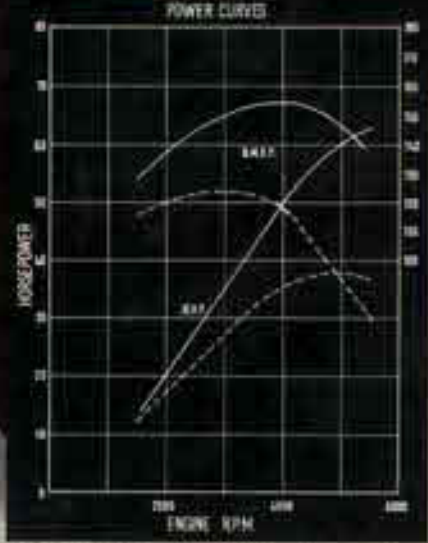




# SHORROCK SUPERCHARGERS

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# PRESSURE CHARGING INTERNAL COMBUSTION ENGINES

... some basic Principles and Advantages

It will no doubt be of interest to those people wishing to improve the all round performance and flexibility of their cars, whether large or small horse power. To gain some small insight into the principles involved in "Pressure Charging" as this system is called when applied to the everyday motor car, or "Supercharging," when applied to obtain the absolute maximum output in the case of a racing car.

In an internal combustion engine the amount of power developed is in direct proportion to the weight of fuel consumed in a given time, the fuel being mixed with the correct volume of air to ensure its complete combustion in the engine. With a "normally aspirated" engine, that is one which is *not* supercharged, the power is limited to the amount of air that can be sucked into the cylinders on the induction stroke, as this determines the weight of fuel that can be burnt with it.

The piston on its downward stroke (i.e., the induction stroke) creates a partial vacuum in the induction pipe which causes air to be drawn through the carburettor to the cylinder, collecting on its way through the carburettor the correct amount of fuel.

However, if the piston were to remain stationary at the bottom of its stroke, the cylinder would only

then fill with mixture, but unfortunately as under working conditions there is only a fraction of a second for this operation to take place, the cylinder is at best only partially filled with the petrol-air mixture.

It is to overcome these inherent limitations in the normal (or atmospherically) aspirated engine that pressure charging is employed. An engine equipped with the Shorrock pressure induction system is free from the foregoing disadvantages, in fact it gives much improved power, flexibility, acceleration and "top gear" performance.

With the SHORROCK Supercharged engine operating at a maximum boost pressure of 5 lbs./sq. in., air is drawn through the carburettor into a compressor, the capacity of which is arranged that it draws a volume of air equal to the FULL SWEEP VOLUME (or capacity) of the engine PLUS ONE-THIRD.

Since the compressor is positively driven from the engine crankshaft, whatever the engine speed, the induction pipe is full of the correct air-petrol mixture UNDER PRESSURE, thus ensuring a perfectly steady flow into the cylinders which results in remarkable flexibility at all engine speeds enabling the car to be driven at walking speed in top gear.

Since the cylinders receive their full volume, plus one third from the compressor, the power output of the engine is increased proportionately, i.e., 33% at least. Pressure charging has not been more universally adopted in the past, as it is only comparatively recently that a compressor suitable for this application has been available. To meet the requirements of the modern car it is essential that the compressor should be quiet in operation and be as reliable as any other part of the engine.

Supercharging has, of course, been employed for a number of years in connection with racing cars where requirements are somewhat different from the ordinary pleasure car.

With the racing car it is generally a question of obtaining the maximum amount of power possible at "full throttle"—increased power and flexibility at lower speeds being of little comparative consequence and as such, in designing superchargers for these conditions no particular attention was given to obtain high efficiency at low engine speed.

In the past, to obtain even moderate results at the "bottom end" of the ordinary car, a supercharger had to be employed which gave too high a boost at maximum speeds causing troubles and annoyances such as burnt plugs and exhaust valves, blown cylinder head gaskets, etc.

The present Shorrock supercharger with many exclusive features in its design, is eminently suitable for pressure charging the normal car in addition to the supercharging of racing cars, having been proved in both spheres to be a unit of remarkable efficiency.

Shorrock Superchargers are the outcome of many years experience in the design of high efficiency compressors, which has resulted in the production of a range of superchargers with remarkably high adiabatic efficiency, low power absorption and which operate with a complete absence of mechanical noise.

The characteristics of these superchargers make them eminently suitable, not only for cars, but for road transport vehicles of all types propelled by either petrol or compression ignition engines and for powered water craft. In the industrial field also, Shorrock compressors have universal application.

The high volumetric efficiency throughout the speed range enables maximum torque and power to be obtained. Another feature of the "Shorrock" is the possibility of using high boost pressures without using multi-stage compression. The range of superchargers covers engine requirements from 850 to 2000 c.c. depending upon boost pressures required and operating speed. The lubrication system has received particular attention and is fully automatic.



Mini Supercharger installation



Typical Supercharger kit fitted to an internal combustion engine

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# PRINCIPLES OF THE SHORROCK SUPERCHARGER

The Shorrock Supercharger is a positive displacement eccentric-drum-type compressor employing four vanes.

The vanes are mounted radially to the compressor casing, each vane being carried by two ball journals mounted on a shaft of ample dimensions concentric with the outer casing.

The vanes are impelled by the internal rotor which is mounted eccentrically to the outer casing and through which the vanes pass.

The angular motion of the vanes relative to the rotor is accommodated by specially designed trunnions.

