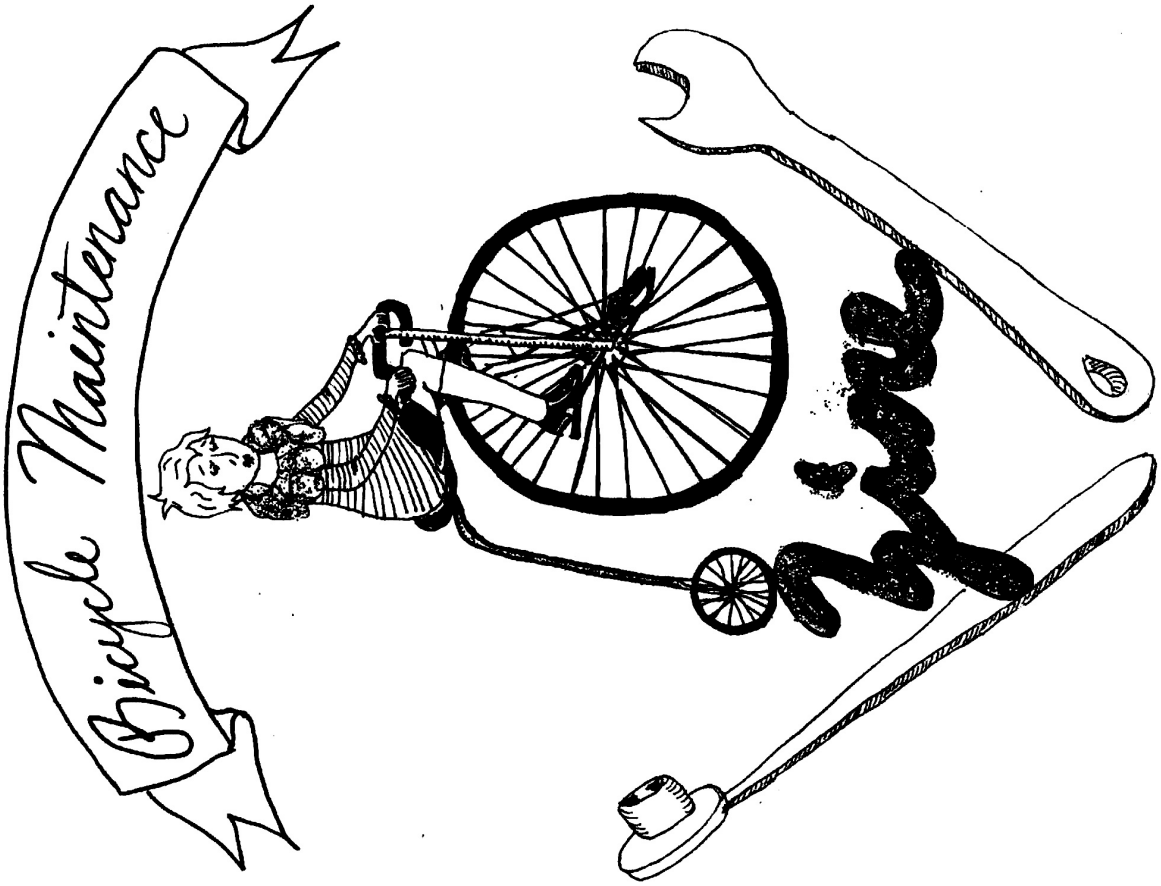
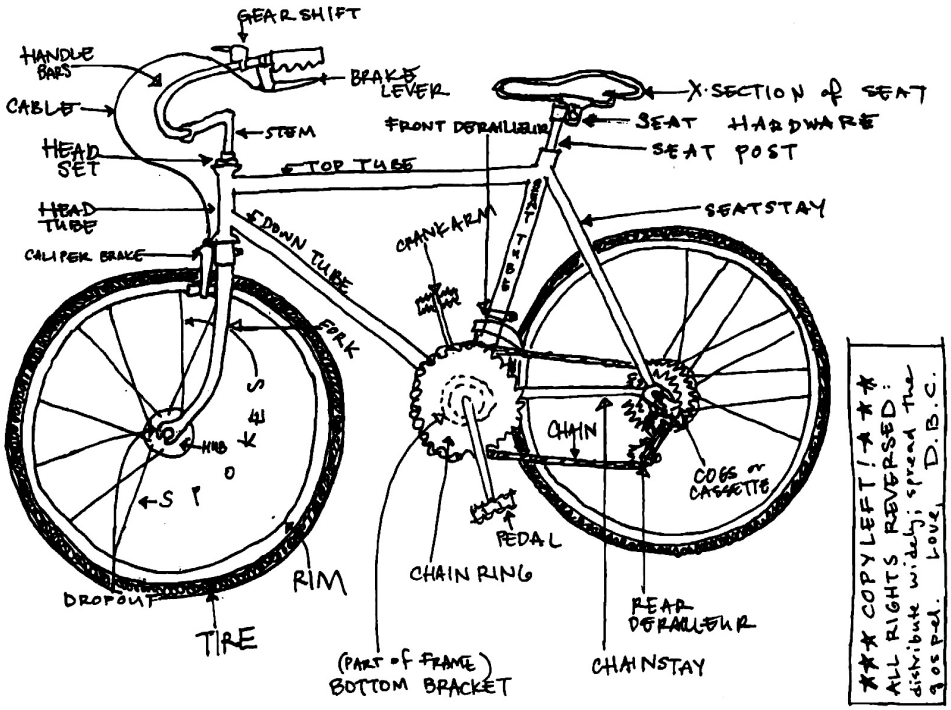
A UNIVERSAL BIKE CHURCH PUBLICATION



A QUICK LESSON IN BICYCLE ANATOMY

★a davis bike church publication★



hello reader!

This zine was created for a series of workshops called Women/Trans/Femme(WTF). The hope being that this movement of DIY community run safe spaces continues to grow and thrive, offering opportunities of self empowerment and a dialogue regarding social issues and gender identity. Thankyou to the folks at Davis Bike Collective, and Bicycle Church of Eugene for making such ideas a reality, Moving out of the Margins into the Stanzas.

→ Ride ON.

