SHIMANO BICYCLE SYSTEM COMPONENTS

1981





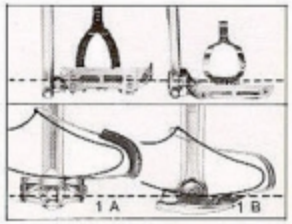
SHIMANO

EX SERIES — EXCITING FEATURES

DD Mechanism
Dyna-Drive Pedal

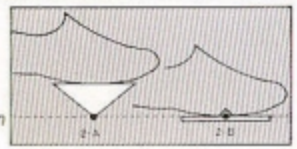
Finally the Pedal's function is defined!

The pedal is an extremely crucial element in the propulsion of the bicycle. It is the first point of contact on the drive train between rider and bicycle. However, very little thought has been given to this area and the first workable design has persisted with us to this day.
A scientific analysis of the pedal soon drew our attention to its prime function: the most efficient transferal of human power into driving energy. By utilizing the twin principles of biotechnological design and aerodynamic efficiency we produced a pedal suited in every way to its task—the DD "Dyna-Drive" Pedal.



Pedal-platform comparison between conventional pedal (left) and DD Pedal (right)

As seen in diagram 1-B, the DD Pedal is connected to the crank by an axle which is slightly higher than the body. In contrast, the conventional pedal, diagram 1-A, is connected by an axle which is lower than the body. The advantages derived from the DD Pedal are tremendous. For a start, the rider no longer needs to dissipate energy by trying to maintain "pedal stability" or "ankling". Because the DD Pedal's axle is level with the rider's foot, the pedal automatically remains stable allowing full power to be used for driving the bicycle. At the same time the center-of-gravity has been lowered for greater stability. Diagram 2-A clearly demonstrates the pivotal instability of the conventional pedal, while diagram 2-B shows how much easier the DD



Pedal Axle Position



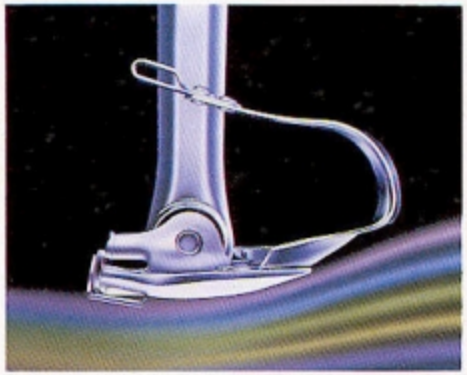
Pedal is to control.
The difference between the two styles can best be compared to someone running in high-heeled shoes rather than flat shoes.

Features:
1. Positive and rhythmic pedaling without power-loss.
2. Lower center-of-gravity means a more stable, safer and comfortable ride.
3. Streamlined design has reduced weight and increased ability to rotate faster.
4. Pedals always right themselves to ideal position for starting.
5. Higher road clearance design of the pedal means faster cornering.



Aerodynamic Design

The important role which aerodynamics plays in making components both lighter and more air resistant has been a corner stone of Shimano's research and development.
The DD Pedal and Crank Set was the first product to utilize this principle closely followed by the Seat Pillar and Handle Stem.
Acute streamlining has contributed in cutting down air resistance for sleeker, lightweight and more efficient bicycle components.



Offset Crank Arm

In the course of Shimano's research activities, it became apparent that by repositioning the crank arm in relation to the chainwheel strength could be increased drastically. And this is exactly what we have done with the new Dura-Ace EX Crank Set. Strength has been improved while still maintaining its light-weight features.



Direction 6

Spoke assembly on a wheel is one of the most troublesome chores associated with the bicycle. Shimano's new "Direction 6" Hub has greatly alleviated this problem with its specially designed flanges. Now all spokes can be threaded from one side of the flange instead of the two-sided alternating method of before. This has been brought about by the indentation of every other spoke hole on the flange. Spokes can line up side by side without interfering with each other. And,



furthermore, they can be assembled on each flange in separate operations—a great time-saving feature.
In addition, Shimano also designed the indentations so that they guide the spokes in the correct direction from every sixth hole. And spokes are made to run at as close a tangent as possible to the hub so that an almost straight line runs from top to bottom for a stronger wheel.
In fact, a substantial increase in spoke width assembly has been achieved by as much as 12% due to the "Direction 6" method. This has meant wheel resistance to lateral force has increased by as much as 20% (Shimano Test Data).
Another important factor is the decrease in spoke distortion compared with the cross-over spoke system of conventional wheel assemblies. Spokes can now be assembled almost in a straight line so that each spoke has equal strength with the other. The "Direction 6" hub adds up to trouble-free cycling with a minimum of maintenance.

Cassette Freehub

The EX Freewheel is a freehub unit incorporating a cassette sprocket assembly system. This has the considerable advantage of allowing the rider to choose the most suitable sprocket combination according to the speed desired, and also leg-power capacity. Overall weight and size reductions have been made—and durability improved.

Features of the "Cassette Freehub"

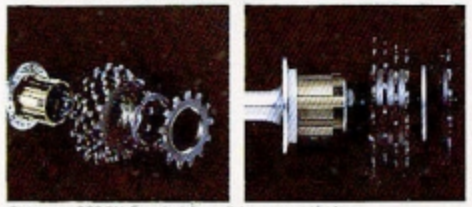
1. Easy to exchange sprockets!
2. Multiple choice of cassette gear combinations—with fewer sprockets!
3. Weight reduction of the Freehub!
   Conventional hub and freewheel (Over lock nut dimension: 4.96" (126mm.), 13T—18T. 6-speed) weigh 23.7oz. (673g.). In contrast, the Dura-Ace EX Freehub weighs 20.1oz. (571g.). This means 3.6oz. (102g.) lighter in weight.
4. At last—11 teeth high gear combination is possible! (Dura-Ace EX Series only)
   The freehub allows a reduction in the number of front chainwheel teeth and, also, a 12T combination is possible for Shimano-600 EX Series. Thus resulting in an overall weight reduction of the drive train.



Dura-Ace EX Freehub (6-speed)/High gear sprocket is threaded type—all others are cassette spline-type.



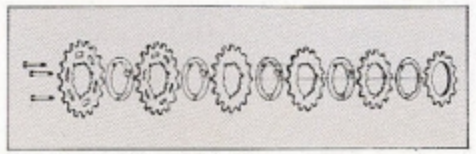
Spline-type cassette gear of Dura-Ace EX Freehub.



Shimano 600 EX Freehub's unit-type sprockets.

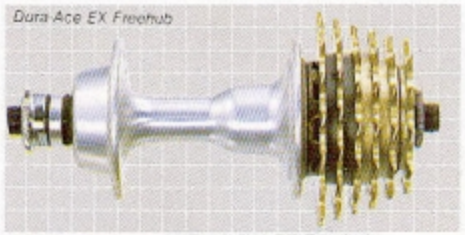
The structure of conventional freewheel sprockets has long posed difficulties for riders. Even when using the same tooth number sprocket, i.e. 15T, the rider needed both threaded sprockets and unthreaded, spline-type sprockets. Thus, sprockets could not be combined as desired unless quantities of both types were available. In contrast, the EX Series Cassette Freewheel incorporates a spline-type system which freely allows all kinds of gear combinations between second to low gears. Since these gears are tightly fastened by a threaded high gear sprocket, it is now possible to obtain any sprocket combination desired with a minimum of fuss.

5. Sturdy design—Freehub structure exhibits minimal deflection!
   Because the freehub is a combination of the hub and freewheel, we are able to move the 1/4" ball much closer to high gear. This move has markedly reduced deflection for both freewheel and hub, while increasing the durability of the hub axle.

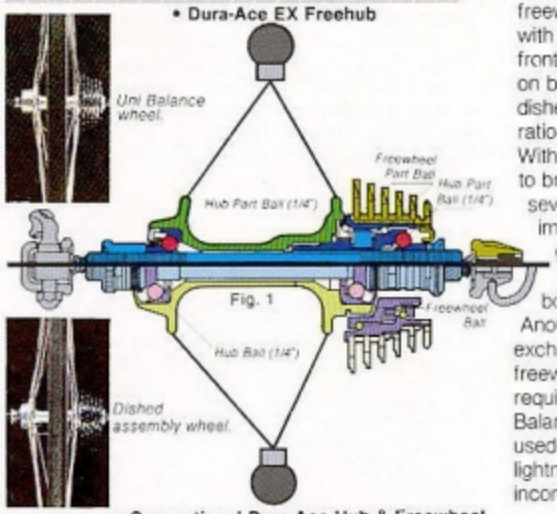


Shimano 600 EX Cassette Gears.

Uni Balance Mechanism



• **Dura-Ace EX Freehub**



• **Conventional Dura-Ace Hub & Freewheel**

Fig. 2 **Uni Balance** Amount of dish/2.7 mm. (0.11")

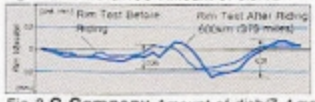


Fig. 3 **C Company** Amount of dish/7.4 mm. (0.29")



The above illustrates the difference in Vibration levels between a conventional dished assembly and the Uni Balance assembly, using 36 spoke wheels, when tested before and after riding. The result of the rim Vibration difference for the conventional rim assembly is 0.47mm (0.02") <Fig. 3>, while the Uni Balance is only 0.05mm (0.002") <Fig. 2>. Thus, the Uni Balance has solved the problem of rim Vibration so apparent in the conventional assembly, and exhibits incredible rigidity.

At Shimano, we tackled the long-outstanding problems of dished wheel assemblies and the inflexibility of changing 5-speed bikes to 6-speed; while still retaining conventional flange dimensions. The newly developed "Uni Balance" Mechanism is our answer and, we feel, will revolutionize accepted standards for multi-speed bicycles. The dished assembly of the multi-speed bicycle wheel has been with us since the conception of the freewheel. Ideally, the wheel rim should be in line with the center of the hub, as in the case of the front wheel. This allows equal distribution of tension on both left and right side spokes, unlike the dished assembly where there is an imbalance. (A ratio of 10: 6 between right and left side spokes.) With the dished assembly, spokes are quite liable to break whenever they are under constant or severe stress. Also, vertical and lateral vibrations impede smooth riding and sure braking. And, in general, riders have to rely on bicycle experts to make the critical adjustments between both left and right side spokes.

Another problem is when the rider wants to exchange a 5-speed freewheel for a 6-speed freewheel: to do this a whole new frame is required. With the arrival of the exciting new "Uni Balance" Mechanism, 5 and 6 speeds can be used on the same bicycle frame; strength and lightness of the bicycle is increased and dishing inconveniences are now a thing of the past!

Features of the "Uni Balance"

1. Durability of spokes and wheel increased!
2. Easy to assemble!
3. Wheel adjustment made easier!
4. Six-speed freehub for a 5-speed frame!
   The same frame can be utilized for both a 5-speed Freewheel and a 6-speed Freehub. (When installing a 6-speed freehub on a 5-speed frame, the dished assembly remains the same as that on a conventional 5-speed freewheel.) The considerable time-saving and convenience of this feature is an outstanding improvement.
5. Lighter wheel!
   By retaining the strength of a 36 hole conventional wheel, the Uni Balance utilizes fewer spokes—without any strength-loss—for a lighter wheel.

EX SERIES—EXCITING FEATURES

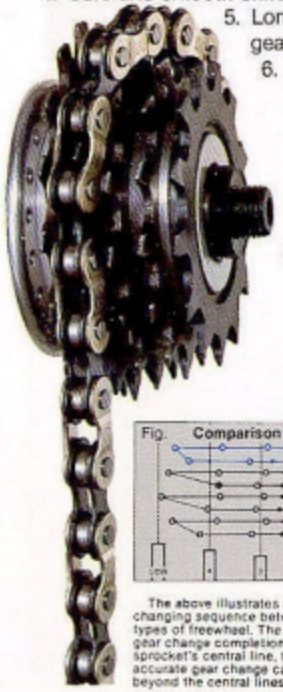
Uniglide Freewheel

The Uniglide Mechanism (UG Freewheel & UG Chain) has brought about an entirely progressive concept toward the gear-shifting efficiency of the multi-speed bicycle and is now installed on all EX Series equipped bicycles.

The teeth of the UG Freewheel are twisted to run parallel with the direction of the chain, when it is moving from high to low gear. And when shifting from low to high gear, the teeth are at cross angles to the chain's movement to prevent any slipping back. Smooth, sure and swift gear changes are now possible.

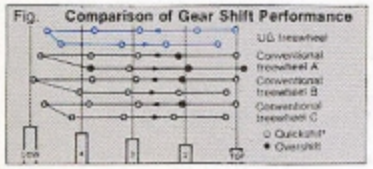
Features

1. Sure and smooth gearshifting performance!
2. Overshifts eliminated!
3. Irritating noises eliminated for quiet and smooth gear changes!
4. Sure and smooth shifting on inclines!
5. Longlasting, high gearshifting efficiency!
6. Immediate shifting response!



UG Freewheel & UG Chain

Fig. **Comparison of Gear Shift Performance**



The above illustrates a high to low and back again gear changing sequence between the UG Freewheel and 3 other types of freewheel. The white circles indicate the chain's gear change completion points. These are all prior to the sprocket's central line, the maximum point at which an accurate gear change can be made. The black circles are beyond the central lines and therefore indicate overshifts.

Trap-Ease Mechanism

Until recently, the pantograph mechanism, used on all conventional front derailleurs, was thought to be ideal. And for the high to low gear shift it was satisfactory. But the low to high gear change was prone to considerable mechanical difficulties. This occurred because the parallel movement of the derailleur caused the inner plate to force the chain onto the gear sprocket with a primarily lateral thrust. This, naturally, caused unnecessary friction and impaired an otherwise perfect gear change. Shimano searched for an ideal gear changing mechanism—and succeeded in developing the "Trap-Ease"

Now, the pantograph's awkward parallel movement has been replaced with the free "swing" motion of the Trap-Ease Mechanism, as seen in diagram 2. The longer travel of (b) over (a) gives the derailleur its trapezium shape—no two angles being the same. When shifting from low (small gear) to high (large gear), the swing allows the inner plate to lift the chain up and deposit it squarely on the gear sprocket teeth without any

Fig. 1. Conventional Pantograph Mechanism

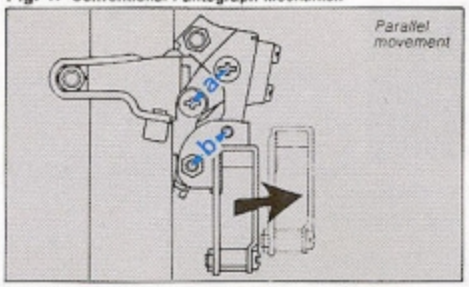
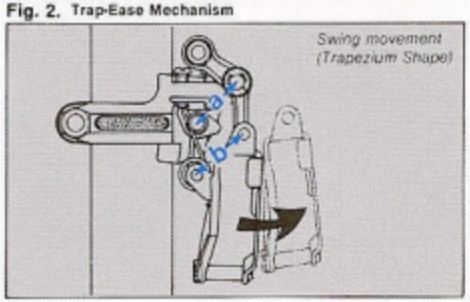
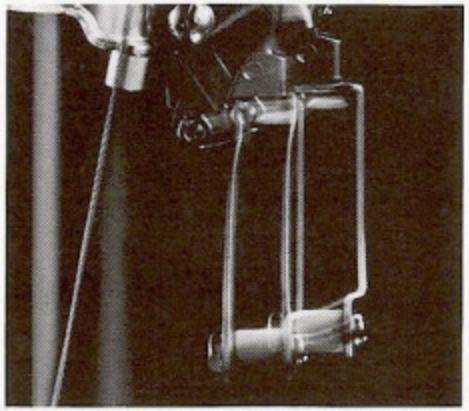
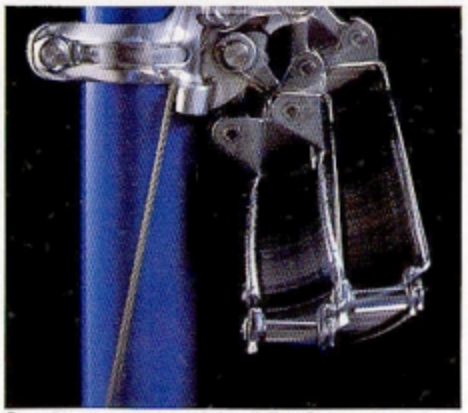


Fig. 2. Trap-Ease Mechanism





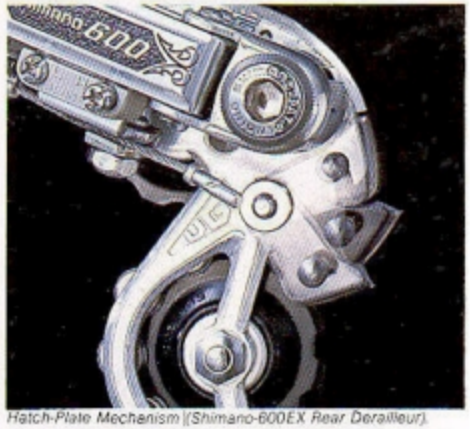
Parallel movement of the conventional pantograph mechanism.



Trapezium shaped swing motion of Trap-Ease Mechanism.

interference. The efficient movement of the "Trap-Ease" Mechanism means less force—and therefore a shorter stroke—is needed to shift the gear lever but still the equivalent power of a conventional front derailleur is produced. Thus we could widen the inside dimensions of the front derailleur plates, eliminating grating noises, through contact with the chain, and resulting in a much more enjoyable ride.

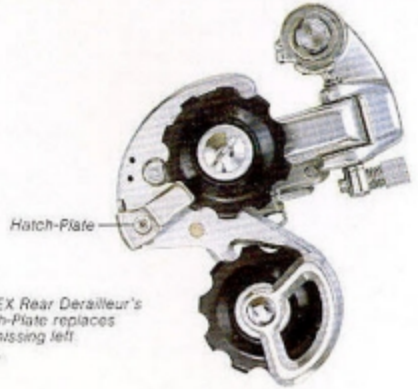
Hatch-Plate Mechanism



Hatch-Plate Mechanism (Shimano-600EX Rear Derailleur).

The Hatch-Plate Mechanism allows much easier dismantling of the rear derailleur than ever before. The need to remove the pulley bolt or to undo the chain is eliminated. A simple movement is all that is needed.

Easier assembly and disassembly is possible and maintenance is much easier to carry out. Also, the elimination of the left plate has resulted in a lighter component. The Hatch-Plate Mechanism rear derailleur is suitable for use on any multi-speed bicycle—and is made especially for a bicycle equipped with a Uni Balance Freehub.



The EX Rear Derailleur's Hatch-Plate replaces the missing left plate.

W cut Teeth Mechanism

When shifting the chain on a conventional front chainwheel from high to low, the effort required to lift it up on the gear teeth, while under a heavy load, causes great stress and wear on the chainwheel and other related parts.

We developed the W cut Chainwheel Teeth for a smoother gear changing operation. We simply shortened the length of two sprocket teeth located



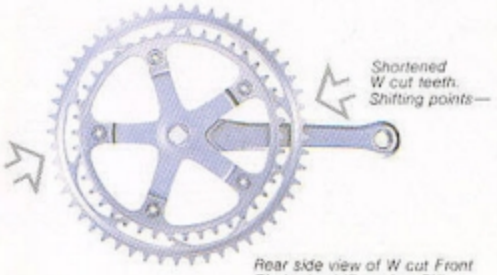
Shortened W cut teeth (Shimano-600EX).



Rear side view of chain moving to low gear off W cut teeth.

almost behind the crank arm, and the two teeth directly opposite because they sustain the least amount of tension when cycling.

Now, the chain is easily released from the chainwheel in order to complete a smooth operation.



Rear side view of W cut Front Chainwheel (Dura-Ace EX).

One Key Release

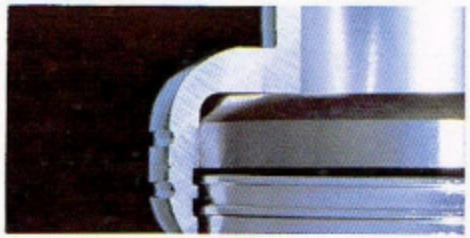
To disassemble the cotterless-type front chainwheel, a special tool plus monkey wrench are ordinarily used in a several-step operation. Shimano's One Key Release consists of one hexagon wrench key for detachment and of course, attachment—and all in one movement.



Hexagon wrench key (6 mm.) with Shimano-600EX Front Chainwheel.

Sealed Mechanism

The Sealed Mechanism is yet another EX Series innovation. Although unseen, it is, nevertheless, vitally important for upgrading the efficiency of the bicycle. The "Sealed Mechanisms" protect all EX Series rotating parts against unwanted foreign objects. And the Dura-Ace EX Series Freehub also has a double-jointed seal to prevent water and dust invasion.



Sectional view of Shimano-600EX Rotating Head Part (Labyrinth seal).

Light Weight

Although the EX Series has incorporated a number of new mechanisms, these have, in fact, contributed to the overall weight reduction. For example: freewheel and hub are combined as one unit—the freehub: the rear derailleur is made without the left plate; and the head parts are made of aluminum.

