

BERKELEY

GENERAL DATA TABLE

Year	Model and description	No. of cylinders	Bore × stroke, mm.	Capacity c.c.
1956-8	328 Sports 2-seater	2	58 × 62	328
1957-8	492 Sports 2-seater	3	58 × 62	492

328 Sports models have either single or twin carburetters.

INDEX TO REPAIR OPERATIONS

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BODYWORK

GENERAL.—Berkeley bodies are constructed almost entirely of glass-fibre reinforced polyester resin. Additional strengthening is given by aluminium bulkheads which are bonded into body, and aluminium-alloy stiffened members which are riveted or bolted to structure. Main parts formed in one piece are punt-shaped under chassis, front moulding and rear moulding. Each section is formed in a moulding and fitted together with a sealing compound between joints. Doors and bonnet cover are also formed of glass-fibre polyester resin. Construction of punt-shaped chassis is shown in Fig. 1.

Seats are of bucket/bench type, resting flat on body floor, and are readily detachable. Boot compartment is reached behind seats.

BODY MAINTENANCE.—For detailed work on fibre-glass bodies refer to general section. However, following notes may be of assistance in deciding procedure where repairs are concerned. Particulars of four types of repairs for fibre-glass bodies are given below.

(1) Abrasions or non-penetrating scores. Treatment, apply stopper in usual manner as for metal bodies. Synthetic paint should be used for repainting.

(2) Holes not larger than 3-4 in. in diameter. Repair, using piece of aluminium formed to body

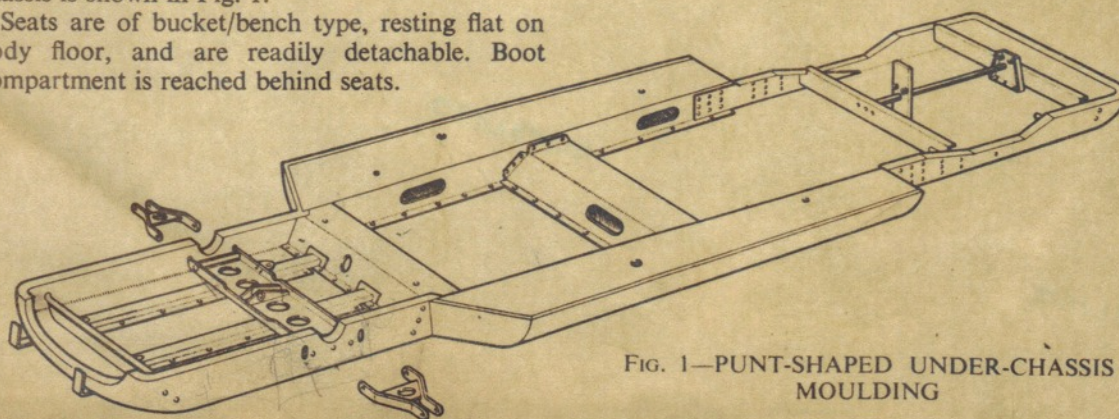


FIG. 1—PUNT-SHAPED UNDER-CHASSIS MOULDING

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contour of damaged section, wax and polish under-side of metal and fix to body over hole with self-tapping screws. Use chopped strand mat fibre-glass. Following instructions given in general section, repair body and, after removing screws, use stopper to fill holes and any imperfections. Ensure that no air bubbles are present in resin solution, since these are a source of weakness.

(3) Where large section of body is damaged repairs can be affected by inserting a new piece of

moulding. New section should be butt-jointed to body, stopper being used to fill in joints.

(4) Major repairs necessitating replacement of front or rear mouldings etc. Strip off damaged part and obtain replacement. Die moulds are available at Berkeley agents for repairing such damaged sections as front portion of wings.

Note.—Do not use silicone-based polishes on glass-fibre reinforced polyester resin bodies. Use barrier cream when handling repair materials.