WOMEN: a person who identifies as a woman

Trans: transgender, genderqueer, gender non conforming, gender creative, anyone whos gender identity is fluid &/or transitioning

Femme: a gender identity in which a person of any gender embodies a feminine appearance/expression

Ally: a person that provides assistance & support

West Coast Bike Churches

The Bike Church:Santa Cruz
(831)425-2453
703 Pacific Ave
Santa Cruz, CA 95060
thebikechurch@gmail.com

Davis Bike Collective
(530)341-8322
1221 ½ 4th St
Davis, CA 95616
bikeministry@gmail.com

Sacramento Bicycle Kitchen
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1915 I Street
Sacramento, CA 95818
info@sacbikekitchen.org

The Bike Kitchen:SF
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650H Florida St.
San Francisco,CA 94110

Bicycle Church of Eugene
299 Garfield St.
Eugene, OR 97405

bike farm;portland
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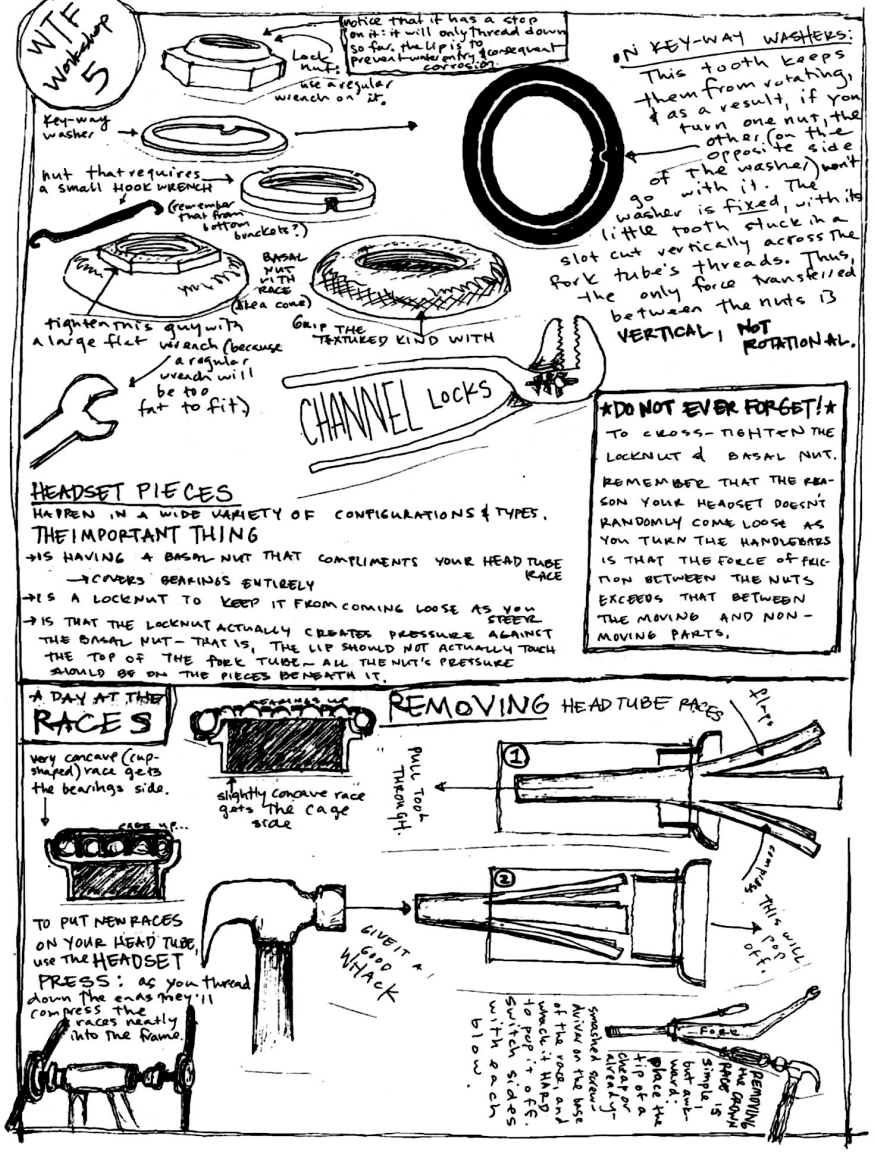
Portland, OR 97212
bikefarm@bikefarm.org

The Bikery:Seattle
845 Hiawatha Pl
Seattle, WA 98144
info@thebikery.org

WTF Workshop 5



•ON KEY-WAY WASHERS: This tooth keeps them from rotating, & as a result, if you turn one nut, the other (on the opposite side of the washer) won't go with it. The washer is fixed, with its little tooth stuck in a slot cut vertically across the fork tube's threads. Thus, the only force transfered between the nuts is VERTICAL, NOT ROTATIONAL.

HEADSET PIECES

HAPPEN IN A WIDE VARIETY OF CONFIGURATIONS & TYPES.

THE IMPORTANT THING

→IS HAVING A BASAL NUT THAT COMPLIMENTS YOUR HEAD TUBE RACE
→COVERS BEARINGS ENTIRELY
→IS A LOCKNUT TO KEEP IT FROM COMING LOOSE AS YOU STEER
→IS THAT THE LOCKNUT ACTUALLY CREATES PRESSURE AGAINST THE BASAL NUT— THAT IS, THE LIP SHOULD NOT ACTUALLY TOUCH THE TOP OF THE FORK TUBE— ALL THE NUT'S PRESSURE SHOULD BE ON THE PIECES BENEATH IT.

★DO NOT EVER FORGET!★ TO CROSS-TIGHTEN THE LOCKNUT & BASAL NUT. REMEMBER THAT THE REASON YOUR HEADSET DOESN'T RANDOMLY COME LOOSE AS YOU TURN THE HANDLEBARS IS THAT THE FORCE OF FRICTION BETWEEN THE NUTS EXCEEDS THAT BETWEEN THE MOVING AND NON-MOVING PARTS.

A DAY AT THE RACES

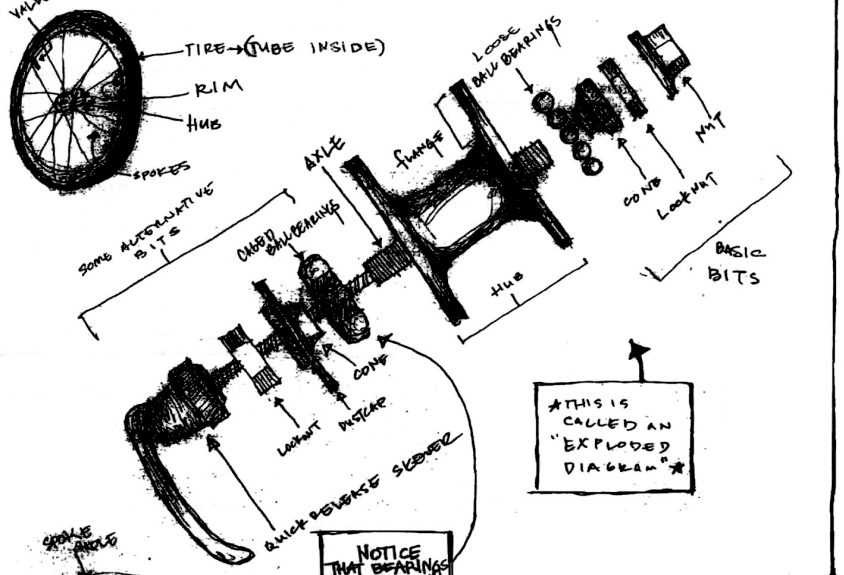
very concave (cup-shaped) race gets the bearings side.