The weight reduction of rotating parts plays another role than merely "lightening a bicycle". It also means an increased acceleration efficiency which requires only a light touch of the pedal to start, and allows the rider to pedal for many hours.

The light weight parts shown in our "System Components" EX Series are of a genuine lightness which only the thorough approach of Shimano could have devised.



Dura-Ace EX Road Ensemble.

One-Step Attachment

The cable fixed to the brake lever, used exclusively for the EX Series, is attachable and detachable with one simple movement. This is a great boost for easy maintenance.



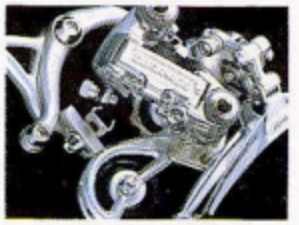
One-step cable attachment mechanism (Shimano-600EX Brake Lever).

Additional Features

Hexagon Release

Dura-Ace EX Series

Wherever possible, a hexagon wrench key is used to tighten all Dura-Ace EX Series components. Easy handling and secure tightening, along with a sportier appearance, are all added benefits.



Safety Crank Arm

Shimano-600EX Series

The Shimano-600 EX Series crank arm has been set back at the point near where it is attached to the chainwheel. This means the ankle is no longer liable to strike the crank arm with the likelihood of an accident. Also the new Dura-Ace Ex has an angled crank arm.



Arabesque Pattern

Shimano-600EX Series

The Shimano-600 EX Series is artistically decorated with Arabesque patterns for a unique appearance.



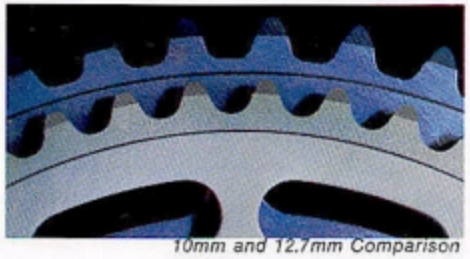
SHIMANO SYSTEM COMPONENTS SPECIAL INNOVATIONS

10mm Pitch System

In the world of bicycle racing a split second can make all the difference. This means light-weight, but at the same time, strong components are as important as the rider's racing skills.

Many methods have been tried to make bicycles as light as possible; for example, reducing the chain wheel and other parts to their bare minimum, and even to the point of putting helium into the tires. However, extreme lightness often resulted in structural weakness. It has been impossible to reconcile such seemingly contradictory racing requirements as lightness and strength until now.

Shimano's engineers, after intensive research and tests, have successfully reduced the pitch of the chain from one half inch (12.7mm.) to 10mm. The new 10mm. pitch system reduces the overall weight and size of other drive train components, such as the chainwheel and rear sprocket without affecting the bicycle's durability.

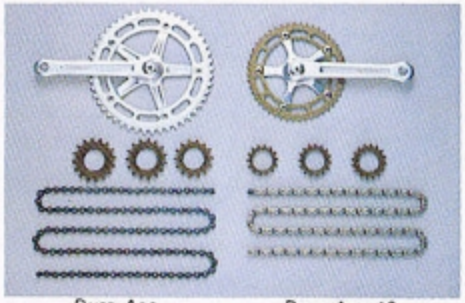


10mm and 12.7mm Comparison

For the past eighty years the chain pitch has been fixed at an industry standard of ½ inch (12.7mm.). No one ever attempted to alter it until Shimano recognised this "blind spot" in the conventional concept of the bicycle. This revolutionary innovation was the result of Shimano's research and development on the basic elements of the bicycle.

Features of the 10mm. Pitch System

1. Miniaturization of Components—
   By reducing the chain pitch from 12.7mm. to 10mm., the diameters of the front chainwheel and rear sprocket have been reduced by a corresponding factor of 10/12.7. This means the front chainwheel has been made 21% smaller in size and 38% lighter in weight.
2. Increased Efficiency—
   As the rotating parts of the 10mm. pitch system have been made lighter, the rear sprocket wheel rotates more easily, increasing accelerating efficiency. The rider's energy is transmitted to the bicycle faster and with less power loss due to components' mass and friction. Just a light step is enough to set the bicycle in motion.
3. Reduced Deflection—
   The 10mm. pitch's smaller drive train greatly reduces bending or flexing due to deflection. Since the rider's energy is transmitted more directly and efficiently from the front chainwheel, through the chain and rear sprocket, to the wheels, less effort is wasted.



Dura-Ace *Dura-Ace 10*

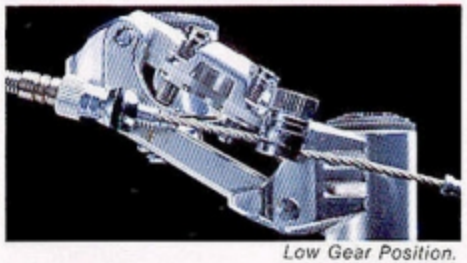
DURA-ACE 10—DURA-ACE Comparison Chart * Weight Comparison (Track Models)

	Dura-Ace 10	Dura-Ace	Saving
Right Hand Crank	8.5 oz. (239 g.)	9.8 oz. (277 g.)	1.3 oz (38 g.)
Chainwheel (49T)	2.2 oz. (63 g.)	4.1 oz. (116 g.)	1.9 oz. (53 g.)
Chain	11.6 oz. (330 g.)	11.8 oz. (335 g.)	0.2 oz. (5 g.)
Rear Hub W/Lock Ring	10.4 oz. (295 g.)	11.0 oz. (313 g.)	0.6 oz. (18 g.)
Rear Sprocket (14T)	0.8 oz. (22 g.)	1.4 oz. (38 g.)	0.6 oz. (16 g.)
TOTAL	33.5 oz. (949 g.)	38.1 oz. (1079 g.)	4.6 oz. (130 g.)

Synchro-Line Mechanism

The Synchro-Line Mechanism, the newest addition to the Dura-Ace Rear Derailleur, keeps the adjusting barrel and the cable fixing pin constantly aligned and therefore the inner cable straight while the derailleur changes speeds. This reduces strain on the cable, prolongs the cable's service life, and facilitates a "positive shift" feeling at the shift lever.

The Dura-Ace derailleur is smaller in size and weight; its links are shortened by 0.2" (5mm.) and it weighs only 6.14oz. (174g.).

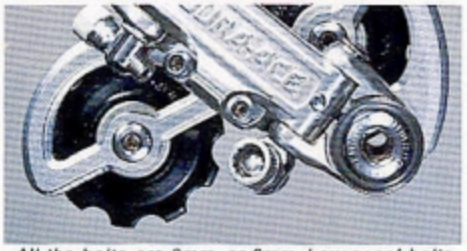


Low Gear Position.



High Gear Position.

All bolts on the Dura-Ace derailleur are either 3mm. or 6mm. hexagonal bolts for easier servicing and securer tightening.

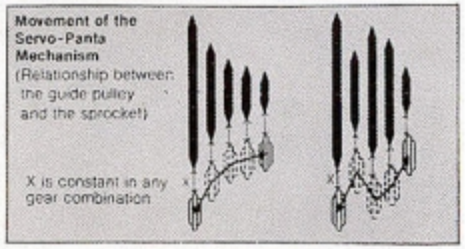


All the bolts are 3mm. or 6mm. hexagonal bolts.

Servo-Panta Mechanism

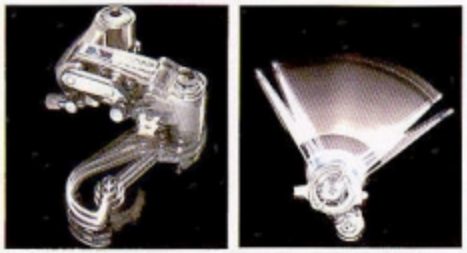
The rear derailleur is the most important part in a 10 speed bicycle. It transforms the cable's longitudinal motion into lateral motion, shifts the chain into the desired gear, and determines the most appropriate gear ratio for the particular gear change. The Pantograph design is presently the most widely used derailleur. Shimano improved it by inserting a spring inside the bracket body (B tension) of the rear derailleur. This enables the derailleur guide pulley to maintain the proper distance from the freewheel sprocket teeth no matter what the combination of gears may be. The chain is guided accurately, resulting in sure and precise speed changes. This is most easily recognized when selecting low gear while climbing a hill. All of Shimano's derailleurs utilize this innovative Servo-Panta Mechanism.





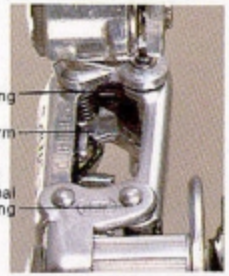
Centeron Mechanism

The Centeron Mechanism employs a unique and extremely effective method of guiding the rear derailleur to the desired gear sprocket. Instead of the guide spring controlling both left and right link plates directly as usual, we have developed a system whereby the guide spring makes direct contact only with the left link. Contact with the right link is made through a special arm which, in turn, controls the link. The reason is to allow the right link a certain amount of designated free-play when shifting from high gear to low. Now when a gear is selected, the shifting lever, via the cable, moves the derailleur toward the gear. At this time the rotating tension of the chain takes over and leads the derailleur and pulley into line with the gear. The free-play of the derailleur's Centeron Mechanism is responsible for the all important flexibility of movement at the point of engagement. In the case of the conventional derailleur, movement is rigidly controlled by the shifting lever without any allowance made for errors of judgement. The Centeron Mechanism is also incorporated in the shifting lever. This means that both rear derailleur and shifting lever have the same coordinated movement for surer, faster and quieter gearshifts.



Free-play of the Rear Derailleur

Free-play of the Shifting Lever







"Centeron Mechanism" functions as follows when gearshifting.

1. When the lever is pulled, the arm strikes the right link, and the links move toward low gear.
2. On releasing the lever the links possess free-play the width of the arm. (Illustration)
3. The tension, caused by the rotating chain, and the play, given to the links, function to automatically set the guide pulley in a straight line with the gear sprocket.

Features of the "Centeron Mechanism"

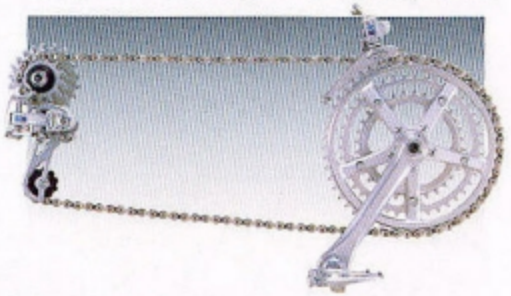
1. Irritating noises are eliminated for a quieter and smoother gear change.
2. Durability is increased because of reduced friction.
3. Fine-Lever adjustment is no longer needed after gear changes.
4. Immediate shifting response.

Triple-gear Sprocket with 18-Speed Capability

The DEORE front chainwheel introduces a fine blend of functional superiority and fashionable style. The chainwheel is cold forged alluminum alloy, affording excellent rigidity, graceful lines and aerodynamic sleekness, while the 5-pin spider with triple chainwheel capability makes possible up to 18 speeds, all with ultra-smooth shifting. Conventional triple sprocket front chainwheels present real shifting problems from the inner to middle gear. In many cases, because of this difficulty, one must first shift to the outer gear, then down to the middle. Poor alignment and noise also plague use of the lower front and higher rear gear combinations. Because of these problems, with conventional systems the full 15-or 18-gear capacities are rarely used.

Not so with the DEORE chainwheel system. Shimano has applied its system component approach to the problem, developing a true 18-speed system that maintains the same spindle length as the Conventional Model (121.5mm). At any time, the double-chainwheel DEORE front chainwheel can be converted to a triple-chainwheel system, without changing the 119mm spindle. And, more important, this can be done with greatly reduced allignment and noise problems.



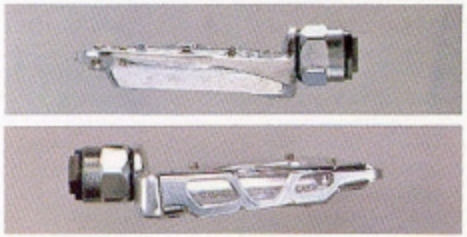


Features

1. Easy to exchange sprockets.
2. High precision and durability.
3. Overall weight greatly reduced, without affecting durability, by using steel for the chainring and light alloy for the adapter and crank.
4. The chain line is fixed by an exclusive design and exhibits minimal deflexion.

Improved Shoe Grip

With the DD pedal, "ankling" stability is not only enhanced by the lowered pedal axle, but also by the contoured shoe plate, for a better grip. You get an exact shoe-to-plate fit, regardless of type, size and shape of your shoe. In fact, its is the closest you can come to not wearing shoes at all.



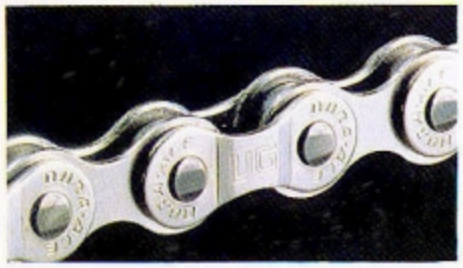
SHIMANO SYSTEM COMPONENTS SPECIAL INNOVATIONS

Uniglide Mechanism

10 speed bicycles now command the major share of the bicycle market. At Shimano we have pushed forward a series of developments based on our "System Components" principle. We believe that in order to innovate the structure of a bicycle, the function of each component has to be re-evaluated and the individual part seen as it relates to the whole.

Our engineers studied the complete power train of the bicycle and singled out the chain and freewheel as being the basis for fundamental improvement. The outcome was the introduction of the Uniglide freewheel (UG freewheel). As components especially designed for multi-speed bicycles, the chain and freewheel greatly improve gearshift performance and have won attention as a revolutionary development.

Uniglide Chain



The UG Chain. Outerplates are widened to the level of chainpin heads.

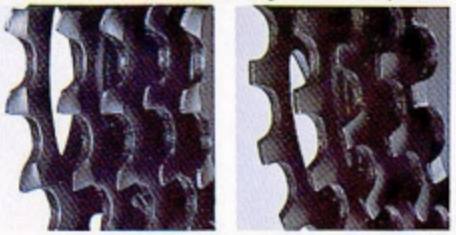
Bicycle chains were originally designed to align the front chainwheel with a rear single speed sprocket and drive the rear wheel. However, the chain on multi-speed bicycles must be able not only to simply rotate but also move up-and-down and side-to-side to transmit the driving force. Moreover, reducing the friction of the chain against its related parts to an absolute minimum became of utmost importance to increase the efficiency of a 10-speed bicycle.

The outer plates of the Uniglide chain are widened to the level of the chainpin heads. This increased width speeds up gear engagement because the outerplate can engage the gear teeth as soon as the chainpin hits the gear. This eliminates the need for overshifting and improves gearshift efficiency. It also minimizes friction, the cause of irritating noise. The Uniglide chain has remarkable durability and doubles the service life of such components as the derailleur, front chainwheel and freewheel.

Uniglide Freewheel

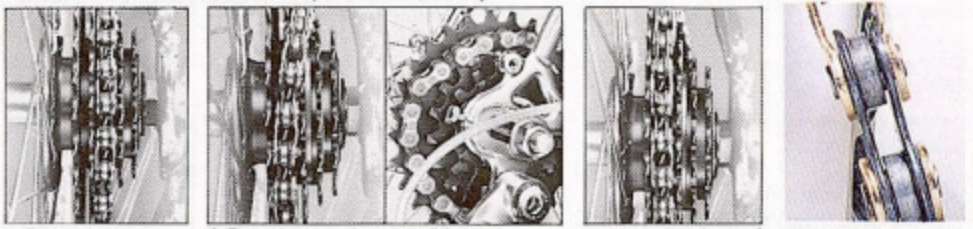
Many attempts have been made to improve the freewheel sprocket teeth, but the shape of the sprocket teeth remained unchanged in a non-parallel plane in relation to the chain's movement during gear shifts.

The teeth of the UG freewheel have been beveled to an angle to accommodate the movement of the chain. When gears are being shifted from high to low gear, the chain moves parallel to the UG freewheel teeth, resulting in a surer, faster gear change. Conversely, when shifting from low gear to high, the chain moves in at a non-parallel angle to the teeth. The downward moving chain does not slip back onto the same sprocket and is smoothly transported to the next gear. With the "Twist" sprocket teeth now available, smooth, positive shifting can be enjoyed every time. Conventional freewheels allow chains to slip over the gear teeth, resulting in either inaccurate gear shifting or overshifting. However, with the UG freewheel, all the gearshift completion points come before the gear's center line. This means that the need to overshift is eliminated.



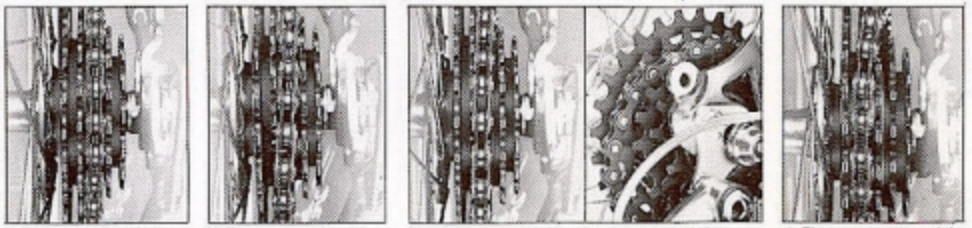
UG Teeth *Conventional Teeth*

• Gearshift with a UG Freewheel (UG Chain Is Used)



1. The chain moves smoothly off the sprocket teeth and quickly moves onto the adjacent gear.
2. The sprocket teeth run parallel to the incoming chain and swiftly engage the chain line . The chain does not slip, so "overshifting" is not necessary to make a proper engagement.
3. A smooth and natural gearshift is completed without undue stress on the chain.
*When shifting from low to high gear, the teeth move in at an angle to the chain and engage the chain links securely.

• Gearshift with a Conventional Freewheel (A Conventional Chain Is Used)



1. The chainpins hit the sprocket of the adjacent larger gear.
2. The chain does not move swiftly off the teeth which delays movement onto the next gear.
3. It is difficult for the sprocket teeth of the adjacent larger gear to catch the incoming chain links. The chain tends to slip over the sprocket instead of engaging the gear.
4. The gear teeth and the chain are under excessive strain resulting in an uneven gearshift and extra wear.

Positive Mechanism

Even with more and more people using both 5- and 10-speed bicycles, conventional shifting mechanisms have required considerable shifting practice to make smooth gear changes. Because of the difficulties involved, Shimano conducted a research program to develop a gear shifting mechanism which would enable everyone to shift gears easily, accurately and safely. The Positive Mechanism is the fruit of this research. The rear derailleur is equipped with the Positive Indexing Mechanism which so simplifies shifting that no special skill is needed. Gears always shift with a positive "click".



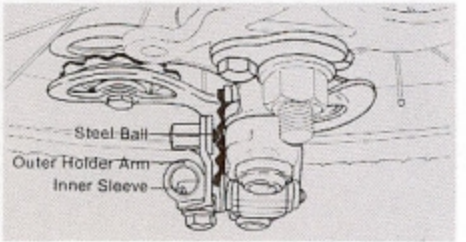
Positron-II Rear Derailleur



Positron-III Shifting Lever



Positive Indexing Mechanism on Positron-II Rear Derailleur *Positive Indexing Mechanism on Positron-III Shifting Lever*

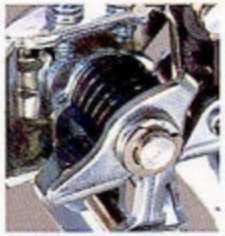


Pre-Select Mechanism

The introduction of Shimano's Pre-Select Mechanism has changed the concept of gearshifting altogether. The rider can now shift gears while coasting or even when the bicycle is not in motion. Simply shift the lever into the desired gear, and when the bicycle rolls forward it will automatically shift into that gear. The Pre-Select Mechanism has made gearshifting completely independent of pedalling, making easy, positive and safe cycling possible under any circumstances.



Pre-Select Mechanism on Positron-II Rear Derailleur


Pre-Select Mechanism on Positron Front Derailleur

Push-Pull Mechanism

In addition, Shimano's Push-Pull Mechanism has completely eliminated the common problem of wire stretching arising from continual gearshifting. And the two-way movement of the Push-Pull Mechanism has replaced the return spring of the derailleur for a smoother, easier and more stable operation.


Push-Pull Cable.

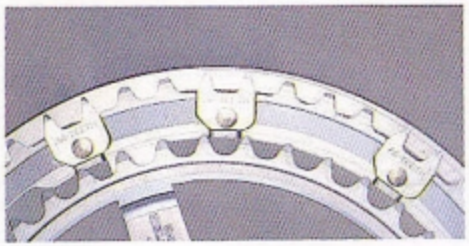
Comparison of Push-Pull and conventional Mechanisms

		H → L → H								
Rear Derailleur	Lever	1	2	3	4	5	4	3	2	1
Positron-II	Positron	2.6	2.5	2.2	2.4	2.5	2.5	2.6	3.0	(kg)
Conventional		4.5	4.8	5.4	6.5	0.9	1.2	1.4	1.6	(kg)

It can be seen from the above chart that the Positron mechanism maintains a constant pressure level. The conventional mechanism, however, goes to the extremes of too stiff pressure when moving from high to low and too weak pressure when moving from low to high.

