

# Leyland

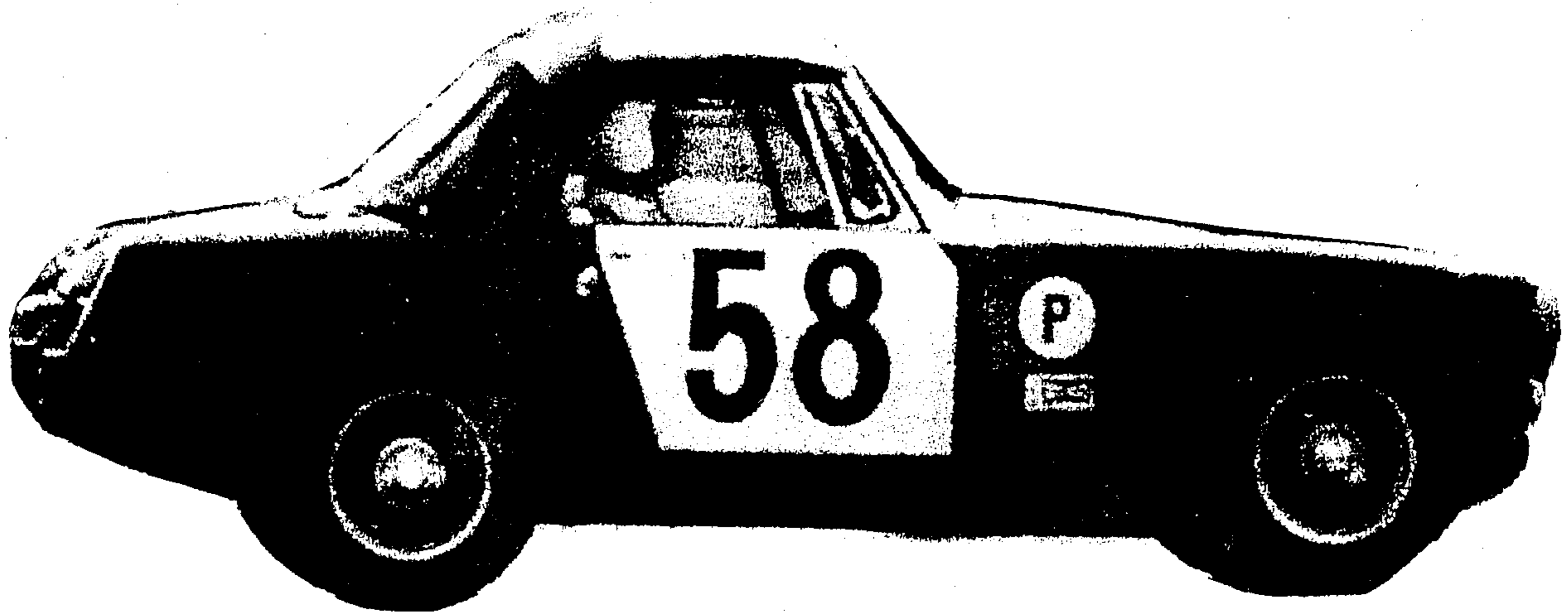


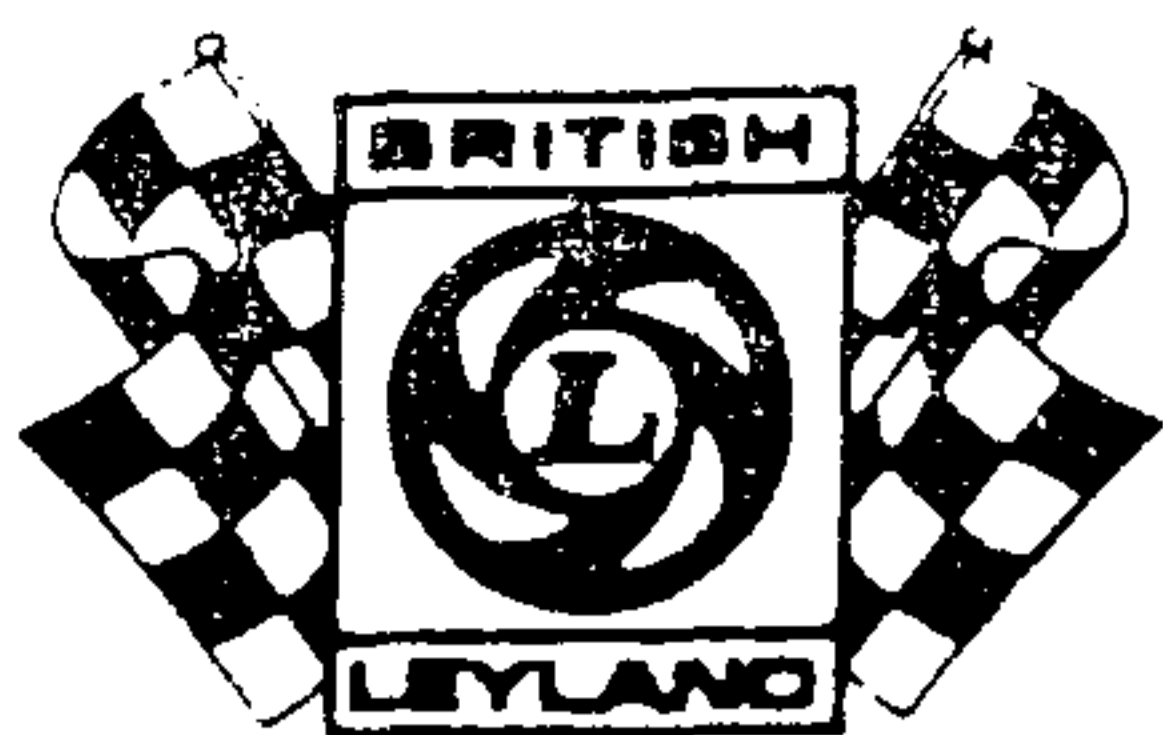
## Special Tuning

for the

# MIDGET and SPRITE

1275 c.c. ENGINES





# SPECIAL TUNING DATA

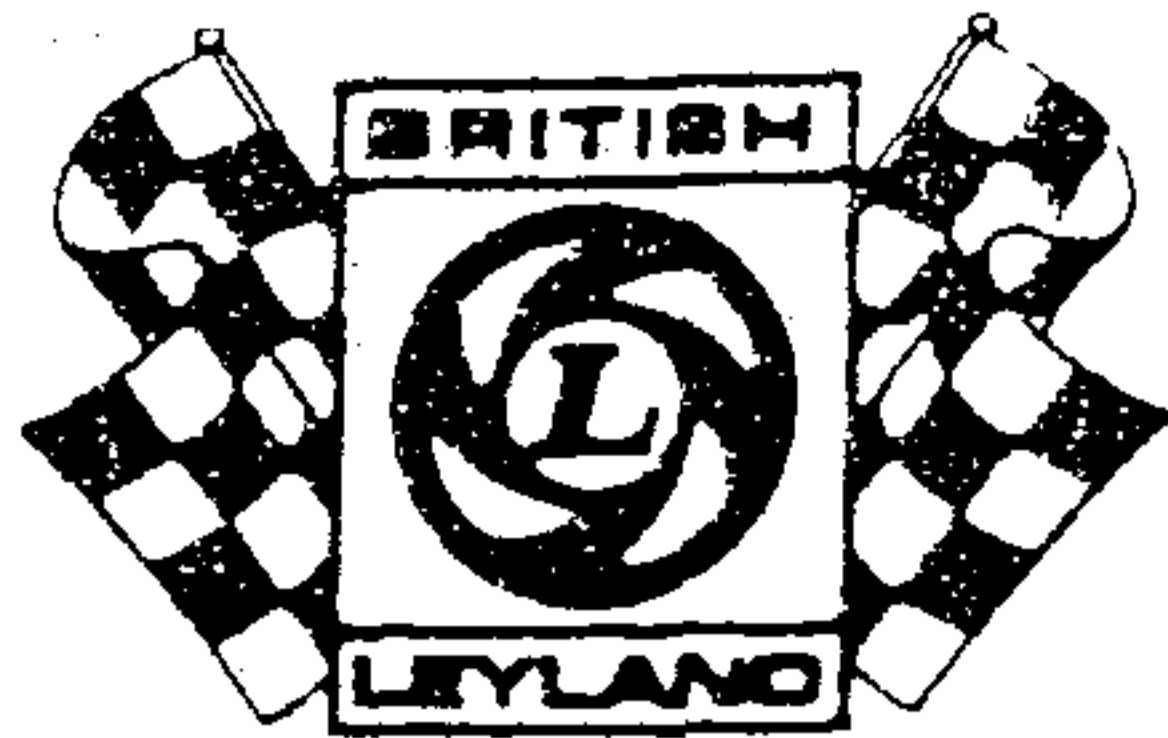
Issued by: BRITISH LEYLAND SPECIAL TUNING DEPARTMENT  
ABINGDON-ON-THAMES • BERKSHIRE • ENGLAND

Model MIDGET III & SPRITE IV 1275 cc

Sheet Ea - 1 Issue 6

## DESCRIPTIVE INDEX

<u>Description</u>	<u>Part No.</u>	<u>Qty/Car</u>	<u>Sheet No.</u>
<u>BODYWORK</u>			
Bonnet securing strap set	C-AJJ 3381	1	E-5
Rubber Toggle Strap set	C-AJJ 4016	1	E-5
Headlamp Cowl Kit	C-AJJ 3385	1	E-5
<u>BRAKES</u>			
DS11 Brake pad set (competition)	C-AHT 16	1	E-5
VG 95/1 lined brake shoes	C- 8G 8997	2	E-5
<u>CAMSHAFTS</u>			
Road 16°, 56°, 51°, 21°, Lift .250"	C-AEG 567	1	E-2/Z-2
Rally 10°, 50°, 51°, 21°, Lift .250"	C-AEG 542	1	E-2/Z-2
Racing 50°, 70°, 75°, 45°, Lift .315"	C-AEG 529	1	E-2/Z-2
Super Sprint 60°, 80°, 85°, 55°, Lift .315"	C-AEG 595	1	E-2/Z-2
Sprint 60°, 80°, 75°, 45°, Lift .315"	C-AEG 597	1	E-2/Z-2
<u>CARBURETTOR</u>			
1½" Twin SU Assembly	C-AUD 194	1	E-3
Installation Kit for C-AUD 194 Carbs	C-AJJ 3334	1	E-3
Flare pipe for 1½" SU Carb. alloy	C-AHT 247	2	E-3
1¾" Twin SU Assembly	C-AUD 416	1	E-3
Installation Kit for C-AUD 416	C-AJJ 4001	1	E-3
Flare Pipes for 1¾" Carburettors	C-AHH 7209	2	E-3
Air Cleaner 1½" SU Carb	C-AHT 210	2	E-3
Weber 45 DCOE 13	C-AHT 143	1	E-3
Installation Kit and manifold for Weber	C-AJJ 3360	1	E-3
<u>CRANKSHAFT</u>			
Competition Nitrided Crankshaft	C-AHT 326	1	E-4
<u>CLUTCH &amp; FLYWHEEL</u>			
Lightened flywheel	C-AHT 70	1	E-3
Competition clutch cover assembly	C-AEG 546	1	E-2
Competition clutch driven plate	C-AEG 547	1	E-2
<u>CYLINDER HEAD</u>			
Race Extra Large Valve	C-AHT 221		E-1
Race Large Valve	C-AHT 222		E-1
Polished 19cc	C-AHT 134		E-1
<u>DISTRIBUTOR</u>			
Competition timing (Lucas 41110)	C-27H 7766	1	E-2
<u>EXHAUST SYSTEM</u>			
Competition large bore manifold	C-AHT 11	1	E-2
<u>FINAL DRIVE &amp; AXLE SHAFTS</u>			
3.727 ratio, matched crown wheel & pinion	BTA 535	1	E-4
3.9 ratio, matched crown wheel & pinion	BTA 1223	1	E-4
4.22 ratio, matched crown wheel & pinion	BTA 539	1	E-4
Limited slip differential	C-BTA 1226	1	E-4
Axle shaft, heavy duty, Disc wheels only	C-BTA 940	2	E-4
