

CB/CL77 TECH-TIPS "LESSONS" LEARNED

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Based upon my "experiences" (in completely restoring and re-assembly of a 1966 CB77) and the timely advise of credible vintage restorers, I offer the following advise (no warrantee or satisfaction is guaranteed or implied!):

GENERAL" RE-ASSEMBLY TIPS:

1. Check all nuts that require cotters, lock / tongue washers, and clips.
2. Take caution in connecting wires (ensure "bare" metal to metal contact especially w/ powder coated parts & avoid ground-to-power!!).
3. Re-check battery water, fork and engine oil levels prior to lite-off.
4. Touch-up/paint re-assembly caused nicks to forks, fenders, etc. Gloss Black works OK on nicks to even blue frames!
5. LUBRICATE/GREASE all zircs, fittings, etc. (incl. SWING ARM!).
6. Check & replace muffler seals (for the 2-pc. units).
7. Install the Tach Cable guide/holder on the fork bolt, and confirm "correct" routing of ALL CABLES.
8. Use "anti-seize" when installing spark plugs and torque to specification.
9. Use a torque wrench as indicated / appropriate. Do NOT "over torque" the front or rear axles!!!!
10. Secure (2) front wheel brake stopper arm TABS (bend over at both bolt heads). Also check the rear brake stopper & ALL cotter pins as well!!!

CLEANING TIPS:

1. Honda Cleaner spray (black can) works very well, Use less expensive Windex for chrome.
2. Always clean and lubricate the chain when "HOT" (it absorbs cleaner / lubricant better after operation). Use Kerosene for chain "cleaning" (works BEST).
3. SS100 Cleaner (brand name) works very well w/ unpolished engine parts (along with a synthetic brush). DO NOT APPLY TO HOT MOTOR / METAL SURFACES!
4. Use SS100 Protectorant on all bare metal (zinc spokes) / alum parts.
5. For TANK cleaning (i.e., rust), use Naval Jelly (w/ aquarium rocks or favorite nuts, bolts, etc.) & flush w/ mineral spirits (to clean & dry). Use lacquer thinner for "just gunk / old gas" (keep sloshing & letting it sit & sloshing..... & flushing until clear) or lacquer thinner with nuts & bolts for rust.
6. For Speedo &/or tach face plate cleaning, use dish soap, warm water & soft rag initially; then dry; & finally, apply "several" coats of ArmourALL to the face plate (in conjunction w/ a Foreign Speedo, a local San Diego shop, disassembly, cleaning & repair job).

TECH-TIPS / "LESSONS" LEARNED:

- (1) NEW BARS: File or sand-off the rough "inner" edges of NOS bar @ the "internal" wiring cut-outs. Otherwise, they will "scratch" or possibly damage the wires.
- (2) BATTERY DISCONNECT/REMOVAL: Disconnect Ground (-) terminal (blk. wire) 1st; remove Red (+) wire last; to re-install, connect Ground last. This avoids sparking &/or possible shock.
- (3) STORAGE PROCEDURES: A) 6 months or less: fill gas tank w/ "new" gas (& use "Stable"); drain & clean petcock & carb/floats (squirt w/ WD40); drain & fill crankcase w/ clean oil; and remove the battery; B) Long term storage: clean the whole bike (& use SS100 Protectorant); drain & flush (use mineral spirits or kerosene) gas tank (& spray inside w/ rust inhibitor or "WD40"); use same as A) (above) for carbs, & petcock, battery, and crankcase.
- (4) BATTERY CHARGING: Recommend a "battery tender" that produces a decreasing voltage charge, and drops to "0" when the battery is fully charged. The tenders come in either 6 or 12 volt. An inexpensive, "low-voltage trickle-charger" is also useful (minimal \$ for a "combo" 6 & 12 volt unit). Use of a "tender" insures a full charge "when needed" & does not require removal from bike.

Battery "Drain" or "Discharge" is often indicative of a "short", bad wire or connection, or some other malady. Absence of a "lock washer" on one of the author's CB77's rectifier posts caused battery drain and erratic charging. The battery would not "hold a charge" for more than 1-week to 10-days. Absence of a lock washer caused the center rectifier wire to "arc" (nearly cutting the small screw in half!). Replacement of the screw (and addition of a lock washer) rectified the problem.

- (5) HEADER (Exhaust) PIPES: To prevent Bluing & "Heat Discoloration" of pipe exterior (after re-chrome or thorough cleaning): A) "Literally" run Silver PJ1 high-temp spray paint down both ends of the pipe over 3 applications; B) LIBERALLY spray or grease the inside of pipe (after PJ1 paint dries) with White Lithium grease. Then "lite" motor and "burn off" excess grease! Run motor w/out mufflers to prevent excess grease & paint flakes from coating insides. Also place pieces of cardboard between frame / wheels and header pipes to preclude burned grease & paint particles from "bathing" bike.

For CL77 pipe install or removal: Remove the LEFT side header pipe exhaust studs (using 2 locked-together 10mm nuts) so as to clear the frame as you "swing" the engine into the frame cradle. Also use the thin gasket material or duct tape wrapped around the frame tubes to protect from motor scratches!!

