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The opening pages of

1980 Yamaha XS650 Buyer's Guide

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IRONHEAD

The 1980 Yamaha XS650G / XS650SG

Factory-Correct Restoration Guide — IronHead

KEY FACTS AT A GLANCE

- **Model year covered:** 1980 only — both US variants: XS650G Special II (code 3G0) and XS650SG Special (code 3G1). The electronic-ignition year; this guide does not cover other years except where differences are explicitly noted.
- **Engine (both):** 654 cc air-cooled SOHC 360° parallel twin; 75.0 mm × 74.0 mm bore × stroke; 8.4:1 compression; ~53 bhp.
- **Fuel system (both):** Two Mikuni BS34 carburetors — NEW for 1980, replacing the BS38s.
- **Ignition (both):** Transistorized TCI electronic ignition — NEW for 1980. No breaker points, no mechanical advance unit, no condensers.
- **Starting (both):** Electric starter + kick starter.
- **Transmission (both):** 5-speed constant-mesh manual, chain final drive, wet multi-plate clutch.
- **XS650G Special II:** Black Gold; wire-spoked wheels; rear drum brake; reduced chrome, chrome-look plastic side covers; serials from 3G0-000101.
- **XS650SG Special:** Cardinal Red or New Yamaha Black; cast/alloy wheels; 267 mm rear disc; full chrome trim; serials from 2F0-200101.
- **Key 1980-only features:** TCI ignition and BS34 carbs arrive together; Specials only — no Standard this year.

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The Yamaha story

Yamaha's history is summarized in full in the IronHead Yamaha manufacturer guide; the key points relevant to this restoration:

- Yamaha Motor Co., Ltd. was founded in 1955, spinning out of Nippon Gakki (the musical-instrument maker) under president Genichi Kawakami.
- Yamaha's first motorcycle was the 1955 YA-1 "Red Dragonfly," a 125 cc two-stroke whose success established the tuning-fork brand in motorcycling.
- Through the 1960s Yamaha built its reputation on two-strokes — the YDS series twins and the TD/TR production racers that dominated small-displacement road racing.
- The XS-1 of 1970 was Yamaha's deliberate four-stroke answer to the Triumph Bonneville and Harley-Davidson Sportster: a 654 cc overhead-cam parallel twin aimed squarely at the American big-bike market.
- By the mid-1970s the XS650 was established as the Japanese alternative to the British twin — and it outlasted them all, running in production from 1970 through 1983.

The XS650 story

The model-line history is summarized here; the sections below cover what makes the 1980 XS650G / XS650SG specifically correct.

- The XS-1 (1970) launched the line: 654 cc SOHC twin, kick-start only, drum brakes front and rear, built to take on Triumph and Harley-Davidson on their home ground.
- The XS-1B (1971) refined the formula in Candy Orange, retaining the front drum brake.
- The XS-2 (1972) added the electric starter and a 298 mm front disc — the first major mechanical revision.
- The TX650 (1973) brought the larger 14 L tank and a front end provisioned for a second disc.
- The TX650A (1974) was the Percy Tait chassis revolution: longer swingarm, repositioned engine, dual 267 mm front discs, and a stronger starter with the compression release deleted.
- The XS650B (1975) restored the XS name; the XS650C (1976) moved the front calipers behind the fork legs.
- The XS650D (1977) is the best-documented Standard — Yamaha's supplementary service manual was written for it.
- 1978 split the line: the XS650E Standard (the last roadster) and the XS650SE Special (the first factory custom), both on 35 mm forks with floating calipers.
- 1979 ran three variants — F Standard, SF Special (with rear disc), and the 2F Special II — the last year of points ignition and BS38 carburetors.
- 1980 brought transistorized TCI electronic ignition and Mikuni BS34 carburetors; the lineup became Specials only.
- 1981 (H/SH) carried the formula with new colors; 1982–83 closed the line as the Heritage Special (SJ/SK).
- Total XS650 production exceeded 500,000 units across the fourteen model years.

What makes the 1980 unique

1980 is the electrics watershed: breaker points and the mechanical advance disappear, replaced by Yamaha's transistor-controlled (TCI) electronic ignition, and the BS38 carburetors give way to BS34s. The engine itself is unchanged — same 654 cc, same bottom end — but the bike's maintenance character changes completely: no more points gaps, no more advance-unit servicing, no more condenser failures. The lineup is Specials only.