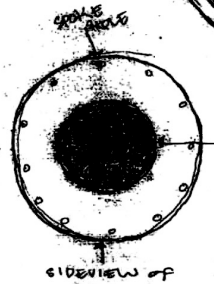
TO PUT NEW RACES ON YOUR HEAD TUBE, use the HEADSET PRESS: as you thread down the ends they'll compress the races neatly into the frame.

REMOVING HEAD TUBE RACES

WTF! WORKSHOP #1

WHEELS (of FORTUNE!) ★

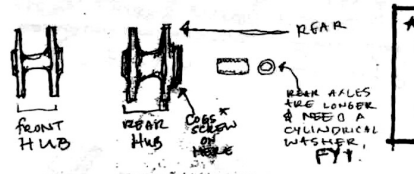




NOTICE THAT BEARINGS FACE RACE & CAGE RACES CONE

★if you have a fancy bike, your hub will have SEALED BEARINGS:

THE MOST IMPORTANT STUFF ABOUT WHEELS:



★ON REAR WHEELS, YOU GENERALLY NEED TO REMOVE THE COGSET TO GET THE AXLE OUT. YOU ALWAYS HAVE TO REMOVE IT TO REPLACE SPOKES.★

YOUR WHEEL WILL ROLL WELL IF... or... ✱ POORLY IF...

IF...	✱ POORLY IF...
① YOUR PARTS ARE SMOOTH	→ YOUR BEARINGS, RACES OR CONES ARE PITTED.
② YOUR PARTS ARE CLEAN ✱ GREASED THOROUGHLY.	→ YOU'RE UNDERGREASED OR LADEN WITH GRIT
③ YOU ADJUST IT JUST RIGHT	→ IT'S A LITTLE TOO TIGHT (RESISTS ROLLING) OR LOOSE (AXLE WOBBLES IN HUB)
④ YOU TIGHTEN THE CONE & LOCKNUT AGAINST EACH OTHER, LOCKING THEM IN PLACE.	→ THEY CAN MOVE AROUND & LOOSEN YOUR HUB.

WHAT HAPPENS IF...

- THE HUB'S TOO LOOSE? → • SMASHES BEARING CAGE & WRECKS BEARINGS ETC
  • LETS GRIT IN, PITTING BEARINGS ETC.
  • BENDS AXLE
  • OH, POOP.
- I OVER-GREASE? → NO SUCH THING.
- IT'S DIRTY IN THERE? → • IT'LL GRIND EVEN WHEN ADJUSTED RIGHT
  • YOU'LL HAVE TO CLEAN IT AGAIN
- PIECES ARE PITTED? → • GRINDING! → MORE PITTING
  • YOU'LL HAVE TO REPLACE THE PART

★WHEN REPLACING ANY PART: CHECK for SIZE (WIDTH, LENGTH, HOLE DIAMETER etc.), THREADING-COMPATABILITY, SMOOTHNESS of SURFACE / DAMAGE TO THREADS, EDGES (of NUTS), & BEARING-CONTACT SITES, & BILATERAL SYMMETRY ACROSS THE HUB★

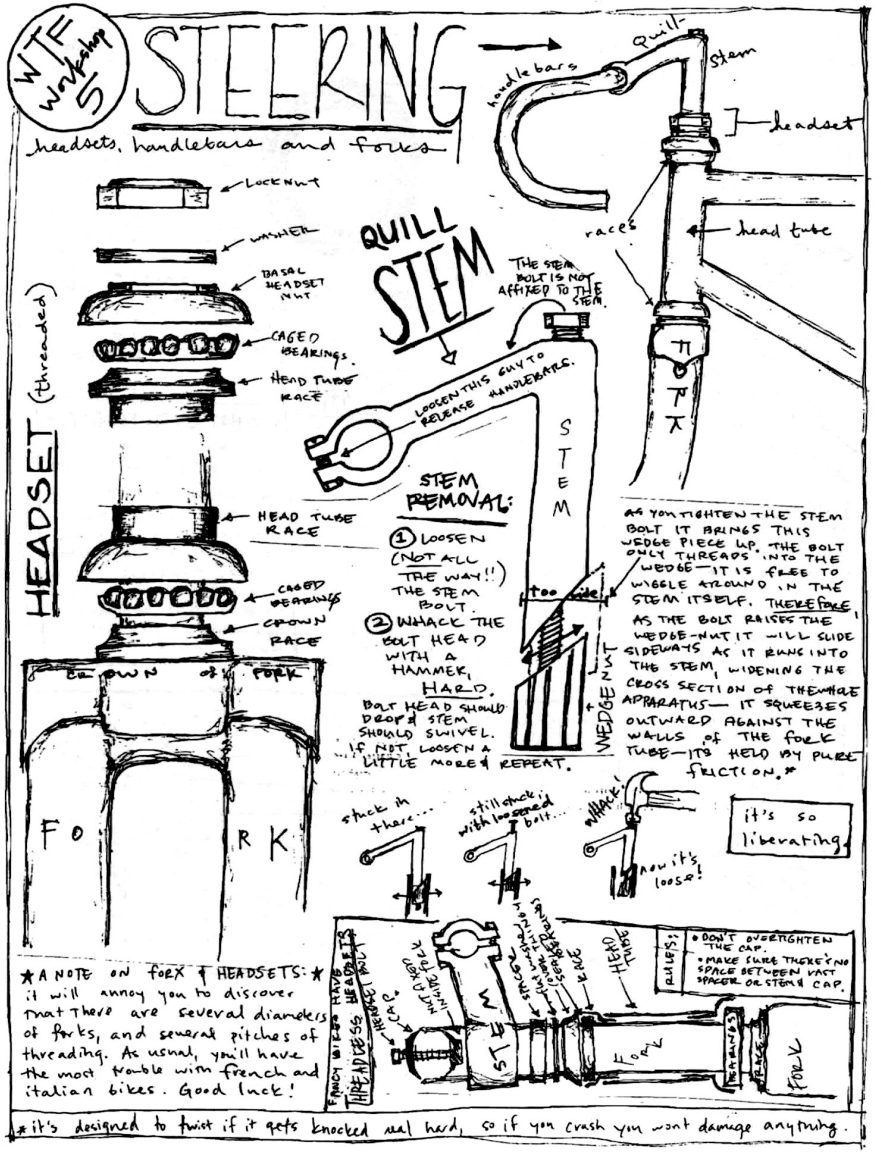
★IF REPLACING A SPOKE, METICULOUSLY follow LACING PATTERN★

TOOLS INVOLVED:

★CODS ARE GOING TO TADPOLE AND DERAILLEURS & CRANKS★

WTF workshop STEERING

headsets, handlebars and forks



★A NOTE ON FORK & HEADSETS:★ it will annoy you to discover that there are several diameters of forks, and several pitches of threading. As usual, you'll have the most trouble with french and italian bikes. Good luck!

