

MARCH 82

Mini Tech News

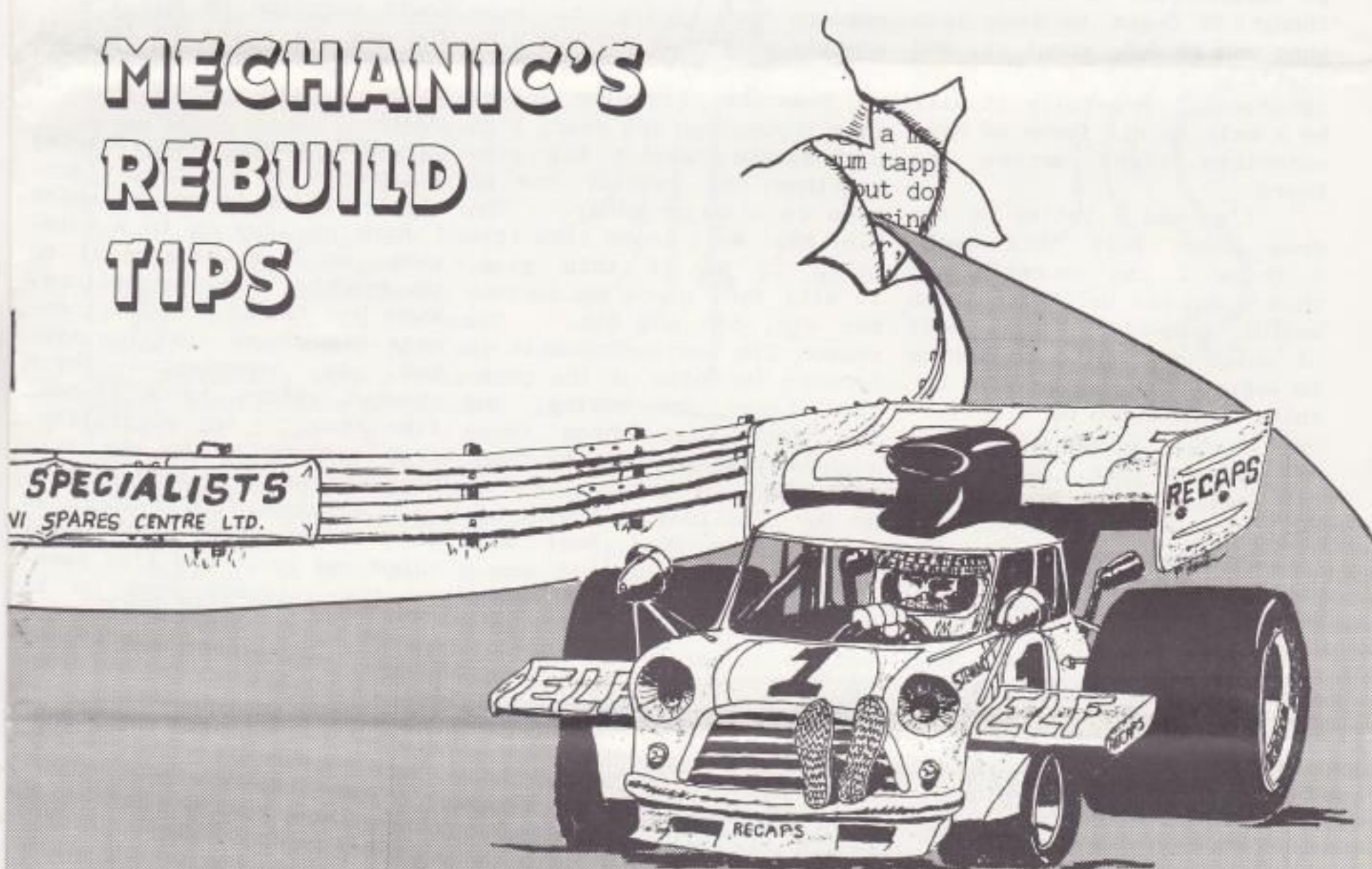
TECHNICAL INFORMATION ON PERFORMANCE, RESTORATION, MAINTENANCE and ECONOMY
FOR LEYLAND MINIS and SERIES 'A' ENGINES

Volume 3

Number 3

AERODYNAMICS

MECHANIC'S REBUILD TIPS



MINI TECH NEWS

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EDITOR'S CORNER

Since the Mini is about as streamlined as a brick, I thought I ought to look into what can be done about it, and that's what most of this issue is about. Hopefully it will be a help to all forms of Mini motorists right across the board.