Axle shaft, heavy duty, Wire wheels only	C-BTA 939	2	E-4
<u>GEARBOX</u>			
Straight cut close ratio gear set complete	C-AJJ 3319	1	E-4



# SPECIAL TUNING DATA

Issued by: BRITISH LEYLAND SPECIAL TUNING DEPARTMENT  
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Model MIDGET III & SPRITE IV, 1275cc

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## DESCRIPTIVE INDEX (Cont'd.)

Description	Part No.	Qty./Car	Sheet No.
<u>LITERATURE</u>			
Special Tuning Booklet - 1275cc Midget/Sprite	C-AKD 5098		
Special Tuning Data Sheet Set - all models	C-AJJ 3333		
Binder, for Special Tuning Sheets	C-AKD 5061		
Divider set for Binder	C-AKD 5093		
British Leyland Special Tuning Emblems (1 pair)	C-AKD 5125	1	E-5
British Leyland Special Tuning Lapel Badge	C-AHT 200		
<u>OIL COOLER</u>			
Oil cooler kit complete	C-AJJ 3323	1	E-3
Oil Cooler Extra large radiator	ARO 9809	1	E-3
<u>PISTONS</u>			
Competition 4 ring flat top, +.040" " "	C-AEG 043043	4	E-1
Flat top forged +040"	C-AJJ 338243		E-1
Flat top forged +020"	C-AJJ 338223	1	E-1
Lightweight forged dished (9.75:1) set (state size required)	C-AJJ 3377		E-1
<u>SUMP</u>			
Deep sump and oil pick-up kit	C-AJJ 3324	1	E-3
<u>SPARKING PLUGS</u>			
Champion N64Y	C-37H 4208	4	E-2
N57R	C-27H 5982	4	E-2
N62R	C-37H 2149	4	E-2
N60Y	C-37H 2148	4	E-2
<u>SUSPENSION</u>			
Shock absorber, competition setting front R.H.	C-AHA 6451	1	E-4
front L.H.	C-AHA 6452	1	E-4
Shock absorber, adjustable rear R.H.	C-AHA 7906	1	E-4
rear L.H.	C-AHA 7907	1	E-4
Lowered rear road springs	C-AHA 8272	2	E-4
Front suspension lowering kit	C-AJJ 3322	1	E-4
Anti-roll bar kit complete 9/16" dia.	C-AJJ 3314	1	E-5
Anti-roll bar 5/8" dia.	C-AHT 56	1	E-5
Anti-roll bar 11/16" dia	C-AHT 57	1	E-5
Installation kit for C-AHT 56 and 57	C-AJJ 3356	1	E-5
Rear bump stop kit	C-AJJ 4031	1	E-4
<u>VALVE GEAR</u>			
Inlet valve - large 1.406" (35.7%) dia	C-AEG 544	4	E-2
Inlet valve (std. size competition material	C-AEG 569	4	E-2
Valve rocker spacer	C-AEG 392		E-3
Strengthened rocker shaft	C-AEG 399		E-3
Lightened tappet	C-AEG 579	8	E-3
Camshaft procket - lightened	C-AEG 578	1	E-3
Valve spring - inner	C-AEA 652	8	E-2
- outer	C-AEA 524	8	E-2
- locating collar	C-AEA 654	8	E-2
<u>WHEELS</u>			
Wire, 60 spoke 13" x 5"	C-AHA 7573	5	E-5



