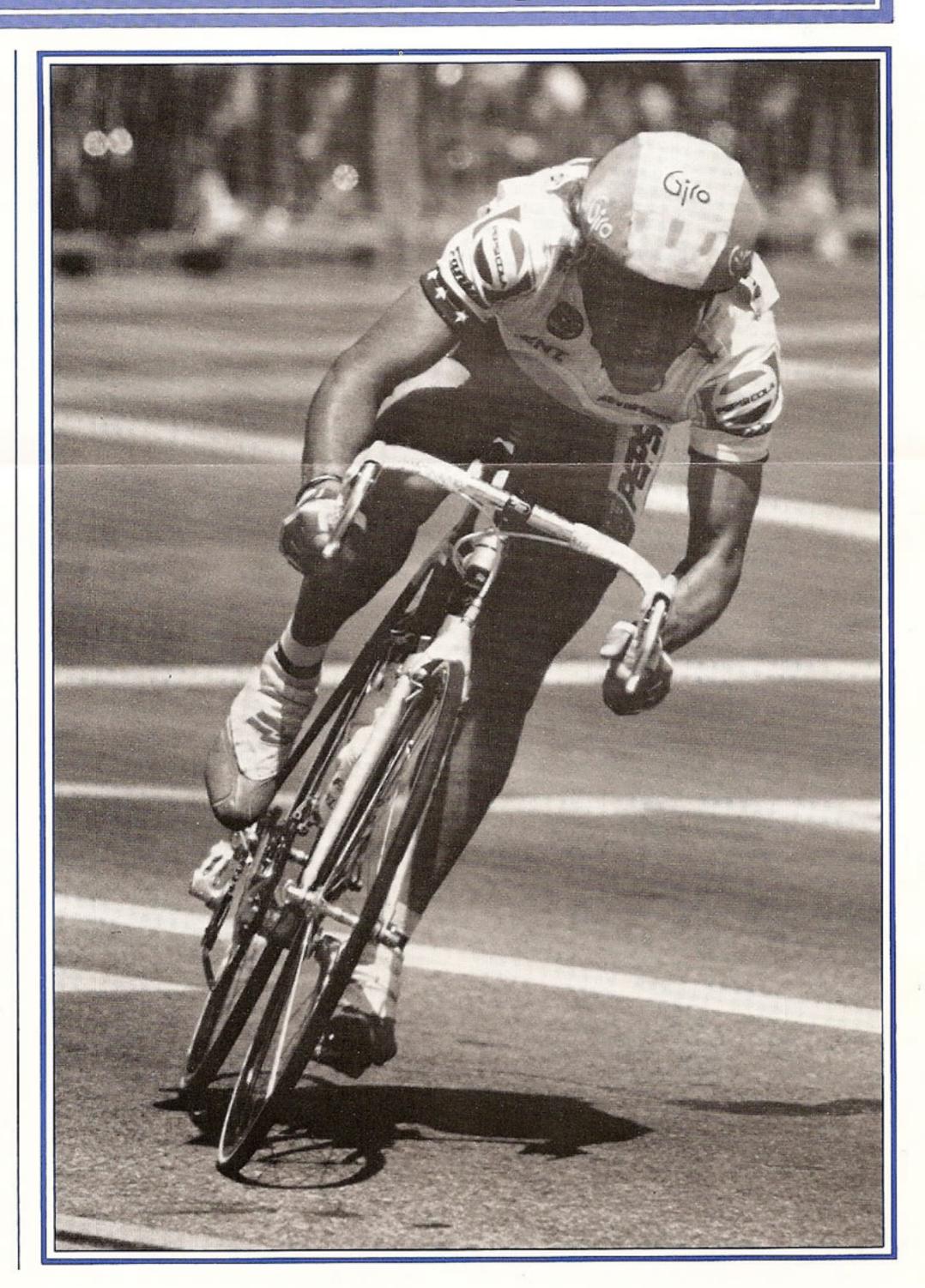
# Record News

WINTER 1988

# Campagnolo Rims Score Big Victories!

In only three years since their introduction, Campagnolo rims have already made their mark on the sport. Earlier this year Roberto Gaggioli of the Pepsi-Fannini team won the Core States Pro Championships on Campagnolo Omega clincher rims. In fact, two of the leading pro teams in Italy are racing and winning on our new clincher rims, proof positive of their superior weight and strength characteristics. On the continent, Campagnolo rims continued to carry Europe's best pros to victory racking up an impressive first, second, and third along with King of the Mountains and team classification in this year's Tour de France. Then, only a few short weeks later Maurizio Fondriest rolled to victory in the World Championships on Campagnolo rims to further establish them as the choice of champions.

The world's best riders including Lemond, Delgado and Fondriest choose our rims because they're 10% lighter and 40% stronger than any other rims made. Their patented double position eyelets ensure against spoke breakage and their unique cross sections and surface treatments give them unparalleled reliability. In addition, Campagnolo rims offer the advantage of tremendous time savings during assembly. Many shops building with Campy rims have remarked how easy they true up thanks to their roundness. To ensure this, each Campagnolo rim is inspected with a sophisticated Vision Camera System before it ever leaves our factory. So if you haven't tried our rims yet, we urge you to find out for yourself what makes them the overwhelming choice of the world's best riders.