This construction makes practical the very fine clearances necessary for high efficiencies, since the vanes being mounted radially to the casing and anchored by the vane shaft cannot come into direct contact with the casing and can be run at very high speeds.

The four vanes passing through the rotor and having such very fine clearances between their extremities and the casing end plates, virtually sub-divide the crescent shaped chamber into four separate chambers. The inlet port of the supercharger is so positioned that as one of the chambers receives its full volume of air, the adjacent chamber (on the inlet side of the unit) is increasing in volume and creating a vacuum at the inlet port. Immediately the vanes have reached the position where the chamber between them contains the maximum volume, the volume between the vanes diminishes as the space between the rotor and the casing becomes less, thus compressing the charge within the supercharger itself before releasing it through the outlet port into the engine manifold. Lubrication is fully automatic and only a very small quantity of lubricant is required for the supercharger

to function with complete reliability. The supercharger is preferably mounted on the inlet manifold side of the engine and driven by twin vee-belts from the front end of the crankshaft, the installation design being such that it can confidently be carried out by any competent garage mechanic or owner-driver.

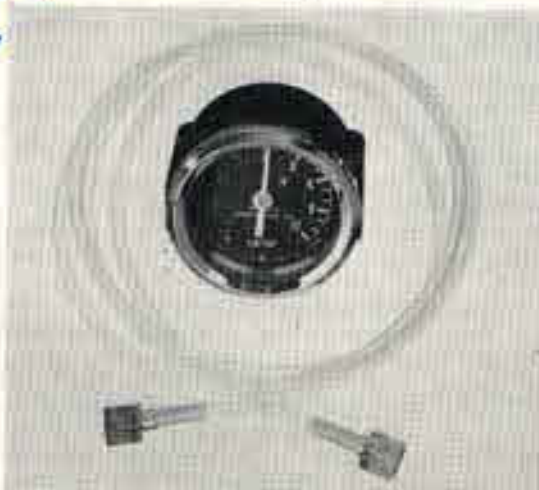
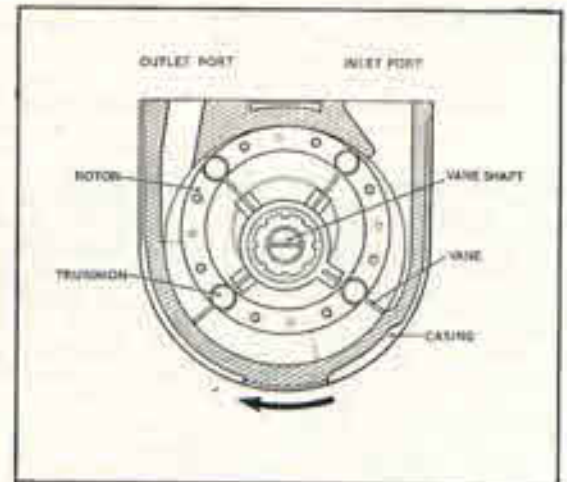
In order to meet special requirements for a Pressure Gauge to be used with our supercharger installations, we have available the gauge as illustrated. It incorporates both positive boost pressure readings and also negative pressures or vacuum readings. This gauge incorporates a damping device which ensures steady non-fluctuating readings to be obtained under all conditions.

The standard calibrations read 0-12 lbs. per square inch on both pressure scales. The diameter of the gauge is 2in. which matches existing instruments and is supplied with clamp fittings and connecting unions.



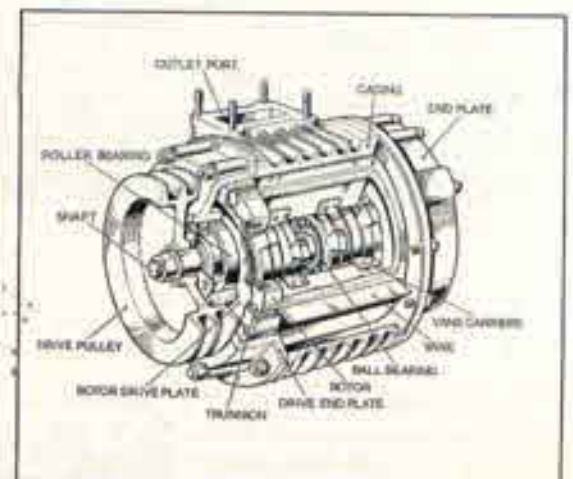
The Shorrock Supercharger Unit

Cutaway drawing supercharger unit end view (Right)



Boost pressure gauge

Cutaway drawing supercharger unit (Right)



# SOME GOOD REASONS WHY YOU SHOULD FIT A SHORROCK PRESSURE CHARGER

Only Shorrock gives you that BIG car performance

- Up to 50% more power
- More hills in top
- Improved engine flexibility
- Vastly improved acceleration
- Higher speeds
- Faster cruising
- Less gear changing
- Little additional noise

These features of Shorrock Supercharging are all important factors in these days of crowded roads.

