

ARDEN ANTI-ROLL BARS

FOR SAFER CORNERING

B.M.C. Models, All Farina Models, including A.40, A.55, A.95, A.105, Nash Metropolitan, Morris Minor 1000, Wolseley 1500, Riley 1.5, Jaguar 2.4 and 3.4, Turner Sports and

M.G.A., 1500 & 1600 Models	£7 0 0	Fitting	...	...	£1 10 0
Triumph T.R.2., 3, 3(a)	£6 0 0	Fitting	...	...	£1 10 0
Competition Type	£7 0 0	Fitting	...	...	£1 10 0
Ford 100E, 105E.	£4 10 0	Fitting	...	...	£1 0 0
Ford 109E Classic	£4 10 0	Fitting	...	...	£1 0 0
Ford Consul, Zephyr Models	£6 10 0	Fitting	...	...	£1 0 0

ARDEN TORQUE ARMS

Eliminate rear axle tramp, spring wind-up, assist wheel grip on acceleration, cornering and braking

All B.M.C. Farina Models, Nash Metropolitan, Riley 1.5, Morris Minor 1000, Wolseley 1500, Ford 100E and 105E Models £6 10 0 per pair Fitting ... £1 10 0

Armstrong Competition shock absorber settings for most of B.M.C. Range ... 12/6d. each

Armstrong adjustable shock absorbers	}	Details on request.
Koni adjustable shock absorbers		
Vari Flow adjustable shock absorbers		

Clayton Dewandre Moto-Vac power Brake Kit, 33½ increased braking power
Kit £14 10 0
Fitted £17 10 0

Baldwin Brake Booster, 33½ increased braking power ... Kit £7 10 0
Fitting extra

Anti fade Brake Linings, Ferodo or Mintex for use in conjunction with the above if required.

Modified Clutches and Clutch Plates, Ferodo or Mintex linings. Prices on Application..

Smiths Rev. counter 0-9000 B.M.C. A.7 and Mini ... £10 10 0

CRYPTON TRANSISTORISED ELECTRONIC TACHOMETERS

B.S.42 0— 6,000 r.p.m. 12v.	£16 0 0	B.T.42 0— 6,000 r.p.m., 6v.	£16 0 0
B.V.42 0— 8,000 r.p.m. 12v.	£16 0 0	B.W.42 0— 8,000 r.p.m., 6v.	£16 0 0
B.X.42 0— 10,000 r.p.m. 12v.	£16 0 0	B.Y.42 0— 10,000 r.p.m., 6v.	£16 0 0

Few minutes fitting. Complete with wires and dial light.

H.C. Compression Pistons, A. and B. Series, B.M.C. Engines.

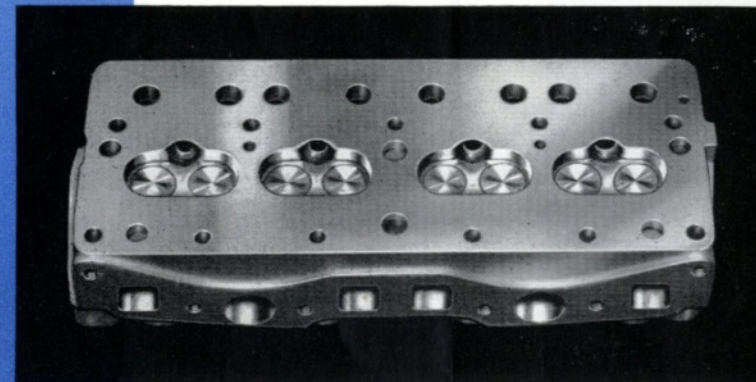
THE ARDEN RACING & SPORTS CARS LTD.

PENN LANE, TANWORTH, ARDEN, SOLIHULL, WARWICKSHIRE

Telephone: WYTHALL 3368

mk1-performance-conversions.co.uk

ARDEN MODIFIED CYLINDER HEADS



A MODIFIED CYLINDER HEAD FROM A STANDARD ENGINE

The modifications include:—

Combustion chamber shape modified and matched.