### Everything You Need to Know About Campy Clinchers

This year Campagnolo has introduced five new clincher rims to the market. These rims represent over two years of testing and analysis and are extruded using a very special aluminum alloy. This remarkable alloy, available from only two sources in the world, lends itself very well to heat treatment providing a very high modulus of elasticity and breaking load level. This guarantees unsurpassed reliability and gives the rim a "MEMORY" making wheelbuilding and truing surprisingly easy. In addition to their unique alloy, two other features combine to make Campagnolo clincher rims superior to all others: their cross section and their patented double position eyelets. The cross section of a rim determines its transverse rigidity, vertical elasticity and weight. Using an advanced CAD system, Campagnolo engineers developed cross sections that would result in the lightest possible weight while still giving maximum transverse rigidity and optimum vertical elasticity.

Campagnolo's patented double position eyelets are offset to each side of the rim and cambered 5 degrees for the angle that the spoke assumes when it leaves the hub. This eliminates the bend that the spoke must make when assembled in an ordinary rim with single position eyelets. Only Campagnolo rims offer this unique feature! The result is fewer broken spokes and faster assembly and truing of the wheel.

Campagnolo clincher rims come in a variety of finishes: **Chromium**, available on **Delta** Rims is 200 times harder than normal "Black" anodizing. **Hardox**, available on **Omega** Rims is a hard anodized oxide finish. **Electrox**, available on **Omicron** and **Gamma** Rims is a galvanically applied oxide finish. **Oxide**, available on **Ypsilon**, **Omicron** and **Gamma** Rims is a clear anodized protective finish.

Campagnolo's range of clincher rims starts with the **Omicron** and **Gamma** Rims. They weigh 480gm, are available in three of the described finishes and are designed for OEM bicycles whose

| Profile | Cat.<br>No.             | Туре   | Finish                        | Drilling                         | Weight<br>~ gm.   | Eyelet                                     | Tire              |
|---------|-------------------------|--|-------------------------------|----------------------------------|-------------------|--|-------------------|
| 145     | P0142<br>P0162          | Delta XL Strada<br>Omega XL Strada   | Chromium<br>Hardox            | 28-32-36<br>28-32-36             | 375<br>375        | Patented<br>Double<br>Positioned<br>Eyelet | Clincher<br>19-25 |
| 20.2    | P0172<br>P0312<br>P0212 | Omega Strada<br>Ypsilon Strada<br>Lambda Strada  | Hardox<br>Oxide<br>Polished   | 32-36<br>32-36<br>32-36          | 430<br>430<br>430 | Patented<br>Double<br>Positioned<br>Eyelet | Clincher<br>19-25 |
| 13.5    | P0222<br>P0322<br>P0232 | Omega Strada<br>V-Profile<br>Ypsilon Strada<br>V-Profile<br>Lambda Strada<br>V-Profile | Hardox<br>Oxide<br>Polished   | 28-32-36<br>28-32-36<br>28-32-36 | 440<br>440<br>440 | Without<br>Eyelets                         | Clincher<br>19-25 |
| 13.5    | P0272<br>P0352<br>P0362 | Omicron Strada<br>Omicron Strada<br>Omicron Strada                                     | Polished<br>Electrox<br>Oxide | 32-36<br>32-36<br>32-36          | 480<br>480<br>480 | Patented<br>Double<br>Positioned<br>Eyelet | Clincher<br>19-25 |
| 13.5    | P0282<br>P0332<br>P0342 | Gamma Strada<br>Gamma Strada<br>Gamma Strada   | Polished<br>Electrox<br>Oxide | 32-36<br>32-36<br>32-36          | 480<br>480<br>480 | Single<br>Eyelet                           | Clincher<br>19-25 |

wheels are assembled on automated machinery. Currently these rims appear on several of Bianchi's new bicycles.

V-Profile Rims weigh 440gm, are available in three different finishes and your choice of 28, 32 and 36 hole drillings. Their aerodynamics gives them a 10% advantage over conventional box-section rims and they are currently the most popular of our clincher rims in America. The Omega, Lambda and Ypsilon Strada Rims are available in Hardox, Oxide and polished finishes and 32 or 36 hole drillings. These 430gm rims are remarkably strong for their weight and are a real joy to build.

The **Delta Strada XL** and **Omega Strada XL** are Campagnolo's top of the line clincher rims. These 375gm rims are race proven and have already won major professional races in Europe and America. The secret is their wide, low-profile cross section which makes

them extremely comfortable and at the same time able to resist tremendous lateral loads. They are available in 28, 32 and 36 hole drillings and either **Hardox** (**Omega**) or the new **Chromium** (**Delta**) finishes. So regardless of which Campagnolo rim you choose, we think that you will be amazed at how easily they build and how durable that they can be.

### Building Campagnolo Wheels

Wheel building, which has not been reduced to a simple science, is still an art. These assembly instructions, for wheels built with Campagnolo hubs and rims, are useful guidelines for any capable wheelbuilder.

The model of the rim decided upon, the rider's weight, spoke gauge, spoke count, flange height, cross pattern, and the tire will all affect the overall durability of the wheel. More important than any of the previously listed criteria is the wheelbuilder's skill and technique that is used to achieve the proper spoke tension.

