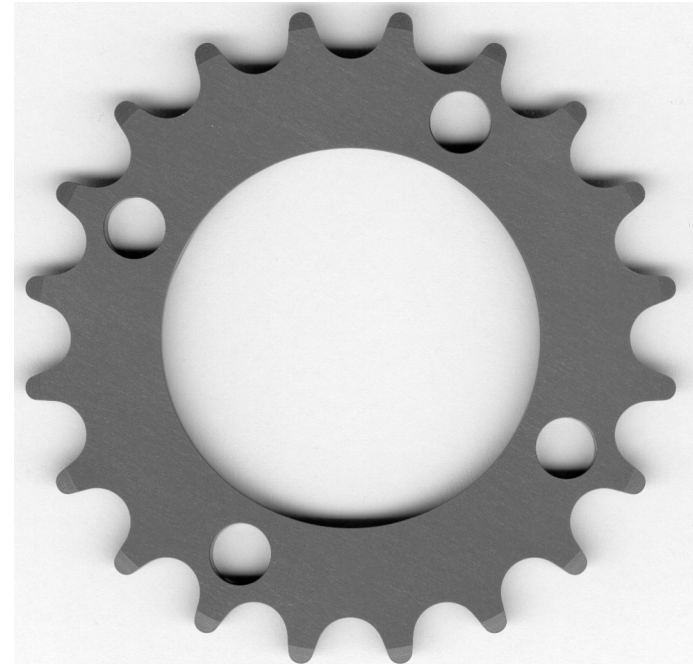

Mountain Goat
20/4 stambecco

The 20 tooth chain ring suited for
four-arm cranks (Compact Drive)

extremely withstanding aluminium alloy,
hard-anodized, or V2A steel



Once upon a time ...

At the early days of the first mountain bikes the gear ratio of ordinary road bicycles was 48- 36- 26. This was - of course - little use for going steeply uphill. In the early nineties, Suntour launched the microdrive system 42- 32- 20 and Shimano called their system CompactDrive, it being a 44-32-22t. With this five-arm system it was perfectly easy to substitute the 22t chain ring by a 20t. Of course, this was the big winner for the bikers. Not to mention that the new system saved them a lot of weight but for the first time a biker was able to master long and spectacularly steep climbs. This opened new possibilities especially to those crossing high mountain ranges.

The technical evolution, however, continued. Shimano decisively switched from their five-arm to a four-arm crank and changed the bolt-circle diameter from 58 to 64 mm. Most manufacturers followed up. Thus, the 20t vanished from the cranks. Some tinkerer tried to redo the 20t from five-hole chain rings into four-hole chain rings but failed. Even though it's possible to fit the four bores onto the 20t chain ring there is a risk that the chain will "ride" on the bolts and that part of the crank surrounding the internal thread and this due will slip.

And today?

This is where the Mountain Goat 20/4 stambecco tackles the challenge. On top of that, we have solved a frequent problem with the formerly five-arm crank related 20t chain rings - the inferior quality of the material. We have introduced a new material which withstands the enormous tractive forces while shifting 20/32 and which endures any signs of wear and tear for a so far unsurpassed period of time.

Technical data

The 20/4 stambecco can be installed to all common four-arm cranks (CompactDrive) with the chain rings 44-32-22 replacing the 22t chain ring.

Bolt-circle diameter 64 mm, bolt-circle gap 45.3 mm

Tightening momentum for the bolts 8-11 Nm

Material: CNC carved aluminium alloy AlZnMgCu1.5 F53, hard-anodized, oiled

Equipment available:

Washers bsch-20/4

Bolts schr-20/4 (thread 12 mm, head diameter 11 mm)

Spacer sp-20/4 (for E-type-derailleur)

Usable chains: all 9-fold chains

Additionally, the 20t has successfully been tested with the broad 8-fold chains with and chains with broad links as well as with really wrong chains such as 10-fold chains (road chains).

A note on the bolts schr-20/4:

Using normal bolts with a 12 mm head diameter the chain will leave traces of friction on the bolt head. Therefore, the bolt heads for the 20/4 stambecco have been reduced to 11 mm, their use is highly recommended. If, however, you need to use washers for the assembly (cf. assembly instructions) their use is technically obligatory (for safety reasons).

Assembly instructions

A quick note in advance: Sometimes 20/4 stambecco is installed within minutes; sometimes it seems to be rather reluctant. With the vast diversity of frames and components every bike is unique. The chain ring is meant to fit them all. This turns out to be easy at times and more difficult at others. There is hardly ever a problem with the crank, more often it is the frame and frequently it is the shifter. Please do take some time for reading the assembly instructions and strictly follow the steps described.