Compression ratio raised to our standard 9.1 or your specification, depending on pistons fitted.

Inlet ports modified for improved gas flow fine ground finish and polished.

Exhaust ports modified for improved gas flow.

Valves modified—Terry's special Aero Valve springs supplied and fitted.

Joint faces precision ground.

All worn or doubtful parts replaced.

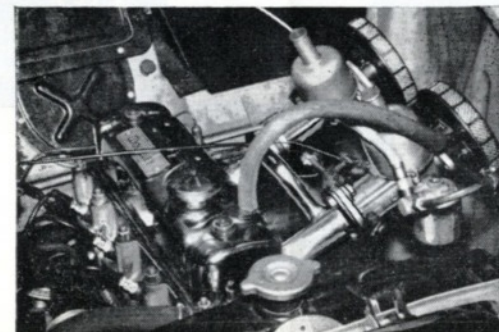
Modified heads available for early or current B.M.C. Triumph, Ford, Rootes, Standard, Renault, supplied ready to fit. Fitting by appointment 8 hours, including testing and setting.

Customer's own cylinder heads modified 2-3 day delivery.

All studs should be removed for carriage.

Special competition models on request.

OVERTAKE SAFELY WITH MORE POWER



A TYPICAL
POWER
CONVERSION
ON A
B.M.C. "B"
ENGINE
1500 c.c.

ARDEN

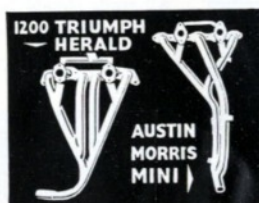
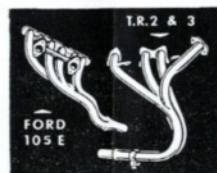
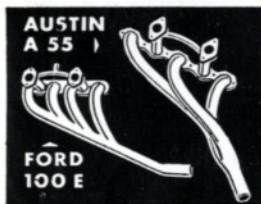
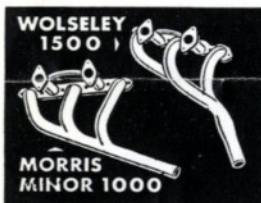
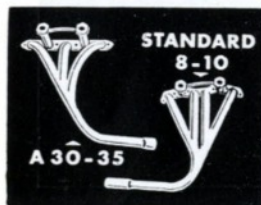
DELUX INLET EXHAUST MANIFOLDS

Every manifold is manufactured from the best quality mild steel tube, hot metal sprayed for a lasting and pleasing finish in aluminium.

They are designed to give an increased performance throughout the power range. An increase in power of up to 20%, depending on degree of engine tune, is normal.

We make special manifolds for all models, including those which ARDEN Exchange Cylinder heads are available, using single or twin S. U. Solex, Zenith, Weber or Amal carburettors.

Special competition models are available on request, these are designed to give more power in higher rev. range.