1980-only details:

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- **TCI electronic ignition.** A pickup on the alternator and an igniter box

under the seat replace the points plate, points cam, advance rod, and mechanical advance. The system fires a wasted spark (both plugs together). Consequence for the restorer: the advance rod is absent on TCI bikes, which matters when fitting aftermarket ignitions — kits for TCI bikes must include an advance rod the factory never fitted.

- **Mikuni BS34 carburetors.** Smaller-bore CV carbs replace the BS38s, with

different jetting, needles, and float specs. BS38 parts do not transfer. The BS34s are lean-sensitive to dirty pilot circuits — the marque forums' standing advice is that most "carb problems" on BS34 bikes are incompletely cleaned pilot passages, not jetting.

- **XS650G Special II (3G0, from 3G0-000101)** — Black Gold, wire-spoked

wheels, rear drum, restrained chrome with chrome-look plastic side covers. The plainer, lighter-trimmed Special.

- **XS650SG Special (3G1, from 2F0-200101)** — Cardinal Red or New Yamaha

Black, cast/alloy wheels, 267 mm rear disc, full bright trim. The flagship cruiser.

- **No Standard.** 1980 is Specials only — the roadster is gone for good.

1980 buyer cautions:

- **TCI box health.** The igniter boxes are 45+ years old; failed boxes are a

known no-spark cause. The marque community's "Gonzo" workaround (a Suzuki GN250 CDI adapted as a replacement) exists precisely because good used TCI boxes are getting scarce. Test for spark with a known-good box before condemning the pickups.

- **Pickup and rotor.** The TCI pickup coils and alternator rotor are the other

half of the ignition; check pickup resistance against the manual's figures and the rotor for the correct resistance — brushes and slip rings wear.

- **BS34 vs. BS38 parts.** Rebuild kits, jets, needles, and diaphragms do not

interchange between the two carb families. Verify which carbs are on the bike (stamping on the carb body) before ordering anything.

- **G vs. SG trim.** Wheels (spoked vs. cast), rear brake (drum vs. disc), and

side-cover trim differ. Verify the model code before buying bodywork.

Serial numbers and model codes

Model year: 1980 · Designation: XS650G / XS650SG · Model code: 3G0 / 3G1. Frame and engine serials: G Special II: 3G0-000101 onward; SG Special: 2F0-200101 onward. The frame number is stamped on the steering head; the engine number is stamped on the crankcase. On a factory-correct bike the two numbers are in the same series and allocation — a mismatch means a replacement frame or engine, which must be disclosed on any judged restoration. Decode carefully: the serial prefix (e.g. S650-, 447-, 2F0-, 5V4-) identifies the model series, and the number that follows places the bike within the year's allocation. The XS650G / XS650SG's prefix is 3G0 / 3G1-series as listed above; any other prefix on the frame or engine means the component is not original to this model year.

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Engine and internals

654 cc (1982–83 Specials: 653 cc) air-cooled SOHC 360° parallel twin. Bore × stroke 75.0 mm × 74.0 mm; compression ratio 8.4:1 (per the factory figures for this year); output ~53 bhp. The 360-degree crank gives the classic British-twin firing interval and the line's characteristic vibration. The bottom end is shared across the entire 1970–83 run — crankcases, crankshaft, and gearbox internals interchange far more widely than bodywork does — which is why the parts fiche for the engine looks so stable year to year while the trim fiche changes constantly. Factory valve clearances (XS650D supplementary service manual): intake 0.10 mm (0.004 in), exhaust 0.15 mm (0.006 in), checked cold. Cam timing, valve seats, and guides follow the factory manual's procedures; the D supplement's torque tables are the authority for fastener values (see Section 10).

