

# THE LONG AND THE SHORT

*Slow-revving long-stroke  
Matchless 350cc G3LS singles from  
the 1950s take on a snappy sixties  
short-stroke G3/Peter Dobson*

**T**ODAY WE TEND TO THINK that all 350cc AJS and Matchless roadgoing singles were solid and dependable, but unexciting. And indeed they were, until the AMC factory's introduction of short-stroke versions in 1962. These later models don't look too inspiring, their rather flashy tank badges being at odds with stodgy overall styling. But the little-seen Matchless G3 Mercury and AJS 16S Sceptre singles combine traditional virtues with a surprising turn of speed. Surely they are among the most overlooked and misunderstood of postwar road machines. Typical of British practice, AMC's 350s were the poor relations of the model range, their cycle parts being hand-me-downs from the larger and more powerful models. But they were just as nicely made and as beautifully finished as the bigger bikes and have a definite charm.

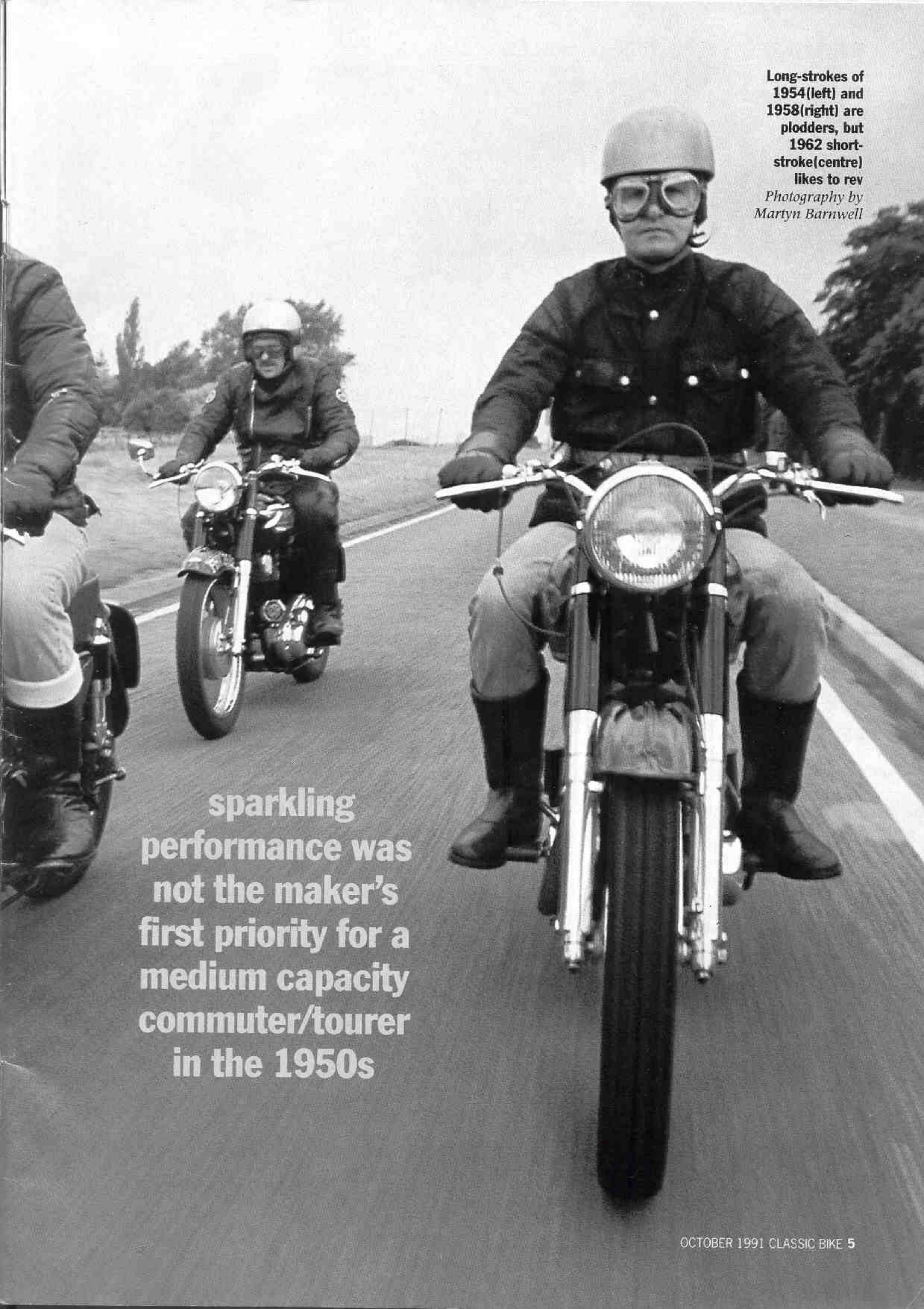
We were loaned three 350cc Matchless singles for a comparison test by Ken Smith, a leading light in the British Owners Club of Essex: G3LS models from 1954 and 1958, plus a Mercury G3 short-stroke of 1962. All have been carefully restored by him to very near original condition.