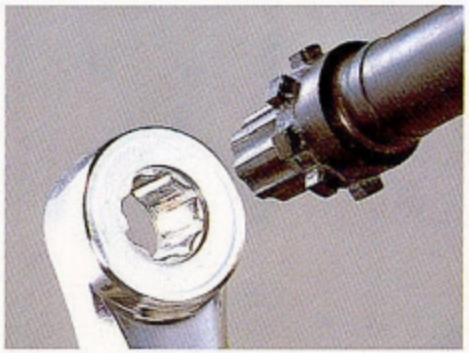
M-Teeth

The M-teeth on the front chainwheel have added another dimension to the smoothness of gear changes. Now the low to high gear change is also as efficient as the W-cut teeth's high to low gear change making a perfect combination.
The taller, pointed M-teeth are ideally positioned to catch the chain as it mounts high gear and then is fed onto adjoining teeth. Made of steel for increased strength, the M-teeth provide a smooth and effortless gear shift every time.



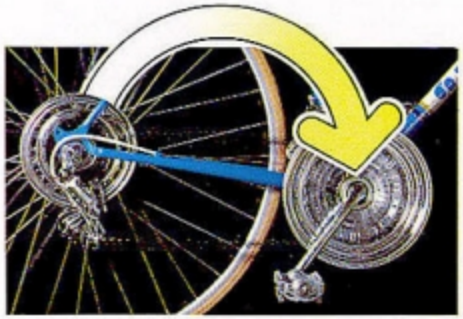
OCTA Joint Crank

This features the newly developed mechanism in which the octagonal Octa Joint system is used to lock the crank and the bottom bracket for increased durability and precision.



Front Freewheeling Mechanism

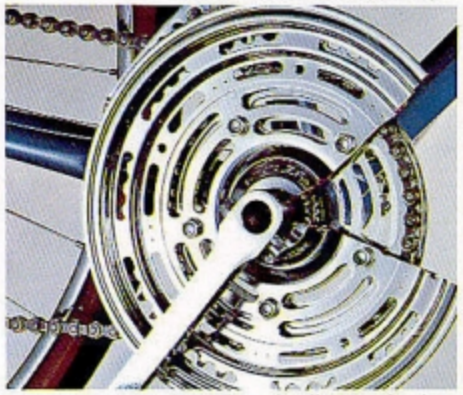
Shimano's revolutionary gearing innovation utilizes a freewheel mechanism combined with the front chainwheel. Our engineers have overcome numerous problems to make gearshifting easier and safer. This mechanism has altered the requirement for pedalling and shifting a conventional bicycle.


Freewheel moves up Front.

With the FF System, the chain moves as long as the bicycle is moving, thus enabling gearshifting without pedalling. The difficulties caused by conventional derailleur bicycles in changing gears while climbing hills or going around curves are virtually non-existant in the FF System. Furthermore, the chain is subject to less strain while shifting.

Features of the FF System

1. Shifts Without Pedalling—
   Whether pedalling or just coasting, the rider can shift gears securely by a simple lever operation because the chain always keeps moving forward.
2. Shifts Easily Even on Inclines—
   Many riders on conventional bicycles have difficulties properly timing gearshifting with pedalling when going uphill. The FF System allows a rider to easily climb hills by simply shifting the lever from high to low gear without any coordination with the pedalling.
3. Gears Change Smoothly While Slowing Down or Coasting—
   As shifting can be done without putting pressure on the pedals, the shift itself will be easier and more precise. While coasting, the chain moves forward with uniform tension, so timing is unnecessary to execute a gear change. The result is unprecedented smoothness in shifting.
4. Shifts Easily into Low Gear before Stopping—
   Gear shifts can be made even when slowing down to a stop. Because the chain and the freewheel continue to rotate, gears can be changed by just shifting the lever. Thus you can shift from high to low gear while slowing down and be prepared for a quick, smooth start next time away.


Front Freewheeling mechanism.

5. Changes Gears with Just a Push of the Bicycle—
   Once a gear is pre-selected, a simple push forward will put the bicycle into the desired gear. This allows the rider to shift from high to low gear before mounting the bicycle, ensuring a smooth start.
6. Guarantees Safe Riding—
   Although the front chainwheel is freewheeling and the rear gear is fixed, if a pant cuff or something else gets caught up in the chain, the fixed rear gear will instantly start freewheeling, stopping the chain's movement. This feature makes riding much safer.

SHIMANO SYSTEM COMPONENTS SPECIAL INNOVATIONS

Twin Gear

Made as one piece, Shimano's Twin Gear Front Chainwheel is a solid unit able to withstand the toughest treatment. This unique process also allows all types of distinctive shapes to be used for the chainwheel thereby enhancing its desirability for design conscious cyclists. Another strong feature is the high gear ridge which in the rare event of a chain slipping off deflects it safely onto the low gear instead of it jamming between both gears. And last though not least is the Twin Gear Front Chainwheel's very economical price.

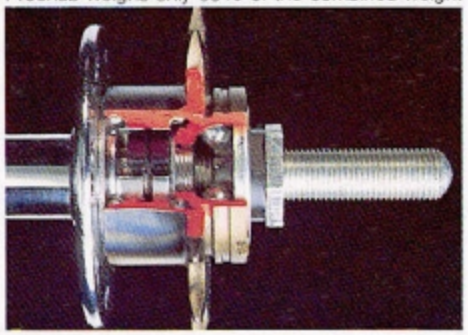


2-Speed Rear Gear Change System

Shimano's new 2-speed gear change provides an extra gear to take the work out of cycling. There are many types of bicycle using a one speed gear which is, in most cases, insufficient to cope with the variety of demands as they arise. Shimano's 2-Speed gear change provides that extra gear to allow the rider to climb hills easily, combat windy or heavy conditions and to get off the mark easier. It is as essential as the second gear which allows cruising or just plain fast riding. Shimano's 1-2 Speed gear change is all these without being difficult or time-consuming to operate. Simply flick the lever and the gear is engaged. Now the bicycle does all the work—not the rider!

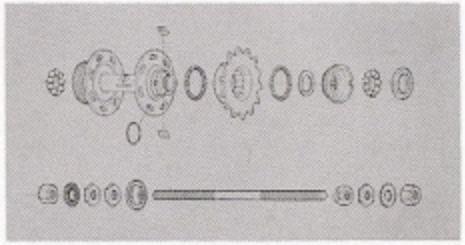
Freehub

The Freehub is so named because it combines the freewheel and hub into one component. It is stronger, smaller, lighter, and more economical than any conventional hub with freewheel. In addition, it eliminates assembly work. By combining the rear freewheel and hub into one body, the freehub unit has more strength than when the components are independently assembled. Also, it is much lighter and much more compact. The Freehub weighs only 63% of the combined weight



of a conventional hub and freewheel. Because the Freehub is a single unit, the conventional number of rear gear small sprocket teeth has been further reduced, resulting in a corresponding reduction of the number of front gear teeth, contributing to the overall weight reduction of the bicycle.

Shimano's new Freehub, by integrating the freewheel and the hub, has greatly improved strength and durability. It has also succeeded in eliminating disturbing lateral movement when loosening takes effect, resulting in even smoother rotation of the freewheel.



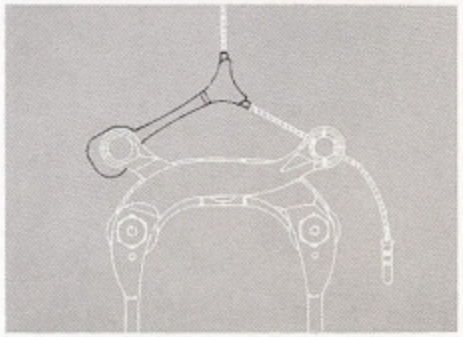
Link Mechanism

Shimano's Link Mechanism is a completely new component that combines the easy cable attachment of the side pull brake and the sure braking power of a center pull brake. This new "Link Type" brake solves the familiar problem of a centerpull caliper brake when the carrier assembly slips slightly out of position and only one brake functions.

The "Link Type" brake has been tested 40,000 times in a running tester and has passed actual performance tests on a tandem bicycle, thoroughly establishing its reliability.

The Link Mechanism can be attached to a 19" sports bicycle.

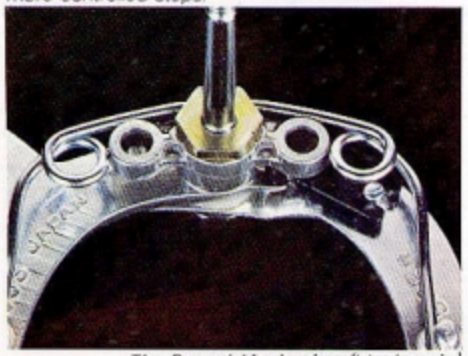




Synpul Mechanism

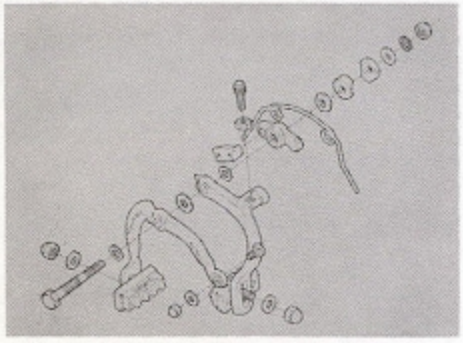
Side-pull caliper brakes are continually pulling to one side and requiring re-alignment. This problem is due to the design of the side pull arms which allows unequal force against the brake shoes.

Shimano's new "Synpul" design synchronizes the brake arms so that the same force from the rider's hand is distributed equally to the brake arms; and the brake shoes grip the wheel at the same time. Smooth, even braking means safer, more controlled stops.



The Synpul Mechanism (black resin).

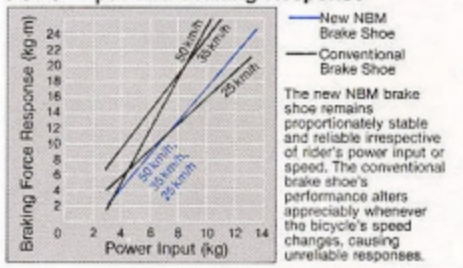




NBM Brake Shoe

The new Dura-Ace NBM Brake Shoe was developed specifically for road racing. It is a well known fact road racing makes many demands on braking equipment—and especially on brake shoes. Inherent material deficiencies of present brake shoes cause fluctuations in braking reliability. Power input is not always consistent with response.

Power Input and Braking Response



Shimano studied this problem and came up with a material perfectly suited for road racing resulting in the NBM Brake Shoe.

The molybdenum additive is responsible for a material that is both heat resistant and much more durable. Also the treads have been redesigned for optimum gripping power without being too severe.

Because of these features, the braking properties of the material never alters appreciably. The rider



can exercise perfect judgement when controlling speeds or stopping. Also, the noise factor is reduced considerably.

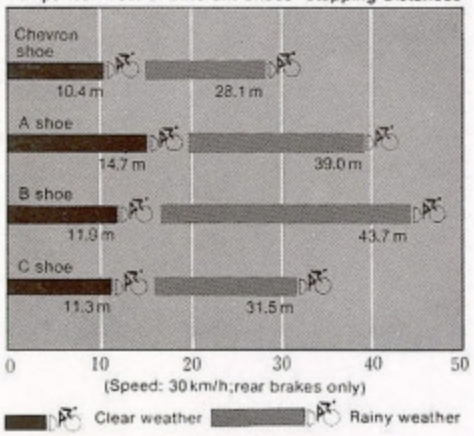
The new NBM Brake Shoe allows power input to equal response so that the rider is always in control of braking.

The Chevron Shoe Brake

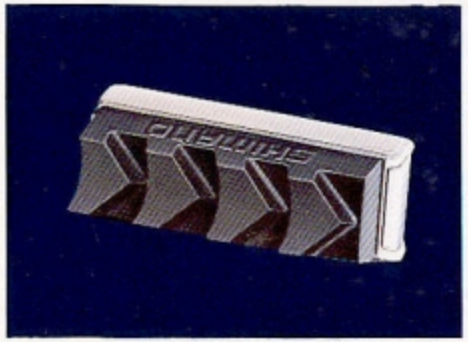
Much research has gone into finding a suitable material which is longlasting and grips well in both fine and wet weather.

But Shimano found that taking care of these factors was not enough in itself. In wet weather water deposits are liable to build up in and around the brake shoe treads. Braking efficiency is impeded. To solve this problem we designed

Comparison Test of Different Shoes' Stopping Distances



chevron shaped treads to spearhead their way through wet conditions. Now braking is much more reliable and safer in wet weather.



The ideally shaped Chevron Shoe —the result of Shimano's numerous brake tests.

Super W-cut Teeth

Top to low and low to top are trouble-free even under the hardest racing conditions. Shifts can be made even when pedaling while standing. Numerous Shimano tests determined the perfect shifting points and the result—stress-free shifts with immediate response.



Smooth and Non-Slip Gear Changes

Smooth and non-slip gear changes, including when pedaling in standing position, are the result of this special front derailleur for BMX. The protector prevents the chain from ever slipping down. And the good looking design is an asset to your bicycle.



Front 2-Speed System.

One-Tap Gear Change

So conveniently positioned right next to the hand that only a finger-tap is necessary to change gears.



One Tap Gear Change— High to Low.



One Tap Gear Change— Low to High.

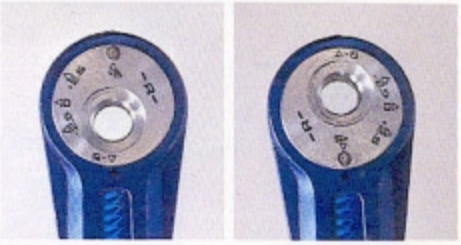
Z-Line Crank

The specially angled design provides optimum strength and is perfect for transmitting powerful downward thrusts while pedaling. Especially suitable when riding in a standing position with legs never hitting against the crank arms.



Features of Z-Line Crank

- Strengthened lightweight design of crank arm exclusive to BMX only.
- Design also allows more powerful and productive pedaling.
- Pedaling can be done standing without catching legs on the crank arms.



Crank Length Easily Changed!

An eccentric circle allows crank arm length to be changed according to rider preference.

SYSTEM COMPONENTS CHART

The "System Components" concept forms the basis of all products developed at Shimano. As a leading manufacturer of components for over half-a-century, Shimano has been able to call upon its abundant experience and acquired technology in making numerous improvements to the bicycle. The reason behind this success story lies in the development of components as related parts rather than as individual parts. We examine all facets of the bicycle's function and the inter-relationships between components. As a result, we have developed many exciting innovations which are now in the process of revolutionizing the entire bicycle industry.

We have successfully incorporated our "System Components" philosophy into the development and marketing of bicycles throughout the world.

And for your convenience we have prepared the following "System Components" combination chart. Naturally we recommend that you use the listed combinations as they have been designed to work together in perfect harmony. However, unless specified, all components can be interchanged as desired.

We sincerely hope that this chart proves to be of invaluable assistance to you and your customers.