Campagnolo rims are designed for three-cross spoke patterns. Two and four-cross patterns are very workable second choices. One-cross patterns are not recommended.

Campagnolo hubs and rims can be assembled in a radial spoke pattern, however, we do not recommend this since neither was designed with this configuration in mind.

### **Spokes**

The spoke length, for Campagnolo rims, can be determined using the charts shown.

Since double-butted spokes weigh less and are more resilient, we have found them to be more stable than straight gauge spokes for most events in which Campagnolo rims are used. We recommend using 15/16 ga. double-butted stainless steel spokes when possible.

Aerodynamic flat spokes, ones that require slotting the hubs, are not recommended since this may result in premature hub failure. Modified Campagnolo hubs will not be warrantable since the modification is beyond our control or our design parameters.

Please Note: As shown in the chart, the spokes on the drive side of the rear hub are generally 1-2mm shorter than the non-drive side due to the dishing effect.

When choosing spokes the specified length may not always be available. If this is so, try to use spokes that are a bit longer than specified rather than a millimeter too short. Remember, it is always possible to cut off the extra spoke length, but it is impossible to make a short one a little longer.

### Campagnolo Rims Primary Camber

The eyelets in Campagnolo rims are Double Positive Camber. The holes are drilled tilted left or right as well as fore or aft. When assembling the wheel you must first find the left and right side of the rim in order to find the orientation of the primary camber.

Campagnolo rims are right handed. If you are looking at the valve hole from one side of the rim, the eyelet to the right of the valve stem hole is further from you than the one on the left.

### **Secondary Camber**

Other rims are manufactured with only the primary camber, as explained above. The holes are drilled as if the wheel will always have a radial spoke pattern with each spoke aimed directly at the hub axle.

When a single camber rim is assembled using a cross-spoke pattern, 3-cross for example, the spoke must bend at some point on its shaft in order to seat the nipple properly in the eyelet. The bend is usually situated just ahead of the nipple.

This bend can be flexed once each time the wheel makes a full revolution and can lead to early spoke failure. At 25 mph this kind of spoke will be flexed 19,000 times an hour.

In order to relieve spoke stress
Campagnolo drills and sets the eyelets
so that spoke will not need to bend
and flex on the shaft in order to get the
nipple to seat properly in the eyelet.

When viewing a Campagnolo rim from the side, the spoke to your right of the valve hole will be tilted to the right of the axle. The spoke to the left of the valve hole will tilt to the left.

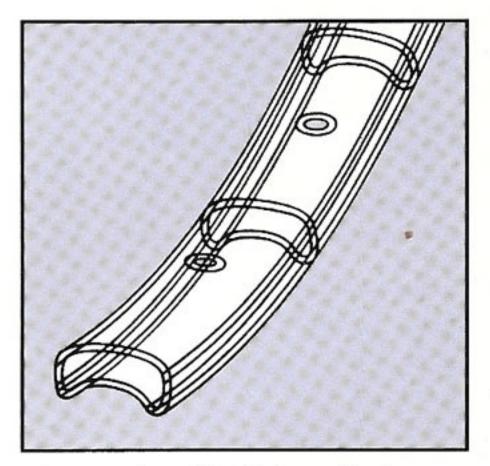
Campagnolo designs the rims so that the spokes on the two sides of the valve hole are parallel to create the pump head space above the valve hole. The secondary camber, the fore or aft lean, is set this way.

Looking at the hub from an extended axis of the axle, the spoke from the right of the valve hole will join the far flange at the two o'clock position and the spoke to the left of the valve hole will join the near flange at the ten o'clock position.

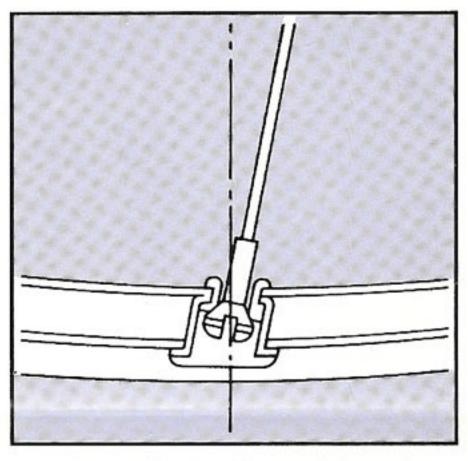
### **Prior to Assembly**

When selecting the parts of a wheel check the following:

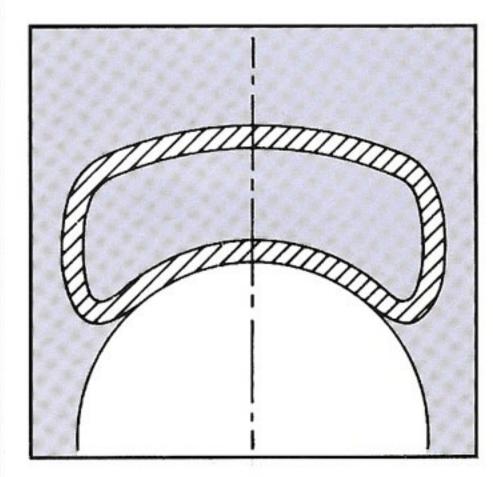
- 1) The rim is proper for the rider's intended use.
- 2) The hub and the rim have the same



Primary camber (offset) is the positioning of the eyelet to the left and the right of the rim's centerline.