I've had a letter or two from Shaun Wall this week. I think I can honestly say that Shaun has deluged me with useful tips for Minis, most of which are going to appear in future issues of MTN. One thing that might be of interest is that Shaun does a lot of work on cars, other than his own, and if you have a real Mini problem and you live in the area, you might like to give Shaun a call at 104 Finian Park, Shannon, Co. Clare. Tel: 061-74557.

Another MTN reader that sent me an exceedingly inter-

esting letter was Hugh Venables in Australia. Probably too few of we pommies and our colonial friends over the seas in the Americas, realize just how enthusiastic the Mini following is, both in Australia and New Zealand. If MTN's expansion in this area continues, we are going to hear a lot more about what they are doing down under, especially if Hugh Venables has his way.

I had a letter from Los Angeles Mini Owners Club member Tony Swisler. Tony wrote to say that the L.A. Club will be hosting the Mini Meet West '82. Of course all you U.S. readers are going to know exactly what that is, but U.K. readers may not realize that at reasonably regular intervals throughout the year, Mini enthusiasts have a big get-together and usually one of them is a major affair. The Mini Meet West looks like it's going to be it this year. It will take place on September 4th, 5th and 6th. The reason I'm mentioning this is because in spite of the problems Laker are having, and the fact that cheap fares might not be so cheap by then, it's still a great place to go for a holiday. I went along to the Mini Meet West meeting in '79 and it was a terrific show. Once again, the American hospitality proved to be every bit as much as it's cracked up to be.

If you are interested in going to Mini Meet West from England or from anywhere else for that matter, I'm sure your U.S. counterparts will make you more than welcome and you don't have to be a member of the L.A. club to go. You just have to be a Mini enthusiast. If you are interested in more details, drop a line to the L.A. Mini Owners Club at P.O. Box 91785, Los Angeles CA 90009.

You can, of course, plan a trip to coincide with the Mini Meet East, but it would be at rather short notice, as it is being held at Greenville South Carolina on May 1 - 2. The guy to write to is Neil Harmon at 4626 Randalwood Drive, Stone Mountain, GA 30083.

MTN reader Don Shirley has passed on a strange technical problem to me, of which I have no idea as to a solution, so I am passing it on to readers for suggestions. When Don fitted the American-made Mega-Spark ignition system, he experienced three cracked rotors in a 24-hour time span. Any suggestions from readers as to why this happened would be appreciated.

Response from readers as to possible drive shaft solutions was good, and I've passed the relevant ones on to Pete Braun in the States. In a future issue we'll deal with this subject in detail.

AIRFLOW!