BRAKES

DATA TABLE

Model	Type and drum dia., in.	Friction area sq. in.
328 and 492 Sports	Girling hydraulic, 7 2 leading shoe front leading/trailing rear	65 (Girling replacement shoes)

Footbrake operates through Girling hydraulic system on all four wheels. Handbrake is of pull-on pistol type operating through two cables. First cable leads from handbrake to pivoted arm located near scuttle. Primary cable is connected to bottom half of pivot arm and runs down right-hand side of car to calliper arrangement situated at centre rear of car. Rods lead from calliper to rear brake drums. For further information on Girling hydraulic brakes refer to general section.

FOOTBRAKE ADJUSTMENT.—Jack up car, placing jack under wishbone so that driving shaft is free to rotate. Adjusters are located at top and bottom of backplate on front brakes and single

adjuster is at bottom of backplate on rear brakes. Screw in adjusters until wheel is held tight by brake shoes and then slacken off until wheel will spin freely. Handbrake should be in "off" position when adjusting brakes. When adjusting rear brakes, place jack in normal jacking position.

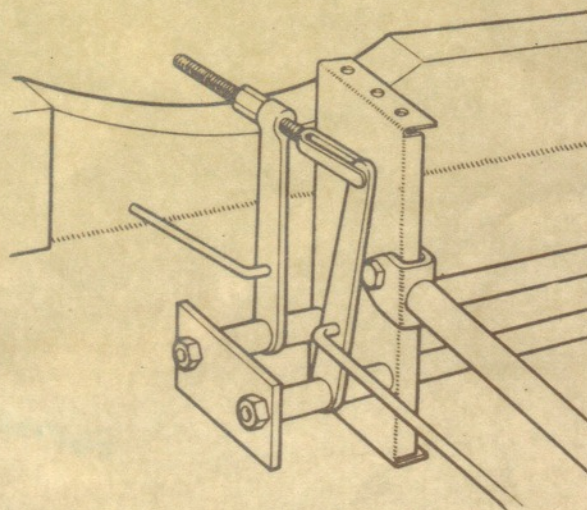


FIG. 2—HANDBRAKE ADJUSTMENT MECHANISM

CLUTCH

GENERAL.—Albion multi-plate clutch is fitted to all models and is incorporated in gearbox. Clutch runs in oil. Clutch is removed with engine and gearbox unit. It is mounted on left-hand side of engine and runs at less than engine speed. For information on removing engine unit, refer to engine section.

Notes on overhauling Albion gearboxes and

clutches will be found in appropriate general section.

CLUTCH ADJUSTMENT.—Initially clutch will require frequent adjustment whilst Klingerite friction inserts settle down. Correct clearance to be maintained between clutch adjusting screw and push rod is $\frac{1}{32}$ in. If ends are allowed to come into contact, clutch will be held partially out of engagement.

ELECTRICAL SYSTEM

GENERAL.—Both twin and three-cylinder models fit Siba Dynastart 12-volt negative earth return electrical equipment. Dynastart is mounted on right-hand side of engine crankcase and incorporates starting motor which becomes a dynamo as soon as engine is running. Regulator unit is mounted

on stator casing. Armature is keyed to crankshaft extension and acts as flywheel. Refer to Siba general section for information on maintenance and repair; this applies to both British and German-made units. Some early cars had German Siba equipment.

DYNASTART REMOVAL

Stator Cover.—Disconnect battery, switch-box and condenser cables. Remove Allen screws holding stator cover to crankcase spigot and withdraw complete cover from engine. When removing cover, ensure that brushes, brush-holders and windings are not damaged. Brushes may be renewed when stator cover has been removed.

Armature.—Remove Allen screw securing cam. Timing-side cylinder must be removed and crankshaft held with crankshaft holding tool as described in Engine sections. (See general section on Excelsior engines.) Using box spanner, remove armature centre nut and then with extractor tool, draw armature off its taper.

Switch Assembly Box.—This is a sealed unit and on no account should cover be removed.

Return to makers for repair and adjustment
DYNASTART REFITTING.—Reverse above procedures, with following additional points:

(1) Drive-shaft key must be of correct size and correctly positioned before fitting armature to shaft. Hold crankshaft with holding tool while armature centre nut is securely tightened.

(2) Replace ignition cam ensuring its correct position.

(3) Brush pigtail connections must be against stator windings with brushes correctly positioned and free to move in holders. Slide stator into position very carefully so as not to damage windings and brushes. Fit stator cover.