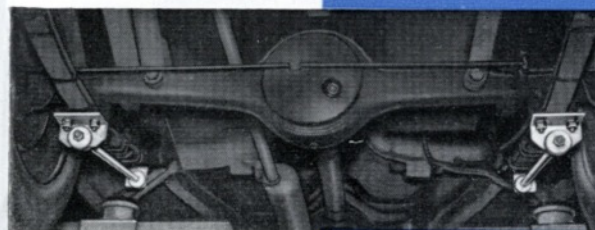
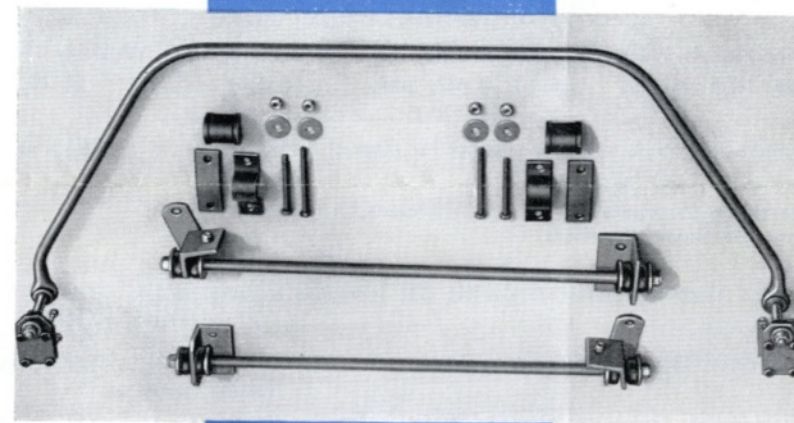
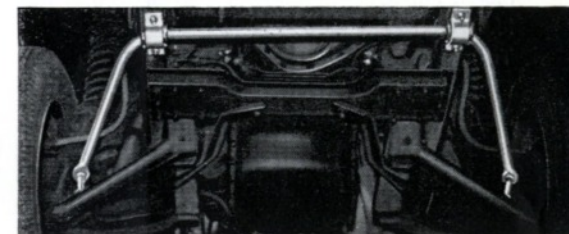


ARDEN

SUSPENSION CONVERSIONS

ARDEN ANTI-ROLL BARS give vastly improved roadholding, 80% reduction in roll on cornering, increased steering sensitivity and reduction of dead roll effect. The spring rates remain unaltered, as does the 'ride.'

Our Anti-Roll Bars are manufactured from best quality spring steel by a world famous spring manufacturer.



ARDEN TORQUE ARMS are developed for cars with semi-elliptic rear springing and help to give 'on the rails' ride by eliminating rear spring wind-up on acceleration, axle tramp, and rear end steering.

We advise 2 Torque Arms for balanced control.

Anti-Roll Bars and Torque Arms are linked to the suspension and chassis by hard rubber bushes and with the minimum of drilling. Fitting instructions with every kit. Tested and proved by more than 12 months continuous use over all types of roads. No servicing or replacements required. Far less and more even tyre wear.

"IN BOTH WET AND FROSTY CONDITIONS IT FELT VERY SAFE" — "AUTOCAR"



Champion Mini

by Michael Bowler

Bowler and Arden Mini rounding Becketts at full chat in second with the rear wheel just beginning to lift. Credit list reads down the side—Castrol, Girling, Burmah, Ferodo, Dunlop, Champion, Britax, T-J, Equipe Arden, Alec Poole and BMC.

PICTURES BY MAURICE ROWE

THE BEST THING about the success of the Arden Mini in winning the Saloon Car Championship is that it is a real privateer; unlike last year, they have had no real help from BMC, and despite this they still managed to hold off the 1,000 c.c. Escort of Laurie Hickman which had more than passing backing from the factory. Equipe Arden is an entity separate from Arden Conversions, so all the work is done in otherwise spare time by just three people.

Jim Whitehouse is king of the miniature castle in Tanworth-in-Arden, about 10 miles south of Birmingham. Jim is one of those slow speaking astute characters whose lazy drawl completely belies the ability for intense mental and physical activity. As the mechanical brains behind the Arden Mini, he has done all the development, design and even some of the machining of most of the bits that make the car so quick. What I described metaphorically as a castle is really a basically elderly but modernised outhouse which some might

continued



Champion Mini *continued*

even be unkind enough to call a shed. In it, though, is all the machinery that Jim needs to make himself self-sufficient—bench, brake, lathes, millers, cam-grinder etc.—with the exception of a foundry area. We've mentioned his eight-port TJ-injected head before, and this is, of course, the one he uses on the 1-litre racer, but he has sold a further 20-odd; we've also tested one of his other offerings—a Mark IV Zephyr powered by 4.7-litre V-8—so the workmanship and methodical preparation come as no surprise.