## PERFORMANCE

THE 'S' IN G3LS stands for Springer, which is accurate enough, but L originally meant Lightweight which is, frankly, nonsense. Overweight and underpowered, with a claimed best of 19bhp at 5,750rpm — which the majority of engines never achieved — these 350s have to haul 380lb of metal before adding the rider, passenger, and luggage. But, in fairness, sparkling performance was not the maker's first priority for a medium capacity home-market commuter/tourer in the 1950s.

Both G3LS models can be relied upon to start at first or second kick, provided a simple procedure is followed. Prime the ►





**Long-strokes of  
1954(left) and  
1958(right) are  
plodders, but  
1962 short-  
stroke(centre)  
likes to rev**  
*Photography by  
Martyn Barnwell*

**sparkling  
performance was  
not the maker's  
first priority for a  
medium capacity  
commuter/tourer  
in the 1950s**

# THE LONG AND THE SHORT

Continued

carburettor, operate the exhaust valve-lifter to ease the piston over compression, and give a decisive swing on the kick starter. The later alternator and coil ignition engine proved a shade easier to start.

The long-stroke, 69 x 93mm, low-compression units have bags of low speed torque: the '54 machine was happy in top gear even at an 20mph crawl when its manual ignition lever was set at full retard, the later model not being quite so docile.

With their heavy cast-iron crankshaft flywheels, the long-stroke engines dislike revs and pick up slowly but steadily through the gears, each power stroke clearly marked by a distinctive bark from the exhaust. The speed at which the engine feels completely effortless with minimal vibration is about 40-45mph in top. Vibration then sets in and worsens as velocity increases. The owner reports that cruising at much above 60mph causes bolts to start dropping off. Even so, an 80mph maximum has been quoted for the G3LS.

Gear changing on the 1954 machine, with its four-speed Burman B52 box, just can't be hurried, though the box's action is pleasant enough if you let the revs die right down. In this respect the later bike with AMC's own gearbox is better, and totally scrunch-free, though with the hefty flywheels churning inside the engine the change is nowhere near slick. Both clutches take up smoothly, with no drag or slip, and don't require a powerful hand to operate.

The short-stroke engine is such a different animal, it's hard to believe it came from the same factory. Said to develop 23bhp at 6,200rpm, it is dramatically snappier on acceleration, loves revs, and is altogether sweeter. Vibration does occur at around 50mph, in top, but it fades again towards 60, so you have a choice of comfortable cruising in a faster or slower mode.

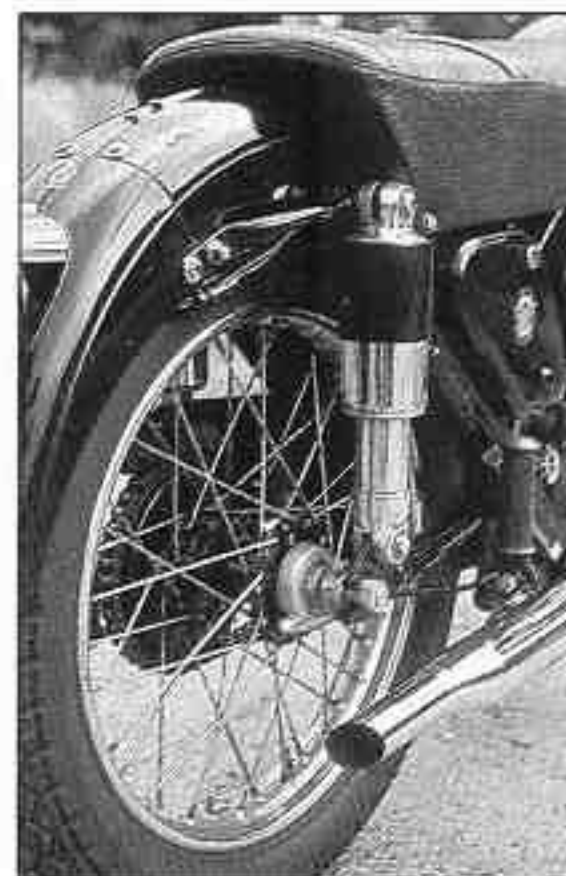
Fourth ratio in the gearbox is the same as in the long-strokes, at 5.8:1, but where they stomp up hills, the later unit needs a drop to third gear to keep on the boil. Not that this spoils the enjoyment: there is a