(4) Connect cables in accordance with wiring diagram. See general section for fuller information and wiring diagrams.

ENGINE DATA TABLE

<i>Year</i>	<i>Model</i>	<i>Capacity, cu. in.</i>	<i>Compression ratio</i>	<i>Max. b.h.p. at r.p.m.</i>	<i>Piston area, sq. in.</i>	<i>Top-gear m.p.h. per 1,000 r.p.m.</i>
1956-8	328 Mark VI	20	7.9	18 at 5,000	8.2	11.8
1957-8	492	30	7.5	30 at 5,500	12.3	13.2

Excelsior two-stroke engine, having either two or three cylinders. Air-cooled without forced-air circulation. Lubrication is by petrol at ratio of one part oil to sixteen of petrol. With self-mixing oil, ratio is one of oil to thirteen of petrol.

Aluminium cylinder-heads and cast-iron cylinder barrels. Barrels held to crankcase with eight studs. Crankshaft of built-up type and each gas-tight crankcase is separable. Crankshaft carried on roller and ball bearings. Double-row roller bearings used in big-ends. Bushed small-ends with fully-floating gudgeon pins. For details on servicing 328 c.c. Mark VI Excelsior engine, refer to general section. Three-cylinder engine incorporates many components used in smaller twin-cylinder version.

Servicing notes on twin-cylinder model will, therefore, largely apply to three-cylinder model.

ENGINE REMOVAL.—Disconnect all leads from engine and cut-out. Release petrol lines and remove carburetter(s) from engine leaving controls attached. Remove clutch cable and final chain cover plate. Disconnect gearshift operating rod from Silentbloc bush. Remove bolts from inboard universal joints. Air intake baffles and exhaust system can now be removed from engine. Release horn and speedometer drive from back of differential housing. Remove engine mounting bolts; engine can now be lifted out.

Above notes on engine removal may vary slightly as several modifications have been incorporated.

FRONT SUSPENSION AND FRONT END DATA TABLE

<i>Model</i>	<i>Toe-in, in.</i>	<i>Camber angle</i>	<i>Castor angle</i>	<i>Kingpin angle</i>
328	0- $\frac{1}{8}$ in.	2 $\frac{1}{2}$ °	Nil	6°
Sports	0- $\frac{1}{8}$ in.	2 $\frac{1}{2}$ °	Nil	6°
492				
Sports				

Front-wheel drive and independent front suspension. Differential is chain driven from gearbox and driving shafts each have two Hardy-Spicer universal joints. See general section for information on Hardy-Spicer universal joints.

Suspension is by unequal length wish-bones with combined coil-spring and shock-absorber unit located at lower end to upper wish-bone and top end to bracket on inside of wing. Suspension links pivot on Silentbloc bushes and require no attention. Both upper and lower links are mounted to trunnion

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blocks which fit on to either end of kingpin bracket. Driving stub is splined on to wheel plate with two ball bearings in wheel-bearing housing.

DIFFERENTIAL AND FINAL-DRIVE HOUSING DISMANTLING.—Remove engine, see Engine section. Engine removed in cradle. Detach final-drive housing, by releasing three bolts and drive chain and lift tab-washers which lock differential nuts. Remove nuts and, with aid of a suitable withdrawing tool, remove coupling flange. Lift tab-washer and remove centre nut on differential housing and withdraw differential from final-drive housing. On removing six final-drive sprocket bolts, differential can be split. See Fig. 4 for construction of differential.

Reassembly.—Planet wheels to be replaced so that two are running with square faces on differential and other two are fitted in opposite manner. Ensure that speedometer skew-gear is correctly positioned in final drive housing. See Fig. 6. Speedometer drive gear is a press fit in final-drive housing. Adjuster is located on opposite side of housing allowing correct positioning of drive gear. Pack final drive housing with grease and fill differential housing with SAE 90. Also adjust final drive chain, ensuring chain is tight; slack chain will eventually strip Tufnol sprocket. Correct slack is $\frac{1}{2}$ in. at centre of chain.