In this Jim is assisted by Norman Seeney, cast rather in the same mould as Jim—quiet and effective—and the two of them take the engine down after each meeting (not in Arden Conversions' time), throw away the bits that they reckon can give trouble—like valve springs after each meeting, oil pumps every other, crankshaft dampers every three, including all the obvious items like big end bolts, all in the cause of the preventive

maintenance that keeps the car in winning form. This obviously consumes time and money, but when you consider that they have to get four class wins (prize money plus bonuses from BMC, Castrol, Champion and Britax) to cover a major engine blow-up, then it is well spent.

All this effort is co-ordinated and the general organisation covered by Alan Edis; he is mainly concerned with the paper-work, but is by no means above the dirty fingered side of things, witness the fact that the three of them were working all night just before we tried the car, building up a new engine for the car's new owners. Jim had already sold the race-winning engine to a New Zealander, with an engine that had effectively done almost two seasons' racing in the hands of Gordon Spice last year and Alec Poole this; they had in fact changed the block shortly before, when they found a cracked main bearing housing during one of the preventive sessions. The new engine, complete with its surrounding car, has also gone to New Zealand to be raced by the leading lady driver there, Mary Donald.

Last year, Arden were effectively racing in the 1-litre class for BMC and Gordon Spice won this class in the Championship. This year Alec Poole took over when Spice went to

drive the Britax Coopers; he came first five times on the trot—if they hadn't, and therefore not gained enough money to keep going, they might well have given up. At this point, Ford began to see the championship slipping away from their long domination, since the Britax Coopers were not letting the Broad-speed Escorts have it all their own way, so Hickman's car went under the Broad-speed wing if not colours. It went faster, relegating Alec Poole to second spot at Mallory and Crystal Palace, and fourth after a wrong-slot penalty at Croft—a lean patch for Arden financially. However Arden returned to the front at the British GP meeting when Hickman's engine gave up, so the Championship hinged on the Gold Cup meeting at Oulton; Poole drove a canny race there. Slower than the Escort in practice due to a breaking up final drive, he stuck just behind it for 18 of the 19 laps, and then outraked Hickman into Esso on the last lap, having saved till just that moment some new-found braking power.

At Croft, Jim Whitehouse had been out watching on the circuit and noticed that Hickman was consistently outraking the Mini; with the big fat tyres it had become impossible to lock the wheels. So Jim went back home, altered his pedal ratios and got



hold of some new light alloy calipers from Girling; this wrought an impressive change, which Alec Poole sampled in practice but saved till the last possible moment in the race.

When it was all over and Alec Poole had won the Championship, even the normally reserved Jim was bubbling over with bewildered joy. Since then they have had another second at Brands Hatch, but now there is no car and no engine, and the offered replacement wasn't quite up to the same standard. Next season, the 1-litre Mini in that stage of development is no longer homologated, so the future is temporarily uncertain.

But let's look at the car. Basically a 970S Cooper, the bodyshell is now two seasons old. Unlike the Britax cars, but like the BMC 1300s, this one is still Hydrolastically sprung, using the blue/double blue displacers; the suspension is set up with a little negative camber on the back, but more on the front, excess negative being a disadvantage with the very wide low profile Dunlop racers—3.75/800 x 12, being only 45% profile and, in fact, only 6% larger diameter than the standard Mini tyre on a 10-inch wheel. Additionally, the sub-frames are bolted solid

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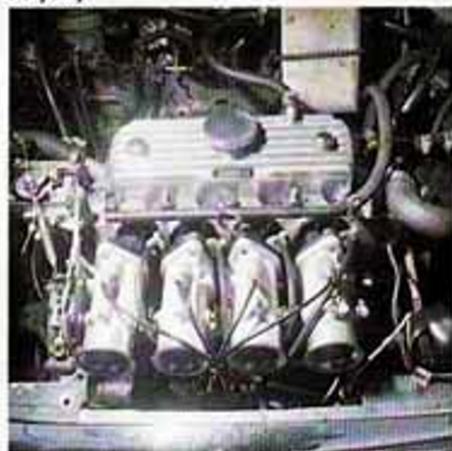


Genius at work. Jim Whitehouse contemplates a 10mm. Champion.