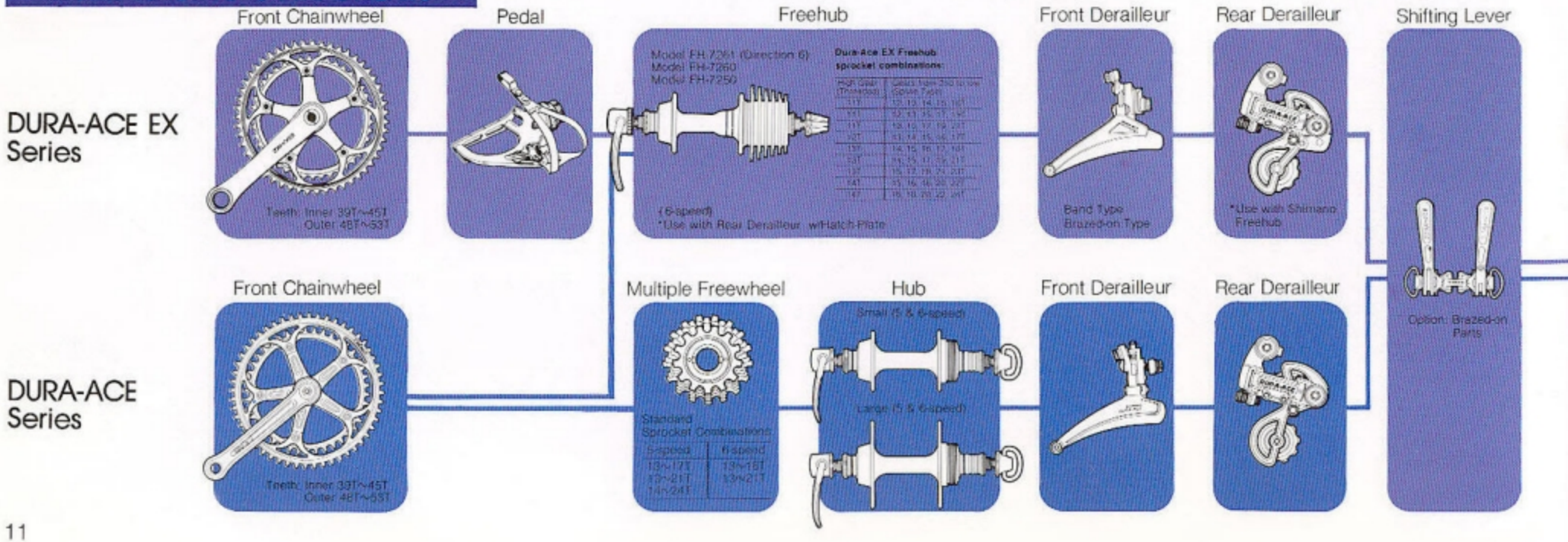


DURA-ACE 10 Track Model

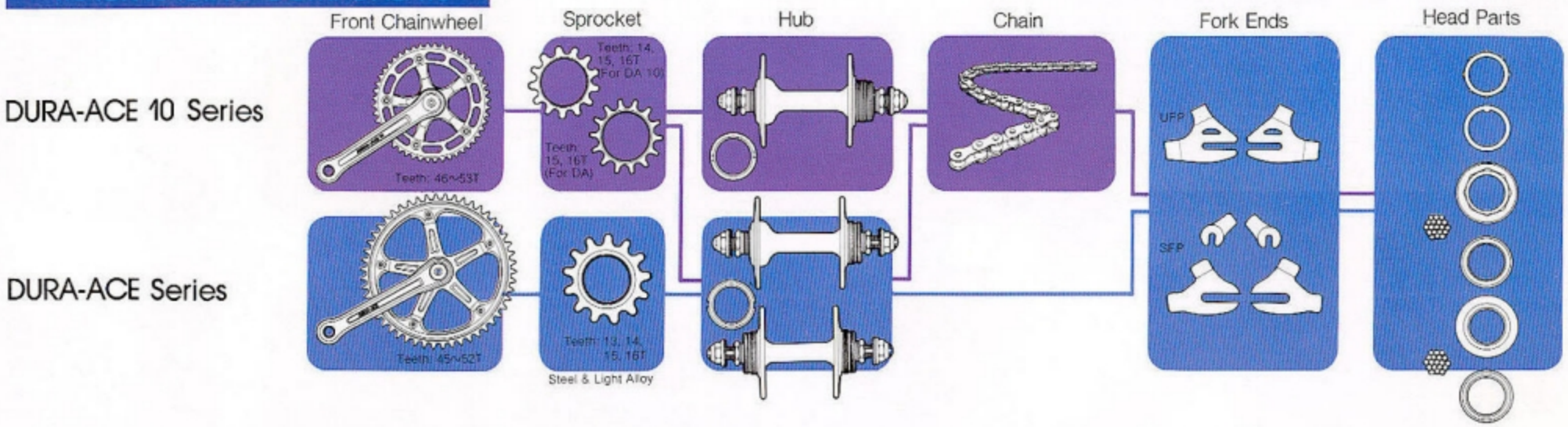


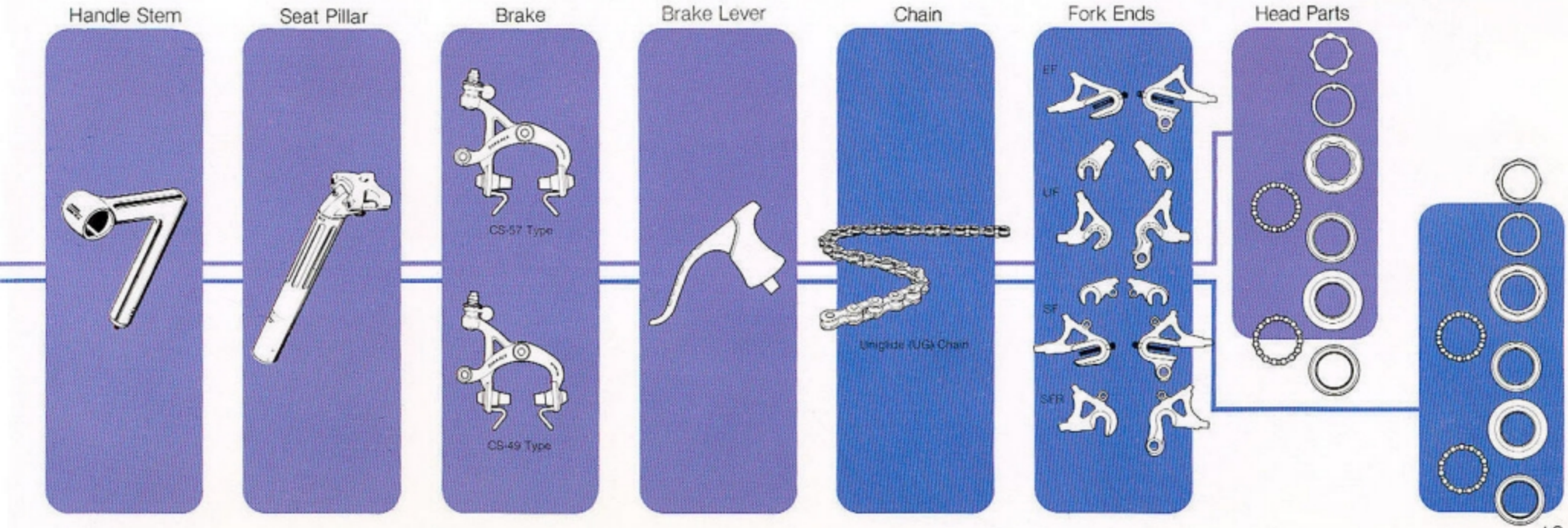
DURA-ACE EX Road Model

ROAD RACING COMPONENTS



TRACK RACING COMPONENTS

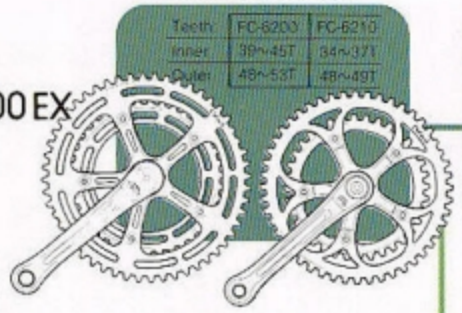




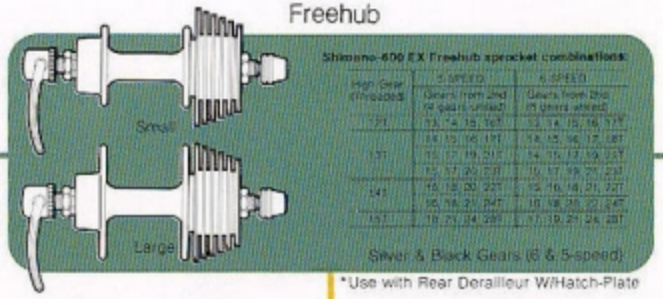
ROAD & TOURING COMPONENTS

SHIMANO-600 EX Series

Front Chainwheel



Freehub



*Use with Rear Derailleur W/Hatch-Plate

Front Derailleur



Rear Derailleur



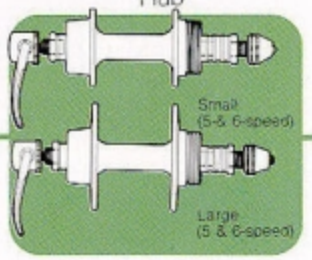
*Long Cage Available

SHIMANO-600 Series

Multiple Freewhee



Hub



Front Derailleur



Rear Derailleur



*Long Cage Available

TOURING COMPONENTS

SHIMANO-DEORE Series

Front Chainwheel



Pedal



Front Derailleur



Rear Derailleur



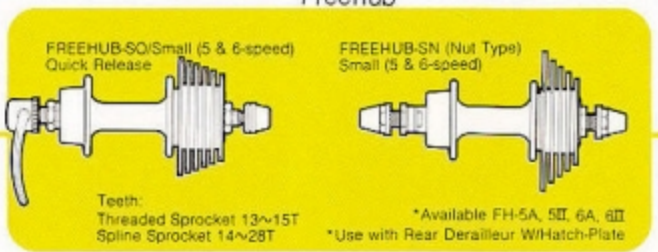
NEW 10 SPEED COMPONENTS

ALTUS-LT-ST / SELECTA-T

Front Chainwheel



Freehub



*Chain Protector Available

Front Derailleur



Rear Derailleur



*Long Cage*Available

Shifting Lever

Option: Brazed-on Parts

Brake

CS-S7 Type

CS-49 Type

Brake Lever

Chain

SHIMANO 600 EX UG Chain (Black & Silver)

Fork Ends

LF

RR

Head Parts

Shifting Lever

Brake

Cantilever Brake

SHIMANO 600 UG (Silver)
SHIMANO 600 UG (Gold)

Shifting Lever

*Use with Rear Derailleur W/Centeron Mechanism

SHIMANO DEORE SERIES

Shifting Lever

ALTUS-LT STEM

ALTUS-LT DOWN TUBE

ALTUS-ST STEM

ALTUS-ST DOWN TUBE

*Use with Rear Derailleur W/Centeron Mechanism

*Available Single Type Lever

Option: Brazed-on Type

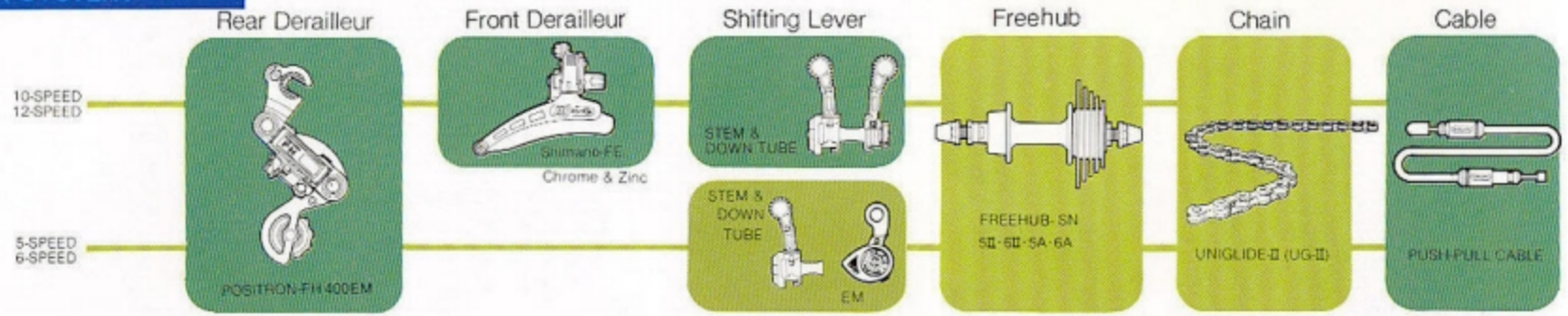
Chain

UNIGLIDE-II (UG-II)

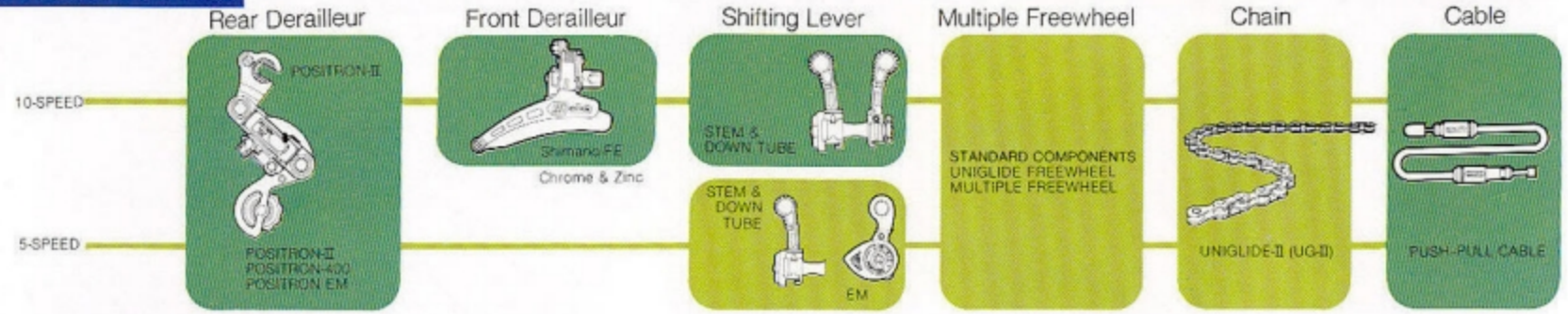
NOTE:

* The chart illustrates ideal combinations with regard to product classifications. However, these components are interchangeable unless otherwise stated.
* Use the ALTUS shifting lever only with ALTUS rear derailleur. The ALTUS rear derailleur can be used separately but the "Centeron Mechanism" will not function.
* Use the Freehub (SQ, SN and EX Series) only with the Shimano "Hatch-Plate" rear derailleur.

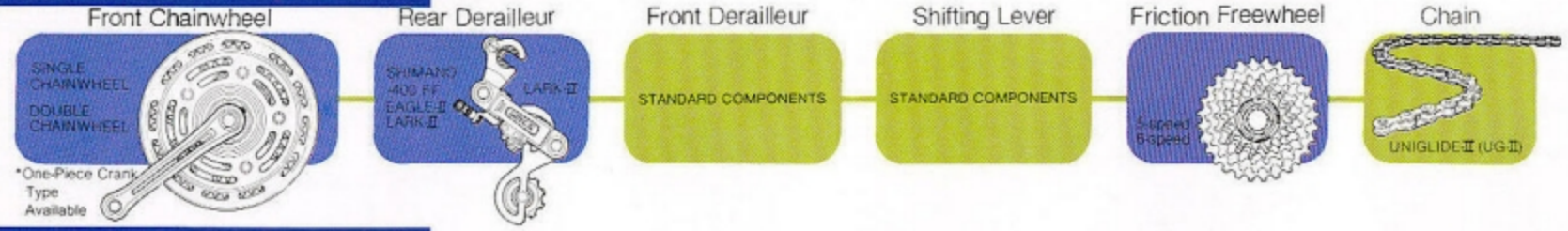
POSITRON-FH SYSTEM



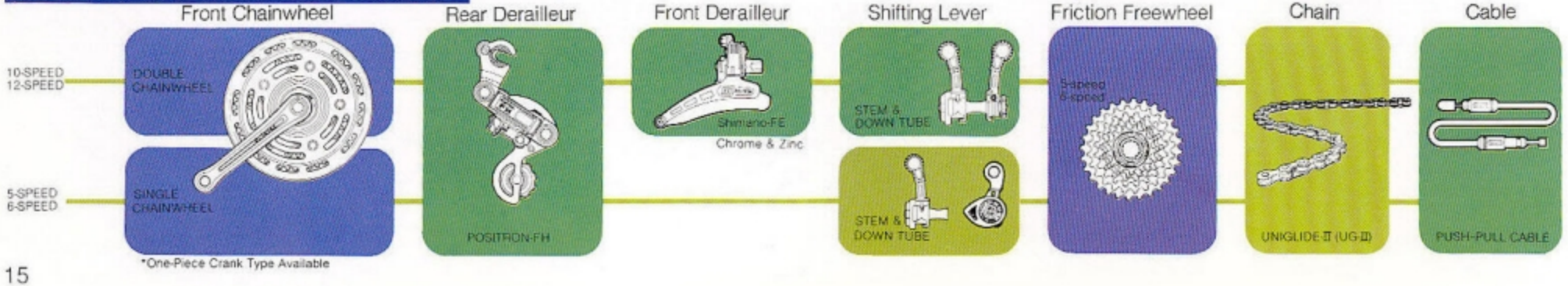
POSITRON-II SYSTEM COMPONENTS



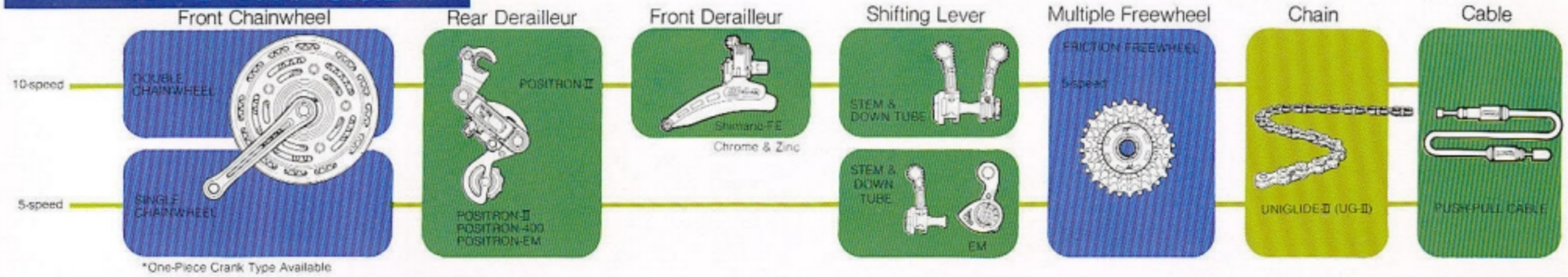
FF SYSTEM COMPONENTS



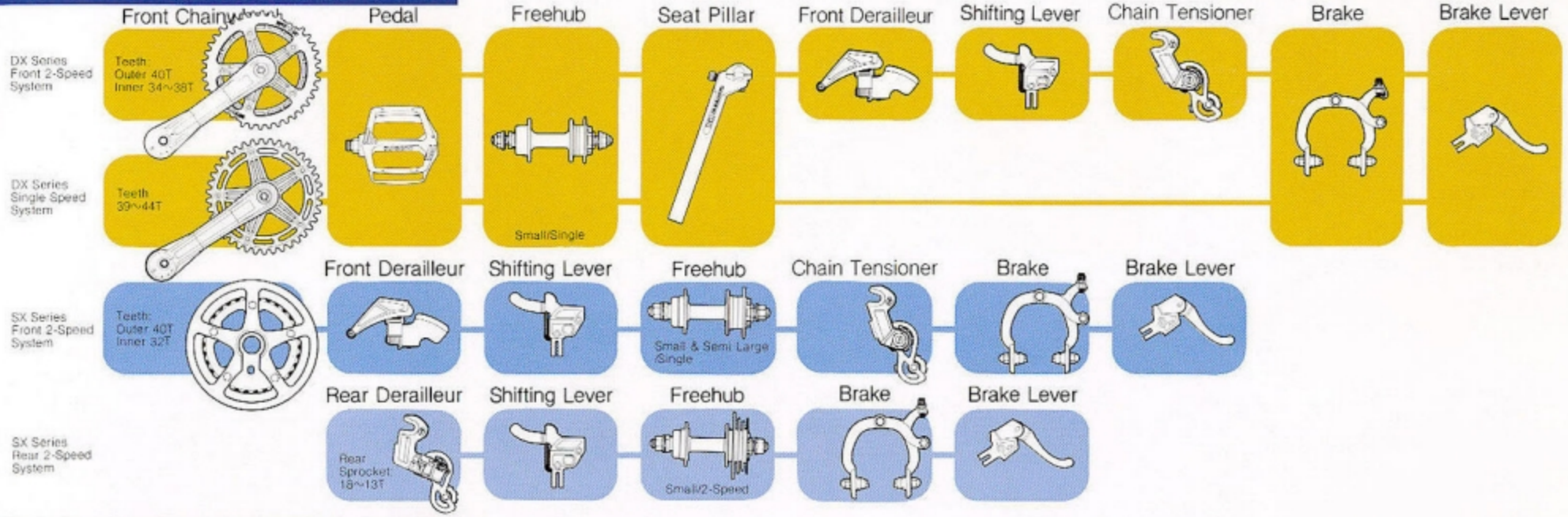
POSITRON-FH PLUS FF SYSTEM



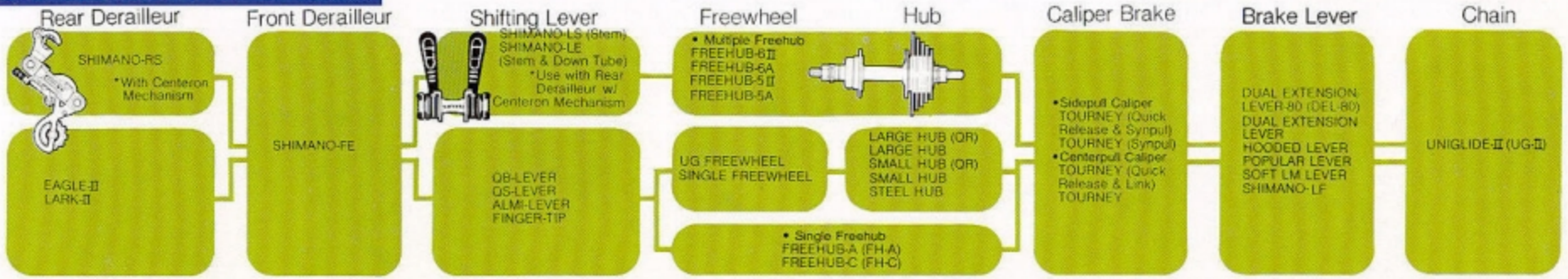
POSITRON-II PLUS FF SYSTEM



BMX COMPONENTS



5 & 10 SPEED COMPONENTS





SHIMANO DURA-ACE 10 System/CompoSeries

The Pitch Revolution That Has Changed The World Of Racing.....10mm. Pitch Series

Shimano's new Dura-Ace 10 Track System is the new standard among competitive bicycle components.

Dura-Ace 10 is the first major deviation from a standard that has existed in the bicycle industry since mass-production of bikes began some 100 years ago.

It was so simple; Shimano reduced the distance between the sprocket teeth from the old 1/2" to the new 10mm. dimension. Ten millimeter pitch allows the front chainwheel and the rear sprockets to be made smaller, and the chain shorter. The smaller size means less weight and more rigidity and when rotating parts are lightened acceleration is increased.

Now competitors on Dura-Ace 10 can jump out of corners more quickly, and get the lead in the sprint.

Dura-Ace 10 track components are already the choice of the best racers in the world. John Nicholson, twice world professional sprint champion, rode to his titles on Dura-Ace 10. More and more racers are changing to the obvious advantages of using the lightest components in track racing—Dura-Ace 10.



DURA-ACE 10 SERIES TRACK ENSEMBLE

10mm Pitch Chaindriving System

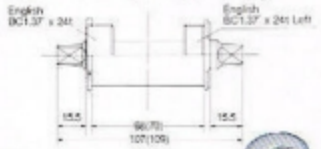
DURA-ACE 10 Front Chainwheel

Model FC-7000 BB-7500

SPECIFICATIONS

Material ● Light Alloy • Special Surface Treatment
Type ● Cotterless
Chain Ring ● 10mm. x 3mm.
Teeth ● 46~53T
Crank Lengths
● 6-1/2" (165mm.), 6-3/4" (170mm.)
Available by request 6-19/32" (167.5mm.)
Crank Thread ● BC 9/16" x 20 T.P.I.
Cup Thread ● English 1.37" x 24t, French 35 x 1.0, Italian 36 x 24t
Super Polished Ball Race

Spindle Length: [Unit: mm.]



10



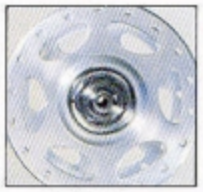
DURA-ACE 10
Front & Rear Hubs
with Lock Ring

Model HB-7020

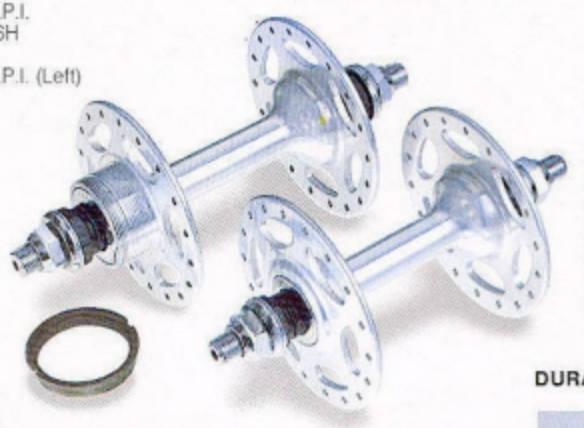
SPECIFICATIONS

Weight ● Front 7.9 oz. (225 g.) Rear 10.4 oz. (295 g.)Including Lock Ring
Material ● Light Alloy • Anodized Finish
Over Lock Nut Dimensions
● Front 3.94" (100mm.)
Rear 4.33" (110mm.) 4.72"(120mm.)
Fork End Slot Width
● Front 0.35" (9mm.), 0.31" (8mm.)
Rear 0.39" (10mm.), 0.31" (8mm.)
Sprocket Thread
● BC33 x 24 T.P.I.
Spoke Holes ● 28H, 32H, 36H
Lock Ring Thread
● BC32 x 24 T.P.I. (Left)
Super Polished Ball Race

10



Drilled Out Shaft





DURA-ACE 10 Chain

Model CN-7000

SPECIFICATIONS

Material ● Chromium Molybdenum Steel • Special Surface Treatment
Type ● Bushed Chain

10

DURA-ACE 10—DURA-ACE Comparison Chart

* Weight Comparison (Track Models)

	Dura-Ace 10	Dura-Ace	Saving
Right Hand Crank	8.5 oz. (239 g.)	9.8 oz. (277 g.)	1.3 oz. (38 g.)
Chainwheel (49T)	2.2 oz. (63 g.)	4.1 oz. (116 g.)	1.9 oz. (53 g.)
Chain	11.6 oz. (330 g.)	11.8 oz. (335 g.)	0.2 oz. (5 g.)
Rear Hub W/Lock Ring	10.4 oz. (295 g.)	11.0 oz. (313 g.)	0.6 oz. (18 g.)
Rear Sprocket (14T)	0.8 oz. (22 g.)	1.4 oz. (38 g.)	0.6 oz. (16 g.)
TOTAL	33.5 oz. (949 g.)	38.1 oz. (1079 g.)	4.6 oz. (130g.)