# SPECIAL TUNING DATA

Model MIDGET III & SPRITE IV, 12'

Sheet E - 1 Issue 6

When carrying out work on these cars always refer to Workshop Manual AKD 4021.

## Cylinder Head - Stage I

Remove all frazes from the combustion chamber and ports, but leave the locating sleeves in place when matching the manifold ports. The compression ratio may be raised by machining the head face, .012" is approximately equal to 1 cc reduction in combustion chamber volume. Examine the waterways to ensure that there are no core wires remaining. Use the competition cylinder head gasket C-AHT 188 and ensure there are no burrs at the base of the head studs by removing the studs and counter sinking the holes. A lightly polished standard cylinder head C-AHT 134 is available with 19cc combustion chamber (9.5:1 ratio).

## Stage 2 Road Tune (9.5:1 ratio)

A large valved polished and gas flowed cylinder head and competition head gasket should be fitted in conjunction with a special distributor, twin 1½" SU carburetters, special inlet manifold and air cleaners which are contained in the carburetter installation kit and a free flow exhaust manifold which should be coupled to a straight through exhaust system.

## Description

## Part No.

Cylinder Head	C-AHT 463
Twin 1½" SU carburetters	C-AUD 640
Installation Kit (carburetters)	C-AJJ 4040
Distributor	C-27H 7766
N64Y Sparking Plugs	C-37H 4208
Gasket (Cylinder head)	C-AHT 188
Exhaust Manifold	C-AHT 11

## Performance Figures (By kind permission of "Motor")

Acceleration through gears from rest

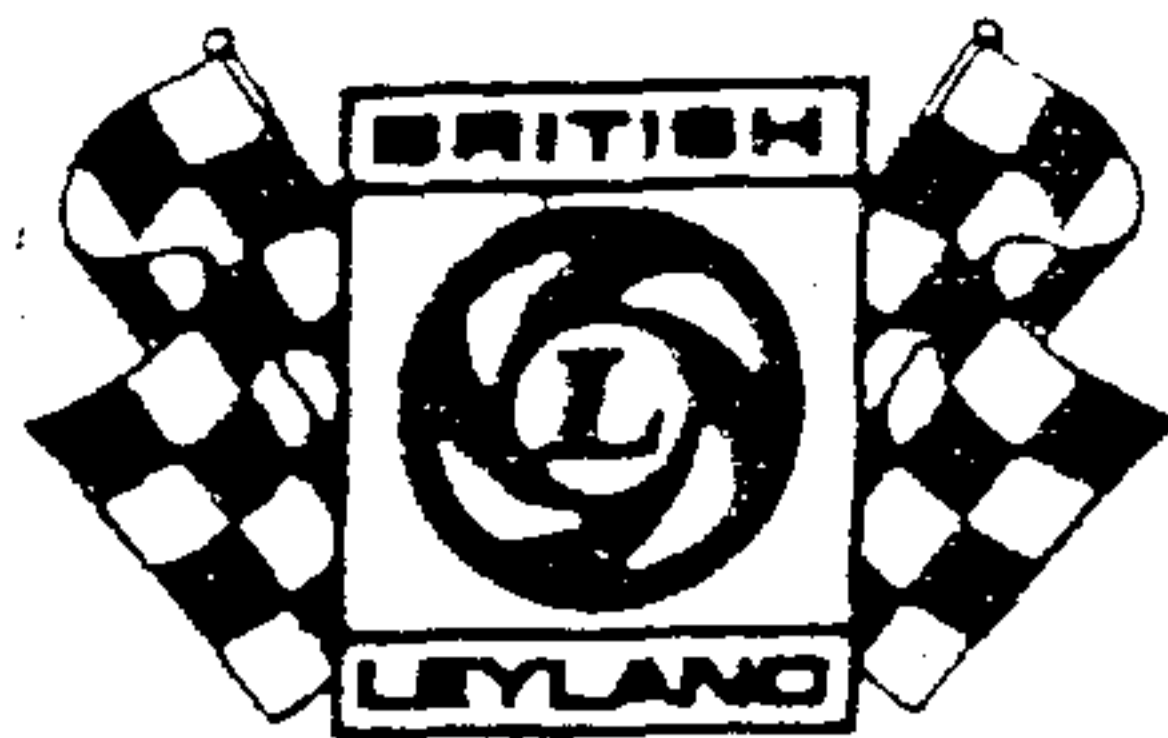
<u>M.P.H.</u>	<u>Km.P.H.</u>	<u>Std.</u>	<u>Stage II</u>
0-30	0-48	4.0 secs	3.3 secs
0-40	0-64	6.5	5.1
0-50	0-80	9.3	7.2
0-60	0-96	13.5	10.0
0-70	0-113	19.1	13.8
0-80	0-129	28.5	18.8
0-90	0-145	45.7	27.5
Standing quarter mile		19.3	17.4

Acceleration in Top Gear

<u>M.P.H.</u>	<u>Km.P.H.</u>	<u>Std.</u>	<u>Stage II</u>
20-40	32-64	9.9 secs	8.9 secs
30-50	48-80	9.6	9.0
40-60	64-96	9.8	8.5
50-70	80-113	11.7	9.1
60-80	96-129	16.0	10.9
70-90	113-145	-	14.0

Maximum Speeds

Flying lap	95 m.p.h.	153.0 km.p.h.	102 m.p.h.	164 km.p.h.
Flying quarter mile	97 m.p.h.	156.0 km.p.h.	104.7 m.p.h.	168.5 km.p.h.



# SPECIAL TUNING DATA

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**Model** MIDGET III & SPRITE IV, 1275cc

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**Issue** 3

## Camshafts

All camshafts fitted to these models use flange 12G 729 for the star oil pump drive. They are not interchangeable with the conventional Pin Drive Oil Pump type.

For road and rally use with emphasis on mid range torque the C-AEA 567 camshaft will be suitable.

For racing purposes C-AEG 529 has increased valve lift .394" (10%) and opening period while two new camshafts for short circuit or sprint work are also available with even longer periods.

For complete camshaft specification refer to sheet Z - 2.

## Distributor

Distributor C-27H 7766 is available for use with the above camshaft, most stages of tune require static setting of T.D.C. Maximum tune may require 1° or 2° A.T.D.C.

## Valves

The standard inlet valve can be replaced by C-AEG 569 in improved material. A large diameter inlet valve C-AEG 544 1.401" (35.7%) is also available. C-AEG 544 is fitted to the competition cylinder head C-AHT 222.

