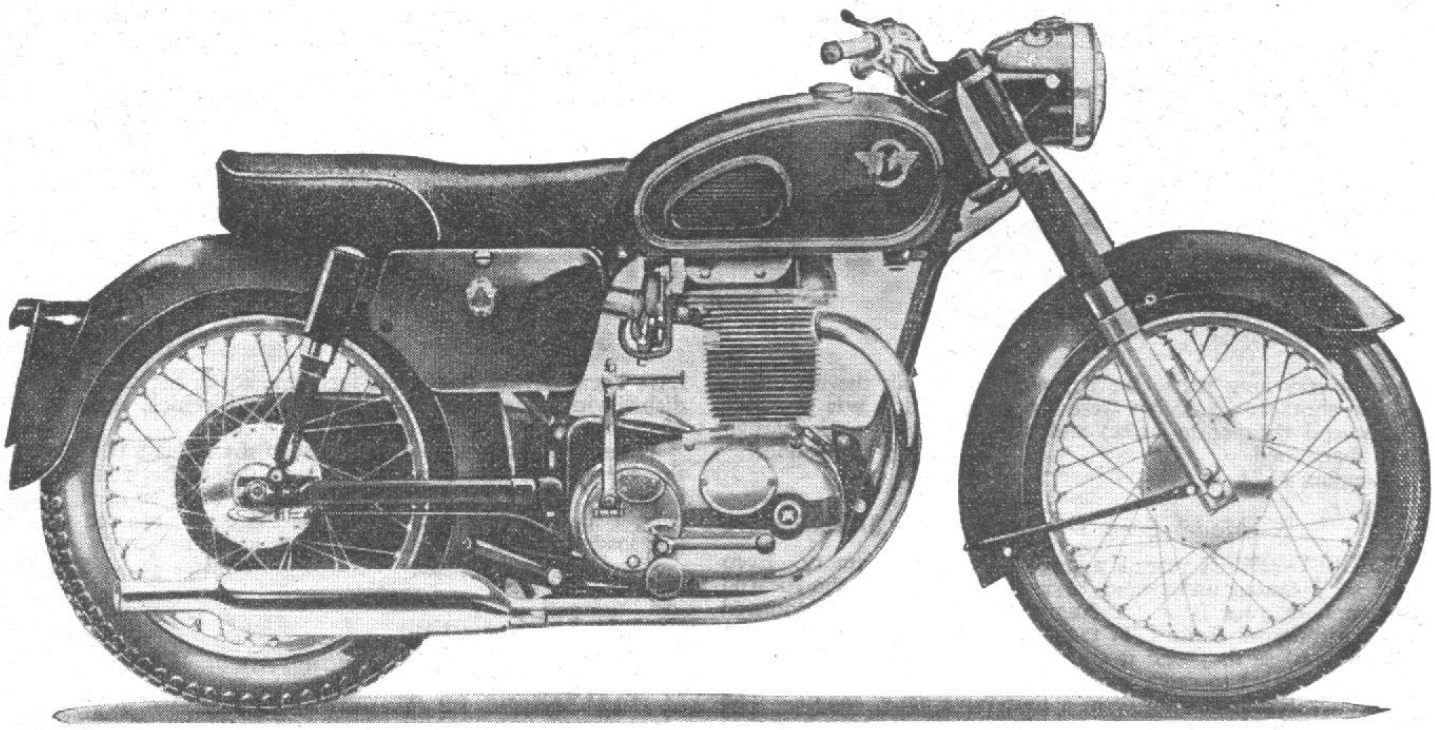


New Lightweight Three-fifty

A.J.S. and Matchless Introduce 348 c.c. Scaled-up Edition of Advanced Two-fifty Design : New Brazed-lug Duplex Frame for Majority of Models : More-efficient Cylinder Heads

A SMART new lightweight three-fifty, a new duplex frame for the majority of the models and redesigned cylinder heads for all the five-hundreds and six-fifties—these are the highlights of the A.J.S. and Matchless programmes for 1960. The 498 c.c. de luxe and sports twins and the 348 c.c. scramblers are discontinued.