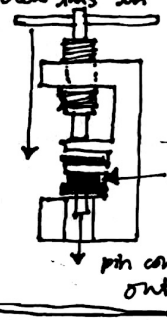
★it's designed to twist if it gets knocked real hard, so if you crash you won't damage anything.

WTF workshop 4

finally... CHAIN of fools...

BREAKING the CHAIN

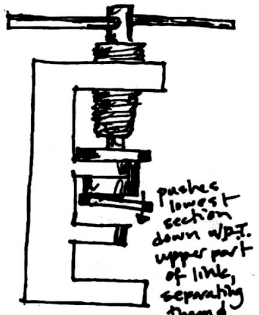
screw this in



chain link

pin comes out.

THE CHAIN TOOL works on pressure, just like the crank puller. It forces out the pin that holds links together.



pushes lowest section down w/ T. upper part of link, separating them & allowing movement.

FYI: when breaking your chain, put chain on lowest ring of tool or you can break the tool. Also, watch not to push pin all the way out - leave it stuck in last piece of link.

STICKY LINKS: if you put your chain back together & the links stick, put the chain on the higher ring & apply a little pressure with the tool - you'll spread it out & de-stick it.

HOW LONG SHOULD YOU MAKE YOUR CHAIN?

LEAVE THE DERAILLEUR OUT OF THIS.

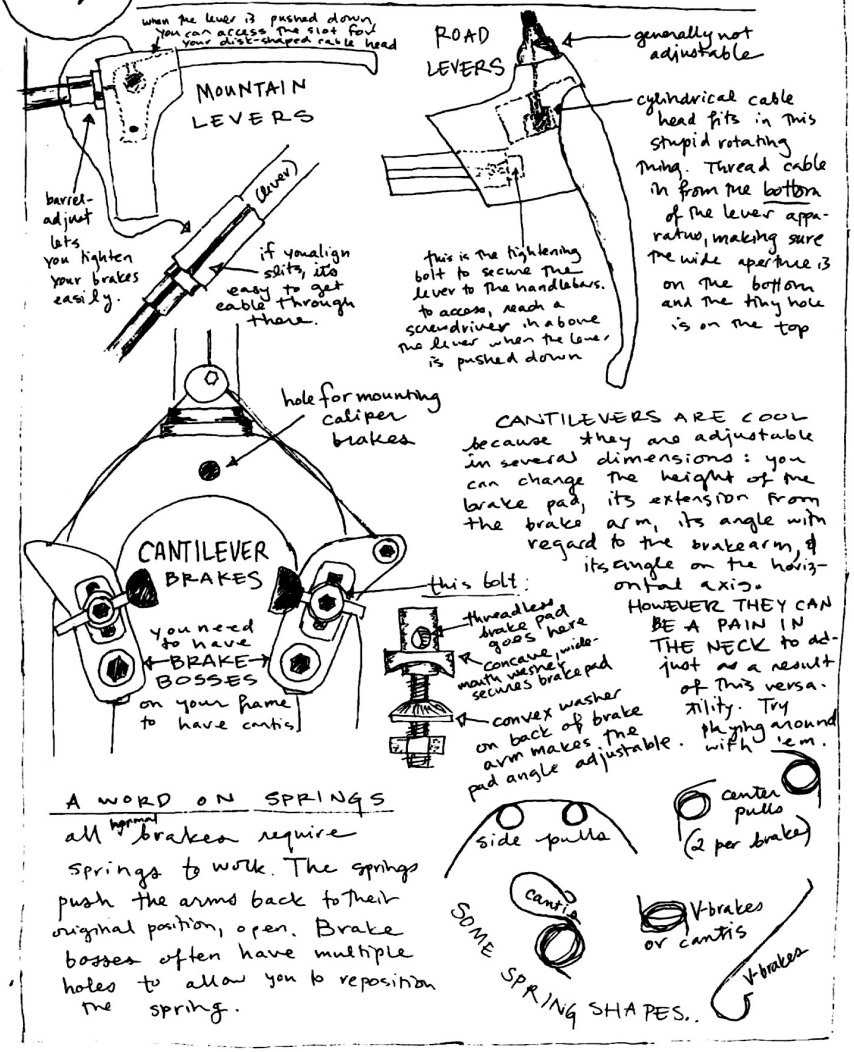
stretch chain as tight as you can across your biggest chain ring & biggest cog. where the last inside link meets the last outside link, add one more inside & one outside link (all told: the right length plus 1 inch).

a closing note on cheating:
CHEATING is okay!* when you're fixing bikes. Look at other bikes when you're not totally sure what to do. Believe me, these aren't written purely from memory... life is an open-note exam. → SISTER CAT 19 May 09

* not applicable to questions of romance or academia.

WTF workshop 2

BRAKES!



CANTILEVERS ARE COOL because they are adjustable in several dimensions: you can change the height of the brake pad, its extension from the brake arm, its angle with regard to the brakearm, & its angle on the horizontal axis. HOWEVER THEY CAN BE A PAIN IN THE NECK to adjust as a result of this versatility. Try playing around with 'em.

