COBRA

CHASSIS INSTRUCTION BOOK

A.C. CARS
LIMITED

Registered Offices and Works:
THAMES DITTON, SURREY, ENGLAND

Sales, Service and Repairs Department:
HIGH STREET, THAMES DITTON, ENGLAND

and

SHELBY AMERICAN INC.,
1042 PRINCETON, VENICE, CALIFORNIA, U.S.A.
Tele. EX. 1-6389

FOREWARD

This book was written with the object of enabling the owner to maintain his car in perfect condition throughout its life.

The A.C. Cobra is designed and built at the A.C. Factory, England, and like all other machinery of advanced design needs regular care and attention to give maximum results. A little time spent now and then in this direction will be amply repaid by ultimate performance.

Shelby American Inc. are responsible for the conception of the car, and in America for the fitting of the engine, and gear box, manufactured by the Ford Motor Company of America.

A.C. Cars were happy to co-operate to produce a sports car of outstanding achievement.

This book will enable the owner to have a more intimate knowledge of the car he possesses, a knowledge which will benefit both owner and car alike.

The A.C. Cobra, on leaving the factory, is as perfect as is possible in every detail, through the efforts of the skilled craftsmen producing it, after that it is in the owner's hands to maintain the high standards which have made the A.C. car famous during 60 years of automobile production for quality and efficiency.

Telegrams:
"Autocarrier, Thames Ditton"

Telephone:
Emberbrook 5621

USEFUL INFORMATION

DIMENSIONS

Wheel Base:	7′ 6″.
Track:	Rear 4′ 3″. Front 4′ 2″.
Overall Length:	12′ 9″.
Width:	5′ 1″.
Height:	4′ 0″.
Weight:	2020 lbs.
Tyres:	640 × 15″ Front. 640 × 15″ Rear.
Petrol Tank Capacity:	15 galls. (Imp.).
Electrical Equipment:	Lucas 12 volt.
Capacity of Engine Sump:	6½ Imp. pints, including Filter.
Capacity of Rear Axle:	2½ Imp. pints, 3 U.S. pints, 1·4 litres.
Rear Axle Ratio:	3·54 to 1 Chassis No. CSX2069. 3·77 to 1 from Chassis No. CSX2070 America. England 3·54 to 1.
Capacity of Gear Box:	2¼ Imp. pints approx.
Capacity of Radiator:	24 Imp. pints approx.

Chassis Number located on Left or Right Front Wishbone mounting bracket and Plate on Right Hand Bulkhead.

Engine Number stamped on Block, Abutment below rear sparking plug left side of Engine and on Plate Right Hand Bulkhead.

IMPORTANT NOTE

Do not fit tyres of odd size to the rear wheels of the Cobra. Running the car in this condition may cause damage to the differential.

The engine of the car must not be run with one rear wheel off the ground with the car in gear. Under these conditions the "Powr-Lok' differential will drive the car off the jack.

It is possible to drive the transmission by raising both wheels clear of the ground and running the engine with the car in gear.

The limited slip differential mainly when hot causes a certain amount of grabbing when the car is making slight or sharp turns at low speeds. This is a normal function with the "Powr-Lok" differential system.

COOLING SYSTEM

IMPORTANT

If the water level in the radiator header tank is to be checked while the engine is hot, the pressure in the cooling system must first be released by half turning the header tank filler cap. This permits pressure to be released through the overflow. It is dangerous to completely remove the filler cap when the engine is hot without releasing the pressure as described.

Cars with aluminium radiators are fitted with a water bleed valve to the cooling system. This must be removed in conjunction with the header tank filler cap when topping up with water. The system is full when water commences to flow from the bleed valve aperture.

It is advisable to run the engine a few minutes with the bleed valve and filler cap removed after topping up with water, this will ensure there are no air locks left in the system.

After running the engine, the water height should again be checked and added to if necessary. Where there is no bleed valve fitted the engine should be run with the header tank filler cap removed following the same procedure.

PROPELLER SHAFT AND HALF SHAFTS

These units are manufactures by Messrs. Hardy Spicer to exceedingly fine limits and are balanced to give freedom from vibration at all speeds. The needle type universal joints will give long and satisfactory service provided normal servicing is given, including greasing. Three such greasing points are provided on each wheel drive shaft, one on each spider and one on the slip splined joint. Two are provided on the propeller shaft spiders. Lubrication is best carried out when the car is raised from the ground and positioning of the shaft is necessary to allow the grease gun to be applied. Attention every 2,000—3,000 miles will suffice.

Messrs. Hardy Spicer provide replacement Universal Joint Sets, these consisting of a spider, four bearing races with needle rollers and snap rings.

In dismantling the Universal Joint observe the positions, this is so that the yokes may be assembled in their original balance order.

Remove the spring clips and push or drive the spider to one side, this will allow the race and needle bearing to come away. Reverse the procedure to remove the other bearing. The spider with one end of the yoke can then be removed. This procedure should be repeated to release the spider itself.

In assembly, apply grease to retain the needles in the races and observe that the sliding yoke is fitted to the correct splines. The yoke arms being in line with each other.

Propeller Shaft Unit Order Number D.66309.

Half Shaft Unit Order Number D.66371.

SALISBURY DIFFERENTIAL UNIT 4HU

REMOVING THE COBRA DIFFERENTIAL ASSEMBLY COMPLETE

The differential casing is supported on three rubber mountings. Two of these are hanger bearings and are located on either side of the differential casing, the front bearing is mounted on the nose of the differential.

Unbolt the drive shaft flanges to the road wheels and the rear flange on the propeller shaft. Remove the front mounting bolts, and support the weight of the differential with a jack or block.

Remove the two side hanger mountings, it may be necessary to rotate the differential assembly when withdrawing the unit from the chassis.

DIFFERENTIAL MOUNTING

PART NUMBERS

FRONT SUPPORT CASTING	C-66091		(1)
Metalistic Mounting	13/1121	D-63784	(2)
Distance Piece	D-66202		(1)
Washer Internal Shake Proof $\frac{5}{8}$″			(2)
$\frac{5}{8}$″ B.S.F. Bolts $2\frac{3}{4}$″ long (Hex.)			(2)
$\frac{7}{16}$″ U.N.C. Bolts $1\frac{1}{4}$″ long	D-66198		(4)
Support packing	D-66196		(4)
SIDE SUPPORT CASTINGS	D-66534		(2)
Metalistic Mounting	13/860	D-63503	(4)
	D-63503		
Support Bolt with Self Locking Nut			
$\frac{5}{8}$ B.S.F. 7″	D-66208		(2)
$\frac{7}{16}$″ U.N.C. Bolts $1\frac{1}{2}$″ long	D-66199		(4)

THE SALISBURY "POWR-LOK" DIFFERENTIAL UNIT

WHY LIMITED SLIP DIFFERENTIALS ARE NEEDED

The purpose of a conventional differential is to provide equal torque division between the two road wheels whilst compensating for the difference in speed between the wheels when cornering. Since equal torque division is obtained at all times, the total torque transmitted is limited by the wheel with least adhesion. Whilst the limitation in performance of the conventional differential has been noticeable in the past when driving on ice or snow, these same factors are now assuming greater importance, due to the trend towards a lighter weight on the axle, combined with greater torque output from the engine. The Limited Slip Differential proportions the torque so that, at all times, the wheel with greater adhesion will transmit the greater portion of the torque available, whilst maintaining the necessary differential action on cornering.

POWR-LOK

The Powr-Lok design combines excellent performance with low initial cost and durability, and it is important to note that no other assembly combines these advantages to the same degree. In operation, the Powr-Lok combines the basic elements of the conventional differential with the restraint of friction clutches which provide the necessary torque bias. These basic features have been incorporated in a number of alternative designs but the Powr-Lok is unique in combining three alternative methods of loading which are supplementary and provide the necessary desirable qualities.

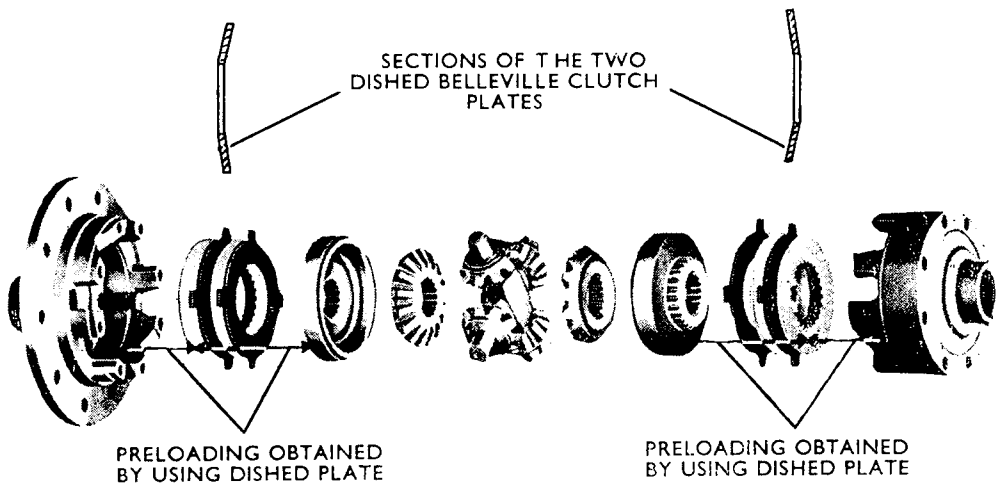
CONSTRUCTION

The cross pins which carry the pinion mates are so constructed that there is clearance at the intersection to permit relative movement between the two parts, each shaft having milled cam flats located in vee slots in the differential case halves. The pinion mates have shoulders engaging abutment faces on the clutch rings mounted adjacent to the differential side gears. The clutch rings and side gears have common splines locating on the axle shaft and the clutch rings are additionally provided with splined hubs carrying the alternative internally splined clutch plates. The remainder of the clutch plates are provided with 4 external lugs locating in slots in the differential case halves. All clutch plates are specially treated to obtain the desired friction characteristics and are flat with the exception of one plate for each assembly which is dished to provide a Belleville spring.

FRICTION CLUTCH LOADING

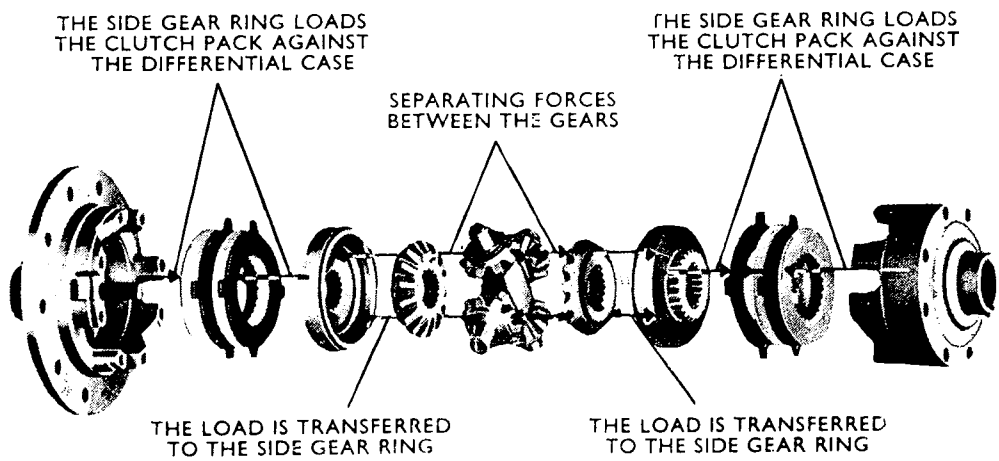
The loading of the friction clutches is effected by three different methods—

1. Belleville Spring. Since one of the plates in each clutch pack is dished to form a Belleville spring, the clutches are under a certain amount of pressure at all times and there is, therefore, effective restraint of free differential action, even if one wheel is clear of the ground. This point is of great importance, since the other means of loading are dependent on the degree of re-action at the axle shafts.



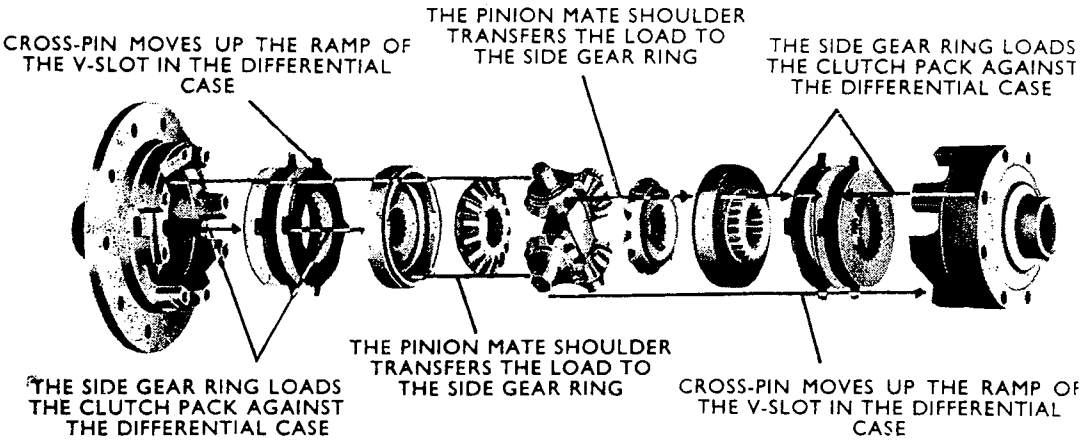
LOADING OF FRICTION CLUTCHES BY BELLEVILLE SPRING

2. The Separating Forces of the Differential Gears. As described, the differential side gear abuts against the side gear ring and the axial loading, due to the separating forces of the differential gears, is therefore transmitted to the clutch pack and this loading will be directly proportional to the torque transmitted by the gears.



LOADING DUE TO SEPARATING FORCES OF DIFFERENTIAL GEARS

3. Cam Loading. The cam faces of the cross pins which engage vee slots in the differential case halves, impose a loading on the cross pins along the axis of the differential when torque is transmitted by the differential assembly. This re-action is transmitted to the side gear clutch rings through the abutment shoulders on the differential pinion mates.



CAM LOADING OF FRICTION CLUTCHES

OPERATION

Under all normal driving conditions, the optimum balance between free differential action and frictional restraint of same is obtained due to the loading of the friction clutches by the combination of the differential gear separating forces and the cross pin cam loading. Since both these methods of loading are proportional to the torque transmission, there will be appropriate division of torque between the clutches and the differential gears. Under extreme conditions, however, when one wheel is on a surface giving extremely low or zero adhesion, it is necessary to provide additional torque bias, since the loading provided by the cam and gear forces depends upon there being a minimum degree of re-action at each axle shaft. In these circumstances, effective action is provided by the loading of the clutch packs by the Belleville springs.

It should be emphasized that the Powr-Lok design is unique, since the supplementary cam loading, in addition to the pressure on the clutch packs from the differential gears, makes it possible to use the minimum number of clutch plates, resulting in a compact assembly. It is also possible to utilize plates with comparatively low friction characteristics which can be maintained throughout the service life of the unit, hence the claim for durability.

POWR-LOK

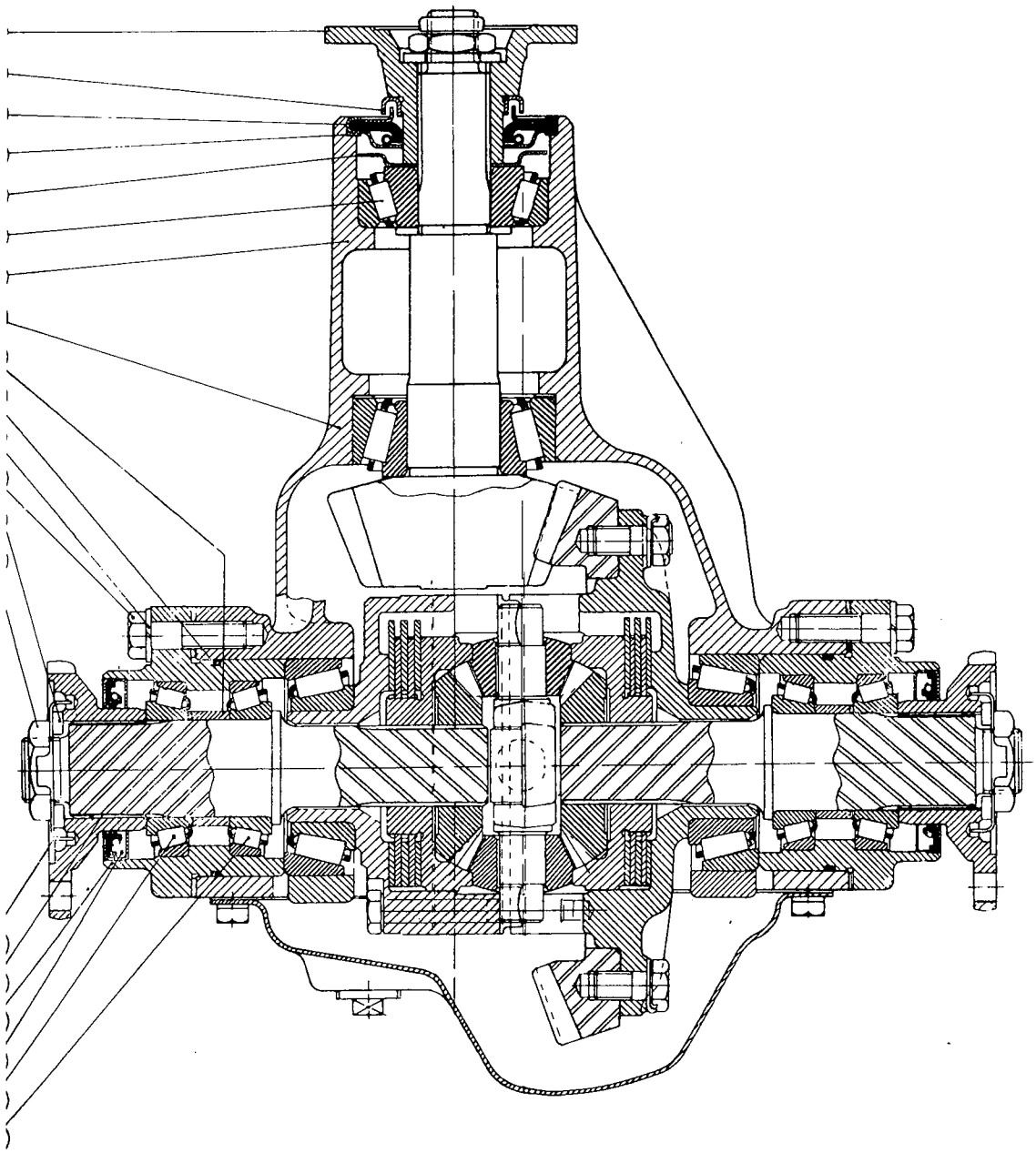
Will prevent a vehicle from becoming immobile when one driving wheel loses traction.