The new three-fifty, designated Model 8 in the A.J.S. range and G5 in Matchless form, is a scaled-up version of the established two-fifties and weighs 40 lb less than the 347 Model 16 and G3. In the bulk of its details the engine follows its two-fifty ancestry and has a *désaxé* cylinder (i.e., the cylinder axis is offset forward from the crankshaft axis) and a cylinder head in which the inlet and exhaust tracts are oblique to the fore-and-aft line of the engine. Advantages claimed for the *désaxé* arrangement are a reduction in piston slap and piston friction and, since connecting-rod angularity is reduced at maximum combustion pressure, slightly better use of that part of the power stroke. Bore and stroke dimensions are 72 × 85.5mm (the same as for the discontinued scrambler engine) and the capacity is 348 c.c.

External appearance of the new engine is virtually the same as that of the two-fifty but a distinguishing feature is an exhaust-valve lifter operating on the exhaust rocker. Similar main bearings are employed—two caged ball bearings on the drive (left) side and a plain phosphor-bronze bush on the timing side. A rotary crankcase breather operates between the two ball bearings.

A major internal difference as compared with the two-fifty lies in the flywheels which are flat faced and, viewed in side elevation, appear as right-angle triangle each with a rounded apex and a semi-circular base. Cast iron is the material used and the thickness is $1\frac{5}{8}$in. The flywheel faces are recessed to receive the crankpin nuts. Crankpin diameter is $1\frac{1}{2}$in and a Duralumin cage spaces the two rows of $\frac{1}{4} \times \frac{1}{4}$in rollers (14 in each row) employed for the big-end bearing.

The wire-wound piston has a flat top with slight cutaways to clear the valves. Two compression rings and an oil-scraper ring are fitted. The top ring is chromium plated.

Cast iron is employed for the cylinder barrel and light alloy for the head. Inlet valve head diameter is $1\frac{3}{8}$in and the inlet port size is $1\frac{1}{8}$in. Hairpin valve springs are featured. Oil is carried in a detachable container bolted to the outside of the crankcase Circulation is by a plunger pump driven by a worm on the crankshaft.

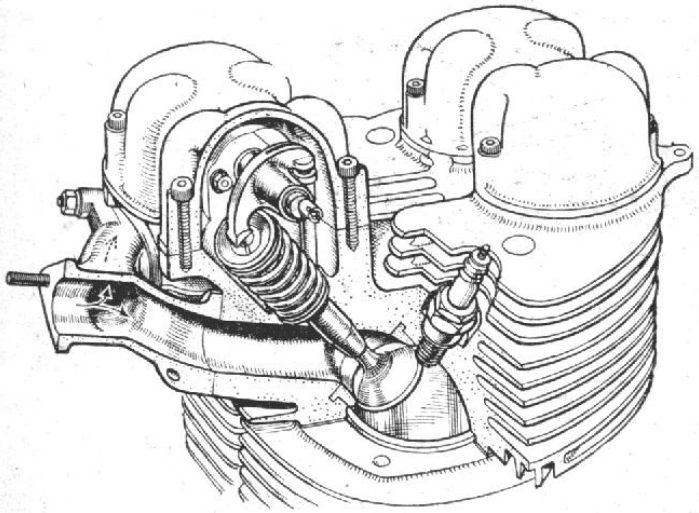
Current for the electrical system is provided by a Wico-Pacy a.c. generator. The stator is carried in the outer half of the primary chaincase and the rotor is mounted on the drive end of the crankshaft outboard of the engine sprocket.

