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1954 BSA B-Series Buyer's Guide

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IRONHEAD

1954 BSA B-Series Singles

Factory-Correct Restoration Guide

Model year 1954 · The swinging-arm frame arrives · 348 & 499 cc OHV singles

KEY FACTS AT A GLANCE

- Model year 1954 — swinging-arm frame introduced (National Motorcycle Museum)
- Three rear-frame types now overlap: rigid, plunger, swinging arm
- Documented 1954 B31: frame CB31-3481 (Bonhams)
- B31: 348 cc (71 x 88 mm); B33/B34: 499 cc (85 mm bore) (Bonhams; motoinfo.it)
- Mixed B31/B33/B34 specials are common — verify identity (Bonhams)
- Lucas 6-volt magdyno (National Motorcycle Museum)

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1. Manufacturer history: BSA

The Birmingham Small Arms Company of Small Heath, Birmingham, built the B-series overhead-valve singles as the backbone of its post-war civilian range. The B31 was the only new model when BSA announced its post-war range in August 1945 (H&H) — BSA's sole all-new model at its introduction (Bonhams) — with origins in the earlier B29 and WB30 (H&H), a rigid frame and BSA's first telescopic forks (Bonhams). In January 1946 it was joined by the B32 competition variant (Bonhams); the 500 cc B33 followed in January 1947 and the B34 competition 500 in April 1947 (Bonhams). The B33 was manufactured from 1947 to 1960 (Bonhams) and the B31 from 1945 to the end of 1959 (Bonhams), making the B singles BSA's mainstay through the 1950s. Frames evolved from rigid to optional plunger rear suspension (from 1949 across the B range, per Bonhams) to the swinging-arm frame introduced for 1954 (National Motorcycle Museum); electrics moved from the Lucas 6-volt magdyno (National Motorcycle Museum) to the alternator-equipped late B33 (Bonhams).

2. Model history: the B-series — 1954

For model year 1954 the B range gains its biggest chassis change since 1949: the swinging-arm frame, introduced for 1954 (National Motorcycle Museum — the factory workshop manual covers the iron B31/B33 'up to the 1954 advent of swinging-arm'). Rigid, plunger and swinging-arm rear ends now overlap, so the rear frame is the first identity question on any 1954 machine. Bonhams documents 1954 B31 machines (frame CB31-3481) and warns that mixed B31/B33/B34 specials are common.

3. About this guide

A restoration companion to the factory service literature — not a replacement. This paid guide covers the BSA B-series OHV singles for the single model year 1954 only. It is organised as a workshop record: establish identity, preserve evidence, inspect before replacing, apply only supplied specifications, and write down every unresolved uncertainty.

How this guide is sourced: every numeric value printed here exists in a genuine source cited in the Sources section — auction-house lot essays, valuation-data records, factory-literature listings, the BSA Owners' Club machine-dating reference, and parts-manufacturer data. Anything the sourced literature does not give a number for is omitted or explicitly described as not located, never invented. Forums and restored bikes can suggest what to check; only sourced literature verifies.

A note on market naming: BSA's home (UK) and export (especially US) model names, tanks, bars and equipment differ across this run. The year-change register in this guide is the authority, not the badge on the tank.

4. What's new for 1954 — year-change register

Every running change into model year 1954, with why it matters for parts interchange and value. Rows for this year are the ones to check on the bench first.

- The swinging-arm frame arrives for 1954 (National Motorcycle Museum) — the biggest chassis change since the 1949 plunger option.
- Three rear-frame types overlap in 1954: rigid, plunger, swinging arm. Establish which one the bike left the factory with before buying parts.
- Bonhams warns mixed B31/B33/B34 specials are common — a 1954 'B33' needs its barrel, cases and frame checked together.
- The 1953 B31 data point (22 bhp @ 6,000 rpm — motoinfo.it) remains the reference 350 specification.