Provides vehicle stability under adverse road conditions.

Controls wheel spin and resultant shock loads.

Reliable and effective throughout the service life of the vehicle.

SALISBURY DIFFERENTIAL
DRAWING UNIT 4HU



DIFFERENTIAL

PART NUMBERS

1.	Front Differential Flange	KA-2-1-GB11
2.	Oil Thrower	2HA-021
3.	Oil Seal	2HA-019
4.	Seating Washer	2HA-020
5.	Oil Thrower	4HA-036
6.	Timkin Taper Roller Bearing	2HA-022
7.	Differential Casing	4HU-004-12
8.	Timkin Taper Roller Bearing	2HA-023
9.	Distance Piece	4HU-018
10.	Sealing Ring	4HA-079-2
11.	Spring Washer	7LW-13
12.	Casing retaining bolt	7B-NC 44
13.	Metal Retaining Washer	16W-28
14.	Retaining Nut	4HU-089-1
15.	Flange Tab Washer	4HU-091-1
16.	Inner Drive Shaft	4HU-005-4
17.	Inner Drive Shaft Retaining Casing	4HU-014-1
18.	Oil Seal	4HA-079-1
19.	Timkin Taper Roller Bearing	4HU-025

REAR AXLE

Service tools recommended by Salisburys Ltd.

SERVICE TOOL LIST

Tool No.	Description
SE.101	Universal Dial Test Indicator, Catalogue No. 160, supplied by J. E. Baty & Co., Ltd., 39 Victoria Street, London, S.W.1.
SE.103	Pinion and Differential Bearing Cone Puller.
SE.105	Pinion Bearing Cup Extractor.
SE.106	Bearing Cup Installation Tool.
SE.107	Pinion Cone Setting Gauge.
SE.108	Pinion Oil Seal Installation Collar.

Complete sets of Service Tools are available from Messrs. V. L. Churchill & Co., Ltd., Great South West Road, Bedfont, Middlesex.

SERVICE DATA

	Model	6HA	HA	3HA	4HA	2HA	5H
(a)	Pinion Drop "A"	1·000″	1·250″	1·375″	1·500″	1·750″	1·75
	Zero Cone Setting "B" ...	2·000″	2·125″	2·250″	2·625″	2·750″	2·96
	Mounting Distance "C" ...	3·375″	3·625″	3·937″	4·312″	4·625″	4·90
	C/L to Brg. Housing "D" ...	4·193″	4·848″	5·130″	5·505″	5·818″	6·13
		4·183″	4·838″	5·120″	5·495″	5·808″	6·12
(b)	Axle Shaft End Float	·006″ to ·008″ all Models					
	Torque Spanner Setting, Drive...	40-50	40-50	$\frac{3}{8}$″ 50-60	$\frac{3}{8}$″ 50-60	40-50	70-
	Gear Bolts Lbs. Ft. ...			$\frac{7}{16}$″ 70-80	$\frac{7}{16}$″ 70-80		
	Diff. Preload Shim Allowance...	·005″ all Models					
	Backlash	As etched on Drive Gear (Minimum) ·004″)					
	Pinion Bearing Preload ...	8-12 lbs. in all Models					

Service data concerning the 4HU differential is the same as the 4HA unit indicated above.

REFER TO PAGE 31 FOR RECOMMENDED OILS.

REMOVAL OF REAR HUB

DISMANTLING REAR HUBS AND BEARINGS

Note: Before removing rear bearings the brake caliper must be removed as directed on page 12.

Disconnect Salisbury Flange to drive shaft, Fig. 10 (4HU.077-2).

Remove hub flange bolt, Fig. 6 (D.66074).

Remove the tab washer, Fig. 12 (4HU.091.1).

Remove Salisbury washer, Fig. 11 (16W-28).

It will then be possible to press out the hub, Fig. 4 (C.66054-5), complete with disc, Fig. 5 (B.66471).

REMOVAL REAR BEARINGS

Remove six set bolts, Fig. 18, securing bearing end cap, Fig. 2 (C.66052).

Withdraw end cap, Fig. 2 (C.66052), and remove outer bearing, Fig. 14 (R & M LJ $1\frac{1}{2}$) complete with oil seal, Fig. 15 (200-275-10).

Remove bearing distance piece, Fig. 7 (D.66084), insert drift through front of hub and tap out inner ball race, Fig. 14 (R & M LJ $1\frac{1}{2}$) and rear oil sea., Fig. 16 (187-337).

Care must be taken not to damage lips on oil seals when re-assembling.

Ensure that oil seals are re-assembled with lips facing inwards.

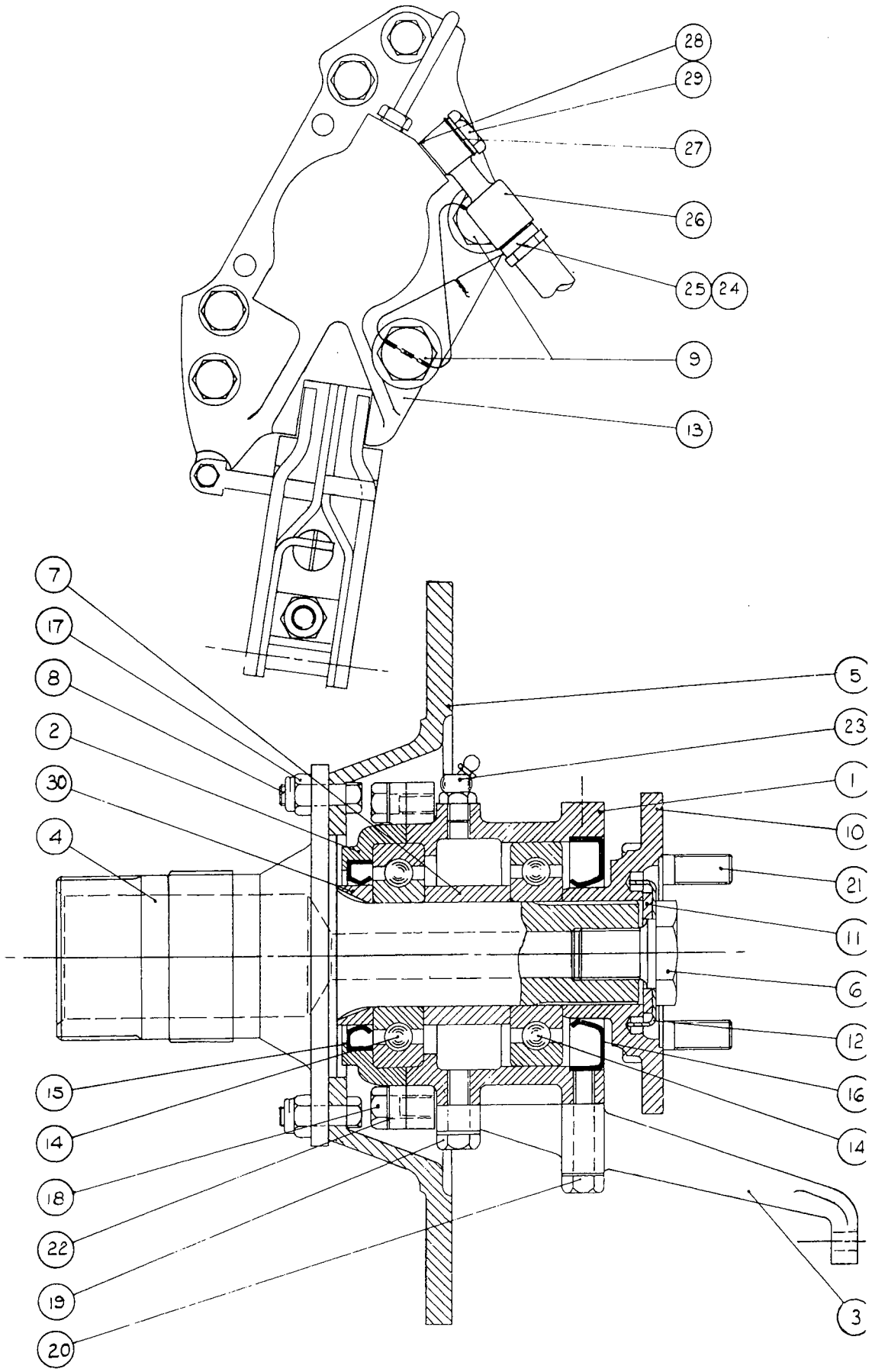
Note; Refer to rear hub drawing when carrying out these operations. Page 11.

REAR HUB AND CALIPER

PART NUMBERS

1.	B.66050-1	Rear Carrier	1 Pr.
2.	C.66052	End Cap	2
3.	D.66053	Handbrake Abutment	2
4.	C.66054-5	Rear Hub	1 Pr.
5.	B.66471	Rear Disc	2
6.	D.66074	Bolt—Hub Flange	2
7.	D.66084	Bearing Distance Piece	2
8.	D.66089	Rear Disc Bolt	12
9.	D.66481	Caliper Bolt	4
10.	4HU.077-2	Flange Salisbury	2
11.	16W-28	Washer Salisbury	2
12.	4HU.091-1	Tab Washer Salisbury	2
13.	64032764/5 EX	Caliper Girling 12/3 H.	1 Pr.
14.	LJ$1\frac{1}{2}$	Bearing R. & M.	4
15.	200-275-10	Oil Seal Burtonwood	2
16.	187-337	Oil Seal Burtonwood SIC.5-1180-A	2
17.		$\frac{5}{16}$" B.S.F. Self Locking Nut	12
18.		$\frac{5}{16}$" B.S.F. × $\frac{3}{4}$" Hex. Bolt	12
19.		$\frac{5}{16}$" B.S.F. × 1" Hex. Bolt	2
20.		$\frac{5}{16}$" B.S.F. × $1\frac{1}{2}$" Hex. Bolt	2
21.	A25 7L	$\frac{7}{16}$" B.S.F. Bolt	8
22.		$\frac{5}{16}$" Internal Shake Proof Washer	16
23.	GN 25	$\frac{5}{16}$" B.S.F. Greaser	1 Pr.
24.	3700634W	Flexible Hydraulic Pipe	2
25.	378711	Connecting Washer	2
26.	352203W	Banjo 64474288	2
27.	378700	Banjo Gasket	2
28.	378711	Banjo Gasket	2
29.	376102W	Bolt for Banjo	2
30.	D.66325	Seal Distance Piece	2

REAR HUB AND CALIPER DRAWING



TO REMOVE CALIPER—REAR BRAKES

1. Remove rear wheel.
2. Remove split pin and clevis pin from handbrake abutment. Fig. 3. (D.66053).
3. Remove wire on two caliper holding Bolts. Fig. 9.
4. Remove caliper holding bolts. Fig. 9 (D.66481).
5. The caliper must be suspended from the wishbone to prevent damage to the hydraulic brake pipe.
6. If the banjo bolt, Fig. 29 (376102W) is removed and the hydraulic pipe disconnected, care must be taken that brake fluid is not permitted to drop on car paintwork.
7. It will be necessary to bleed the brakes if the hydraulic brake pipe is disconnected.

Note: Refer to rear hub drawing when carrying out this operation. Page 11.

REAR UPRIGHT REMOVAL

Remove caliper as stated.

Remove nut and top pin from spring.

Remove four universal joint flange bolts, Fig. 21 (A 25.7L $\frac{7}{16}''$ B.S.F. Bolt), and disconnect Salisbury flange. Fig. 10 (4HU.077-2).

Undo end nut, pull off shock absorber.

Undo clamp bolt from bottom of upright.

Drive out bottom pin.

REMOVAL OF FRONT HUB

Castor Angle 7°.

Camber Angle front 1° Positive.

Camber Angle rear 2° Negative.

Toe in front wheels 1/16th.

King Pin inclination 10°.

DISMANTLING FRONT HUB AND BEARINGS

Note: Before removing front bearings the brake caliper must be removed as directed on page 17.

Undo and remove the $\frac{9}{16}''$ slotted nut and split pin Figs. 39 and 40, the D washer Fig. 33 (D.66446) and Plain washer Fig. 38. The Timken bearing Fig. 32 (LM11949-LM11910) will then be exposed.

The Hub Fig. 1 (C.66353/4) may then be removed complete with the brake disc Fig. 2 (B.66490).

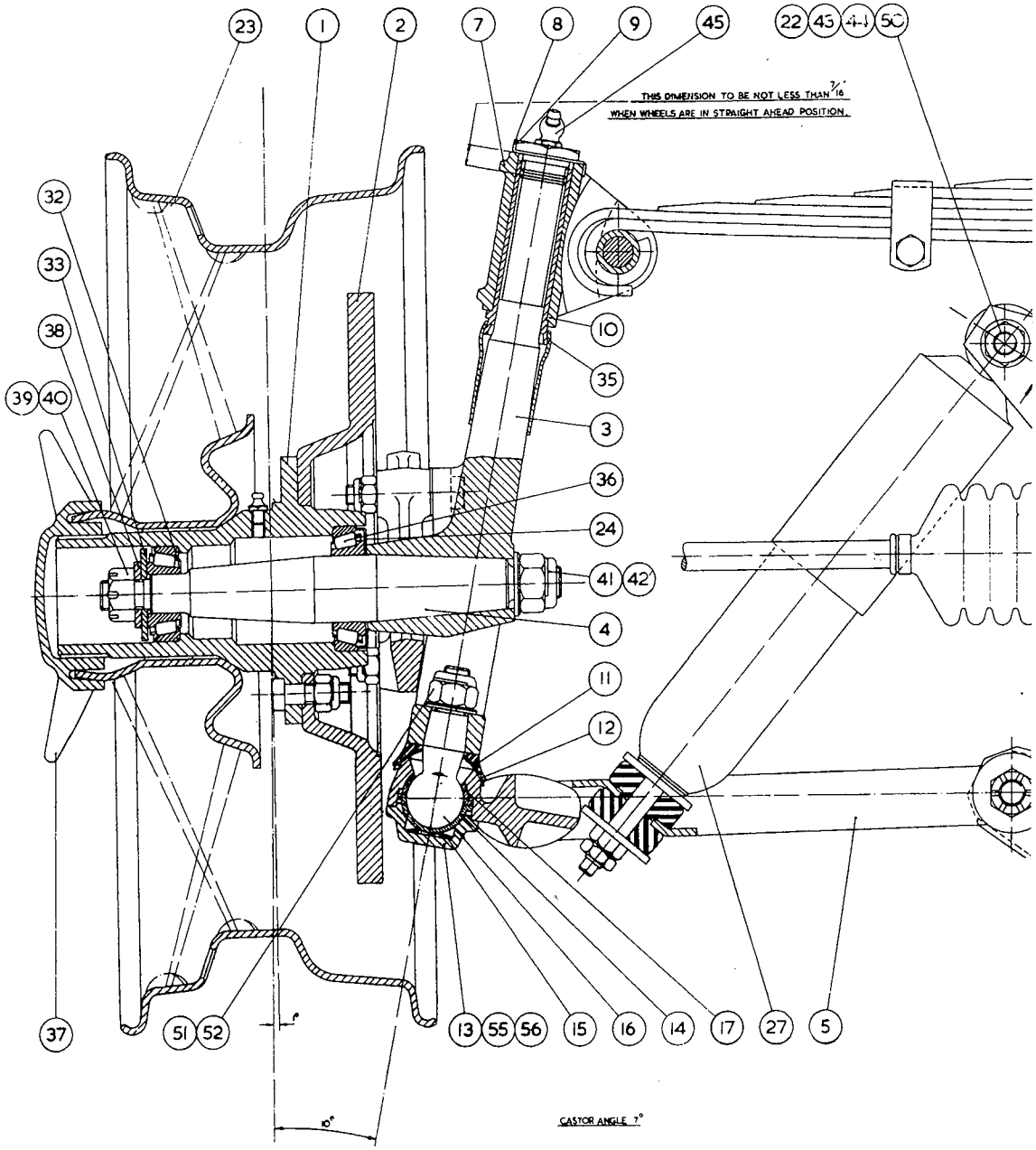
REMOVAL FRONT BEARINGS

It will be found that the outer Timken bearing Fig. 32 (LM 11949-LM11910) will withdraw with the hub. The inner Timken bearing Fig. 36 (LM67048-LM67010) and the oil seal ring Fig. 24 (D.66445) may now be withdrawn from the stub axle Fig. 4 (D.66359).