Secondary camber is a tilt toward the spoke hole in the flange. The broken line represents a radial spoke.



Fully apply glue in the tough of the rim in order to reduce the chance of rolling a tire.

CAMPAGNOLO INFO: Call: 1-800-US CAMPI 10:00 a.m.-12:00 p.m. 2:00 p.m.-4:00 p.m. E.S.T. number of holes.

- 3) The correct gauge and length spoke are being used.
- 4) You have a Lubricant/Fixing Agent for the spoke threads.
- 5) The rear axle is the correct length.
- **6)** The nipple seats on the V-section rims have been lubricated.
- 7) Note the direction of the old spokes if using a pre-used hub. Be sure that the new spokes are pointed in the same direction as the previous ones.

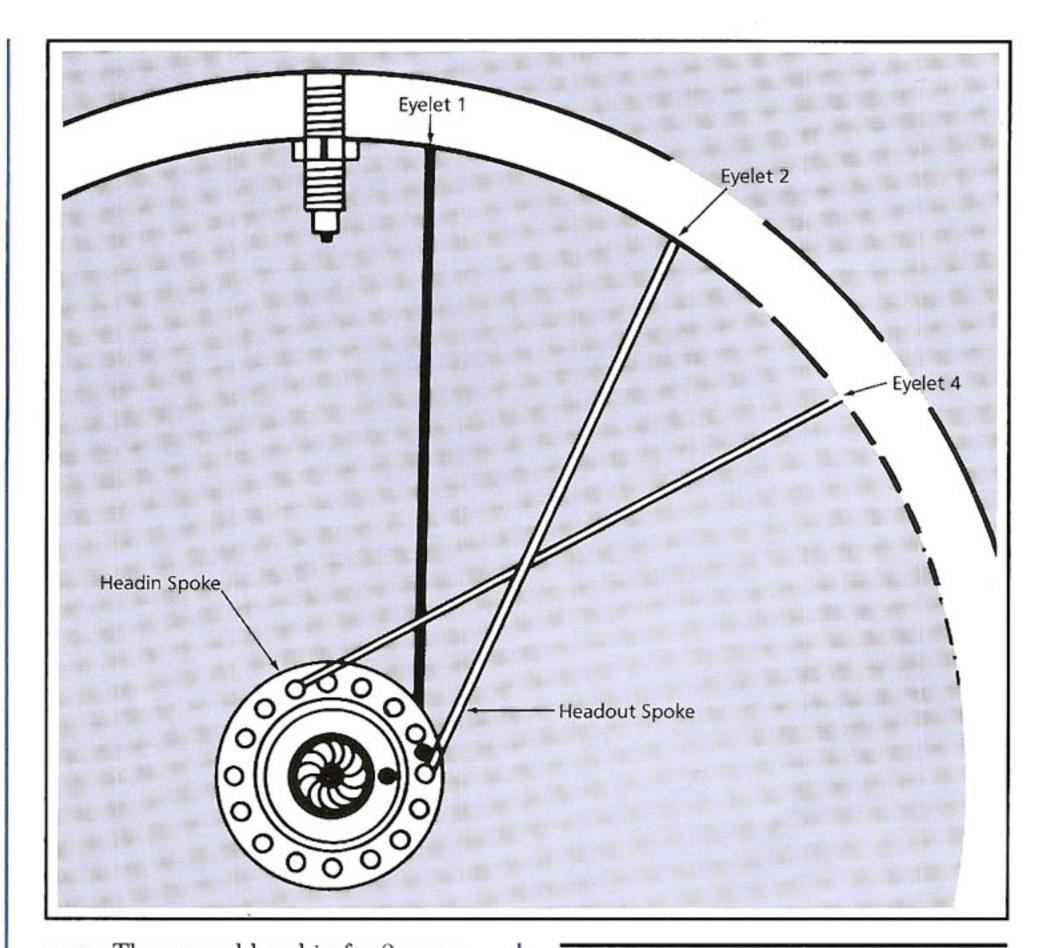
### Spoking the Hub

These basic steps would be used in all common spoking patterns.

**Example:** The Rear Hub 32 hole, 3X, Campagnolo Omega Rim

- 1) Hold the hub so that the axle is vertical to the floor.
- 2) Insert a spoke into the drive-side flange so that the spoke head is on the outside of the flange. Mark this spoke #1 with a piece of tape. The spokes on the drive side should be 1-2mm shorter than those on the other side.
- 3) Hold this spoke so that it extends across the hub to the other flange and is parallel to the axle. The spoke should cross the other flange between two spoke holes. Use a magic marker or a pencil to mark the first counterclockwise hole from the extended spoke.
- 4) Now insert a spoke into this hole with the head on the outside of the flange. Mark this spoke #2 with a piece of tape.
- 5) Insert all the other spokes to the proper holes using the #1 and the #2 spokes as your guide.
- 6) Place the rim flat on a table. With the hub sitting vertically and the drive side up, take the #2 spoke and put it into the eyelet to the right (clockwise) of the valve hole.
- 7) Take the #1 spoke and put into the next clockwise eyelet.
- 8) With these two spokes in place rotate the rim counter-clockwise while holding the hub in place until the prime crossing spoke, the one which is the third counter-clockwise head-in spoke from the number #1 spoke, will reach the next same side eyelet to the right (clockwise) of the #1 spoke. Be sure to interweave the #1 and the prime spokes.