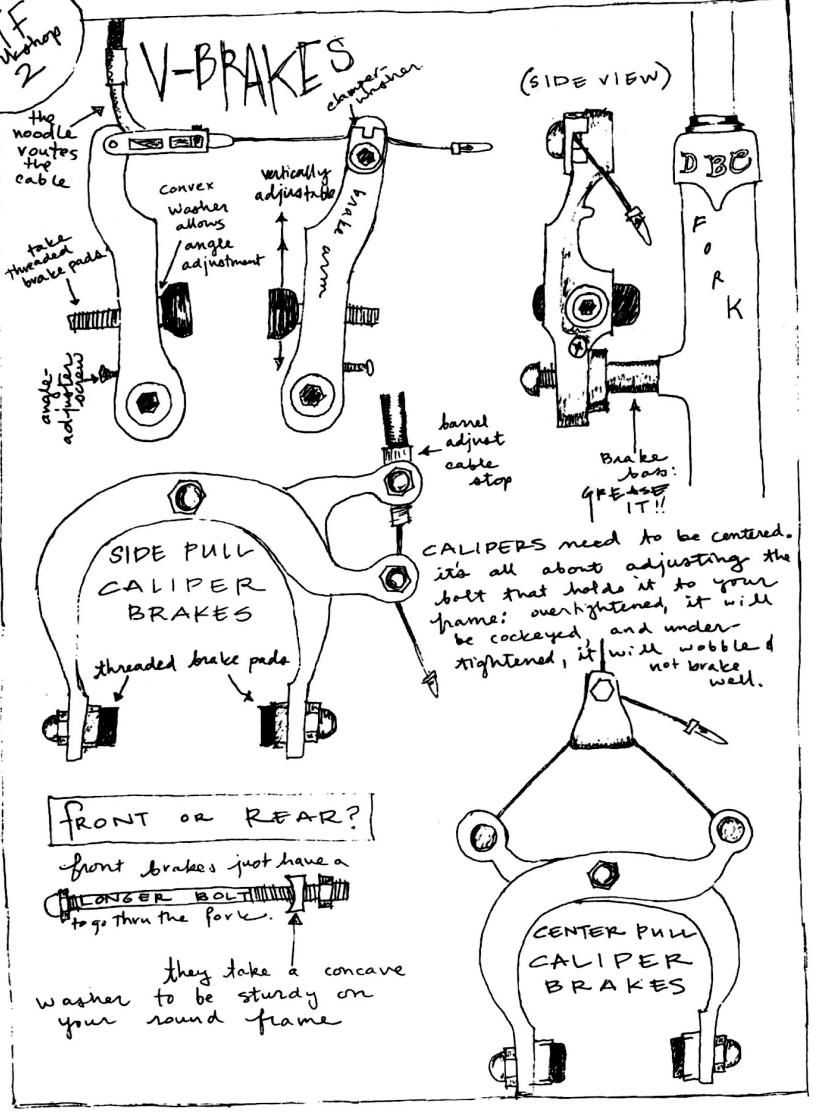
A WORD ON SPRINGS

all normal brakes require springs to work. The springs push the arms back to their original position, open. Brake bosses often have multiple holes to allow you to reposition the spring.

SOME SPRING SHAPES..

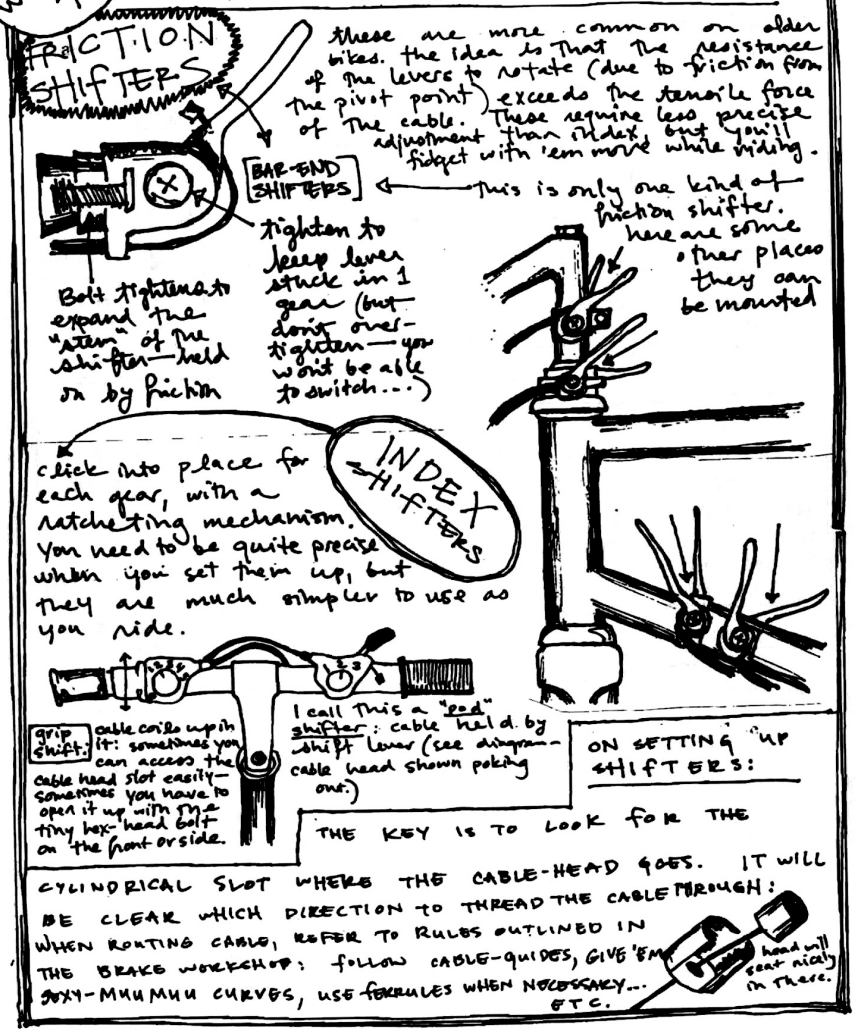
WTF workshop 2

V-BRAKES



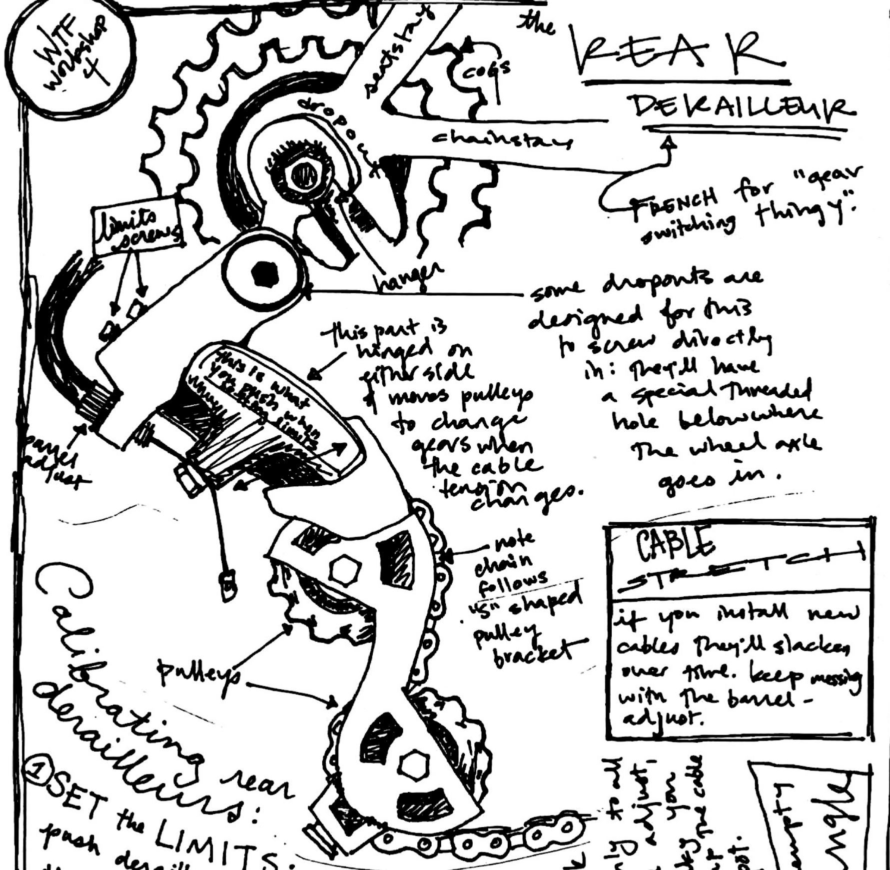
WTF workshop 4

SHIFTERS...