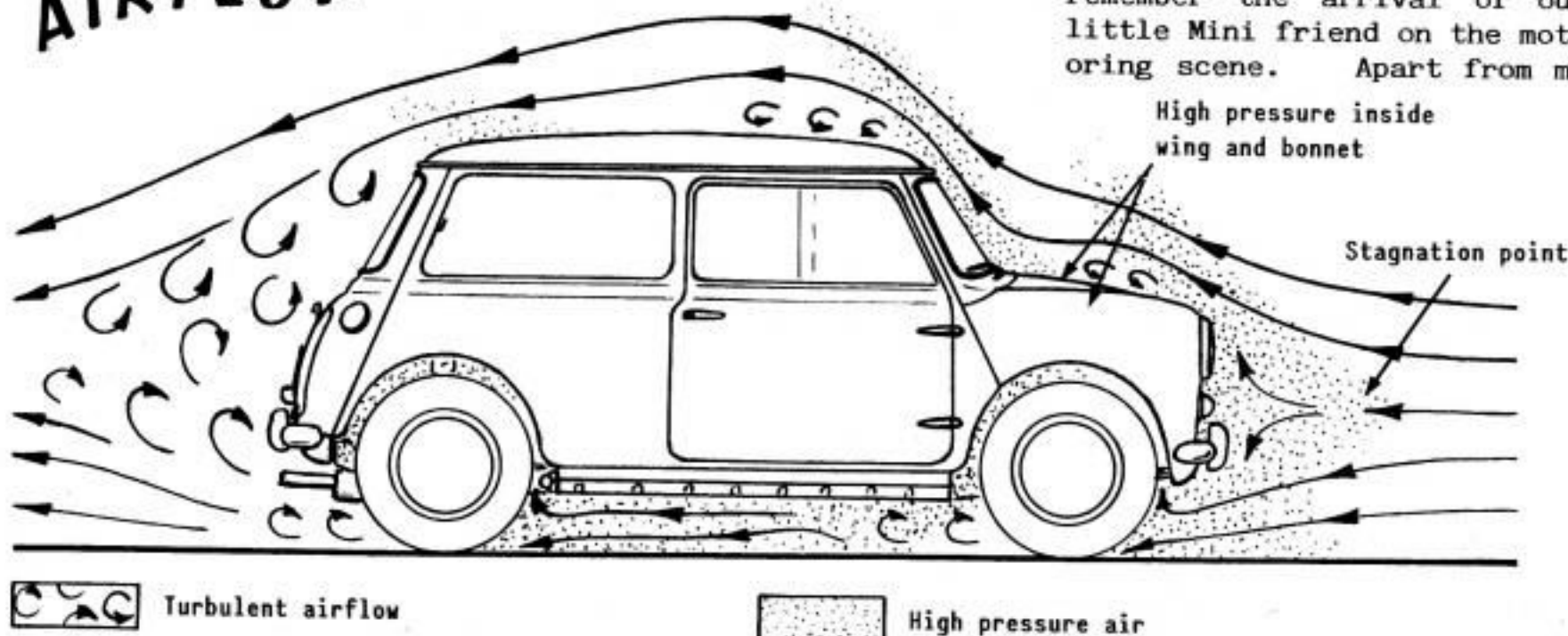


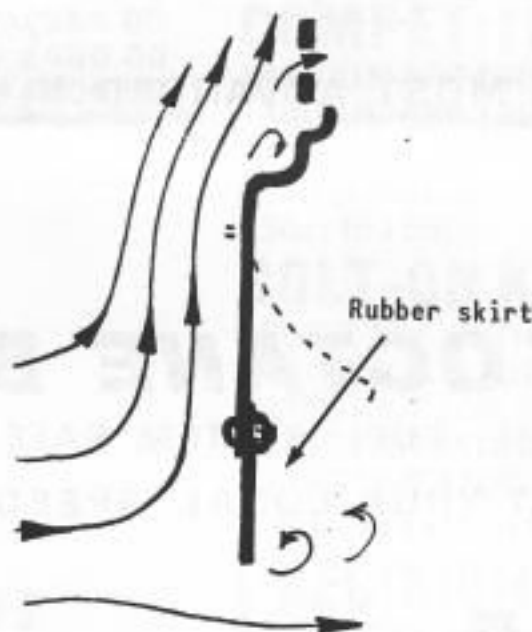
Fig. 1 Airflow pattern - standard Mk. 1/11 Mini

own (abiding) reaction that the wheels were too small, I recall the motoring press referring to it as the "Mini-brick". Now, much as I would like to believe they meant its strength and reliability, I have a more-than-sneaking suspicion they meant its shape.

At first sight it would appear that the Mini does, indeed, have all the aerodynamic properties of a brick as an inevitable consequence of its shape. In fact, the parts of a Mini which are immediately visible aren't at all bad aerodynamically - side seams excepted! - and the only real problems lie below the surface. To improve this situation, the obvious first step is to try to keep the air away from the areas which cause trouble and, to this end, the fitting of an air dam is an essential starting point as it has the effect of sweeping air over the back of the car and to the sides instead of allowing it to get caught up in the subframes. Use a vertical air dam, preferably with a rubber skirt, rather than a "scoop" shaped one - see fig. 2 - as this minimizes the velocity change of the air, and thus the amount of power needed to push it along.

