

GENERAL TECHNICAL INFORMATION

SHORROCK SUPERCHARGING

Shorrock supercharger installations are designed for fitting to a wide range of popular cars for normal road use. with, in most cases no modifications to the internals of the engine other than fitting a 'colder' set of spark plugs and the re-setting of the ignition. However, to get the best from your supercharged engine, it is very important to apply the following general rules.

FUEL

On all occasions when full performance is likely to be used 100 Octane rating fuel must be used. However, for round town or for trips where a very small amount of boost is used the engine will usually run on the normal grade of fuel recommended by the manufacturer for that particular engine, in supercharged form.

SPARK PLUGS

All engines fitted with a supercharger installation must be fitted with a colder grade of plug than normally fitted to the unsupercharged engine. A Champion type N.3 or the equivalent heat range of plug should be used for best performance, with standard gap setting.

For competition work we recommend the use of racing plugs in most cases.

For further details please refer to our spark plug and carburettor settings data sheet.

COMPRESSION RATIO

For all normal road work where a maximum boost of not more 7.5 p.s.i. is employed it is not usually necessary to reduce the compression ration. However, generally we do not recommend more than 9.0 : 1. An ideal ratio for the average engine with a maximum boost of 7.0 p.s.i. would be approximately 8.0 : 1.

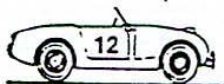
For those wishing to further improve the performance and efficiency of their supercharged engine, modifications to the cylinder head will be one of the first essentials.

IGNITION SETTING

For most road installations, a static ignition setting of 7°-10° advance will prove most satisfactory, but as engines vary final adjustments should be made after road testing.

For certain engines we supply a limiting bush with the supercharger installation to fit over the bob-weight stop peg to limit maximum advance.

Where a bush is not supplied it is generally necessary to limit maximum distributor advance, this is equally important on road or competition engines. The vacuum advance pipe is normally disconnected.



BMC 'A' SERIES ENGINE

IGNITION SETTING AND MODIFICATION TO DISTRIBUTOR

1. Remove the distributor from the engine.
2. Remove the bakelite cap, rotor arm and top plate to expose bob weights.
3. Mark the weights so that they can be returned to their respective positions after removal.
4. Examination of the weights will show that they are limited in their outward throw by a peg which is cast into the weight itself. This peg fits into a slotted hole, located beneath it when in position. Thus the maximum movement of the weight is controlled by the pegs movement with this slot.
5. The peg on the weight which carries the heavy spring must be bushed to further limit the movement. A $\frac{1}{8}$ " dia. bush should be used, the centre hole of which must be a good fit on the peg. With the bush in position, lightly pean the head of the peg to hold the bush securely. On later distributors where the limit for the bob weights is in the form of a separate steel peg riveted to the bottom plate of the distributor a 5/16" bush should be used. This peg also anchors the spring.
6. Return the modified weight to its position in the distributor. Check that both weights and springs are fitted correctly.
7. Re-assemble distributor, check contact points and gap and return to engine.
8. Re-check the ignition setting and give 7°-10° static advance.

CAMSHAFT

Modified camshafts can be fitted to supercharged engines to improve performance, but generally speaking a full race camshaft with a lot of valve overlap should not be used as this will result in a loss of boost pressure and power, as well as a big increase in fuel consumption. This is due to too much of the unburnt or partially burnt gas going straight through the cylinder and out through the exhaust pipe.

On engines specially designed with the supercharger in mind large lift and very long overlap cams can be accommodated, and prove very helpful in transmitting heat from the combustion chamber particularly if used in conjunction with a free flow exhaust system.

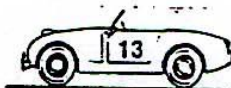
Most Stage 2 of half race camshafts are suitable for improving the performance of the supercharged engine.

EXHAUST

All supercharged engines will benefit to a large extent from the fitting of bigger bore free flow exhaust manifolds and systems, allowing the engine which is handling a far greater quantity of gas when supercharges to get rid of this additional gas flow. By reducing or eliminating the exhaust back pressure the engine will run cooler, and therefore produce more power.