1954 G3LS Suspension is softest on the earlier model with front fork dive under braking



Magneto-equipped engine is the best-looking, but Burman B52 gearbox demands slow-motion changes



AMC's own Jamspot rear suspension units were used up to 1957. Early type of dual seat is too short



Twin parking lights mounted either side of headlamp are more stylish than practical. Speedo is Smiths Chronometric

loud, but pleasant, note from the exhaust as the revs begin to rise. The engine feels unburstable, but does lack the long-stroke's immense flexibility. Again, top speed is reckoned to be 80mph, which is

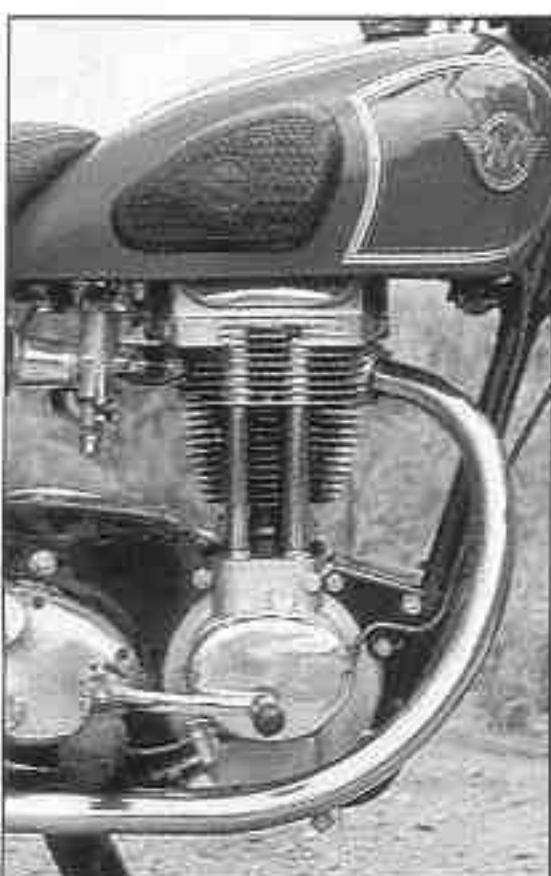
a credible figure for the G3. Although the G3's clutch is the same three-spring AMC component found on the '58 model, it feels different, being much sharper on the take up. The explanation for this must be the different dimensions of the hand lever, which has a longer throw between its pivot and the cable.

There is actually little to choose between the three chassis, despite their variations. On the 1954 machine you perch up high, while on the others you sit in, more than on. The earlier G3LS on test had flatter handlebars and a hardish seat, against its sister's slightly higher 'bars and softer seat. The G3's seat is an inch lower, but the touring handlebars are similar to those on the 1958 machine.

Matchless G3LS 1954	
FOR	Comfortable slogger with sound handling and traditional looks
AGAINST	Soggy suspension, slow gearchange
What's it worth? £950 - £2200	