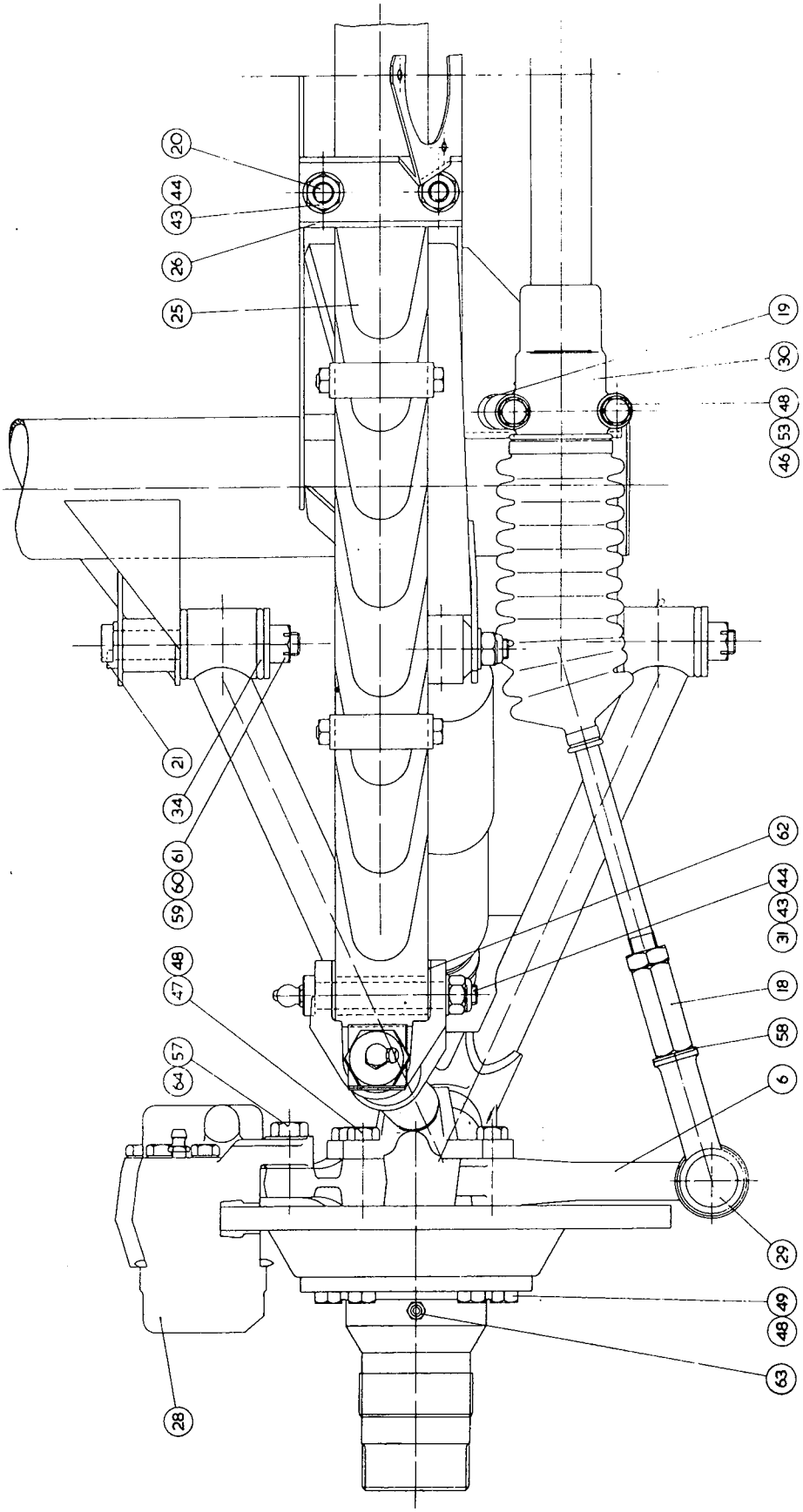
To remove the stub axle Fig. 4 (D.66359) undo and remove the self locking nut Fig. 41 and the plain washer Fig. 42.

The stub axle Fig. 4 (D.66359) is a taper fit in the vertical link Fig. 3 (B.66317) and may be removed without difficulty.

FRONT HUB AND SUSPENSION
DRAWING A



FRONT HUB AND CALIPER
DRAWING B



FRONT HUB SUSPENSION AND CALIPER

PART NUMBERS

1.	C.66353/4	Front Hub	1 Pr.
2.	B.66490	Disc	2
3.	B.66317	Vertical Link	2
4.	D.66359	Stub Axle	2
5.	B.66575/6	Front Wishbone	2
6.	C.66460/1	Steering Arm	1 Pr.
7.	C.66330/1	Yoke	1 Pr.
8.	D.66362	Locking Tab	2
9.	D.66361	Yoke Bush Cap	2
10.	D.66360	Yoke Bush	2
11.	D.66368	Rubber Dust Shield	2
12.	D.66367	Dirt Shield	2
13.	D.66329	Ball Cap	2
14.	D.66370	Glacier D.U. Hemisphere No. FH.1125	2
15.	D.66407	Terrys Belleville Washer	2
16.	D.66366	Ball Pin	2
17.	D.66369	Inner Hemisphere	2
18.	D.66364	Tie Rod Adapter	2
19.	D.66363	Rack Mounting Distance Piece	4
20.	D.66203	Spring Bolt Unit	2
21.	C.62300	Wishbone Mounting Bolt	4
22.	D.60106	Shock Absorber Distance Piece	2
23.		Centre Lock Wire Wheel 6DM4408 Dunlop	2
24.	D.66445	Seal Ring	2
25.	C.66086	Front Spring	1
26.	C.66430	Electric Fan Main Support Assembly	1
27.	D.66355	Front Shock Absorber	2
28.	64032770/1EQ	Caliper Girling Ltd. Type 16/3	1 Pr.
29.		Ball Joint Assy. Cam Gears Ltd. No. 19320	2
30.		Left Hand Rack and Pinion	1
31.	D.60153	Top Shackle Pin	2
32.		Timken Bearing LM.11949, LM.11910	2
33.	D.66446	D. Washer	2
34.		Metalastik Bush 13/935 Type BCT	8
35.	D.66444	Sleeve	2
36.		Timken Bearing LM.67048—LM.67010	2

P.T.O.

37.	415, 416	Hub Cap	1 Pr.
38.		$\frac{9}{16}$″ Plain Washer	2
39.		$\frac{9}{16}$″ B.S.F. Slotted Nut	2
40.		Split Pin, $\frac{1}{8}$″ dia., $1\frac{1}{2}$″ long	2
41.		$\frac{5}{8}$″ B.S.F. Self-locking Nut	2
42.		Plain Washer, $\frac{11}{16}$″ 1/D × $1\frac{11}{32}$″ O/d 8G	2
43.		$\frac{7}{16}$″ B.S.F. Self-locking Nut	8
44.		$\frac{7}{16}$″ Plain Washer	8
45.		$\frac{1}{4}$″ B.S.F. 35° Angle Greaser	4
46.		$\frac{3}{8}$″ Plain Washer	4
47.		$\frac{3}{8}$″ B.S.F. Bolt, 2″ long	6
48.		$\frac{3}{8}$″ B.S.F. Self-locking Nut	20
49.		$\frac{3}{8}$″ B.S.F. Bolt, $1\frac{1}{4}$″ long	10
50.		$\frac{7}{16}$″ B.S.F. Bolt, $2\frac{1}{2}$″ long	2
51.		$\frac{1}{2}$″ B.S.F. Self-locking Nut	2
52.	D.66448	Special Washer	2
53.		$\frac{3}{8}$″ B.S.F. Bolt, $2\frac{3}{4}$″ long	4
55.	D.66447	Socket Head Screws	4
56.		$\frac{5}{16}$″ Spring Washer	4
57.	D.66483	Caliper Bolt	4
58.		$\frac{9}{16}$″ Internal Shake-proof Washer	2
59.		$\frac{1}{2}$″ B.S.F. Slotted Nut	4
60.		Split Pin, $\frac{3}{32}$″ dia. × $1\frac{1}{4}$″ long	4
61.	D.62321	Wishbone Bush Clamp Washer	4
62.		Thrust Washer (Vandervell 840B)	4
63.		$\frac{1}{4}$″ B.S.F. Greaser straight	2
64.		$\frac{1}{16}$″ dia. Soft Locking Wire	

TO REMOVE CALIPER FRONT BRAKES

1. Remove front road wheel.
2. Remove caliper bolt locking wire, Fig. 64.
3. Undo and remove the two $\frac{7}{16}$" caliper holding bolts, Fig. 57 (D.66483).
4. The caliper, Fig. 28, must be suspended from the wishbone to prevent damage to the hydraulic brake pipe when the holding bolts are disconnected.
5. If the hydraulic brake pipe is disconnected care must be taken that brake fluid is not permitted to drop on the car body work.
6. It will be necessary to bleed the brakes as indicated on page 28 if the hydraulic brake pipe is disconnected.
7. When removing the caliper it will assist if reference is made to the front hub and caliper drawings, pages 13 and 14.

VERTICAL LINK REMOVAL—FRONT SUSPENSION

Remove the nut from the steering ball joint, Fig. 29, and disconnect steering arm, Fig. 6 (C66460/1), from the steering tie rod.

Remove the $\frac{7}{16}$" self-locking nut, Fig, 43, the plain $\frac{7}{16}$" washer, Fig. 44, and tap out the top shackle pin, Fig. 31 (D.60153), remove the $\frac{1}{2}$" B.S.F. self-locking nut, Fig. 51, and the special washer Fig. 52 (D.66448), the vertical link will then pull away from the wishbone end.

STEERING

LUBRICATION

The use of S.A.E.140 Hypoid oil is recommended for the steering rack, and only if this is not available may another heavy gear oil be substituted.

ADJUSTMENT

The steering damper is pre-set to provide the required amount of damping effect and should not be altered.

REMOVAL OF STEERING WHEEL

Remove the A.C. monogram from the steering wheel centre, undo and remove the exposed nut and washer. The steering boss aluminium casting is a tight fit and it may be necessary to make use of a draw to effect removal.

If the indicator and horn lever is to be removed, undo the grub screw located on the lever housing, disconnect the five electric wiring snap connections beneath the dashboard. The complete housing may then be removed from the steering column.

STEERING COLUMN REMOVAL

Remove the four pinch bolts at the top and base of the steering column lower section.

Slide the two universal joints together on the splines provided at both ends of column, it will then be possible to lift out the section complete.

To remove the top part of the column, undo the pinch bolts at the base of the shaft in the driving compartment.

Undo the slide bolt under the dashboard, the top column section may then be removed.

REMOVING STEERING RACK FROM CHASSIS

Jack up the front of car and remove road wheels. Loosen the pinch bolts on the steering column and pinion splines. Fig. 21 (steering drawing). Undo and remove the four $\frac{3}{8}$" B.S.F. self-locking nuts from the steering rack assembly Fig. 48 (front hub and caliper drawing), undo the holding nuts on the steering arm ball joints Fig. 29 (front hub and caliper drawing).

The rack should be moved towards the radiator to provide clearance for the pinion shaft, and may then be removed through the wheel arch aperture.

When removing the steering rack from a right hand drive Cobra, the radiator should be drained and the bottom hose with the aluminium casting should be removed to obtain the necessary clearance.

Remove the rivets from the wing valence anti-splash plate, located by the wishbone front arm and bend outwards the aluminium panel with the attached rubber splash guard to provide clearance for rack withdrawal.

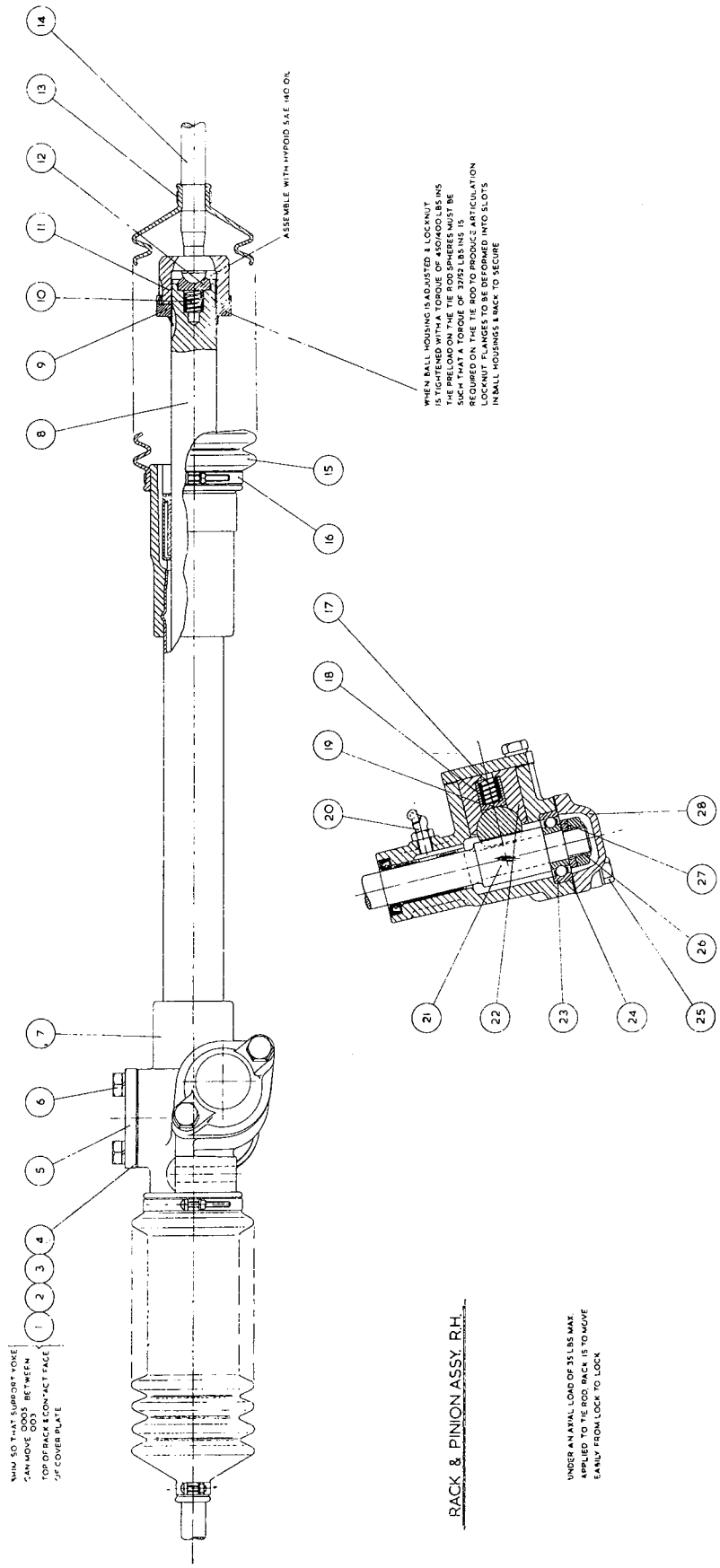
REFITTING THE STEERING RACK

The foregoing instructions will naturally be reversed when refitting the steering column.

STEERING ADJUSTMENT

The steering is mounted on a slide at the top end of the column, to raise or lower the steering undo the slide securing bolt, behind the dashboard, together with the bolt located at the lower end of the column in the driving compartment, the steering may then be adjusted to the desired position. Re-tighten bolts.

STEERING DRAWING



PART NUMBERS

1.	18681	Shim, ·0024″	As required
2.	18683	Shim, ·010″	As required
3.	18682	Shim, ·005″	As required
4.	19139	Joint	1
5.	19135	Cover Plate	1
6.	18271-S	$\frac{5}{16}$″ U.N.C. Bolt, $\frac{7}{8}$″ long	2
7.	70173	Rack Housing Assembly—Right-hand Drive	1
	70177	Rack Housing Assembly—Left-hand Drive	1
8.	19003	Rack for Left and Right-hand Drive Cars	1
9.	19008	Locknut	2
10.	18255	Thrust Spring	3
11.	19007	Ball Housing	2
12.	19004	Ball Seat	2
13.	16057	Seal Clip—Outer	2
14.	19006	Tie Rod	2
15.	18685	Rack Seal	2
16.	15258	Seal Clip—Inner	2
17.	18255	Thurst Spring	3
18.	13443	Damper Pad	1
19.	19498	Plain Washer	1
20.	19424	Grease Nipple—Right-hand Drive	1
	15771	Grease Nipple—Left-hand Drive	1
21.	19500	Pinion—Right-hand Drive	1
	19499	Pinion—Left-hand Drive	
22.	19136	Support Yoke	1
23.	18676	Ball Bearing	1
24.	18679	Joint	1
25.	18686-S	$\frac{5}{16}$″ U.N.C. Bolt × $1\frac{1}{4}$″ long	2
26.	18677	Nut	1
27.	15481	$\frac{5}{8}$″ Spring Washer	1
28.	18678	End Cover	1

BRAKE INSTRUCTIONS

DESCRIPTION—THE GIRLING DISC BRAKE

Front Disc Diameter 11 11/16". Rear Disc Diameter 10¾".

The Girling Disc Brake is of simple construction consisting basically of a disc made from high quality cast iron and a cast iron caliper mounted on a support bracket.

The disc, which is attached to and rotates with the hub, is straddled by the caliper, held by two studs on the stub axle flange. On each side of the caliper the cylinders contain a rubber sealing ring positioned in a groove in the body and a piston protected by a dust cover. Inserted between the piston and the disc is the segmental lining pad bonded to a steel plate which is held in the body by retaining pins or plates.

Upon application of the brake pedal the hydraulic pressure generated in the system causes the co-axially aligned pistons to apply equal and opposite pressure by the friction pads on the rotating disc in direct proportion to the foot effort applied to the pedal.

When the pressure is released and the compression on the disc relieved, the pads and the pistons remain in a relaxed position with the pad just touching the disc ready for the next application. In this manner adjustment for lining wear is automatic and no manual adjustment is required.

The present disc brake has friction segments which operate on a small area of the braking surface leaving a large proportion of the disc exposed to the atmosphere, allowing maximum dissipation of heat.

Girling disc brakes fitted to the Cobra are self compensating and require no adjustment whatsoever. The hand brake from chassis CSX2188 is self adjusting and requires little attention. Instructions for adjusting the earlier types of brake are given on page 27 under separate heading.

RUNNING ADJUSTMENTS

CYLINDER MAINTENANCE

In order to replace the rubber rings or seals, it is necessary to remove the caliper assembly from the vehicle. The brake segments should be removed in the manner described and instead of pushing the pistons to the bottom of the bore withdraw them from the caliper body taking care not to damage the surfaces. The sealing rings may then be removed by inserting a blunt tool under the seals and prising out, taking care not to damage the locating grooves. Examine the bores and pistons carefully for any signs of abrasion or "scuffing".

It is important that in cleaning the components no petrol, paraffin, trichlorethylene or mineral fluid of any kind should be used. Clean with methylated spirits, allow to vaporize leaving the components clean and dry.

After cleaning and examining, lubricate the working surfaces of the bores and pistons with clean genuine Castrol Girling Brake and Clutch Fluid Crimson.

ASSEMBLING

Fit new rubber seals into the grooves of cylinder bore. Locate the rubber dust cover with the projecting lip in the groove provided, the outer one, in the cylinder bore.

Insert the piston, closed end first, into the bore taking great care not to damage the polished surface. Push the piston right home then engage the outer lip of the rubber boot in the groove.

The replacement of the lining pads as described on page 25 will retain the pistons in position.

Refit the caliper assembly to the support bracket by means of the two securing bolts confirming that the disc passes between the two pads. If packing shims are assembled between the caliper and the mounting face, it is important to replace them as initial assembly.

Re-connect the hose and bleed the brakes. Page 28.

LINING PAD REPLACEMENT

It is time to consider replacement when the lining pad is approximately $\frac{1}{8}''$ thick and under no circumstances should the pad be allowed to wear below $\frac{1}{16}''$ in thickness.

It is advisable to remove and reverse the positioning of the pads on front and rear brakes at 2,000 miles intervals. This procedure will not be necessary with the parking brake.