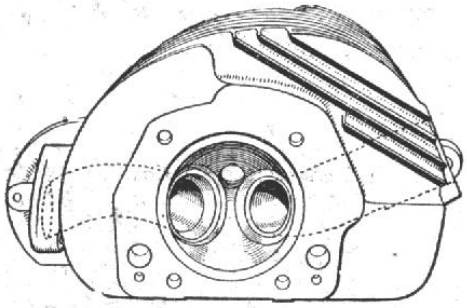
The gear box has a cylindrical shell and is retained against a matching curvature on the rear of the crankcase by two steel straps. As the mainshaft lies appreciably above the shell axis, adjustment of the $\frac{1}{2} \times 0.205$in simple chain used for the primary drive can be effected by rotating the gear-box shell.

Similar to that used on the two-fifty, the frame features a single front down tube. Channel-section pressings form the cradle and provide engine mountings. A single top tube curves downward at the rear of the $2\frac{3}{4}$-gallon petrol tank to form the seat tube, at the base of which a massive malleable-iron lug houses the pivot for the rear fork. A bolted-on, triangulated sub-frame provides the upper mountings for the Girling suspension units, which are adjustable for load. A roll-on centre stand is featured (and is extended also to the latest two-fifties).

Front suspension is by a Teledraulic fork of the type used before the present heavier pattern was adopted for the larger models. It is a more robust fork than the lightweight version without adding unnecessary weight. Wheels are of 18in diameter.

A major change in all the other machines in both ranges is marked by the introduction of a full cradle frame. Duplex front down tubes are continued rearward to pass beneath the engine and gear box. A single $1\frac{1}{2}$in-diameter 12-gauge top tube and a vertical seat tube complete the main frame which is built on the time-honoured principle of malleable-iron lugs brazed in position. Massive indeed are the cast lugs forming the steer-