## FIT SHORROCK FOR PERFORMANCE

### Questions and Answers to often asked questions

<b>What actually is supercharging?</b>	The function of a supercharger is to allow a larger quantity, by weight of petrol-air mixture to be fed to the engine than could be induced in the normal way. In other words, the engine receives its input of air at a pressure higher than atmospheric pressure, which is virtually equivalent to increasing the	swept volume of the engine. Thus, an engine of 1500 c.c. capacity supercharged at a pressure of 5 lbs./sq. in. has the same effective capacity as an engine of 2000 c.c. swept volume, since it is receiving its charge at atmospheric pressure (14.74 lbs./sq. in.), plus 5 lbs./sq. in. or at approximately one-third	greater pressure. To obtain the fullest benefit, it is necessary to employ a supercharger which itself will operate efficiently over a wide spread range with the minimum absorption of power. It is to this end that the SHORROCK supercharger was designed.
<b>Why are they not offered as optional equipment by the motor manufacturer?</b>	All cars are produced with engines of specified basic ratings and a supercharger is considered to be an extra appliance for boosting the	engine by pressure induction. In our opinion, the many advantages now proved by supercharging should lead to even greater popularity in the	future, which may induce motor manufacturers themselves to offer the appliance as an "optional".
<b>In what way does it improve performance?</b>	The Shorrock installation provides substantially more power (up to 50%). It gives improved engine flexibility which means less gear	changing in all times. Many more hills can be taken "in top" and all at higher speeds if necessary. Snappy "off-the-mark" accelera-	tion is obtained and the increased power considerably raises the average cruising speed.
<b>What about fuel consumption, and do I need special grades?</b>	If a supercharged car is driven normally, that is without taking advantage of the extra power for increased speed and top gear performance, then fuel consumption is not affected. By using the super-	charger to its full effect, however, increase in fuel consumption is only to be expected. This varies from 10%-15%. Measuring performance and economy, however, against bigger cars of higher basic	rating, this small increase is comparatively negligible. 100 Octane fuels should be used for maximum performance.
<b>Will fitting a supercharger impair the basic engine?</b>	On the contrary, with low pressure charging as used by Shorrock, apart from increasing thermal efficiency, all cylinders operate with a mixture of equal strength. This even distribution gives a longer life to the	engine and prevents local mixture starvation to any one cylinder, often a cause of inadequate lubrication on starting is also a common cause of bore wear. The Shorrock supercharger supplies all cylinders with	a surplus of oil collected in the casing upon starting which provides upper cylinder lubrication when it is most needed.
<b>I thought superchargers were noisy?</b>	The noise often associated with superchargers can be caused by pressure differences at the discharge	port. The Shorrock vane type compressor has the advantage of reducing noise, the charge being	compressed internally and there is no back flow of air when the port is uncovered.
<b>Will the supercharger fit any car, and are any modifications necessary?</b>	The Shorrock "blower" can be fitted to most cars where the engine layout provides the necessary room. We publish a list of current cars suitable for the Shorrock installation. For older cars, we will gladly advise as to suitability. The complete installation can be fitted in approximately a day. A new	carburettor, however, is necessary which, together with manifold pipes, fitting brackets, pulleys and belts, is supplied inclusive with the Supercharger. Installation may be effected quite easily by any competent garage or owner-driver. We recommend that standard "touring" plugs be replaced by the "sports" type,	apart from this normally no other engine modifications are necessary for normal road use. Finally, should you change your car, the Supercharger can be transferred providing the engines are of reasonably similar capacities.
<b>I believe they are good for high altitudes?</b>	Indeed yes. Supercharging is the only means of compensating for the loss of power inevitable with	lowered air density. Quite a feature, particularly for Continental touring	and, of course, for the export market generally.
<b>What servicing does the supercharger require and what is its expected life?</b>	The supercharger is fed with a small supply of oil for lubrication of the bearings. It is essential that the engine oil is kept clean and the	lubricator cleaned every 5,000 miles. Apart from this no servicing is required. Providing the oil is kept clean and	the supercharger unit is not overrevved, the unit will last the life of the average engine.
<b>Surely there must be a disadvantage in fitting a supercharger?</b>	Well, the only disadvantage if you can call it that, is that by increasing the filling of the cylinder under	pressure, there will inevitably be more heat to dissipate. However,	providing the engine is in good condition no harm will result.
<b>Is a supercharger worth the outlay?</b>	If you mean the SHORROCK, yes. It's a precision engineered job backed by twenty years of research in the Supercharger field and proved	under the most exacting trials. Bearing in mind that the average supercharger installation gives up to 30% increase in both maximum	power and torque with a substantial increase from as low as 2000 R.P.M., then it is excellent value for money in terms of B.H.P. for £ spent.

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# SHORROCK SUPERCHARGER INSTALLATIONS

## FORD

(Range of complete installations available)

Make of car	Supercharger	Carburettor	Maximum Boost
Anglia 997 c.c.	C75B	1 - 1½" SU	7.0 p.s.i.
Anglia, Cortina 1200	C75B	1 - 1½" SU	8.0 p.s.i.
Cortina 1300	C75B	1 - 1½" SU	7.0 p.s.i.
Escort 1100, 1300, 1300GT	C75B	1 - 1½" or 1¾" SU	7.0 p.s.i.
Capri 1300, 1300GT	C75B	1 - 1½" SU	7.0 p.s.i.
Cortina 1500, 1500GT	C142B	1 - 2" SU	7.5 p.s.i.
Cortina 1600, 1600GT, 1600E	C142B	1 - 2" SU	7.0 p.s.i.
Capri 1600, 1600GT	C142B	1 - 2" SU	7.0 p.s.i.
Cortina-Lotus	C142B	2 - 1½" SU	7.0 p.s.i.
Escort Twin-Cam	C142B	2 - 1½" SU	7.0 p.s.i.



