

THE QUICK 'n DIRTY ON

BOTTOM BRACKETS



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The bottom bracket is the spindle, cup, and bearing assembly that allows the cranks to turn in the frame. There are many variations of bottom brackets, but don't worry, they all adhere to a common theme!

First off, you should know about the different styles of cranks (which attach to the bottom bracket) and the different styles of bottom bracket shells (where the bottom bracket attaches to the frame).

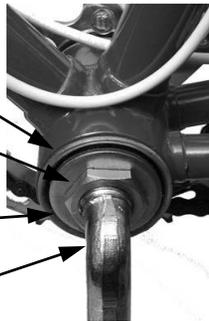
ONE-PIECE CRANK versus THREE-PIECE CRANK

Large Shell
(2.02" ID)

Threaded hardware
on non-drive side

Cups pressed
into frame

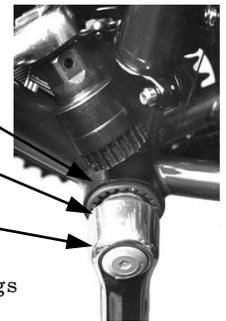
Bend in crank



Small Shell
(1.37" ID)

Cups are threaded
into frame

Crank arm pressed
onto spindle



Crank arms

Chainrings

Chainring(s)

Crank and
spindle
are one

Cups, bearings,
and hardware



Bottom bracket



One-piece cranks are typically found on older bikes, cheap department store bikes, and BMX bikes.

Three-piece cranks are a sign of quality. For the most part, this is still the design of choice for modern bicycles.

CONVERSIONS

A common request at the co-op is to convert from one-piece to three-piece cranks.

One conversion kit looks like this:



It comes with a square taper spindle

Another conversion kit looks like this:



With this you can use any three-piece bottom bracket with standard threads

NOTE: You can't convert from three-piece to one-piece. Why would anyone want to?

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BRACKETS**

FOOT COLLINS BIKE CO-OP



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ANATOMY OF A ONE-PIECE CRANK