- (6) MOTOR BREAK-IN: A) Run the bike at 45 mph / 4500 RPM or less (& VARY engine RPM) for first 200 MI; B) Next 200 mi., run up to 55 MPH & 5500 RPM & vary engine speed. After 450-500 Mi., change oil & run at gradually increasing RPM. I did not exceed 6500 rpm until 1500 miles. Use "synthetic oil" only after the rings "seat" (after 2,000-plus miles) and with new engine case seals (old seals tend to "weap" with synthetic more easily). Synthetic oil terminates any "seating" process(es) for valves or rings!

- (6a) ENGINE OIL: Recommend HONDA M/C Oil (10W-40) or SPECTRO Regular or DURABLEND. I have tried BOTH and think that regular oil is "best" for the CB77! Also tried "MOBIL ONE", but switched to Spectro as the Mobil is also too "viscous" for older bikes and is not as conducive to efficient "wet" clutch operation.

Recommend a RED "NO OIL" TAG when draining oil and then working on other items. Don't want to light bike with "NO" oil!

- (7) CABLE ROUTING / ADJUSTMENT / CLEARANCE (For CB77): A) Cables - Throttle (& electrical wiring) on left side & Clutch on right side - ALL ABOVE the U-shaped (frame) tank mounts; b) Tach cable runs under steering stem lock & to right side / Tach cable routing is evident as "guided" by tach cable guide (which mounts under front horn mount); c) Clutch cable runs behind/aft of front brake cable & closest to upper triple clamp; Insure Tach & Speedo Drive-Cables are "seated" in drive-ends (at: tach, tach drive unit, speedo, & speedo drive) before tightening (hand tighten initially). Suggest viewing a "built" bike to confirm cable routing (BUT different bars may dictate different routing). Periodically check the cables to insure that they have not "slipped" from the "holders". The latter are designed/positioned to prevent cable "chafing" on the frame. Place a small piece of carpet foam between the REAR brake cable as it passes "beneath" the rt. air filter cover (actually between the cable & A/C cover at "highest" point).

Throttle cable travels behind the rt upper fork ear (you adjust the position of the metal "elbow" below the throttle handle so that the cable runs just "aft" of the rt fork ear), loops behind (as a "downward" loop) the head lamp, behind the left upper fork, loops back along the left side of the tank ABOVE the left tank / frame mount, follows (at the 7 or 8 o'clock position) the frame spine aft, and drops under the frame (toward the carb tops) just before the frame "splits" or forks into 2 pieces. I use a "zip tie" to locate and fix my cable junction box (where the cable transitions from 1 into 2 cables) to the frame / spine. Make sure the throttle cables are "seated" into the carb tops. The end of the cable "must" drop into the little "seat" atop the carb.

Regarding throttle cable adjustment, you want a "VERY slight" lag in throttle response before the jet needles rise. You don't want the throttle cable(s) taught / too tight! You can check that there are no hang ups or binding on the cables / in the carb when viewing the jet needle operation (See Item #11 below).

(8) POINTS AND POINT CAM: Ensure that FELT pad that rides on / lubricates the outer-end of camshaft is "oiled" periodically. Otherwise, point lobes will wear excessively!! Marvel Mystery Oil or engine grade oil works fine - suggest a minimal re-lube every 500 miles.

(9) CHAIN / REAR WHEEL ADJUSTMENT: Loosen rear adjusting bolts (long) & lock nuts; loosen rt. side rear axle nut only to point that you can "wiggle" wheel back & forth; adjust long adjusting bolts (1/4 turn at-a-time) until axle is located at same "MARKS" on swing arm & chain has proper slack ...& tighten lock nuts; hold left side of axle w/ a bar & "torque" rt. side axle nut; align rt. side axle adjuster w/ wooden block (downward wack) & re-check lock nuts / bolts. (NOTE that "marks" on swing arm & axle adjuster may not EXACTLY coincide). Also note that "testing" chain adjustment should be done when weight is "on the seat" & bike is "off" the center stand!! Also, do NOT "over tighten" the axle bolts!! It is better to have a little too much than not enough chain slack (3/4" between up & down travel ... as I recall).

ONLY "lubricate" a HOT chain. Ensure the chain has been driven and is hot/warm before applying the chain lube (I use the Spectrol brand product, but others use a "waxing" process or the Honda brand). A "hot" chain more readily accepts the lube and lets it flow into the roller joints and niches.

Kerosene is an appropriate medium to clean chains. Suggest 2 "baths" to clean a dirty chain thoroughly. You can also use a kerosene dampened rag to clean the external dirt off taking several passes along the chain & using a clean portion of the rag.

(10) TUNE UPS: Valve adjust & Points adjustment are detailed in Bill Silver's (Bill S.) "Red Book". Valves are done COLD with a 10mm wrench and the special holder that comes with the CL/CB77 tool kit. Remove the point cover, spark plugs & stator cover. Set the right piston to TDC, and using the T mark, adjust the right valves first. Loosen the 10mm nut first and then adjust the set-screw. "Trick" is to tighten the set-screw so that it just pinches the .004" "feeler" gauge & then back it off so that the gauge barely slides in & out. You can tell when the valves are at TDC as the rocker arms are "unsprung" and are easily lifted off the valve stems. Insure that the tappets are NEVER too tight (just a little too "snug" for the .005 gauge, but "fits" the .004 gauge) as the valves will not close & you can burn them!! Set the lock-nut so that the set-screw does not move or pinch the feeler gauge. Do both right valves first. Then rotate the stator wheel 180 degrees to the left LT mark (with left cylinder at TDC) & repeat the process. Always check the set-screws with the feeler gauge after you tighten the lock-nut. (Item #7 in Bill's Red Book). NOTE that the valves TIGHTEN (& not loosen) over time and progressive burning of the exhaust valves results from failure to properly adjust them.