CYLINDER HEADS

As previously mentioned, many engines will benefit from a reduction in compression ration, which can be achieved by modifying the combustion chamber and or changing the pistons for a low compression set, depending on the design of the engine.



Generally more emphasis should be put on improving the flow through the exhaust ports than would be with a normally aspirated engine. However, it is wrong to ignore the induction side now that this is under pressure.

S.U. CARBURETTOR

Setting of single H type carburetors

As the needle size is determined during engine development, tuning of the carburettor is confined to correct idling setting.

The engine should be run until it has attained its normal temperature, then close the throttle completely by unscrewing the throttle adjusting screw until the face of the screw just clears its stop. Open it by screwing down the screw $1\frac{1}{2}$ turns.

Remove the piston and suction chamber, disconnect the mixture control wire and screw the jet adjusting nut until the jet is flush with the bridge of the carburettor, or 'full up' if this position cannot be obtained. Replace the piston and suction chamber assembly, and check that the piston falls freely on to the bridge of the carburettor (by means of the piston lifting pin). Turn down the jet adjusting nut two complete turns (12 flats).

Re-start the engine and adjust the throttle adjusting screw to give the desired idling speed generally 750-850 RPM.

Turn the jet adjusting nut until the fastest idling speed is obtained, consistent with even firing. During this adjustment it is necessary to ensure that the jet is pressed upwards and is in contact with its adjusting nut.

As the mixture is adjusted the engine will probably run faster, it may therefore be necessary to unscrew the throttle adjusting screw a little, in order to reduce the speed.

Now check the mixture by lifting the carburettor piston (by means of a lift pin situated on the side of the carburettor body) by approximately $1/32$ " (.75mm) when if:-

- (a) the engine speed increases and continues to run faster, this indicates that the mixture is too rich.
- (b) the engine speed immediately decreases, this indicates that the mixture is too weak.
- (c) the engine speed momentarily increases very slightly, this indicates that the mixture is correct.

When the mixture is correct the exhaust note should be regular and even. If it is irregular with a splashy type of misfire and colourless exhaust, the mixture is too weak. If there is a regular or rythmical type of misfire, together with a blackish exhaust, then the mixture is too rich. N.B. It is always best to err on this rich side rather than set the carburettor weak.

Re-connect the choke control wire with approximately $1/16$ " free movement before it starts to pull on the jet lever.



Carburettor Maintenance

Every 1,000 miles unscrew the hydraulic piston damper on the top of the section chamber replenish damper reservoir as necessary with SAE 20-50 engine oil and replace damper.

ALLARD MOTOR COMPANY LIMITED

SHORROCK SUPERCHARGER SERVICING INSTRUCTIONS

INTRODUCTION

1. The Shorrock supercharger is a precision mechanism, which is fully tested before despatch. Like any other machine, however, it requires running-in, and should be driven gently for the first 250 miles. During this period the maximum speed in top and third gears should not exceed 45 m.p.h. and 30 m.p.h. respectively. Properly treated, it will give many thousands of trouble-free miles.

Dismantling or major overhauls should only be undertaken by your dealer or his distributor.

SYSTEM OF LUBRICATION

2. The system of lubrication for the Shorrock Supercharger has been designed to give trouble free service. It is very simple in operation but it is thought that some explanation would perhaps be of help and guidance to the owner of a Shorrock supercharged vehicle.

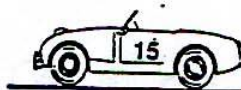
Oil is fed, under normal engine oil pressure by means of flexible pipes from the pressure gauge or oil warning light, tapping in the crankcase of the engine to the lubricator, which is positioned in the centre of the rear end plate of the supercharger.

There are two types of lubricator, both of which are similar in detail the only difference being, that whereas one is integral with the supercharge, the other is a separate small casting and is bolted to it.

The lubricator consists of reamed 5/16" bore .3125. Into this bore is fitted a finely machined restrictor or metering pin. The size of this pin is dependant upon the engine oil pressure and the viscosity of the oil used, but a range of pins is made to cover nearly all eventualities. The largest of these pins which are lettered alphabetically is the 'A' .311. These decrease in size a $\frac{1}{2}$ thou. .0005 at a time, thus a 'B' pin will be .3105 and a 'C' pin .3100 and so on.