The fourth head-in spoke from the #1 spoke is used to cross #1 for a four-



cross. The second head-in for 2-cross.

9) Finish lacing the wheel with these three spokes as the guide. Be sure that all the proper crosses are made.

10) When lacing the wheel tighten the spokes only enough to keep the nipple on the spoke. Do not overtighten the spokes by estimating (guessing) how far the nipples will be threaded when the wheel is completely finished.

If you used the spokes' lengths from the Campagnolo charts, for Campagnolo rims, tighten all the spokes until the nipple reaches the end of the spoke threads where the smooth shaft begins. They will still be quite loose.

11) Once the spokes are all put into the proper holes, but have not been tensioned, bend the spokes in the direction of travel, across the plane of the flange, by pressing on the spokes. Press on the spokes about ¾ of an inch from their heads.

The spokes that need to be bent across the flange are the ones with their heads on the inside of the flange.

Spoke tension will be able to straighten the spoke out of a curve more easily and more accurately than it can bend it into the curve.

### Lacing the Front Hub

The front hub is laced the same as the rear except that there is no drive side. You can start on either side of the hub.

### Truing and Dishing the Wheel

True, dish and round-out the wheel evenly. Do not try to get the spokes tight, all in a single turn. Once the nipples have been brought up to the end of the threads, start truing by turning no more than one full turn per spoke.

After all the spokes have been tightened with one complete turn, make each following turn smaller until you reach the point where you are turning each spoke only ¼ to ½ a turn with each tightening.

Do not overtension and return. Get the rim both true and round with each spoke in the 70 to 100kg tension range. Use a tensionometer to check tension as you progress or once you are done.

When checking the tension on both sides of the rear wheel do not try to make the two sides even. The drive side will be approximately 55-70% that of the other side. The exact amount depends on the spoke size, flange height, cross pattern and the rim.

As the wheel is being dished and trued, relieve the torque by squeezing pairs of spokes by hand. Stress relieving should be performed several times during the truing process.

We recommend you relieve the torque after two full revolutions of tightening the spokes.

**Please Note: Do not** relieve this torque stress on the spoke by pressing sideways on the rim with all the pressure being supported by the axle.

**Do not** relieve spoke tension by pulling spokes together that are not mounted on the same flange.

### Recommended Building Techniques

- Lubricate the threaded end of the spoke with a thread locking lubricant like Wheelsmith Spoke Prep.
- 2) As a final check to relieve spoke torque on a completed wheel, which has the tire in place and fully inflated, set the wheel on the floor the way it is ridden. Now, press down on the rim, via the hub axle, and roll the wheel under your weight. Roll through, one full rotation.
- 3) Fix the nipple to keep it from rotating in the eyelet due to road shock. Use a thread locking lubricant, like Wheelsmith Spoke Prep, on the spoke threads.

Wheelbuilders often let tubular tire rim cement get into the eyelet behind the nipple, on road racing wheels, to prevent the nipple from dropping into the rim if a spoke should have to be replaced. This does reduce the nipple's ability to spin freely and keeps the nipple flats within reach of a spoke wrench, but does make maintenance truing more difficult.

Some builders still crimp the nipple with sidecutters, it is not recommended. Tieing and soldering the spokes does not prevent the nipple from loosening due to impact trauma.