Point adjustment is detailed in Bill's Red-Book. Just remember that there is a point adjustment for one side only; the other side is adjusted by rotating the point base. For timing the engine, use a timing light. I suggest use of a separate 12-volt battery supply for the timing light (i.e., the car battery) to get a strong & unimpeded current. Obtain a .002" to .016" feeler gauge set.

(11). CARB ADJUST: The rich / lean mixture is governed by 3 components [carb main jets (#135 std. at sea level), air jet screw and the position of the jet needle]. Operation at higher altitude necessitates use of a lower numbered jet (#130 at 2500 -4000 feet and the #125-120 above 5000 ft.). Just REMEMBER TO "SWITCH" BACK TO THE #135'S AT SEA LEVEL!!! Bill S. even suggests having spare jet holders "set up" with the smaller-numbered jets installed to expedite the jetting swap! (Take it from someone who rides a bike set-up for San Diego & then drives it in Yosemite Valley & higher elevations).

The Main Jet governs the overall mixture throughout the RPM band while the Jet Needle and air jet screw effect mixture at low and low to mid-range RPM. To "lean - out" the low & mid-range, lowering the jet needle further down into the throttle valve (or slide), and un-screwing the air jet screw. Suggest lowering the needle one (1) "mark" at a time (CAREFULLY), but only after "noting" the original position of the needle in the throttle slide. Remember, lowering the jet needle further "down" into the needle jet makes the engine run "leaner". If the engine continues to run to "rich" (especially noticeable at elevations above 1500 feet), then the main jet must be changed.

My 1966 CB77 Jet Needle was set at the "fourth of the five (5) jet needle settings" (Bill S. notes that later Superhawks run better with 3 of the 5 jet needle "rings" visible inside the carb slide / i.e., 3 "rings" visible above the base of the carb slide bottom). Bill S. suggests unscrewing air jet screw 1 to 1 & 1/4 turns from full stop. Also "NOTE" that the air jet screws are used to "synch" the bottom of the jet needles. (My '66 CB77 is more like 1 3/4's-plus from the "stop"). Bill S. states that the air jet screw has more impact upon low to mid-range fuel mixture.

TO CHECK "SYNCH" BETWEEN JET NEEDLES (PER Bill S. & probable cause of former "popping" noise at idle from my rt. muffler): Drain (& drop) the float bowls, remove bottom of needle jet holders, and check the "synch" on jet needles (as they protrude through the base of the jet holder). You want the bottom of the jet needles to move up & down on the same "plane"; that is , very bottom (protruding) tip of needles move in the same "plane" when viewed across the bottom of the jet holders. Remember, the "book" suggests a "slight" hesitation (a "blip") in the throttle (cable) opening before the jet needles move and seat (and they should do this in unison). NOTE: "USE" Air Jet screw to (fine) adjust "synch" of the jet needles.

I have "heard" that testing with the chock lever (after motor is warm) is a "quick" way to determine whether the bike runs too lean. If you get a "burble" at half-chock, then you're about right. If you can run to full-chock and get minimal or "NO" burble, YOU ARE TOO LEAN!!

Synch of the carb floats is also crucial. You check by calibrating the point at which the float engages / touches the bottom of the float valve and the calibrated distance from bottom of float to lower end of the carb body (less float reservoir). There is a Honda tool made for adjusting the carb float level. When all else fails, you can run the bike (make sure petcock is "on") until warm, shut it down, and drop each float bowl. Then, compare the fluid levels to insure they are approximately the same I've never determined the EXACT percentage of total (fuel) volume the bowl requires to be adjusted "spot on".

Remember, upon re-assembly of carbs, DO NOT "switch" the left and right slides. Insure that the "aft" end of each slide is the "notched" or "concave" side. If the "flat" side (not the cut-away) portion of the slide faces aft, they have been reversed! & the bike won't idle worth a hoot (if it runs at all).

Operation (continuous) over 2,000 feet requires different jetting. Check the dealer to determine what works best. The 11/97 edition of the CJMC Newsletter includes a Honda jetting table by "altitude".

CARB INSTALL/SETTING:

It is VIP that the carb nuts (4 nuts total & w/ NO washers per Bill S!) NOT be over-tightened!! BEST process is the hand-tighten the carb nuts (rock

carbs back & forth to get nuts as hand-snug as possible) & then wrench-tighten nuts between 1/4 & 1/3 turn (& NO MORE!). Over-tightening results in warped (or broken) carb insulators!!

NEW:

Once you get the carbs set-up, remove the float bowls, floats (watch the float valve stoppers as they will drop out) & the needle jet holder SO THAT you can check the "synch" of your jet needles. The jet needles should slide up & down in unison, and the jet needles should "just" protrude below the carb body opening (i.e. the bottom "plane" thereof) that "holds" the needle jet holder (now removed) when the throttle is fully "closed". You want the jet needles to rise in "unison" (but with a "slight" delay) as you start to open the throttle.

Also noted that someone (on eBay) is selling "updated" carb insulators (bake-a-lite??) equipped with "built-in" (after-market) vacuum adjustment fittings hmmm??

In Nov. '02, purchased Honda-quality carb rebuild kit from Ken Awea in Mission Viejo, CA for \$47. STAY AWAY from the KEYSTER carb rebuild kits. The parts are VERY poorly sized/made and won't improve performance beyond your current "worn" parts.