Cortina 1500 and 1500GT  
C142B supercharger installation



Escort 1300GT installation for  
left hand drive models



Escort 1300GT engine power graph



Escort 1300GT (right hand drive)

(Extract from road test report) from Cars and Car Conversions Magazine dated June, 1968.

### Escort 1300GT

... "Unlike every other small motor machine that we have tried, this one has FLEXIBILITY, oodles of it in fact. We just could not get over the fact that for £70 you've got what feels like 2.5 litres under the hatch, and 2.5 litres in an Escort means low down go. On

crowded British roads it is quicker to overtake in fourth slot than it is in most other cars second or third. Of course if you want to grind people into the ground, then thrust into third and grind 'em".

# SHORROCK SUPERCHARGER INSTALLATIONS

## FORD

Cortina/Capri 1600 and 1600GT Supercharger Installation



### Basic Specification:

Shorrock C142B supercharger  
 Drive by Twin "V" belts  
 Drive ratio 0.8:1  
 Maximum boost 7.5 lbs/sq in.  
 Carburettor single 2" SU  
 Maximum B.H.P. 105 at 6,000 R.P.M.  
 Up to 135 B.H.P. with further modifications

Cortina 1600GT installation

Comparative performance figures (Ford Range)

ACCELERATION THROUGH GEARS	ESCORT 1300GT	ESCORT 1300	ANGLIA 997	CORTINA 1200	CORTINA 1600GT
0-30	3.0 (3.8)	4.0 (5.8)	4.1 (6.2)	4.4 (5.6)	4.0 (4.1)
0-40	4.8 (5.7)	5.9 (8.7)	6.5 (10.0)	6.1 (9.5)	5.6 (6.1)
0-50	6.8 (8.7)	9.0 (13.2)	10.0 (16.7)	10.0 (14.3)	7.7 (9.1)
0-60	9.2 (13.1)	13.3 (19.4)	14.5 (25.0)	14.6 (22.5)	10.2 (13.1)
0-70	12.2 (17.1)	17.2 (30.4)	22.2 (40.0)	21.7 (37.7)	13.9 (17.8)
0-80	17.2	—	—	—	18.0 (26.6)
MAX. SPEED	95 (93)	94 (85)	91 (74)	90 (76)	110 (100)
STANDING START 1/4 MILE	17.2	(22.0)	20.6	19.6 (22.4)	—
ACCELERATION IN TOP GEAR					
20-40	—	(10.7)	—	9.2 (12.8)	—
30-50	7.6 (10.5)	(12.3)	9.1 (16.1)	10.5 (13.1)	—
40-50	7.8 (10.8)	(14.1)	10.5	10.3 (15.4)	—
50-70	—	(19.0)	11.4	10.6 (24.5)	—
MAX. B.H.P.	96 (72)	—	63 (39)	69 (46)	109 (88)
TOURING FUEL CONSUMPTION			32 (39)		
OVERALL FUEL CONSUMPTION	23 (28) mpg	27 (30)	29 (33)	27 (32)	21 (25)

Escort, Twin Cam and Cortina Lotus Supercharger Installation

### Basic Specification:

Shorrock C142B Supercharger  
 Drive by twin Duplex belts  
 Drive ratio 0.8:1  
 Maximum boost 7.5 lbs/sq in.  
 Carburettor single—2" SU

Maximum B.H.P. 130 at 6,500 R.P.M. (standard engine)  
 Up to 155 at 7,500 R.P.M. possible with further modifications.

All stages of tune suitable for normal road use.

Escort Twin-Cam in action



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# SHORROCK SUPERCHARGER INSTALLATION

B.L.M.C.

Austin-Morris Mini 850 and 998 c.c.  
 Austin A40, Minor 1000  
 Austin-Morris 1100, M.G. 1100  
 Sprite-Midget  
 Austin-Morris Cooper 998 and 1071 c.c.  
 Morris-M.G. 1300  
 Cooper 'S' 1275 c.c.

All these installations are supplied complete with carburettor, mounting brackets, manifolding, relief valve, belts, pulleys and all fittings required for the installation.

Power increases of up to 50% are available with no additional modifications to the engine for normal road use, apart from the fitting of a harder set of plugs.

Comparative performance figures:  
 (see performance sheets)