Note: Some Girling calipers are made in paired halves bolted together, it should be emphasized that no useful purpose can be served by separating the two halves of the caliper.

It should also be noted that some calipers are manufactured with an end plug on the side; these are tightened into the calipers by the manufacturers by special process and no attempt should be made to disturb them in the service.

CLUTCH BLEEDING

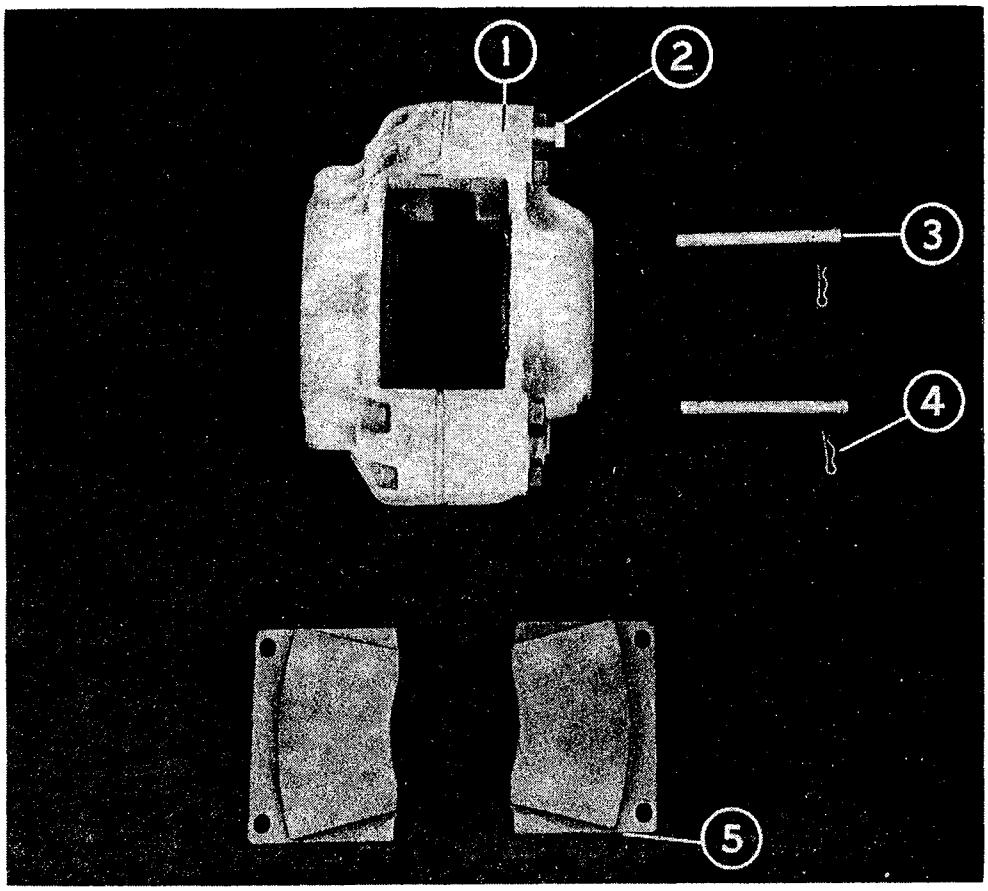
The Clutch hydraulic system may be bled in the same manner as the brake system explained on page 28, the bleed tube should be attached to the clutch slave cylinder and the clutch pedal depressed until all air is expelled from the system.

After bleeding the clutch the reservoir should be topped up with Castrol Girling brake and clutch fluid crimson.

The clutch reservoir should be examined and topped up during service periods, 2,000 mile intervals together with the two brake reservoirs, which are mounted on the bulkhead under the bonnet. The clutch reservoir is visible below the brake reservoirs.

GIRLING FRONT BRAKE CALIPER
TYPE 16/3
PART NUMBER 64032770/1EQ

1. Front Brake Caliper
2. Brake Bleeder
3. Pad Retaining Shafts
4. Split Pin
5. Brake Pad



REMOVAL AND REPLACEMENT FRONT BRAKE PADS

1. Withdraw split pins on both pad retaining shafts.
2. Withdraw both pad retaining shafts. These are withdrawn and replaced from the inside of both calipers.
3. It will now be possible to withdraw both pads complete with metal backing plates.

REMOVAL AND REPLACEMENT REAR BRAKE PADS

1. Withdraw split pins on both pad retaining shafts.
2. Withdraw both retaining shafts.
3. It will now be possible to withdraw both brake pads complete with metal backing plates.

HAND BRAKE REPLACEMENT BRAKE PADS

1. Hold back spring tensioner and remove rubber dust cap from brake adjuster.
2. Remove split pin on pull rod pivot pin.
3. Tap out pivot pin.
4. Pull apart clamping levers and push down brake pull rod to permit easy withdrawal of brake pads.
5. The pads are both held by retaining springs which must be released before pads may be withdrawn.
6. It should now be possible to remove brake pads and backing plates from the socket provided without difficulty.

Note: When replacing rear brake pads the car must be jacked up and the road wheels removed.

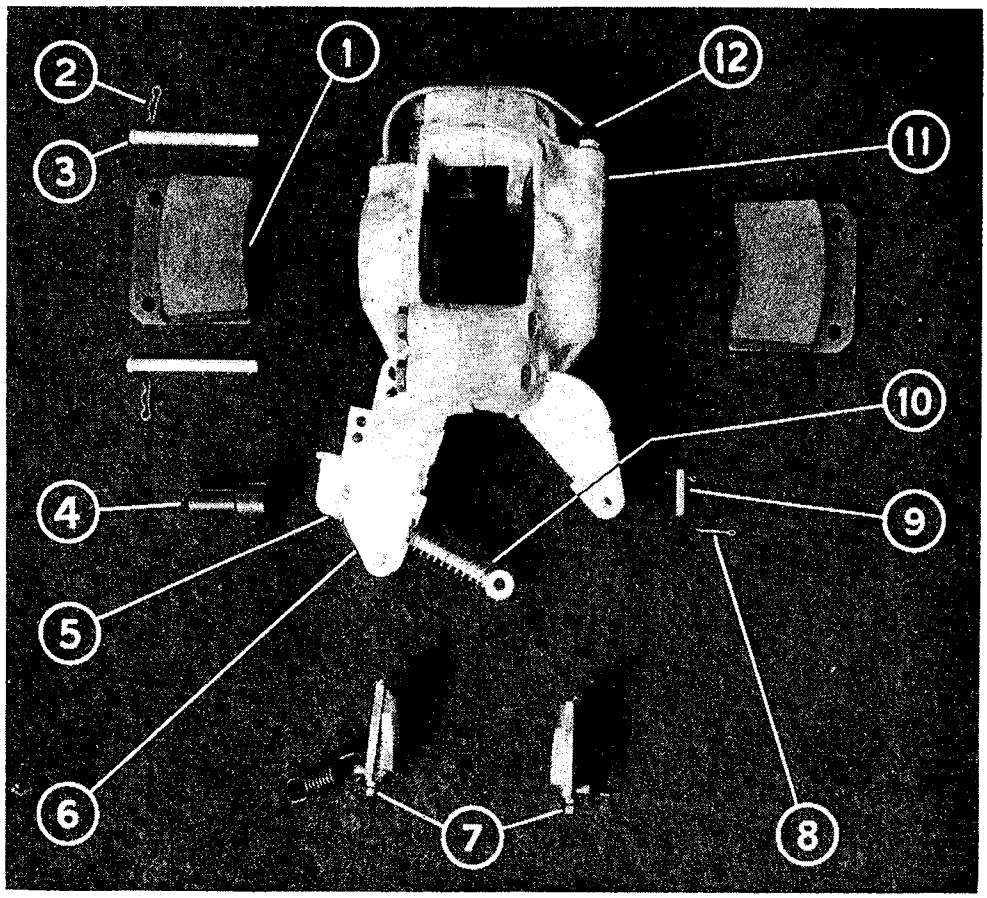
Access to the parking brake adjusting nut is possible with the road wheels still in position.

When ordering new front or rear brake pads quote brake part number.

GIRLING REAR BRAKE CALIPER TYPE 12/3H

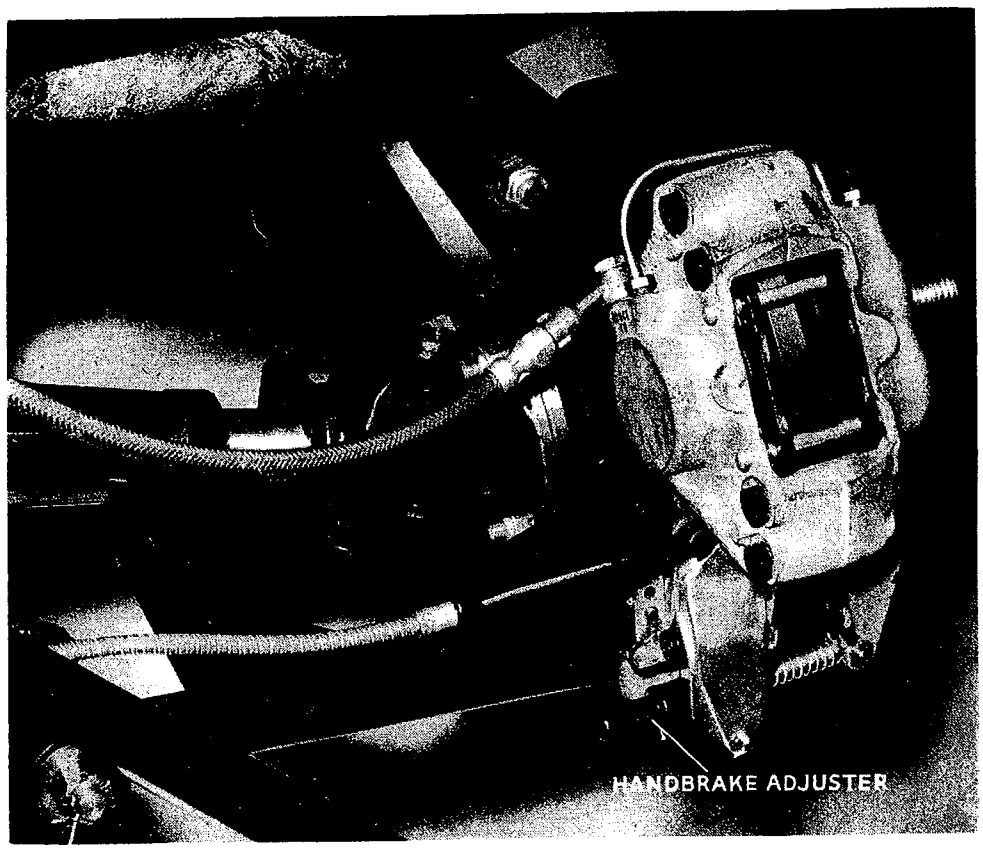
PART NUMBER 64032764/5 EX

1. Rear brake pad.
2. Shaft retaining split pin.
3. Pad retaining shaft.
4. Automatic hand brake adjuster.
5. Hand brake adjuster dust cap.
6. Hand brake pull-rod.
7. Hand brake pads.
8. Split pin.
9. Pull-rod pivot pin.
10. Hand brake pull-rod.
11. Rear brake caliper.
12. Brake bleeder.



HANDBRAKE ADJUSTMENT

From chassis CSX.2188 the handbrake pads are self-adjusting for wear. Should it become necessary to fit new pads as described on page 25, adjustment for clearance is automatically effected by applying the handbrake. It may be necessary to slacken off the adjuster slightly to allow for the increased thickness with the new pads. The handbrake cable is preset before the car leaves the works and should not require further adjustment when new pads are fitted.



The following information concerns earlier Cobras with Chassis Nos. up to and including CSX.2187—

Adjustment for wear on the handbrake pads must be maintained so that there is not more than ·003″ between the disc and each pad. An operating lever and pull-rod is employed, adjustment is made by tightening the adjusting nut on the pull-rod. No alteration to the handbrake cable or linkage should normally be made.

If the play is excessive in the handbrake cable and/or linkage, the pads should be tightened on to the disc by the adjusting nut, the handbrake cable adjusted, and the adjustment at the pull rod slackened to provide the correct pad clearance.

The handbrake must be in the off position when these adjustments are taking place.

BLEEDING THE SYSTEM

The process of bleeding is necessary only when a portion of the system has been disconnected, or when the level in the supply tank has been allowed to fall too low, thus permitting air to enter the fluid circuit. It consists of removing any air which may have found its way into the system. The GIRLING BRAKE FLUID used is specially prepared for the purpose and it is important that no other fluid be introduced into the system for replenishment or serious trouble will ensue.

PROCEDURE

The brake located the furthest distance from the Master Cylinder should be bled first so in the case of left-hand drive cars the following sequences should be adopted:

Rear Right-hand Wheel.
Rear Left-hand Wheel.
Front Right-hand Wheel.
Front Left-hand Wheel.

When bleeding the brakes on a R.H.D. car proceed as follows:

Rear Left-hand Wheel.
Rear Right-hand Wheel.
Front Left-hand Wheel.
Front Right-hand Wheel.

Bring all brake pads into contact with the discs by pumping the brake pedal a few times.

Fill up supply tank with fluid, exercising great care to prevent entry of dirt.

Take one brake at a time, jack up car and remove road wheel. Remove the rubber cover from the bleeder nipple of the brake cylinder, this will be found on the outside of the caliper. Fit rubber bleeder tube in its place, and allow to hang in a clean container or glass jar, always keeping end of tube below surface of fluid.

Unscrew the nipple about three-quarters of a turn with a suitable spanner, and operate brake pedal up and down a few times, lifting foot free from pedal after each application. One or two strokes will cause fluid to commence flowing, but pumping must be continued until the fluid appears entirely free from air. It is important that the reservoir is frequently replenished during this operation as should it be allowed to become empty, more air will be drawn into the system. After expelling all traces of air, tighten nipple with brake pedal depressed and repeat procedure with other wheels.

On completion make sure that reservoirs are topped up to correct level, i.e., three-quarters full.

Later Cobras from Chassis CSX.2165 inclusive are fitted with a Twin Master Cylinder braking system, the dual reservoirs are located under the bonnet on the bulkhead just above the clutch reservoir.

Never use any fluid other than genuine Castrol Girling Brake and Clutch Fluid Crimson which can be obtained from any Girling Agent or direct from Messrs. Castrol Limited.

Always fit Girling factory replacement brake pads.

FRONT AND REAR SHOCK ABSORBERS

The Armstrong Hydraulic Heavy Duty Damper is fitted as a standard component to the suspension of the A.C. Cobra.

The damper is a double acting direct control unit which ensures a smooth damping of the spring oscillations on both bump and rebound.

The valving control which has been built into these dampers is the result of extensive and exacting trials conducted by the development engineers of A.C. Cars Ltd., and the suspension engineers of Messrs. Armstrong.

The damper is a self-contained and trouble-free unit and needs no servicing attention of any kind.

By means of a special seal in the damper the hydraulic fluid is kept in circulation in such a manner that leakage is not possible and therefore no "topping up" is required at any time.

These dampers will not vary in control characteristics but will give a long life of constant control and if the comfort of the ride should deteriorate, attention should be given to tyre pressures and an examination made of the springs to ensure that these are able to flex freely.

Should the dampers at any time require attention they cannot be repaired by a garage or service station but should be returned to the A.C. factory or Shelby American Inc. together with an order for replacement units.

ROAD SPRINGS

Front and rear road springs are greased and wrapped on assembly, no attention is, therefore, necessary, and they should give years of service. No periodical spraying is required.

Should the necessity arise we give the following instructions regarding removal.

FRONT SPRING

Length of spring $39\frac{1}{4}''$ to eye centres.

Number of leaves 10.

Free Camber of spring $3\frac{1}{4}''$.

Should it be found necessary to remove the spring the weight of the chassis must be taken on a jack. Remove both wheels which will allow access to the spring shackle bolts. Then remove the four bolts securing the spring to the chassis. The spring will then come away.

REAR SPRING

Length of spring 41" to eye centres.

Number of leaves 8.

Free Camber of spring $5\frac{5}{16}''$.

For further instructions concerning the removal of the rear spring see petrol tank removal page 30.

The rear of the car must be jacked up and the wheels removed to provide access to the spring end pins. It may be necessary to lower the differential slightly as described on page 4 in order that the spring holding bolts may be pushed down just sufficiently to allow the complete spring withdrawal.

PETROL TANK REMOVAL

Undo securing screws and remove rear cockpit panel.

Unscrew and remove the petrol filler pipe.

Drain petrol tank by disconnecting petrol pipe from petrol pump.

Disconnect the petrol pipe from the base of petrol tank and remove plug and filter.

Undo the tank holding down clamp bolts through wheel arches.

The petrol tank may now be withdrawn through the cockpit.

This operation also exposes the spring shackle bolts for rear spring removal.

RECOMMENDED OILS

ENGINE & GEARBOX

Gearbox

E.P. 90 Oils. For further information concerning Gearbox and engine oils consult engine instruction book.

Suitable S.A.E.30 Engine Oils

Castrol XL
Energol S.A.E.30
Essolube 30
Shell S.A.E.30
Mobiloil A

Note: Reference should be made to the engine instruction book concerning oil grades should competition driving be anticipated.

STEERING RACK

The use of S.A.E.140 Hypoid oil is recommended for the steering rack, and only if this is not available may another heavy duty gear oil be substituted.

WHEEL HUBS

U.K.	Shell Retinax A.	Castrolease Heavy	Mobilgrease MP	Energrease L2	Esso High Tmp. Grease
Overseas	Shell Retinax A.	Castrolease Heavy	Mobilgrease MP	Energrease L2	Esso Bearing Grease

CHASSIS GREASE POINTS

U.K.	Shell Retinax A.	Castrolease LM	Mobilgrease MP	Energrease L2	Esso Grease
Overseas	Shell Retinax A.	Castrolease LM	Mobilgrease MP	Energrease L2	Esso Chassis Grease

LUBRICATION

Correct and methodical lubrication is an essential point in obtaining perfect running from a car, a point where an occasional expenditure of time will be amply repaid by the results.

The mileages when the various points should receive attention are set out on page 32.