Such air as gets past the airdam will contribute to are-

Standard Mini front with bumper and number plate



Good air dam profile



Poor air dam profile (power-consuming flow reversal and turbulence)

Fig. 2 Sections through air dam to show flow patterns

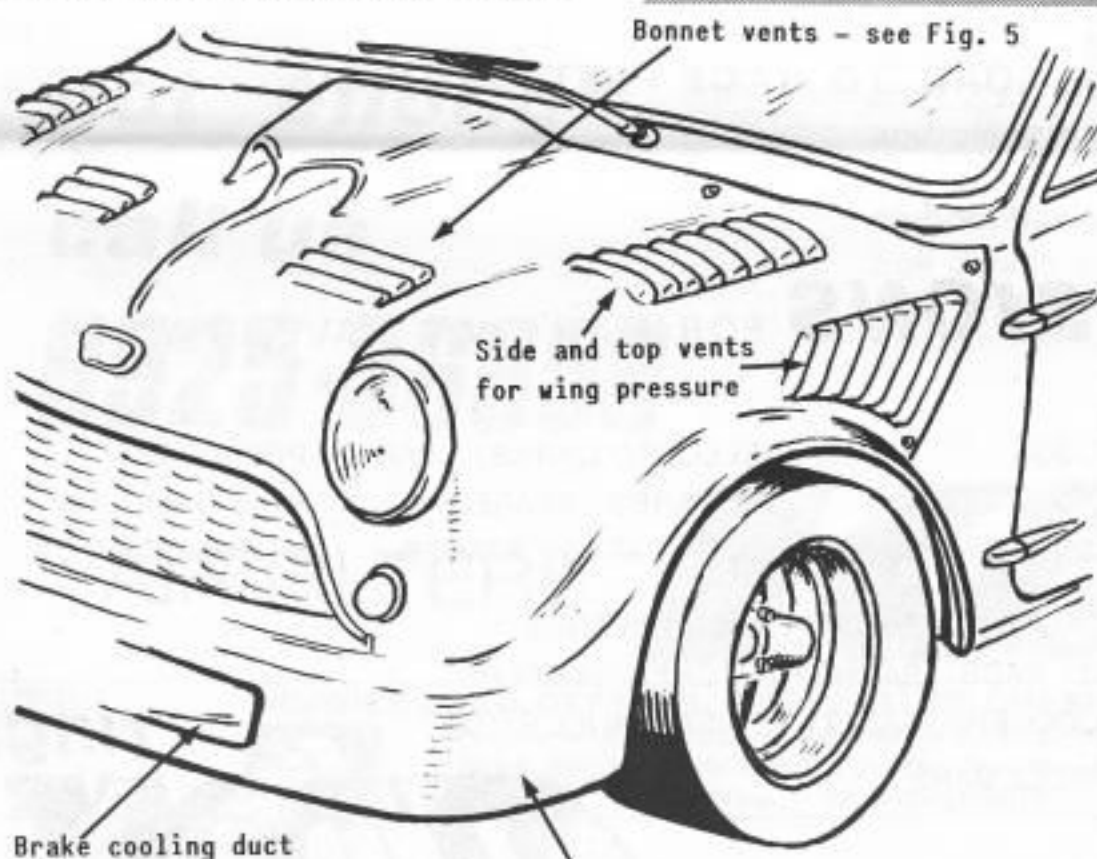


Fig. 3

Air dam - see Fig. 2

as of high pressure in the top rear corners of the front wings, causing lift. This is effectively reduced by the addition of louvres, slots or plain, ordinary holes in the tops and sides of the wings - the side vent is particularly necessary on the left side, due to the extra volume of air flowing through this wing from the radiator. Air entering the engine bay via the front grille produces an area of high pressure below the bonnet at the same time as air flowing over the bonnet produces an area of low pressure and turbulence above the bonnet. Vents cut in the bonnet, just ahead of the engine, will help to disperse the lift-producing pressure differential and