SUSPENSION ASSEMBLY.—Wish-bones are easily detachable from chassis brackets by withdrawing pivot bolts. Check Silentbloc bushes for damage. Coil-spring and shock-absorber units are

FIG. 4 (below)—DIFFERENTIAL AND DRIVE SPROCKET COMPONENTS

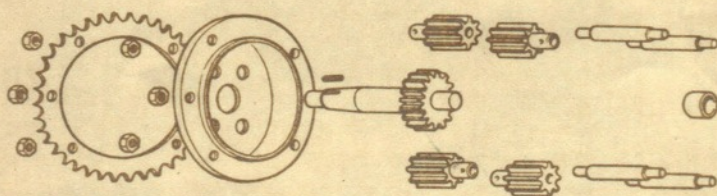


FIG. 5 (below)—DRIVING SHAFTS, KING-PIN BLOCK AND WHEEL HUBS

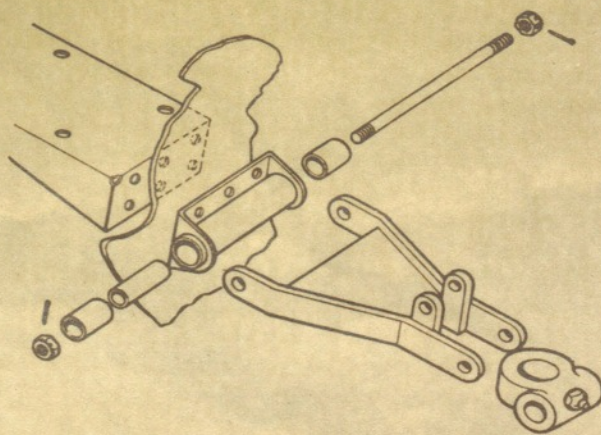
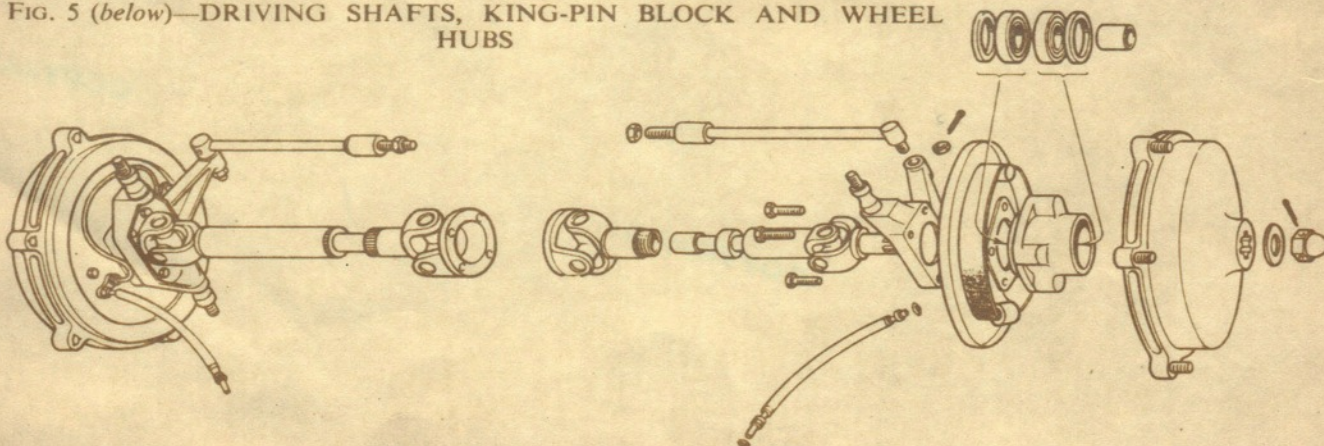


FIG. 3—UPPER WISHBONE ASSEMBLY

removed in similar manner and mounting bushes should be checked.

KINGPIN REMOVAL.—Dismantle inboard universal joints, by removing four bolts. Detach road wheels. Remove split pin and domed nut and withdraw brake drum by using withdrawal tool. Release suspension units at lower mountings. Ease lower end of unit out with aid of flat tyre lever. Disconnect brake line. Remove top and bottom trunnion-bearing pivot bolts. Withdraw split pin and nut from track-rod ball end. Remove halfshaft complete with kingpin. Ease brake backplate complete with kingpin apart from halfshaft, then remove four bolts— $2 \times \frac{3}{8}$ in., $2 \times \frac{5}{16}$ in.—allowing kingpin assembly to be removed.