SALISBURY HYPOID REAR AXLE TECHNICAL DATA

Lubricants approved by Messrs. Salisburys for use in Salisbury Hypoid Rear Axles:

LUBRICANT

Hypoid Gear Oil S.A.E.90
Esso Expee Compound 90
Hypoid "Filtrate" Gear Oil S.A.E.90
Silvertown Hypoid 90
Mobilube GX.90
"Oiline" H.A. Compound Hypoid Gear Lub. 90
Energol E.P. S.A.E.90
Ragosine Nimrod Hyp. (S.A.E.90)
Redline Super Hypoid 90 Oil
Caltex Hypoid Thuban 90
Shell Spirax 90 E.P.
Royal Snowdrift Gear Oil H.G. 90
Vigzol Vitapoid 90
Castrol Hypoy

ROUTINE MAINTENANCE

After first 500 miles	Monthly or every 1,500 miles	Twice yearly at seasonal change of oil or every 10,000 miles
Drain and refill oil	Check oil and top up if required	Drain and refill oil

OIL CAPACITY OF SALISBURY HYPOID AXLES

Model	Oil Capacity		
6 HA	1¾ pints	2¼ U.S. pints	1·0 litre
HA	2 pints	2½ U.S. pints	1·1 litres
3 HA	2¼ pints	2¾ U.S. pints	1·3 litres
4 HA	3 pints	3½ U.S. pints	1·7 litres
2 HA	3 pints	3½ U.S. pints	1·7 litres
5 HA	3 pints	3½ U.S. pints	1·7 litres

OIL CAPACITY 4HU DIFFERENTIAL UNIT FITTED TO COBRA

2½ Imp. pints. 3 U.S. pints. 1·4 litres.

It is better always to use the same brand of oil and to avoid mixing, but in any case, use only one of the approved grades.

Oil drain plug located underside differential, lowest point.

Oil filler plug located at rear of differential, right side.

SERVICING, GREASING AND OILING INFORMATION

Every 200 miles

Examine oil level in sump and if necessary add oil to correct level.

First 500 miles

It is advisable after a new car has completed this mileage to drain the gearbox, rear axle and engine oils and refill with new oil. Drain from a plug at under side in all cases and fill to the levels indicated.

Change oil filter, and again at 2,500 miles with new engine. Change filter thereafter at 5,000 mile periods.

500 miles

Spring ends rear suspension, both sides.
Spring ends front suspension, both sides.

1,000 miles

Vertical link swivel pin bearings.
Add distilled water to battery.
Check and top up if necessary brake master cylinder reservoirs with Castrol Girling Brake and Clutch fluid Crimson.

2,000 miles

Change engine oil.
Universal joints wheel drive shafts.
Splines on drive shafts.
Universal joints, propeller shaft.

3,000 miles

Oil Distributor very sparingly in aperture provided in Distributor Housing using S.A.E.30 Oil. Oil accelerator pedal shaft on bulkhead.

4,000 miles

Change Differential Oil.
Change Gearbox Oil.
Steering Pinion bearing, grease very sparingly.

5,000 miles

Grease nipples, parking brake cables.
Place S.A.E.30 oil sparingly on Carburettor linkages.

10,000 miles

Front hub bearings, Rear hub bearings, grease should be applied to these points only sparingly. Inject sparingly S.A.E.30 engine oil into lubrication hole on dynamo nose.

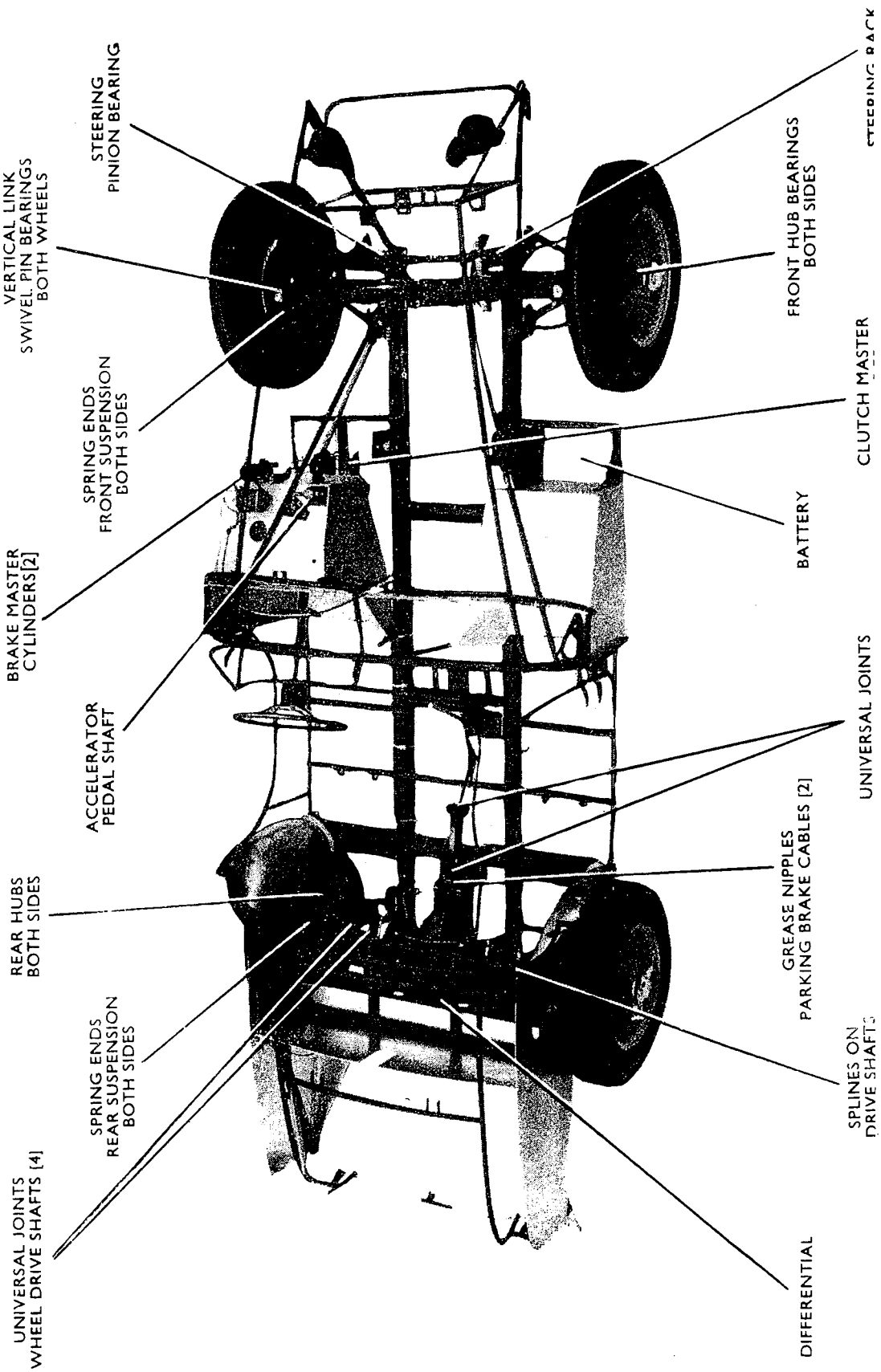
The steering rack is pre-packed and requires very little attention. Remove clip on rubber gaiter and insert S.A.E.140 Hypoid oil into gaiter end. Tighten gaiter clip.

Occasionally

Give the two pivots on the wiper arm a drop of oil; do not add more owing to the possibility of it getting on wiper blades.

Smear grease on battery terminals.

GREASING AND OILING DIAGRAM



ELECTRICAL
GENERAL MAINTENANCE

MAINTENANCE INSTRUCTIONS FOR LUCAS 12 VOLT ELECTRICAL EQUIPMENT AS FITTED TO A.C. COBRA

The electrical equipment is designed and manufactured to give long periods of service without any need for adjustment or cleaning.

Normally very little attention is required to the electrical equipment but for the benefit of those persons who desire, or find it necessary to carry out their own electrical maintenance, the electrical components of the Cobra are described in detail. It should be emphasized, however, that servicing of an advanced character may be carried out by the Lucas Service Organization, who have agencies in all parts of the world.

COIL

The coil requires no routine attention other than checking the terminal connections for security and cleaning the spaces around the terminals at intervals as necessary.

For detailed information concerning the coil, consult Engine Instruction Book.

CONTACT BREAKER

During the first 500 miles (800 km.) running of a new car, the contact breaker heel tends to bed down; it is therefore advisable to check the gap at this stage. It is vitally important to keep the contact breaker points clean, set to the correct gap and parallel to each other.

For detailed information concerning Distributor maintenance, consult Engine Instruction Book.

SMITHS ELECTRIC ENGINE COOLING FAN

Type PES.2379/4 mounted ahead of radiator.

From car CSX.2080 fan mounting rear of radiator, Type PES.2626.

From chassis CSX.2167 inclusive, a Lucas electric cooling motor is fitted, Model 3GM with large cooling blades, located ahead of radiator.

The radiator cooling fan is fully automatic and is controlled by a thermostat switch located in the casting integral with the bottom radiator hose. No manual switch is provided.

LUCAS 12 VOLT BATTERY
TYPE FRT.9A

GENERAL INFORMATION — THE BATTERY

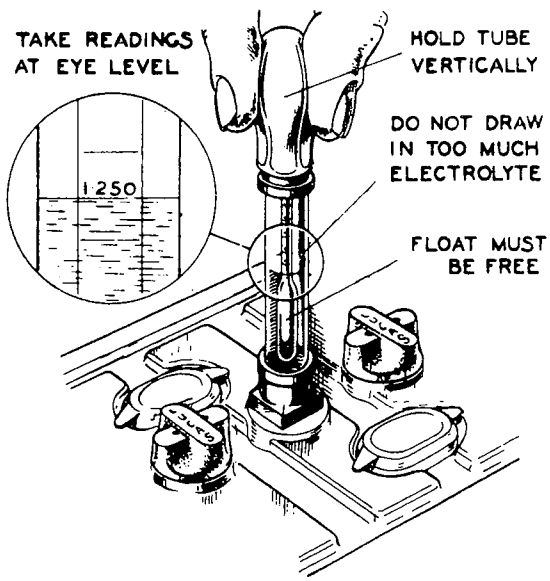
Occasionally check the condition of the battery by taking hydrometer readings of the specific gravity of the electrolyte in each of the cells. Readings should not be taken immediately after "topping-up" the cells. The specific gravity readings and their indications are as follows:

1·280 – 1·300. Battery fully charged.

About 1·210. Battery about half discharged.

Below 1·150. Battery fully discharged.

These figures are given assuming the temperature of the solution is about 60°F.



TAKING HYDROMETER READINGS

The readings for all cells should be approximately the same. If one cell gives a reading very different from the rest, it may be that acid has been spilled or has leaked from this particular cell or there may be a short circuit between the plates. In this case the battery should be examined by a Service Depot or Agent.

EVERY 1,000 MILES, OR MONTHLY

BATTERY. Remove the filler plugs from each of the cells of the battery and, if necessary, add sufficient distilled water to bring the electrolyte level with the tops of the separators, thereby replacing water which has been lose by evaporation. A Lucas Battery Filler will be found useful for topping-up. This ensures that the correct level is automatically obtained and also prevents distilled water from being spilled on top of the battery. Its use is particularly recommended on cars where visual examination of the electrolyte level is difficult. Do not use tap water. Never use a naked light when examining the conditions of the cells and never over-fill the cells when topping-up.

Wipe away any dirt or moisture from the top of the battery and make sure that the connections and fixing bolts are clean and tight.

Examine the terminals and, if necessary, scrape them clean and coat them with petroleum jelly. The taper fitting cable connector must never be hammered on to the terminal post nor should the self-tapping screw be used in an attempt to tighten the connector—if necessary, a light tap with the wooden handle of a screwdriver will do this, before the screw is fitted. The sole purpose of the screw is to maintain a tight joint after the connector has been fitted.

AMMETER READINGS

When noting ammeter readings, it must be remembered that during daytime running when the battery is in good condition, the dynamo gives only a trickle charge so that the charge reading will seldom be more than a few amperes.

A discharge reading may be given immediately after switching on the headlamps. This usually happens after a long time when the voltage of the battery is high. After a short time, the battery voltage will fall, and the regulator will respond, causing the dynamo output to balance the load.

When starting from cold, the charging current will rise until it reaches a steady maximum at a speed of say 20 m.p.h., after which it will remain fairly high for about 10 minutes and then fall to a steady charge which is most suitable for the particular state of charge of the battery.

It will be noticed from the ammeter readings that the dynamo does not charge at very low engine speeds. This is because it is not rotating fast enough to generate sufficient energy to charge the battery. The cut-out, which is an automatic switch connected between the dynamo and battery, allows the flow of current from the dynamo to the battery only. It closes when the dynamo is running fast enough to charge the battery and opens when the speed is low or the engine is stationary, thus preventing current flowing from the battery through the dynamo windings.

The regulator causes the dynamo to give an output which varies according to the load on the battery and its state of charge. When the battery is discharged, the dynamo gives a high output so that the battery receives a quick recharge which brings it back to its normal state in the minimum possible time.

On the other hand, if the battery is fully charged, the dynamo is arranged to give only a trickle charge which is sufficient to keep it in good condition without any possibility of causing damage to the battery by overcharging.

The regulator also causes the dynamo to give a controlled boosting charge at the beginning of a run which quickly restores to the battery the energy taken from it when starting. After about 30 minutes' running, the output of the dynamo falls to a steady rate, best suited to the particular state of charge of the battery.

LUCAS GENERATOR MODEL C40-1

1. GENERAL

The generator is a shunt-wound two-pole two-brush machine arranged to work in conjunction with a Lucas regulator unit.

Generator model C40-1 is of extruded yoke construction and is ventilated. Holes in each end bracket allow a pulley-mounted fan to draw cooling air through the generator.

Ventilated versions are designed for use with a 5″ (127 mm.) diameter fan and current-voltage control and have a maximum output of 22 amperes. When a $4\frac{1}{2}$″ (114 mm.) diameter fan is used, the maximum output must be limited to 20 amperes. The effective output is slightly reduced when compensated voltage control is used with either fan size.

2. ROUTINE MAINTENANCE

(a) Lubrication

Every year, or 10,000 miles inject a few drops of high quality S.A.E. engine oil into the Lubrication hole at the end of the C.E. bearing housing.

(b) Inspection of Brushgear

At every second lubrication period, the generator should be removed from the engine and the brush-gear inspected by a competent automobile electrician.

Refer to Lucas generator drawing, page 41.

3. PERFORMANCE DATA

The cutting-in and maximum output speeds quoted below are production test figures and refer to cold machines with brushes only partially bedded.

(a) MODEL C40-1 (ventilated)

Cutting-in speed: 1,450 r.p.m. (max.) at 13·0 generator volts.

Maximum output: 22 amp. at 2,250 r.p.m. (max.) at 13·5 generator volts and a resistance load of 0·61 ohm.

Field resistance: 6·0 ohms.

4. SERVICING

(a) Testing in position to locate fault in charging circuit

In the event of a fault in the charging circuit, adopt the following procedure to locate the cause of trouble.

(i) Inspect the driving belt and adjust if necessary.

(ii) Check the Lucas connections on the commutator end bracket. The larger connector carries the main generator output, the smaller connector the field current.

(iii) Switch off all lights and accessories, pull off the connectors from the terminal blades of the generator and connect the two blades with a short length of wire.

(iv) Start the engine and set to run at normal idling speed.

(v) Clip the appropriate lead of a moving coil type voltmeter, calibrated 0–20 volts, to one generator terminal and the other lead to a good earthing point on the yoke.

(vi) Gradually increase the engine speed, when the voltmeter reading should rise rapidly and without fluctuation. Do not allow the voltmeter reading to reach 20 volts, and do not race the engine in an attempt to increase the voltage. It is sufficient to run the generator up to a speed of 1,000 r.p.m. If the voltage does not rise rapidly and without fluctuation the unit must be dismantled for internal examination, see Para. 4(b). Excessive sparking at the commutator in the above test indicates a defective armature which should be replaced.

Note; If a radio suppressor capacitor is fitted between the output terminal and earth, disconnect this capacitor and re-test the generator before dismantling. If a reading is now given on the volt-meter, the capacitor is defective and must be replaced.

If the generator is in good order, remove the link between the terminals and restore the original connections.

(b) To Dismantle

(i) Take off the driving pulley.

(ii) Unscrew and withdraw the two through bolts.

(iii) Withdraw the commutator end bracket from the yoke.

(iv) Lift the driving end bracket and armature assembly from the yoke. Take care not to lose the fibre thrust washer from the commutator end of the shaft.

(v) The driving end bracket, which on removal from the yoke has withdrawn with it the armature and armature shaft ball-bearing, need not be separated from the shaft unless the bearing is suspected and requires examination, or the armature is to be replaced; in this event the armature should be removed from the end bracket by means of a hand press, having first removed the shaft key.

(c) Brushgear (Checking with yoke removed)

(i) Lift the brushes up into the brush boxes and secure them in that position by positioning the brush springs at the sides of the brushes.

(ii) Fit the commutator end bracket over the commutator and release the brushes.

(iii) Hold back each of the brush springs and move the brush by pulling gently on its flexible connector. If the movement is sluggish, remove the brush from its holder and ease the sides by lightly polishing on a smooth file. Always refit brushes in their original positions. If the brushes are badly worn, new brushes must be fitted and bedded to the commutator. The minimum permissible length of brush is either 9/32″ (7·14 mm.), i.e. when the spring arm reaches the brush box, or 7/32″ (5·55 mm.), whichever is applicable, depending on the design of brush holder fitted.

(iv) Measure brush spring pressures, using a spring balance held radially to the commutator. With a commutator diameter of 1·485″–1·490″ (37·72–37·85 mm.) these pressures should be 30 oz. (0·85 kg.), maximum, when exerted on a new brush and 13 oz. (0·37 kg.), minimum, on a brush worn to 9/32″ (7·14 mm.). Both pressures should be measured and defective springs replaced.

5. COMMUTATOR

A commutator in good condition will be smooth and free from pits or burned spots.

Whilst the C40-1 generator was designed to accommodate a commutator of moulded construction, initial production also included machines having commutators of the older fabricated type. Moulded commutators can be recognized by the exposed end being quite smooth, unlike that of fabricated commutators from which a metal roll-over and an insulating cone protrude.

A moulded commutator can be re-skimmed during service, but care must be exercised to ensure that the finished diameter is not less than 1·450″ (36·83 mm.). The process of re-skimming consists of rough turning, undercutting and diamond turning—in that order. Whether or not rough turning is carried out depends upon the severity and unevenness of the wear which has taken place. If a moulded commutator cannot be completely cleaned up without going below the specified diameter, the armature should be replaced.