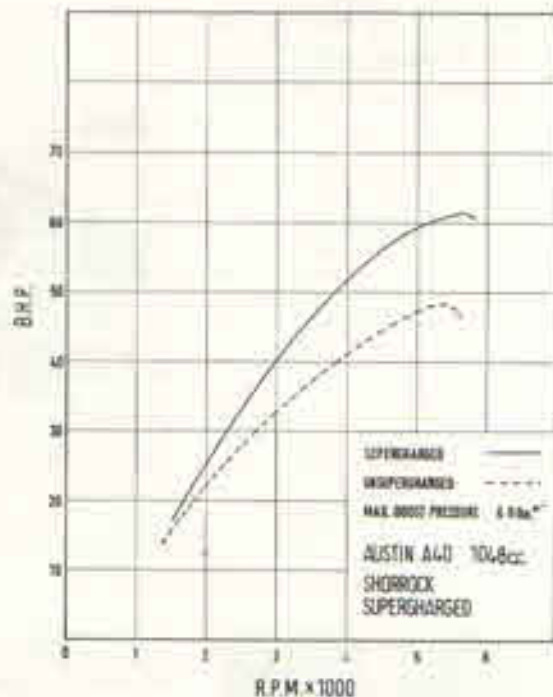
ACCELERATION THROUGH GEARS	MINI 850	MINI COOPER 997	MORRIS 1100	MORRIS 1300	SPRITE or MIDGET 1275	AUSTIN A40 1098	MINOR 1000
0-30	3.9 (6.4)	— (4.8)	4.5 (5.8)	4.8 (5.0)	—	5.4 (7.7)	5.2 (7.2)
0-40	6.8 (11.3)	— (7.7)	6.9 (8.7)	6.9 (7.7)	—	—	—
0-50	10.8 (18.1)	— (11.8)	10.4 (15.2)	10.7 (11.7)	8.2 (10.0)	11.0 (18.8)	13.2 (18.2)
0-60	15.4 (28.7)	— (17.2)	15.1 (22.7)	14.8 (17.4)	10.8 (15.9)	15.6 (27.1)	17.4 (31.4)
0-70	25.0 (—)	— (47.3)	23.8 (39.8)	21.4 (25.7)	14.8 (25.6)	25.2 (—)	26.0 (—)
0-80	— (—)	— (—)	— (—)	— (—)	— (—)	— (—)	— (—)
MAX. SPEED	85 (70)	87 (—)	88 (80.0)	92 (88)	100 (88)	90 (76.5)	85 (71)
STANDING START 1/4 MILE	20.4 (23.7)	21.1 (—)	—	—	8.4 (10.8)	20.2 (23.1)	—
ACCELERATION IN TOP GEAR							
20-40	10.0 (14.6)	11.8 (—)	10.0 (12.1)	10.6 (13.0)	—	—	—
30-50	10.3 (16.6)	12.7 (—)	8.9 (13.0)	9.7 (12.1)	—	11.0 (14.7)	—
40-60	11.6 (22.3)	13.3 (—)	10.1 (16.8)	10.0 (15.2)	—	—	—
50-70	12.4 (—)	16.5 (—)	—	—	—	11.0 (39.2)	—
MAX. B.H.P.	58 (38)	55 (—)	—	—	76 (59)	62 (48)	51 (38)
TOURING FUEL CONSUMPTION	35 (39)	40 (—)	—	—	—	32 (38)	—
OVERALL FUEL CONSUMPTION	32 (37)	34 (—)	28 (30)	— (28)	—	30 (37)	32 (38)



Shorrock C75B installation fitted to BMC 'A' series engine.



M.G. Midget C75B supercharger kit.



Power graph Austin A40 1098 c.c.

(Extract from road test report)  
 Shorrock Supercharger  
 for A40:—

... The Crypton Rolling Road dynamometer at Abingdon indicated a power output of some 62 B.H.P. at something like 5,600 R.P.M., in contrast to the 48 B.H.P. 5,100 R.P.M. of the standard unit—an improvement of some 30 per cent. Without any modification whatever to the engine itself. What was particularly impressive was that the original 48 B.H.P. was now produced at only 3,600 R.P.M.

A subsequent test with a Bowmonk accelerometer confirmed our deduction that the torque curve was almost dead flat from 1,500-5,000 R.P.M. When the acceleration of other cars was tailing off, our blown A40 just went on and on! Compared with the 50-70

M.P.H. acceleration figure for the standard A40 of 39.2 sec. the blown figure of 11.0 sec. is quite amazing. The simplest way to put it is that it feels, not like a tuned 1100 c.c. car, but a good touring car with a much larger engine, perhaps even getting on for two litres. It has all the smoothness, flexibility, and top gear 'pull' of a big car, with the compactness and manoeuvrability of a small one. It will trickle along at 20 M.P.H. in top gear and pull away quite strongly; the power 'really comes' in at about 30-35 M.P.H. and from then on it just keeps on going. It idles smoothly and quietly and starts easily, and of course one carburettor is easier to tune than two.

# SHORROCK SUPERCHARGER INSTALLATIONS

Comparative performance figures:

TRIUMPH	ACCELERATION THROUGH GEARS M.P.H.					Max. Speed	Standing Start 1/4 Mile	ACCELERATION IN TOP GEAR				Max. B.H.P.	Tripp Fuel Con'tn.	Overall Fuel Con'tn.
	0-30	0-40	0-50	0-60	0-70			20-40	30-50	40-60	50-70			
Herald 1200	4.0 (8.5)	7.0 (11.0)	9.0 (18.4)	14.0 (28.6)	17.2 (-)	95 (79)	20.0 (23.4)	—	8.8 (16.3)	8.5 (21.8)	10.5	—	—	24 (29)
1300 Triumph	4.5 (8.3)	6.9 (8.4)	10.8 (12.8)	13.8 (19.0)	19.8 (29.6)	85 (84)	—	—	10.0 (12.5)	11.4 (12.5)	11.9 (17.0)	—	—	25 (28)
Viva 1098	4.0 (5.2)	5.8 (8.6)	8.3 (13.7)	12.3 (22.1)	—	90 (73)	—	11.1 (11.9)	8.9 (12.9)	9.9 (17.6)	11.6 (20.0)	—	—	28 (32)
Hillman Imp	4.6 (4.9)	7.2 (7.8)	10.5 (11.1)	15.6 (17.1)	—	92 (86)	20.3 (20.7)	—	11.0	12.9	—	—	—	32 (37)
Volkswagen 1200	5.4 (6.2)	8.2 (10.2)	12.6 (15.8)	18.0 (27.5)	28.0 (-)	88 (73)	20.7 (22.9)	13.1 (15.0)	14.6 (18.0)	15.3 (22.5)	21.7	—	—	28 (33)
Renault RB	4.4 (5.6)	6.3 (8.6)	9.3 (14.1)	12.8 (22.0)	19.2 (36.4)	92 (79)	—	12.5 (12.8)	10.9 (13.3)	11.0 (17.6)	—	—	—	28 (34)