4) Bend the spokes at the flange once

### Campagnolo Rim Chart Campagnolo Large Flange Road Hubs

|                    | Tubular     |           |           | Clincher    |           |           |           |           |           |  |
|--------------------|-------------|-----------|-----------|-------------|-----------|-----------|-----------|-----------|-----------|--|
|                    | Box Section |           |           | Box Section |           |           | V-Section |           |           |  |
| Drilling<br>of Hub | Front       | Rear<br>L | Rear<br>R | Front       | Rear<br>L | Rear<br>R | Front     | Rear<br>L | Rear<br>R |  |
| One Cross          |             |           |           |             |           |           |           |           |           |  |
| 24 Hole            | 280         | 280       | 278       | N/A         | N/A       | N/A       | N/A       | N/A       | N/A       |  |
| 28 Hole            | 278         | 279       | 277       | 278         | 279       | 277       | 270       | 271       | 269       |  |
| 32 Hole            | 277         | 278       | 276       | 277         | 278       | 276       | 269       | 270       | 268       |  |
| 36 Hole            | 277         | 277       | 276       | 277         | 277       | 276       | 269       | 269       | 268       |  |
| 40 Hole            | 276         | 277       | 275       | N/A         | N/A       | N/A       | N/A       | N/A       | N/A       |  |
| Two Cross          |             |           |           |             |           |           |           |           |           |  |
| 24 Hole            | 293         | 293       | 291       | N/A         | N/A       | N/A       | N/A       | N/A       | N/A       |  |
| 28 Hole            | 288         | 289       | 287       | 288         | 289       | 287       | 281       | 281       | 279       |  |
| 32 Hole            | 285         | 286       | 284       | 285         | 286       | 284       | 277       | 278       | 276       |  |
| 36 Hole            | 283         | 283       | 282       | 283         | 283       | 282       | 275       | 276       | 274       |  |
| 40 Hole            | 282         | 282       | 280       | N/A         | N/A       | N/A       | N/A       | N/A       | N/A       |  |
| Three Cross        |             |           |           |             |           |           |           |           |           |  |
| 24 Hole            | 310         | 310       | 309       | N/A         | N/A       | N/A       | N/A       | N/A       | N/A       |  |
| 28 Hole            | 302         | 302       | 301       | 302         | 302       | 301       | 294       | 295       | 293       |  |
| 32 Hole            | 297         | 297       | 296       | 297         | 297       | 296       | 289       | 289       | 288       |  |
| 36 Hole            | 293         | 293       | 291       | 293         | 293       | 291       | 285       | 285       | 284       |  |
| 40 Hole            | 290         | 290       | 288       | N/A         | N/A       | N/A       | N/A       | N/A       | N/A       |  |
| Four Cross         |             |           |           |             |           |           |           |           |           |  |
| 24 Hole            | 326         | 326       | 325       | N/A         | N/A       | N/A       | N/A       | N/A       | N/A       |  |
| 28 Hole            | 317         | 317       | 316       | 317         | 317       | 316       | 309       | 309       | 308       |  |
| 32 Hole            | 310         | 310       | 309       | 310         | 310       | 309       | 302       | 302       | 301       |  |
| 36 Hole            | 304         | 304       | 303       | 304         | 304       | 303       | 296       | 296       | 295       |  |
| 40 Hole            | 299         | 300       | 298       | N/A         | N/A       | N/A       | N/A       | N/A       | N/A       |  |

N/A: Clincher rims are not available in these drillings.

Rear L: rear hub, non-drive side. Rear R: rear hub, drive side.

Track Specifications: Track spoke lengths are not listed. However, front track hubs are the same as road hubs. The rear track hubs generally require a spoke 1mm longer than the one listed for road wheels.

More Information: These are the rim Calculation Specifications used for the spoke lengths listed above. These figures can be used when determining wheel configurations not listed above.

Rim Diameter: Box Section Tubular or Clincher: Average 615mm V-Profile Clincher: Average 599mm Sigma 650: Average 567mm

| Hub Specifications |                   |                 |                  |  |  |  |  |
|--------------------|-------------------|-----------------|------------------|--|--|--|--|
| Flange             | Front or Rear     | Flange Diameter | Center to Flange |  |  |  |  |
| Low<br>Low         | Front<br>Rear 126 | 39<br>44.5      | 34<br>L-36 R-21  |  |  |  |  |
| High<br>High       | Front<br>Rear 126 | 67<br>67        | 34<br>L-36 R-21  |  |  |  |  |
| High Track         | Rear              | 67              | L-44 R-31        |  |  |  |  |

This chart of spoke lengths regarding Campagnolo hubs and rims was determined through calculations using the Wheelsmith Spoke Length System.

See page 6 for Small Flange Road Hub/Rim Chart.

# Campagnolo Rim Chart Campagnolo Small Flange Road Hubs

|                    | Tubular |             |           | Clincher |             |           |       |           |           |  |
|--------------------|---------|-------------|-----------|----------|-------------|-----------|-------|-----------|-----------|--|
|                    | E       | Box Section |           |          | Box Section |           |       | V-Section |           |  |
| Drilling<br>of Hub | Front   | Rear<br>L   | Rear<br>R | Front    | Rear<br>L   | Rear<br>R | Front | Rear<br>L | Rear<br>R |  |
| One Cross          |         | 72          |           |          |             |           |       |           |           |  |
| 24 Hole            | 291     | 289         | 288       | N/A      | N/A         | N/A       | N/A   | N/A       | N/A       |  |
| 28 Hole            | 291     | 288         | 287       | 291      | 288         | 287       | 283   | 280       | 279       |  |
| 32 Hole            | 290     | 288         | 286       | 290      | 288         | 286       | 282   | 280       | 278       |  |
| 36 Hole            | 290     | 287         | 286       | 290      | 287         | 286       | 282   | 280       | 278       |  |
| 40 Hole            | 290     | 287         | 286       | N/A      | N/A         | N/A       | N/A   | N/A       | N/A       |  |
| Two Cross          |         |             | Married   |          |             |           |       |           |           |  |
| 24 Hole            | 299     | 298         | 296       | N/A      | N/A         | N/A       | N/A   | N/A       | N/A       |  |
| 28 Hole            | 296     | 295         | 293       | 296      | 295         | 293       | 288   | 287       | 285       |  |
| 32 Hole            | 294     | 293         | 291       | 294      | 293         | 291       | 287   | 285       | 283       |  |
| 36 Hole            | 293     | 292         | 290       | 293      | 292         | 290       | 285   | 284       | 272       |  |
| 40 Hole            | 292     | 291         | 289       | N/A      | N/A         | N/A       | N/A   | N/A       | N/A       |  |
| Three Cross        |         |             |           |          |             |           |       |           | e - 24    |  |
| 24 Hole            | 308     | 309         | 308       | N/A      | N/A         | N/A       | N/A   | N/A       | N/A       |  |
| 28 Hole            | 304     | 304         | 303       | 304      | 304         | 303       | 297   | 296       | 295       |  |
| 32 Hole            | 301     | 300         | 299       | 301      | 300         | 299       | 294   | 292       | 291       |  |
| 36 Hole            | 299     | 298         | 296       | 299      | 298         | 296       | 291   | 290       | 288       |  |
| 40 Hole            | 297     | 296         | 294       | N/A      | N/A         | N/A       | N/A   | N/A       | N/A       |  |
| Four Cross         |         |             |           |          |             |           |       |           |           |  |
| 24 Hole            | 318     | 320         | 318       | N/A      | N/A         | N/A       | N/A   | N/A       | N/A       |  |
| 28 Hole            | 313     | 314         | 312       | 313      | 314         | 312       | 305   | 306       | 304       |  |
| 32 Hole            | 308     | 309         | 308       | 308      | 309         | 308       | 301   | 301       | 300       |  |
| 36 Hole            | 305     | 305         | 304       | 305      | 305         | 304       | 297   | 297       | 296       |  |
| 40 Hole            | 302     | 302         | 301       | N/A      | N/A         | N/A       | N/A   | N/A       | N/A       |  |