The stem lengths of these valves are longer than Cooper 'S' and they are NOT interchangeable.

## Valve Springs

Standard valve springs suffer valve crash around 6700 r.p.m. without causing undue load on the valve gear. Stronger (180 lb.) springs may be required for competition, these raise valve crash to around 8300 r.p.m. with the C-AEG 529 camshaft.

Valve Spring Inner	C-AEA 652	8 off
Valve Spring Outer	C-AEA 524	8 off
Bottom Collar	C-AEA 654	8 off

The locating collar C-AEA 654 must be fitted with high lift camshafts to prevent valve springs becoming 'solid'.

## Plugs

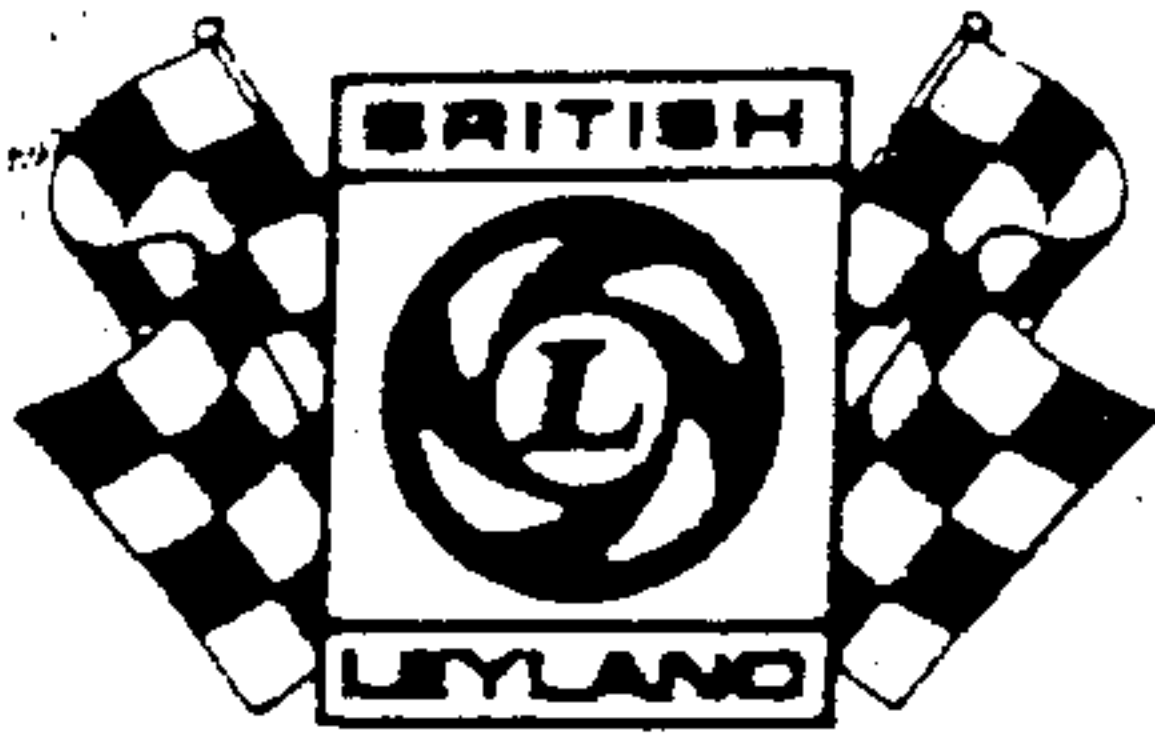
For rally or road use N64Y (C-37H 4208) will be most suitable. For racing it will depend on various factors, but N57R (C-27H 5982), N62R (C-37H 2149) or N60Y (C-37H 2148) cover a suitable range.

## Exhaust Manifold

A competition large bore exhaust manifold, C-AHT 11 can be connected to a large bore silencer with tail pipe terminating in front of the rear wheel for track use, or it can be connected into the existing exhaust system for rally/road use.

## Clutch

A competition clutch is available, cover assembly C-AEG 546 has a stronger diaphragm spring and should be fitted with driven plate C-AEG 547. For very highly tuned power units a special clutch may be required, if 105 b.h.p. is likely to be exceeded.



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Issue 3

## Sump

Where oil surge is experienced in competition it is recommended that a Deeper sump, with repositioned oil pick up be fitted. These are contained in kit C-AJJ 3324.

## Oil Cooler

If the car was not delivered with an oil cooler a complete kit is available C-AJJ 3323. For racing use the larger capacity cooler ARO 9809, but this will slightly restrict air flow to the radiator and must be carefully positioned.

## Carburettors

Twin  $1\frac{1}{2}$ " SU carburettors are available C-AUD 194 and should be fitted with Installation Kit C-AJJ 3334. This kit contains all necessary gaskets, studs, etc

Flare pipes C-AHT 247 may be fitted to restrict blow back and air cleaners C-AHT 210 are also available for normal road use.

Weber carburetter (twin choke 45 D.C.O.E.) C-AHT 143 is available to suit a race tuned engine. Other uses may require different chokes or jets.

Fitting kit C-AJJ 3360 is complete with manifold for the Weber and contains all the necessary parts required.

## Valve Gear

A strengthened rocker shaft C-AEG 399 was fitted in production from Engine No. 12CC/Da/H16597, using modified rocker pillars 12G 1926 and 12G 1927. The pillars must be located correctly to maintain the oil supply and locate the shaft.

Friction between the rockers can be reduced by replacing the coil springs with solid spacers C-AEG 392 (3 off). The standard rocker 12G 1221 can be further lightened by carefully grinding the sides of the pad and bosses. Ensure correct positioning over the valve by using spacing washers AEG 168 or slightly machining the pillars.

A specially lengthened adjuster screw should be used with Race, Sprint or Super Sprint camshafts, Part No. C-AEA 692.

## Flywheel

A specially lightened flywheel C-AHT 70 is available weighing 12.5 lbs. (5.67 kg.).