Left: Unloading at Silverstone watched by Alan Edis, general organiser of Equipe Arden. Wheels by Tech-Del.

Below: Clean engine compartment showing the four T-J injection barrels attached to the Arden eight-port head. The grille is quickly detachable with two screws.

Bottom: Hidden in the boot is the lightweight battery and all the T-J bits and the twin-barrel SU pump.



Face of the new owner, Mary Donald, at Silverstone just to get the hang of things while chief Jim is still around.

Well instrumented cockpit gives all that is necessary when you have time to look; ex-1800 flasher light gives oil pressure warning, and pattern of Jack Knight gearbox is taped to screen.



Champion Mini

continued

to the unitary shell without the cushioning medium of rubber bushings, and both ends are adjustable for toe-in and camber, with Rose-joined links on the front.

The Minilite wheels have six-inch rims front and rear; the tyres are the standard Mini size but a combination of the way the car is set up and the lower output of the 1-litre engine means that it can use the Dunlop general-purpose 184 mix all the time without the temperatures getting higher than 80°C.

The engine used all last season was basically an overbored 970S; the Arden cam is matched to their own advance curve on the special Lucas distributor. Fuel injection is the T-J system which Jim sells complete with his own eight-port head; he knows the T-J inside out now, and has had very good results with it—although nine m.p.g. may not sound brilliant for a Mini, there is enough tankage and the extra power is worth it.

Where the previous engine fell down a little was in mid-range torque, so Jim started work on a short-stroke version with a one-off 58mm. stroke crankshaft, and used larger valves; this doesn't really sound like the ideal recipe for low-down power, but it changed the power curve to the extent that 60 b.h.p. was developed at 5,500 r.p.m. instead of 7,000 r.p.m. and at the 8,000 r.p.m. rev. limit of the Arden test-rig it now develops 105 b.h.p. instead of 100. Extrapolating onwards to a peak around 9,500 r.p.m., they reckon on about 115 b.h.p.

This new engine was dropped straight into the car with only six gallons worth of bench-testing, and that was how we tried it at Silverstone. Other changes to the car for its New Zealand emigration were twin-circuit braking (for NZ regs) and a seating position (unadjustable) for its lady driver.

When I first sat in the car I thought it was going to be quite impossible; the back had been raised about three inches bringing my knees up around the small leather-rimmed wheel, which I thought was going to foul up heel and toe attempts. After the conventional

instruments set in a binnacle on top of the normal fascia rail, the next thing you see is the gear lever gate pattern taped to the screen on the right for instant reference; it has always been there since Gordon Spice drove it last year. This is because the box has the Jack Knight five-speed cluster, with a pattern like a mirror image of the Porsche system—first, left and forwards, second centre back, third forwards, fourth right and back, fifth forwards. The confusing part is the dog-leg change between three and four, and the straight shove forwards for upward changes from two and four. Dog-clutches replace synchromesh and it is very easy to snick through, although with a longer lever and more deliberate plane spacing it is not quite as easy as on the road-going Cooper we tried with this box some two years ago. There is no spring loading, but Arden have set up the system so that the gate feels very precise; there is a detent which stops you jumping two gears at once—five to three to one is possible, and so is four to two, but five to two is impossible.

Gordon Spice was at Silverstone that day to help with the initial setting up and bedding in of the new engine and brakes, gradually bringing up the revs. for the latter stages of running in. With a 9,000 r.p.m. limit, he finished at 1m. 11s. against the 1m. 12.5s. on the Club circuit from last year—tyres and engine both contributing—but he reckoned that there were probably another two seconds to come off that, so the improvement is fairly spectacular.