Reassembly is reverse of removal. Suspension unit can be eased into position with flat tyre lever.

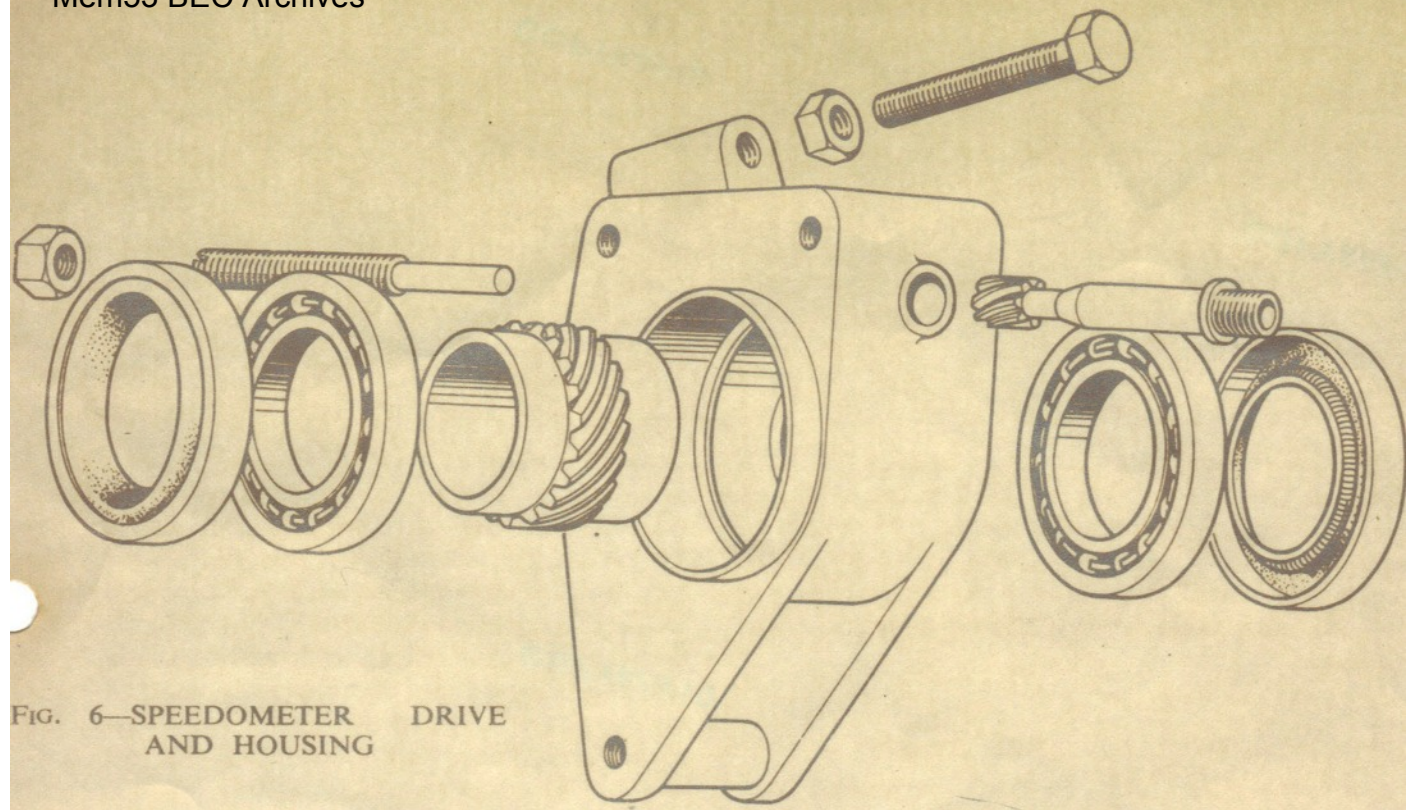


FIG. 6—SPEEDOMETER DRIVE AND HOUSING

FUEL-SUPPLY SYSTEM CARBURETTER DATA TABLE

<i>Year</i>	<i>Model</i>	<i>Amal type No.</i>	<i>Main jet</i>	<i>Needle jet</i>	<i>Pilot jet</i>	<i>Throttle valve</i>
1956-8	328 Sports	(One) 376	230	105	25	4 cutaway
1956-8	328 Sports de Luxe	(Two) 376	190	105	25	4 cutaway
1957-8	492 Sports	(Three) 376	190	105	25	4 cutaway