N/A: Clincher rims are not available in these drillings.

Rear L: rear hub, non-drive side. Rear R: rear hub, drive side.

Track Specifications: Track spoke lengths are not listed. However, front track hubs are the same as road hubs. The rear track hubs generally require a spoke 1mm longer than the one listed for road wheels.

More Information: These are the rim Calculation Specifications used for the spoke lengths listed above. These figures can be used when determining wheel configurations not listed above.

Rim Diameter: Box Section Tubular or Clincher: Average 615mm

V-Profile Clincher: Average 599mm Sigma 650: Average 567mm

| Hub Specifications |                   |                 |                  |  |  |  |
|--------------------|-------------------|-----------------|------------------|--|--|--|
| Flange             | Front or Rear     | Flange Diameter | Center to Flange |  |  |  |
| Low<br>Low         | Front<br>Rear 126 | 39<br>44.5      | 34<br>L-36 R-21  |  |  |  |
| High<br>High       | Front<br>Rear 126 | 67<br>67        | 34<br>L-36 R-21  |  |  |  |
| High Track         | Rear              | 67              | L-44 R-31        |  |  |  |

This chart of spoke lengths regarding Campagnolo hubs and rims was determined through calculations using the Wheelsmith Spoke Length System.

the spokes are all loosely mounted in the hub and the rim. Bend them only enough to make it easier to thread on the nipples through the eyelet. Do not over bend the spokes.

5) Once the rim is fully built and trued, mount a tire on the wheel. Inflate the tire to full pressure. Now allow the wheel to 'age' (mature) overnight. This will allow the components of the wheel to settle into a more stable position. The next morning squeeze the proper spoke pairs to relieve any remaining torque tension and check the truing.