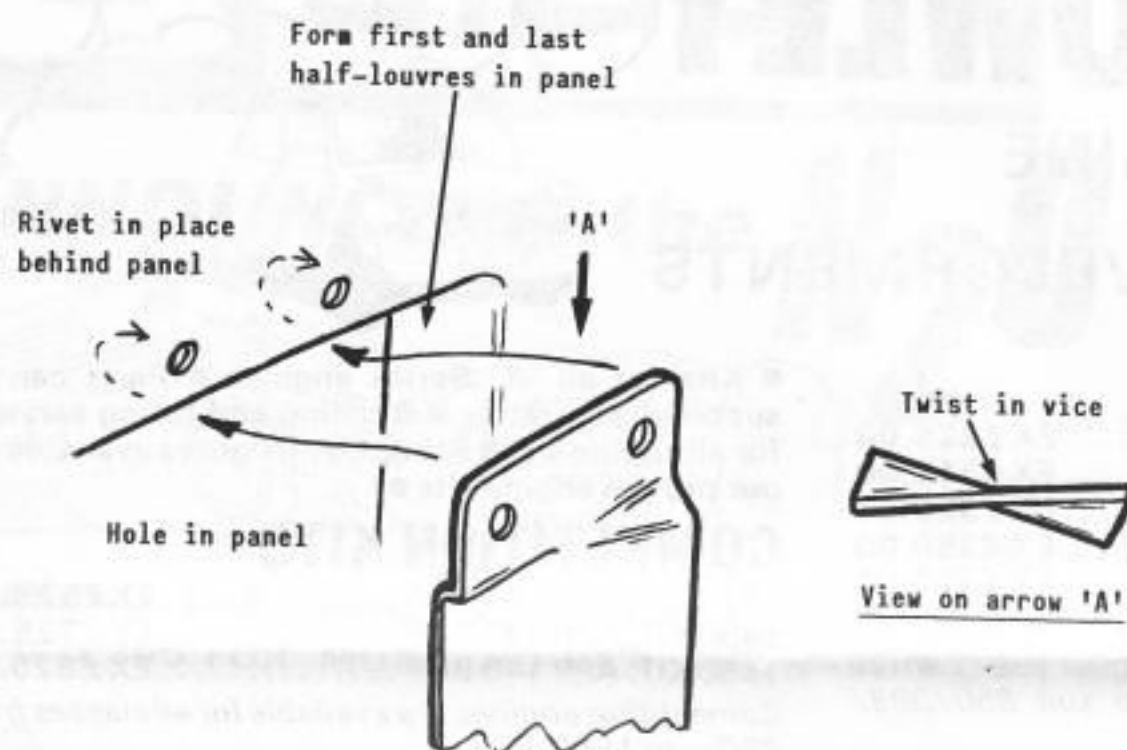


Fig. 4 Method for fabrication of louvers

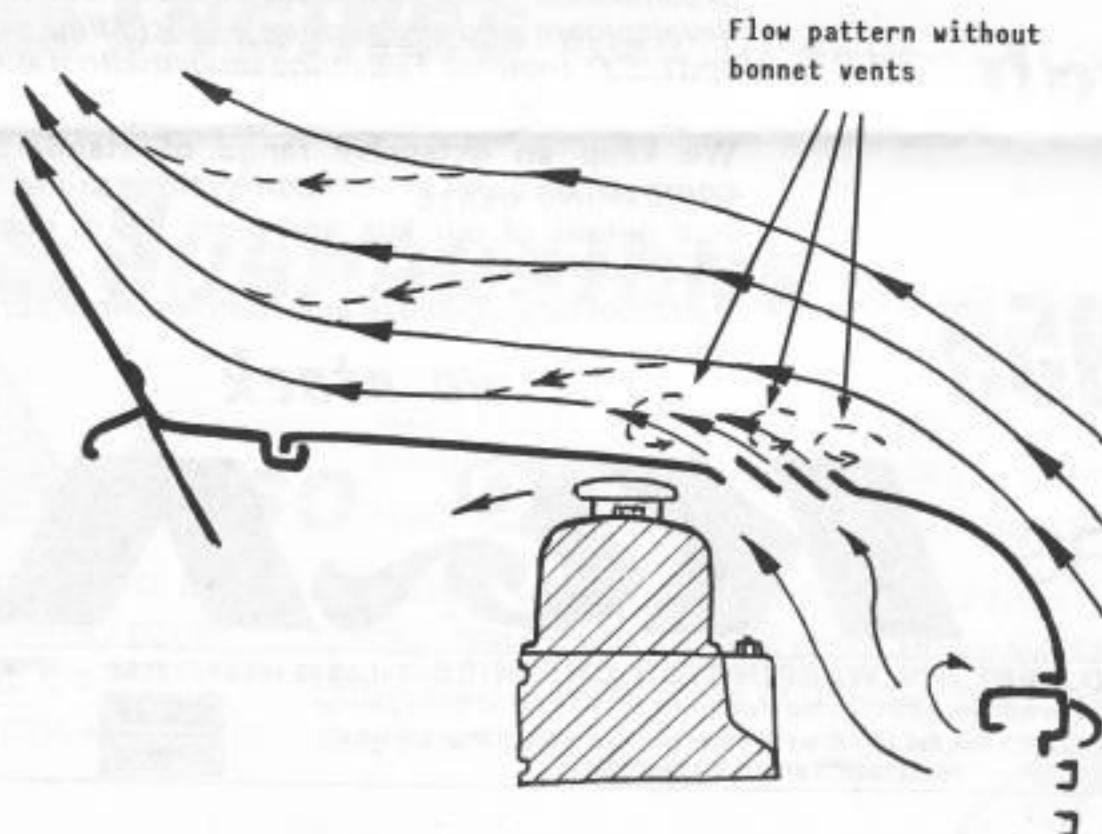


Fig. 5 Bonnet vents to fill low pressure flow separation area above bonnet

THE BL

ENGINE

1300 GT Engine £190 Exchange	£250.00
1275 GT Engine £190 Exchange	£250.00
998 Cooper Engine	£250.00
1400 Part Engine (Exchange)	£285.00
1275 'S' Crank	£140.00
1275 Non 'S' Crank	£70.00
1275 GT Race Crank	£140.00
86mm Crank Steel 91mm also	£375.00
83 84mm Crank EN16	£150.00
998 Tufftrided Crank	£87.50
998 Crank	£85.00
850 Tufftrided Crank	£75.00
850 Crank	£65.00
Primary Gears	£18.00
'S' Forged Pistons 20 40 60	£94.00
'S' Pistons up to 60	£48.50
'S' Flat top pistons up to 60	£90.00
998 Cooper pistons raised crown	£36.00
73.5 Omega Pistons	£95.00
Std Pistons Ring Set	£19.00
Forged Piston Ring Set	£28.35