The width of undercut slots must not exceed 0·040″ (1·016 mm.) with a depth of 0·020″–0·035″ (0·508–0·889 mm.). It is important to see that the insulating material is cleared from the sides of each slot to a minimum depth of 0·015″ (0·381 mm.).

6. ARMATURE

Indication of an open-circuited armature winding will be given by burnt commutator segments. If armature testing facilities are not available, an armature can be checked by substitution.

To separate the armature shafts from the drive end bracket, press the shaft out of the drive and bracket bearing. When fitting the new armature, support the inner journal of the ball bearing, using a mild steel tube of suitable diameter, whilst pressing the armature shaft firmly home.

7. FIELD COILS

Measure the resistance of the field coils, without removing them from the generator yoke, by means of an ohm meter connected between the field terminal and the yoke.

The resistance is 6·0 ohms.

If an ohm meter is not available, connect a 12-volt d.c. supply between the field terminal and generator yoke with an ammeter in series. The ammeter reading should be approximately 2 amperes. Zero reading on the ammeter or an "Infinity" ohm meter reading indicates an open circuit in the field winding.

If the current reading is much more than 2 amperes, or the ohm meter reading much below 6 ohms, it is an indication that the insulation of one of the field coils has broken down.

In either event, unless a substitute generator is available, the field coils must be replaced. To do this, carry out the procedure outlined below, first noting to which end of the coil the field terminal blade is soldered:

(i) Drill out the rivet securing the field coil terminal assembly to the yoke and remove the insulating sleeve from the terminal blade to protect it from the heat of soldering.

(ii) Unsolder the terminal blade and earthing eyelet.

(iii) Remove the insulating piece which is provided to prevent the junction of the field coils from contacting with the yoke.

(iv) Mark the yoke and pole shoes so that the latter can be refitted in their original positions.

(v) Unscrew the two pole shoe retaining screws by means of a wheel-operated screwdriver.

(vi) Draw the pole shoes and coils out of the yoke and lift off the coils.

(vii) Fit the new field coils over the pole shoes and place them in position inside the yoke. Take care to ensure that the taping of the field coils is not trapped between the pole shoes and the yoke.

(viii) Locate the pole shoes and field coils by lightly tightening the fixing screws.

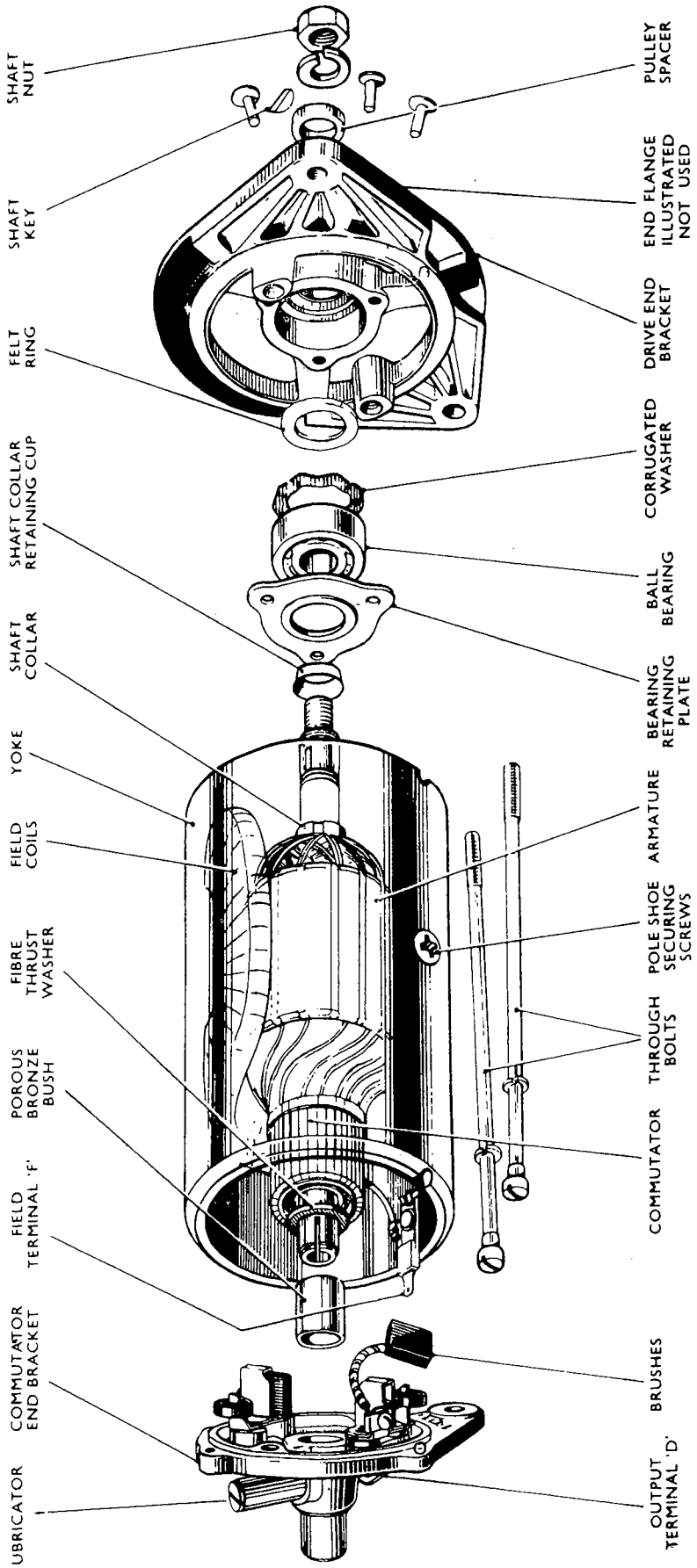
(ix) Fully tighten the screws by means of a wheel-operated screwdriver.

(x) Solder the original terminal blade and earthing eyelet to the appropriate coil ends.

(xi) Refit the insulating sleeve and re-rivet the terminal assembly to the yoke.

(xii) Refit the insulation piece behind the junction of the two coils.

LUCAS GENERATOR DISMANTLED WITH TACHO DRIVE



LUCAS CONTROL BOX

MODEL RB.106/2

1. SERVICING

Preliminary Checking of Charging Circuit

Before disturbing any electrical adjustments, examine as follows to ensure that the fault does not lie outside the control box:

(i) Check the battery by substitution or with an hydrometer and a heavy discharge tester.

(ii) Inspect the generator driving belt. This should be just taut enough to drive without slipping.

(iii) Check the generator by substitution or by linking large terminal "D" to small terminal "F" and connecting a voltmeter between this link and earth and running the generator up to about 1,000 r.p.m., when a rising voltage should be shown.

(iv) Inspect the wiring of the charging circuit and carry out continuity tests between the generator, control box and, when fitted, the ammeter.

(v) Check earth connections particularly those of the control box.

(vi) In the event of reported undercharging, ascertain that this is not due to low mileage.

2. TEMPERATURE COMPENSATION

Control box model RB.106/2 is of compensated voltage control design.

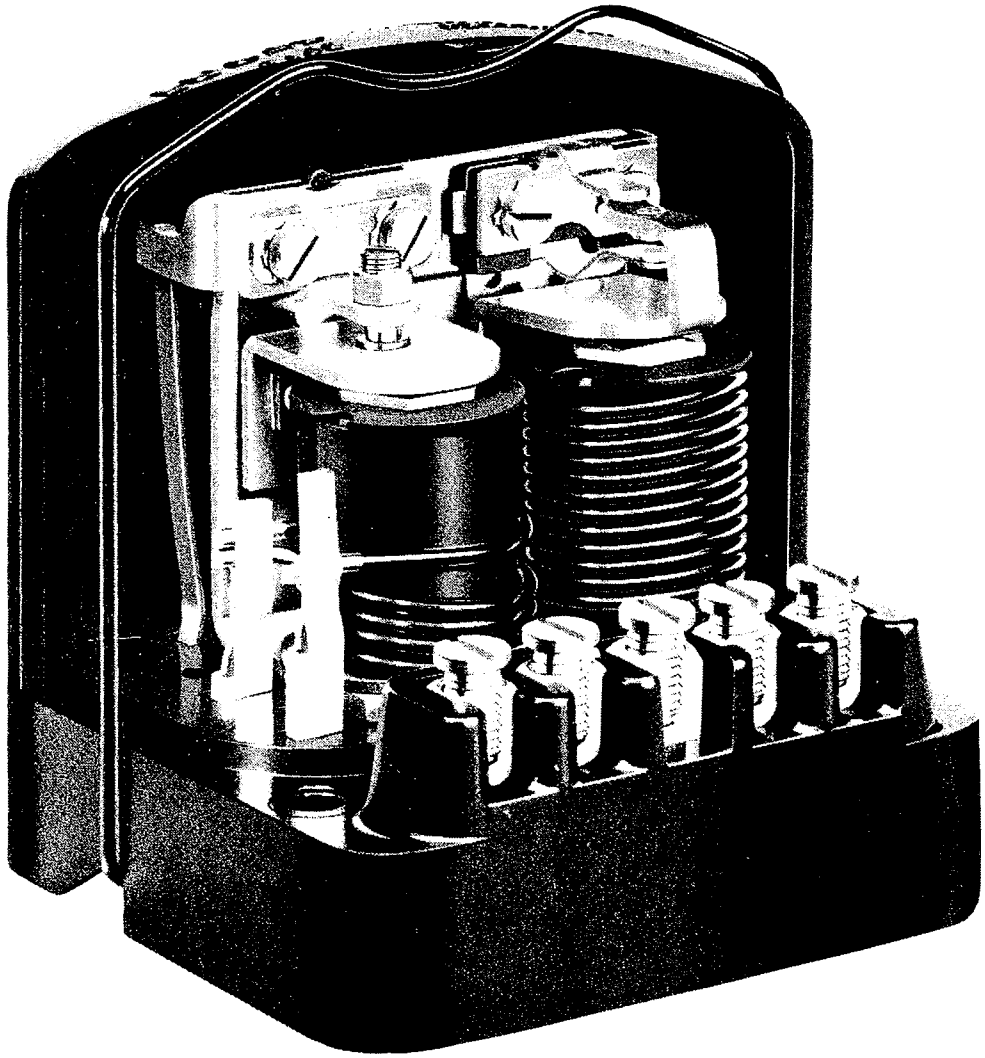
The shunt coils of the cut-out relay and voltage regulator consist of many turns of fine copper wire and, consequently, the ohmic resistance of these coils rises and falls as the temperature rises and falls—due in part to ambient working conditions and in part to the normal passage of current. In turn, this causes the operating current and therefore the magnetic pull on the armature to vary inversely with changes in temperature. Thus, to maintain the necessarily close operating limits expected of these units, some form of compensation is required.

The method adopted is to utilize a bi-metal strip either to supplement or to take the place of the armature tension spring—the hinge spring being of steel, copper coated in cut-outs and blue in voltage regulators. The effect of the bi-metal is to cause the spring force on the armature to reduce with rises in temperature and to increase with falls in temperature. This method also compensates for variations in battery voltage with temperature —a higher operating voltage being provided in cold weather.

Early in 1956 the amount of compensation in regulators was reduced by fitting bi-metal strip of 0·010″ thickness, in place of the original 0·012″, thus making necessary the prior identification of units before setting at temperatures other than 20°C. Units can be identified for this purpose by reference to the colour of the bi-metal spring fitted to the voltage regulator, as follows:

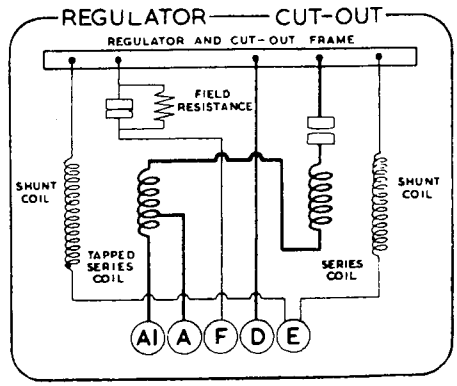
0·010″ bi-metal springs are **copper plated**
0·012″ bi-metal springs are **bright and unplated.**

LUCAS CONTROL BOX
MODEL RB106/2



ISSUED BY

JOSEPH LUCAS LTD
BIRMINGHAM
ENGLAND



3. ELECTRICAL SETTING DATA

Regulator

The following settings are given for a generator speed of 3,000 r.p.m.

(a) Units with copper plated bi-metal springs

		12-volt units
10°C. (50°F.)	...	16·1–16·7 volts
20°C. (68°F.)	...	16·0–16·6 volts
30°C. (86°F.)	...	15·9–16·5 volts
40°C. (104°F.)	...	15·8–16·4 volts,

(b) Cut-out Relay

		12-volt units
Cut-in voltage	...	12·7–13·3 volts
Drop-off voltage	...	8·5–11·0 volts
Reverse current	...	3·0– 5·0 amp.

4. CHECKING REGULATOR ELECTRICAL SETTING

Checking and adjusting should be completed as rapidly as possible to avoid errors due to heating of the shunt coil.

With model RB106/2, disconnect terminals A and A1 indicated on control box diagram, withdraw the cables and connect them together. Start the engine.

Run the generator at 3,000 r.p.m. and observe the voltmeter reading. This should lie between the appropriate limits given in para. 3 (a).

An unsteady reading may be due to unclean contacts but if the reading occurs outside the appropriate limits, an adjustment must be made.

Stop the engine.

5. REGULATOR ELECTRICAL ADJUSTMENT

Remove the control box cover.

Start the engine and run the generator at 3,000 r.p.m.

Slacken the locknut of the voltage adjustment screw and turn the screw (clockwise to raise the setting or anti-clockwise to lower it) until the correct setting is obtained.

Retighten the locknut.

Check the setting by stopping the engine and then again raising the generator speed to 3,000 r.p.m.

Restore the original connections and refit the cover.

6. CHECKING CUT-OUT RELAY ELECTRICAL SETTING

Checking and adjusting should be completed as rapidly as possible to avoid errors due to heating of the shut coil.

Connect a first-grade 0–20 moving coil voltmeter between control box terminals "D" and "E" indicated on control box diagram. Remove the control box cover in order to note the instant of contact closure.

Alternatively, switch on an electrical load such as the headlamps when the instant of contact closure will be indicated by a slight drop in the voltmeter reading.

Start the engine and slowly increase its speed.

Observe the voltmeter pointer.

If the reading occurs outside the limits given in para. 3 (b), an adjustment must be made.

Stop the engine.

7. CLEANING CONTACTS

Regulator Contacts

To clean the voltage regulator contacts, use fine carborundum stone or silicon carbide paper.

Cut-out Relay Contacts

To clean the cut-out relay contacts, use a strip of fine glass paper—never carborundum stone or emery cloth.

8. ADJUSTMENT OF AIR GAP SETTINGS

Air gap settings are accurately adjusted during assembly and should require no further attention. If, however, an armature is removed for any reason, care must be taken to obtain the correct setting on re-assembly.

Voltage Regulator

With the armature in the free position and correctly set, the distance between the core face and the underside of the armature is 0·030″, of which 0·015″ is through air when the copper separation consists of a disc or of two parallel wires, and 0·021″ when a square of copper is used. To obtain this air gap, proceed as follows:

Slacken the fixed contact locking nut and unscrew the contact screw until it is well clear of the armature moving contact.

Slacken the voltage adjustment screw locking nut and unscrew the adjuster until it is well clear of the armature tension spring.

9. CUT-OUT RELAY ELECTRICAL ADJUSTMENTS

Method of Cut-in Adjustment

Remove the control box cover.

Slacken the locknut of the cut-out relay adjustment screw and turn the screw (clockwise to raise the setting or anti-clockwise to lower it) until the correct setting is obtained. Retighten the locknut and retest the setting by increasing the engine speed from zero.

Restore the original connections and refit the cover.

Method of Drop-off Adjustment

Disconnect the cable from control box terminal "A" and connect a first-grade 0–20 moving coil voltmeter between this terminal and earth.

Start the engine and run up to speed.

Slowly decelerate and observe the voltmeter pointer.

Opening of the contacts, indicated by the voltmeter pointer dropping to zero, should occur between the limits given in para. 3 (**b**). If the drop-off occurs outside these limits, an adjustment must be made. In this event, continue as follows:

Stop the engine and remove the control box cover.

Adjust the height of the fixed contact by carefully bending the fixed contact blade towards the armature to reduce the drop-off voltage or away from it to raise the drop-off voltage.

Recheck the setting and, if necessary, re-adjust until the correct drop-off setting is obtained.

Restore the original connections and refit the cover.

10. CHECKING REGULATOR ELECTRICAL SETTING

Insert a gauge of appropriate thickness (and wide enough to cover completely the core face) between the armature and the copper separation. Take care not to turn up or damage the copper disc, wires or square.

Press the armature **squarely** down against the gauge and retighten the two armature assembly securing screws.

With the gauge still in position, turn the fixed contact adjustment screw until it just touches the armature contact.

Retighten the locking nut.

Reset the voltage adjustment screw.

Cut-Out Relay

Slacken the adjustment screw locking nut and unscrew the adjuster until it is well clear of the armature tension spring.

Slacken the two armature securing screws.

Press the armature **squarely** down against the core face (copper sprayed in earlier units, fitted with a square of copper in later units) and retighten the armature securing screws. No gauge is necessary.

Press the armature **squarely** down against the core face and, using suitable pliers, adjust the gap between the armature stop arm and the armature tongue to 0·025″–0·040″ by carefully bending the stop arm.

Adjust the fixed contact blade to give a "follow-through", or blade deflection, of 0·010″–0·020″ when the armature is pressed **squarely** down against the core face.

Reset the cut-out adjustment screw.

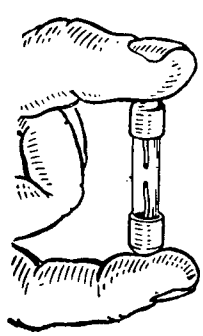
LUCAS MODEL SF4 TYPE

FUSE BOX

The fuse box contains two 50 amp. fuses, two 25 amp. fuses and two spare fuses. Access to these fuses is obtained by unscrewing the single cover securing screw and lifting off the cover.

The units which are protected by the fuses can readily be identified by referring to the wiring diagram.