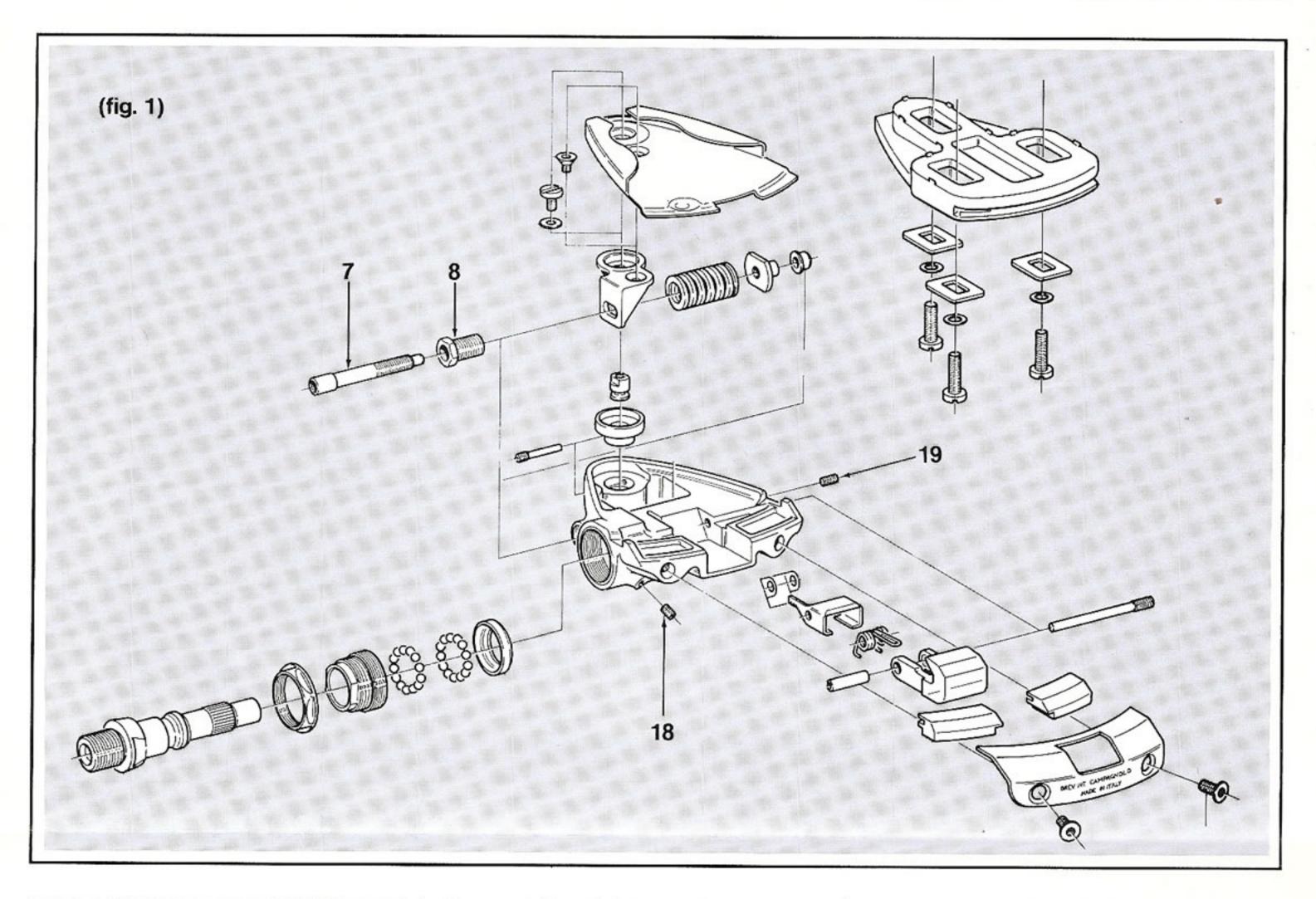
### **Building New Wheels** On Old Hubs

When removing the hub from the old wheel de-tension the spokes easily and evenly. Do not cut the spokes when they are still under full tension. This 'rapid removal' will cause the hub shell to wind-up. Wind-up removes the needed spoke hole offset.

When assembling the wheel be sure the new spokes are running in the same direction as the original ones.

### The New Wheel

- Make a general check of the tension. Do not exceed 70-100kg per spoke. If you are checking all the spokes, try to keep them within 25% of each other.
- 2) Be sure that all the wind-up torque has been relieved from the spokes.
- 3) Be sure that the spokes do not protrude through the nipple so much that it could puncture the tire or tube.
- 4) Clean the trough of a tubular rim with alcohol and steel wool before gluing the tire into place. Use the proper glue for the type of tire being used.
- 5) Be sure to fully coat the tire trough with the proper adhesive. This area of the rim should be coated from one side to the other.
- 6) Once the wheel has been fully tensioned and trued, check the axle adjustment under quick-release compression.



## Adjusting the Campagnolo SGR-1 Clipless Pedal

It has been said that Campagnolo's new **SGR** pedal is not just another clipless pedal but a machine in itself. This is true if you consider that the pedal has two separate lubrication ports and can be adjusted independently for lateral freeplay of the foot as well as release tension. These features, when combined with the pedal's 34 degree cornering clearance and patented "Triple Bearing System" make the **SGR** the most sophisticated clipless pedal in the world today.

The **SGR** was designed to eliminate stress related injuries by giving up to 5 degrees of lateral foot movement during the pedal cycle. This lateral movement as well as the effort needed to disengage the shoe from the pedal can be adjusted via two allen screws located on the inboard side of each pedal (fig. 1).

Screw #7 (fig. 1) A 3mm allen head (located inside screw #8) controls the effort needed to disengage. The factory adjusted tension is set at the midpoint. In order to reduce the effort needed to disengage, screw #7 should be unscrewed counter-clockwise 5 to 7 full turns.

The crank should be at the 6 o'clock position in order to disengage the shoe from the pedal because the foot has a greater range of lateral motion when the leg is extended. We have also found that applying a small amount of **Triflow** or **Campagnolo O8-TH** oil on the groove at the rear of the cleat will make disengagement smoother and easier.

Screw #8 (fig. 1) controls the adjustment of the lateral freeplay of the foot on the **SGR** pedal. In order to give the foot more lateral movement, turn the screw #8 (6mm allen head or 11mm open end wrench) counterclockwise. Be sure not to turn screw #8 more than four full turns counterclockwise. Also, it should be noted that

screw #8 comes from the factory adjusted for the minimum amount of lateral movement. So if screw #8 is turned clockwise the lateral movement will not change.

The **SGR** pedal is designed so that it is not necessary to disassemble the axle mechanism in order to lubricate it. There are two lubrication ports (fig. 1) built into the **SGR**. By removing the screws with a 2mm allen wrench, grease can be injected directly into the roller bearings (screw #19) and also into the double sets of ball bearings (screw #18). This should be done approx. every 2000 miles. Use caution when re-installing the 2mm allen screw into the outboard grease port. It can be threaded in past the end of the threads so that it falls into the bearing chamber.

In order to disassemble the axle or adjust the bearings, Campagnolo tool #7130025 must be used. This tool is currently available from your favorite Campy distributor.

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