'S' Con Rod Set	£88.00
VP Comp Bearings	£8.50
Thin Crank Thrusts	£6.00
Centre Main Strap	£5.00
'S' Main Bearing Nut Set	£4.00
'S' Big End Bolt Set	£3.40
'S' Big End Nut Set	£4.80
1300 Big End Bolt Set	£8.96
1300 Big End Nut Set	£1.12
ST Locking Plate Crank Pulley	70p
Star Drive Oil Pump	£7.95
Pin Drive Oil Pump	£7.50
'S' Pin Drive Oil Pump	£10.50
Oil Pump Spacer	£5.00
Felt Oil Filter	£2.99
Spin on Filter Head	£4.50
Oil Pressure Ball & Spring	50p
22lb Oil Pressure Warning Switch	£3.16
Oil Pressure T Piece	£1.05
Std Cam Followers	£8.00
Lightened Cam Followers	£14.00
'S' & 1300 Push Rods Set	£6.60
998 Push Rod Set	£5.92
Simplex Kit	£12.00
Std Duplex Set	£13.90
Steel Duplex Kit	£22.00
Lightened Duplex Kit	£29.50
Duplex Chain	£3.50
Ultimate Eng Slab Kit	£17.00
Genuine Engine Mounting	£2.00
Engine Block Gasket Set	£3.25