DURA-ACE 10
Sprocket for Track Hub

Model SS-7000

SPECIFICATIONS

Material ● Nickel Chromium Molybdenum Steel
Standard Sprocket
● 10mm. x 3mm.
Thread ● BC33 x 24 T.P.I.
Teeth ● 14T, 15T, 16T
Weight ●

14T	0.8 oz. (22.0 g.)
15T	0.9 oz. (26.8 g.)
16T	1.1 oz. (30.8 g.)

Sprocket for Use with Standard Dura-Ace Track Hubs Only
Thread ● 1.37" x 24 T.P.I.
Teeth ● 15T, 16T
Weight ●

15T	0.9 oz. (26.0 g.)
16T	1.0 oz. (29.0 g.)

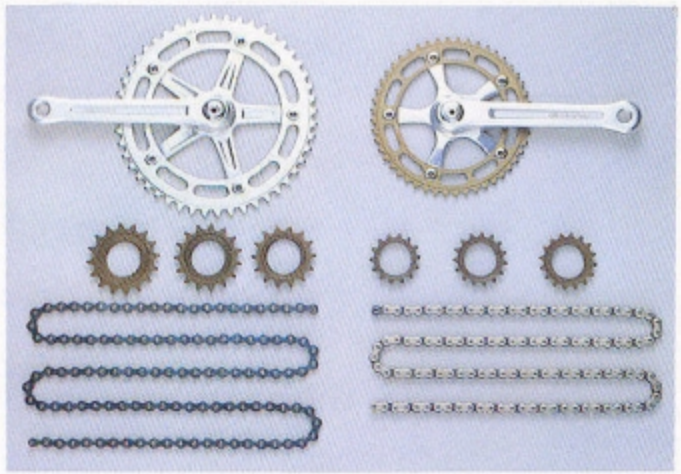
10



For Use with Dura-Ace 10 Track Hubs Only

For Use with Standard Dura-Ace Track Hubs Only

DURA-ACE — DURA-ACE 10 Comparison Photo





SHIMANO
DURA-ACE
System Compo Series

The Racing Components Professionals Choose

When sprinting at top speed a 10th of a second equals about 15 feet...too big a gap to close against a good competitor. To shave off those fractions of a second the pro sprinter must use the lightest but strongest possible equipment.

Dura-Ace track products are constructed of "super duralumin 75S", an alloy so light and strong that it is rarely used for bicycle components because of its difficulty to form. Shimano's advanced metallurgical techniques, including the cold-forging process, have overcome the obstacles and produced the best track products available.

Dura-Ace Track means performing at your best.



DURA-ACE SERIES TRACK ENSEMBLE

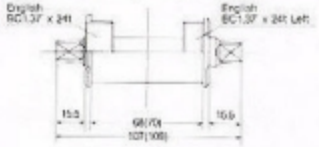
DURA-ACE Front Chainwheel

Model FC-7500 BB-7500

SPECIFICATIONS

Material ● Light Alloy • Anodized Finish
Type ● Cotterless
Chain Ring ● 1/2" x 1/8" Chain
Teeth ● 45T~52T
Crank Lengths
● 6-1/2" (165mm.), 6-3/4" (170mm.), 6-7/8" (175mm.) Available by request 6-19/32" (167.5mm.), 6-13/16" (172.5mm.)
Crank Thread ● BC 9/16" x 20 T.P.I.
Cup Thread ● English 1.37" x 24t, French 35 x 1.0, Italian 36 x 24t
Option ● Super Polished Ball Race

Spindle Length: [Unit: mm.]



DURA-ACE Sprocket for Track Hub

Model SS-7500

SPECIFICATIONS

Material ● Chromium Molybdenum Steel/Light Alloy • Special Surface Treatment
Standard Sprocket
● 1/2" x 1/8" Chain
Thread ● 1.37" x 24 T.P.I.
Teeth ● 13T, 14T, 15T, 16T
Weight ●

	Light Alloy	Steel
13T	0.39 oz. (11.0 g.)	1.06 oz. (30.1 g.)
14T	0.48 oz. (13.5 g.)	1.34 oz. (38.0 g.)
15T	0.55 oz. (15.7 g.)	1.67 oz. (47.3 g.)
16T	0.63 oz. (18.0 g.)	1.89 oz. (53.5 g.)









DURA-ACE
Front & Rear Hubs
with Lock Ring

Model HB-7520

SPECIFICATIONS

Weight ● Front 8.5 oz. (240 g.) Rear 11.0 oz. (313 g.)/Including Lock Ring
Material ● Light Alloy • Anodized Finish
Type ● Solid Axle
Thread ● 1.37" x 24 T.P.I.
Over Lock Nut Dimensions
● Front 3.94" (100mm.) Rear 4.33" (110mm.), 4.72" (120mm.)
Fork End Slot Width
● Front 0.35" (9mm.), 0.31" (8mm.) Rear 0.39" (10mm.), 0.31" (8mm.)
Spoke Holes ● 28H, 32H, 36H
Lock Ring Thread
● 1.29" x 24 T.P.I. (Left)
Super Polished Ball Race



DURA-ACE Head Parts

Model HP-7500

SPECIFICATIONS

Material ● Chromium Bearing Steel (Main Parts)
Polished Ball Race

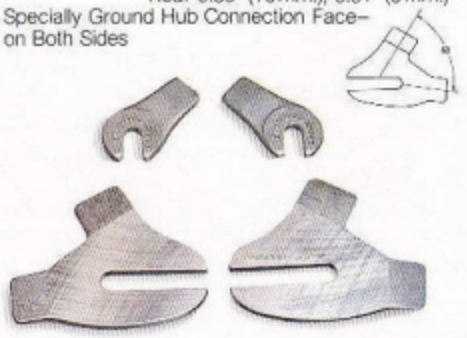


SHIMANO-SFP Fork Ends

Model FE-SF10

SPECIFICATIONS

Material ● Steel
Fork End Slot Width
● Front 0.35" (9mm.), 0.31" (8mm.) Rear 0.39" (10mm.), 0.31" (8mm.)
Specially Ground Hub Connection Face—on Both Sides



SHIMANO-UFP Fork Ends

Model FE-UF10

SPECIFICATIONS

Material ● Steel
Fork End Slot Width
● Front 0.35" (9mm.), 0.31" (8mm.) Rear 0.39" (10mm.), 0.31" (8mm.)
Specially Ground Hub Connection Face—on Both Sides
Fine Blanking Finish



THE NEW CONCEPT COMPONENTS

DURA-ACE EX Road Ensemble

For over half-a-century, Shimano has devoted itself to the production of bicycle components. Based on the abundant experience and technology acquired through the continuous innovation of bicycle parts, Shimano was able to create the "System Components" concept. Components which are made to work together in perfect harmony.

And now we, at Shimano, as a result of this enlightened policy, are pleased to introduce our latest system components success—the EX Series.

It was through our involvement with bicycle racing that we were able to succeed so perfectly in coordinating the necessary requisites of lightness and strength combined —and precision of parts. Many of the mechanisms incorporated in this series are revolutionary in their concept and are certain to spearhead the bicycle into a new era. The Dura-Ace EX Series and the 600 EX Series are now unveiled for the world of bicycling to appreciate— and to herald a new age for the bicycle!

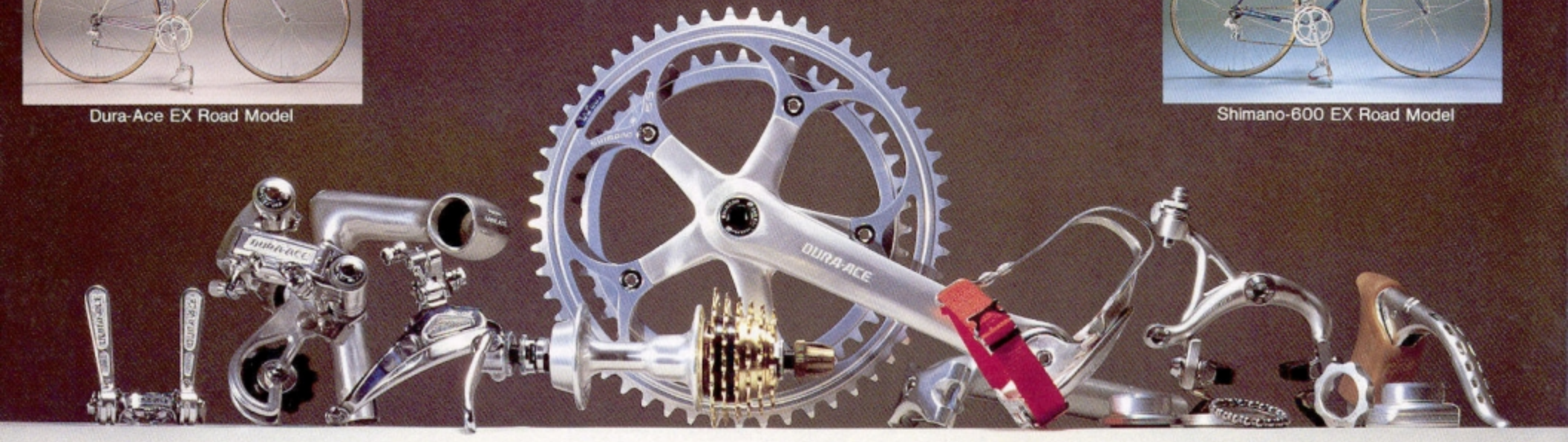
SHIMANO 600 EX Road Ensemble



Dura-Ace EX Road Model



Shimano-600 EX Road Model



Shifting Lever • Rear Derailleur • Handle Stem • Front Derailleur • Freehub • Front Chainwheel • Seat Pillar • DD Pedal • Head Parts • Brake • Brake Lever

DURA-ACE EX SERIES ROAD ENSEMBLE

DURA-ACE EX DD Pedal

Model PD-7200

SPECIFICATIONS

Weight • 6.1 oz. (173 g.)/Including Toe Clip & Toe Strap (Blue & Red)
Material • Light Alloy (Body)
• Chromium Molybdenum Steel (Cup • Cone)
• Steel (Toe Clip)
Light Alloy Toe Clip (Optional Parts)
Crank Thread • BC1" × 24 T.P.I.
Type • DD Mechanism, Sealed Mechanism, Aerodynamic Design
Option • DD Pedal Reflector

*Use: With Shimano DA EX Front Chainwheel (Model FC-7200)

Feautures of the DD Pedal:

1. Improved "Ankling" increases pedaling Efficiency
2. Lightweight and aerodynamic design
3. Lower center-of-gravity
4. Improved shoe grip
5. Unique, adjustable toe clip
6. Sealed mechanism









DURA-ACE EX Handle Stem

Model HS-7200

SPECIFICATIONS

Weight • 8.9 oz. (252 g.), 9.2 oz. (260 g.)
Material • Light Alloy
Handle Stem Diameter
• 22.2 mm.
Handle Bar Clamp Diameter
• 25.8mm or 26.5mm
Extension • 70mm., 80mm., 90mm., 100mm., 110mm., 120mm., 130mm.,
Type • Hexagon Release Mechanism, Aerodynamic Design



Hexagon Wrench Key for Handle Stem

DURA-ACE EX Seat Pillar

Model SP-7200

SPECIFICATIONS

Weight • 7.9 oz. (224 g.)
For pillar w/27.2 mm. Outside diameter
Material • Light Alloy
Outside Diameter of Pillar
• 26.0mm., 26.2mm., 26.4mm., 26.6mm., 26.8mm., 27.0mm., 27.2mm.
Type • Hexagon Release Mechanism, Aerodynamic Design



DURA-ACE EX Freehub

Model FH-7261 (Small/6-speed)

SPECIFICATIONS

Weight • Over Lock Nut Dimensions • Amount of Dish •

	Weight	Over Lock Nut Dimensions	Amount of Dish
Front	8.1 oz. (229 g.)	3.94" (100 mm.)	—
Rear (Except Cassette Gears)	14.5 oz. (412 g.)	4.96" (126 mm.)	0.17" (4.3mm.)

Material • Light Alloy • Anodized Finish (W/Light Alloy Adjusting Nut)
Sprocket • Golden Finish
Teeth • Threaded Sprocket 11T~19T
• Spline Sprocket 12T~28T
Spoke Holes • 32H, 36H
Type • Direction Mechanism, Quick Release, Uni Balance Mechanism, Uniglide Teeth, Cassette Gear, Sealed Mechanism (Double-Jointed Seal)
Use • With EX Rear Derailleur Only



DURA-ACE EX SERIES ROAD ENSEMBLE

DURA-ACE EX Rear Derailleur

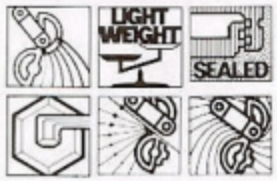
Model RD-7200

SPECIFICATIONS

- Capacity: Front Difference/13 Teeth or less; Rear Largest Sprocket/26 Teeth or less
- Weight: 6.2 oz. (175g.)
- Material: Light Alloy • Anodized Finish (Body); Light Alloy (Cage Plate); Heat Treated Stainless Steel (Guide Pulley Teeth)
- Type: Servo Panta Mechanism, Hatch Plate Mechanism, Without Left Plate, Hexagon Release, Synchro-Line Mechanism, Sealed Mechanism



Model SL-7220

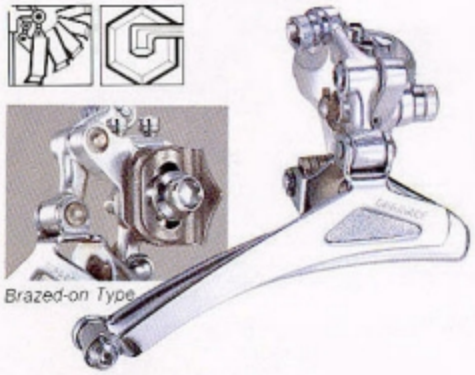


DURA-ACE EX Front Derailleur

Model FD-7210 (Brazed-on Type)
FD-7200 (Band Type)

SPECIFICATIONS

- Capacity: 14 Teeth or Less
- Weight: 3.6oz. (102g.)
- Material: Light Alloy (Body); Steel • Chromium Finish (Chain Guide)
- Type: Lower Inlet Type 1-1/8"; Trap-Ease Mechanism; Hexagon Release



Brazed-on Type

DURA-ACE EX Shifting Lever

Model SL-7200 (Band Type)
SL-7210 (Brazed-on A Type)
SL-7220 (Brazed-on B Type)

SPECIFICATIONS

- Weight: 2.01oz. (57g.)
- Material: Light Alloy • Anodized Finish
- Type: Friction Type
- Attachment Position: Down Tube
- Lever Clamp Diameter: 1-1/8"
- Option: Brazed-on parts (w/Sealed Mechanism)
- Lever Non-loosening Feature



Brazed-on Parts (Model SL-7210)



Brazed-on Type Only

DURA-ACE EX
Front Chainwheel
& Bottom Bracket Assembly

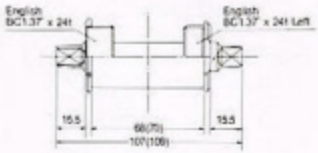
Model FC-7200 (Double)
BB-7500

SPECIFICATIONS

- Material: Light Alloy • Anodized Finish
- Type: Cotterless
- Chain Ring: 1/2" × 3/32" Chain
- Teeth: Inner Chain Ring 39T~45T; Outer Chain Ring 48T~53T
- Crank Lengths: 6-1/2" (165 mm.), 6-3/4" (170 mm.), 6-25/32" (172.5mm.), 6-7/8" (175mm.)
- Crank Thread: BC1" × 24 T.P.I.
- Cup Thread: English 1.37" × 24t, French 35 × 1.0 Available by request: Italian 36 × 24t
- Material of Chain Ring: Light Alloy. • Anodized Finish
- Type: Aerodynamic Design, Offset Crank Arm, W cut Mechanism, One Key Release Mechanism, Safety Crank Arm
- Option: Super Polished Ball Race
- Use: With DURA-ACE EX DD Pedal (Model PD-7200) Only

SHIMANO aero dynamics





*Standard Model FC-7110 can also be used with Dura-Ace EX Series. See Page 29.

DURA-ACE EX Freehub

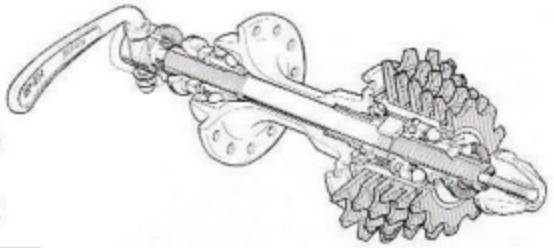
Model FH-7250 (Small /5-speed)
FH-7260 (Small /6-speed)

SPECIFICATIONS

Weight • Over Lock Nut Dimensions • Amount of Dish ●

		Weight	Over Lock Nut Dimensions	Amount of Dish
Front		7.4 oz. (210 g.)	3.94" (100 mm.)	-
Rear (Except Cassette Gears)	5-speed	13.9 oz. (393 g.)	4.72" (120 mm.)	0.17" (2.95 mm.)
	6-speed	14.0 oz. (398 g.)	4.72" (120 mm.)	0.31" (7.8 mm.)
		14.0 oz. (403 g.)	4.96" (126 mm.)	0.19" (4.8 mm.)

Material ● Light Alloy • Anodized Finish (W/Light Alloy Adjusting Nut)
Sprocket ● Golden Finish
Teeth ● Threaded Sprocket 11T~19T
● Spline Sprocket 12T~28T
Spoke Holes ● 28H, 32H, 36H
Type ● Quick Release, Uni Balance Mechanism, Uniglide Teeth, Cassette Gear, Sealed Mechanism (Double-Jointed Seal)
Use ● With EX Rear Derailleur Only



Dura-Ace EX Freehub sprocket combinations:

High Gear (Threaded)	Gears from 2nd to low (Spline Type)
11T	12, 13, 14, 15, 16T
11T	12, 13, 15, 17, 19T
11T	13, 15, 17, 19, 21T
12T	13, 14, 15, 16, 17T
13T	14, 15, 16, 17, 18T
13T	14, 15, 17, 19, 21T
13T	15, 17, 19, 21, 23T
14T	15, 16, 18, 20, 22T
14T	16, 18, 20, 22, 24T

We offer all kinds of tooth sprocket possibilities: High gear (threaded sprockets), from 11T to 19T; other gears (spline-type), from 12T to 26T.



DURA-ACE EX Head Parts

Model HP-7200

SPECIFICATIONS

Weight ● 3.7 oz. (106 g.)
Material ● Light Alloy • Anodized Finish (Body),
● Bearing Steel (Ball Race)
Type ● Road Type
Polished Ball Race
Sealed Mechanism (Labyrinth Seal)



DURA-ACE EX Caliper Brake

Model BR-7200 (CS-49 Type)

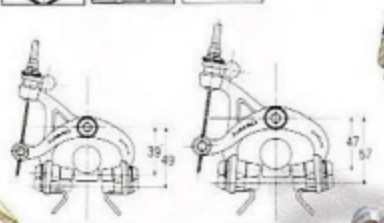
SPECIFICATIONS

Weight ● Front 5.6 oz. (160 g.)
● Rear 5.6 oz. (158 g.)