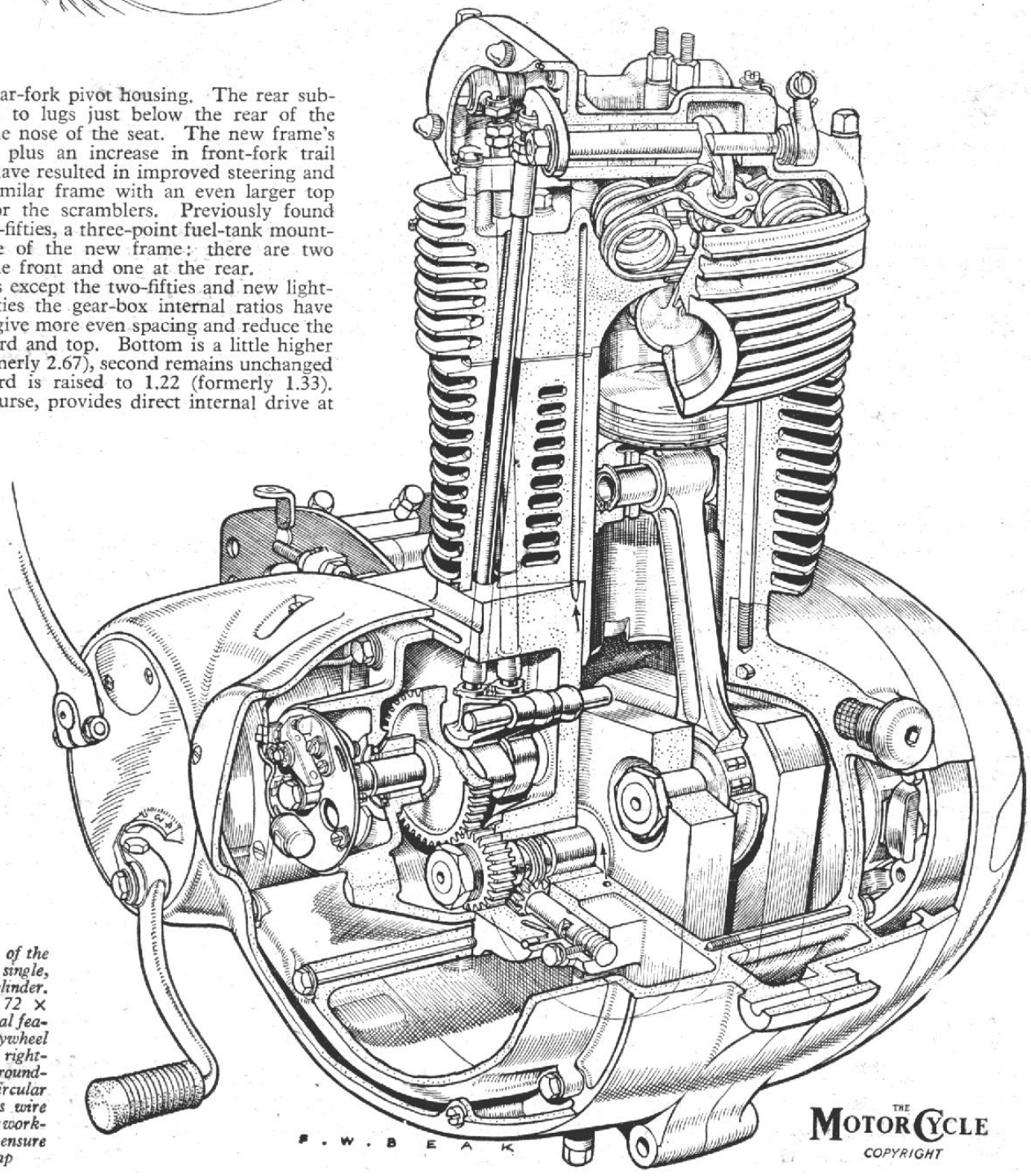




Above left : Cylinder heads on the twin-cylinder engines have been redesigned and the combustion-chamber shape is now hemispherical. The diagrammatic illustration above shows how the inlet port describes an arc between the carburettor and the inlet valve to promote swirl to the charge

ing head and rear-fork pivot housing. The rear sub-frame is bolted to lugs just below the rear of the gear box and the nose of the seat. The new frame's greater rigidity plus an increase in front-fork trail are claimed to have resulted in improved steering and handling. A similar frame with an even larger top tube is used for the scramblers. Previously found only on the two-fifties, a three-point fuel-tank mounting is a feature of the new frame: there are two mountings at the front and one at the rear.

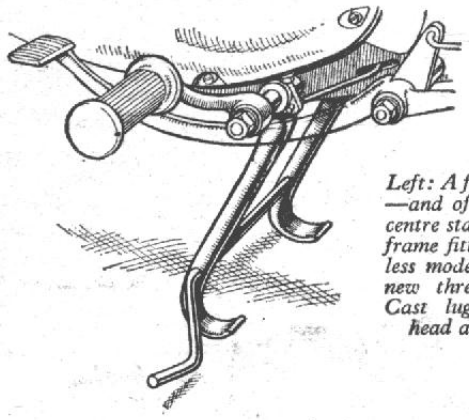
On all models except the two-fifties and new lightweight three-fifties the gear-box internal ratios have been altered to give more even spacing and reduce the gap between third and top. Bottom is a little higher at 2.56 to 1 (formerly 2.67), second remains unchanged at 1.77 and third is raised to 1.22 (formerly 1.33). Top gear, of course, provides direct internal drive at