the REAR DERAILLEUR

WTF workshop 4



DERAILLEUR: FRENCH for "gear switching thingy".

some dropouts are designed for this to screw directly in: they'll have a special threaded hole below where the wheel axle goes in.

CABLE ~~STRETCH~~

if you install new cables they'll slacken over time. keep messing with the barrel-adjust.

Calibrating rear derailleurs:

① SET the LIMITS: push derailleur all the way in & all the way out while turning the cranks. Does it go to all gears? Does it go too far & push the chain off the cogs? Use the limits screws to resolve this issue: one limits the high gear, the other, the low gear. Make it perfect.

② FIGURE out CABLE TENSION: Set shifter to middle gear & put derailleur on middle position. Barrel adjust should be in its middle position. Now tighten the cable & clamp it down. Check to see if it shifts smoothly to all gears. Try the barrel adjust. But it might have to reclamp the cable in a tighter/looser spot.

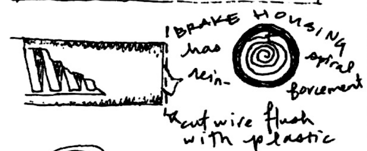
awkward empty triangle

CABLES & HOUSING

WTF Workshop 2

WHAT IS HOUSING FOR?

it allows the linear force of your brake lever to go around curves, & receives the cable's "equal & opposite" force to the lever.

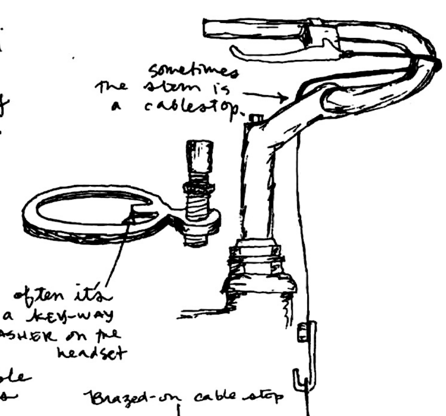


Sheldon Brown's four COMMANDMENTS of CABLE ROUTING:

1. Allows handlebars their full range of motion (does not limit turning.)
2. Curves shouldn't make wrong-way bends, as in: C, NOT ☡.
3. All curves should be as wide as possible:
4. Make housing as short as possible without violating the above rules.

FERRULES

are these little metal housing-tips. you only need them where the housing doesn't fit snugly in the cable stop.



★ SIDEPULLS & V-BRAKES DON'T REQUIRE CABLE-DANGLING DEVICES, BUT CANTIS & CENTERPULLS DO.

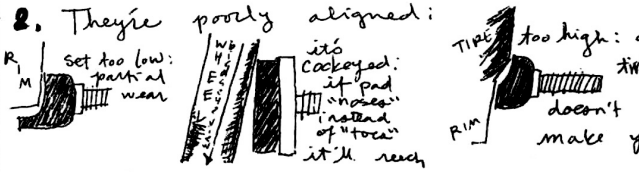
WHERE DO I PUT THE CABLE? → the bike will give you hints: if this is the frame, on top you'll see some structures that direct the cable.

WTF Workshop #2

TOP FIVE REASONS WHY YOUR BRAKES SUCK:

1. Poor friction due to buildup of crap on your rims or pads: try filing the surface of your brakepad & cleaning your rim.

2. They're poorly aligned:

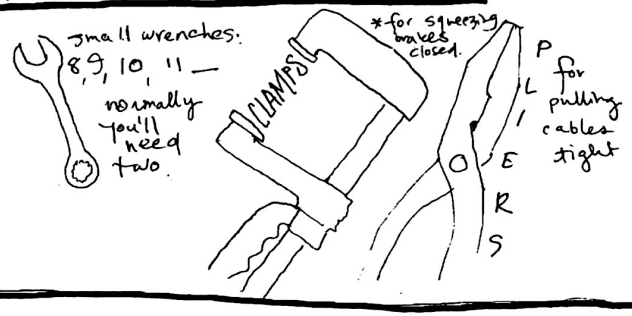


3. They're too loose: you can tighten them using your barrel adjust for only so long before you have to loosen the nut holding your cable, squeeze your brakes together, pull the cable tight & resecure the cable in there. Make sure to put barrel adjust in middle position first!

4. If the brakearms don't open up again after you brake, you've probably got excessive friction in your housing. Sometimes it works to clean & lube it, but if it's too corroded you might just have to replace the housing entirely.

5. Your brakearms are asymmetrical: one pad contacts the rim before the other, making it squeaky & not effective at braking.

TOOLS FOR BRAKE ADJUSTMENT:



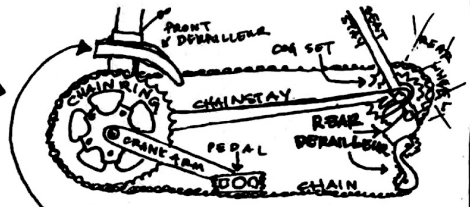
WTF Workshop #4

HOLY SHIFT, BATMAN!

derailleurs, chains & shifters

get on the

DRIVE TRAIN:

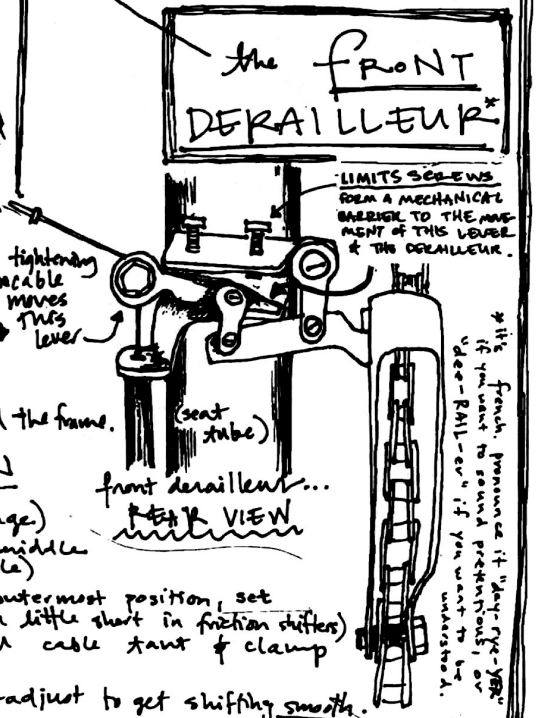


the FRONT DERAILLEUR*

*A NOTE ABOUT CABLE

SHIFTER CABLE IS SKINNIER THAN BRAKE CABLE & HAS A CYLINDRICAL HEAD.

