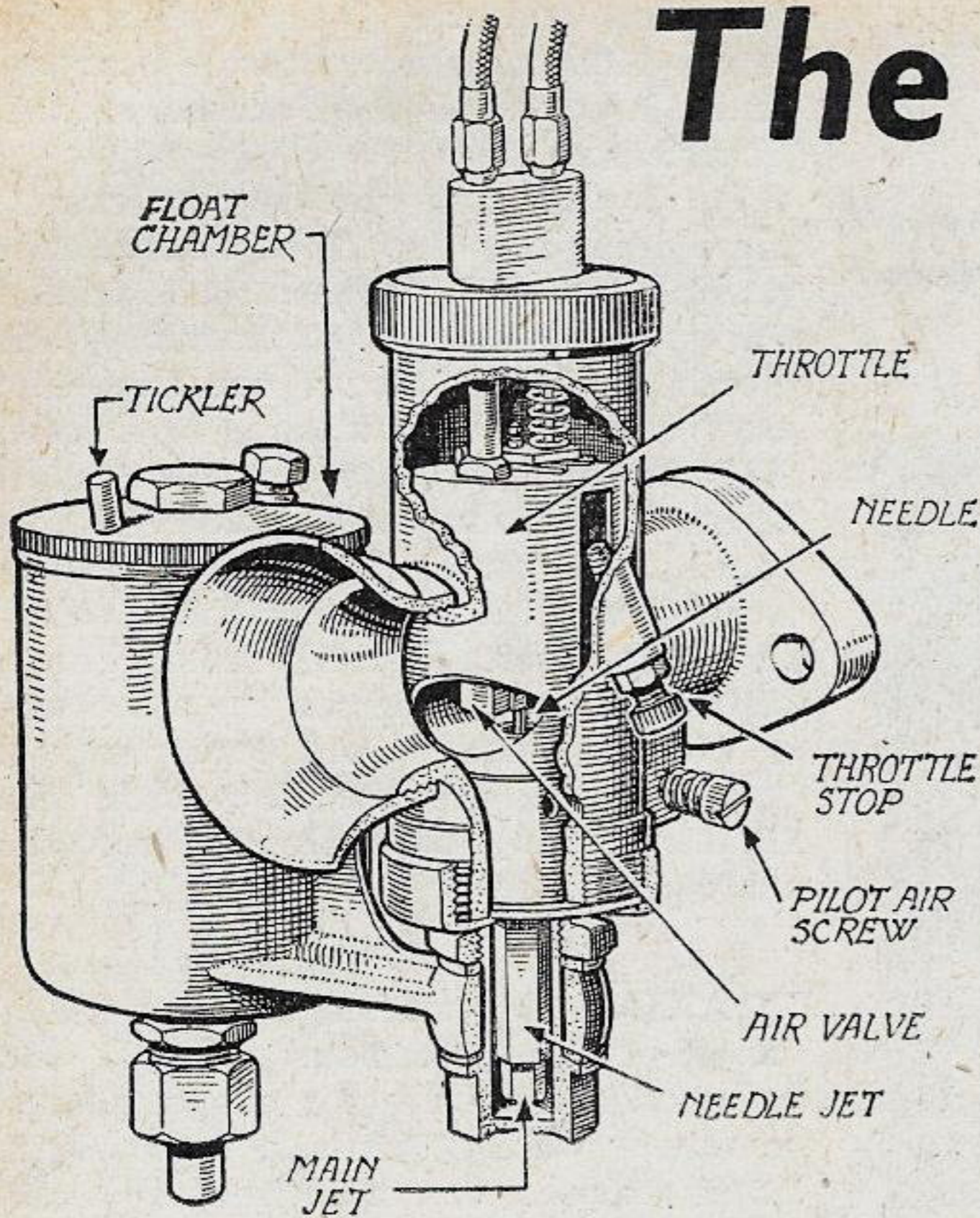