(12). ELECTRICAL GREMLINS & ADVICE: All contact points on the frame must be cleaned (moto-dremel tool) of excess powder coat (especially!!). This is especially true regarding the rectifier (at frame), headlamp shell, taillight assy., motor ground strap, and "most" of the motor attachment points.

CL77 3rd generation (solid state) rectifier fits the CB77. Rectifiers were also available from Dixie for "cheap"! Paid \$4.50 for my last CB77 "Superior" rectifier (from Dixie International)!

Per one "old school" CB77 source, turning the headlight shell light switch "ON" (but leaving the headlight bar switch in "MID" position / not having the light/bulb "ON"), kicks the stator into the "super-charge" mode & charges the battery. ONLY LEAVE STATOR IN "SUPER-CHARGE" MODE FOR "BRIEF" PERIODS, or BATTERY WILL GET "FRIED"! Bill S. noted that early CB77's had a higher output stator, and they "fried" a lot of batteries. The later-generation stator (like my '66 CB77) had a "72L" stamp or mark (for low output) on the dynamo rotor. USE THIS PROCEDURE AT YOUR OWN RISK!!!!

CB77 source above also notes that the CB77 is NOT DESIGNED for "running the lights ON" all the time. Only when exceeding 4000 RPM's (constantly) should the lights be left "ON". Otherwise, the bike uses more electricity than the stator puts back in! MY EXPERIENCE CONFIRMS THIS ASSERTION.

ALSO "check" all electrical nuts, bolts & washers!! Refer to "3-wire" rectifier "story" above. This "problem" manifested itself in strange ways before it was fixed (battery not properly charging, bike occasionally "dying", etc.).

Note that the electric starter requires 10-to-15 times the initial electrical draw as any other electrical component!

If the bike is not driven for 2 or more weeks, you should probably charge the battery first. A spare battery allows to keep one fully charged at all times! I installed a "battery tender" tether on my battery to allow for "trickle" charging with battery in the bike. "Trickle" is so minimal that it won't harm the bike's electrical system. I STRONGLY ENDORSE THIS SET-UP!

Check the 2 "snake fang" contacts inside the rear taillight bulb holder socket (on a regular basis) as it can cause intermittent electrical contact (dimming of bulb or no stop light). This is due to the weakness of the "fanged" contact springs coupled with rear fender vibration of the bike. Check this prior to investigating the "ground" connection between fender and lamp/license mount/holder. CB/CL72/77/160 uses a standard automotive 12V taillight, Chief or Kragen code # 1157 (a major savings over the Honda part).

(Refer to the "Grounding" instructions at end of this document).

Of note, the CB77 (black, shielded) Starter Cable Wire (which runs thru the stator cover case) starter cable goes through the same (rear motor deck) hole along with stator wiring harness, then under the sheet metal transmission cover, up through the hole in the frame's backbone brace plate and up to the starter solenoid, which is mounted under the tool box.

(13) CLUTCH SPRINGS: Resolved at last! Use of the "long" or standard CA77 / Dream clutch springs (coded "425") is OK per Bill S. A local Honda dealer informed me (4/96) that the stock CB clutch spring code now supersedes to the "275" code, which is the "YB" coded part (a SHORTER, MUCH STIFFER spring). Bill S's red Honda Manual clearly shows the "275-code" as the "YB" spring!!! As "YB" springs are very hard on the parts (clutch basket & opposite side of the engine case), I see the longer/softer "425" code spring. Bill S. notes that some clutch "slippage" is common with the "425" spring (when engaging 3rd gear) & when the bike is still warming up/first driven. This disappears in a matter of minutes as the plates warm-up. ENSURE you adjust clutch free-play (at clutch lever adjuster) AFTER the clutch plates are fully warmed!!

NOTE (per Bill S.) that the CB77 clutch/clutch lever is NOT of the "long throw" variety (it has a very narrow "engagement" range), and does not have a "wide band" engagement like some other bikes. Clutch "release" occurs very early and suddenly when "pulling in" on the clutch lever, and therefore very little lever action is required to shift gears (i.e., clutch lever only needs to be "depressed" 25-35% / no more than a "third of the way" to effect gear changes that is after 1st gear is engaged). Also note that "riding with your fingers" on the clutch lever may result in slippage just from normal suspension travel (and slight pressure/motion of your fingers).

"Wobble" or "chatter" with clutch engagement can be caused by: (1) wear to the bushing or inner portion of the CLUTCH PRESSURE PLATE (where the tranny main shaft passes through the plate). The plate is aluminum w/ an alum. bushing that rides on the steel main shaft. Grabbing the outer plate and "torquing" on the main shaft will determine bushing wear. Pressure plate must be replaced if the bushing is worn. The outer and middle clutch (baskets) can ALSO be tested for wear in the above manner; and (2) WARPING OF ALL OR ANY OF THE 5-STEEL CLUTCH PLATES (PLATE "B") also causes "chatter". Removal and "stacking" of the plates will easily ID warped plates; replace those warped. This latter problem (warped plates) is often characterized by clutch "drag" which is exhibited by the clutch attempting to intermittently "grab" or "feinting" engagement when the bike is stopped in 1st gear with the clutch lever disengaged.

Clutch plates are easily removed (R&R'd) by simply unbolting 4 - 10mm bolts, washers & springs at pressure plate. BUT take care when removing spring plunger-device and it's TINY ball bearing (make sure you properly reinstall both of them!).