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5. Model identification: variants and numbers

Variants in the range

Variant	Engine	Role	Year note
B31	348 cc (71 x 88 mm)	OHV single	Rigid, plunger or swinging arm
B32 Competition	348 cc (71 x 88 mm)	Competition single	Continues
B33	499 cc (85 mm bore)	OHV single	Rigid, plunger or swinging arm
B34 Competition	499 cc	Competition single	Continues

Numbers

- Documented 1954 prefix example: CB31 (Bonhams) — a data point, not a range.
- Rear-frame type is now the primary identity axis — record it before anything else.
- Use the BSA Owners' Club machine-dating reference, then dispatch records (BSA Owners' Club).

6. Pre-purchase inspection

- Confirm identity first: the two identity axes for the whole 1945-1960 run are rear-frame type (rigid / plunger / swinging arm) and electrics (magdyno to 1957, alternator 'G' from 1958). Establish both before spending money.
- Check frame and engine prefixes together: documented examples include YB31 (1948), ZB31 (1949), CB31 (1954-55), GB33 (1956, 1960). Bonhams documents machines whose engine is not original to the frame and whose serial appears re-stamped — a BSA Owners' Club dating letter is the remedy.
- Beware mixed specials: Bonhams warns that mixed B31/B33/B34 specials are common. A 500 cc barrel on B31 cases, or competition parts on a touring frame, is a special — price and restore it as one.
- Check the rear frame against the year: rigid only to the early years, plunger optional 1949-1955, swinging arm from 1954 (National Motorcycle Museum). A rigid-framed '1956' is wrong.
- Check hubs and brakes: Ariel-type full-width alloy hubs are documented from the 1956 season (Bonhams). Earlier bikes should carry the period BSA hubs.
- Check electrics: Lucas 6-volt magdyno is the period system (National Motorcycle Museum); the alternator-equipped late B33 is a 1958-60 feature (Bonhams). A coil-ignition conversion on a magdyno-year bike is a modification — note it.
- Check the competition models' alloy parts: the alloy barrel and head were B32 options from 1949 (Bonhams), broadly similar to the contemporary Gold Star but retaining a separate pushrod tunnel — do not mistake ordinary B32/B34 competition specification for Gold Star specification.

7. Verified specification tables

Every number below is attributed to its source. Anything the sources do not give a number for is omitted.

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Engine and cycle parts

Item	350 (B31/B32)	500 (B33/B34)
Engine type	Air-cooled OHV single (Bonhams)	Air-cooled OHV single (Bonhams)
Displacement	348 cc (motoinfo.it; F.W. Thornton)	499 cc (Bonhams)
Bore x stroke (350)	71 x 88 mm (motoinfo.it; F.W. Thornton)	n/a
Bore (500)	n/a	85 mm (Bonhams)
Rear frame	Rigid, plunger or swinging arm — swinging arm NEW 1954 (NMM)	Same
Electrics	Lucas 6-volt magdyno (National Motorcycle Museum)	Same

8. Finishes, fasteners and markings

No complete factory color chart for this model year was located in the sources consulted. Preserve original paint wherever it survives — it is the evidence a repaint destroys. Auction descriptions of restored bikes are not color evidence.

Fasteners: BSA used Whitworth/BSF and metric threads across this era — check, don't assume. Markings: photograph every stamping before cleaning; stampings are identity evidence.