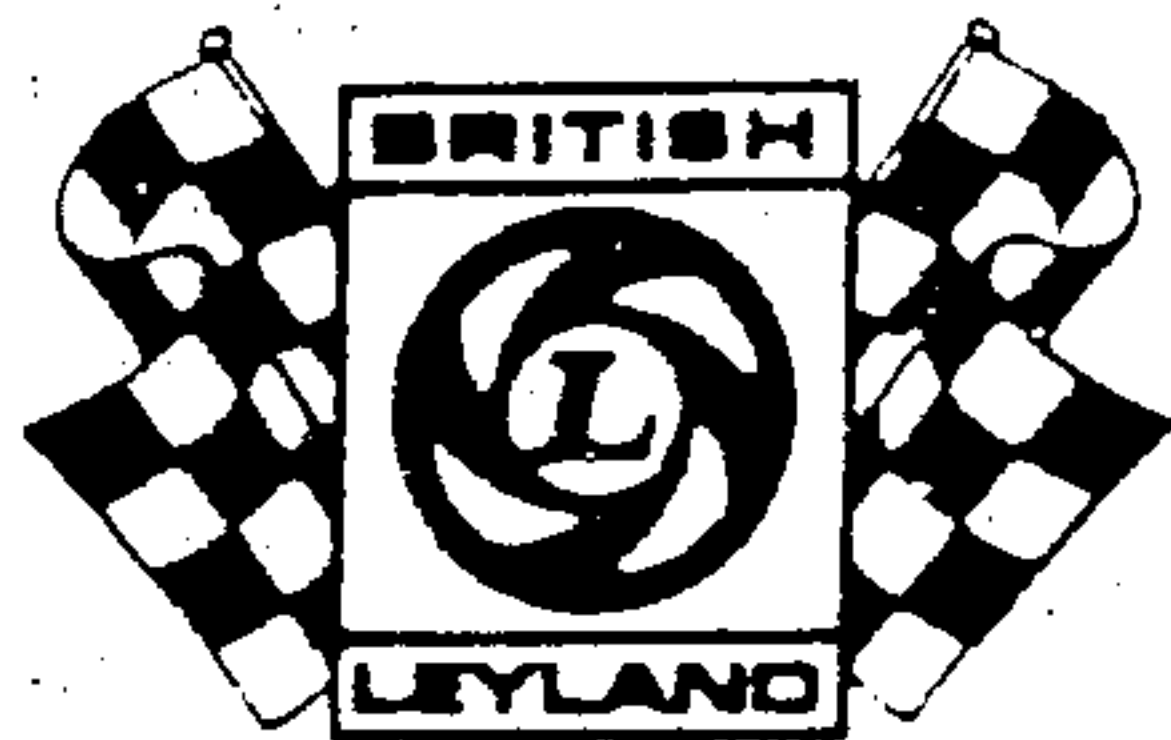
This must be balanced with clutch, crankshaft and damper to ensure perfect balance.

## Lightened Tappets & Sprocket

Special tappet C-AEG 579 are available that are lighter than standard thus reducing the loading on the camshaft and raising the valve crash point.

A lightened steel camshaft sprocket C-AEG 578 is also available. This is NOT suitable for B Series engines as timing would be incorrect.

$1\frac{3}{4}$ " HS6 SU carburettors C-AUD 416 can be fitted with the fitting kit C-AJJ 4001 which includes manifold and flare pipes.



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## Gearbox

Close ratio straight cut gear set C-AJJ 3319 is available for fitting direct into these gearboxes and all the necessary joints and lock washers are included in this kit which gives the following ratios:

	<u>C/R</u>	<u>Std.</u>
1st	2.573	3.2
2nd	1.722	1.92
3rd	1.255	1.36

Ensure that the latest Laygear 22G 673 is fitted when installing these close ratio gears.

## Axle Ratios

The following alternative axle ratios are available to fit these cars

3.727 : 1	11/41 teeth	Crown wheel & pinion	BTA 535
3.9 : 1	10/39 teeth	Standard (late cars)	BTA 1223
4.22 : 1	9/38 teeth	Standard (early cars)	BTA 539

## Limited Slip Differential

When regulations permit the use of a limited slip differential a Powr-Lok type is available, C-BTA 1226 which may be used with any of the above axle ratios.

## Axle Shaft

Stronger axle shafts C-BTA 940 are available for competition use on cars with Disc Wheels only and shafts C-BTA 939 are suitable for cars with Wire Wheels. Ensure that the wheel bearings are in good condition when fitting new shafts.

## Front Suspension

The front suspension may be lowered slightly by changing to the softer front coil springs Part No. 2A 4214. Alternatively, or if the car is to be lowered even further, use the lowering kit C-AJJ 3322 which contains a special packing for the rebound stops. The standard front springs AHA 8003 give the greatest ride height.

## Rear Suspension

A lowered rear road spring C-AHA 8272 is available to be used in conjunction with the lowered front suspension.

## Shock Absorbers

Front shock absorbers C-AHA 6451 R.H. and C-AHA 6452 L.H. are available, which have a harder setting. For the rear use adjustable shock absorbers C-AHA 7906 R.H. and C-AHA 7907 L.H. These can be adjusted after fitting to obtain the desired damping.

Before fitting the shock absorbers, they should be mounted in a vice and the arm operated on full stroke for a few minutes to expel any air from the valve.

If large capacity fuel tanks or heavy loads are carried, also for towing, it is recommended that the special rear bump rubbers are fitted C-AJJ 4031.



# SPECIAL TUNING DATA

**Model** MIDGET III & SPRITE IV, 1275cc

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## Anti Roll Bar

When a new car is ordered with an anti roll bar it is fitted with one 9/16" (14.3%) dia. but if the car was supplied without a roll bar it may be fitted afterwards using kit C-AJJ 3314 which contains all necessary parts and fitting instructions.

For competition use two larger diameter roll bars are available 7/8" (15.9%) dia. C-AHT 56 or 11/16" (17.5%) dia. C-AHT 57. These will fit straight onto cars already fitted with a works roll bar. but installation kit C-AJJ 3356 will be required if no roll bar has previously been fitted.

## Wheels

Wider rim 60 spoke wire wheels Part No. C-AHA 7573 are available. These are 13" (330.2%) dia. with 5" (127%) rims.

The latest Rostyle wheel Part No. AHA 8892 which has a 4 1/2" rim can be fitted to earlier cars with disc wheels providing the latest hubs Part No. BTA 1254 are fitted. These can be identified by a groove in the periphery of the wheel mounting flange. Wheel nut torque must not exceed 45lb.ft. (6.2 kg.m). Contact tyre manufacturer direct for all tyre recommendations but note that great care must be taken if any larger wheels or tyres are fitted. The front brake hoses must be regularly checked and it is essential to ensure that the brake hose is well clear of the tyre.

## Bonnet Straps

To eliminate any possibility of the bonnet flying open during competition events, leather straps as supplied under part number C-AJJ 3381 should be fitted. All cars competing in International competition events must have a supplementary locking device such as the leather straps fitted to the bonnet and boot lid.

## Brakes

Competition Ferodo DS11 brake pad set C-AHT 16 is recommended for competition use, together with VG 95/1 rear brake linings C-88G 8997. Use only Lockheed Series II Disc Brake Fluid for flushing or topping up.

## Special Tuning Emblems

British Leyland Special Tuning self adhesive emblems are now available in pairs under Part No. C-AKD 5125. In vinyl material they are practically indestructable once fitted to a smooth flat surface.