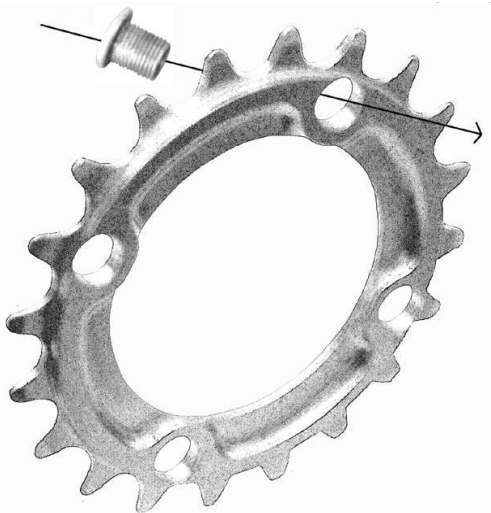
A) Check before assembly

1. Measure the chain, that is the spaces between the chain-links, with the suitable instrument (e.g. "chain caliper" by Rohloff) to check for signs of wear-out, i.e. extension.

2. Fit three washers onto one of the enclosed bolts and screw it into one of the holes for the small sprocket. If the diameter of the surrounding of the internal thread for the bolt at the crank is NOT wider than the diameter of the washers you can install the chain ring with the smooth side facing towards the pedal (meaning the right-hand side when facing forward) and without the washers. The chain must not touch the internal threads on the crank as otherwise it will slip when put under weight. This favourable situation is very seldom the case depending on the cranks. If the overhang is only marginal you might file the bits away (see clause D for this procedure). Likewise, this remains the only option if you do not want to change the chain line.

B) Assembly as in illustration no. 1

Having removed the crank and the 22t sprocket, put the 20t onto the crank, smooth side facing to the axis bearing, that is to the left (meaning the milled side is facing to the pedal). Then put some copper (Cu) paste or some ball bearing grease into the internal thread and slightly screw in the enclosed bolts, diagonally taking turns in fastening them evenly and increasingly by hand. Finally, tighten them with the torque wrench/spanner. Be careful not to tilt the bolts and ruin the thread. Do not tighten a bolt too much while the others are still a great deal more loose. Now re-install the crank.



ill. 1

Next step: adjusting the derailleur:

1. Switch to 44 (front)/11 (rear). Then, keep on turning the adjusting screw of the left shifter clockwise into the shifter until the metal of the cage starts rubbing the chain. Now, turn the adjusting screw back until the rubbing stops. If the adjusting screw is already in its end position and you can't screw it in any further, a slight release of the cable at the fixation of the shifting cable at the derailleur will allow a repositioning of the adjusting screw.

2. The derailleur has two tiny screws labelled L and H. Gently turn the H-screw inwards until you feel a slight resistance, then stop. Now, the outer end of the derailleur is fixed.

3. Shift to the middle blade 32/32(34). The chain MUST NOT rub the derailleur. If it does, please correct by using the adjusting screw.

4. Now turn the L-screw outwards until it starts turning really smoothly.

5. Shift from 32/32(34) to 20/32(34):

Case a) The chain falls left of the 20t chain ring onto the axis shell. Turn the L-screw inwards till the chain sets down centrally on the 20t chain ring.

Case b) The chain has set down centrally on the 20t chain ring. Perfect! Softly turn the L-screw inwards until you feel a slight resistance, then stop.

Case c) The chain still sets down between the middle blade and the 20t. What a pity! Follow the assembly instructions C (ill. 2) or move on to D straight away.

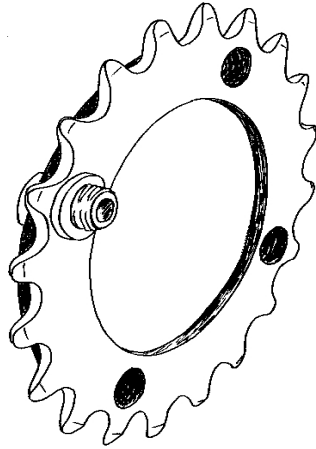
Tip: While going over tough off-road patches, e.g. stairs, the L- and H-screws may loosen and shift a little. You can prevent this by applying a drop of anti-loosening screw adhesive (middle grade, average strength) into the threads after the adjusting process.

This assembly always works with XTR-cranksets or with a Sram-shifter with more than three indexations for the front derailleur. It also sets the chain exactly onto the 20t blade with other cranks.

C) Assembly according to illustration no. 2

There are bikes where the chain (despite adjusting the derailleur) does sometimes fall between the 20t and the middle chain ring than exactly onto the 20t chain ring. Under weight the chain would then get stuck. The cause for this is the indexation of the shifter which can happen to be very narrow and, in addition to that, can be different among specimen of the same model. The space released by the shifting cable when shifting down from the middle to the small sprocket is tight. The 20/4 stambecco is thicker than a XT-blade and when installing it according to illustration no. 1 the gap to the middle cog wheel is accordingly bigger. The shifting cable sometimes cannot compensate the additional distance. However, if you had adjusted the derailleur in such a way that the chain would set down in the centre of the 20t, the shifter wouldn't manage the gap when shifting up to the 32 chain ring. Thus, follow the assembly instructions according to illustration no. 2 with the smooth side to the right and using the washers between the 20t and the thread. The 20t is now closer to the 32 than in the assembly of illustration no. 1 because of its asymmetric construction. Do use the washers as otherwise the chain might set

down onto the surrounding of the internal threads and thus might slip under weight. If this will actually happen, depends on how thick these thickenings surrounding the threads are (cf. ill. no.2).



ill. 2

This assembly method is successful for most cranks.