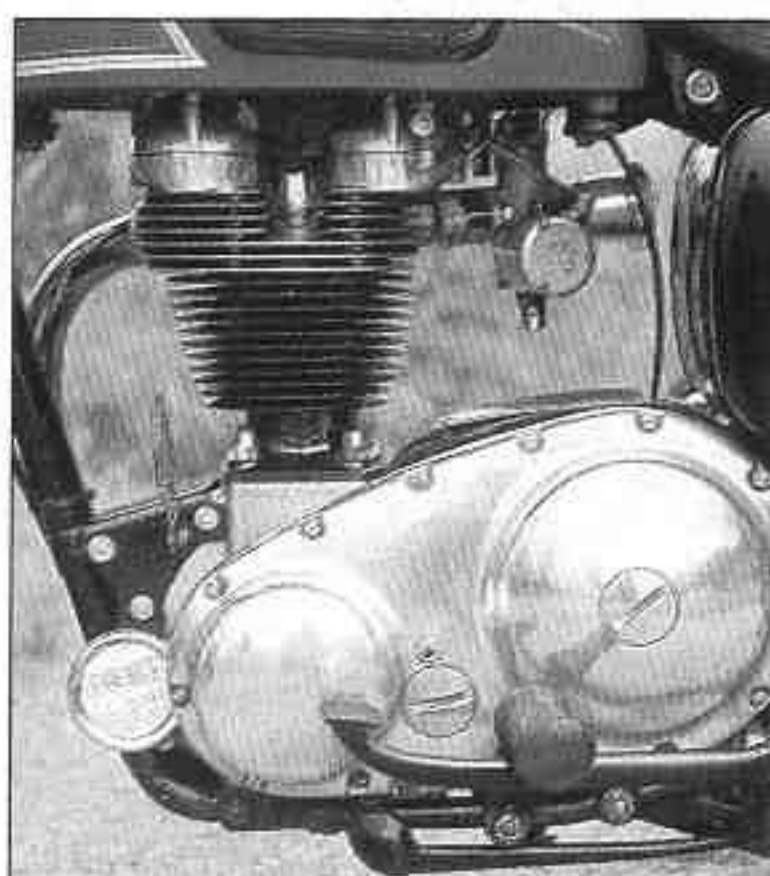
**1958 G3LS** Single downtube chassis can be swung confidently through bends



**Alternator provides for coil ignition with points behind timing cover. Gearbox is AMC's own**



**Full-width 7in front brake is best described as adequate rather than exceptional**



**Alloy primary chaincase is usually less leaky than earlier pressed-steel design. Amal Monobloc carburettor was introduced in 1955**

The 1954 version, with AMC's own non-adjustable Jampot rear units clearly has the softest suspension, and its front forks dive noticeably under heavy braking — you can also hear them working.

Having come up with such a perky engine — the G3 sounds rather reminiscent of an AJS 7R cammy racer, incidentally — it seems a shame that AMC housed the '62 short-stroke in the same big and heavy duplex frame that was used for 650cc twins.

All three machine handle in a reassuring and safe manner. They steer precisely over any surface, and can be taken through corners at surprising speed, although the 1954 model, with its softer ride, was not quite as rock-steady as the other two. Also, its silencer clamp bolt

grounded when the machine was cranked over well.

The full-width hub front brakes vary in detail from model to model, but all felt about the same: adequate without being

<b>Matchless G3LS 1958</b>	
<b>FOR</b>	<b>As 1954 model, with firmer roadholding, easier gearchange</b>
<b>AGAINST</b>	<b>Vibration limits cruising speed</b>
<b>What's it worth? £850 – £2000</b>	

**It seems a shame that AMC housed the short-stroke in the same heavy duplex frame that was used for 650cc twins**

particularly good. The back brakes are very effective, providing bags of bite without locking the wheel. When they are combined with the front anchors, there is sufficient stopping power for modern traffic conditions.

All three machines are pigs to pull up onto their centre stands, though they roll off them easily enough. Each has a fly-up prop stand, so you can't ride off with it down. You do have to be careful that it doesn't suddenly retract when you are in the act of parking, however.

We didn't have to rely on lights during the test, but the owner considers them to be reasonable, provided the electrics are kept in good condition.

### **HISTORY**

ASSOCIATED MOTOR CYCLES were the first of Britain's volume manufacturers to offer telescopic forks and swinging arm suspension on production models, and they got it pretty much right first time.

The G3LS Matchless, and its AJS counterpart, the Model 16MS, were produced from 1949 to 1961. They were closely based on the military Matchless G3L, which had AMC's Teledraulic front fork back in 1941, when BSA and Norton still employed girders, making it the forces' favourite.