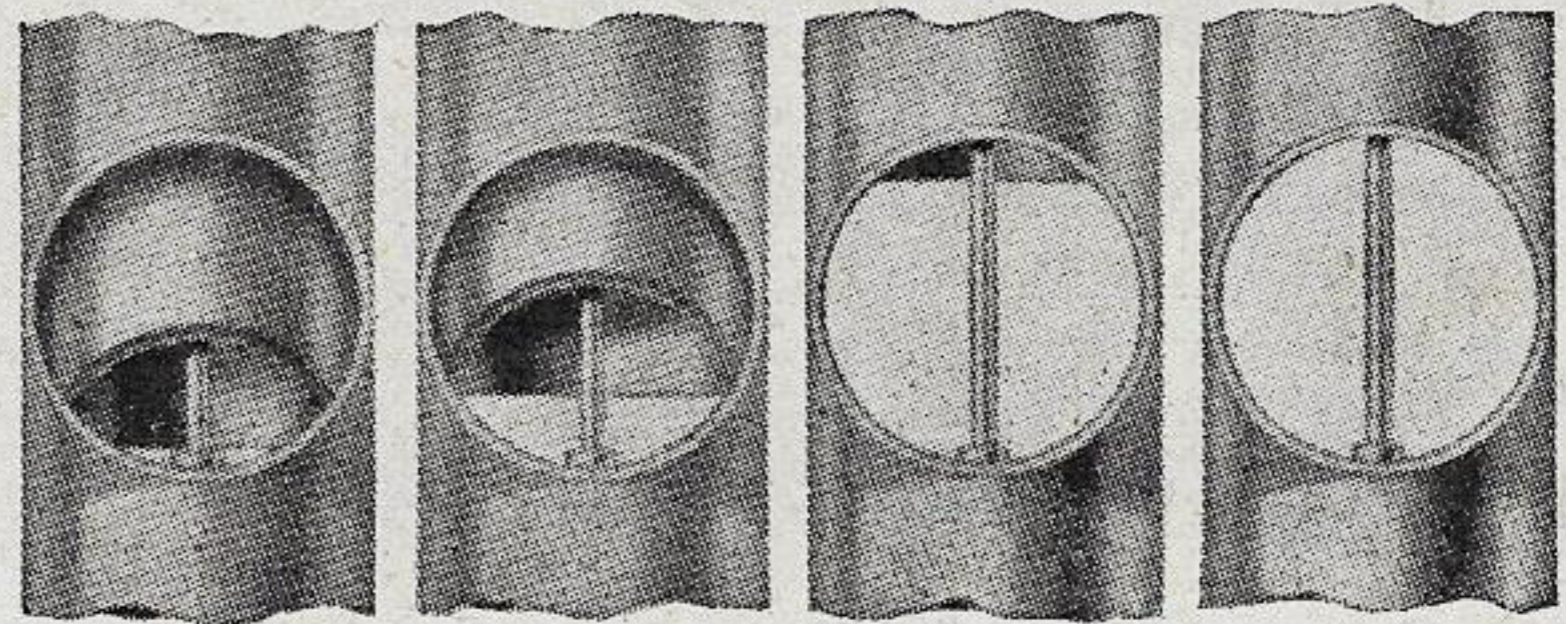