On all models except 492 Sports, fuel-feed is by gravity. On 492 Sports model an S.U. electric fuel pump, type L is used. For information on servicing and adjusting Amal carburetters and S.U. fuel pumps, see appropriate general sections.

Multi-carburetter installations employ single throttle cable connected to an equalising arrange-

ment mounted above carburetters. Both air and throttle cables are connected to levers at one end of equaliser. Movement of each cable is transmitted through rods to carburetter tops. Amount of movement can be adjusted by stop-screws to ensure exactly equal operation of each carburetter, which should be adjusted separately.

GEARBOX

DATA TABLE

<i>Model</i>	<i>Gearbox type</i>	<i>Gear ratios</i>				
		<i>1st</i>	<i>2nd</i>	<i>3rd</i>	<i>Top</i>	<i>Rev.</i>
*328 Sports	Albion 3-speed	13.85	8.43	—	5.27	17.25
492 Sports	Albion 4-speed	15.1	9.12	6.33	4.61	16.5

* May have 4-speed gearbox.

Motorcycle-type gearboxes. Gearbox operation is through tie-rod from centrally-placed gate-change lever. Tie-rod adjuster located forward of lever, to ensure correct gearbox engagement.

MAINTENANCE AND ADJUSTMENT.—For information on servicing Albion 3- and 4-speed gearboxes, refer to general section. Gearbox removed from car with engine and clutch unit. See Engine section. To part gearbox-clutch unit from engine, remove clutch cover and disconnect chain drive. Unscrew nuts from studs which pass through gearbox casing from engine crankcase and detach gearbox-clutch unit complete.

IGNITION TUNE-UP DATA TABLE

Year	Model	Firing order	Ignition timing b.t.d.c.	Contact-breaker gap, in.	Sparking plugs	
					Type	Gap, in.
1956-8	328 Sports	12	$\frac{5}{32}$ in. on piston	0.014-0.016	K.L.G. FE70D	0.018-0.020
1957-8	492 Sports	123	$\frac{11}{64}$ in. on piston	0.014-0.016	K.L.G. FE70D	0.018-0.020

Ignition by coil with contact-breaker for each cylinder. Contact-breaker mechanism incorporated in starter-generator unit. Condensers mounted on switch-assembly box. Refer to electrical system for starter generator removal and to general section for full information on servicing Siba electrical equipment.

MAINTENANCE AND ADJUSTMENT

Contact-breaker Gap Setting.—Remove small cover from centre of stator cover. Contact-breakers

located on breaker plate. Set gap with feeler gauge in usual manner with pistons set at top dead centre.

Ignition Timing.—Providing that contact-breaker cam is located correctly on crankshaft stub, the only ignition setting required is by turning contact-breaker baseplate until correct position is obtained. Remove sparking plugs and use depth gauge to measure piston travel. Turning baseplate clockwise will retard ignition and *vice versa*. Release baseplate screws and rotate baseplate, which has elongated holes. Tighten screws and ensure that contact-breaker gap is set correctly.

REAR AXLE AND REAR SUSPENSION

Swinging half-axes are employed pivoted on centre-line of car. Combined coil-spring shock-absorber unit located at lower end to forward axle member and upper end to bracket to inside of wing. Silentbloc bushes used throughout. Pronounced camber of rear wheels when car is in unladen condition. Rear axle and rear suspension, Fig. 7.