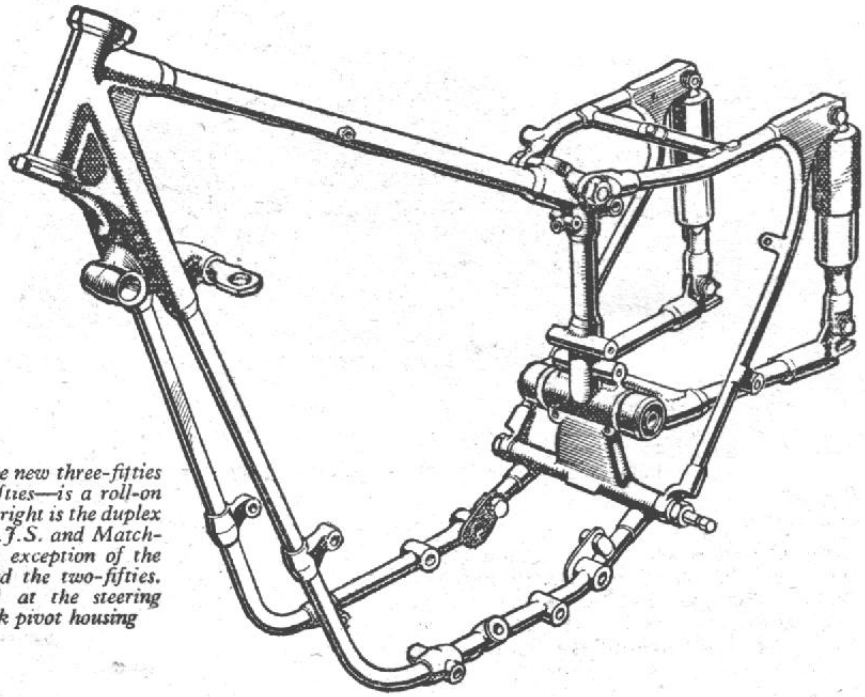


Timing-side details of the three-fifty o.h.v. single, with a désaxé cylinder. Bore and stroke are 72 × 85.5mm. An unusual feature is that each flywheel is shaped to form a right-angle triangle with a rounded apex and a semi-circular base. The piston is wire wound to permit close working clearances and so ensure freedom from slap

1 to 1. The previous ratios may be specified if desired.

Cylinder heads on both the roadster and scrambler five-hundred singles and all the twins have been redesigned. Combustion-chamber shape is now hemispherical and flat-top pistons with small recesses for the valves are used but the compression ratios are unchanged. The inlet tract describes an arc between the carburettor and inlet valve. Object of the design is to promote swirl in the gases and another effect is that the valve stem and protruding portion of the guide are at one side of the tract where they offer less restriction to gas flow.





Left: A feature of the new three-fifties —and of the two-fifties—is a roll-on centre stand. On the right is the duplex frame fitted to all A.J.S. and Matchless models with the exception of the new three-fifties and the two-fifties. Cast lugs are used at the steering head and rear-fork pivot housing

Two noticeable external differences on the heads of the twins are thicker lugs at the front for attachment of the cylinder-head steady and an additional horizontal fin. Cast into the underside of the extra fin are three short fins disposed diagonally to the direction of air flow which are designed to improve cooling in the region of the exhaust port. In conjunction with the new shape of combustion chamber and inlet port the valve included angle has been reduced to 40 degrees in the case of the twins and 39 degrees on the singles. The twins' bolt-on induction manifolds have also been modified to suit the re-designed ports. Two-rate valve springs (coil) are featured on the twins instead of the previous single-rate coil springs. All the singles have hairpin springs.

The former spring-loaded felt oil filter is superseded for 1960 by one employing wire gauze of two different mesh sizes. A spring-loaded pressure-release valve is now fitted on the twins and is located inside the front of the timing chest; oil released from it flows into the timing chest and drains into the crankcase.