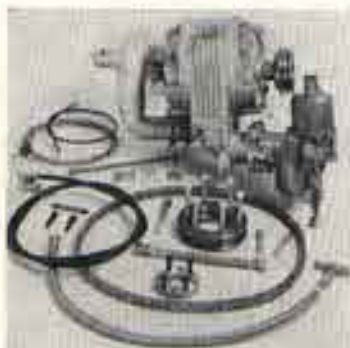
KITS also available for:— Herald 12/50 and 13/60; Spitfire Mk. I, Mk. II and Mk. III; Hillman Chamois; Vauxhall Viva HA, HB and SL90; Renault R1100 and R10.

Triumph (range of installations)

Herald 1200, 12/50 and 13/60

Spitfire Mk. I, II and III

Triumph 1300



Triumph 1300 C75B kit

(extracts from VW 1200 Autocar road tests:)

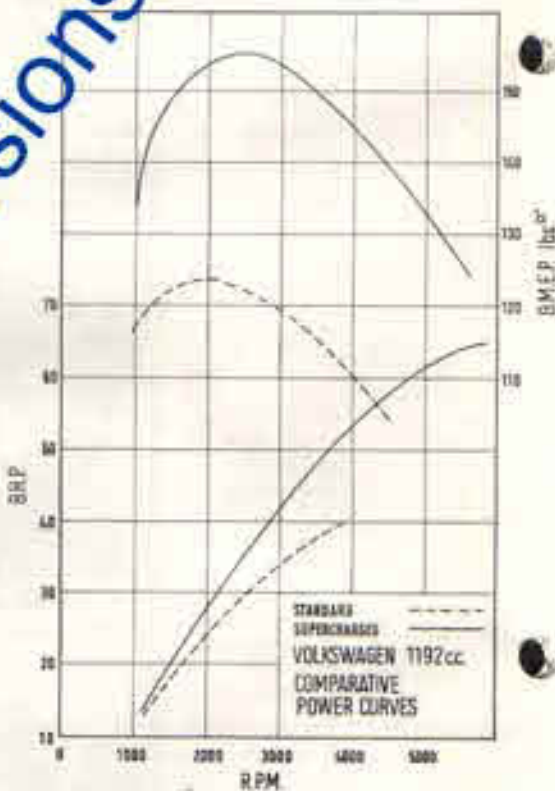
The initial impression is of greater engine refinement at all speeds, and particularly of the car's willingness to pull away from as little as 18 m.p.h. in top gear and 10 m.p.h. in third. But although the engine is smoother than the standard cars at these speeds and fractionally better on acceleration, the enthusiastic driver would prefer to change up into third at about 32 m.p.h. and top at 43 m.p.h., at which speeds the blower really "gets up on the step" and nearly halves acceleration times.

The installation includes everything to effect the conversion—new carburettor and trunking, petrol pipe and S.U. sump, the supercharger and its drive. Many Volkswagen owners might consider the outlay good value in return for better than 1500S performance.



Volkswagen 1200/1300 and 1500 supercharger installation

certainly enables the car to keep up with fast traffic and saves it the ignominious treatment normally meted out to beetles by chauvinistic Mini drivers. Even the potterer would enjoy the extra docility of the engine and the ability to jog along at about 40 m.p.h. in top without frequent changes.



VW 1200 power graph

Volkswagen

Complete installations available for all VW Beetle models. 1200 c.c., 1300 c.c. and 1500 c.c. All installations employ C75B supercharger unit and include an SU electric fuel pump.

RB, 1100 and R10 C75B supercharger installation.

If your particular car is not listed, please contact us, as we may be able to help you. We can often help with advice or supply what we call "prototype installation".

We also undertake a number of special supercharger fittings to customers cars, and in certain cases where we wish to use this opportunity to add a new kit to our range, we will fit an installation free of charge, only charging for parts supplied.

We also carry out all supercharger repairs and overhauls. Ring 01-874 2333 or 5123

# BLOW YOUR ENGINE

An Extract from an article by Ken Currie, published by Custom Car Magazine, May, 1970 together with photographs showing the fitting of a supercharger installation by stages.

Supercharging is probably one of the oldest methods of getting more power from an engine. If you think about it, what is more logical? If you want more power—get more combustible mixture into the cylinders. Having a supercharger, which holds a controlled pressure in the inlet manifold so that the engine does not have to do all that sucking nonsense to get the mixture to the cylinders, is a good lazy way to do it.

Up to the 1940s the most powerful racing cars were all blown and the reason they are not used for racing today is because of fuel restrictions. But this does not mean that blowers aren't good for the road. The more advanced fuels we have available at the pumps today means that blown and unblown engines can use compression ratios that would have been unthinkable a few years ago.

There have been many sorts of superchargers produced over the years, the most successful of which for road use has been the Shorrock's vane type. This produces pressure from very low revs increasing proportionally with engine revs to give smooth power all the way through the rev range. I have owned a supercharged Mini Cooper which had the legs of normal 1275s, and pulled from 1,500 to 7,000 revs and averaged 28-30mpg with complete reliability.

