

GEAR GUIDE

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CRANK LENGTH

Crank arms – the ‘arms’ – come in different lengths to match different length legs and leverage preferences. The average is 172.5mm but 170 and 175mm cranks are relatively common on complete smaller and larger bikes respectively, and you can get as short as 160mm or as long as 180mm.

2

AXLE

Most cranksets use an axle permanently fixed to the driveside crank and a left crank that bolts/clamps into place. Some brands still use a separate axle, while Campagnolo uses two half axles that join in the centre on its Ultra Torque designs. Most come with 24mm steel axles or 30mm alloy ones.

CHAINSETS

We test 12 of the latest chainsets to see which are watt friendly winners and which are slow shifting fails



Crank arms are the crucial levers that turn pedal pressure into propulsion and upgrading this transmission centrepiece

is always a cosmetic and performance temptation. But what do you need to know to arm yourself with the right chainset – cranks, axle, spider and chainrings – for your bike and riding?

Before you even start thinking about budget or clever design, you need to check which ones will fit your bike. Even though we tried to limit the axle types on test as much as possible, the sheer number of bikes we had to rope into our testing regime to find a home for all the different

variants shows it's no simple task. Even on same diameter axles, different details mean that different brands often need their own specific bearings to work. Adaptors and converters have made things easier recently but different bearing sizes and fitting standards are still a potential minefield so it's still essential that you double check your chosen crankset will fit your frame before you part with any cash.

Don't assume that bigger axled cranks are stiffer, either. Overall stiffness is governed by the entire structure, from the chainrings, through the spider and crank then across the axle to the offside crank. While they look fancy, don't assume that

carbon fibre cranks are automatically stiffer than alloy ones either, as both materials use a range of manufacturing methods for a wide spread of results.

Don't get hung up on weight either, as chainsets sit in the most central, lowest point of your bike possible. This makes their weight the least obvious of any component in dynamic or handling terms and it's why most pro bikes use torque meters or even extra heavy axles to bulk their weight up to the minimum legal lever. Conversely, a lightweight crank that flexes so much it feels like your feet are bending under your bike is really demoralising when you're trying to claw your way up a climb. →





3

SPIDER

The four or five-arm piece that connects chainrings to axle. Some are moulded into the arms, some made separately but permanently attached, others are removable. Standard (53/39) chainrings generally have a 130mm bolt circle diameter (BCD – the fitting pattern for the rings), compact (50/34) 110mm.

4

CHAINRINGS

Most chainrings are made from a single-piece reinforced disc with teeth cut into the edge. In many cases brands are interchangeable or replaceable with aftermarket options. Shimano's 'blended' chainring/spider design demands specific replacements to keep aesthetic and functional form.

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6

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MATERIAL

Solid forged alloy cranks are the cheapest option but generally the heaviest. Drilled or hollow moulded alloy cranks then follow in the fashion (but not necessarily function) hierarchy. Carbon wraps on alloy armatures look good but don't always perform well and even 'full' carbon cranks have to use alloy pedal and axle interfaces.

6

BEARINGS

As well as different axle diameters, different bearing shoulder dimensions mean most cranks will only run in bearings from the same brand or specific aftermarket options, though converters are reducing the number of 'impossible' combinations. None of our test cranks obviously lost spin smoothness during our test period.

WE SAY
Zayante 'Turns' Praxis's excellent reputation into an outstanding chainset



TURN ZAYANTE

★★★★★ £240
Happy threesome

Weight 742g **Crank length** 172.5mm
Chainrings 52/36 **Axle** 30mm alloy

Praxis Works has developed an excellent reputation for its converter bottom brackets and durable, slick-shifting cold forged rings. These cranks 'Turn' them into a complete package. While the hollow forged arms are relatively heavy they combine with the fixed 30mm axle to feel impressively stiff however hard you're muscling them round, and converter BBs mean they fit threaded or BB86/BB92 bottom brackets which are normally limited to 24mm axles. Shifting is excellent and bearing and chainring longevity are already the benchmark even in grim UK weather. Both BCD sizes are available, giving 46/36, 50/34, 52/36 or 53/39 options.

CYCLING PLUS
BEST ON TEST

HIGHS
Durability, stiffness and compatibility

LOWS
Durability and stiffness add weight



CYCLING PLUS
BEST VALUE

SHIMANO 105
★★★★★ £120

Weight 759g **Crank length** 175mm
Chainrings 52/36 **Axle** 24mm steel

If there's a version to suit you, 105 delivers all Shimano's latest innovations at a bargain price. The four-arm spider and seamlessly synching 3D formed rings are asymmetric to support the rings in their highest load phase. A composite web bonded onto the back of the big ring creates an impressively solid feeling crank. Weight is reasonable, shifting quality excellent and installation in Shimano's long running bearings is easy. Only expensive Shimano rings will fit, though, and complete chainsets are currently 50/34 or 52/36 with no triple ring or BB30 axle option.