Model BR-7210 CS-57 Type)

SPECIFICATIONS

Weight ● Front 6.3 oz. (180 g.)
● Rear 6.3 oz. (178 g.)
Material ● Light Alloy • Anodized Finish
Type ● Side Pull with Quick Release and Tire Guide
● Pivot Bolt with Lubricating Channel
● Hexagon Release, NBM Brake Shoe
Option ● Sunk Pivot Bolt System



CS-49 Type *CS-57 Type*



Open *Close*

Quick Release



DURA-ACE EX Brake Lever

Model BL-7200

SPECIFICATIONS

Weight ● 7.3 oz. (206 g.)/Pair (Including Rubber Cover)
Material ● Light Alloy • Anodized Finish
Lever Clamp Diameter
● 23.8 mm ,24.2 mm.
Type ● Hooded Lever with Rubber Cover
Drilled Out Finish
One-Step Cable Attachment Mechanism



SHIMANO-600 EX SERIES ROAD & TOURING ENSE

SHIMANO-600 EX
Rear Derailleur

Model RD-6200

SPECIFICATIONS

Capacity ● Front Difference/13 Teeth or Less
● Rear Largest Sprocket/28 Teeth or Less
Weight ● 6.7oz. (190g.)
Material ● Light Alloy • Anodized Finish (Body)
● Light Alloy (Cage Plate)
Type ● Servo Panta Mechanism, Hatch-Plate Mechanism, Without Left Plate
Arabesque Pattern Design



Long Cage Type (Model RD-6210)

SHIMANO-600 EX Front Derailleur

Model FD-6200

SPECIFICATIONS

Capacity ● 14 Teeth or Less
Weight ● 3.95oz. (112g.)
Material ● Light Alloy (Body)
● Steel • Chromium Finish (Chain Guide)
Type ● Lower Inlet Type 1-1/8" Trap-Ease Mechanism
Arabesque Pattern Design





SHIMANO-600 EX Shifting Lever

Model SL-6200 (Band Type)
SL-6210 (Brazed-on Type)

SPECIFICATIONS

Weight ● 2.05oz. (58g.)
Material ● Light Alloy
Type ● Friction Type
Attachment Position
● Down Tube
Lever Clamp Diameter
● 1-1/8"
Arabesque Pattern Design
Lever Non-loosening Feature





Brazed-on Type Only





Brazed-on Parts

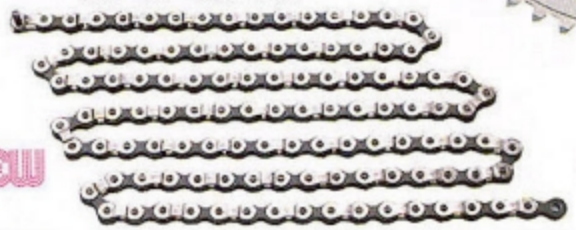
SHIMANO-600 EX UG Chain

Model CN-6200

SPECIFICATIONS

Material ● Steel
Surface Treatment
● Roller Link Plate/Black Finish
● Pin Link Plate/Satin Nickel Finish (Silver)
● Rivet Pin/Special Hardened Finish
Type ● Roller Chain
Size ● 1/2" × 3/32" Chain

new



SHIMANO-600 EX Front Chainwheel

Model FC-6210 FC-6200
BB-6210 BB-6200

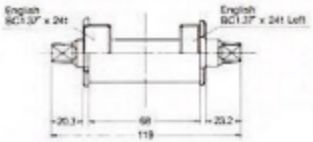
(Spindle Length 119 mm. for FC-6210) (Spindle Length 116 mm. for FC-6200)

SPECIFICATIONS

Material ● Light Alloy • Anodized Finish
Type ● Cotterless
Chain Size ● 1/2" x 3/32" Chain
Teeth ● FC-6210/Inner 34T~37T, Outer 48T~49T,
● FC-6200/Inner 39T~45T, Outer 48T~53T,



Spindle Length: [Unit: mm.]



Crank Lengths
● FC-6210/6-1/2" (165mm.),
● FC-6200/6-1/2" (165mm.), 6-3/4" (170mm.)
Crank Thread ● 9/16" x 20t
Cup Thread ● English 1.37" x 24t, French 35 x 1.0, Italian 36 x 24t
Material of Chain Ring
● Light Alloy • Anodized Finish
W cut Mechanism, One Key Release Mechanism, Safety Crank Arm and Arabesque Pattern Design



Model FC-6200 (LD-Type) Dura-Ace Chain Ring Attachable



Model FC-6210 (MD-Type)



Model BB-6200 Bottom Bracket Set for FC-6200 (Spindle Length 116 mm.)

SHIMANO-600 EX Small Flange Freehub

Model FH-6261 (Silver/6-speed) FH-6251 (Silver/5-speed)

SHIMANO-600 EX Large Flange Freehub

Model FH-6263 (Silver/6-speed) FH-6253 (Silver/5-speed)

SPECIFICATIONS

Weight • Over Lock Nut Dimensions • Amount of Dish ●

		Weight (Small)	Weight (Large)	Over Lock Nut Dimension	Amount of Dish
Front		8.3 oz (235 g.)	9.7 oz (275 g.)	3.94" (100 mm.)	—
Rear (Except Cassette Gears)	5-speed	13.9 oz (395 g.)	14.2 oz (405 g.)	4.72" (120 mm.)	0.07" (1.75 mm.)
		14.1 oz (402 g.)	14.5 oz (412 g.)	4.88" (124 mm.)	0" (0 mm.)
	6-speed	14.2 oz (403 g.)	14.5 oz (413 g.)	4.72" (120 mm.)	0.28" (7.05 mm.)
		14.2 oz (405 g.)	14.6 oz (415 g.)	4.88" (124 mm.)	0.21" (5.3 mm.)
		14.3 oz (408 g.)	14.7 oz (418 g.)	4.96" (126 mm.)	0.17" (4.3 mm.)

Material ● Light Alloy
Sprocket ● Silver Finish
Option ● Black Finish
Teeth ● Threaded Sprocket 12T~15T
Spline Sprocket 13T~28T
Spoke Holes ● 36H
Type ● Quick Release, Uni Balance Mechanism, Uniglide Teeth, Cassette Gear, Sealed Mechanism
Use ● With EX Rear Derailleur Only



Large Flange Type
(Model FH-6262 /6-Speed, FH-6252/5-Speed)
Black Finished Sprocket

Shimano-600 EX Freehub sprocket combinations:

High Gear (Threaded)	5-SPEED Gears from 2nd (4 gears united)	6-SPEED Gears from 2nd (5 gears united)
12T	13, 14, 15, 16T	13, 14, 15, 16, 17T
13T	14, 15, 16, 17T	14, 15, 16, 17, 18T
	15, 17, 19, 21T	14, 15, 17, 19, 21T
	15, 17, 20, 23T	15, 17, 19, 21, 23T
14T	16, 18, 20, 22T	15, 16, 18, 21, 22T
	16, 18, 21, 24T	16, 18, 20, 22, 24T
15T	18, 21, 24, 28T	17, 19, 21, 24, 28T

We offer a wide range of tooth sprockets. High gear (threaded sprockets), from 12T to 15T, other gears (spline-type), from 13T to 28T. Even if all 3 bolts of the 600 EX unit gear are removed the bicycle can still proceed unhindered.



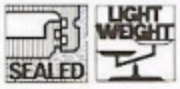


SHIMANO-600 EX Head Parts

Model HP-6200

SPECIFICATIONS

Weight ● 5.29 oz. (150 g.)
Material ● Light Alloy • Anodized Finish (Cup & Nut)
Steel • Chromium Finish (Cone)
Type ● Road Type
Sealed Mechanism
(Labyrinth Seal)



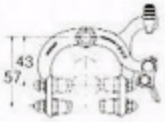


SHIMANO-600 EX
Caliper Brake

Model BR-6200

SPECIFICATIONS

Weight ● Front 5.6 oz. (159 g.)
Rear 5.5 oz. (157 g.)
Material ● Light Alloy • Anodized Finish
Type ● Side Pull with Quick Release and Tire Guide
Size ● 43 mm.~57 mm.





SHIMANO-600 EX
Caliper Brake

Model BR-6210

SPECIFICATIONS

Weight ● Front 5.3 oz. (150 g.)
Rear 5.2 oz. (147 g.)
Material ● Light Alloy • Anodized Finish
Type ● Side Pull with Quick Release and Tire Guide
Size ● 39 mm.~49 mm.



SHIMANO-600 EX
Brake Lever

Model BL-6200

SPECIFICATIONS

Weight ● 7.4 oz. (209 g.)/Pair (Including Rubber Cover)
Material ● Light Alloy • Anodized Finish
Type ● Hooded Lever with Rubber Cover
One-Step Cable Attachment
Drilled Out Finish
Lever Clamp Diameter
● 23.8 mm.







SHIMANO
DURA-ACE
System Compo Series

Designed For The Business Of Road Racing.

The Dura-Ace Road Ensemble is more than just individual components assembled under one name; Dura-Ace is a total set of the finest racing equipment; each piece designed to work in perfect harmony with the other.

This coordinated engineering cannot be achieved when a bicycle is equipped with different parts from different manufacturers.

The Dura-Ace Road Ensemble is designed for the business of road racing. Shimano has refined Dura-Ace from its experience gained through sponsorship of professional cyclists, pro teams and top class amateurs.

Precision is the byword in the Dura-Ace division of Shimano. Skilled craftsmen personally handle each product, some requiring 40 to 50 steps in finishing and assembly. Close tolerances result in the smooth functioning of the Dura-Ace product, and also increase resistance to contamination by water, grit, and other foreign particles. Final touches to the Dura-Ace Road Ensemble include either a lustrous finish, or a corrosion-resistant black anodized finish.

The Dura-Ace Ensemble has been proven on the toughest road circuits in the world. It is designed for the business of racing.



DURA-ACE SERIES ROAD ENSEMBLE

DURA-ACE
Rear Derailleur

Model RD-7100

SPECIFICATIONS

Capacity ● Front Difference/13 Teeth or Less
● Rear Largest Sprocket/26 Teeth or Less
Weight ● 6.1 oz. (174 g.)
Material ● Light Alloy • Anodized Finish
Type ● Servo Panta Mechanism, Synchro-Line Mechanism, Hexagon Release



Synchro-Line Mechanism

The Synchro-Line Mechanism, the newest addition to the Dura-Ace Rear Derailleur, keeps the adjusting barrel and the cable fixing pin constantly aligned and therefore the inner cable straight while the derailleur changes speeds. This reduces strain on the cable, prolongs the cable's service life, and facilitates a "positive shift" feeling at the shift lever.

The Dura-Ace derailleur is smaller in size and weight; its links are shortened by 0.2" (5mm.) and it weighs only 6.14oz. (174g.).

All bolts on the Dura-Ace derailleur are either 3mm. or 6mm. hexagonal bolts for easier servicing and securer tightening.

DURA-ACE
Front Derailleur

Model FD-7100

SPECIFICATIONS

Capacity ● 16 Teeth or Less
Weight ● 3.9 oz. (110 g.)
Material ● Light alloy • Anodized Finish (Body), ● Steel • Chromium Finish (Chain Guide)
Type ● Lower Inlet Type 1-1/8" Panta Mechanism, Hexagon Release



DURA-ACE EX Shifting Lever

Model SL-7200 (Band Type)
Model SL-7210 (Brazed-on Type)

SPECIFICATIONS

Weight ● 2.0 oz. (57 g.)
Material ● Light Alloy • Anodized Finish
Type ● Friction Type
Attachment Position ● Down Tube
Lever Clamp Diameter ● 1-1/8"
Option ● Brazed-on Parts (W/Sealed Mechanism)
Lever Non-loosening Feature

LIGHT WEIGHT
SEALED
Brazed-on Type Only





Brazed-on parts

DURA-ACE UG Chain

UG (UNIGLIDE) chains are designed with the outer plates widened to the level of the chain pin heads. Because of this shape, the outer plates engage the gear teeth at the same time as the chain pins. This makes shifting faster, eliminates the need for overshifts, and improves overall shifting performance. In addition, bearing steel is used for the roller pins, and an ultra-hard surface treatment assures outstanding strength. With these innovations, the UG chain is truly an international choice among professionals.



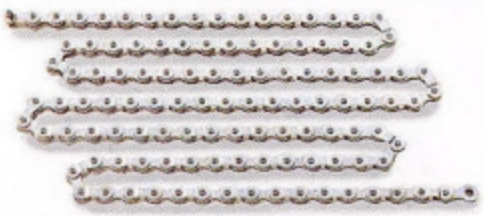
DURA-ACE UG Chain

Model CN-7100

SPECIFICATIONS

Material ● Outer & Inner Plate/Steel. Link Pin/Bearing Steel • Special Surface Treatment, Bush/Chromium Molybdenum Steel
Size ● 1/2" x 3/32" Chain
Surface Treatment ● Roller Link Plate/Nickel Finish, Pin Link Plate/Nickel Finish
Type ● Roller Chain
Information ● Special Chain Cutter available for UG Chain

UNIGLIDE



Cable Parts

CABLE GUIDE

Model SM-CG10

SPECIFICATIONS

Material ● Steel
Clamp Diameter ● 1-1/8"
Use ● 10-speed



OUTER STOPPER

Model SM-CS30

SPECIFICATIONS

Material ● Steel
Clamp Diameter ● 5/8"



OUTER STOPPER

Model SM-CS11

Material ● Steel
Clamp Diameter ● 1-1/8"
Use ● 10-speed and Bar-End Control



Brazed-on Parts

CABLE GUIDE

Model SM-CG70

SPECIFICATIONS

Material ● Steel



OUTER STOPPER

Model SM-CS70

SPECIFICATIONS

Material ● Steel



Chain Cutter for both UG Chain and ordinary chain (Model TL-CN20)

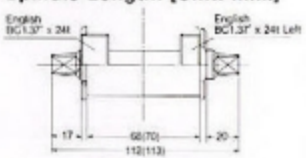
DURA-ACE Front Chainwheel

Model FC-7110
BB-7200

Material • Light Alloy • Anodized Finish
Type • Cotterless
Chain Ring • 1/2" x 3/32" Chain
Teeth • Inner Chain Ring 39T~45T
• Outer Chain Ring 48T~53T
Crank Lengths
• 6-1/2" (165mm.), 6-3/4" (170mm.), 6-7/8" (175mm.)
Available by request
• 6-19/32" (167.5mm.), 6-13/16" (172.5mm.)
Crank Thread • BC9/16" x 20 T.P.I.
Cup Thread • English 1.37" x 24t, French 35 x 1.0, Italian 36 x 24t
Material of Chain Ring
• Light Alloy • Anodized Finish
W cut Mechanism, One Key Release
Option • Super Polished Ball Race

W CUT

Spindle Length: [Unit: mm.]





DURA-ACE
Multiple Freewheel

Model MF-7150
MF-7160

SPECIFICATIONS
Standard Sprocket
• 1/2" x 3/32" Chain
Thread • 1.37" x 24 T.P.I. (English)
Available by request 35 x 1.0 (French)
Sprocket • Golden Finish
Polished Ball Race

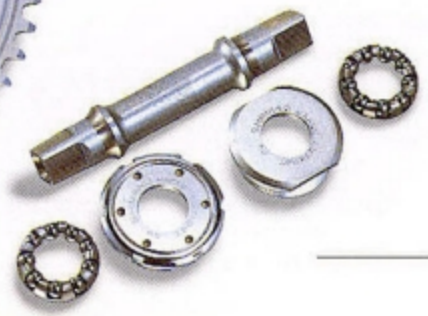






Standard Sprocket Combinations
•

5-speed	13, 14, 15, 17, 19T
	13, 15, 17, 19, 21T
	14, 16, 18, 20, 22T
	15, 17, 19, 21, 24T
6-speed	13, 14, 15, 16, 17, 18T
	13, 15, 17, 19, 21, 23T



DURA-ACE
Light Alloy Hub

Model HB-7110 (Small)

SPECIFICATIONS
Weight • Front 7.8 oz. (220 g.)
Rear 10.8 oz. (305 g.)/5-speed
10.9 oz. (310 g.)/6-speed

QR HUB



DURA-ACE
Light Alloy Hub

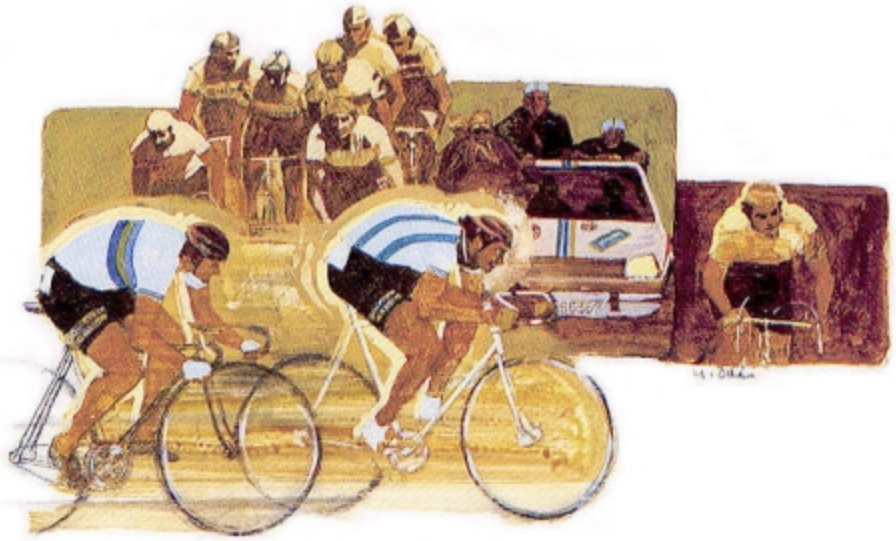
Model HB-7120 (Large)

SPECIFICATIONS
Weight • Front 9.2 oz. (260 g.)
Rear 11.6 oz. (330 g.)/5-speed
11.8 oz. (335 g.)/6-speed
Material • Light Alloy • Anodized Finish
Type • Quick Release
Thread • 1.37" x 24 T.P.I. (English)
Available by request 35 x 1.0 (French)
Over Lock Nut Dimensions
• Front 3.94" (100mm.)
Rear/5-speed/4.72" (120mm.)
Rear/6-speed/4.96" (126mm.)
Spoke Holes • 28H, 36H
Available by request 24H, 32H, 40H
Polished Ball Race

QR HUB



SHIMANO DURA-ACE System Compo Series



SHIMANO-SF Fork Ends

Model FE-SF20

SPECIFICATIONS

Weight • 8.8 oz. (250 g)/
Including Front & Rear
Material • Steel
Type • Road Type
With Adjusting Bolt
Specially Ground Hub Connection Face

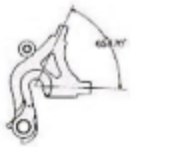


SHIMANO-SFR Fork Ends

Model FE-SF21

SPECIFICATIONS

Weight • 5.2 oz. (147 g)/
Rear Only
Material • Steel
Type • Touring Type
Vertical Drop Out
Specially Ground Hub
Connection Face





Model FE-SF20

Model FE-SF21



OUTER BAND

Model SM-CB20

SPECIFICATIONS

Material • Steel
Clamp Diameter
• 1"



SHIMANO-UF Fork Ends

Model FE-UF20

SPECIFICATIONS

Weight • 5.7 oz. (161 g)/
Including Front & Rear
Material • Steel
Type • Road Type
With Adjusting Bolt (2 mm.)
Specially Ground Hub Connection Face



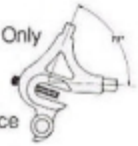


SHIMANO-EF Fork End

Model FE-EF20

SPECIFICATIONS

Weight • 5.1 oz. (145 g)/Rear Only
Material • Steel
Type • Road Type
With Adjusting Bolt
Specially Ground Hub Connection Face



LIGHT WEIGHT



DURA-ACE Head Parts

Model HP-7100

SPECIFICATIONS

Material • Chromium Bearing Steel (Main Parts)
Type • Road Type
Polished Ball Race



SHIMANO-600 SERIES ROAD & TOURING ENSEMBLE

SHIMANO-600 Rear Derailleur

Model RD-6100

SPECIFICATIONS

Capacity • Front Difference/13 Teeth or Less
• Rear Largest Sprocket/28 Teeth or Less
Weight • 8.3 oz. (235 g.)
Material • Light Alloy • Anodized Finish (Body)
• Steel • Satin Nickel Finish (Cage Plate)
Type • Servo Panta Mechanism
Option • Adaptor





Long Cage Type (Model RD-6101) available

SHIMANO-600 Front Derailleur

Model FD-6100

SPECIFICATIONS

Capacity • 14 Teeth or Less
Weight • 4.7 oz. (133 g.)
Material • Steel • Satin Nickel Finish (Body and Chain Guide)
• Light Alloy • Anodized Finish (Clamp)
Type • Lower Inlet Type 1-1/8" Panta Mechanism

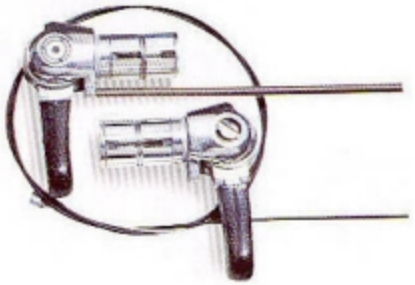


SHIMANO-600 Shifting Lever

Model SL-BC10 (Old No. LD-500)

SPECIFICATIONS

Weight • 5.6 oz. (160 g.)/Pair
Material • Light Alloy • Anodized Finish
Attachment Position
• Bar-End
Type • With Spiral Spring (Balance Spring)



SHIMANO-600 Light Alloy Hub

Model HB-6120 (Large)

SPECIFICATIONS

Weight • Front 9.7 oz. (275 g.)
• Rear 12.4 oz. (350 g.)/5-speed
12.5 oz. (355 g.)/6-speed

Model HB-6110 (Small)