A new Lucas 12-amp-hour battery of

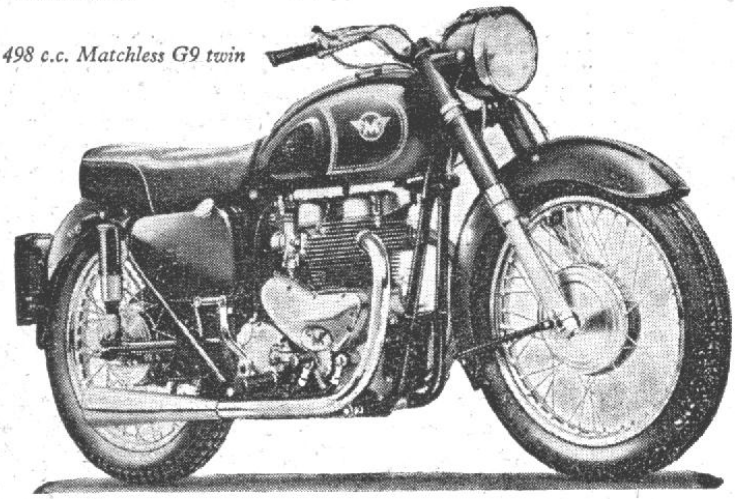
A.J.S. Model	Capacity, Bore, Stroke and Type of Engine	Comp. Ratio	Ign.	Gear Ratios	Capacity Fuel Oil	Susp. F R	Size of Tyres Front	Rear	Wt. lb	Basic Price £ s d	Total Price £ s d
14	248 c.c. 70×65mm o.h.v.	7.8 : 1	C	6.89 8.95 12.75 20.12	3½g 2½pt	T PF	3.25×17	3.25×17	325	—	—
14CS Scrambler	248 c.c. 70×65mm o.h.v.	10.0 : 1	C	8.95 11.63 16.55 21.62	2½g 2½pt	T PF	3.00×19	3.50×19	321	—	—
8	348 c.c. 72×85.5mm o.h.v.	7.5 : 1	C	6.18 8.03 11.43 18 0	3½g 2½pt	T PF	3.25×18	3.25×18	340	—	—
16	347 c.c. 69×93mm o h.v.	7.5 : 1	C	5.8 7.08 9.85 14.85	4½g 4pt	T PF	3.25×19	3.25×19	382	—	—
16C Trials	347 c.c. 69×93mm o.h.v.	6.5 : 1	M	6.48 10.1 15.8 21.0	2g 2½pt	T PF	2.75×21	4.00×19	306	—	—
18	498 c.c. 82.5×93mm o.h.v.	7.3 : 1	C	5.02 6.13 8.53 12.86	4½g 4pt	T PF	3.25×19	3.50×19	394	—	—
18CS Scrambler	497 c.c. 86×85.5mm o.h.v.	8.7 : 1	M	5.8 7.08 9.85 14.85	2g 4½pt	T PF	3.00×21	4.00×19	336	—	—
20	498 c.c. 66×72.5mm o.h.v. twin	8.0 : 1	C	5.25 6.4 8.93 13.42	4½g 4pt	T PF	3.25×19	3.50×19	399	—	—
31	646 c.c. 72×79.3mm o.h.v. twin	7.5 : 1	C	4.78 5.83 8.13 12.23	4½g 4pt	T PF	3.25×19	3.50×19	403	—	—
31 de Luxe	646 c.c. 72×79.3mm o.h.v. twin	7.5 : 1	M	4.78 5.83 8.13 12.23	4½g 4pt	T PF	3.25×19	3.50×19	405	—	—
31CS Scrambler	646 c.c. 72×79.3mm o.h.v. twin	8.5 : 1	M	5.25 6.4 8.93 13.42	2g 4pt	T PF	3.00×21	4.00×19	386	—	—
31CSR Sportstwin	646 c.c. 72×79.3mm o.h.v. twin	8.5 : 1	M	4.78 5.83 8.13 12.23	4½g 4pt	T PF	3.25×19	3.50×19	388	—	—
7R	349 c.c. 75.5×78mm o.h.c.	11.6 : 1	M	4.87 5.36 6.48 8.68	5½g 5½pt	T PF	2.75×19	3.25×19	285	—	—

MANUFACTURERS: A.J.S. Motor Cycles, Plumstead Road, London, S.E.18.