The Shorrock range are rated to supply the engine with one and a third times the full swept volume of the engine. The average increase in power is between 33% and 40% and this power is there all the way through the range. This means that

you can drive more comfortably under all conditions and overtake without having to snatch a lower cog to find steam.

It's funny how most people react to superchargers; there's the sporting brigade who stand back and look at it like a rugby union player watching an American football player taking off his padding and crash hat or, there's the others who tell you about their friend Fred who has a supercharged Morris Minor and carries a spare set of big ends in the glove pocket so he can change them at the side of the road. How people can regard supercharging as some form of cheating beats me. Unless you are involved in some sort of competition with class limits and restrictions surely what anyone tuning a car for the road wants is the largest increase in bhp possible while keeping a tractable engine. For road use I am a firm believer in bigger engines and/or superchargers for applying extra push. The side effect of supercharging are always grossly overstated by the anti-blowing brigade. At the risk of being a bore I will repeat that the thing which ruins engines quickest is using far more revs than they were designed to cope with. Inertia loads increase as a square of revs; they do not increase proportionately. Remembering that power output is directly proportional to combustion and pressure and engine revs, as far as engine overloading is concerned increasing the combustion pressure is a better way of upping the power. Fitting a supercharger is a straightforward enough operation which I hesitate to describe as simple

because of the varying amounts of underbonnet space. Blowers go into Minors and Cortinas relatively easily but you need a very thin set of fingers to get an installation into a Mini or Volkswagen.

The detail fitting varies from car to car, but to give you some idea of what is involved we took shots of an Escort lump being fitted up. We had the engine out to make photography easier—you can do it with the engine in (honestly).

As with a lot of other jobs, the more room you have the better. Remove the bonnet, drain the water and remove the radiator. Before disconnecting the battery, try to free the crankshaft pulley by putting the engine in first gear and have the handbrake hard on. If you can't budge it, get a good ring spanner over the bolt with the other end resting on the chassis member and dab the starter button—that'll free it. Remove the generator complete with all its mounting brackets, then heave off the air cleaner and carburettor.

The crankshaft pulley is replaced with a special two or three row pulley. One drives the normal fan belt and the other one or two drive the supercharger. Whether the installation uses a single or twin belt depends on which engine is used. The normally high revving mills have twin belts.

Bracketing which holds the blower unit is bolted into position on the side of the block and the front of the timing cover, longer bolts being provided. The generator is replaced in an underslung position and the blower bolts on top.

Tension on the generator is done

in the normal way and blower belt tension is taken up by varying the blower position in the slots in the mounting brackets. The simplest way to fit the blower fan belts, especially with twins, is remove the blower pulley and slide it back on complete with belts. Carburettor and the inlet pipe connections are simple enough if the car is fitted with an accelerator cable and flexible fuel line; others need a bit of chopping and rejigging.

The oil supply to the blower is taken from a 'T' piece fitted in the oil warning light hole. There is a special metering needle at the blower to control the amount taken in. It is a positive loss system in that the oil is burnt, but not in any appreciable quantity. There are a number of metering needles to cope with all ranges of pressure.

All that's left is to run the inlet pipe from the blower to the manifold, tighten it all up and you're in business. The SU is tuned on the blower the same way as with a normal manifold.

Shorrock Superchargers are now manufactured by the Allard Motor Co and they reckon to have even better control on quality. They offer full repair and service facilities which don't get used that much as blowers are really reliable.

The cost of kits is quite high, ranging from £69 15s to £75 15s but it would cost just as much or more to get the power by other means and then you would still be without the torque and flexibility you have with a blower.

Full details of the kit for your car from: Allard Motor Co., 51 Upper Richmond Road, Putney, SW15.



Typical supercharger assembly as supplied to the customer with as many parts bolted in position as possible.



Triple row pulley replaces the original and the dynamo is underslung. Mounting plates are held on the block and timing cover using spacers as necessary.



Manifold pipe, fuel pipe and oil supply connections.



Blower unit in bolted position with shortened dynamo tensioning strap. Best way to fit the double belts is by removing blower pulley.

Performance-conversions.co.uk

# SHORROCK SUPERCHARGED ENGINES

Shorrock have the distinction of being chosen for supercharging engines holding over 50% of the

total "fastest ever" world class records. For competition and other special

applications we can supply specially developed supercharged Ford engines.

Up to 165 b.h.p. from 1300 c.c. crossflow

Up to 185 b.h.p. from 1600 c.c. crossflow

200 + b.h.p. from 1600 c.c. Twin Cam



*Dragon Supercharged engine*

## Special engine components:

In order to meet special requirements we can supply engine components suitable for supercharged

engines, these include, modified cylinder heads, forged pistons, special oversize valves, "blower"

camshafts, and big bore free flow exhaust manifold and systems.



*head & camshafts etc.*

## Marine Applications:

Inherent characteristics of the supercharged engine mentioned earlier in this brochure and the Shorrock supercharger in particular make it

ideally suited to use on a wide variety of inboard engined marine craft.

With the marinised engine, cooling

should present little problem and in most engine bays there is ample room for the supercharger installation and drive belts.