SPECIFICATIONS

Weight • Front 8.3 oz. (235 g.)
• Rear 12.0 oz. (340 g.)/5-speed
12.2 oz. (345 g.)/6-speed
Material • Light Alloy
Type • Quick Release
Thread • 1.37" x 24 T.P.I. (English)
Over Lock Nut Dimensions
• Front 3.94" (100mm.),
• Rear 4.72" (120mm.)/5-speed
4.96" (126mm.)/6-speed
Spoke Holes • 36H



Cable Parts

CABLE GUIDE

Model SM-CG11

SPECIFICATIONS

Material • Steel
Clamp Diameter
• 1-1/8"
Use • 10-speed



OUTER STOPPER

Model SM-CS30

SPECIFICATIONS

Material • Steel
Clamp Diameter
• 5/8"



OUTER STOPPER

Model SM-CS11

SPECIFICATIONS

Material • Steel
Clamp Diameter
• 1-1/8"
Use • 10-speed and Bar-End Control



Brazed on Parts

CABLE GUIDE

Model SM-CG70

SPECIFICATIONS

Material • Steel



OUTER STOPPER

Model SM-CS70

SPECIFICATIONS

Material • Steel

QB-Lever DX

Model SL-QB11

SPECIFICATIONS

Weight • 3.1 oz. (88g.)
Material • Light Alloy
Type • Friction Type
Attachment Position • Down Tube
Lever Clamp Diameter • 1-1/8"



SHIMANO-600
Cantilever Brake

Model BR-6102

SPECIFICATIONS

Weight • 11.9oz. (338g.)
Material • Light Alloy and Steel
Type • Cantilever Brake With Brake Mounting Shaft
Option • Cable Hanger



SHIMANO-600 UG Multiple Freewheel

Model MF-6150 (Black/5-speed) MF-6160 (Black/6-speed)

MF-6151 (Silver/5-speed) MF-6161 (Silver/6-speed)

SPECIFICATIONS

Standard Sprocket • 1/2" x 3/32" Chain
Sprocket • Black Finish, • Satin Nickel Finish
Standard Sprocket Combinations •

5-speed	13, 15, 17, 19, 21T
	14, 16, 18, 21, 24T
	15, 17, 19, 21, 24T
6-speed	13, 14, 15, 16, 17, 18T
	13, 15, 17, 19, 21, 23T



Model MF-6150



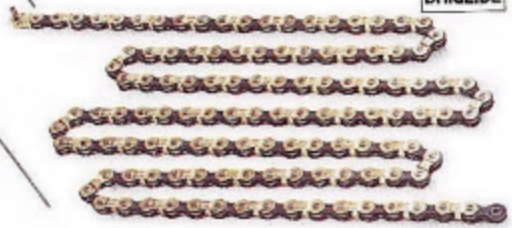
Model MF-6151

SHIMANO-600 UG Chain

Model CN-6110

SPECIFICATIONS

Material Steel
Surface Treatment • Roller Link Plate/Black Finish • Pin Link Plate/Golden Finish
Type • Roller Chain

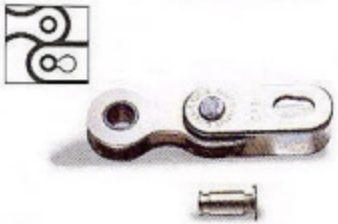


Chain Link Lock

Model CN-6130

SPECIFICATIONS

Material • Steel • Silver Finish
Use • 1/2" × 1/8" Chain
1/2" × 3/32" Chain



Without using special tools, the LINK LOCK chain can be easily cut and removed, thanks to the revolutionary pin-removing device incorporated within the chain itself.



SHIMANO-600 UG Chain

Model CN-6120

SPECIFICATIONS

Material • Steel
Surface Treatment • Roller Link Plate/Black Finish • Pin Link Plate/Satin Nickel Finish
Type • Roller Chain



SHIMANO-LF Fork Ends

Model FE-LF20

SPECIFICATIONS

Weight • 8.2 oz. (235 g.)/Including Front & Rear
Material • Steel
Option • Axle Stopper Set



SHIMANO-PR Fork Ends

Model FE-PR20

SPECIFICATIONS

Weight • 4.4 oz. (127 g.)/Rear Only
Material • Steel
Type • Vertical Drop Out

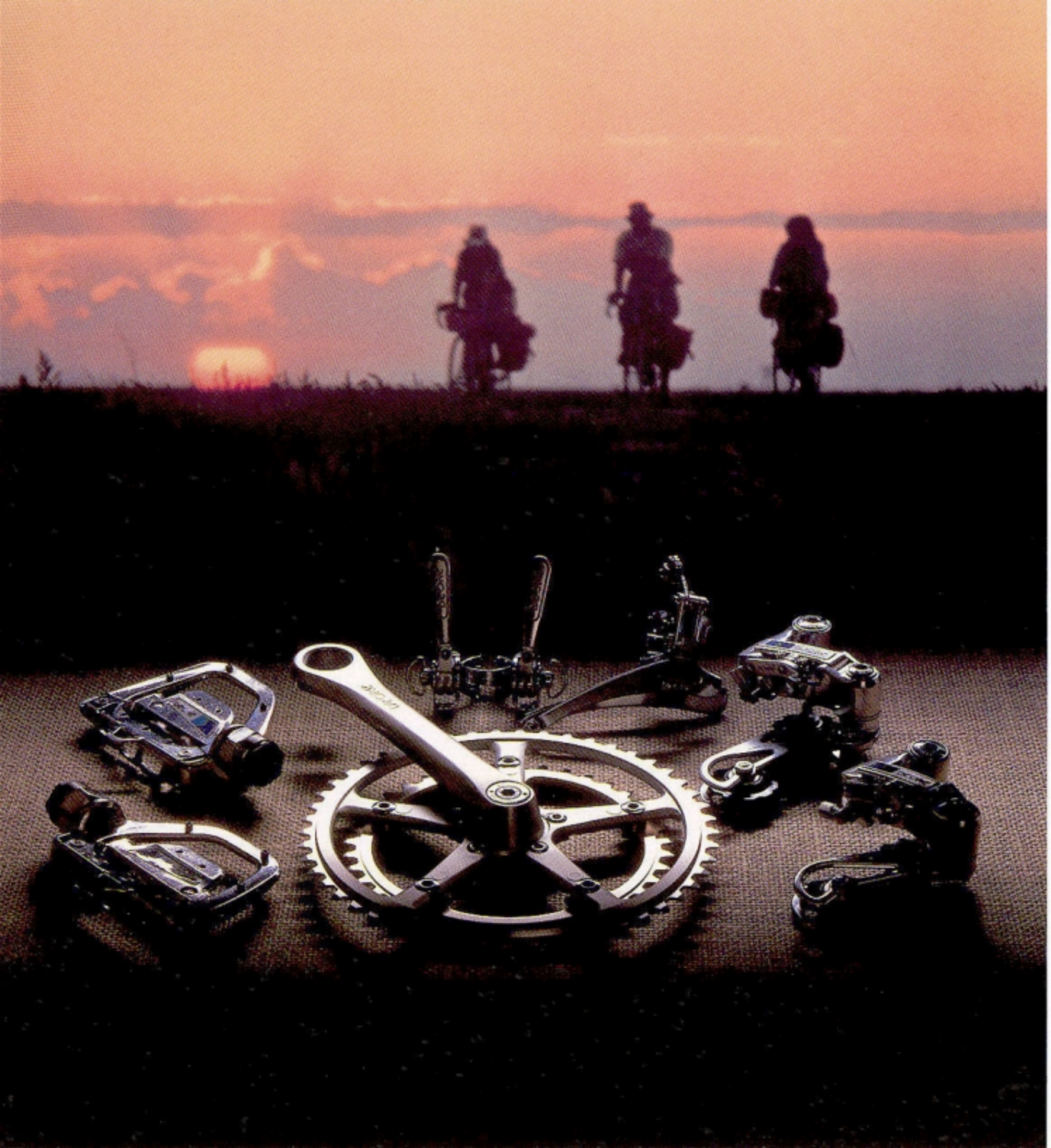




COLOR OUTER CASING (Old Model No. WE-100)

PART No. 840 99932 (Red)
840 99927 (Yellow)
840 99928 (Green)
840 99931 (Blue)
840 99929 (Dark Blue)





SHIMANO
DEORE
SERIES

New Deore Touring Components

Bicycle Touring encompasses all facets of cycling. Winding roads, endless uphills. Dirt and mud. Sun, wind and rain. Touring can be a tough experience, a challenge to man and his machine.

To help meet this challenge, we at Shimano have pioneered two approaches. First, the biotechnological approach takes a close critical look at the man-bicycle relationship and how that relationship can be refined and perfected. Second, Shimano's famed system component approach, the relationship between each component and the bicycle as a whole. This combination ensures an efficient, intergrated approach to equipping a touring bicycle properly.

Now Shimano proudly presents Deore Touring Components with rugged construction and durability, clean and attractive lines, and excellent performance. Much pleasure can be derived from touring and with Deore components that pleasure is even more enhanced.

Deore, the new concept in touring components.



DEORE TOURING ENSEMBLE

Centeron Mechanism

The Centeron Mechanism employs a unique and extremely effective method of guiding the rear derailleur to the desired gear sprocket. Instead of the guide spring controlling both left and right link plates directly, we have developed a system whereby the guide spring makes direct contact with the left link only. Contact with the right link is made through a special arm which, in turn, controls the link. The reason is to allow the right link a certain amount of designated free-play when shifting from high gear to low. Now when a gear is selected, the shifting lever, via the cable, moves the derailleur toward the gear. At this time the rotating tension of the chain takes over and leads the derailleur and pulley into line with the gear. The free-play of the derailleur's Centeron Mechanism is responsible for the all important flexibility of movement at the point of engagement.



In the case of the conventional derailleur, movement is rigidly controlled by the shifting lever without any allowance made for errors of judgement.



The Centeron Mechanism is also incorporated in the shifting lever. This means that both rear derailleur and shifting lever have the same coordinated movement for surer, faster and quieter gearshifts.

Gear Capacities to Handle Any Situation

Conventional touring rear derailleurs are usually designed with long cages to handle extra-large multiple free-wheels. But the diverse requirements of rugged touring demand various wheel ratios.

The Shimano DEORE series makes available two types of rear derailleur. The long cage model covers large gear capacities up to 34T, and the medium cage model allows a gear capacity of up to 30T. This choice makes possible a touring bicycle perfectly adapted to any kind of road condition you will ever encounter.



Trap-Ease Mechanism

The Trap-Ease Mechanism has greatly improved front chainwheel gear shifting from low to high gear. The conventional gear change was prone to considerable mechanical difficulties because the parallel derailleur movement caused the inner plate to force the chain onto the gear sprocket with a primarily lateral thrust. This resulted in unnecessary friction which impaired gear changes. Shimano researched this problem and succeeded in developing the "Trap-Ease" mechanism.





Now the awkward parallel movement has been replaced with the free "swing" motion of the Trap-Ease mechanism. When shifting from low to high gear, the swing allows the inner plate to lift the chain up and deposit it squarely on the sprocket teeth without any interference. In addition, the new design allowed us to widen the inside dimensions of the plates eliminating drag noises, through contact with the chain, and resulting in a much more enjoyable ride.

Hatch-Plate Mechanism

Sealed Mechanism

Servo-Panta Mechanism

DEORE Rear Derailleur

Model RD-DE10 (Middle Cage)
RD-DE20 (Long Cage)

SPECIFICATIONS

Capacity: Front Difference/20 Teeth or Less
: Rear Largest Sprocket/30 Teeth or Less (Middle) 34 Teeth or Less (Long)
: Total of Front & Rear Sprocket Difference/30 Teeth or Less (Middle) 34 Teeth or Less (Long)
Weight: 7.7oz. (218g.) Middle
9.30oz. (265g.) Long/Except Bracket
Material: Body/Light Alloy
: Cage Plate/Light Alloy (Middle)/Steel (Long)
Type: Servo Panta Mechanism, Centeron Mechanism, Hatch-Plate Mechanism, Sealed Mechanism



DEORE Front Derailleur

Model FD-DE10

SPECIFICATIONS

Capacity: 20 Teeth or Less
Weight: 4.3oz. (121g.)
Material: Body/Light Alloy
: Chain Guide/Steel
Type: Lower Inlet Type 1-1/8"
Trap-Ease Mechanism, Sealed Mechanism



DEORE Shifting Lever

Model SL-DE21 (Brazed-on Type)
SL-DE20 (Band Type)

SPECIFICATIONS

Weight: 1.4oz. (39g.)/Brazed-on Type
: 2.9oz. (82g.)/Band Type
Material: Light Alloy, Steel
Type: Friction Type
Attachment Position: Down Tube
Lever Clamp Diameter: 1-1/8"
Centeron Mechanism, Sealed Mechanism (Brazed-on Type Only), Lever Non-loosening Feature
Use: Rear Derailleur with Centeron Mechanism Only

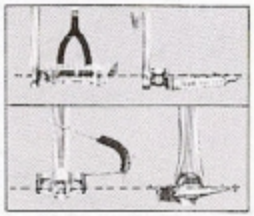


Brazed-on parts

Brazed-on Type Only

DD (Dyna-Drive) Mechanism

In the long and sophisticated chain of power that starts with the rider's brain and ends with the bicycle wheel, the pedal is the first point of contact between rider and bicycle. An obvious point, perhaps, but somehow never seriously considered in the manufacture of the bicycle—the result being an unscientific pedal design.

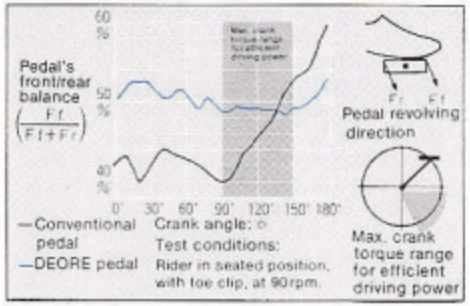


It took Shimano's biotechnological approach to come up with a more rational, efficient system for transmission of human power into driving energy. That system is the revolutionary DD (Dyna-Drive) mechanism, which has already been proven in the world of professional racing as part of our Dura-Ace EX component series. Now, making available the benefits of Shimano's biotechnology to touring enthusiasts, we have introduced the DD mechanism to the DEORE touring component series. With the conventional pedal, the rider's foot is postioned above the pedal axle. This means that part of the driving force transmitted from the foot is dissipated in simply maintaining pedal stability. The object of the DD pedal's radical departure in design is to transmit the full force of the foot's driving power to the pedal axle. This has been made possible by lowering the pedal plate so that the bottom of the rider's foot is level with the axle, thereby affording pedal stability and full utilization of the foot's power for bicycle propulsion. For the tourer, this increased stability and power-drive efficiency will be immediately apparent on the first ride.



Positive and rythmic pedalling without power-loss

Comparison of Balance: DD vs Conventional Pedal



The pedalling power applied on the front and rear portions of a pedal should be equal for best balance. Contrary to the imbalance seen on the conventional pedal, the DEORE DD pedal maintains its stability and shows superb performance with crank angles between 90—150°, a range where the revolving force is most efficiently transformed into driving power.

Aerodynamic Design

The distinctive shape of the DEORE DD pedal is not simply a matter of eye-catching design.



Rather, it's the inevitable outcome of Shimano's search for an aerodynamic design capable of reducing air resistance to the absolute minimum.

Improved Shoe Grip

With the DD pedal, "ankling" stability is not only enhanced by the lowered pedal axle, but also by the contoured shoe plate, for a better grip. You get an exact shoe-to-plate fit, regardless of type, size and shape of your shoe.

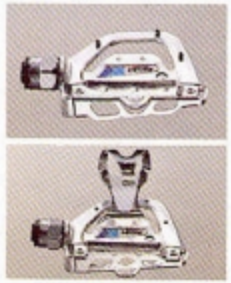


Adjustable Spike Pins

The DEORE DD pedal comes with three spike pins, positioned according to a definitive look at the morement dynamics of the foot. If uncleated shoes are worn, the pins prevent slippage, affording enhanced grip and maximum efficiency.



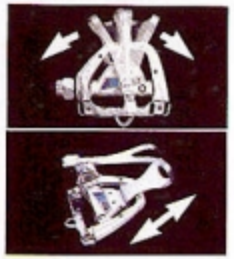
Turnplate for Racing Shoes



If cleated shoes are worn, the back piece of the pedal shoe plate can be removed and inverted allowing the cleat to engage the pedal properly.

Adjustable Toe Clip

The unique design of the DEORE DD pedal toe clip allows adjustment not only forward and backward, but also from side to side. The result is a toe clip position tailored perfectly to the rider's shoe size and shape.



Sealed Mechanism

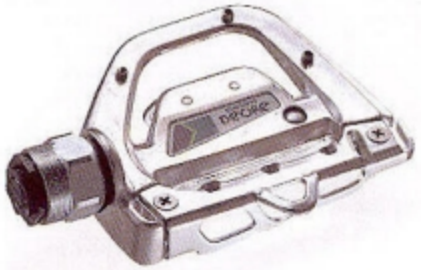
DEORE DD Pedal

Model PD-DE10

SPECIFICATIONS

Weight: 20.1oz. (570g.)
Material: Body/Light Alloy
: Cup Cone/Chromium Molybdenum Steel
Crank Thread: BC1" × 24T.P.I.
Right-handed Screw (Right Pedal)
Left-handed Screw (Left Pedal)
Type: DD Mechanism, Aerodynamic Design, Sealed Mechanism
Use: DEORE Front Chainwheel





Triple-gear Sprocket with 18-Speed Capability

The DEORE front chainwheel introduces a fine blend of functional superiority and fashionable style. The chainwheel is cold forged alluminum alloy, affording excellent rigidity, graceful lines and aerodynamic sleekness, while the 5-pin spider with triple chainwheel capability makes possible up to 18 speeds, all with ultra-smooth shifting. Conventional triple sprocket front chainwheels present real shifting problems from the inner to middle gear. In many cases, because of this difficulty, one must first shift to the outer gear, then down to the middle. Poor alignment and noise also plague use of the lower front and higher rear gear combinations.



Because of these problems, with conventional systems the full 15- or 18-gear capacities are rarely used.

Not so with the DEORE chainwheel system. Shimano has applied its system component approach to the problem, developing a true 18-speed system that maintains the same spindle length as the Conventional Model (121.5mm). At any time, the double-chainwheel DEORE front chainwheel can be converted to a triple-chainwheel system, without changing the 119mm spindle. And, more important, this can be done with greatly reduced alignment and noise problems.

Forged Outer Sprocket with Smooth Lines

Since the outer sprocket in the DEORE series is an all-aluminum forged alloy, it offers more rigid construction and greater lightness than conventional triple-gear types. Another advantage of the DEORE series forging is a freedom of sprocket shape and bold overall design not found in competitive component systems allowing for a sleek, aerodynamic design.



Forged outer sprocket with aerodynamic styling.

Aerodynamic Design

The aerodynamic design of the DEORE chainwheel is an extremely important feature, because Shimano belives that reducing air resistance to a minimum is a requirement for every touring component. The same aerodynamic engineering principles used in designing the Dura-Ace EX front chainwheel, have been fully utilized in the DEORE, as can be seen from the streamlined shape.



DEORE touring chainwheel with aerodynamic design.

5-pins with Fixed Position Nuts

For riders who frequently change sprockets, Shimano has introduced fixed position nuts. Wear and tear is reduced while at the same time work can be done much more quickly and efficiently. The DEORE series components are also made so as to be readily interchangeable with other components. This versatility is just another example of Shimano's component systems approach to the complete touring bicycle.





Long service life is assured by 5 pins with fixed position nuts.

One Key Release

Safety Crank Arm

DEORE Front Chainwheel

Model FC-DE21 (Double/LD Type)
FC-DE20 (Double/MD Type)
BB-6210 (Spindle Length 119mm.)

SPECIFICATIONS

Material: Light Alloy (Top Sprocket/Forged)
Type: Cotterless 5-Pin Type
Chain Ring: 1/2" × 3/32" Chain (2mm.)
Teeth: LD Type/Inner Chain Ring 39T~45T
Outer Chain Ring 48T~53T
: MD Type/Inner Chain Ring 34T~35T
Outer Chain Ring 48T~50T
Crank Lengths: 6-1/2" (165mm.), 6-3/4" (170mm.)
Crank Thread: BC1" × 24T.P.I.
Cup Thread: English 1.37" × 24T, French 35 × 1.0
Aerodynamic Design, One Key Release, Safety Crank Arm
Use: With DEORE DD Pedal

Model FC-DE31 (Triple/LD Type)
FC-DE30 (Triple/MD Type)
BB-DE30 (Spindle Length 121.5mm.)

Teeth: LD Type/Inner Chain Ring 28T~33T
Middle Chain Ring 39T~45T
Outer Chain Ring 48T~53T
: MD Type/Inner Chain Ring 28T~33T
Middle Chain Ring 34T~37T
Outer Chain Ring 48T~50T

new





ALTUS SERIES SELECTA

The Ideal Gearshifting System! High shifting performance plus outstanding strength.

At Shimano, we have constantly examined the integrated functions of the bicycle's drive train and braking system. This thorough research has been responsible for some of the bicycle's most progressive improvements. Gearshifting performances, especially, have seen vast changes. And our "System Components" philosophy, whereby all components are made to work together in perfect unison, has produced such successes as the FF System, the PPS System and, recently, the "EX Series".