SHIFTER HOUSING HAS WIRE REINFORCEMENT RUNNING LENGTHWISE, LIKE SO...



The up/down motion of this lever translates to the sideways movement of the derailleur & chain.

a spring pulls the derailleur naturally toward the frame.

front derailleur... REAR VIEW

*it's french. pronounce it "day-ray-YAHR" if you want to sound pretentious! or "dee-RAIL-ee-er" if you want to be understood.

CALIBRATION

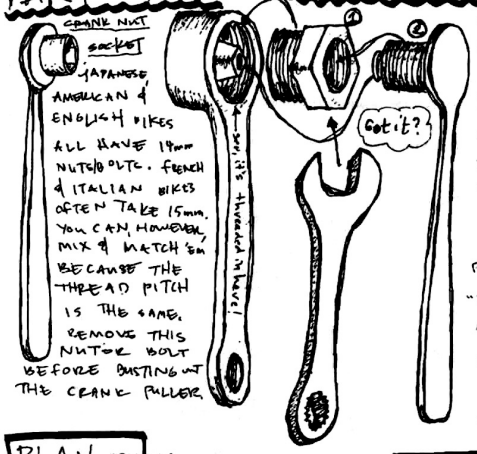
1. set limits (see next page)
2. put barrel adjust in middle position (if applicable)
3. hold derailleur in outermost position, set shifter to 3rd gear (a little short in friction shifters) & get a friend to pull cable taut & clamp it down tight.
4. fine-tune with barrel-adjust to get shifting smooth.

WTF workshop 3

TOOLS for BOTTOM BRACKETS

★ THEY INVOLVE THE USE of A SUITE of ODD CHARACTERS. WHAT FOLLOWS IS THE GALLERY...

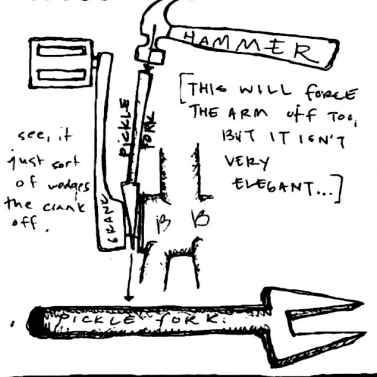
PART ONE: CRANK-ARMS...



JAPANESE AMERICAN & ENGLISH BIKES ALL HAVE 19mm NUTS/BOLTS. FRENCH & ITALIAN BIKES OFTEN TAKE 15mm. YOU CAN, HOWEVER, MIX & MATCH 'EM BECAUSE THE THREAD PITCH IS THE SAME. REMOVE THIS NUT OR BOLT BEFORE BUSTING OUT THE CRANK PULLER.

THE CRANK-PULLER IS PRETTY ELEGANT. "PIECE ONE" THREADS INTO YOUR CRANKARM. USE A WRENCH TO DO THIS SO YOU GET AS MANY THREADS AS POSSIBLE ON THERE — PEOPLE SOMETIMES STRIP THEIR CRANK THREADS IF THEY DON'T — YOU'RE ABOUT TO APPLY A LOT of FORCE PERPENDICULAR TO THE THREADS. SCREW "PIECE TWO" INTO "PIECE ONE" (YOU'LL NEED QUITE A BIT of TORQUE) & IT WILL PUSH AGAINST YOUR BB SPINDLE WHILE GRIPPING YOUR CRANK & FORCE IT OFF

PLAN B: if YOUR CRANKARM THREADS ARE SHOT, IT'S HAMMER TIME; GRAB THE PICKLE FORK:

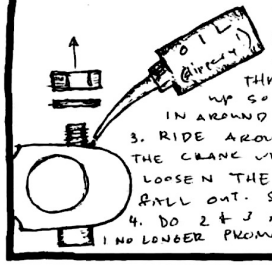


[THIS WILL FORCE THE ARM off TOO, BUT IT ISN'T VERY ELEGANT...]

see, it just sort of wedges the crank off.

★ ALL YOU HAVE TO DO TO GET THE CRANKS BACK ON IS TIGHTEN THE CRANKNUT/BOLT WITH THE SOCKET ★ no... that's so easy!

REMOVING COTTERED CRANKS...



1. UNDO NUT ON COTTER PIN
2. DROP SOME OIL IN: MAKE SURE THREAD SIDE IS FACING UP SO OIL WILL SINK IN AROUND THE PIN.
3. RIDE AROUND THE BLOCK. THE CRANK WILL WIGGLE & LOOSEN THE PIN, WHICH WILL FALL OUT. SO PAY ATTENTION.
4. DO 2 & 3 AGAIN IF NECESSARY

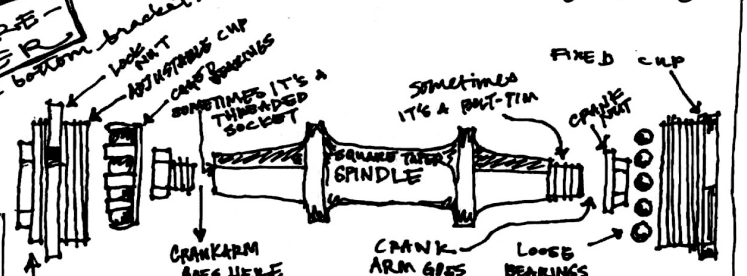
I NO LONGER PROMOTE THE USE of HAMMER FOR THIS JOB.

WTF workshop 3

BOTTOM BRACKETS, CRANKS & PEDALS

SQUARE-TAPER

3-piece bottom bracket:



People seem to really like these.

THIS CAN BE A LOT of DIFFERENT SHAPES.

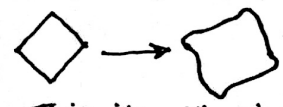
★ SQUARE TAPER CRANKARMS CAN HAVE 2 KINDS of SPINDLE HOLES:

diamond OR square. (less common)

make sure your arms MATCH or else pedaling will feel so WEIRD!!