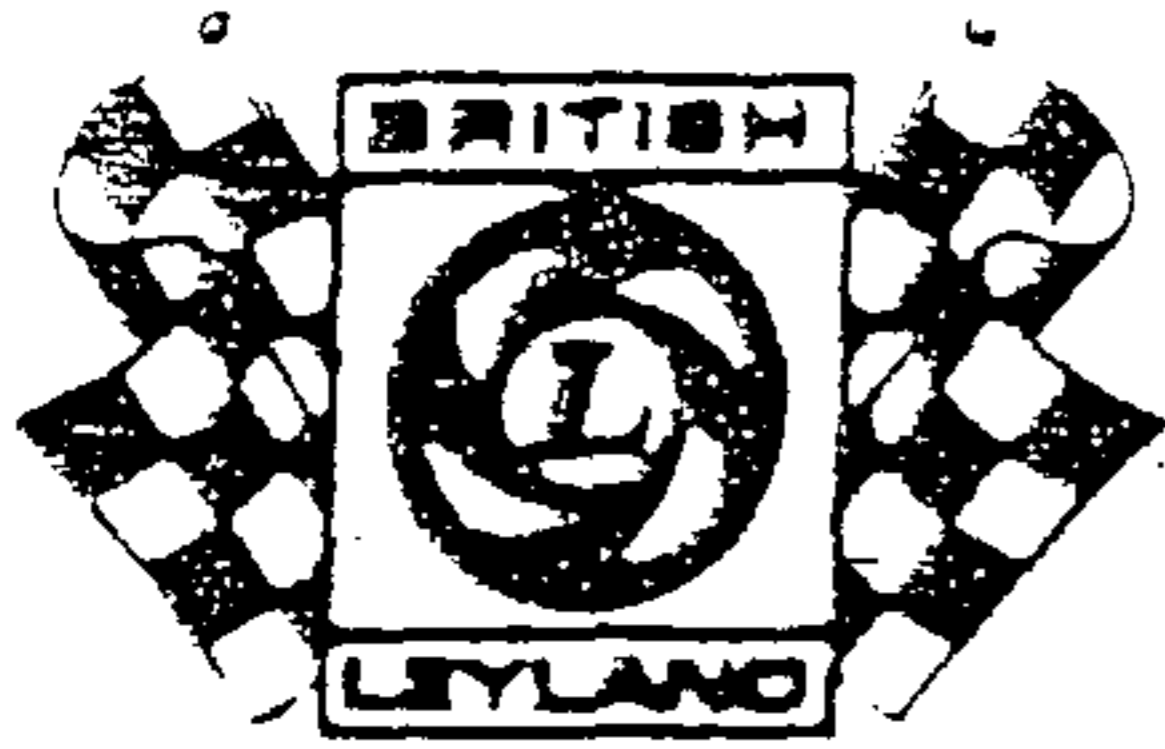
## Headlamp Cowls

These fix direct to the headlamp rims and protect the light units from stone damage etc. Part No. C-AJJ 3385 (1 pair).

## Alternator Fitting

A special bracket C-AHT 32 is designed to take the increased loading when using Lucas 11AC alternator 13H 2131 in place of the existing dynamo. This will cope with extra lights or continual stop-start motoring where the dynamo output may not be adequate.





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Issue 2

## AXLE RATIO

Axles fitted after Austin Healey Sprite Car No. HAN7-24731 and MG Midget GAN2-16183 have changed pinion bearings and redesigned differential assembly. While the complete differential assemblies are interchangeable between early and late type axles, crown wheel and pinions 'A' are NOT interchangeable.

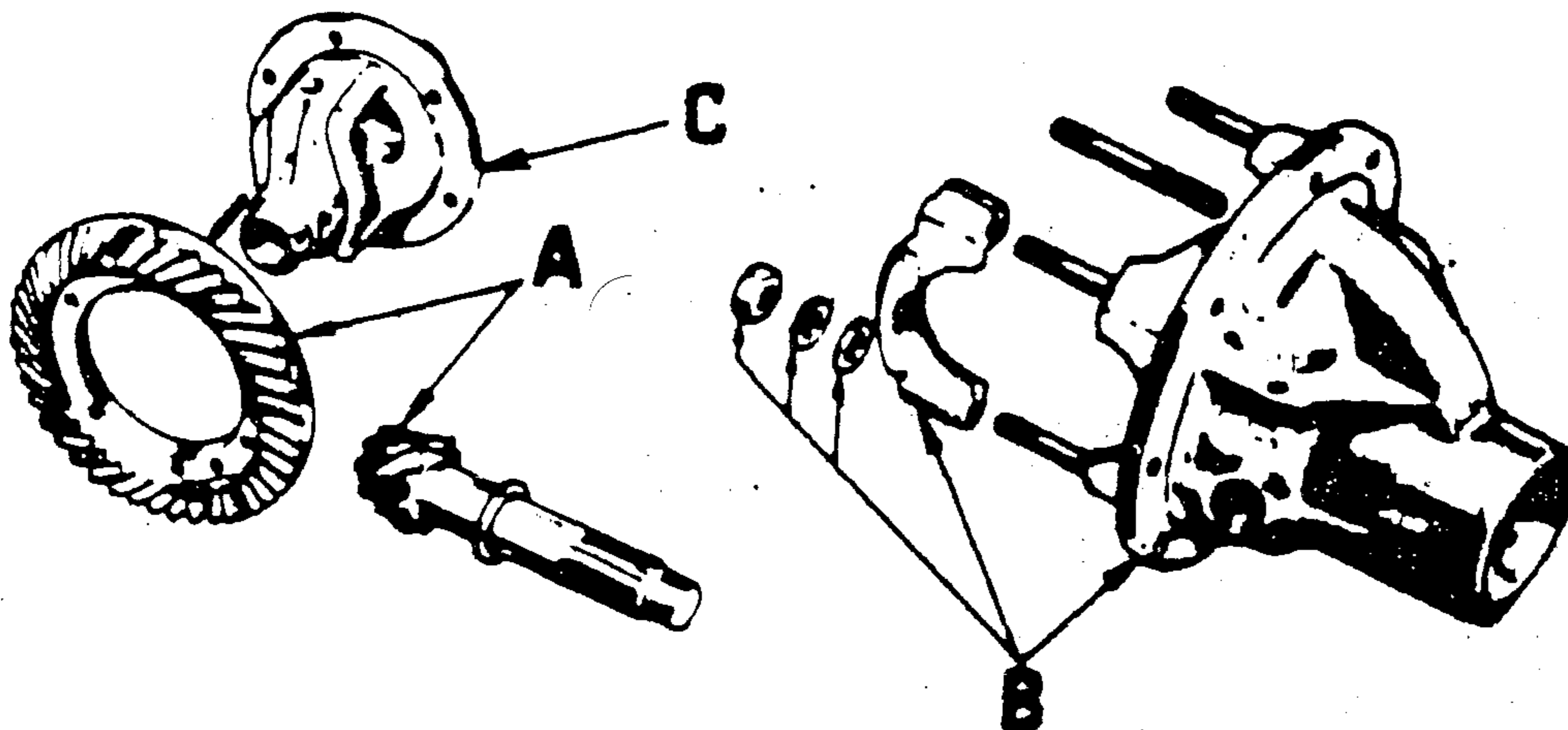
The differential cage ATA 7036 (illus. C) remains unaltered and ALL axles accept the Limited Slip Differential C-BTA 1226.

Ratio	No. of Teeth	C.W. & P. Part No. Illustration A	Carrier Assy. Part No. Illustration B	Differential Assy. Part No.	Standard Model
3.727	11/41	ATA 7240 *	ATA 7167	BTA 551	Riley 1.5
3.9	10/39	C-ATA 7354 *	ATA 7167	BTA 1222	
4.22	9/38	ATA 7266	ATA 7032	ATA 7326 *	Up to I
4.55	9/41	8G 7129	ATA 7032	ATA 7093	Morris 1/2 ton Van
4.875	8/39	C4 110	ATA 7032	2A 7230	A35 Van
5.375	8/43	ATA 7040	ATA 7032	ATA 7073 *	Morris GPO Van
3.727	11/41	BTA 535	BTA 549	BTA 551	Later Riley 1.5
3.9	10/39	BTA 1223	BTA 549	BTA 1222	Sprite/Midget Ø
4.22	9/38	BTA 539	BTA 549	BTA 550	From I to Ø
4.55	9/41	C-BTA 816 *	BTA 549	ATA 7093	

\* Information only. No longer available

I Sprite/Midget Change Point HAN7-24731/GAN2-16183

Ø Sprite/Midget Change Point HAN9-66226/GAN4-77591





Model GENERAL

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Issue 7

The following information is issued in order to facilitate the choice of a suitable final drive ratio and tyre for any particular application.

