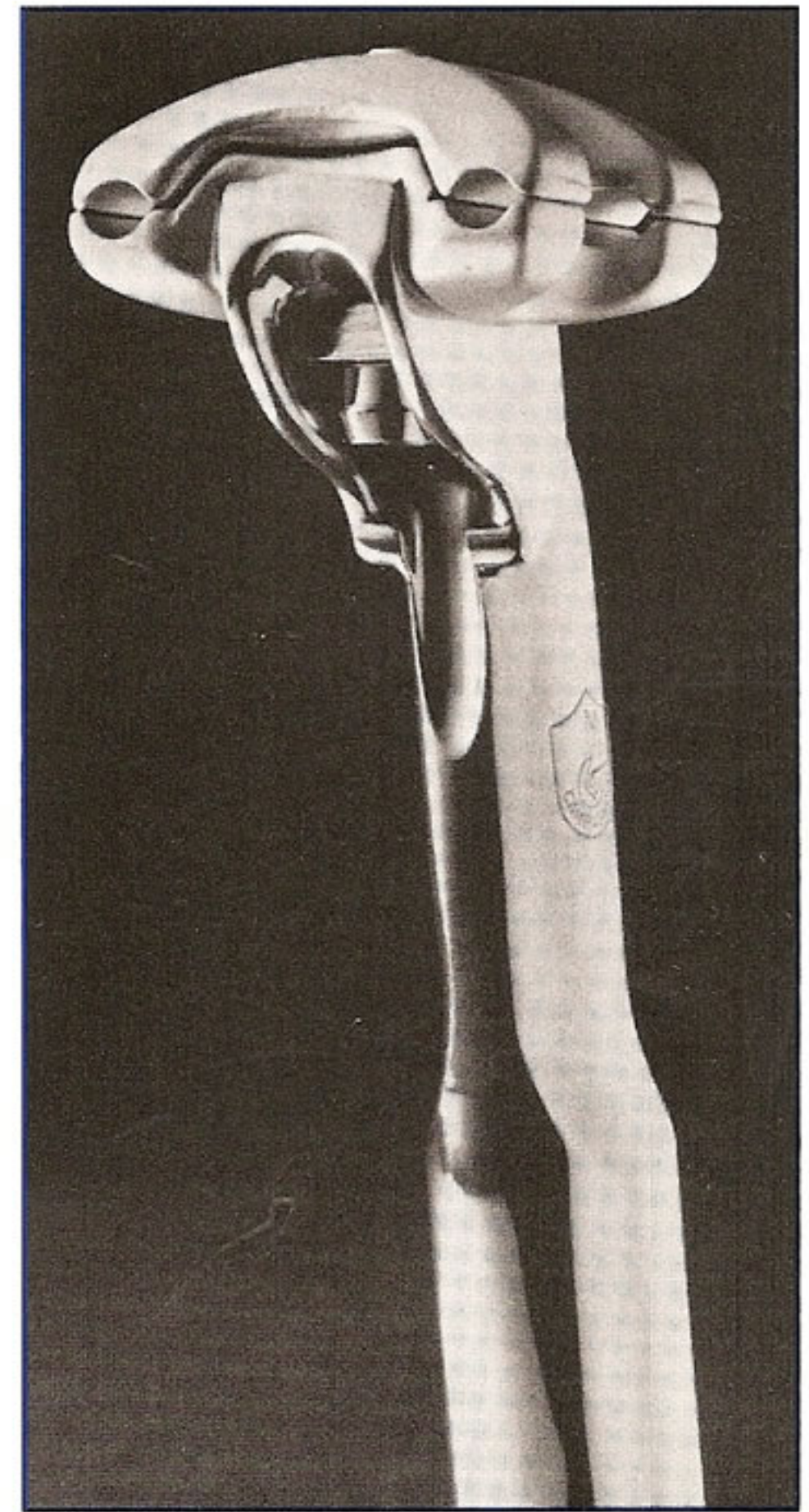
The hub shell has a hole in each dust cap and in the center of the shell for grease injection. This allows the axle and the bearings to be properly re-lubricated without disassembly. The center hole is covered with a spring clip held in place by the reinforcing shoulders of the shell center. These shoulders also protect the hub shell from torque wind-up.



