

LEVEL 2 TUNE-UP CHECKLIST (for bikes with rim brakes)

*Not all steps apply to all bikes. Italicized items unavailable on Level 1 Tune-Up.
Torques are minimum recommended in absence of manufacturer specifications.*

Check-off items done to specification. Mark items with “NA” when not applicable, or “X” when problems could not be repaired and/or are in need of further attention.
EXISTING CONDITIONS

- Derailleurs operated and performance evaluated.
- Brakes operated and performance evaluated.
- Stem height marked or recorded.
- Control-lever positions recorded.
- Seat height recorded.

DISASSEMBLY, CLEANING, AND INSPECTION

- Wheels removed.
- Tires inspected for damage and wear, *then removed.*
- Rear cogs or freewheel removed.
- Freewheel or cassette cleaned in solvent.*
- Freewheel or cassette inspected for wear and damage.
- Rims and spokes thoroughly cleaned.*
- Rims inspected for damage.
- Pedals removed.*
- Pedals inspected for worn and damaged parts.
- Crank arms removed, *cleaned* and inspected.
- Chainrings *cleaned* and inspected for wear.
- Chain removed and cleaned.*
- Chain inspected for wear and damage.
- Brake cables removed and inspected for rust, frays, and kinks in the inner wire and housing.
- Brake levers inspected for damage.
- Brake calipers removed and cleaned.*
- Brake caliper inspected for damage.
- Brake pads checked for wear.
- Derailleur cables removed and inspected for rust, frays, and kinks in the inner wires and housing.
- Rear derailleur removed, disassembled and cleaned.*
- Rear derailleur inspected for damage and worn pulleys.
- Front derailleur removed, cleaned, and inspected.
- Stem removed from fork.
- Stem bolts removed and cleaned.*
- Handlebars and stem inspected for damage.
- Fork inspected for damage.
- Frame thoroughly cleaned.*
- Frame checked for damage and cracks.

FRAME PREP, ASSEMBLY, and BEARING ADJUSTMENT

- Stem bolts greased and installed.*
- Brake-caliper threads, pivots, and springs lubricated.
- Adjustable brake pivots adjusted for no play or binding.
- Brake-pivot nuts and/or bolts checked for security.
- Rear derailleur threads, pivots, and springs lubricated *and pivots assembled.*
- Rear-derailleur pulley wheels lubricated *and installed.*
- Seat-post retention mechanism secured.
- Seat checked for proper alignment and security (non-integral clamp 130in-lbs, single-bolt-integral clamp 120in-lbs, double-bolt-integral clamp 85in-lbs).
- Fork dropouts aligned (as materials allow).
- Rear swing-arm/linkage pivots secured.
- Rear dropouts aligned (as materials allow).

- Rims trued laterally to .5mm tolerance or better.
- Rims trued radially to .5mm tolerance or better.*
- Wheel dish corrected to .5mm tolerance or better.*
- Spokes tensioned to 90-120 kgf right-side average (rim and spoke condition allowing).*
- Wheels stressed until true is stabilized.
- Hubs adjusted to have no free play secured in bike, but with free play when QR is loosened 45°.
- All hub locknuts secured to 120in-lbs.
- Freewheel or cassette lubricated and installed (cassette lockring secured to 355in-lbs).
- Tires *installed*, inflated, and inspected for proper seating.
- Drive-side cup (or both sides of cartridge BB) secured to 300in-lbs.
- Bottom-bracket adjusted to minimal drag and no free play, and lockring secured to 300in-lbs.
- Chainring bolts secured to 50in-lbs.
- Crank-arm bolts greased and arms secured:
Square taper – 335in-lbs (Race Face 420 in-lbs)
Spline fit (Octalink & ISIS) – 420in-lbs
Split-hole (such as Hollowtech II) binder bolts – 110in-lbs
- Threaded dustcaps lubed and gently secured.
OR One-key-release washers greased, cap threads prepped with Loctite 242, and caps gently secured.
- Pedal bearings adjusted to minimal drag and no free play.
- Pedal *threads greased* and pedals secured to 300in-lbs.
- Quill-stem shaft, wedge, and bolt greased, then installed to original depth of insertion (or minimum insert mark, whichever is lower), aligned perpendicular to fork, and secured to 170in-lbs (steel bolts only). **OR** Threadless-stem bolts greased and installed, stem and top cap installed, and stem aligned perpendicular to fork.
- Headset adjusted to loosest setting with no free play.
- Threaded-headset locknut secured to 300in-lbs
OR Threadless-stem-binder bolts secured to 50in-lbs (double bolts) or 120in-lbs (single bolt).
- Handlebars inspected for damage.
- Handlebar-binder bolts secured (8mm bolts: 180in-lbs, 7mm bolts: 155in-lbs, 6mm bolts 120in-lbs, side-by-side binder bolts: 60in-lbs each).
- Handlebar add-ons secured.
- Brake-pivot studs (if any) greased, Loctite 242 applied to mounting threads (except nylock nuts or bolts), & calipers mounted (70in-lbs for sidepulls, 25in-lbs for others).
- Brake levers set to original alignment (unless unacceptable) and secured (cast clamp: 35in-lbs, strap clamp: 60in-lbs).
- Brake-lever pivots, cable-anchor pivots and cable adjusters lubricated.