Fuel system

Carburetors: 2 × Mikuni BS34 constant-velocity (new 1980; replaces BS38). Points-era bikes (1970–79) run Mikuni BS38s; TCI-era bikes (1980–83) run BS34s. The two families share nothing in rebuild parts — jets, needles, diaphragms, and float specs are family-specific. Identify the carbs by the body stamping before ordering anything. Factory jetting for the XS650D (supplementary service manual): main jet #122.5, with market variants #117.5 and #112.5 — the manual explicitly documents all three. Set float height, synchronize the pair on vacuum gauges, and set the idle mixture by the book before chasing any jetting change; the marque forums' standing finding is that most "carb problems" are incompletely cleaned pilot circuits and intake leaks, not jetting. The fuel tap (petcock) is vacuum-operated on later bikes and gravity on early ones; either way, rebuild it — a weeping tap hydrolocks engines and washes bores.

Electrical system

Ignition: Transistorized TCI electronic ignition (new 1980; no points, no mechanical advance). Starting: Electric starter + kick starter. TCI maintenance is connector-first: clean and treat every bullet connector with dielectric grease, verify pickup resistance against the manual's figures, check the alternator rotor resistance and brush length, and test the igniter box with a known-good unit before condemning anything else. The advance rod was deleted with the points — aftermarket ignition kits for TCI bikes must supply one. Battery, harness, switches, and grounds: replace the battery on any unknown-history bike, unwrap and inspect the harness for chafing at the steering head and under the seat, and verify every ground — 45+ year-old grounds are the leading cause of "mystery" electrical faults.

Transmission and driveline

5-speed constant-mesh manual gearbox. Primary reduction 72/27 (2.667). Factory gear ratios (D supplement): 1st 2.462, 2nd 1.588, 3rd 1.300, 4th and 5th per the manual's table; final drive by roller chain. Clutch: wet multi-plate. Measure the friction-plate stack against the manual's service limit, check the clutch basket fingers for notching (file smooth or replace — notched baskets cause drag and false neutrals), and replace the springs as a set on any unknown-history bike. Chain and sprockets: replace as a set. Check countershaft sprocket splines for wear — neglected chains fret the splines, and a worn countershaft is an engine-out repair.

Brakes

Dual 267 mm front discs (floating single-piston calipers); rear: drum (G) / 267 mm disc (SG). Rebuild every hydraulic component on an unknown-history bike: master cylinder, calipers (new seals, pistons inspected for pitting — pitted pistons are replaced, not reused), stainless or new rubber hoses (original rubber hoses are all time-expired), and fresh DOT fluid. 1978-on floating calipers need their slide pins cleaned and greased; opposed-piston pre-1978 calipers need all four seals per caliper. Discs: measure thickness and runout against the manual's limits. Note the 1978-on disc offset change — pre-1977 and 1978-on front discs do not interchange.

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Wheels, forks, and suspension

Wheels: Wire-spoked (G Special II); cast/alloy (SG Special). Spoked wheels: check every spoke for correct tension and the rims for true before any cosmetic work — a freshly painted rim that is bent is wasted money. Takasago alloy rims polish well but pit deeply; decide early whether the rims are candidates for restoration or replacement. Cast wheels: inspect for cracks at the spokes, especially around the disc mounts. Forks: full rebuild — new seals, fresh oil at the manual's level, stanchions inspected for pitting (pitted stanchions eat new seals; re-chrome or replace). Rear shocks: the originals are all worn out; period-correct replacements are available, but verify eye-to-eye length and spring rate against the manual.

Paint, trim, and finishes

1977-and-later factory colors for this year are listed in the Key facts section above. Paint codes and stripe layouts are year-specific — verify against the parts fiche for the XS650G / XS650SG, not against a generic XS650 reference. Tank and side-cover paint: base/clear two-stage in the original color, with the correct stripe width and placement. Badges are year-specific — the 1980 badges differ from neighboring years in script, color, or mounting. Chrome and brightwork: original chrome was thin; re-chrome to show standard where the bike warrants it. Special II models' chrome-look plastic trim is unique and fragile — handle with care and verify reproduction availability before stripping originals.

Torque specifications

All torque figures below are from the Yamaha XS650D factory supplementary service manual — the genuine article, applicable to the shared fasteners across the line. Always use the manual's figure for the specific fastener; the values here are the commonly referenced ones.