Recognising that the gearshift system plays the most important role in the development of the modern multi-speed bicycle, we have given this area a great deal of attention in order to bring the consumer easier, smoother and more accurate gearshifts.

The ALTUS REAR DERAILLEUR is another of our innovations designed to make cycling a more pleasure experience.

The secret of this system is an incredibly innovative device which we have called the CENTERON MECHANISM. It solves virtually all former problems of gearshifting.

Along with the ALTUS, we have also developed an entirely new front chainwheel system called the SELECTA. The Shimano "ALTUS/SELECTA" Series provides an excellent gearshifting system which will make the bicycle a real pleasure to ride in this modern age.

SHIMANO ALTUS / SELECTA SERIES

SHIMANO ALTUS-LT
Rear Derailleur

Model RD-AT12 (Short Cage)

SPECIFICATIONS

Capacity: Front Difference/13 Teeth or Less
Rear Largest Sprocket/28 Teeth or Less
(*30T: Use Shimano Products Only)
Weight: 9.2 oz. (262 g.)/Except Bracket
Material: Light Alloy/Bracket Body, Outer Link
: Steel/Others
Type: Servo Panta Mechanism, Centeron Mechanism, Hatch-Plate Mechanism



SHIMANO ALTUS-ST Rear Derailleur

Model RD-AT11 (Short Cage)

SPECIFICATIONS

Capacity: Front difference/13 Teeth or Less
Rear Largest Sprocket/28 Teeth or Less(Short)
(*30T: Use Shimano Products Only)
Weight: 10.7 oz. (303 g.)/With Bracket
Material: Light Alloy/Bracket Body
: Steel/Others
Type: Servo Panta Mechanism, Centeron Mechanism and Hatch-Plate Mechanism
Available by Request: Brazed-on Type



SHIMANO ALTUS-LT
Front Derailleur

Model FD-AT12

SPECIFICATIONS

Capacity: 14 Teeth or Less
Weight: 4.3 oz. (122 g.)
Material: Light Alloy (Body)
: Steel (Chain Guide)
Type: Lower Inlet Type 1-1/8"
Trap-Ease Mechanism



SHIMANO ALTUS-ST
Front Derailleur

Model FD-AT11

(Old No. EF-100)

SPECIFICATIONS

Capacity: 14 Teeth or Less
Weight: 4.3 oz. (122 g.)
Material: Light Alloy (Body)
: Steel (Chain Guide)
Type: Lower Inlet Type 1-1/8"
Trap-Ease Mechanism



SHIMANO ALTUS-LT
Rear Derailleur

Model RD-AT22 (Long Cage)

SPECIFICATIONS

Capacity: Front Difference/13 Teeth or Less
Rear Largest Sprocket/34 Teeth or less
(*30T: Use Shimano Products Only)
Weight: 9.8oz. (277g.)/Except Bracket
Material: Light Alloy/Bracket Body, Link
: Steel Others
Type: Servo Panta Mechanism, Centeron Mechanism, Hatch-Plate Mechanism



SHIMANO ALTUS-ST Rear Derailleur

Model RD-AT21 (Long Cage)

SPECIFICATIONS

Capacity: Front Difference/13 Teeth or Less
Rear Largest Sprocket/34 Teeth or Less
(*30T: Use Shimano Products Only)
Weight: 11.2oz. (318g.)/With Bracket
Material: Light Alloy/Bracket Body
: Steel/Others
Type: Servo Panta Mechanism, Centeron Mechanism and Hatch-Plate Mechanism
Available by Request: Brazed-on Type



Centeron Mechanism

The Centeron Mechanism has been standardized and equipped on the ALTUS Rear Derailleur and ALTUS Shifting Levers. The result is a natural and quiet gearshift without any of the problems normally associated with multi-speed bicycles. The Centeron Mechanism is a unique method of centering the chain on the sprockets by using the natural force of the chain's tension. A special arm attached to the rear derailleur and synchronized with the shifting lever allows the chain enough latitude to follow a natural line when making a gear change. This is sufficient to center the chain on the chosen sprocket without time-consuming fine-lever adjustment.



Free-play of the Rear Derailleur



Free-play of the Shifting Lever

Trap-Ease Mechanism



Trapezium shaped swing motion of Trap-Ease Mechanism.

The free "swing" motion of the Trap-East Mechanism has now replaced the pantograph's awkward parallel movement. When shifting from low (small gear) to high (large gear), the swing allows the inner plate to lift the chain up and deposit it squarely on the gear sprocket teeth without any interference. The efficient movement of the "Trap-Ease" Mechanism means less force—and therefore a shorter stroke—is needed to shift the gear lever but still the equivalent power of a conventional front derailleur is produced.

SHIMANO ALTUS-LT DOWN TUBE
Shifting Lever

Model SL-AT22 (Band Type)
SL-AT23 (Brazed-on Type)

SPECIFICATIONS
Weight: 3.0 oz. (85 g.)/Band Type
: 1.7 oz. (46.8 g.)/Brazed-on Type
Material: Light Alloy, Steel
Type: Friction Type
Attachment Position: Down Tube
Lever Clamp Diameter: 1-1/8"
Centeron Mechanism
Use: Shimano ALTUS Rear Derailleur with Centeron Mechanism Only
Single Lever Available



Brazed-on Parts



SHIMANO ALTUS-LT STEM
Shifting Lever

Model SL-AT12

SPECIFICATIONS
Weight: 3.3 oz. (94 g.)
Material: Light Alloy, Steel
Type: Friction Type
Attachment Position: Handle Stem
Lever Clamp Diameter: 7/8"
Centeron Mechanism
Use: Shimano ALTUS Rear Derailleur with Centeron Mechanism Only
Single Lever Available



SHIMANO ALTUS-ST DOWN TUBE
Shifting Lever

Model SL-AT21 (Band Type)

SPECIFICATIONS
Weight: 3.0 oz. (84 g.)/Band Type
: 1.6 oz. (45.8 g.)/Brazed-on Type
Material: Light Alloy, Steel
Type: Friction Type
Attachment Position: Down Tube
Lever Clamp Diameter: 1-1/8"
Centeron Mechanism
Use: Shimano ALTUS Rear Derailleur with Centeron Mechanism Only



Single Lever Available



SHIMANO ALTUS-ST STEM
Shifting Lever

Model SL-AT11

SPECIFICATIONS
Weight: 3.3 oz. (93 g.)
Material: Light Alloy, Steel
Type: Friction Type
Attachment Position: Handle Stem
Lever Clamp Diameter: 7/8"
Centeron Mechanism
Use: Shimano ALTUS Rear Derailleur with Centeron Mechanism Only



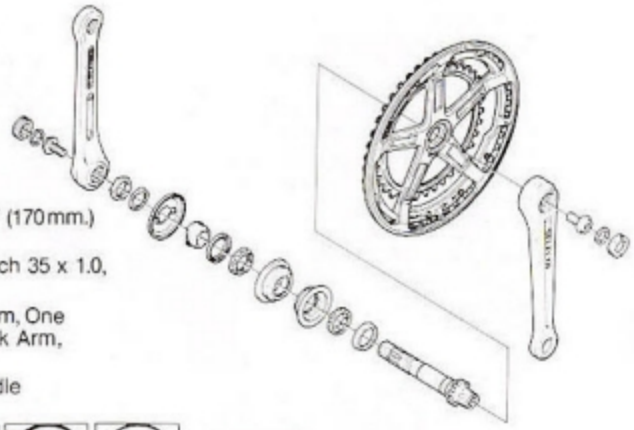
Single Lever Available



SELECTA-T Front Chainwheel

Model FC-SL24 (Double)
BB-SL31

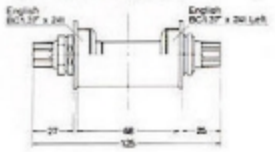
SPECIFICATIONS
Material: Light Alloy
Type: Cotterless
Chain Ring: 1/2" × 3/32"
Teeth: 36T-48T Type, 42T-52T Type
Crank Lengths: 6-1/2" (165mm.), 6-3/4" (170mm.)
Crank Thread: BC 9/16" x 20 T.P.I.
Cup Thread: English 1.37" x 24t, French 35 x 1.0, Italian 36 x 24 T.P.I.
W-cut Mechanism, M Teeth Mechanism, One Key Release Mechanism, Safety Crank Arm, Octa Joint Crank
Option: Cover Cap for Left Side Spindle







Spindle Length: [Unit: mm.]



FREEHUB-SQ (FH-SQ)

Model FH-Q610 (Small 6-speed)
FH-Q510 (Small 5-speed)

SPECIFICATIONS

Weight • Over Lock Nut Dimensions • Amount of Dish:

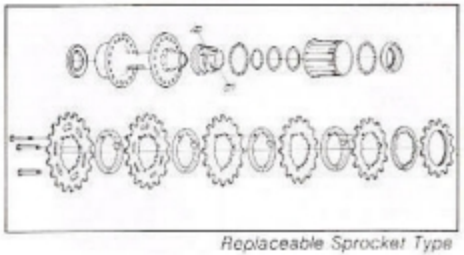
		Weight	Over Lock Nut Dimensions	Amount Dish
Front		8.6 oz. (245 g.)	3.78" (96 mm.)	-
Rear (Except Cassette Gears)	5-speed	14.3 oz. (405 g.)	4.72" (120 mm.)	0.07" (1.75 mm.)
		14.6 oz. (415 g.)	4.88" (124 mm.)	0" (0 mm.)
	6-speed	14.6 oz. (413 g.)	4.72" (120 mm.)	0.28" (7.05 mm.)
		14.6 oz. (415 g.)	4.88" (124 mm.)	0.21" (5.3 mm.)

Material: Light Alloy
Sprocket: Black Finish
Teeth: Threaded Sprocket 13T~15T
Spline Sprocket 14T~28T
Spoke Holes: 36H
Type: Quick Release, Uni Balance Mechanism, Uniglide Teeth, Cassette Gear Sealed Mechanism
Use: With Hatch-Plate Rear Derailleur

Shimano Freehub-SQ, SN Sprocket Combinations:

High Gear (Threaded)	5-SPEED Gears from 2nd (4 gears united)	6-SPEED Gears from 2nd (5 gears united)
13T	14, 15, 16, 17T	14, 15, 16, 17, 18T
	15, 17, 19, 21T	14, 15, 17, 19, 21T
	15, 17, 20, 23T	15, 17, 19, 21, 23T
14T	16, 18, 20, 22T	15, 16, 18, 21, 22T
	16, 18, 21, 24T	16, 18, 20, 22, 24T
15T	18, 21, 24, 28T	17, 19, 21, 24, 28T

We offer a wide range of tooth sprockets. High gear (threaded sprockets), from 12T to 15T, other gears (spline-type), from 13T to 28T. Even if all 3 bolts of the unit gear are removed the bicycle can still proceed unhindered.



Replaceable Sprocket Type

FREEHUB-SN (FH-SN)

Model FH-N610 (Small 6-speed/Nut Type)
FH-N510 (Small 5-speed/Nut Type)

FREEHUB-SK (FH-SK)

Model FH-K610 (Small/6-Speed /Cap Nut Type)
FH-K510 (Small/5-Speed /Cap Nut Type)

SPECIFICATIONS

Weight • Over Lock Nut Dimensions • Amount of Dish:

		Weight FH-SK	Weight FH-SN	Over Lock Nut Dimensions	Amount of Dish
Front		6.7 oz. (190 g.)	6.3 oz. (180 g.)	3.66" (93 mm.)	—
Rear (Except Cassette Gears)	5-speed	13.6 oz. (386 g.)	12.8 oz. (364 g.)	4.88" (124 mm.)	0" (0 mm.)
	6-speed	13.6 oz. (386 g.)	12.8 oz. (364 g.)	4.88" (124 mm.)	0.21" (5.3 mm.)

Material: Light Alloy •
Sprocket: Black Finish
Teeth: Threaded Sprocket 13T~15T
Spline Sprocket 14T~28T
Spoke Holes: 36H
Type: Uni Balance Mechanism, Uniglide Teeth, Cassette Gear, Sealed Mechanism
Use: With Hatch-Plate Rear Derailleur

FREEHUB PROTECTOR

Model CP-FH10 (For 26"/Black)
CP-FH20 (For 27"/Blue)

SPECIFICATIONS

Diameter: 5" (127mm.)
Material: Steel & Resin
Use: Small Flange Hub 36H
Use Range: Low Sprocket 24T, 26T, 28T



FREEHUB PROTECTOR

Model CP-FH30 (For 36 Holes)
CP-FH40 (For 28 Holes)

SPECIFICATIONS

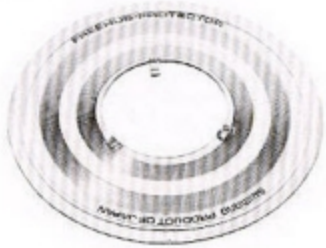
Diameter: 5.4" (137 mm.)
Material: Resin
Use Range: Low Sprocket 28T, 30T (for 28 Holes)
24T, 26T, 28T, 30T (for 36 Holes)

FREEHUB PROTECTOR

Model CP-FH50
CP-FH51

SPECIFICATIONS

Diameter: 7-1/2" (190 mm.)
Material: Resin
Use Range: 36 Holes Only Low Sprocket
28T, 30T/Model CP-FH50
32T, 34T/Model CP-FH51



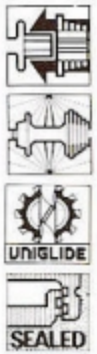




Model FH-Q510

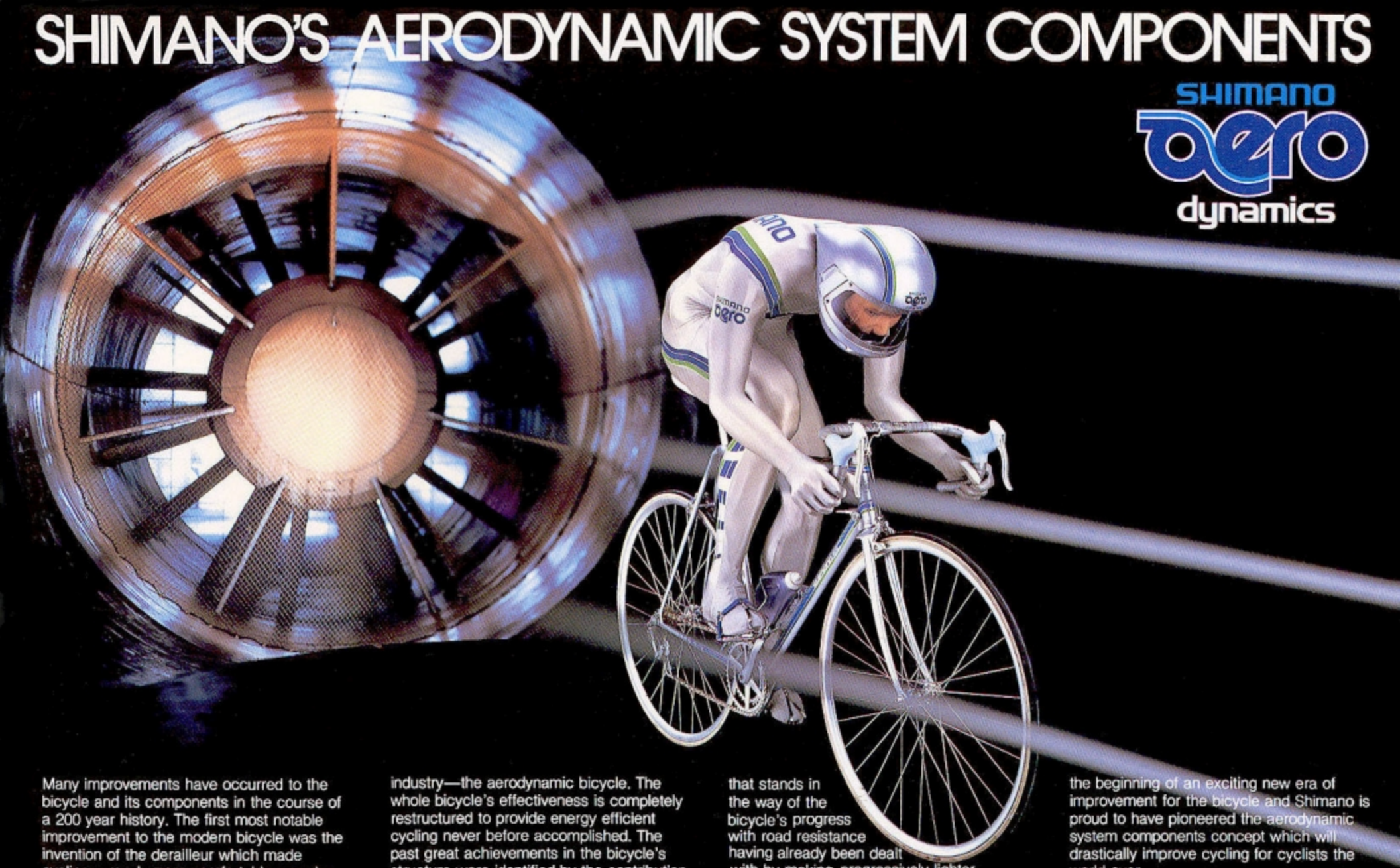


Model FH-N610



SHIMANO'S AERODYNAMIC SYSTEM COMPONENTS

SHIMANO aero dynamics



Many improvements have occurred to the bicycle and its components in the course of a 200 year history. The first most notable improvement to the modern bicycle was the invention of the derailleur which made cycling a much more comfortable exercise. The second historical innovation came about through the introduction of new metals which made possible lighter weight bicycles.

The Aerodynamic Era

Now another breakthrough of historical dimensions has revolutionized the bicycle industry—the aerodynamic bicycle. The whole bicycle's effectiveness is completely restructured to provide energy efficient cycling never before accomplished. The past great achievements in the bicycle's structure were identified by the contribution they made to comfort and speed. These elements took up most of the bicycle industry's time and effort in trying to improve the bicycle.

Recently, however, Shimano through intensive wind tunnel tests and related research identified another area in need of much improvement—air resistance.

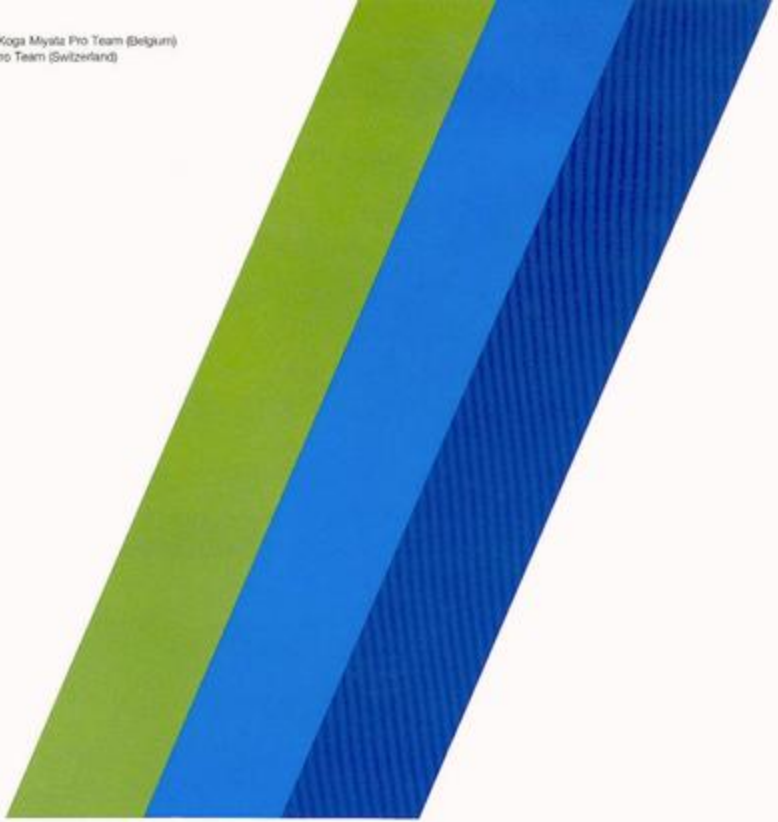
Air resistance is now the biggest obstacle that stands in the way of the bicycle's progress with road resistance having already been dealt with by making progressively lighter components.

By overcoming air resistance, the rider is able to win races and break time trial records, and most important, all categories of cyclists benefit from the extra comfort derived from using energy more productively This achievement signifies another great landmark in the 200 years of the bicycle's history. 1980 will long be remembered as the beginning of an exciting new era of improvement for the bicycle and Shimano is proud to have pioneered the aerodynamic system components concept which will drastically improve cycling for cyclists the world over.

We are now preparing Aerodynamic Shimano Component Catalogs.

For further information on Shimano's complete range of aerodynamic components and data, please write or telephone to your nearest distributor or directly to Shimano at one of the addresses listed on this catalog.

Cover Photos:
Shimano sponsored team (l) Capri Sonne/Koga Miyata Pro Team (Belgium)
(r) Clo Aufina Pro Team (Switzerland)



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