AMC did not waste time at the plungers or sprung-hub stages of rear suspension evolution, but went direct to swinging arm suspension with a pair of Teledraulic shock absorbers, but they were replaced by the chubby Jampot type in 1951. Typically for a large, commercially-aware factory, each year saw a mass of minor modifications. Some advances came via development in competition, such as the light alloy cylinder head introduced for roadsters in 1951.

Burman CP gearboxes were replaced by the B52 type for 1952. Lighter, stiffer crankshafts arrived for 1954, as did the first full-width alloy wheel hubs. For 1956, all models in the roadster range from the 600cc twins downwards got the same

# THE LONG AND THE SHORT

Continued

frame with a slab-sided oil tank and matching battery box-cum-toolbox. AMC used the in-house gearbox shared with its Norton subsidiary from 1957. At the same time, Jampots were relinquished for bought-in Girling units, adapted to fit the AMC swinging fork by adding clevis-type lower fixings.

A major change for 1958 was the six-volt Lucas AC alternator. It modernised the electrics, but left gaps around the engine big enough for a well-fed cat to stroll through, spoiling the machines' lines in the eyes of many. In 1960 the G3LS acquired AMC's multi-model twin-downtube frame: whether it really needed it is arguable.

Short-stroke engines — though not the same as AMC's admired motocross units — arrived on roadsters with the Mercury and Sceptre models in 1962. There were S-coded sporting versions, too, with cosmetic variations such as downturned 'bars and plated mudguards. For 1963, 18in wheel rims were adopted for the models' last appearance. In 1964, when the once-huge AMC group was hurtling down the slide to ruin, another short-stroke unit, this time in 350 and 500cc versions, both using the G80CS's competition engine's 85.5mm stroke, followed but all production tailed off in 1966.

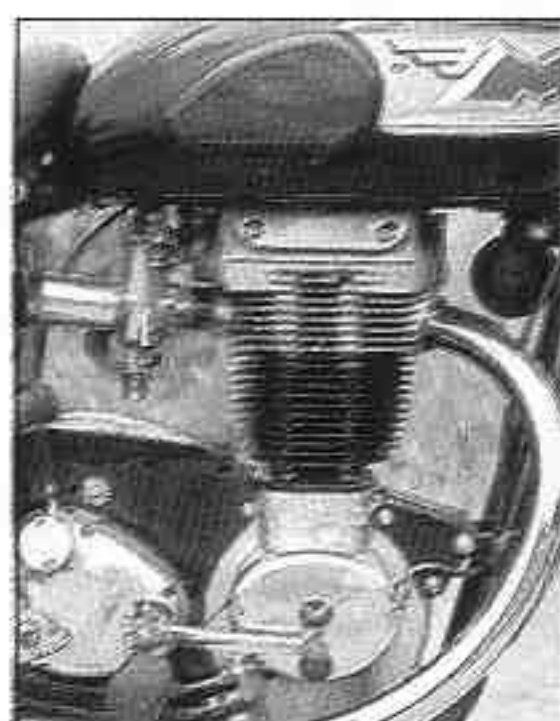
## EQUIPMENT

ENGINES FITTED to G3LS models hardly changed between 1954 and 1958. They are simple, robust units, based on pre-war practice, having many components in common with the AMC 500cc Matchless G80 and AJS Model 18 engines. A built-up crankshaft with iron flywheels is supported on two ball races on the drive side, and a plain bronze bush on the timing side. Other features include caged roller big-ends, dry sump lubrication with a gear-type pump, cast-iron barrels, alloy heads and hairpin valve springs.

The 1954 test machine is fitted with a wire-wound piston, as originally specified. This unusual design was to be soon dropped but it successfully silenced piston-slap noise from the singles. Amal separate-