After replacing (ANY) CLUTCH PLATES, always re-adjust the LARGE CLUTCH SCREW located on the side case. To do so, remove all tension from clutch cable and "upper" clutch adjusting bolt atop side case; clutch lever (inside side case) must be totally "free" of tension! Then align LARGE screw with MARK on side case [or slightly to left (counter-clock) of case mark] and re-tighten locking bolt. Always adjust latter prior to cable adjust when re-adjusting clutch.

LATE NEWS: A "knowledgeable source" notes the Honda XL350 clutch pack ("329"- code & w/ more plates) fits in the CB77. This OBE's heavier

springs as there is more SURFACE AREA! Source also says that newer (& more \$), high-tech alloys (titanium) make the "YB" springs dinosaurs! I HAVE NOT CONFIRMED THIS SOURCE / APPLICATION.

(14) PRIMARY CHAIN (CB77) : Primary chain (there is NO adjustment, only a "tensioner") stretches and should be replaced at 10K mile intervals (another of the prominent CB77 wear items!). Replacement requires "pulling" both clutch basket assy. & primary drive gear. Clear indication of excessive wear or stretch is noted by wear or "shinning" on the upper (inner) portion of the case directly above the chain. To test chain wear, disengage chain tensioner & check chain free play "free play" should be no more than 3/4 to 1-inch MAXIMUM. Wear or excessive "slack" in the primary chain can also be tested by placing bike on center stand, engaging 1st gear, and "rocking" the rear wheel. This is more subjective as you must account for "slack" or free play in primary drive sprocket and tranny gears. (Replacement chains are available thru Ohio-Nick, a large Honda dealer in the Netherlands, & Western Hills Honda spare primary chains are good "spares").

NOTE: A "LOOSE" (improperly adjusted) drive chain can cause the same "rubber band" effect (upon shifting) as a worn primary chain!

(15) AIR FILTERS: Ensure the "aft" vacuum hole on new/NOS CB-filters is "plugged" w/ silicon prior to installation. ALSO..... Never use "old / weathered" filters. Motor can "ingest" dirt, paper particles, etc. (from a "bad or worn" element) into the motor (UGH!!!).

(16) SPARK PLUGS: Use of the "platinum" plugs (YES, they were once & still may be available) appears to work very well on CB & CL77 with minimal "fowling". Use "Anti-Seize" when installing plugs and a torque wrench is a "MUST". (Note that CB/CL72/77 sparkplugs also fit CB/CL160's).

Of NOTE, the asymmetrical head design (porting) of the CB/CL77 combustion chambers results in the right & left plugs burning differently or unevenly (due to combustion "swirl"). The left cylinder is not as efficient as the right, and there will always be a slight "soot" spot on the very end of the ceramic portion of that plug. The motor was not designed symmetrically from right to left; this design imperfection can also manifest itself in carburetor adjustment and other aspects of tuning.

(17) STEERING DAMPER: Advise a "tightened" damper for the freeway, but loosen the damper 2/3 turn (so that front wheel just "falls" of center position on main stand w/ rear wheel on the ground) for "twisty" driving. A "tightened" damper tends to make the bike want to stand-up & travel in a straight line on twisting roads / impair "twisty" steering / handling. Installation of the "YB" damper kit should rectify this problem (as long as the steering damper plunger is a GOOD functional unit).

(18). CHECK NUTS/BOLTS & COTTER PINS: Ensure that all nuts and cotter pins are THOROUGHLY CHECKED AND TIGHTENED after re-assembly or repairs. Failure of the front or rear brake stopper arm OR loosening of the lower fork / axle retaining nuts WILL be disastrous (AND POSSIBLY DEADLY)!! Also note that the use of Anti-Seize (spoke nipples, spark plugs, etc.) and Lock-Tite is appropriate for some items.

(19). OIL SEPARATOR: When installing or cleaning the separator "unit" (equivalent of a oil filter), ensure that shaft turns freely in the separator "drum" prior to re-assembly. Also ensure that separator "washer" is installed on the "OUTSIDE" of separator drum (and NOT on the inside / toward the engine interior). Also ensure that the "tab" on the shaft is between the "11:00 and 1:00 O'clock" position prior to re-installing the "round / 3-bolt" outer oil separator case. The inside of the case is "beveled" to accept the shaft tab in this position.

(20). COMPRESSION: NOS compression should be 175psi. My rebuilt CB77 tested at 162 psi left & 170 psi right (at 2600 miles). Ensure the throttle is "wide-open" when testing compression. Also test for compression "bleed down" to get a TRUE sense of the condition of your rings, integrity of the cylinder barrel (i.e., being "truly" round vs. somewhat elliptical).

As long as the difference is less than 10+/-% side-to-side, and over 145psi, there is "NO compression problem". Many factors cause the compression difference such as thickness of head gasket, valve guide efficiency, piston shape/consistency from right to left, ring seating, valve adjustment, cylinder volume difference due to manufacturing tolerances (an inherent design flaw), cam chain positioning/lash as effected by the advancer unit (and we know what an exact unit that is!), etc. The "only" way to insure TOTAL equality & exact / maximum specifications is to have the motor balanced, ported and built to exacting specifications. Remember, the CB72/77 motor it is a mass produced, assembly-line motor of late 1950's design!! There ARE inherent design flaws / inconsistencies in the head & intake chambers of all CB72/77 motors!