CYLINDER HEAD

Longman GT14 Exchange	£138.50
Longman GT15 Exchange	£176.00
Longman GT17 Inclined Head	£219.00
1300 Recon/Exchange Head	£35.00
940 Casting Bare	£59.50
Hidural Valve Guide Set	£19.00
Steel Valve Guide Set	£6.50
Valves up to 29mm	£3.00
Valves over 29mm	£3.25
Competition Valves under 35mm	£4.75
Competition Valve Cover over 35mm	£9.85
'S' Valve Seal Set	£3.50
Std Valve Spring Set	£14.00
180lb Valve Spring Set	£17.00
200lb Valve Spring Set	£23.00
Spacer Set for Rockers	£3.69
Rocker Shaft	£5.00
Rocker Bush Std Kit	£3.20
Rocker Hi Lift Bush Kit	£11.50
High Lift Rocker Post Set	£16.00
Std 'S' Forged Rockers	£4.90
Special Head Washer Set	£1.31
Special Manifold Gasket	£2.20
'S' & 1300 Cooper Head Gasket	£3.00
C AHT 168 Head Gasket	£7.04
C AEA 647 Head Gasket	£11.00
Decoke Sets	£3.30
Polished T-Stat Housing	£2.00

CAMSHAFTS

Camshaft Bearing Set	£5.00
Reprofiled Cams (Exchange)	£17.00
ST 649 Race Cam	£44.00
ST 595 Race Super Sprint Cam	£44.00
229/510 (Pin Drive) Cam New	£35.00
AEG 542 Cam 'S' Spider Drive	£38.00

ALLOY ROCKER COVER



£12.00

Chrome 'T' Bars to hold R/Cover on £2.50 (set)