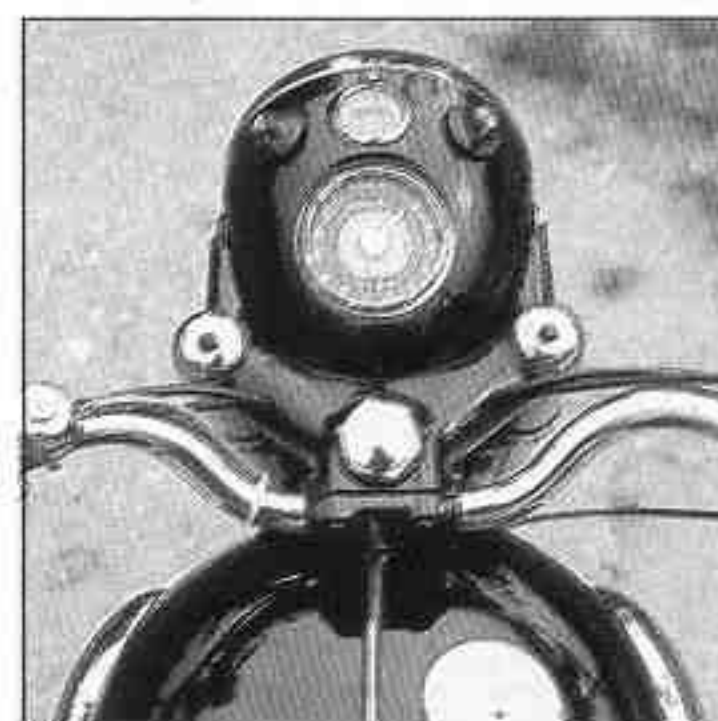
1962 G3 Duplex chassis handles well, but is too heavy for peppy short-stroke engine



Redesigned top-end features enclosure of push rods. Large tank badges are off-putting for some



Girling rear units have AMC's lower clevis mounts. Rear mudguard hinders wheel removal



Styling had become smooth but stodgy by 1962. Less rugged Smiths magnetic speedo had replaced Chronometric

float-bowl carburettors (the '54 test bike has been fitted with a pre-war version of the correct Type 76 instrument) were replaced by the Monobloc in 1955. Choke size remained unchanged at 1 1/16 in.

A notoriously incontinent pressed-steel chaincase, dating back to well before the war, covers the '54 machine's primary chain, whilst the '58 model benefits from the handsome aluminium case which

superseded it in that year. Ironically, Ken finds his early case oil tight while the later weeps a bit. With modern sealants, the earlier type can now be made acceptably leak-free.

The front forks may appear identical externally, but the 1958 G3LS has stronger stanchions previously fitted to the competition bikes; stronger springs and improved damping. In 1956 the standard frame was strengthened in the area of the swinging arm mounting, at the time that the various cosmetic changes were made to the rear sub-frame. The later model has a slightly wider petrol tank, but both types have rubber knee-grips.

Still an optional extra for 1954, when single saddles were considered the norm by some factories, AMC's early dualseat is firm though comfortable, but too short to accommodate a passenger in comfort. By 1958 the twin seat had become standard issue, and it had been sensibly lengthened by almost 3in.

Matchless G3 1962	
FOR	Smooth and lively engine, sure handling
AGAINST	Too heavy, looks boring
What's it worth? £ 850 – £1750	

## SPECIFICATIONS

Matchless G3LS/G3	1954 G3LS	1958 G3LS	1962 G3
<b>ENGINE</b>			
<b>Type:</b>	ohv single	ohv single	ohv single
<b>Bore and stroke:</b>	69 x 93mm	69 x 93mm	74 x 81mm
<b>Capacity:</b>	348cc	348cc	348cc
<b>Compression ratio:</b>	6.5:1	7.5:1	8.5:1
<b>Carburation:</b>	1-1/16 in Amal 76	1-1/16 in Amal Monobloc	1-1/8 in Amal Monobloc
<b>Output:</b>	16bhp @ 5600rpm	19bhp @ 5750rpm	23bhp @ 6200rpm
<b>Electrical:</b>	magneto ignition, Lucas dynamo, 6v battery	coil ignition, Lucas alternator, 6v battery	coil ignition, Lucas alternator, 6v battery
<b>TRANSMISSION</b>			
<b>Primary drive:</b>	single-row chain	single-row chain	single-row chain
<b>Clutch:</b>	multi-plate, wet	multi-plate, wet	multi-plate wet
<b>Gearbox:</b>	4-speed Burman	4-speed AMC	4-speed AMC
<b>Final drive:</b>	chain	chain	chain
<b>CYCLE PARTS</b>			
<b>Frame:</b>	tubular cradle, single downtube	tubular cradle, single downtube	tubular cradle, twin downtubes
<b>Suspension:</b>	(front): telescopic fork (rear): swinging arm, AMC units	(front): telescopic fork (rear): swinging arm, Girling units	(front): telescopic fork (rear): swinging arm, Girling units
<b>Tyres:</b>	(front): 3.25 x 19in Dunlop K70 (rear): 3.50 x 19in Dunlop K70	(front): 3.60 x 19in Dunlop K70 (rear): 3.25 x 19in Avon SM	(front): 3.25 x 19in Avon Speedmaster Mk2 (rear): 3.50 x 19in Dunlop K70
<b>Brakes:</b>	7in(178mm) s/s drums	7in(178mm) s/s drums	7in(178mm) s/s drums
<b>Wheelbase:</b>	56.5in(1436mm)	56.5(1436mm)	56.5in(1436mm)
<b>Seat height:</b>	31.5in(800mm)	31.5in(800mm)	30.5in(775mm)
<b>Ground clearance:</b>	6.5in(165mm)	7in(178mm)	6.5in(165mm)
<b>Kerb weight:</b>	395lb(179kg)	395lb(179kg)	395lb(179kg)
<b>Fuel capacity:</b>	3.75gal(17litre)	3.75gal(17litre)	4.25gal(19.3litre)
<b>Oil capacity:</b>	4 pints(2.3litre)	5 pints(2.8litre)	5 pints(2.8 litre)
<b>PERFORMANCE</b>			
<b>Top speed:</b>	75mph(est)	75mph(est)	80mph(est)
<b>Fuel consumption:</b>	85mpg	85mpg	85mpg