Per Bill S., CHECK "replacement" pistons to determine whether they are "early" (more domed) with higher compression or late versions. "EARLY's" are more problematic with today's fuels & timing set-up sensitive (i.e., detonation & burning holes in the pistons!). "IF" YOU SHAVE OR MILL THE TOP OF THE BARREL (TO SOLVE A "LOOSE BARREL LINER PROBLEM") OR shave the head, the compression will go up even MORE!! To rectify any of these "high compression" problems, one can USE 2 (DOUBLE-UP) GASKETS BETWEEN THE CASE & BARREL to reduce compression and prevent detonation!! I have NOT had this problem, and therefore, cannot attest to the practicality or viability of the aforementioned solution. I would advise consulting with someone VERY KNOWLEDGEABLE "PRIOR TO" making this alteration. MY MOTTO is: "KEEP HER AS STOCK AS POSSIBLE!!!!" & avoid the problem.

There is a solution to "loose" cylinder liners, which I've encountered on 2 small twins. The FIX is to remove the liners, clean & "scuff up" both the liner outer & barrel inner surfaces, apply LOCKTITE SUPER DUTY or similar adhesive, & re-assemble. Other solution is to find NOS or undamaged barrels.

(21). TACH RATIO: Per Bill Silver, the tach ratio is computed as follows:

"Starting at the camshaft, there are 3-teeth on the tach drive end of the camshaft (remember, cam runs at 1/2 speed, so double that) and 10-teeth on the tach cable drive gear." Foreign Speedo calculates this as an overall ratio of 7:1. FS also notes that the Bill Silver-supplied gear figures (and the ultimate ratio) must take into account the type of gear bezel (BOTH gears are the LONG, spiral type). This info applies to the "late" model CB77's; the earlier model "counter-rotating" speedo / tach unit may have a different ratio.

(22). FUEL / FUEL ADDITIVES: Modern fuels (especially CA "ARB" version UGH!) "murder" old valve seats. I use a kerosene-base, tetra ethyl lead additive that helps "preserve" the valve seats and bumps the octane level 2-points for each ounce of additive per one-gallon of fuel. I use Shell Super Unleaded. The additive costs approx. \$30 per gallon, but lasts a very long time with normal vintage use!

(23). SPEEDO &/or TACH REPAIR / REFURBISHMENT: Foreign Speedo (in SD) will disassemble, repair, clean & lubricate, & re-assemble any vintage speedo/tach unit including the CB/CL77 model (that includes "up to" 1968 Honda models with metal speedo/tach cases and chrome bezels). For. Speedo prices range from \$30 to \$70. Author has cleaned/refurbished his own face plates (as noted herein), and cleaned & repainted speedo/tach needles & redline mark. Bill S. notes that the "change-over" from the earlier counter rotating tach & speedo needles to the later ('66 CB77 included) left-to-right needles occurred early in the 1965 model year. Unsure as to whether the motor's tach drive unit differs before & after this change (but that would make sense).

(24). SPROCKET ADJUSTMENT / TIGHTENING & REPLACEMENT: Upon disassembling or re-conditioning a bike, the primary/front & rear sprockets are often "wobbly" (more the case with front), worn or somewhat loosened. Sprockets take a "LOT" of abuse as they are constantly being "wipsawed" between full torque & hard engine braking! Ensure both are checked for "tooth" wear (generally appears as "cupping" on one side of the teeth) as well. The latter requires replacement (including the front drive sprocket locking flange). NOS replacements work BEST. A "loose" rear sprocket

usually requires only re-torquing of the 4-bolts that secure it to the aluminum rear hub. Bill S. recommends checking the sprockets every couple-a-thousand miles. Replacement of the front drive sprocket is least expensive, and has the most beneficial effect on reducing driveline sloppiness. (It also helps to prolong the life of the rear sprocket & chain).

(25). UN-"SEIZING" PISTONS (This is based upon input from a number of sources): START by using a mix of Marvel Mystery oil and penetrating oil. Pour into the spark plug port / OR / open head (if you can/have removed the camshaft & head) to loosen the rings. Can ALSO put in Kroil for a few hours, to REALLY "soak & loosen".

The Bob Fong approach: PRIOR TO THE "ABOVE", weld a 16x1.5 mm nut onto the spare rotor (see below). Using the "altered" rotor, screw in the rotor-setting bolt (go longer?) into the now thread-aligned nut welded onto rotor & apply the necessary torque. This allows use of the stock rotor puller to subsequently extract the "nut-altered & aligned" rotor (after using it to turn / unstick the pistons). Allows use of a breaker bar to ease the motor free with no need to use a hammer (& pound). Bob Fong saw this idea in a VJMC-post. It's very simple and effective, but you end up destroying a rotor.

[Bob Fong followed the suggested technique (in the VJMC post), but used a 16x1.5 nut as it matched the threads in the rotor. The threads must be the same size and pitch as the rotor puller. He screwed the nut onto the puller, screwed both onto the rotor, and had a local muffler shop weld the nut onto the rotor (thereby destroying it for any other use). Because the weld was made with the threads of the nut lined up with the threads in the rotor, you can still screw and unscrew the puller when you decide to extract the rotor. Anyhow, remove the puller, then screw the newly created "tool" in with the original hold down bolt. Voila, you have the ability to apply much torque via a large socket attached to a long breaker bar. This allows you to do rocking back and forth with gentle, but high torque applications, thus saving your bearings from hammer shocks that you might apply using a shorter lever arm via, for instance, a chain type vise grip or shorter wrench.]