ANOTHER NOTE ON SPINDLE HOLES:

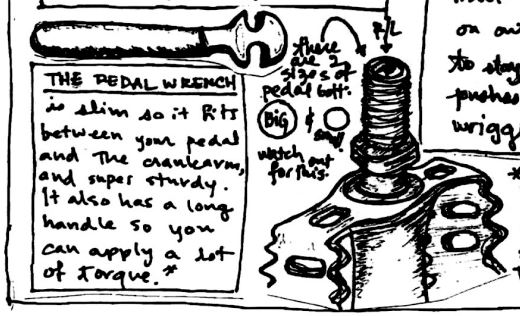
if your crankarm gets loose & falls off, your spindle hole is probably all jacked up.



so if it's mashed like this it will wriggle on the spindle no matter how much you tighten the crank nut — because the arm relies on outward force of the spindle to stay on — the nut just pushes it on. If the crank wriggles, it will loosen the nut.

THE PEDAL WRENCH

is slim so it fits between your pedal and the crankarm, and super sturdy. It also has a long handle so you can apply a lot of torque.*



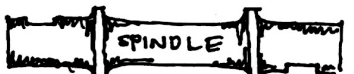
*NOTE! Right pedals thread ON clockwise & left pedals thread OFF clockwise. It's so if it freezes up you'll thread it off by pedaling.

WTF workshop 3

OTHER KINDS of CRANKS & BBs...

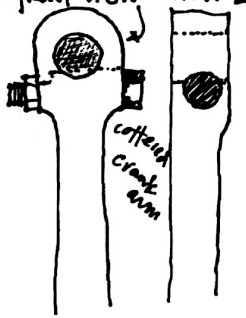
COTTERED CRANKSET

(3-piece bottom bracket)



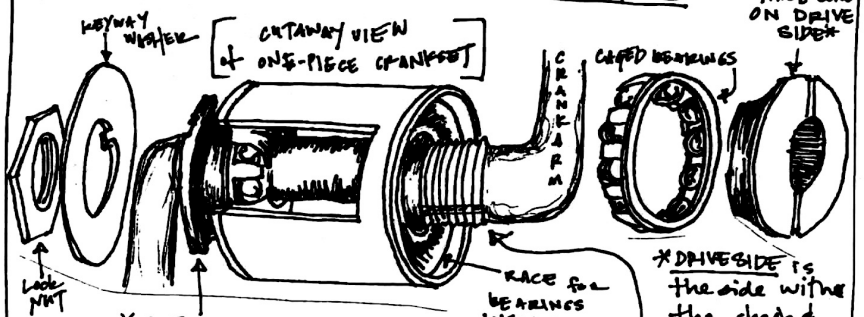
FRONT VIEW

SIDE VIEW



*Cottered cranksets take the same BB setup (cups, bearings...) as the square taper. The only difference is how the cranks attach to the spindle.

ONE-PIECE CRANKS



*ADJUSTABLE CONE: unlike the fixed cone, you don't thread this on all the way; just tighten it enough so the crankset doesn't wiggle, but not so tight that there's resistance, then lock it in place with the locknut.

*DRIVESIDE is the side with the chain & gears.

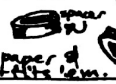
CHAINRING THREADS ON HERE AFTER CONE.

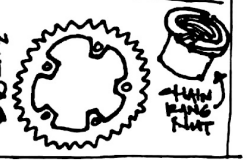
THE CHAINRING RUNDOWN:

NOTE the spacing of your crankarm tabs:

TRACE onto a piece of paper & find a chainring that fits 'em.

Tighten your bolts on REAL TIGHT!!





WTF workshop 3

3-PIECE BOTTOM BRACKET ASSEMBLY/DISSEMBLY.

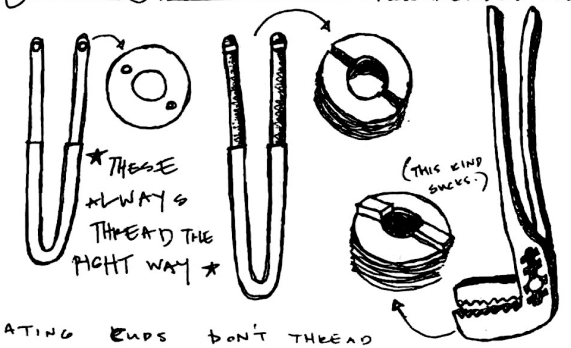
FIXED CUP SITS FLUSH ON FRAME...

* ON JAPANESE/AMERICAN BIKES IT THREADS ON COUNTERCLOCKWISE & off CLOCKWISE (LEFT-HAND OR WRONG-WAY THREADING). BUT! ON FRENCH & ITALIAN BIKES IT'S NORMAL (LEFTY LOOSY, RIGHTY TIGHTY). GO FIGURE. *

floating | **ADJUSTABLE CUP**: DESIGNS & RECOMMENDED TOOLS!

ON BOTTOM BRACKET THREADS:

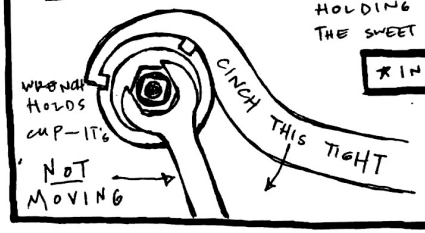
IT'S TRICKY TO ENGAGE BB THREADS BECAUSE THEY'RE CLOSELY SPACED & LONG. IF YOU START SPINNING THE WRONG WAY YOU'LL FEEL THE THREADS ENGAGE. IT'S HARD TO SCREW ON EVEN WHEN IT'S CORRECTLY THREADED SO IT WILL SERVE YOU WELL TO CLEAN OUT THE THREADS REALLY WELL.



* THESE ALWAYS THREAD THE RIGHT WAY *

LOCKNUTS!

OKAY, SO FLOATING CUPS DON'T THREAD ALL THE WAY ON. THIS IS VERY IMPORTANT, & HERE'S WHY: REMEMBER HOW WITH HUBS YOU HAVE TO FIX ONE CONE & NUT PAIR & USE THE OTHER TO FIND THE "SWEET SPOT" BETWEEN WHERE IT'S TOO TIGHT & TOO LOOSE? YEAH, IT'S LIKE THAT AGAIN. TIGHTEN FLOATING CUP TO WHERE THE SPINDLE SPINS FREELY WITHOUT WIGGLING OR GRINDING. THEN USE THE HOOK WRENCH TO TIGHTEN DOWN THE LOCKNUT WHILE HOLDING THE FLOATING CUP STILL (IN THE SWEET SPOT) WITH [INSERT TOOL of CHOICE HERE.]



* IN A PINCH * YOU CAN ALSO RESORT TO THE OLD HAMMER & SCREWDRIVER TECHNIQUE.