Security advice: It is absolutely necessary to use the enclosed 12 mm bolts as the screw-in depth of common bolts is too short (hence danger of breaking the threaded sleeve during assembly or loosening while in motion!)

D) TROUBLESHOOTING: What to do if nothing seems to work or to assemble within “five minutes”?

What to do if - as rarely happens, but never the less - neither B) nor C) worked?

PROBLEM: You have followed the assembly instructions as shown in illustration no. 2 but the chain still keeps falling between the medium and the small chain ring and gets stuck there. CAUSE: extremely narrow shifter indexing.

OR: Under load the chain – in spite of the washers - rubs at the thickenings around the threads and jumps.

CAUSE: the thickenings of this crank are too thick.

You may return the chain ring and we will refund the full price.

If you do not want to refund the 20/4 stambecco there is still some hope. Same if you have only “five minutes” for assembly. There’s a quick and effective method, if each minute is important for you. You might solve the problem by filing at the aluminium crank. BUT please be aware: you are now altering the original crank and may therefore lose your right to claim under guarantee. You are not acting upon our advice but on your own risk.



ill. 3



ill. 4

If you dare to take the risk here are a few hints to avoid mistakes.

- Remember: Never file the XTR crank because its to assemble as in illustration no. 1. All others:

1. File manually, do not use an electronic device.
2. Put three of the enclosed washers onto one of the enclosed bolts and screw it into one of the threads for the small blade. Now you can recognise by how much the shaft juts out of the washer at the crank. Mark this area with a felt tip pen.
3. Fix the crank into a vise and file off the overlapping bits by approximately 2 mm (ill. 3) at every shaft, but only at the very outer segment (ill. 4)



Setting up a new chain

After having set up a new chain it may happen, that the chain does not leave the chain ring but gets stuck to the crank (chain suck). Normally this informs you that your chainring is worn out. Not so about 20/4 stambecco. Except after a long time of use (more than 150.000 m of altitude) Mostly the new chain gets stuck to the surrounding of an internal thread for one of the bolts for the 20/4 stambecco. Perhaps you had filed but not wide enough. Or in spite of having assembled washers the chain touched the surrounding of the internal thread and „filed“ itself and did it not wide enough. Differences from one chain to the other - may be only 1/1000 mm – may cause that the chain gets stuck. Just a tiny bit of filing can solve the problem, especially where you can see that the chain had touched the surrounding of the internal thread. Having used the crank unit more than 100.000 m of altitude setting up a new chain it is recommended to use the same model as before.

E) Problems with the derailleur / E-type-derailleur

A bike is a complex system. Putting the derailleur further to the left by 1mm can cause difficulties. With some bikes the derailleur then already touches the frame. In this case you can put a spacer between the frame and the inside bearing / axle bearing. So the complete crank unit moves slightly to the right. This method might seem a little unorthodox, but it works.

We deliver the spacers at cost.

With some bikes, especially with “Fullies”, there is a so-called **E-type-derailleur** instead of one with a clamp - it is a steel plate which is threaded onto the crank axle, which is screwed together with the axis bearing and carries the derailleur. The 20t chain ring might rub there. With this also, the spacer will help. Assembly on the side of the drive: frame, E-type-derailleur, spacer (maybe additional spacer), bearing unit. However, you must make sure to keep the power balance of the bearing unit and the frame.

F) Step after the assembly

As soon as you have assembled the 20t chain ring successfully, first, run it on a flat area and shift without significant load several times through all the sprockets – front and rear. Only then, simulate the mountain situation combining 20/32 (or 34) by slightly hitting the rear brake and then pushing against the resistance.

G) A final word on durability

AlZnMgCu 1.5 F53 is an especially hard aluminium alloy. The surface is additionally hard-anodized - a hardening process from the field of mechanical engineering with which to achieve a very high quality for flexible metal parts subjects to wear and tear.

Every chain ring is subject to wear. You recognise it when the teeth of the chain ring look like shark fins. Therefore, please check your chain rings at the end of each season.

Durability depends on the way you use your chainring.

- Change your chain a good time before it is worn out.

- Use your 20/4 stambecco only in combination with 34 - 23 on the back wheel. Extremely diagonal shifted chain not only damages your chainring but also may cause chain rupture.



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Supply available for resellers too.

Durability test under real conditions:

Most versions of the 20t chain ring of Mountain Goat are made from an especially long-lasting alloy of aluminium. It has been tested among others on a crossing of the Alps from Trieste to Locarno, crossing the Wallis and Western Alps from Locarno to Ventimiglia on the Mediterranean Sea and several cross tours through the Bavarian Forest and Swiss Alps accumulating to 7.500 km in distance and 170.000 m in altitude. After this distance the 20/4 stambecco (alloy version) was worn out.