Having convinced myself that if Gordon could fit into the seat I could, I set off rather more confidently. Starting was quite simple—with the fuel pump on first, it fired straight away; if you flood it, you turn the pump off and churn it dry again. The noise was fairly raucous as the exhaust pipe ends just under the back of the seats. Lower revving 1300s have pipes to the rear of the car, but on the 1-litre cars the pipe-lengths are tuned considerably shorter.

The idea of the first few laps was to make sure of absolute familiarity with the gear change. I say "the idea", but the car seemed to inspire so much confidence in corners straight away, that inhibitions disappeared very quickly, particularly when I found that heel and toeing wasn't the unnatural contortion I had first thought.

The first surprise came when I lifted off after the flat Maggots curve before braking for the Becketts hairpin; having lined up fairly well over to the left I was a little put out to find that the car immediately leapt back into the middle of the track when I lifted off. This happens with the Mini-type Salisbury limited slip differential when you go from foot-on to foot-off; but you learn to counter steer—if you are strong enough with one hand, because by that time you have usually started the downchanges. The strength required became evident on the Club straight; the big wide tyres just climb up any ridge they feel and you can't relax the grip on the wheel; I noticed this particularly on the surface change just past the pits, at which point I was just changing gear—surprise number two. The resultant twitch felt like a tyre deflation; after that I avoided that ridge and could then concentrate on the performance and handling.

It seemed to misfire a little on part throttle which worried Jim during Gordon Spice's preliminary testing; but once flat it was dead clean from 5,000 to 9,000 r.p.m., or 10,000 later; it can pull from 4,000 r.p.m. if you want to try, but the gearbox keeps it comfortably between about 6,800 and 9,000 r.p.m. On the straight it pulled 9,200 r.p.m. which works out at 115 m.p.h. before braking for Woodcote. By fiddling with drop down-gearing, the final drive gets down to 5.2:1 with direct internal gearing, which, with the 0.91:1 fifth gear, works out to about 12.5 m.p.h. per 1,000 r.p.m.

Having established that it didn't feel very stable in a straight line, but that in fact it was (and, incidentally, wondered how Mini drivers race in such close proximity), I was prepared to try cornering faster. As promised, it was set up to behave more neutrally than any Mini I had met before; that is, not enough power to break traction on those big fat wheels, and the rear anti-roll bar transfers all the weight from the inner wheel to its opposite number, so the car just goes where it is steered, feeling as if it is about to oversteer slightly at the adverse camber Copse—though it never did with me; Gordon has used opposite lock here, though. Servoed brakes pull it up very squarely for Becketts, then you throw it in and power round in second; there is a trace of front wheel scrub as the wheels get jerked off the deck on the ridges there, and from the photographs you can see that the inside rear wheel is in the air—i.e. all weight has been transferred, but it never feels like this. There is no lift-off tuck-in, either.

With close ratios you have to keep a wary eye on the rev. counter, but with prior instruction I knew which gear to use for which corner, and then a quick glance at the windscreen reminded me where to move the lever; one never felt terribly conscious of acceleration but the revs. just kept on increasing. The only time when a relative lack of power was at all noticeable was when pulling up the hill out of Copse in fourth, but I changed up early for this to avoid having to watch the rev. counter round Maggots.

I did eight laps and stopped after a consecutive two at 1m. 13s.; when you get two laps the same in this sort of exercise, it's as far as you are going to get without starting to take braking distances more seriously, and going deliberately faster through each corner until either the nerve or the grip gives way.

After that the new driver, Mary Donald, tried her mount for a dozen laps or so; by the end of the day the car had done over 50 laps. That a completely new engine, bolted in only the night before, can do 50 laps straight off without attention is a fair certificate of Arden workmanship.