Bill Silver's Latest Approach: Bill S. touts the use of a steering wheel puller/remover device the "tang" is secured to the motor/block & the "puller" (or pushing device) is set atop a block of wood or other appropriate medium which fits into the cylinder bore to push on the stuck piston(s) & unseize them. The theory being it's better to apply constant pressure to the piston(s) rather than beating atop them & possibly damaging the wrist pin & / or crank rod bearings!! [Use of a penetrating oil & alternating (left to right bore at some routine interval during the "torquing" process) piston pressure is probably the most prudent method of solving the "stuck" motor dilemma].

(26). "TURNING" BRAKE DRUMS: Several folks have had CB77 drums "turned" at knowledgeable brake shops as the drums were "out of round". Bill S. notes to be VERY CAREFUL when turning drums as the steel liner is NOT very thick! Uncertain as to whether "turning" can be done with a "built" wheels??

Suggest checking the metal liner specification / thickness prior to turning the drum! A local shop owner notes that a scored or out-of-round drum does NOT necessarily reduce stopping power all that much. MOTTO: "FIRST - Clean up the drum & scuff the drum/pads & see how the brakes works!" I use 220 wet/dry paper to "scuff" both. There is often some surface rust to be found inside the brake drum where the bike that has been outside & unused for years. The wet/dry paper works well to also remove rust.

(27). FRONT FORKS: "STUCK" FORKS - Due to rust & metal corrosion, the aluminum fork tubes are often STUCK in the lower fork (triple tree) clamps. To facilitate removal, recommend the following procedure: 1) apply a "super" lubricant / penetrating oil to the lower clamp / fork area & let it penetrate; 2) insert a screw driver or wedge in the lower clamp "slot" where the clamp bolts tighten to the fork tube (carefully pound a tool or wedge into the "slot" to expand the clamp & loosen same from the tube); 3) remove the alum. top fork bridge / clamp & fork oil cap / screws, and insert a "long" 10mm bolt into the fork tube then use a mallet on the bolt head & pound the fork tube down & thru the lower fork clamp use of a clamp / large plyers may be required to "work" the fork tube down & out of the lower clamp. BE SURE to avoid use of a clamp or plyers on any area where the fork tube slides thru the fork seal!! Use of a clamp or channel locks just below the point where the lower clamp meets the fork tube is advised. And, do NOT grip/clamp onto the aluminum tube with too much force. You can distort the tube.

Before reinstalling the fork tube, clean & remove all rust deposits & spurs (w/ emory paper) from the fork tube & lower clamp. On early "metal" forks, MAKE SURE to use the correct size (length) bolt for the drain hole (too long a bolt will damage the fork slider).

NOTE: Lower Fork (axle) Holders (secured by 2-each bolts, lock & flat washers) are installed with the "tallest" portion/part toward the front. Tighten the front bolt (tall end) of each side 1st & then "snug-up" the aft bolt on each side (short end of the holder). This procedure ensures the axle is SECURELY fastened in place w/ no chance of coming or working itself loose.

FORK OIL CAPACITIES - Per "Mr. Honda" Bill Silver, CB77 steel forks take 215_225cc of fork oil dry and 200_210 on refill (just drained). Alloy forks hold 185cc on refill and 200cc when dry. Bill recently used synthetic ATF fork oil in his CYP77 forks (after a rebuild) and it worked great! Any good medium grade fork oil will suffice.

(28). AXLES, SWING ARM PIVOT BOLT, ETC: General wear & tear, lack of maintenance or lubrication, and mileage can cause scoring or wear to the axles & swing arm pivot bolt. Wear or scoring of the "axles" is far more critical than to the swing arm pivot bolt. The latter does not support bearing surfaces which revolve at hundreds of rpm's; it only supports motion thru a portion of an arc.

Thorough cleaning of the axles, the pivot bolt, bearing surfaces (NOTE: removal of ALL grease from the bearings without replacement / removal is nearly impossible), etc. is appropriate when the part is torn down ALONG with re-packing of fresh axle grease. Regarding scoring or wear marks on the axles or pivot bolt, use of emory cloth or ##### steel wool to remove burs / rust and smooth rough surfaces is recommended. If axle wear (at the point of contact) with the bearing surface is severe, the axle should be replaced. Replacement of the swing arm pivot bolt (due to scoring or wear) is far less critical. However, let your conscience guide you.

Sealed axle and steering stem bearings are available & should be used to replace the originals. Author has determined that the Timken CB750 steering head bearing fits the CB/CL77.

(29) RING (PISTON) INSTALLATION / TIPS: Rings are installed @ 10, 2 & 5 o'clock "position" (top to bottom / front to back) or @ 120-degree angles as you DO NOT want "ring gap" DIRECTLY fore & aft (pistons have a tendency to rock fore & aft).

Cam chain & camshaft install is a "delicate" & involved installation. Chain should be TOTALLY vertical & straight/true in its (up & down) alignment, and cam (end) holders need to seat perfectly or else the gaskets between the end plates will not seat. Bill S. spent several minutes tapping, aligning & adjusting the cam & chain (on my CB77) to get it as good as he could. Once ALL of the adjusting takes place, the cam is "locked" in place by the screw @ the rt. side and by tightening the cam lock-nut in the center.