SRAM RIVAL 22
★★★★★ £145

Weight 883g **Crank length** 175mm
Chainrings 52/36 **Axle** 24mm steel

SRAM's mid price crankset works okay but is weighty. Rival uses similar deep machine sculpted X Glide R chainrings as Force for easy shifting function, and the similar scooped-back, removable spider means stiffness is decent, with reasonable if not dramatically rigid power transfer. The 110mm BCD spider is available in 50/34, 52/36 and 46/36 cyclo-cross formats and can even be switched for a CX1 single ring spider. The solid forged, hollow backed cranks are significantly heavier than its obvious competitor, Shimano 105, and the BB30 version is even weightier.



SRAM FORCE 22
★★★★★ £232

Weight 709g **Crank length** 175mm
Chainrings 52/36 **Axle** 24mm steel

With its broad gloss carbon arms, forged removable spider and laser-etched X Glide R chainrings, SRAM's Force is a very good looking chainset. Shifting performance is clean and prompt, it's lighter than similar priced alloy competitors and the £260 BB30 version is a few grams lighter still. Both 110mm and 130mm BCD five-armed spiders mean 53/39, 50/34, 52/36 and 46/36 cyclo-cross options, and it can be switched for a CX1 single ring spider. Stiffness is okay if not outstanding under full gas power, confirmed by independent testing we've seen.



WE SAY
Stunning shifting
but skinny axle
only and spares
are costly

SHIMANO DURA-ACE

★★★★★ **£375** > Crank up the quality

Weight 636g **Crank length** 175mm **Chainrings** 52/36 **Axle** 24mm steel

Shimano's flagship chainset is a striking and sweet-shifting unit. The 3D chainring arms synching into the spider, introduced with last generation 7900 series Dura-Ace, has been refined with an asymmetric 110mm BCD spider design using four broader arms. The outer chainring uses an alloy backing plate to create an extremely stiff hollow structure and Shimano's ramp and pin arrangement delivers the best front shifts in the business. The polished face arms are cosmetically very durable.

Replacement rings cost up to £130, though the number of aftermarket options are increasing. While the cranks are stiff under high pressure pedalling, the 24mm axle means

overall stiffness is adequate rather than amazing. Drive often dilutes further if you have to use an adaptor in an oversized BB shell to compensate for the fact that Shimano still doesn't make a BB30 version.

INSIDE INFO

Bearing up

There's a rundown of bottom bracket standards and their pros and cons at tinyurl.com/cplus-bb but the basics are as follows.

Despite the same 24mm diameter axle, different details mean SRAM and Shimano require their own bearings in the format for your frame. Shimano and

FSA are generally interchangeable and so are some Miche and Campagnolo.

After being introduced by Cannondale, 30mm alloy axled cranks are now available from Cannondale, SRAM, FSA, Rotor, Specialized and Turn, but converters mean BB30 or PF30 specific frames aren't necessarily essential.



CAMPAGNOLO ATHENA CARBON

★★★★★ **£286**

Weight 650g **Crank length** 172.5mm
Chainrings 50/34 **Axle** 24mm steel

The Athena's one-piece slim carbon cranks and spider make this a light unit at any cost. The fifth 'arm' of the spider is actually a direct fit onto the crank to add extra support to the relatively spindly rings. Heavy or powerful riders will notice definite deflection and a drive-diluting rubber chain sensation when they're at full throttle. Chainring longevity is good, though, and the axle-mounted driveside bearing guarantees Campagnolo's reputation for season after season of smoothness. You'll need Campag tools for installation/removal, though.

HIGHS
Impeccable shifting, smooth bearings

LOWS
Expensive spares, limited fit

WE SAY
Reasonably stiff,
but we expect less
weight and better
shifting for
£500

MICHE SUPERTYPE CARBON HSL

★★★★★ **£500**
Distinctive looker

Weight 697g **Crank length** 172.5mm
Chainrings 52/36 **Axle** 24mm steel

Miche has tried some interesting features with its top of the range chainset but it doesn't perform like a £500 one should. The hollow carbon cranks and broad four-arm spider are fractionally heavier than the already relatively lardy Campagnolo Record UT (below). The 110mm asymmetric BCD rings are joined by two extra bolts for support across the largest arm gaps and they're deeply webbed too so they feel stiff underfoot. The steel axle is Shimano-compatible and ring wear has been good so far too. The splined taper is very stiff to fit though, there's no BB30 option and shifting is occasionally glitchy under power, which isn't what you'd hope for £500.