# The Makers Recommend



(Left) The majority of British motorcycles are fitted with the needle-type Amal carburettor here shown in semi-section. At the part-throttle openings used in economy running, pilot setting, throttle slide cut-away and needle position are the important factors.

(Below) How the mixture strength is controlled throughout the range of throttle opening. Up to  $\frac{1}{8}$  open, the pilot jet is in charge. From  $\frac{1}{8}$  to  $\frac{1}{4}$  open, the throttle slide cut-away has an important effect. From  $\frac{1}{4}$  to  $\frac{3}{4}$  open, the needle position is the governing factor. Only in the seldom used  $\frac{3}{4}$  to full open position does the main jet assume control.



## Comprehensive Advice for Ariel Riders

THE information given below is intended primarily for riders who wish to obtain more miles per gallon from their Ariel machines as a result of petrol rationing. It must be understood, however, that where a carburettor setting is modified to give a weaker mixture, the model must never be driven hard, or overheating may cause serious engine trouble.

First, see that the engine, transmission and cycle parts are in sound mechanical condition and that all moving parts are properly free and lubricated; also, be sure that the brakes are not rubbing. Keep the engine free from carbon and the valves properly ground in. It will probably be advantageous to decarbonize and grind in the valves at intervals not exceeding 2,000 to 2,500 miles.

Check over the ignition system for cleanliness and correct gap of the contact breaker points, sound H.T. cables, etc., and always use the most suitable type of sparking plug. As the machine will not be driven hard, a touring plug will be best. On recent Red Hunter models, the ignition timing has been set to give  $\frac{5}{8}$  in. maximum advance; as this means retarding when the engine is running at low revs., it will be better to reset the timing to give  $\frac{7}{16}$  in. maximum advance.

On the de luxe o.h.v. and s.v. and the 1931-1936 o.h.c. four-cylinder machines, retain the standard fully advanced settings of  $\frac{3}{8}$  in.,  $\frac{5}{16}$  in. and  $\frac{1}{4}$  in. respectively. This recommendation applies also to the later push-rod-operated four-cylinder models 4F (600 c.c.), 4G (1,000 c.c. de luxe) and 4H (1,000 c.c. standard), the normal ignition timing of the smaller engine giving  $\frac{3}{16}$  in. maximum advance, and that of the larger unit  $\frac{5}{16}$  in.

The standard carburettor settings are given in the next column; the instruments fitted to all the single-cylinder models are of Amal manufacture, while those on the 1937-1939 "fours" are of the car type, made by Solex. Weakening the mixture is mainly a matter for experiment; it should, however, be possible to make certain modifications in both instances.

With the Amal carburettor, the main jet might be reduced by one or two sizes, a throttle slide with slightly more cut-away might be fitted, and the taper needle might be lowered. Understand first, however, that control up to one-eighth throttle is effected by the pilot jet; from one-eighth to quarter throttle by the amount of cut-away; from quarter- to three-quarters throttle by needle position; and from three-quarters to full throttle by the main jet.

Alter the settings in the following order, making one adjustment at a time and testing the running of the machine after every adjustment independently.

- (1) Reduce the main jet by one size, or, if possible, two.
- (2) Set the pilot jet air-adjusting screw. Keep this screwed out as far as possible, consistent with a good tick-over when hot and reasonably easy starting when cold.
- (3) Fit a throttle valve with greater cut-away. The valve has a number stamped upon the top, for example,

"6/4"; the first figure indicates the type of carburettor used, while the second is the amount of cut-away on the intake side of the valve measured in sixteenths of an inch. A throttle valve with  $\frac{1}{16}$  in. greater cut-away would be, therefore, of size 6/5, with  $\frac{1}{8}$  in. greater cut-away 6/6, and so on.

(4) Lower the needle one notch at a time as far as possible, consistent with a clean pick-up when the throttle is opened gently. If the necessary parts are available, it is advisable to fit a new taper needle and needle jet—the latter, of course, being of exactly the same size as the original—before tackling this part of the economy tuning programme.

## STANDARD CARBURETTOR SETTINGS FOR ARIEL CIVILIAN MOTORCYCLES

Model	Year	Main Jet	Throttle Slide	Needle Position
LF. LG. . . . .	1933-6	85	4/3	All models, third notch from the top
LH. NF. . . . .	1933-4	110	5/4	
NF. NG. . . . .	1935-9			
LH. NG. . . . .	1935-9	110	5/3	
OH. OG. . . . .	1939			
NH. . . . .	1933-9	150	6/4	
VA. . . . .	1933-5	160	6/5	
VB. . . . .	1933-9			
VA. . . . .	1939	140	6/4	
VF. VG. . . . .	1933-9	170	6/4	
VH. . . . .	1933-9	200	29/3	
4F. (500/600 c.c.) . . . . .	1931-6	90	4/4	
4F. . . . .	1937-9	100 x 58	55	
4G. (Air Strangler) . . . . .	1937-9	115 x 58	55	
4G. (Bi-starter) . . . . .	1937-9	120	70	
4H. (Bi-starter) . . . . .	1939			

With the Solex instrument fitted to the later four-cylinder engines, it should be possible to reduce both the main and auxiliary jets by one or two sizes. First, reduce the main jet size, and when this has been done as far as is practicable, experiment with a reduction in the auxiliary jet size. The pilot adjusting screw, also known as the volume control screw, will probably require resetting for slow running with each alteration in jet size.