REAR SUSPENSION REMOVAL.—Remove rear wheel and hub cap, split pin and stub-axle nut. Withdraw brake drum by using withdrawal tool

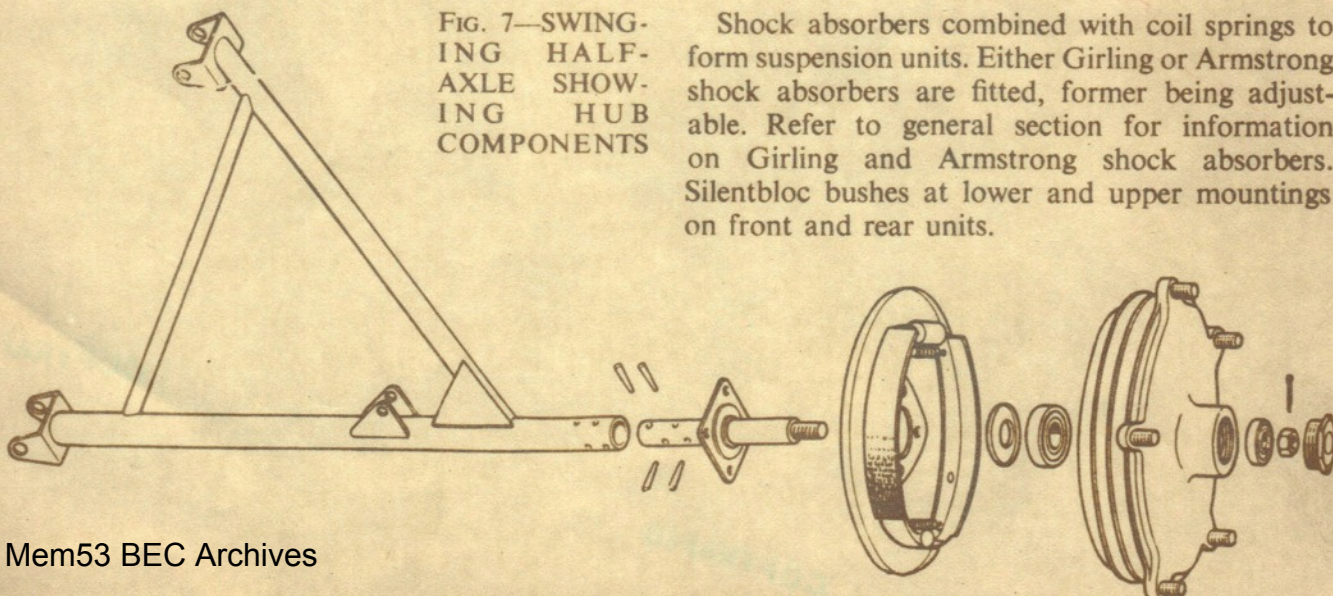
and disconnect hydraulic brake line. Disconnect lower suspension mounting bolt and remove hand-brake operating rod. Front and rear pivot bolts can now be removed from two suspension arms. Backplate is released from stub axle by removing four nuts and bolts. Axle stub secured in front arm tube by four split pins, two pairs set at 90° to each other around tube.

Reassemble in reverse order to removal, ensuring that Silentbloc bushes are in good condition.

SHOCK ABSORBERS

FIG. 7—SWINGING HALF-AXLE SHOWING HUB COMPONENTS

Shock absorbers combined with coil springs to form suspension units. Either Girling or Armstrong shock absorbers are fitted, former being adjustable. Refer to general section for information on Girling and Armstrong shock absorbers. Silentbloc bushes at lower and upper mountings on front and rear units.



STEERING

Burman worm and nut steering gearboxes fitted to all models. Refer to general section on Burman steering for information on adjustment and servicing. Adjustment is by square-headed adjusting screw on top of steering box.

Toe-in Adjustment.—Track rod divided into three pieces. Centre section has two brackets; steering drop-arm fits into one and other is bolted to idler lever. Silentbloc bushes used throughout. Outside track-rod sections adjustable. Ensure that track-rod sections are adjusted equally. See Front Suspension

section for removal of track-rod ball ends and kingpins. Toe-in $\frac{1}{8}$ in.

Steering-gearbox Removal.—Forward end of steering box bolted to forward bulkhead. Release split pin and unscrew nut off steering arm thus enabling drop arm to be removed. Steering arm bracket should be detached from bulkhead below steering box. On releasing steering column, steering box can now be removed. Steering gear shown in Fig. 8. Check and adjust steering geometry after box and linkage components have been refitted.