The table indicates the wheel revolutions per mile for various tyre sizes, from this the vehicle speed per 1000 engine revolutions per minute can be calculated using the formula:

$$\text{M.P.H./1000 R.P.M.} = \frac{60,000}{A \times B} \quad \text{or} \quad \text{K.P.H./1000 R.P.M.} = \frac{96,560}{A \times B}$$

where A = Final Drive Ratio :1

B = Wheel revolutions per mile

This formula gives the speed in direct top gear only but the equivalent road speed in any intermediate gear can be calculated by dividing this by the gearbox gear ratio.

Tyre Size & Type (Dunlop)	Wheel revs per mile	Tyre Size & Type (Dunlop)	Wheel revs per mile
520 x 10 C41	1058	145/530 x 13 CR82	965
145 x 10 SP	1095	155/530 x 13 CR82	960
520 x 10 CW44	1060	185/550 x 13 CR82	904
500 x L10 R7	1053 *	175 SR x 13 MS MK11	865
145 x 10 SP44	1080	175/70SR x 13 SP44	910
		195/70SR x 13 SP44	862
550 x 12 CP41	960	195/70SR x 13 MS MK11	865
145 x 12 SP44	974	205/60 x 13 Rally Super	934
155 x 12 SP	960	185/70SR x 13 MS Type 564	890
550 x 12 CW44	955		
175 x 12 SP44	959	520 x 14 C41	865
155/500 x 12 CR89	1013	550 x L14 R7	807 *
		560 x 14 C41	853
520 x 13 RS5	914	590 x 14 RS5	842
520 x 13 C41	917	590 x 14 C41	831
560 x 13 C41	884	145 x 14 SP	892
550 x L13 R7	840 *	155 x 14 SP	873
590 x 13 RS5	871	165 x 14 SP	854
590 x 13 C41	867	185 x 14 SP	821
600 x L13 R7	807 *		
145 x 13 SP	934	550 x L15 R7	775 *
165 x 13 SP	892	560 x 15 C41	814
560 x 13 MS MK11	855	590 x 15 RS5	807
560 x 13 MS Snow	851	590 x 15 C41	803
600 x 13 MS Type 564	869	600 x L15 R7	747 *
175/550 x 13 CR65	917	165 x 15 SP	820

For further information contact the tyre manufacturers direct.

Any change in final drive ratio or tyre size will affect the accuracy of the speedometer and odometer, which should be recalibrated by the instrument manufacturer.

All wheel revs per mile are at 30 M.P.H. except those marked \* which are at 100 M.P.H.

The following chart shows details of camshafts produced for 'A' series in-line.

Part Numbers (Flange oil pump drive)	Cam lobe width	Markings	Standard use	8 PORT HEAD	
				C-AEG 636	C-AEG 599
12A 1065	1/8"	Auto Mini Auto 1100			
12G 726	1/8"	2 rings Auto Mini Auto 1100			
AEG 523 AEG 522 AEG 323 AEG 538	1/8"	Allegro 1275 GT Midget III Sprite IV 1300 Marina 1.3			
C-AEG 567	1/8"	AEG 568			
C-AEG 542					
C-AEG 800	1/8"	3 rings Road Rally			
C-AEG 643	1/8"	707/1473 Rally			
C-AEG 529	1/8"	AEG 530 Race			
C-AEG 597	1/8"	AEG 598 Sprint			
C-AEG 595	1/8"	AEG 596 Super Sprint			
C-AEG 636	1/8"	AEG 637 Rally			
C-AEG 599	1/8"	AEG 600 Race			
Part Numbers (Pin oil pump drive)					
BG 712 2A 297 2A 571	1/8"	Mini			
12G 165 AEA 630	2 rings	1100 Midget Allegro			
AEG 148	1/8"	Cooper 'S' Midget II			
88G 229 2A 948 12A 122	1 ring	Cooper 997cc			
AEG 510	1 ring	Cooper 'S'			
C-AEA 731	3 rings	Road Rally			
C-AEA 648		AEA 649 Race			
Inlet opens BTDC					
Inlet closes ABDC					
Exhaust opens BBDC					
Exhaust closes ATDC					
Inlet period					
Exhaust period					
Cam lift					
Valve lift					
Running clearance					
Part Numbers					
BG 712 2A 297 2A 571					
12G 165 AEA 630					
AEG 148					
88G 229 2A 948 12A 122					
AEG 510					
C-AEA 731					
C-AEA 648					
AEG 523 AEG 522 AEG 323 AEG 538					
C-AEG 567					
C-AEG 542					
C-AEG 800					
C-AEG 643					
C-AEG 529					
C-AEG 597					
C-AEG 595					
C-AEG 636					
C-AEG 599					

For identification see markings and cam lobe width (3/8" = 9.5%, 1" = 12.7%)

- \* For checking, set rocker clearance to .019" (.48%)
- + For checking, set rocker clearance to .016" (.40%)

NB. See P.C.M.I. Microform Parts List of appropriate vehicle for full details of change-points.

Overheating

Assuming that the cylinder head gasket is not leaking due to distortion and that the correct sparking plugs, ignition timing and mixture are being used, check the running temperature with an accurately graduated gauge. Note the boiling points under pressure - 5 lb/sq.in. 226°F, 7 lb/sq.in. 232°F, 13 lb/sq.in. 246°F and refer to the pressure on the cap. If excessive temperatures are confirmed, possible cause may be found amongst the following paragraphs, but overheating in traffic can often be prevented by opening the water valve and running the heater so that this acts as an extra radiator.

Examine bottom hose on 'A' series engines in case heater outlet portion protrudes into the main bore. Cut off surplus with a sharp knife or replace if there is any sign of flaking. The water pump should be checked to ensure clearance between vane and body is no more than .020 to .030in. (.508 to .762%). The water pump intake bore should be as large as possible and the grinding of a slight taper into the bore will also assist flow. Ensure fan belt tension is adequate. A larger water pump 12G 1771 was fitted to the late Cooper 'S' models and the 1275 GT, this may be fitted to earlier models after grinding away part of the block casting to clear the pump rotor. A new bottom hose 12A 1550 MUST be fitted at the same time.

If existing thermostat is working correctly, it may be better to fit a colder operating one, such as 13H 3727 (74°C, 165°F). When thermostat is removed altogether it is essential to blank thermostat bypass, using sleeve kit C-AJJ 4012. On 'A' series engines, the bypass connection between head and water pump may be sealed.

After continual use in dusty conditions, the radiator core may become partially blocked with leaves and insects. This can be cleared by compressed air or a jet of water used in the opposite direction to normal air flow.