Further economy can be obtained, especially in hilly districts, by adjusting the throttle stop so that the throttle valve is completely closed when the twist-grip control is turned right off. And the rest is up to you. Economy depends, most of all, upon one's driving methods.

## Nortons Emphasize Carburettor Wear and Driving Methods

NORTON owners should examine their float chamber needles and jet needles for wear and straightness, and the needle jet should also be examined for wear. Dripping from the carburettor is not uncommon, and is due to one or more of four causes: dirt in the float chamber, bent

# A Series of Fuel Economy Hints Volunteered by our Leading Manufacturers

or worn float chamber needle, loose mixing chamber bottom nut (the jet plug), or loose unions.

If the machine is parked at an angle—for instance, against a kerb—it should be leaned towards the float chamber side; otherwise, the contents of the carburetter will be lost, and if the petrol tap is not turned off, this loss will be continuous until the machine is restored to the vertical.

Equally important, though not quite so obvious, is the fact that all cycle parts should be free from binding, chains in correct tension, etc., for a motorcycle can run at its greatest efficiency only when it is in perfect adjustment.

But, above all, economy in fuel consumption can be obtained by careful driving—violent acceleration and deceleration can make a difference of up to 20 per cent. It is probably here that the greatest saving may be made.

## RECOMMENDED CARBURETTER ECONOMY SETTINGS AND IGNITION TIMINGS FOR NORTON MOTORCYCLES

Model	Amal Carb. Type	Main Jet	Throttle Slide	Needle Position	Ignition Timing B.T.D.C., Fully Advanced
16H ..	76/011	170	6/4	3	7/16 in.
Big 4 ..	76/011	160	6/5	3	3/8 in.
18 and E.S.2 ..	76/022	160	6/4	3	3/4 in.
19 ..	76/022	160	6/4	3	5/8 in.
20 ..	76/022	200	6/4	3	3/4 in.
50 and 55 ..	76/012	170	6/4	3	11/16 in.
C.S.1 ..	29/001	180	29/4	2	3/4 in.
30 Inter. ..	T.T. 34	109	5	3	3/4 in.
40 Inter. ..	T.T. 34	107	4	4	11/16 in.

## Practical Hints for Owners of A.J.S. and Matchless Machines

FUEL consumption is governed by two main factors, i.e., the mechanical condition of the engine and the speed at which one drives, or, shall we say, the amount of throttle opening one uses. No doubt many riders have looked after their machines pending the return of the basic ration; at the same time, there must be an equal number who have not had either the time or the necessary replacements to keep the "works" in good order. For economical running, the engine must be in good condition, the valves and guides should be a good fit, and a new set of valve springs is always a tonic.

Assuming the engine to be sound, it follows that the carburetter must be in the same condition. The only part of this instrument that is likely to wear and, at the same time, adversely affect the petrol consumption, is the needle jet (excluding waste by leakage), wear of which is more pronounced on carburetters fitted with horizontal mixing chambers. Should wear have taken place, lowering the taper needle will have no beneficial effect; therefore, the investment of 2s. 3d. for a new needle jet is worth while.

As regards leakage or flooding, on no account should the petrol level be altered; this is set by the makers and must not be changed. Flooding is usually due to a punctured float, a worn float needle, dirt between the needle and its seating (most rare in bottom-feed chambers), or possibly a bent float needle. In the first case, fit a new float; replace the needle if bent or saucer-shaped on the seating—do not grind the needle in. A worn throttle valve usually results in poor slow-running, and under such conditions fuel will be wasted if the engine is run fast in traffic stops to keep it turning.