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- [] New or existing brake housings sized. (Lever to frame piece: as short as possible to allow full normal fork rotation. All others: as short as possible without abrupt bends at ends, or interference with caliper motion.)
 - [] Brake-housing ends finished with filing and end caps, wherever end caps fit (parts addtl.).
 - [] Wheels mounted in proper alignment and security (front axle nuts 180in-lbs, rear axle nuts 240in-lbs.
OR Q.R. skewers set so force is required through out the last 90° of closure and base of lever ends up parallel to dropout.
 - [] Derailleur hanger aligned to less than 4mm tool-to-rim gap at all points.
 - [] Rear derailleur installed and secured to 70in-lbs.
 - [] Front-derailleur pivots lubricated.
 - [] Front derailleur set so bottom of outer cage plate clears outer chainring teeth by 1-3mm.
 - [] Front derailleur rotated so outer cage plate is parallel to line of chain in outermost gear combination.
 - [] Front derailleur secured to 35in-lbs.
- BRAKE AND DERAILLEUR ADJUSTMENTS**
- [] Brake-pad height set so top edge of pad is even with top edge of rim's braking surface (except U-brake and outer-pivot arm of dual pivot: set so bottom edge of pad is even with bottom edge of rim's braking surface).
 - [] Brake pads set tangent (parallel) to rim.
 - [] Brake-pad toe set to .5-1.5mm if needed to reduce squeal.
 - [] Brake cables lubricated where they pass through housing.
 - [] Brake cables routed correctly (no interference with other cables, or unnecessary bends) and cable-pinch mechanisms secured to 50in-lbs.
 - [] Cantilevers only: Straddle-wire cable carrier set to clear tire by 35-45mm
OR Link-unit set so alignment line on link-unit head points to bottom end of link wire (± 10 mm).
 - [] Brake-cable system stress tested by pulling brake lever firmly a minimum of ten times.
 - [] Brake-pad clearance set to 1-2mm per side (looser if cable release is difficult, or tighter if lever clears grip/bar by less than 25mm when pads first contact rim).
 - [] Brake pads centered to less than .5mm difference.
 - [] Brake cables trimmed, soldered, and capped.
 - [] Rim braking surfaces cleaned of lubricants.
 - [] New or existing derailleur housings sized and ends finished with end cap. (From controls to frame: sized as short as possible to allow full normal fork rotation. To rear derailleur: sized such that with derailleur body parallel to chain stay, housing enters adjusting barrel in a straight line.)
 - [] New or existing derailleur cables lubricated where they pass through housings.
 - [] Derailleur cables routed so they do not interfere with any other cables, and pinch mechanisms secured to 35in-lbs.
 - [] Derailleur cables pre-stressed.
 - [] Wobbling chainwheels aligned to less than .5mm wobble.
 - [] Chain lubricated, sized to longest acceptable length in small/small gear combination, and installed.
 - [] Chain inspected for tight links, protruding rivets, and too-short symptoms in big/big gear combination.
 - [] Rear-derailleur limit screws set to tightest settings that allow shift to largest and smallest sprockets (with no excess noise).
 - [] Rear-derailleur cable tension set to tightest setting that allows indexing without out-shift hesitation or post-shift chain-to-cog rubs.
 - [] Front-derailleur outer-limit screw set to hold .5-1.0mm clearance between the chain and outer cage (with chain on outer/outer gear combination).
 - [] Front-derailleur outer-limit screw set to hold .5-4.0mm clearance between the chain and inner cage (with chain on inner/inner gear combination).
 - [] Front-derailleur overshift checked in all gear combinations.
 - [] Front-derailleur cable tension set to create .0-.5mm clearance between inner cage and chain (chain on innermost rear cog and next-to-outermost chainring), with no audible rubs in any gear combination.
 - [] Accessories checked for mounting security and interference with moving parts or safety hazards.
- TEST RIDE AND INSPECTIONS**
- [] Handlebar and add-ons load-tested (30lb side load and 150lbs down load - tested at furthest point from headset).
 - [] Seat nose load tested (50lbs side load and 75lbs down load).
 - [] Brakes checked for stopping power and squeal.
 - [] Bicycle checked for tracking problems.
 - [] Derailleurs checked for performance and overshift.
 - [] Chain and freewheel cogs checked for skipping under load.
 - [] Bicycle checked for unusual noises.

MECHANIC'S SIGNATURE _____

DATE _____