When a supercharger installation is despatched from our works it is fitted with a metering pin which is the correct size for the engine to which it is to be installed. To take care of any difference which might occur between one engine of the same make and another, a second pin is supplied one size above the one which is fitted. This is usually bolted to the casing of the supercharger in a plastic capsule.

It will no doubt be realised that if for some reason the engine oil is changed for one of higher or lower viscosity some adjustment may have to be made by changing the metering pin to compensate for this, and again



if a very thin additive is used, thus bringing down the oil viscosity the same will apply. It has been found that the correct rate of oiling for the supercharger is approximately one pint per 850 miles. As this is completely lost to the engine, topping of the sump should be slightly more frequent.

It should be pointed out that although the oil used by the supercharger is lost to the engine, it has some compensation in the fact that it supplies the engine with upper cylinder lubricant nearly all the time. More especially when the engine is started from cold, the presence of oil in the fuel will be visible from the exhaust smoke.

The method of removing and replacing metering pins is described in the installation and maintenance supplied with each supercharger installation.

It is essential that the engine oil be kept clean, and free from sludge. Dirty, unsuitable or graphited oil will clog the lubricating passages and eventually lead to serious damage.

This supercharger is despatched with a 'B' pin in its lubricator. This should be satisfactory for initial running, and quite likely permanent. As a guide, there should be a slight amount of smoke from the exhaust on starting up from cold, which should clear after a few minutes running. Should however, signs of pronounced over-oiling arise (for instance, clouds of exhaust smoke) then the lubricator pin should be replaced by the larger 'A' pin supplied with the supercharger. After fitting the new pin, check that the supercharger is getting a supply of oil.

Every 5,000 miles the lubricator pin should be removed from the supercharger, and the pin wiped with a soft rag: on no account should abrasives be used.

To remove and replace the lubricator pin, proceed as follows:-

- (a) Models with external lubricator (of brass) - unscrew the plug at the end of the lubricator furthest from the shaft - when the plug, spring, and pin will come out together.

To re-assemble:-

Assemble pin, spring, and plug together, insert and screw down plug firmly.

- (b) Models with the lubricator inside the drive shaft - unscrew the pipe union at the end of the supercharger, when the spring will push out the pin.

To re-assemble:-

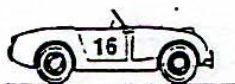
Insert spring first, then pin, then screw down pipe union firmly.

CHECKS AND MAINTENANCE

First 250 miles

Do not exceed 3,500 r.p.m. in gears.

Between 250 - 500 miles fit the 'A' oil metering pin at rear of supercharger (as per servicing instructions). If the supercharger unit is fitted to a new engine particular care must be taken to see that not more than a third throttle is used and that 3,500 r.p.m. is not exceeded for the



first 500 miles.

First 500 - 1000 miles

1. Check installation, bolts, nuts generally. Do not exceed 4,500 R.P.M. if fitted to new engine.
2. Check belt tension, adjust as necessary, by slackening top, front and rear mounting plate bolts and adjusting belt tension by means of the eccentric nut on the front mounting plate, or by sliding the supercharger slightly away from the engine.
3. Top up carburettor dashpot with 20 - 50 engine oil.

Every 5,000 miles

Check as for 1000 miles.

Check carburettor flange nuts and front and rear mounting bracket bolts for tightness (do not over tighten).

Check oil metering pin at rear of supercharger.

Check tightness of float chamber bolt.

Check dynamo bolts.

Check plugs and points.

Renew belts if necessary.

Set carburettor and float level.

Check ignition setting.

Check crankshaft and blower pulleys for tightness.

Check rubber connections on induction manifolding.

Check carburettor rubber insulation pad if fitted.

CONCLUSION

Confident of the experience and care built into the Shorrock Supercharger, we wish you many thousand miles enjoyable motoring from the much improved performance of your car.

KEEP THESE INSTRUCTIONS FOR REFERENCE. IN ANY CORRESPONDENCE QUOTE SUPERCHARGER SPECIFICATION AND SERIAL NUMBER.

ALLARD MOTOR COMPANY LIMITED
WORLD DISTRIBUTOR AND MANUFACTURER
OF SHORROCK SUPERCHARGERS.

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To be continued -