Before making any attempt to weaken the mixture, it is important that the pilot jet is in operation and can be controlled by the air-regulating screw. The pilot acts as a bridging jet on the change-over to the main jet; if the former does not function, a weak mixture in the first part of the throttle opening will result, which will be aggravated

if the taper needle is lowered. To test, form a point on a matchstick and insert the point in the small hole drilled midway across the boss which houses the pilot regulating screw. This action should create a rich mixture if pilot is working, and if it is weak the slow running will be improved. The pilot jet, actually, is the small hole in the brass jet block; use a single strand of Bowden wire to remove any obstruction, and do not overlook the small hole in the mixing chamber which registers with the pilot jet.

A word about air leaks: when the carburetter is removed for cleaning, place a straight-edge or rule along the flange (if this type of instrument is fitted), and hold the two against the light. If the flange is buckled, file it flat and use a thin gasket when refitting. When the carburetter settings have been reduced, by lowering the needle, fitting a slide with a larger cut-away, or substituting a smaller main jet, the rider should avoid "snap" throttle openings—try to "coax" up the engine revs. and do not let the engine labour in top gear. If the mixture is unduly weak after lowering the needle, make sure the amount of ignition advance as recommended by the makers is correct. A sparking plug which fires inside the body will have the same effect; the remedy for this is obvious.

It may be necessary to run with the air lever half open until the engine has warmed up, when full air can be used. The cycle parts, also, should have attention; look for tight chains, binding brakes, and, most important, under-inflated tyres.

In conclusion, when you stop or garage the machine, ask yourself: "Is that tap turned off?"

## STANDARD CARBURETTER SETTINGS AND IGNITION TIMINGS FOR MATCHLESS AND A.J.S. CIVILIAN MOTORCYCLES

Year	C.C.	Main Jet	Throttle Slide	Needle Position	Ignition Timing B.T.D.C., Fully Advanced
<b>O.H.V. Models:—</b>					
1935/40 Coil .. .. .	250	120	5/3*	2	{ 5/16 in. 7/16 in.
1935/40 Mag. .. .. .	250				
1935/40 Coil .. .. .	350	150	6/4	2	{ 5/16 in. 7/16 in.
1935/40 Mag. .. .. .	350				
1935/37, A.J.S. only ..	350	120	5/4	2	See above
1935 Mag., Matchless only ..	500	180	29/4	2	{ 9/32 in. 9/16 in. 7/16 in.
1935/36 Mag., A.J.S. only ..	500				
1936/40 Mag. .. .. .	500				
<b>S.V. Models:—</b>					
1935 Mag. .. .. .	250	55	4/4	2	{ 7/16 in. 5/16 in.
1936/40 Coil .. .. .	250				
1935 Coil .. .. .	500	130	6/4	2	{ 1/4 in. 3/8 in.
1935 Coil, A.J.S. only ..	500				
1935/36 Mag., A.J.S. only ..	500	150	6/4	2	{ 9/16 in. 5/16 in.
1935/6 Mag., A.J.S. de Luxe only	500				
1937/40 Coil .. .. .	500	130	6/4	2	{ 5/16 in. 3/16 in.
1935/36 Coil .. .. .	990				
1937/40 Mag. .. .. .	990				{ 1/4 in.

Contact breaker gap settings: .012 in. (magneto); .018 in. (coil).

Next week, it is hoped to publish a further selection of economy tuning tips provided by the manufacturers of popular models. Meanwhile, we would emphasize the need for discretion both in the limits to which modifications are taken and in the methods of driving to be employed after the mixture has been weakened. It would be false economy, for example, to gain a few more miles per gallon only to sacrifice that advantage by burning the plug, valves or piston crown through asking too much of a thin mixture.

It should be realized that the standard settings are those found by patient experiment to be the best for engines in new condition, i.e., as they leave the makers. Where an inlet valve guide, for example, has become worn, the standard setting is already on the thin side due to air leaks past the guide. Thus, to further weaken the mixture without first eliminating the valve guide wear will only result in a mixture which is too weak to be safe.

The cardinal rule in driving is never to let the engine slog in too high a gear or to over rev. on a ratio which is too low for the load of the moment. If the maximum number of miles per gallon is to be covered, flashing acceleration must be dispensed with, whilst the temptation to set sail after those who pass one at speed must be resisted.

To sum up, before tackling the carburetter, check up on engine condition, freedom of bicycle parts and your own determination to drive with economy as your main object.