The 1954 model has AMC's first type of full-width front hub. Dubbed the 'Spam Tin' by riders, it was rapidly redesigned to a more pleasing shape by AMC, with a convex curve on the finned area between the spokes. The single-sided rear hub seen on the 1954 machines was replaced by a full width item in 1955.

A difference in the ample mudguarding of the long-strokes is the loss of the forward stays on the later bike, and by 1958 the removable section of the rear guard is held on by a single bolt, rather than two. Details like this can make AMC restoration a complex business for the unwary.

The 1962 short-stroke engine is virtually a short-stroke top half on a long-stroke crankcase. Its looks were modernised by enveloping the pushrods in the cylinder barrel's iron casting. Cylinder and head are secured by long through-studs instead of the short studs through barrel-base flanges on the long-strokes. The compression ratio

is higher at 8.5:1 and the engine has larger valves, and a bigger-bore 1 1/8in Monobloc. This example carries an after-market float chamber extension, commonly seen in the 1960s.

AMC's updated unit was installed in the same rolling chassis as its G3LS predecessor, with the 4 1/4-gallon fuel tank and deeply valanced mudguards introduced in 1959. By this time, the rear guard lacked a detachable section, making life awkward if the wheel needs rapid removal for puncture repair. Maybe there's a small indicator here of AMC's descent into cheapness. The G3's dry weight remained the same as the G3LS's at 380lb.

UK enthusiasts tend to think of AMC singles as being available in any colour the customer wanted — as long as it was black. In fact a range of colour options was offered on export markets, and Ken Smith's trio is brightened up by the 1958 model's red fuel tank.

**The long-strokes are bomb-proof. The G3 should be reliable, too, but owners must take care with settings**

## CONCLUSION

GIVEN THE GENERAL SAMENESS of steering, handling, durability, comfort, weight and fuel consumption of all three test machines, the choice comes down to whether you are happy to cruise at moderate speeds, or prefer a bit more zest from an engine. The G3LS models are both supreme plodders, while the short-stroke G3 has an eagerness to get up and go, only held back by its weight.

The long-stroke engines are very nearly bomb-proof. The G3 should be reliable, too, but owners must take care with settings. Because the model is so little known, there is misleading information in circulation. Ken holed a piston using the grade of plug he saw recommended on one list. He has since found out that the short-stroke needs a hardish (Champion N3 or NGK B8ES, for example) grade.

Long-time *CB* readers may remember that a 1962 Matchless G3 featured in the April 1986 issue didn't find much favour with our tester, Richard Dames-Longworth. But ridden side-by-side with its older sisters, it emerges as an interesting and underrated AMC single.

Style is important for many enthusiasts, and no-one can argue with the traditional



**AMC 350 singles are all economical to run**

good looks of the G3LS, particularly the earlier magneto-equipped Jampot model.

However, don't be put off by the G3's funny tank-badges: any of these 350s will provide enjoyment for a minimum outlay, but the short-stroke is the most fun