A blown fuse is indicated by the failure of all the units protected by it, and is confirmed by examination of the fuse, which can easily be withdrawn from the spring clips in which it fits. If it has blown, the broken ends of the wire will be visible inside the glass tube. Before replacing a blown fuse inspect the wiring of the units that have failed for evidence of a short circuit, or other fault which may have caused the fuse to blow and remedy the cause of the trouble.



It is important to use only the correct replacement fuse. The fusing value is marked on a coloured slip inside the glass tube of the fuse.

If the new fuse blows immediately and the cause of the trouble cannot be found, have the equipment examined at a Service Depot or Agent.

THE STARTER

When starting:—

1. See that the controls are properly set.
2. Operate the starter key firmly and release it as soon as the engine fires.
3. Do not operate the starter when the engine is running. If the engine will not fire at once, allow it to come to rest before operating the starter again.
4. Do not run the battery down by keeping the starter on when the engine will not start.

HEADLAMPS — AMERICA

Lucas sealed beam headlights are fitted to all cars for the American continent. This is a sealed unit and in the event of a fault occurring it will be necessary to change the light unit.

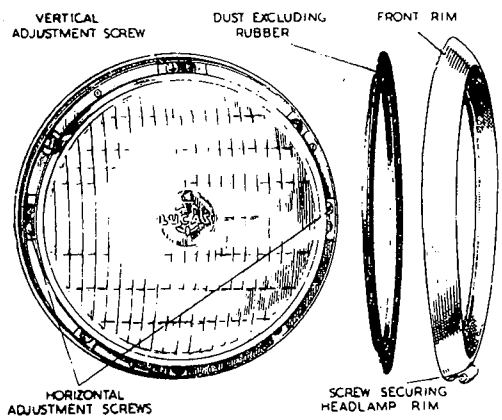
HEADLAMPS — EUROPE

Each headlamp incorporates a Lucas Light Unit which consists essentially of a reflector and "block-pattern" lens assembly provided with a mounting flange by means of which it is secured in the body housing. The bulb is located accurately in the reflector and is secured by a bayonet-fixed backshell, which also provides the contact to the bulb. The design of the bulb and of its holder is such that the bulb is correctly positioned in relation to the reflector and no focusing is required when a replacement bulb is fitted.

Identical double-filament bulbs are fitted in each lamp. In the dipped position, both headlamp beams are deflected downwards and to the left, right, or vertically, depending on local anti-dazzle legislation.

TO REMOVE THE LIGHT UNIT FOR BULB RENEWAL— EUROPE

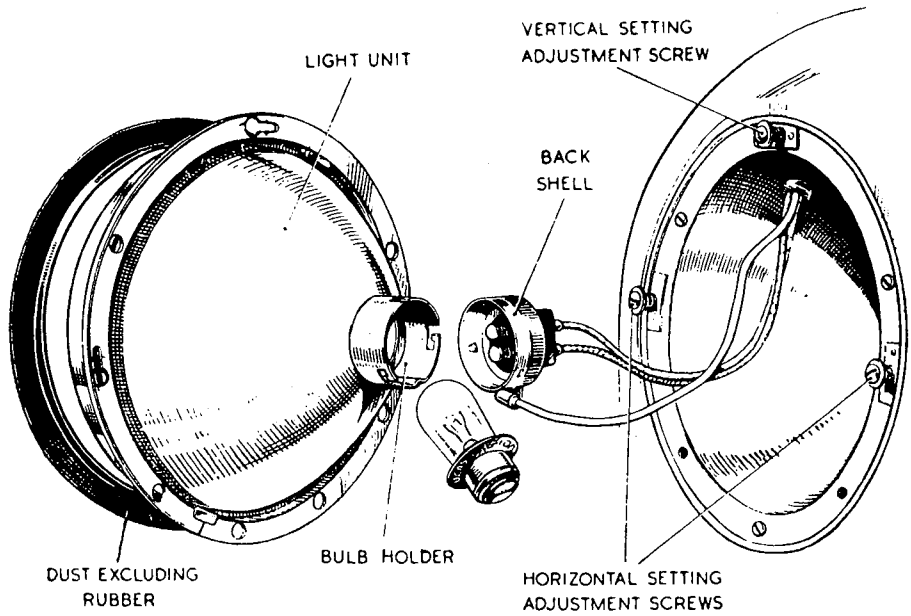
Remove the front rim by unscrewing the rim securing screw and lifting off the rim. Next remove the rubber dust excluder, when three spring loaded adjustment screws will be visible. Press the Light Unit in



against the tension of the adjustment screw springs and turn it in an anti-clockwise direction until the heads of the screws can be disengaged through the slotted holes in the Light Unit rim. Do not disturb the screws when removing the Light Unit or the Lamp setting will be altered.

Twist the back shell in an anti-clockwise direction and pull it off. The bulb can now be removed from the rear of the reflector.

Place the replacement bulb in the holder, taking care to locate it correctly. Engage the projections on the inside of the back shell with the slots in the holder, press on and secure by twisting it to the right.



Position the Light Unit so that the heads of the adjusting screws protrude through the slotted holes in the flange, press the unit in and turn in a clockwise direction. Replace the rubber ring so that the thicker inner edge rests in the recess around the Light Unit rim.

Refit the front rim, locating the top of the rim first and secure by means of the fixing screw.

HEADLAMP SETTING

The lamps should be set so that the main driving beams are parallel with the road surface and with each other. If adjustment is necessary, remove the front rim and dust excluding rubber as described above and trim each lamp to the correct position by means of the three spring loaded adjustment screws.

The setting of the lamps can be carried out by placing the car in front of a blank wall at the greatest possible distance, taking care of course that the surface on which the car is standing is not sloping relative to the wall.

Cars fitted with sealed beam headlights are adjusted in this manner with two set screws which are exposed when the lamp is rim removed.

BULB AND HEADLAMP INFORMATION

Lucas Sealed beam headlights 12 volt 60-45 watt (American continent) model number SZA20.

Lucas LeMans Yellow Bulbs. Phillips Duplo 371 imp. 12 volt 45/40 watt (France and Europe). Despatch Number 51534.

Lucas LeMans White Bulbs. Phillips Duplo 12741 12 volt 45/40 watt. Despatch Number 51534.

Standard Lucas headlamp, Right Hand Drive White Bulb (England) Aisk Osram 12 volt 50/40 W 414 Despatch Number 58260.

Marchal Asymmetrical Headlamps Standard Optique.

Marchal Bulbs 1263B clear glass. 1263 J Cadmium Yellow Glass.

Lamp Model Number. Standard 6063.

Model Number DeLuxe 6963 (England and Europe).

SIDE AND TAIL LAMPS

SIDE/FLASHER LAMPS

To gain access to the bulb, turn the rim anti-clockwise, which will release the glass and rim from the lamp. Note the bulb has offset securing pins and can only be inserted in the holder the correct way round, thus ensuring the low wattage filament is used for the side lamp and high wattage for the flasher.

TAIL/FLASHER LAMPS

Access to the bulbs is obtained from the inside of the boot. As in the side lamp bulb the securing pins are offset.

REAR LIGHTS INDICATORS AND STOPLIGHT

Phillips HO 380 12 Volt 6/21 watt ·44 Offset pins.

SIDELIGHTS, FRONT AND INDICATORS

Phillips No. 380 12 volt 6/21 watt ·44 Offset pins.

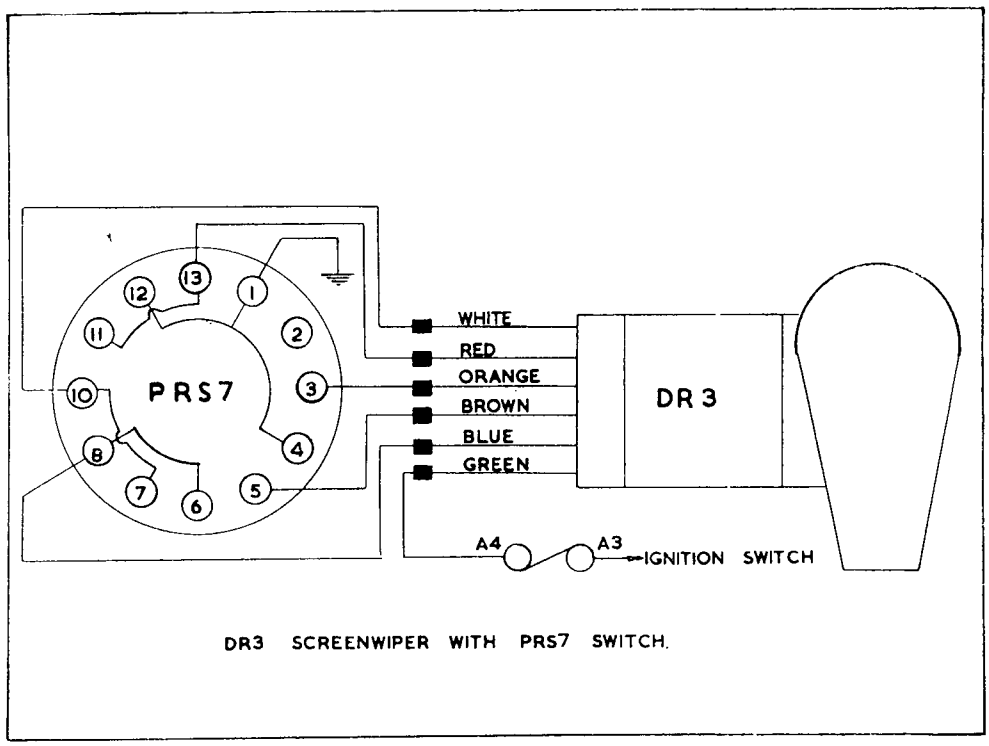
LUCAS TWO SPEED WINDSCREEN WIPER

MODEL 073152 (DR3)

The windscreen wiper consists of a powerful electric motor which transmits motion to the wiper arm spindle through a flexible cable rack mechanism. All moving parts are packed with grease during assembly, and no adjustment is required.

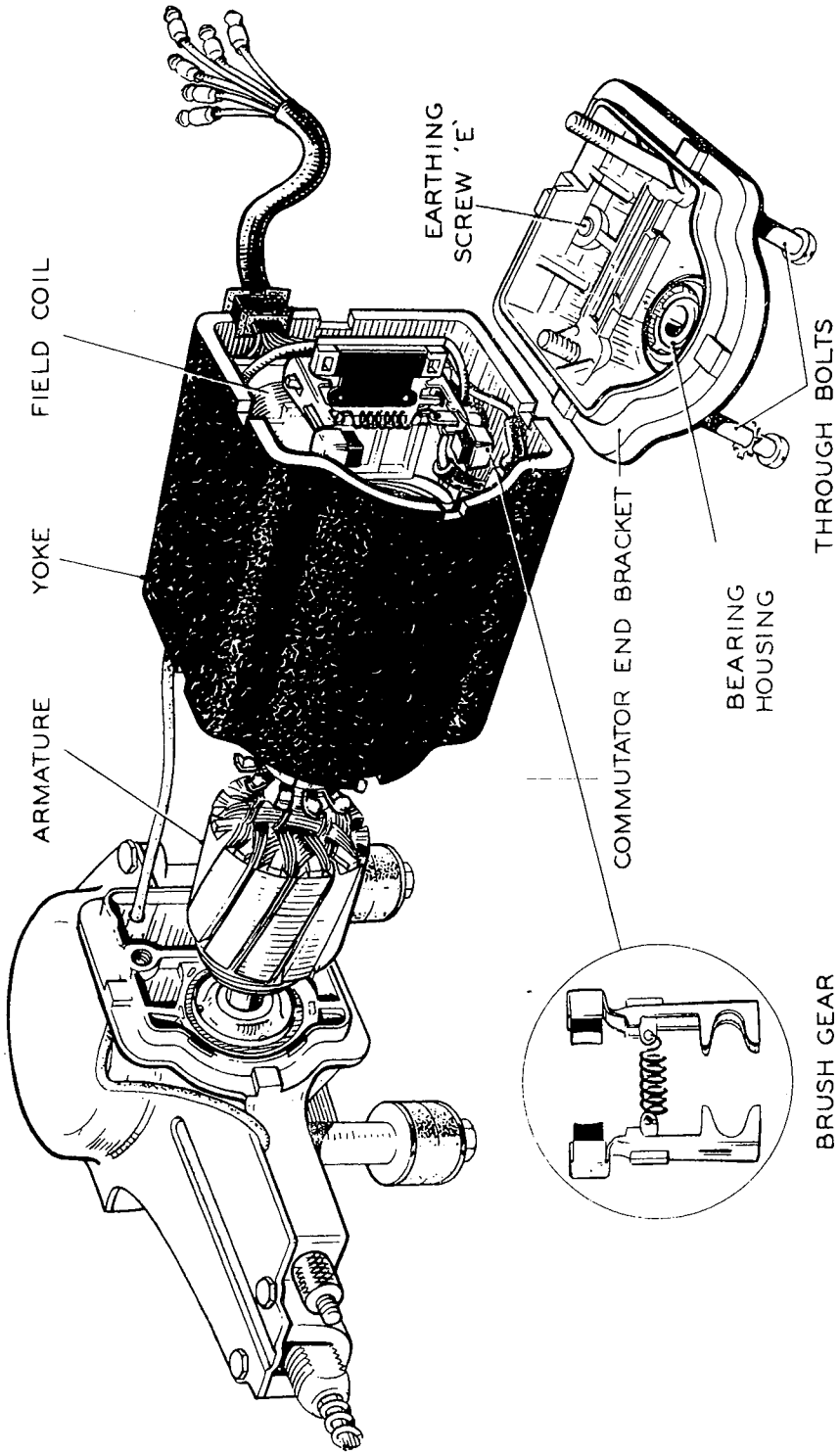
The motor incorporates an overload protective device in the form of a thermostat which under conditions of excessive heating will disconnect the current supply to the motor. When the motor windings have cooled and normal conditions restored, the wiper will automatically re-start.

A switch is situated in the centre of the instrument board. To bring wipers into operation turn the switch to the right. The wiper is so wired as to be inoperative when the ignition is turned off.



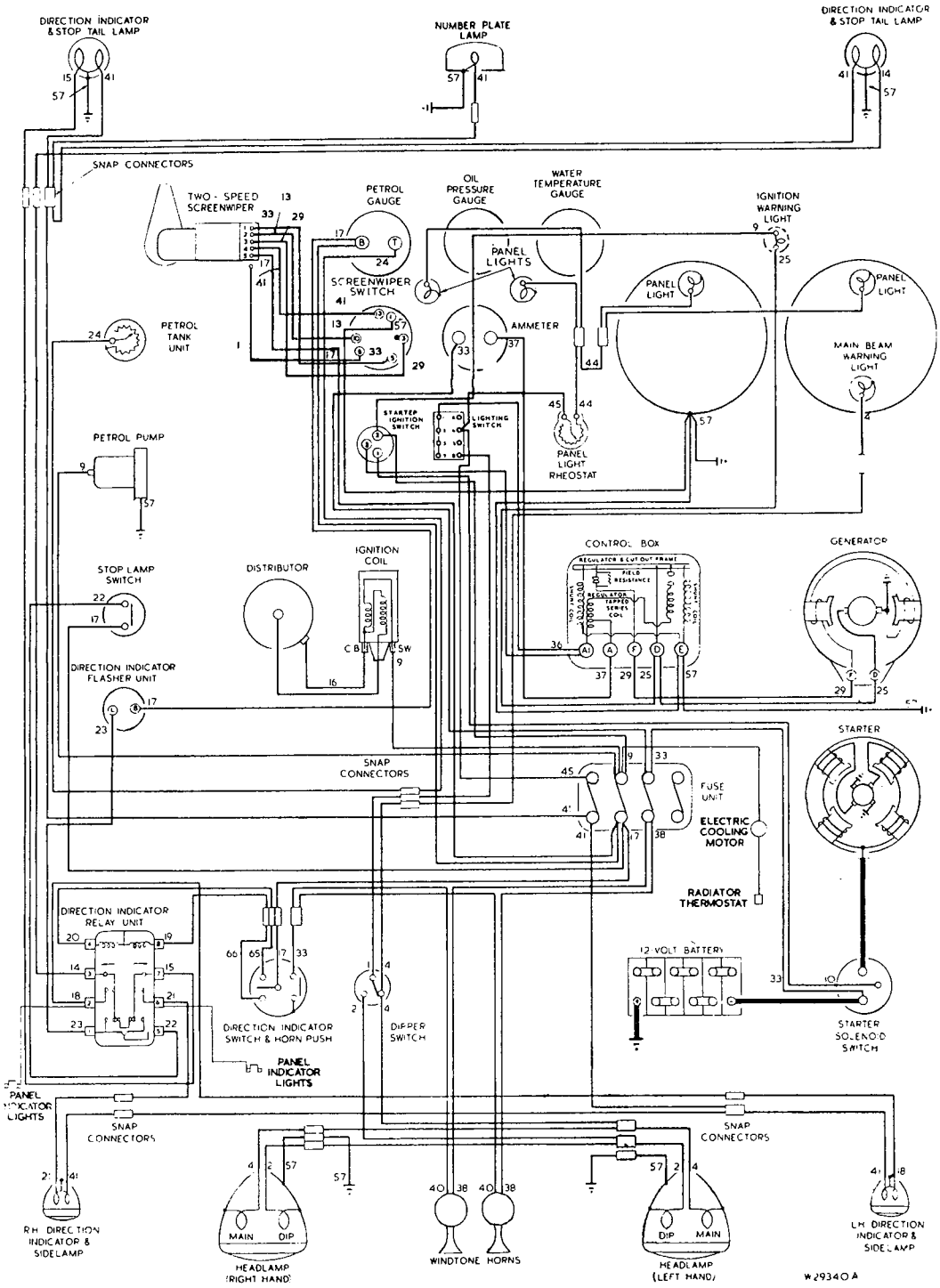
DR3 SCREENWIPER WITH PRS7 SWITCH.