HIGHS
Stiff, Shimano compatible

LOWS
Heavy and glitchy for the price



KCNC RD K-TYPE

★★★★★ **£300**

Weight 632g **Crank length** 172.5mm
Chainrings 50/34 **Axle** 24mm steel

KCNC's heavily machined crank is the only design here to use a separate axle, but a year of running an identical setup – external cup, stainless steel bearing bottom bracket and big diameter scandium alloy spindle mountain bike design – has proved it's reliably secure. The rings wear well, too, though shifting isn't quite as quick as bigger brand designs. There's a soft feel underfoot when you're really stamping the power down and there are only 53/39 or 50/34 chainring options. It is the lightest alloy crank here, and unlike the others, the price includes the bottom bracket.



CYCLING PLUS
MOST WANTED

SRAM RED 22

★★★★★ **£331**

Weight 594g **Crank length** 175mm
Chainrings 52/36 **Axle** 24mm steel

SRAM's flagship chainset is a combination of high stiffness, low weight and multiple fit options. The broad carbon cranks and spider are moulded together, with the crank forming the fifth connection point for the deeply webbed X Glide R chainrings. This creates an impressively stiff feel even in the skinny axle version we tested, but it's also available with a stiffer 30mm alloy axle and a full range of ring options. Shifting isn't quite as slick as Shimano Dura-Ace but it's still better than most, and the replacement rings and complete crankset are cheaper and lighter too.



CAMPAGNOLO RECORD UT

★★★★★ **£470**

Weight 678g **Crank length** 175mm
Chainrings 52/36 **Axle** 25mm steel

Campagnolo's four-arm chainset spins beautifully, but it's heavy for cost and the unique chainrings are a pain. The one-piece broad unidirectional carbon crank and 'webbed' spider design is shared with £658 Super Record. A stainless steel axle and bearings reduce cost for minimal weight gain and decent if not dramatic stiffness. Two BCDs, 112mm and 145mm for inner and outer rings, means spare rings are specific and there's no BB30 option. The Ultra Torque axle is easy to fit with a long 8mm Allen key and the pre-fitted bearings are beautifully smooth. →

WE SAY
Distinctively solid,
universal fit crank
with optional
asymmetric
rings



ROTOR 3D+

★★★★★ £514

Weight 651g **Crank length** 175mm
Chainrings 50/34 **Axle** 30mm alloy

This has been around for a while but it's still a distinctively stiff and wide fitting option. The ribbed alloy cranks with triple internal drilled channels look old school but feel rock solid. That feeling is bolstered by the 30mm axle and Rotor has developed an external bottom bracket design that makes the crankset compatible with threaded frames and completes its universal compatibility. We've had some short lifespans from press-fit Rotor bearings, so regular TLC is wise in filthy conditions. But the heavily machined chainrings are stiff and durable, weight is good and splined fit is secure if tightened

aggressively from new. The 110mm five-arm spider gives a wide range of ring options including Rotor's own asymmetric Q-Rings if you fancy experimenting.

HIGHS

Obviously stiff,
universal fit

LOWS

High price, bearings
need TLC



FSA K-FORCE LIGHT

★★★★★ £640

Weight 567g **Crank length** 175mm
Chainrings 50/34 **Axle** 30mm alloy

FSA's top model is eye-wateringly expensive but very light and impressively stiff. The fat carbon cranks use a hollow construction and the deep arms of the spider sync with Shimano style 3D machined chainring arms. Add the 30mm spindle and the result is an impressive stiffness to weight ratio. Using adaptors, the 386EVO axle/BB design gives a universal frame fit and reliability on several 386 setups we've used has been good. Shifting is occasionally hesitant and there's no 52/36 option currently, but there is a stealth grey version.

VERDICT

It's easy to build up preconceptions when testing chainsets as part of a complete bike, but testing them head to head in isolation has thrown up some interesting results. There's certainly a big drop off in genuine gain for increased spend once you go much past £300. This makes the light, tight but still relatively affordable SRAM Red 22 chainset our real world race winner. The solid, slick-shifting Shimano 105 also shames a lot of chainsets double or even quadruple the price, to crank out a decisive victory for value.

Our overall winner is a chainset many won't even have heard of. Turn's Zayante takes the proven performance of Praxis's existing components and adds dramatically stiff hollow-armed torque transfer. The result is an extremely tough, durable, all-weather, all-purpose chainset that proves a relentless work ethic is way more important in real world riding than a few grams saved in the last place on your bike you'll notice them. **PLUS**