MATCHLESS											
G2	248 c.c. 70×65mm o.h.v.	7.8 : 1	C	6.89 8.95 12.75 20.12	3½g 2½pt	T PF	3.25×17	3.25×17	325	—	—
G2CS Scrambler	248 c.c. 70×65mm o.h.v.	10.0 : 1	C	8.95 11.63 16.55 21.62	2½g 2½pt	T PF	3.00×19	3.50×19	321	—	—
G5	348 c.c. 72×85.5mm o.h.v.	7.5 : 1	C	6.18 8.03 11.43 18.0	3½g 2½pt	T PF	3.25×18	3.25×18	350	—	—
G3	347 c.c. 69×93mm o.h.v.	7.5 : 1	C	5.8 7.08 9.85 14.85	4½g 4pt	T PF	3.25×19	3.25×19	382	—	—
G3C Trials	347 c.c. 69×93mm o.h.v.	6.5 : 1	M	6.48 10.10 15.8 21.0	2g 2½pt	T PF	2.75×21	4.00×19	306	—	—
G80	498 c.c. 82.5×93mm o.h.v.	7.3 : 1	C	5.02 6.13 8.53 12.86	4½g 4pt	T PF	3.25×19	3.50×19	394	—	—
G80CS Scrambler	497 c.c. 86×85.5mm o.h.v.	8.7 : 1	M	5.8 7.08 9.85 14.85	2g 4½pt	T PF	3.00×21	4.00×19	336	—	—
G9	498 c.c. 66×72mm o.h.v. twin	8.0 : 1	C	5.25 6.4 8.93 13.42	4½g 4pt	T PF	3.25×19	3.50×19	399	—	—
G12	646 c.c. 72×79.3mm o.h.v twin	7.5 : 1	C	4.70 5.83 8.13 12.23	4½g 4pt	T PF	3.25×19	3.50×19	403	—	—
G12 de Luxe	646 c.c. 72×79.3mm o.h.v. twin	7.5 : 1	M	4.78 5.83 8.13 12.23	4½g 4pt	T PF	3.25×19	3.50×19	405	—	—
G12CS Scrambler	646 c.c. 72×79.3mm o.h.v. twin	8.5 : 1	M	5.25 6.4 8.93 13.42	2g 4pt	T PF	3.00×21	4.00×19	386	—	—
G12CSR Sportstwin	646 c.c. 72×79.3mm o.h.v. twin	8.5 : 1	M	4.78 5.83 8.13 12.23	4½g 4pt	T PF	3.25×19	3.50×19	388	—	—
G50	496 c.c. 90×78mm o.h.c.	10.6 :1	M	4.02 4.42 5.34 7.16	5½g 5½pt	T PF	3.00×19	3.25×19	290	—	—

MANUFACTURERS: Matchless Motor Cycles, Plumstead Road, London, S.E.18. *ABBREVIATIONS:* C, coil; M, magneto; T, telescopic fork; PF, pivoted fork.

The 498 c.c. Matchless G9 twin

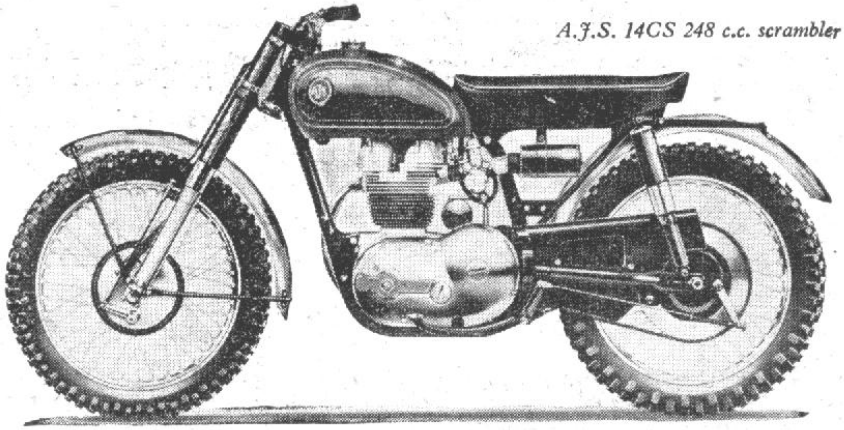


compact design and retained by a rubber strap in the combined battery and tool box on the left side of the machine is featured on all models except the two-fifties and new three-fifties. On the larger models, frontal appearance is improved by a more compact headlamp which yet houses the speedometer. Large-capacity air filters are extras on all the roadsters but brake-warning lights and pillion footrests are standard equipment.