WRIST PINS pins are another "normal wear" item on the CB77, and Honda manufactured an over-sized wrist pin (0.004"-over standard ending w/ code xxxxx-xxx-305) to remedy the problem. The O-size pins are "back order" thru Honda, but Western Hills & Bill Silver may have them available. The upper crank (arm) hole "elongates" w/ mileage (even as little as 8-10K) so that a "replacement" standard size pin will produce a "slapping" sound at idle (e. g., my blue 1966 CB77). (Whether this is the "cause" of the "fore & aft" piston wear in the cylinder barrel or vice-versa, ask Bill S.?). If worn, the standard pin will actually rock slightly (or wobble) in the upper crank opening. Use of the O-size pin requires "CAREFUL" honing of the upper crank arm

opening & the piston/pin hole as well (NOTE: ONLY "minor honing" is required TAKE CARE NOT TO OVER-SIZE THE HOLES!!)

NOTE: The Oil pump body has 2 gaskets..... , NOT just 1!!

ADDITIONAL INFO/NOTES:

1 DRIVING / SHIFTING TIPS:

A. Shifting "works best" when pressure is applied to the shift pedal just as the clutch is depressed. (At least on my CB77!).

2) PROCEDURES FOR ELECTRICAL GROUNDING:

(RECOMMENDED cleaning & preparation of engine, frame & other contact points prior to re-assembly & especially after powder coating):

- A. At rear fender bolt points to frame (best at upper 8mm) at one point.
- B. At rear fender / taillight mount bracket (one bolt only).
- C. At one motor / frame bolt mount (upper mount points are tightest fit). Recommend taking p-coat off inside of both upper mounts due to very "snug" fit.
- D. At Coil / frame mount (both sides), including ground strap.
- E. At upper fork ears / upper triple clamp (alum.) - both sides. Ensure upper fork ear contact w/ alum. upper triple clamp.
- F. Fork ear / headlight shell at bolt (one side) & inside of hd-lt. shell to same bolt / nut.
- G. At junction of battery box, frame & rear fender (at location of 1 of 2 - 6mm bolts).

NOTE: Unique routing of ground wire "inside" the frame cage at battery box "passage" point (& not outside frame tubes!).

H. Both "ears" of rectifier mount (inner and outer), a VERY critical contact point; some re-assemblers even run a green ground wire from one rectifier bolt to a frame / motor mount contact point.

3) PAINT (Powder Coat): RAL 5013, COBALT BLUE: This is the best and most practical / economical match for the original Honda Royal Blue (both for the CB77 & 160). There was an earlier BLUE for the HONDA CB92's, etc. called COLUMBIA Blue. RAL 5003 (Sapphire Blue) is a near "dead-match" for the Columbia Blue (CA110??). Paint code is for Tiger Drylac p-coat that is manufactured / located in Buena Park, CA. Next project will ('65 CB77 Cafe' will be done in Crimson RED p-coat).

4) CB/CL77 "Key" WEAR Parts: All parts wear with time, and with higher miles, (generally) all parts wear greater. However, there are several CB/CL77 parts which are considered "KEY" wear parts/items; these include: 1) Primary Chain; 2) Shift Forks; 3) Shift Drum (more forks than drum); 4) Drive Sprocket; 5) Rear Sprocket; 6) Cam Chain Tensioner (wheel); 7) Cam Chain Roller (wheel, again); 8) kick starter spindle Bushing "C" (brass); 9) gas cap Gasket; 10) fuel cock Packing A (4-holes); 11) fuel cock joint Nut Packing (CB77 only); 12) Starter Clutch, Roller Springs & Caps; 13) Kick Spindle Pawl; and???? (If you plan to complete multiple restorations, these parts should be "horded").

5) Misc. Notes:

A. From Japan, there is available the larger, black-cabled plastic "outer" wrap & the silver-looking "woven" (heat shrink?) point wire wrap. Bought smaller version at El Camino '98.

B. Bill S. recommends checking "FIT" of the CB72/77 frame "ON TO" the motor prior to mounting wheels, forks, etc. It's MUCH EASIER to "fit" the motor this way than "lifting" motor up into an assembled / rolling frame (& filing down p-coated mount points!!!). Good luck with the CL72/77! Removal of threaded header flange bolts is the "best" suggestion before putting a CL motor back into the frame.

C. Bill S. also suggests using a Dremel-Moto tool or ACE Hardware grinding tool (later is cheaper) to "grind off" excess p-coat from the frame & clean-out screw / bolt holes & fittings prior to assembly. Use a .22 calibre wire bursh / cleaning rod w/ fitting also works well for "reaming out" screw / bolt holes (and not damaging threads). Latest idea regarding cleaning of excess powder coat or paint from bolt holes is an inexpensive metric thread tap kit available from Harbor Freight.

DISCLAIMER: Most of the above applies to CB/CL77's; however, many concepts also apply to many early Honda twins & singles.

NOTE: I have written the above based upon my experiences, conversations with other "knowledgeable" sources, and recollections of the aforementioned conversations.

If you want totally accurate, irrefutable expertise, please contact "Mr. Honda" Bill Silver (now of Hilo, HI) @ sterling.silver@turquoise.net Bill S. is the "most knowledgeable" CB77 person that I have come across since my re-introduction to vintage Honda's in 1994. He has forgotten more than I will EVER know. Further, Bill has no biases or hidden agendas when it comes to rendering advice. He's probably one of the few folks I know that treats EVERYONE the same whether they be a good friend or something lesser (that I wouldn't waste my time talking to).

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