The bearings are supplied in matched sets with a .001 mm (1 micron) tolerance. The cones and the races are all rotary ground and polished to properly utilize the high-precision bearings. The bearing races are case-hardened for extended durability.

### Croce D'Aune Seatpost

The Croce D'Aune Seatpost features the same slim-line profile of the Record Seatpost. The saddle carrier cage is designed for seats using 4 mm rails. The carrier cradle can be adjusted in two-degree increments using the 6mm allen bolt.



The seatpost comes in both the 130mm and the 180mm lengths—the 130mm length is for frames smaller than 49.5cm and the 180mm length is for frames larger than 50cm. It is available in all standard diameters.



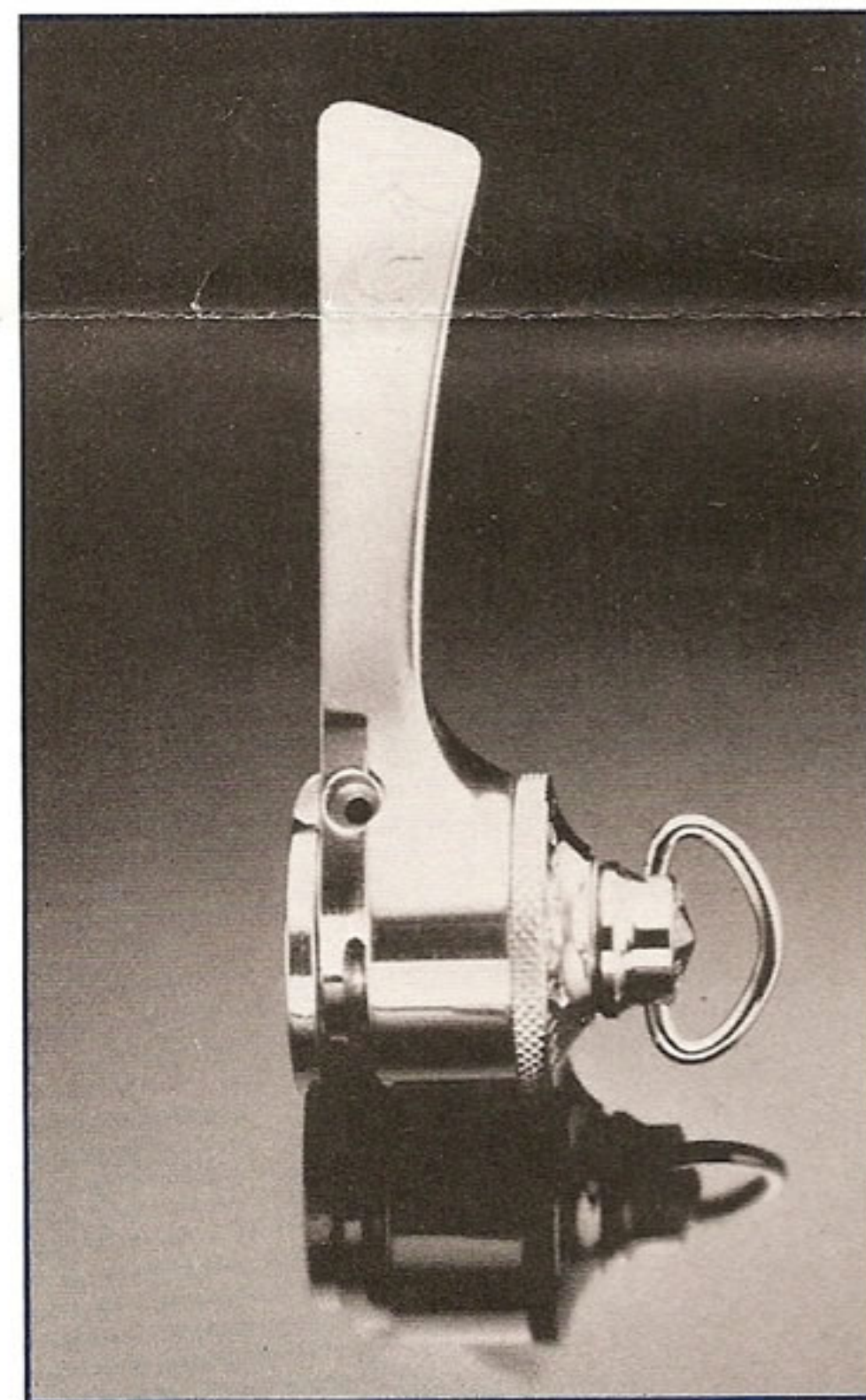
## Campagnolo Syncro Update:

Campagnolo's Syncro index system is now over two years old. The Syncro has been received in the marketplace with great enthusiasm and it has also scored well on the racing circuit with our Campagnolo Sponsored teams. In fact, it was used by Kent Bostick to win the National Road Championship in '87 and also by James Urbanos of the US National Cycling Team during his important stage win in the Russian Baltic Sea Race last year.

Early this year Campagnolo introduced **Syncro II**, a simplified version of the original race proven Syncro. **Syncro II** can be used with the same derailleurs, chains and freewheels as the original Syncro; it even uses the same gear inserts as its older brother, Syncro. Along with the introduction of **Syncro II**, Campagnolo has also introduced the Chorus, Athena and Croce D'Aune rear derailleurs. Because the geometry of these derailleurs is different from our previous gear changers they require different gear inserts when used with Syncro. In order to keep the Syncro system as simple as possible the same shift lever is used for every Campagnolo derailleur and you only have to change the gear insert to match the derailleur that you intend to use. For example, say that you have the Syncro system on your bicycle with a Victory rear derailleur and you would like to upgrade the drive-train with a Chorus derailleur. The only thing that you must do is replace the gear insert in your Syncro lever with the appropriate insert for the Chorus derailleur, that's all. Campagnolo has color coded the Syncro inserts so that you can tell at a glance which insert to use.

SYNCRO SHIFT LEVER GEAR INSERTS			
PART #	COLOR	MARKING ON GEAR	DERAILLEUR APPLICATION
7222063	Blue	None	C Record, Victory, Athena (7-speed) Croce D'Aune "LG" (Long cage)
7222064/a	Yellow	"C"	C Record, Victory, Athena (6-speed) Croce D'Aune "LG"
7222046	Yellow	None	C Record, Victory
7222071	Green	A7	Chorus derailleur in "A" Position (7-speed)
7222072	Red	A6	Chorus derailleur in "A" Position (6-speed)
7222075	White	B6	Chorus derailleur in "B" Position (6-speed)
7222076	Black	B7	Chorus derailleur in "B" Position (7-speed)
7222088	Grey	None	Croce D'Aune "SM" (Short cage) (7-speed)

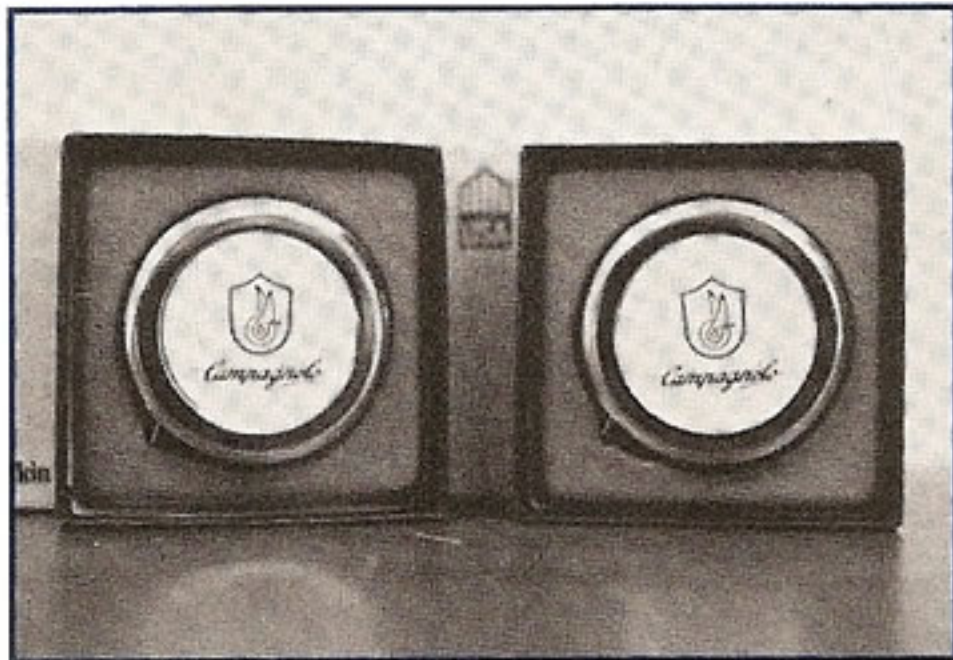
If you are experiencing difficulty with Syncro **CHECK TO BE SURE THAT YOU ARE USING THE CORRECT INSERT.** It is possible that you may have received the wrong insert with your Syncro kit, so begin your Syncro set-up by checking to see that you have the right one for the derailleur on your bike. If you still are having problems they will most likely be the result of using the wrong chain and freewheel combination. It has been our experience that Regina America and Shimano 600 or Dura Ace freewheels work great with our Syncro system when used with Sedisport chain. One last thing, remember never to overtighten the D-ring friction adjuster on the shift lever. Too much friction on the lever will not allow it to center the derailleur under the freewheel cog after the shift has been made. Below is a list of the different Syncro inserts, their color, part numbers and which derailleur they must be used with.