## Present day trends:

Continued development on the lines indicated and research in connection with carburation, ignition and latterly with either direct or indirect fuel-injection, has increased peak speeds to the point where supercharging must again be considered if further output per litre is sought. Although it is generally assumed that development and a consequent continual gain in efficiency is a process of constant progression, it does appear that a stage has now been reached, or will be reached in the near future, where the limit to

further development is that imposed by atmospheric pressure and induction. Practically every conceivable type and layout of valve and valve-operating gear has been tried, and it is difficult to visualise that much greater volumetric efficiency can be obtained.

Ignition systems, thermal and mechanical considerations etc., might well allow of still higher peak operating speeds being obtained, but increased speed without maintenance of a good volumetric efficiency curve cannot achieve any

useful purpose. This being so, it would appear that a combination of higher speeds and still acceptable volumetric efficiency can only be achieved by pressure induction or supercharging. The ever-lessening time factor per operating cycle and its influence in connection with problems of inlet-charge inertia, even with the most efficiently designed induction systems, now makes it necessary to appreciate that the limits of atmospheric induction are about to be reached.

## CONVERSION KITS

Supercharger conversion kits are available, to allow the transfer of your supercharger installation to another car of similar engine capacity. When you wish to sell your car, the supercharger installation can quite

easily be removed and the engine put back to standard. All 850-1300 c.c. engines require the same basic C75B supercharger unit and we can supply all the parts necessary to make your kit suitable for another

car of similar engine capacity. Alternatively, you can send the complete installation to us for conversion, we can then also clean and check the condition of the supercharger unit as required.

Examples of conversion kits are as follows:—

Anglia to Escort 1300  
Mini to Midget  
Mini to Morris 1100  
Viva to Renault  
Herald to Spitfire

We have complete workshop facilities for all Shorrock supercharger fittings and overhauls. (Please ring 01-874 2333/5123. 8.00 a.m. to 5.00 p.m. Monday to Friday)

*A typical conversion kit.*



### PROTOTYPE INSTALLATIONS

Due to increased demand we are now able to offer a supercharger kit for prototype use. By purchasing the following kit of components which

form the bulk of most supercharger installations. An installation can, quite easily, in many cases be made up for a wide range of cars for which

we at the present time do not have a complete installation.

The kit comprises the following:—

#### C142 Prototype kit

- 1 - C142B Supercharger Unit
- 1 - 2" SU Carburettor
- 1 - 2" Carburettor pipe
- 1 - 2" Carburettor rubber pad
- 1 - Outlet pipe
- 1 - Pressure relief valve
- 1 - 4½" diameter supercharger pulley

All nuts, bolts, gaskets required for the above.

#### C75B Prototype Kit

- 1 - C75B Supercharger Unit
- 1 - 1½" or 1¾" SU Carburettor
- 1 - 1½" or 1¾" Carburettor pipe
- 1 - 1¾" Carburettor rubber pad
- 1 - Outlet pipe
- 1 - Pressure relief valve
- 1 - 4" diameter supercharger pulley

The main components which will need to be made up to complete the installation for each particular application, comprise:— induction manifold, mounting brackets and crankshaft pulley.

We will be pleased to give technical advice concerning proposed special installations, and in certain cases undertake to build "one off" instal-

lations. All enquiries should be sent in writing so that full consideration can be given to each particular proposal.

Our prototype C142B kit is suitable for engines of from 1300-2000 c.c. and for smaller capacity engines where a higher boost pressure is required for competition purposes. The C75B prototype installation is

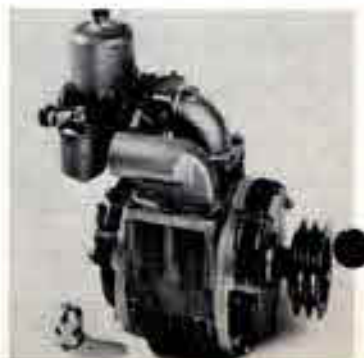
suitable for engines from 850-1300 c.c.

In certain cases we are able to give advice concerning the fitting of superchargers to cars for which we do not already have complete installations.

As a guide we list below the overall supercharger unit dimensions and other relevant information.

### Shorrock Supercharger Specifications

Supercharger Type	C75B	C142B
Overall length (to end of drive shaft)	9"	10½"
Overall length (casing)	7"	8"
Overall diameter	7"	8½"
Weight	21 lbs.	30 lbs.
Maximum (efficient) engine capacity	1,300 c.c.	2,000 c.c.
Maximum r.p.m.	7,000	5,500
Rotation	Clockwise viewed from drive end. (May be reversed by dismantling and changing over end casings).	



*C142B Prototype installation*

# What do you find in a can of Duckhams?



## 1 Quality

A combination of the purest base oils and most modern additives – products of Duckhams research blended with the skill of 70 years' specialisation in the production of the finest motor oils available to the British motorist.

## 2 Value

Take our word for it. Compare the price you are at present paying, whether for packaged oil or for oil dispensed in the service bay, then compare with the price of Q20-50. You can't buy a better oil, so why pay more?

## 3 Availability

Duckhams Q20-50 motor oil is available everywhere – with over 30,000 stockists in the United Kingdom. Now used by more than one in four motorists – truly the choice of the enthusiast.

## 4 Leadership

Duckhams were first to introduce multigrades to the British motorist. Q20-50 is the result of this leadership, and is today the most experienced and most modern motor oil. Although the name does not change, the formulation continues to improve whenever we can provide a valid benefit for the motorist.

DUCKHAMS OILS, SUMMIT HOUSE, WEST WICKHAM, KENT



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