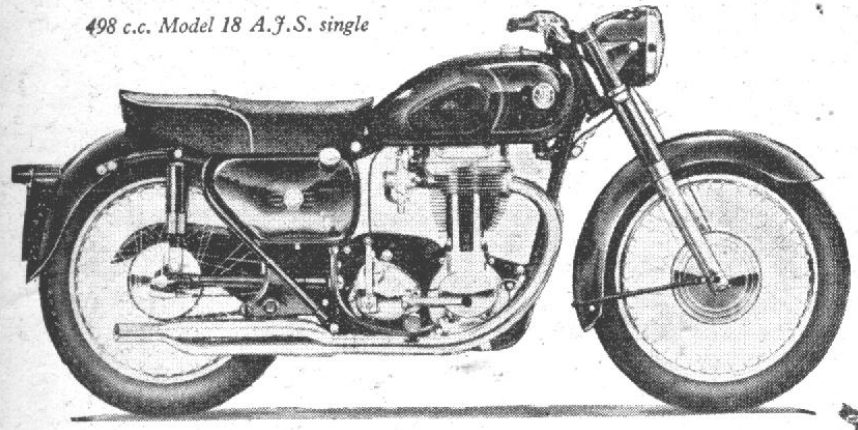
Yet another innovation common to the roadsters is a two-level dual-seat designed to provide extra comfort for the pillion passenger without making the rider's seating position too high.

For trials enthusiasts the three-fifty

A.J.S. 14CS 248 c.c. scrambler



498 c.c. Model 18 A.J.S. single



16C and G3C models are retained with a few changes. The rear mudguard is more strongly supported and a modified pivot bearing for the rear fork contains a small reservoir of oil. On the five-hundred scrambler the oil tank has been moved to the left of the seat tube to enable a 1⅜in-bore Amal GP carburettor to be fitted to the redesigned cylinder head. The oil tank's former position is now occupied by a large air filter.

Both the five-hundred single and six-fifty twin scramblers are normally supplied stripped ready for racing. If lights are required these models can be supplied equipped with an a.c. generator in addition to the magneto. The battery then fits on the right side of the seat tube beneath the air cleaner. The two-fifty scramblers have larger inlet valves and the gear-box internals are being made from a higher grade of steel to give greater strength under competition conditions. In the light of experience gained during the past season the gear-box internal ratios have been altered and include a higher bottom gear. The new internal ratios are 3.24, 2.44, 1.56 and 1 to 1.

On all models frames and forks are finished in black while wheel rims, handlebars and exhaust systems are chromium plated. The Model 14 (A.J.S.) and G2 (Matchless) respectively have a blue petrol tank with gold lining and a red tank with silver lining. An optional finish is an integral chromium panel on each side of the tank.

Black is the tank colour on the larger standard models, but chromium side panels as fitted on the de luxe versions can be specified as an extra. The two-tone finishes introduced as an extra last year are continued. They are blue and grey for A.J.S. and arctic white and red for Matchless. A chromium strip separates the two colours on the fuel tanks. Black petrol tanks are standard on the trials and scrambles machines, but blue (A.J.S.) or red (Matchless) may be specified at extra cost. The road-equipped A.J.S. sports twin and Matchless G12CSR feature the appropriate blue or red petrol tanks with chromium panels.

Following usual policy details of the A.J.S. 7R and Matchless G50 racers will not be available until later as most of the development work is done in winter.

(Prices will be given in a later issue.)

Trials Matchless—the 347 c.c. 16C