Spacer/Dust cover

Notched to match crank

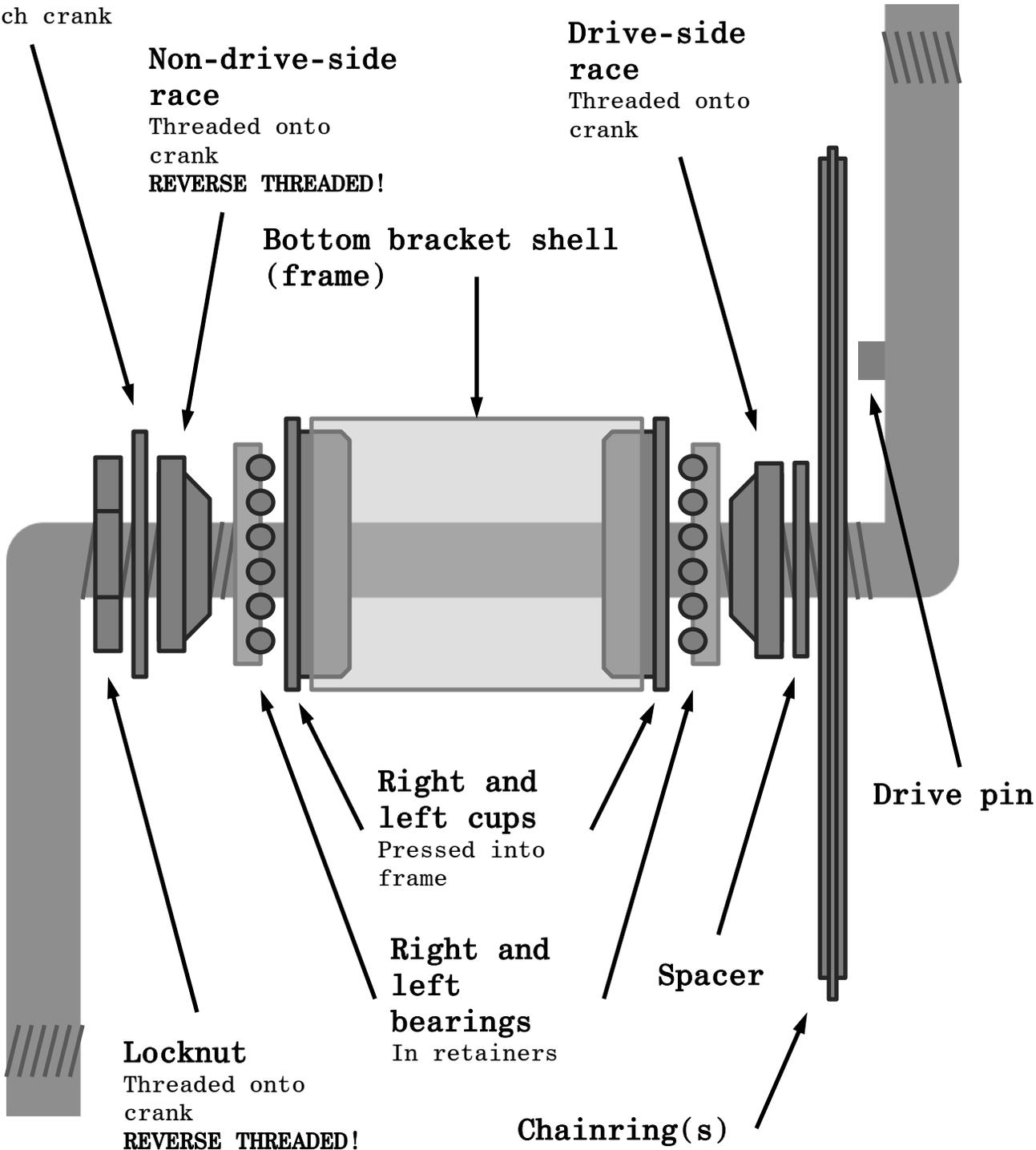
Non-drive-side race

Threaded onto crank
REVERSE THREADED!

Drive-side race

Threaded onto crank

Bottom bracket shell (frame)



Right and left cups
Pressed into frame

Right and left bearings
In retainers

Spacer

Drive pin

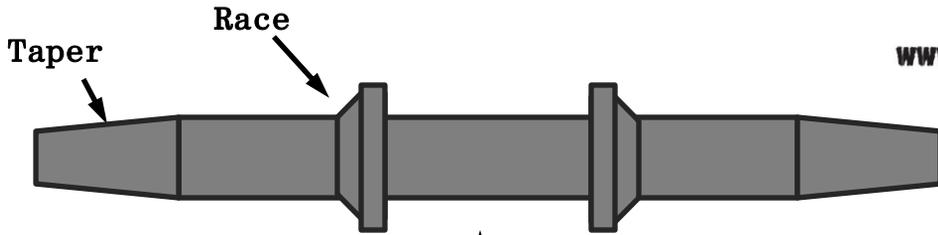
Locknut
Threaded onto crank
REVERSE THREADED!

Chainring(s)

**BOTTOM
BRACKETS**



ANATOMY OF A THREE-PIECE CRANK



Threads
Are normal -
tighten clockwise

Spindle

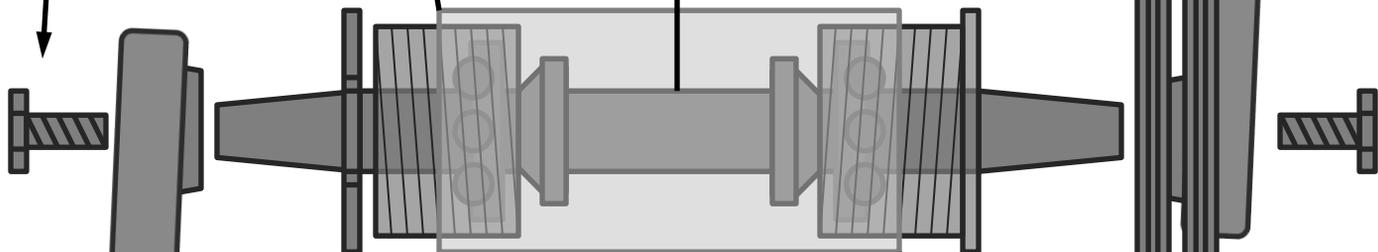
**Right
crank
arm**

Lockring
To lock the
adjustable cup
into place

**Crank
bolt**

"Adjustable cup"

Cups are
threaded
into frame!