LUCAS WINDSCREEN WIPER DR3



ELECTRIC WIRING DIAGRAM

KEY TO CABLE COLOURS							
1	BLUE	18	GREEN WITH RED	35	BROWN WITH YELLOW	52	PURPLE WITH BLUE
2	BLUE WITH RED	19	GREEN WITH YELLOW	36	BROWN WITH BLUE	53	PURPLE WITH WHITE
3	BLUE WITH YELLOW	20	GREEN WITH BLUE	37	BROWN WITH WHITE	54	PURPLE WITH GREEN
4	BLUE WITH WHITE	21	GREEN WITH WHITE	38	BROWN WITH GREEN	55	PURPLE WITH BROWN
5	BLUE WITH GREEN	22	GREEN WITH PURPLE	39	BROWN WITH PURPLE	56	PURPLE WITH BLACK
6	BLUE WITH PURPLE	23	GREEN WITH BROWN	40	BROWN WITH BLACK	57	BLACK
7	BLUE WITH BROWN	24	GREEN WITH BLACK	41	RED	58	BLACK WITH RED
8	BLUE WITH BLACK	25	YELLOW	42	RED WITH YELLOW	59	BLACK WITH YELLOW
9	WHITE	26	YELLOW WITH RED	43	RED WITH BLUE	60	BLACK WITH BLUE
10	WHITE WITH RED	27	YELLOW WITH BLUE	44	RED WITH WHITE	61	BLACK WITH WHITE
11	WHITE WITH YELLOW	28	YELLOW WITH WHITE	45	RED WITH GREEN	62	BLACK WITH GREEN
12	WHITE WITH BLUE	29	YELLOW WITH GREEN	46	RED WITH PURPLE	63	BLACK WITH PURPLE
13	WHITE WITH GREEN	30	YELLOW WITH PURPLE	47	RED WITH BROWN	64	BLACK WITH BROWN
14	WHITE WITH PURPLE	31	YELLOW WITH BROWN	48	RED WITH BLACK	65	DARK GREEN
15	WHITE WITH BROWN	32	YELLOW WITH BLACK	49	PURPLE	66	LIGHT GREEN
16	WHITE WITH BLACK	33	BROWN	50	PURPLE WITH RED		
17	GREEN	34	BROWN WITH RED	51	PURPLE WITH YELLOW		

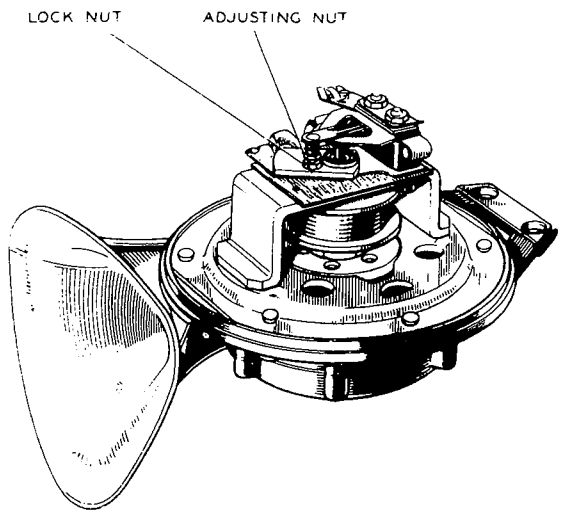


LUCAS ELECTRIC HORNS

Model Numbers 69087A Low Note—69090A High Note.

All horns are adjusted during manufacture to give their best performance and will give a long period of service without any attention.

If one of the horns fails or becomes uncertain in its action it does not follow that the horn has broken down. First ascertain that the trouble is not due to some outside source, e.g., a discharged battery, or loose connection or short circuit in the wiring of the horn; a short circuit in the horn wiring will cause the fuse to blow. If both horns fail or become uncertain in action, the trouble is probably due to a blown fuse, defective relay or a discharged battery. If the fuse has blown, examine the wiring for the fault and replace the spare fuse provided. A defective relay must be replaced. A discharged battery can be recharged by a long period of day driving or from an external source of current.



It is also possible that the performance of a horn may be upset by the fixing bolt working loose, or by some component near the horn being loose. If after carrying out the above examination the trouble is not rectified, the horn may need adjustment; but this should not be necessary until the horns have been in service for a long period.

Adjustment does not alter the pitch of the note, but merely takes up wear of moving parts. When adjusting the horns, short circuit the fuse, otherwise it is liable to blow. Again if the horns do not sound on adjustment, release the push instantly.

When making adjustments to a horn, always disconnect the supply lead to the other horn, taking care to ensure that it does not come into contact with any part of the chassis and so cause a short circuit.

ADJUSTMENT

Remove the horn cover after withdrawing the fixing screw and detach the cover securing bracket by springing it from its fixing.

Slacken the locknut on the fixed contact and rotate the adjusting screw until the contacts are just separated (indicated by horn failing to sound). Turn the adjustment nut half a turn in the opposite direction and secure in this position by tightening the lock nut. Finally if the note is still unsatisfactory, do not dismantle the horn but return it to a Lucas Service Depot or Service Agent for examination.

THE IGNITION SWITCH AND WARNING LIGHT

The ignition switch, besides forming a means of stopping the engine, is provided for the purpose of preventing the battery being discharged by the current flowing through the coil windings when the engine is stopped. A warning lamp is provided which gives a red light when the ignition is switched on and the car is running very slowly or is stationary, thus reminding the driver to switch off.

Should the warning lamp burn out, this will not in any way affect the ignition system, but it should be replaced as soon as possible in order to safeguard the battery.

DASHBOARD BULBS

Ignition Warning Lights

2·5 volts ·2 amp. mes Mazda.

Direction Indicators Warning Lights

12 volt 2·2 watt Phillips.

Speedometer and Revolution Counter

12 volt 2·2 watt Phillips.

Electric Clock

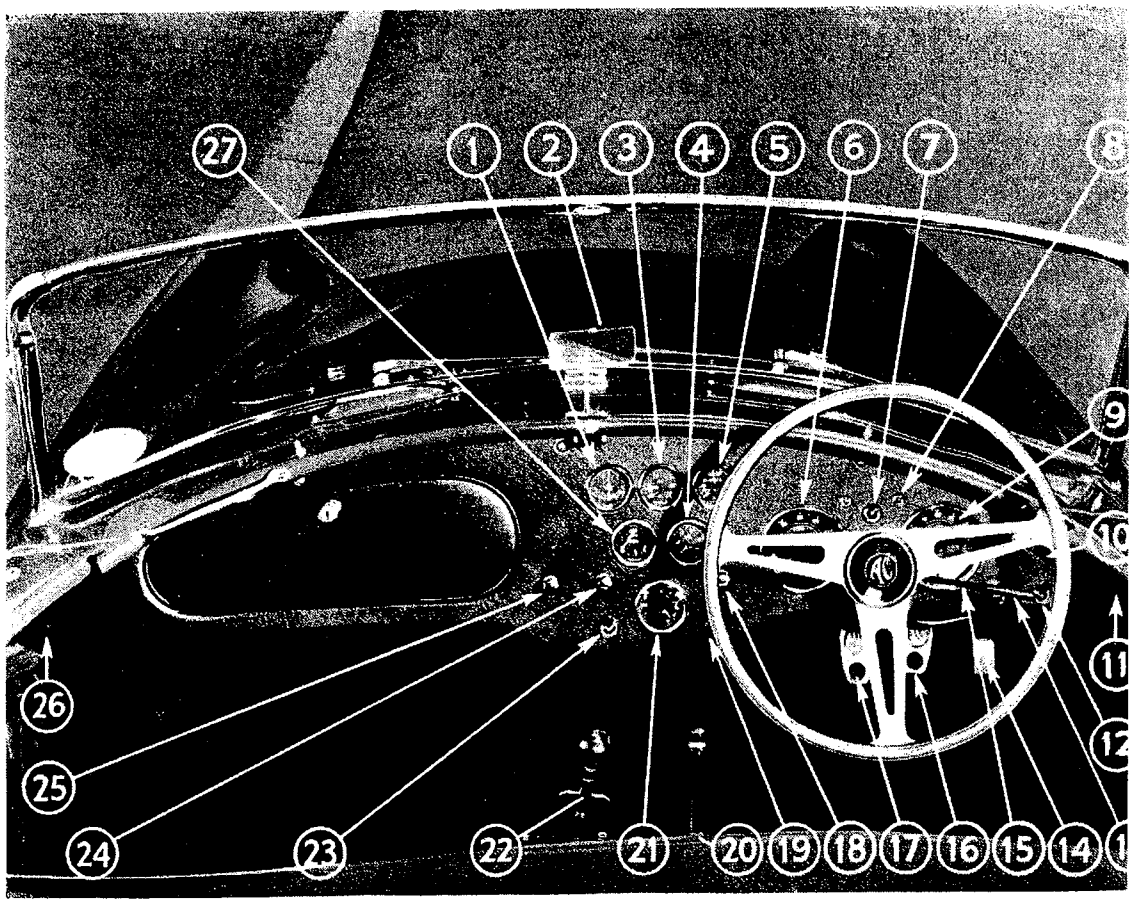
Phillips 12 volt 2 watt 12829.

Panel Light Bulbs (Two)

12 volt 3 watt MCC P53 B 643 Torpedo Type Bulb.

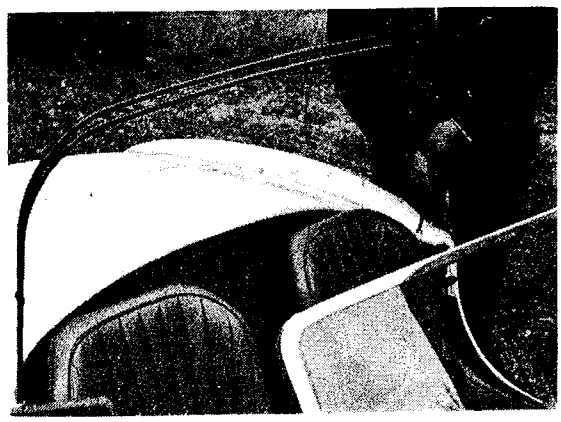
DASHBOARD INSTRUMENTATION

1. Ampmeter 2. Rear View Mirror 3. Oil Temperature 4. Oil Pressure 5. Water Temperature 6. Speedometer 7. Ignition Warning Light 8. Indicator Warning Light 9. Engine Revolution Counter 10. Light and Dip Switch (R.H.D. Cars) 11. Fresh Air Control 12. Electric Screen Washer 13. Electric Horn 14. Accelerator Pedal 15. Direction Indicators 16. Foot Brake 17. Clutch 18. Windscreen Wiper 19. Ignition 20. Handbrake 21. Electric Clock 22. Gear Change 23. Lights 24. Panel Lights 25. Heater 26. Fresh Air Control 27. Fuel Gauge.

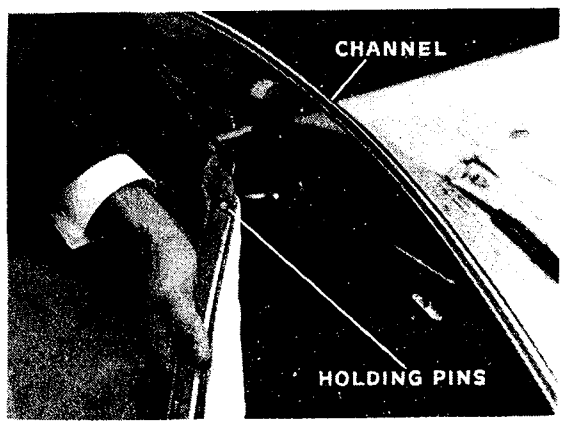


ERECTING FOLDING SOFT TOP

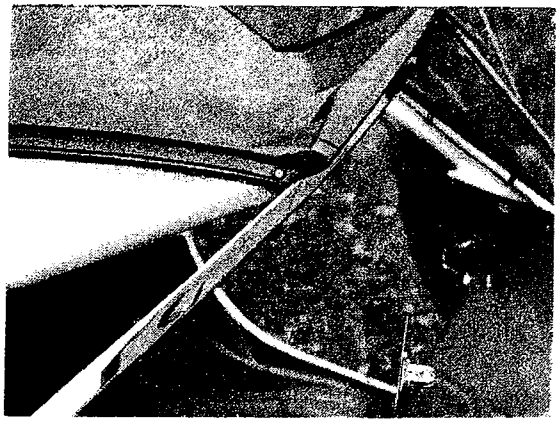
1. Remove soft top bars from rear boot.



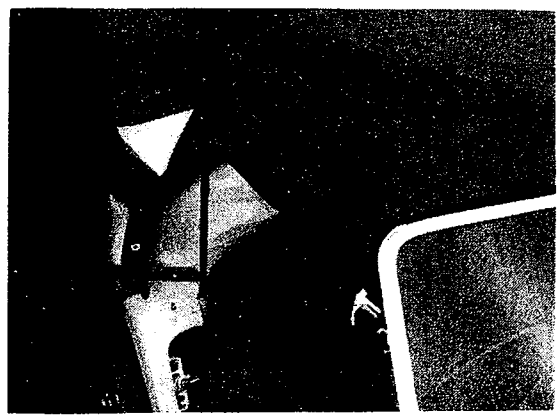
2. The two sections must be joined together and inserted in the sockets provided at rear of cockpit.



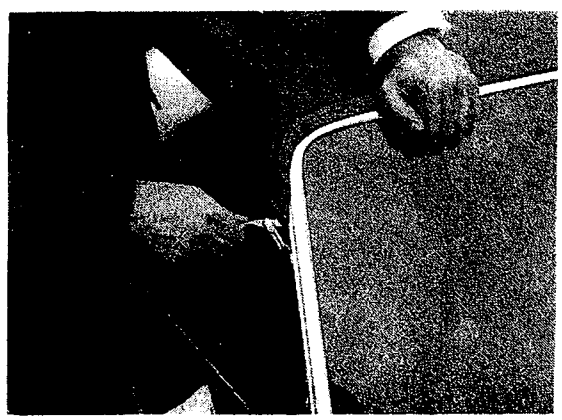
3. Remove the soft top from the pocket provided at rear of seats, holding the metal front section near the centre pins.



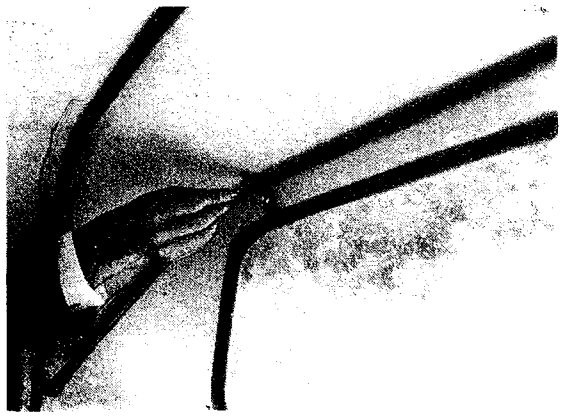
4. Insert centre holding pins in the slot provided in windscreen centre. Press the holding pins into the slot one at a time and pull sideways to engage the head of the pin under the channel.



5. Push down studs at rear of the soft top with exception of the last three on either side.



6. Push down holding clips at side of windscreen.



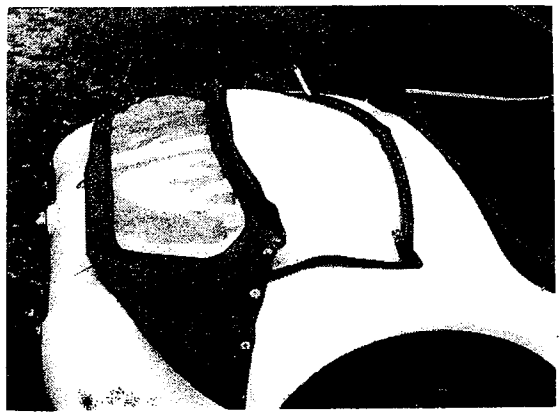
7. Push rear folding soft top hoop backwards to tension soft top and do up internal securing tabs.

8. Push down remaining six studs on rear deck.

To remove the soft top reverse this procedure.

The thick perspex side screens are secured by inserting the bottom bars into door sockets.

WHEN FOLDING SOFT TOP ADOPT THE FOLLOWING PROCEDURE



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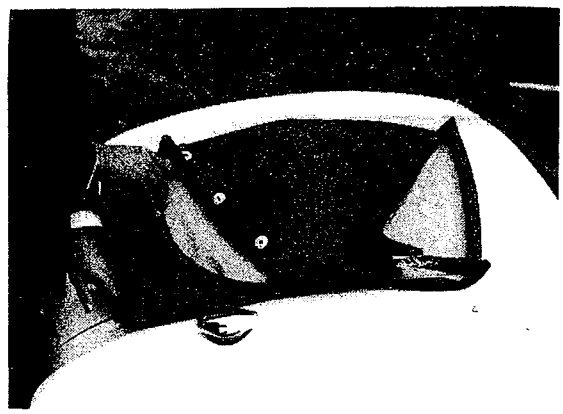

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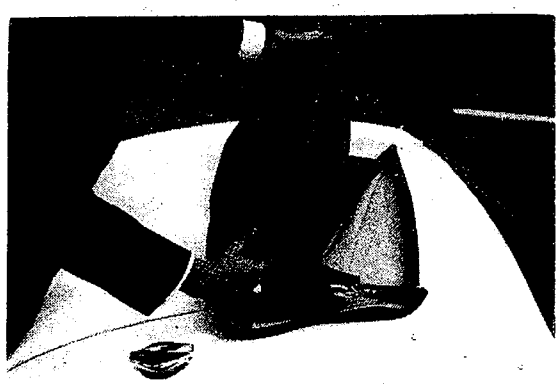

3

COACHWORK

We are justly proud of our coachwork and would like to feel that when the car is out of our hands it will be kept in that same condition of excellence it possessed on leaving our Works. To enable the owner to do this, we give a few useful hints which will help to retain the car's beauty of appearance.

CELLULOSE

Wash thoroughly and then polish with a wax or liquid polish of reputable make. On no account should abrasives be used, excepting when this is carried out by an experienced coach painter.

The wheels and chassis are painted with synthetic enamel enabling them to withstand high pressure washing.

UPHOLSTERY

The interior leather is washable and careful washing will preserve its appearance. When cleaning, do not wet the leather too much.

PLATED PARTS

Clean plated parts with warm water and leather off perfectly dry.

LUBRICATION

Smear the lock striker with vaseline. Occasionally oil the bonnet fastener to prevent sticking.

GENERAL INFORMATION FOR GUIDANCE WHEN ORDERING SPARE PARTS

All orders for replacement parts, spares or accessories for the United States of America should be addressed to:—

Shelby America Inc.,
6501 West Imperial Highway,
Los Angeles, California 90009
Tel: 213 674-1961

A.C. Cars Limited, Spares Department,
Thames Ditton,
Surrey,
England.

If Telegraphed, to:—
AUTOCARRIER, THAMES DITTON.

If Telephoned, to:—
EMBERBROOK 5621 (Ask for Spares Department).

CHASSIS INDEX