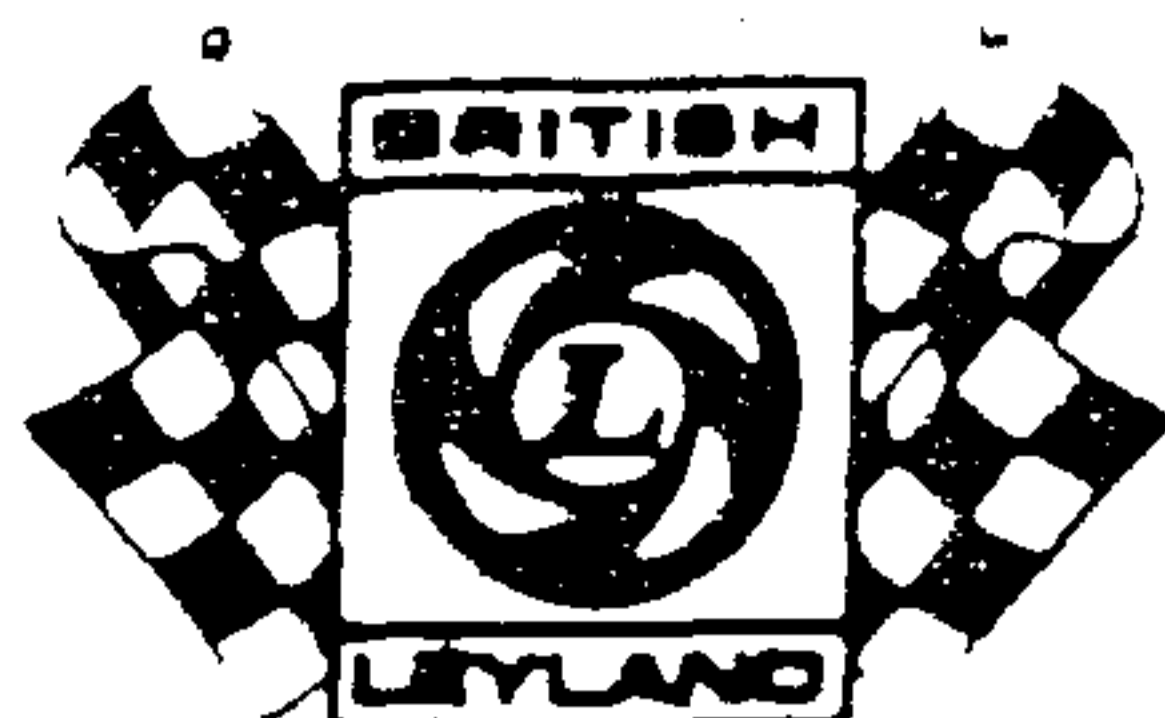
Obstructions to air flow, such as badges, extra lights and rally plates can all cause overheating, and should obviously be reduced as much as possible. If a sump guard is fitted, it is essential to use a large capacity cooler, and this is also desirable for competition or motorway use. On the Mini range use a cooler such as that contained in kit C-AJJ 3309. On the Clubman range use kit C-AJJ 4030. Full details for oil cooler installations are shown on the M.G.B. Midget and Sprite parts micro film but a larger one is available part number C-ARO 9875 for the M.G.B. and ARO 9809 can be fitted to the Midget and Sprite.

On the Mini Cooper 'S' the radiator efficiency was improved by changing from 13 gills per inch (25.4%) to 16 gills per inch (25.4%). This may be checked by counting vertically the number of horizontal fins in a given height of the radiator core. The latest Part No. ARA 2064 MUST be used with the correct cap ARA 2161 and improved top hose 12G 1164 on the 'S' only. This same radiator and cap can also be used on the Mini Cooper, but top hose 12G 104 must be used. For very severe conditions, an auxiliary radiator may be fitted to the Mini range using Kit C-AJJ 4011.

For the Mini range, 6 bladed fan 2A 998, Stiffener 2A 803 are the most efficient for cooling. The 11 bladed Plastic Fan 12G 1305 is quietest, but for racing 1 or 2 bladed Fan C-2A 997 may be used with stiffener 2A 803.

The latest thermostat Part Nos. are as follows:-

13H 3727 (74°C, 165°F), 13H 4070 (82°C, 180°F), 13H 4964 (88°C, 192°F).



# SPECIAL TUNING DATA

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ABINGDON-ON-THAMES · BERKSHIRE · ENGLAND

Model GENERAL

Sheet Z-5 Issue 1

The following chart shows Piston Dimensions for 'A' Series engines.

Part No.	12A 187 C-2A 946	12A 145	12A 280	12A 120	12A 673	12G 303	12G 306	12A 674
Bore	2.478"	2.478"	2.478"	2.478"	2.543"	2.543"	2.543"	2.543"
Pin Dia.	0.625"	0.625"	0.625"	0.625"	0.625"	0.625"	0.625"	0.625"
Compression Ht.	1.339"	1.339"	1.339"	1.495"	1.345"	1.194"	1.194"	1.366"
Piston Height	2.592"	2.592"	2.592"	2.718"		2.288"	2.288"	1.616"
Rings	4	4	4	4	4	4	4	4
Crown @	Flat	4.2cc	2.79cc	.87cc	5.69cc	6.9cc	2.46cc	2.16cc
O/S Available	+010" +020" +030" +040"	+010" +020" +030" +040"	+010" +020" +030" +040"	+010" +020" +030" +040"	+010" +020" +030" +040"	+010" +020"	+010" +020"	+010" +020"
Std. use (b)	9CG	9C	9CG L/C	848 Mini	998 Elf-Mini Hornet	ADO 16 AMM MGR-L/C	ADO 16 MGR 1098cc	998cc Cooper
Connecting Rods (c)	2A 654 2A 656	2A 654 2A 656	2A 654 2A 656	2A 654 2A 656	12G 123- 12G 126	12G 123- 12G 126	12G 123- 12G 126	12G 123- 12G 126
Comment (d)	c	c	c	c	Sp, Ff	Sd, Ff	Ff	Ff
Part No.	C-AEA 639	C-AEA 637	C-AEA 711	8G 2432 C-AEG 043	8G 2434	8G 2546	8G 2545	
Bore	2.538"	2.538"	2.667"	2.780"	2.780"	2.780"	2.780"	
Pin Dia.	0.687"	0.687"	0.687"	.813"	.813"	.813"	.813"	
Compression Ht.	1.400"	1.400"	1.339"	1.495"	1.495"	1.495"	1.495"	
Piston Height	2.152"	2.152"	2.092"	2.310"	2.310"	2.745"	2.745"	
Rings	3	4	3	4 (e)	4	4	4	
Crown (a)	3.55cc R	3.5cc R	Flat	Flat	6.6	11.13	15.8	
O/S	N11	N11	N11	See (e)	+010 +020	+010 +020	+010 +020	
Std use (b)	F	F	F	970cc 'S'	'S' 1071/1275	12cc	12cc	
Connecting Rods (c)	C-AEA 620 C-AEA 621	C-AEA 620 C-AEA 621	C-AEA 706 C-AEA 709	12G 176	12G 176	AEG 520	AEG 520	
Comment	Sd, I	Sd, I	Sd, I	I	Sd, I	Sd, I	Sd, I	

- (a) D = Dish, followed by approx. capacity of dish  
Flat = pistons have flat tops  
R = Raised, followed by approx. capacity of dome
- (b) Engine Prefix or car type, ADO 16 is 1100/1300 range  
FJ is Formula Junior  
S is Cooper 'S'  
12cc is Sprite/Midget
- (c) Connecting rods are handed, two off each required. One Part No. indicates four identical rods.
- (d) Sd means solid skirt, Sp split skirt piston, Ff means fully floating gudgeon pin, C means clamp type gudgeon pin, I means interference fit gudgeon pin requiring special tool
- (e) 8G 2432 available +.010" & .020" C-AEG 043 is only +040"  
3 ring piston C-AEG 190 available Std size only  
12G 176 and AEG 520 are interchangeable as sets, having identical dimensions