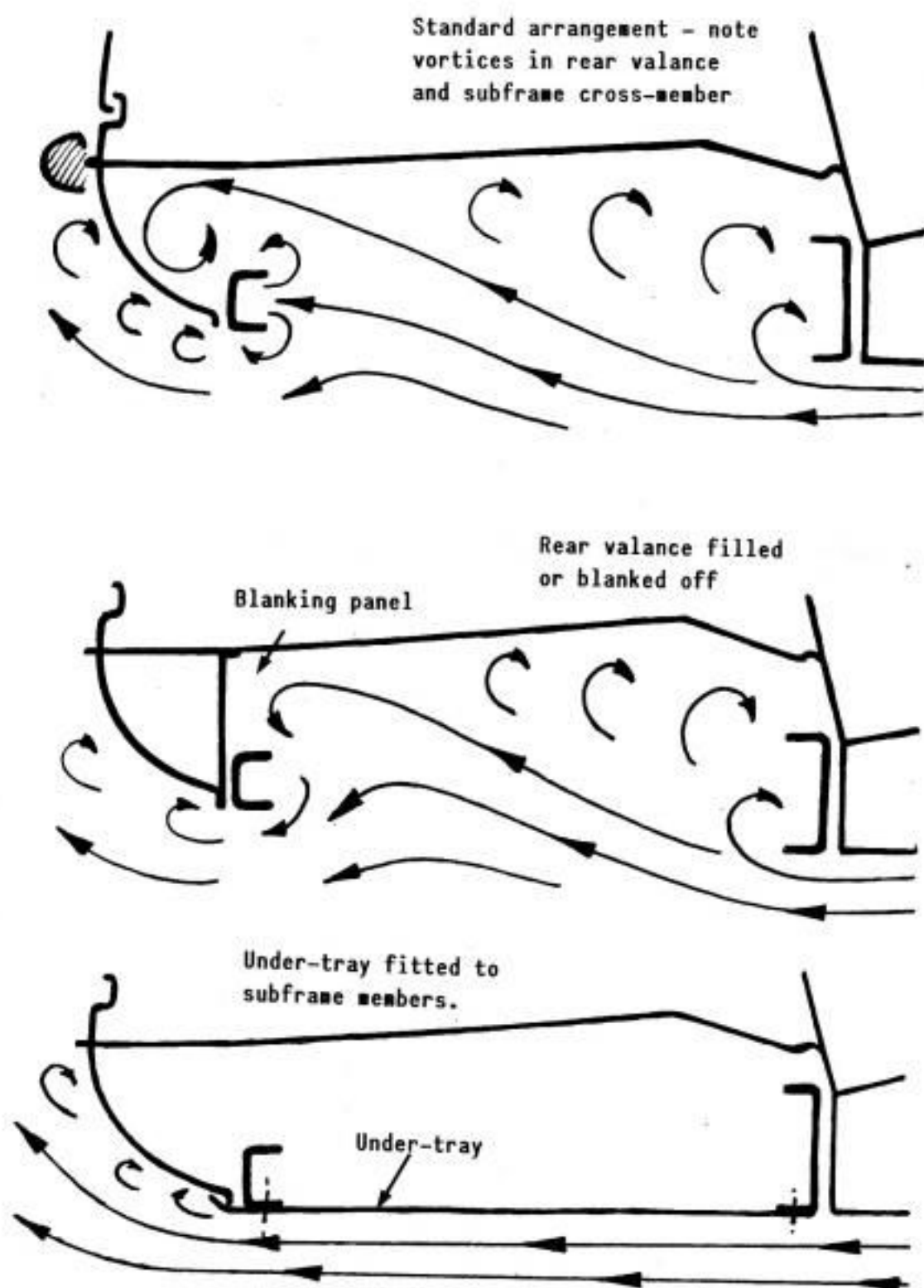
BOOKS

'MINI' by Rob Golding	£7.95
How to Modify your Mini by D Vizard	£3.95
BMC Workshop Manual	£8.75
Haynes Workshop Manual	£5.00
Cooper & Cooper 'S' Workshop Manual	£4.50
Mini Body Parts	95p
The Amazing Mini by Peter Filby	£8.95
Mini Cooper 1961-71 by Brooklands	£4.50

CARPET SETS

Genuine BMC Carpets in Twist Pile, Black Or Dark Brown Only, Complete Set	£23.00
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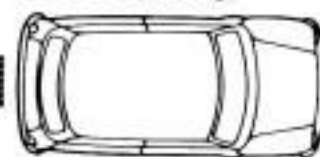
Fig. 6 Sections through rear subframe area showing flow patterns



smooth the air flow over the bonnet.

The worst area for pure drag on the car must be the space under the rear body where the back subframe is fitted. Quite apart from the turbulence caused by the recess itself and the channel sections of the subframe, the open fronted rear valance bears more than a passing resemblance to an air brake - see Fig. 6. It is tempting to ease this situation by cutting a row of holes in the valance, just below the floor of the boot - don't. Air flowing through sharp-edged holes produces enormous drag and is a principle which has actually been used on aircraft dive brakes! The simplest solution is to fit a wall across the open front of the valance and, if possible, round off the corners that the air will flow over as it leaves the subframe recess. By far the best solution, of course, is to stop the air from entering this space in the first place; this can be fairly readily achieved by fitting a sheet of aluminium over the underside of the subframe. Use of a central silencer system makes life easier on this job, and don't forget to use screws, not "blind" rivets, to fit the under-tray or you'll find your fuel pump will "pick up" as soon as you start up - no reason, just Murphy's Law!

Peter Davney



Tappet Time

For many years, I have adjusted tappets on 'A' series engines to about 10 - 12 thou without using a feeler gauge. I started out when I could not get a third hand. "How is it done?" you may ask. The pitch of the thread on an adjuster is 0.037" so a quarter of a turn on the screw will change the gap by 0.009". Tightening down the nut tends to pull the screw back by 0.001", or maybe 0.002" if you give an extra squeeze. I use the "method of nines", and

loosen off the nuts about two turns. I then turn in the screw while attempting to rotate the pushrod with my fingers. The point at which it refuses to rotate is zero-gap. I now turn the screw out exactly one-quarter of a turn, and tighten down the nut while holding the screw with the screwdriver.

The exhaust gets a slightly greater squeeze. I can now say that the inlets are 10,000 and the exhausts are eleven-and-a-half, give or

take half a thou.

The competition settings I gauge by observing the flats on the nut as I loosen them out. Two flats and tighten for 14 thousandths. This method has proved simple and effective, and though it's wise to check, you will find that your feeler gauge is going to end up largely redundant.

Shaun Wall