Fastener	Torque
Cylinder head nuts (M10)	36 Nm (26 ft-lb) — in sequence, in stages
Camshaft cap bolts (M6)	10 Nm (7.2 ft-lb)
Cam sprocket bolt	40 Nm (29 ft-lb)
Crankcase bolts (M6)	10 Nm (7.2 ft-lb)
Crankcase bolts (M8)	20 Nm (14.5 ft-lb)
Oil drain plug	43 Nm (31 ft-lb)
Front axle nut	105 Nm (77 ft-lb)
Rear axle nut	120 Nm (87 ft-lb)
Front fork pinch bolts	20 Nm (14.5 ft-lb)
Handlebar clamp bolts	23 Nm (17 ft-lb)
Brake caliper mounting bolts	40 Nm (29 ft-lb)
Rear brake torque arm nut	25 Nm (18 ft-lb)
Sprocket nuts	60 Nm (43 ft-lb)
Spark plugs	20 Nm (14.5 ft-lb)

Torque in stages, in the manual's sequence, with threads clean and lightly oiled unless the manual specifies dry. Cylinder-head and cam-cover fasteners are the critical ones — uneven torque warps covers and weeps oil permanently.

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Service schedule and wear items

Factory service intervals (D supplement): engine oil every 1,500 miles / 6 months; oil filter every 3,000 miles; valve clearances, points (where fitted), and carburetor synchronization every 3,000 miles; brake fluid every year; fork oil every 12,000 miles; steering-head and swingarm bearings inspected every 6,000 miles.

Item	Spec / interval
Engine oil (with filter change)	2.5 L — SAE 20W-40/20W-50, every 1,500 miles
Final drive chain	Clean, lube, and adjust every 300 miles
Valve clearances	IN 0.10 mm / EX 0.15 mm, check every 3,000 miles
Breaker points (pre-1980)	Gap and timing every 3,000 miles
Carburetor synchronization	Every 3,000 miles
Brake fluid	Replace annually (DOT 3/4)
Fork oil	Replace every 12,000 miles
Tires (factory spec)	3.50H-19 front, 4.00H-18 rear (D supplement)

Consumables to replace on any unknown-history bike regardless of appearance: tires (age, not tread — anything over six years old is suspect), brake hoses, battery, fuel lines, petcock seals, fork seals, wheel bearings, steering-head bearings, swingarm bushings, chain and sprockets, points and condensers (pre-1980), and all rubber intake manifolds.

Rust-prone areas and inspection points

Check in this order: (1) fuel tank interior — liner or replace; (2) exhaust system — originals rot from the inside at the collector and muffler seams; (3) frame at the steering head and swingarm pivot; (4) rear fender and chain-guard mounting points; (5) fork lower legs at the seals; (6) brake caliper pistons and master-cylinder bores; (7) electrical connectors and grounds; (8) the advance unit (pre-1980) for frozen weights. Frame inspection: with the bike stripped, dye-penetrant or careful visual inspection of the steering-head welds and swingarm pivot area. Any crack is a stop-work item — the frame is repaired by a qualified welder or replaced, never ridden cracked.

Restoration sequence

Step 1: Document and photograph everything before disassembly — cable routing, fastener positions, wiring runs. Bag and tag every fastener by assembly. **Step 2:** Assess the frame and running gear first: check the frame for cracks and straightness, then rebuild the rolling chassis (bearings, brakes, forks, wheels) before the cosmetics. **Step 3:** Engine: full strip, measure everything against the factory manual's service limits. The bottom end is robust; budget for valve seats, guides, and a rebore only if measurements demand it. **Step 4:** Carburetors: ultrasonic clean, all new soft parts, set to factory jetting and float height before any tuning. Do not re-jet to fix what is actually an intake leak or weak spark. **Step 5:** Electrical: rebuild the harness or replace it — 45+ year-old wiring is not trustworthy. Points-era bikes get new points, condensers, and advance-unit service; TCI-era bikes get connector hygiene and igniter/pickup testing. **Step 6:** Paint and plating: bodywork painted in the correct year color with correct stripes and badges; chrome re-plated to show standard; fasteners correctly finished (zinc, black, or plain as original). **Step 7:** Reassembly in the factory sequence, torqued to the manual's figures, with all fluids fresh and every adjustment set to spec. **Step 8:** Shakedown: 500 careful miles with frequent checks, then re-torque the head, re-check valve clearances, re-synchronize the carbs, and change the oil. The bike is finished when it starts, idles, and stops like Yamaha intended.

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