"Fixed cup"

**Bottom bracket
shell (frame)**

**Left
crank
arm**

Bearings
In retainer

Chainrings

Threads
Are reversed -
tighten
counterclockwise

Lip
On fixed cup is
bottomed-out
against the
frame

THE QUICK 'n DIRTY ON

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Bottom brackets are the most stressed component on a bicycle. Imagine the forces you generate while pedaling. Because of this, they can wear or become out of adjustment faster than other components.

TROUBLESHOOTING bottom bracket problems

1) The bottom bracket has play

The bottom bracket is loose. **One-piece:** tighten the hardware on the non-drive-side. **Three-piece:** check that the fixed cup is still fixed. If working with an adjustable model, tighten the adjustable cup and set the lockring. If working with a sealed cartridge model with cups installed tight, the play is within the sealed cartridge and the bottom bracket should be replaced.

2) The bottom bracket rotation is stiff

The bottom bracket may be too tight. **One-piece:** loosen the hardware on the non-drive-side. **Three-piece:** loosen the adjustable cup. If it is a sealed cartridge, there's probably severe wear or corrosion – time to replace.

3) Bottom bracket movement is rough

Something on the bottom bracket is either worn out, damaged, or incorrectly assembled.

- a) Disassemble the bottom bracket enough so that the bearings and races can be inspected. Are any bearings missing? Are the retainers bent? Are the surfaces of the races in good condition? Are the cups cracked? Is the spindle bent?
- b) Check to make sure the bottom bracket is properly assembled. Is everything in the right order? Are the bearings facing the proper direction?
- c) Check for alignment issues. Are the cups pressed (one-piece) or threaded (three-piece) squarely into the frame? Are the faces of the bottom bracket shell square to each other? Are the threads of the bottom bracket shell aligned with each other (the two sides of the bottom bracket shell). **NOTE:** At this point you should consult with an experienced mechanic. The frame prep tools are extremely expensive and require special training to use.

4) Creaking noises w/ three-piece bottom brackets

Bottom brackets are prone to creaking when assembled without grease. Take the bottom bracket out of the frame. Clean the bottom bracket shell. Grease the threads. Reinstall cups to proper torque specs. Make sure to add grease to the tapers of the spindle before pressing on the crank arms. Creaks can also result from cracked crank arms – if cleaning and re-greasing doesn't do the job, inspect the crank arms for cracks, especially near the taper interface.

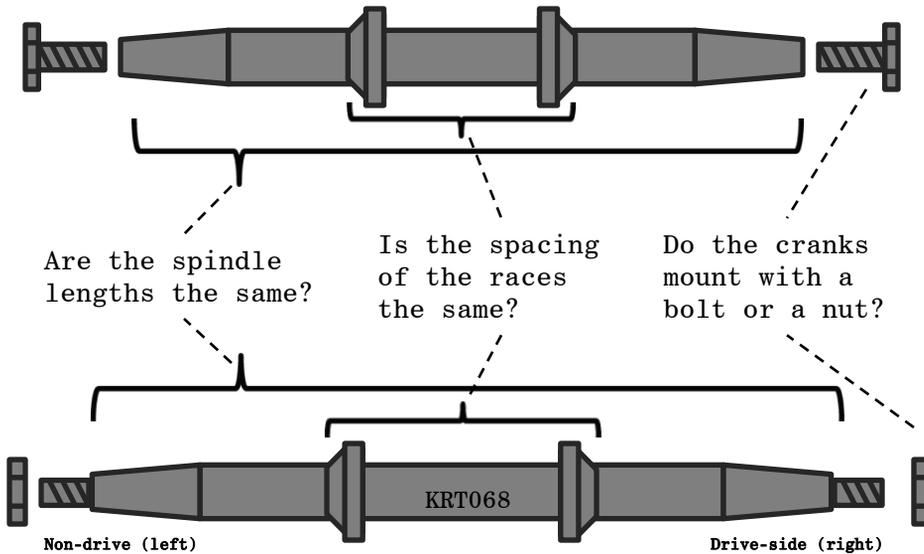
5) Loose cups w/ three-piece bottom brackets