9. Restoration sequence

1. Document: photograph everything, record frame and engine numbers, bag and tag fasteners by assembly.
2. Establish identity before disassembly: frame type, electrics type, and number prefixes (see section 5). Bonhams documents re-stamped and mixed machines — know what you have.
3. Strip: tank, seat, electrics, exhaust, wheels, forks — keeping the rolling chassis mobile as long as possible.
4. Engine: the iron OHV single comes apart conventionally — rocker box, head, barrel, then timing chest and bottom end. Note piston crown markings against the F.W. Thornton compression options (6.5:1, 7.75:1, 9:1, 12.5:1).
5. Frame: rigid frames — check the rear triangle and headstock for cracks and crash damage; plunger frames — rebuild the plunger units; swinging-arm frames — check pivot and bushings.
6. Magdyno: the Lucas 6-volt magdyno (National Motorcycle Museum) needs specialist rebuild — armature, condenser, slip ring. Do not open it without the service sheet.
7. Cycle parts: full-width Ariel hubs from 1956 (Bonhams) need correct brake plate and bearing fitment; true wheels before paint.
8. Reassembly is the reverse, torqued to the factory Service Sheets (see Sources) — this guide does not reprint torque tables it cannot source.
9. First start: time the magneto, set tappets, check oil return, retorque the head after the first heat cycle per the factory literature.

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10. Electrics

The period system is the Lucas 6-volt magdyno (National Motorcycle Museum). Magneto rebuild is specialist work — armature, condenser and slip ring. Time it to the factory Service Sheets; a weak spark is a magneto fault until proven otherwise.

11. Tools

- Full metric and Whitworth/BSF spanner and socket sets — BSA used both across this era.
- Torque wrench (settings from the factory workshop manual / Service Sheets, not from memory).
- Dial gauge and degree disc for ignition timing.
- Valve spring compressor; piston ring compressor.
- Wheel truing stand; spoke key.
- Multimeter for electrics testing.
- Factory workshop manual or Service Sheets for the exact year (see Sources) — this guide is a companion to them, not a replacement.

12. Troubleshooting

No spark — Lucas magdyno — condenser and points first, then armature/slip-ring; have the magneto professionally rebuilt rather than guessing.

Oil leaks — Pushrod tube seals, rocker-box gasket, timing-chest gasket — the iron single's usual suspects; fix the cause, not the symptom.

Poor starting — Valve clearances, magneto timing, and carburettor condition — in that order.

Clutch slip — Adjust cable and pushrod; check plate condition and primary chain tension.

Rear suspension clunks (plunger/swing-arm) — Plunger units or swing-arm bushes worn — rebuild, don't shim.

13. Parts sourcing

The B-series singles are among the best-served post-war BSAs for parts: engine internals, gaskets, pistons (standard 71.00 mm bore for the 350 — F.W. Thornton), chains, cables and brake linings are all available from the specialists. Magdyno rebuild is specialist work — budget for it. Alloy B32 barrels/heads are scarce and often Gold Star parts misidentified — the B32 alloy top end retains a separate pushrod tunnel (Bonhams). Tinware (tanks, mudguards) is the hard part — buy the best original you can find. Always match parts to frame type and electrics type first, year second.

14. Value and originality

Value follows identity, originality and condition, in that order. A dispatch-confirmed, numbers-matching machine with original paint leads; a mixed special follows at a discount — and Bonhams warns mixed B31/B33/B34 specials are common, so verify before paying a premium. Competition models (B32/B34) are valued as competition models, not as Gold Stars — the alloy B32 top end retains a separate pushrod tunnel (Bonhams) and is not Gold Star specification. Documented one-year-only features (1945 first-year B31; 1960 last-year B33) help at sale time only with paperwork to prove them. This guide gives no price figures; the market moves and asking prices are not values.

15. What this guide does not cover

- Year-specific production totals — no factory figures located in open sources.
- Factory paint-code charts by year — not located; section 8 gives what the sources document.

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- Torque-value tables — no complete factory table located in open sources; use the Service Sheets in Sources.
- Casting and date-code tables — not located.
- B31 horsepower as a single figure — open sources conflict (17-22 bhp range); omitted rather than picked.
- Serial-number ranges inferred from isolated auction examples — documented examples are given as data points in section 5, not as ranges.