# Campagnolo Accessories

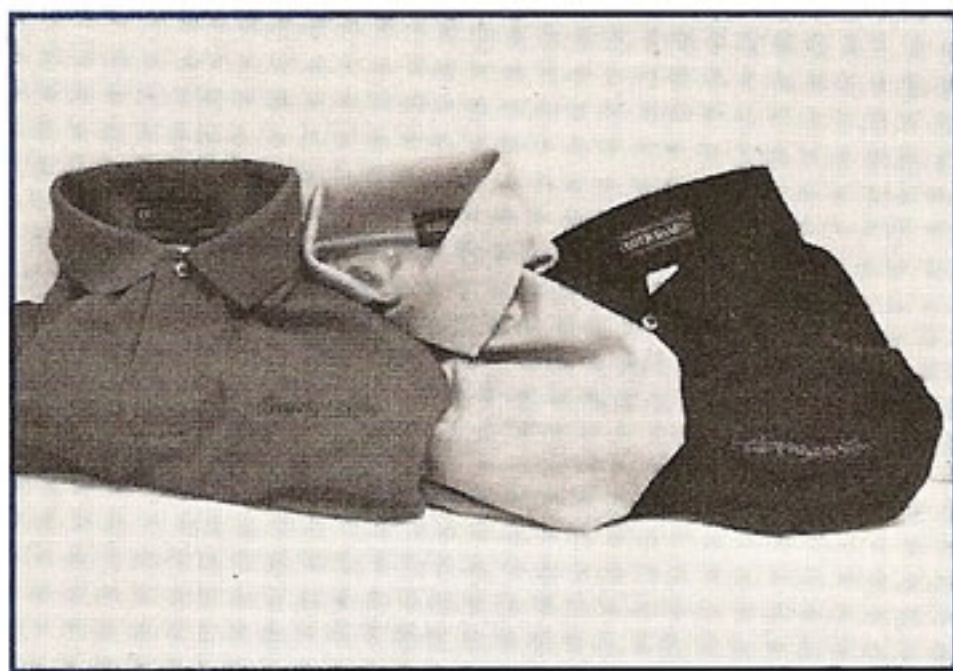
## Pocket Metric Tape Measure

Absolutely the finest small tape measure that money can buy. Made for Campagnolo in the U.S. by Lufkin and features both inch and metric measurements. Unique disc wheel design.



## The Campagnolo Polo

You cannot buy a better quality polo than this. It's made in the USA of luxurious 100% cotton interlock material with knit collar and band cuff. Who needs an alligator or polo pony when you can have Campagnolo beautifully embroidered on the left breast. White, Black, Turquoise and Red.



## Campagnolo Wings

A truly distinctive belt buckle, in brass or pewter 3" round design.



## Campagnolo Travel Bag

This rugged, multipurpose bag is constructed of heavy woven nylon and features a reinforced bottom and side pocket. Elegant dark blue with contrasting light blue trim and logo.