Loose cups can happen if cups were not properly torqued during installation. Hopefully you catch this sooner than later. If loose cups are allowed to persist the frequent heavy loads sent to the bottom bracket will damage the threading in the bottom bracket shell. Sometimes a damaged bottom bracket shell on a steel bike can be saved by re-tapping the threads. **NOTE:** At this point you should consult with an experienced mechanic.



Several notes on spindles and threads.

REPLACING SPINDLES on three-piece bottom brackets



JIS Taper
Shorter and blunt



versus

ISO Taper
Longer and smaller end



NOTE:

You can use a spindle with a different taper style but it will affect where the crank sits (+/- 4.5mm)

NOTE: The drive-side of the spindle is a tiny bit longer to accommodate the chainrings - orient the spindle so you can read the text (left to right).

REPLACING CUPS

The two most common non-standards

“The Standard”

English Threaded

1.370 or 1.375” cup O.D.
24 T.P.I.
Drive-side is left threaded
Non-drive is right threaded
68 or 73mm shell width

Italian Threaded

36mm cup O.D.
24 T.P.I.
Drive-side is **RIGHT** threaded
Non-drive is right threaded
70mm shell width

French Threaded

35mm cup O.D.
1mm threading
Drive-side is **RIGHT** threaded
Non-drive is right threaded
68mm shell width

NOTE: None of these different threading standards are compatible with each other. Never let a French or Italian anywhere near your bike - they aren't to be trusted!

FYI One-piece cups are pretty much all the same
2.02” cup O.D.
No threads
68mm shell width

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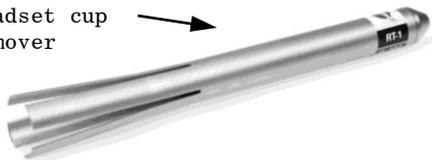
The basic bottom bracket toolset.

ONE-PIECE BOTTOM BRACKETS

Most basic adjustments require nothing more than a crescent wrench

To remove the cups from the frame

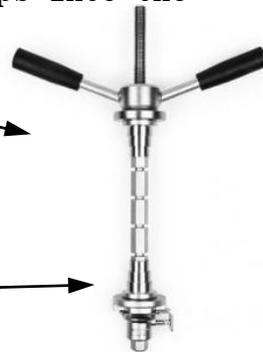
You Need a headset cup remover



There's a special version of this tool in the tool cabinet that works better for removing the bottom bracket cups.

To press the cups into the frame

You Need a headset press



Remove the stepped cones when using on bottom bracket cups

THREE-PIECE BOTTOM BRACKETS

To remove the cranks from the spindle

You Need a cotterless crank puller



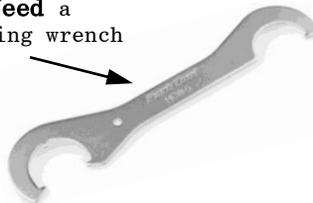
To remove modern cups from the shell



You Need a splined cup remover tool

To remove adjustable cups from the shell

You Need a lockring wrench



You Need a spanner wrench to loosen the adjustable cup



You Need a fixed cup wrench



NOTE: This is the most common cup remover, but there are some brand-specific interfaces, requiring different tools.

You Need this tool for octalink and some ISIS bottom brackets



You Need this tool for all external cups



NOTE: fixed cups with two wrench flats are notoriously difficult to remove. We have a "special tool" - an extra fixed cup that can be bolted alongside the stuck cup to provide more surface area for the wrench.

To repair threads and face the shell

You Need a tapping and facing set, cutting oil, and an experienced mechanic