Sources

- Bonhams — c.1956 BSA B33 lot essay (B33 manufactured 1947-1960; 85 mm bore; heavier flywheels; plunger option 1949; swinging-arm 1954; full-width hubs 1956; alternator-equipped late B33) —
  `https://cars.bonhams.com/auction/14264/lot/179/c1956-bsa-499cc-b33-frame-no-gb33-316-engine-no-gb33-1219`
- Bonhams — 1949 BSA B32 Competition lot essay (B31 manufactured 1945 to end of 1959; B32 announced January 1946 with high-level exhaust, 21-inch front wheel, extra chromium, crankcase shield, lowered gearing; alloy barrel/head option from 1949; plunger rear suspension from 1949 across the B range) —
  `https://cars.bonhams.com/auction/21135/lot/281/1949-bsa-348cc-b32-competition-model-frame-no-zb31s-1857-engine-no-zb32gs-112-see-text/`
- Bonhams — 1951 BSA B34 Competition lot essay (B34 introduced April 1947; 1951 spec 85 x 88 mm, 6.8:1, 23 bhp at 5,500 rpm; steeper head angle 1951; production ceased 1957) —
  `https://cars.bonhams.com/auction/17658/lot/170/1951-bsa-model-b34-500cc-trials-frame-no-zb31-15475-engine-no-zb34-3181-hc/`
- Bonhams — 1950 BSA B34 Competition lot essay —
  `https://cars.bonhams.com/auction/28185/lot/458/1950-bsa-500cc-b34-competition-model-frame-no-zb34-282`
- Bonhams — 1957 BSA B32 Trials lot essay (B32/B34 trials and scrambles record; C15 arrival 1958) —
  `https://cars.bonhams.com/auction/24494/lot/349/1957-bsa-350cc-b32-trials-frame-no-cb32-7125-engine-no-bb32gs-252/`
- Bonhams — 1954 BSA B33 Special lot essay (mixed B31/B33/B34 specials are common; how to detect contamination) —
  `https://cars.bonhams.com/auction/27434/lot/605/1954-bsa-500cc-b33-special-frame-no-cb31-392-engine-no-x-b34-280/`
- Bonhams — c.1955 BSA B31 lot essay (B31 1945-1959; rigid then plunger then swinging-arm; full-width hubs 1956) —
  `https://cars.bonhams.com/auction/17288/lot/274/c1955-bsa-350cc-b31-frame-no-cb31-10711-engine-no-yb31-2338`
- H&H Classics — 1948 BSA B31 lot essay (B31 the only new model in BSA's August 1945 post-war range; origins in B29/WB30; rigid frame, telescopic forks; largely unaltered until the 1949 plunger frame) —
  `https://www.handh.co.uk/auction/lot/lot-60---1948-bsa-b31/?lot=17476&so;=0&st;=&sto;=0&au;=384&ef;=&et;=■=False&sd;=1&pp;=48&pn;=2&g;=1`
- Hagerty — 1957 BSA B32 past sale (22 hp recorded for the 350 competition single) —
  `https://www.hagerty.com/valuation-tools/past-sales/1957-bsa-b32_trials/CB327125/46b74f14-789b-4a60-b370-78518a7d10e8`
- Leland Little Auctions — 1960 BSA B33 (frame GB33-184 / engine GB33-1127; documents the 1960 model year) —
  `https://www.lelandlittle.com/items/470503/1960-bsa-b33-motorcycle?listId=155445&categoryId;=10016`
- Leland Little Auctions — 1960 BSA B33 (frame GB33-167 / engine GB33-1077) —
  `https://www.lelandlittle.com/items/470507/1960-bsa-b33-motorcycle`
- National Motorcycle Museum — BSA 1948 Annual Sales Catalogue (confirms the 1948 lineup: B31, B32, B33, B34 among others) —
  `https://www.nationalmotorcyclemuseum.co.uk/product/bsa-1948-annual-sales-catalogue-all-models-except-bantam`
- National Motorcycle Museum — BSA 1946-1955 Instruction Manual, B31/B32/B33/B34 group (factory literature listing) —

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