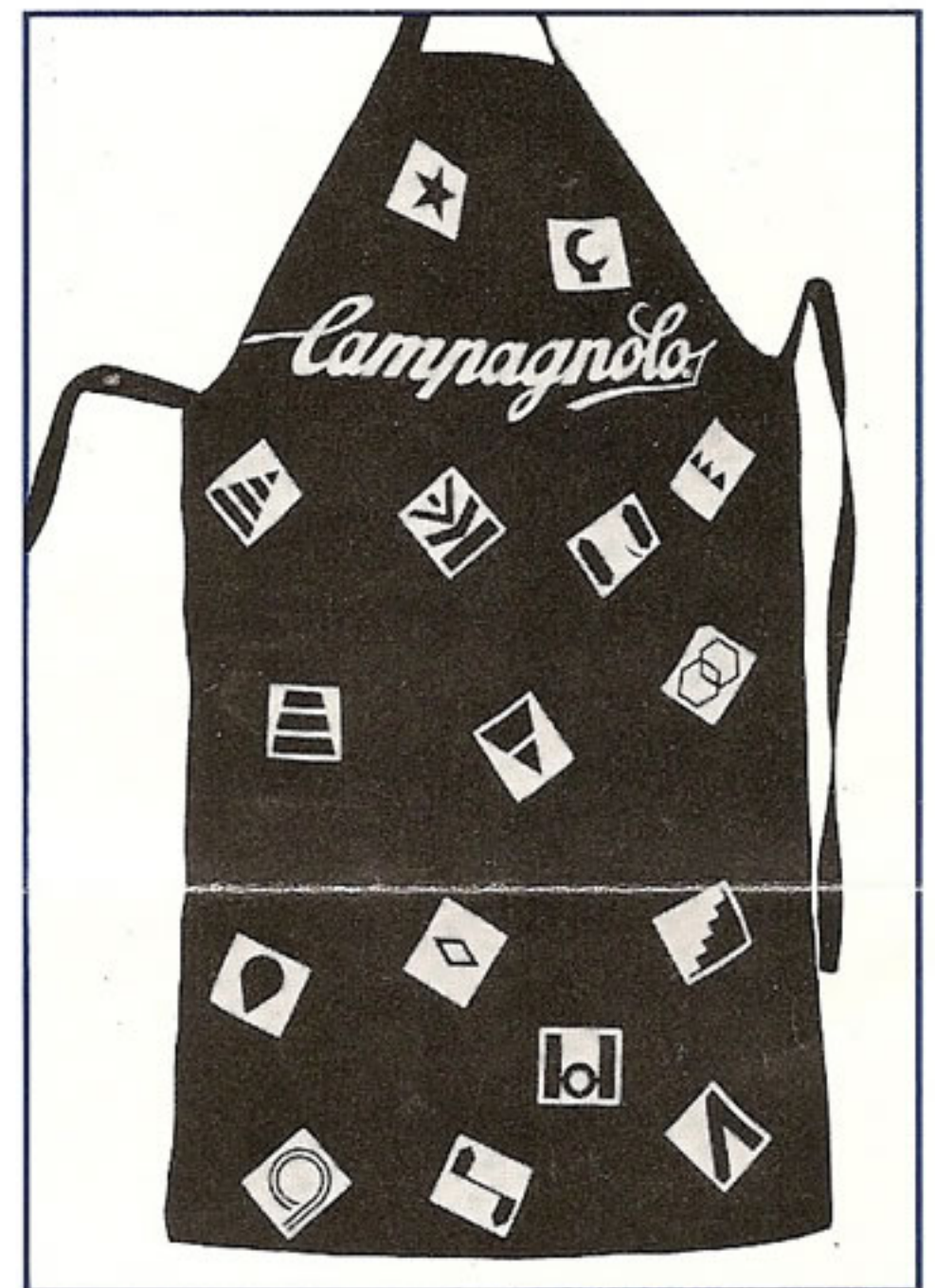
## Campagnolo Ball Cap

This is not your average baseball cap but a full coverage cotton cap. (No Mesh) Available are both winter (corduroy) and summer (water repellent, poplin) styles. Adjustable sizing, braided cord on bill with the world famous Campagnolo script logo embroidered in contrasting colors.



## Campagnolo Shop Apron

This is the real thing, made in America of super tough washable denim. This premium quality shop apron features an adjustable neck band, tool pockets, custom length and of course our famous logo and alphabet.



## Campagnolo Oval Decals

These high quality, vinyl decals are an excellent way to tell your friends and customers that you use the world's finest cycling components.



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