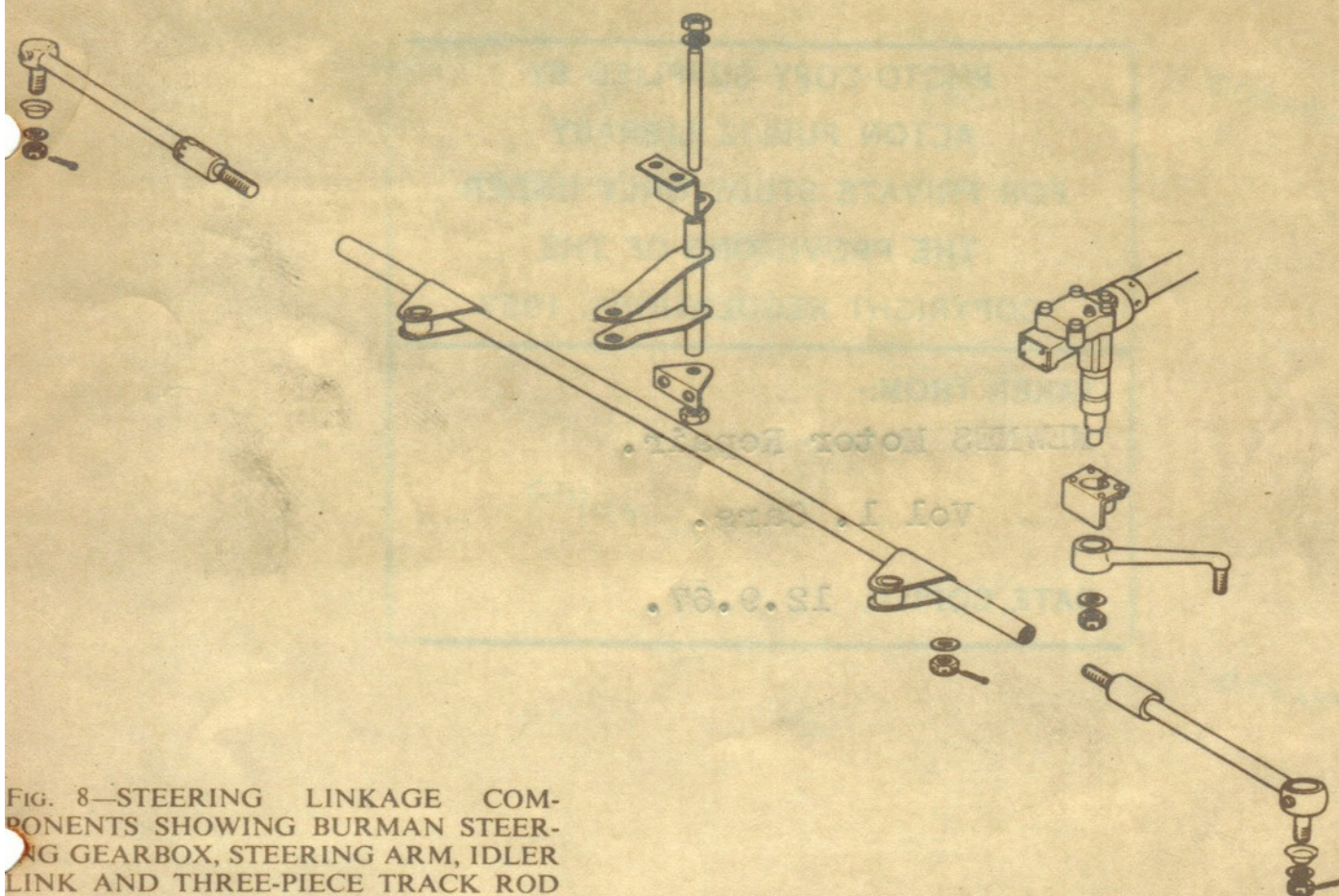


FIG. 8—STEERING LINKAGE COMPONENTS SHOWING BURMAN STEERING GEARBOX, STEERING ARM, IDLER LINK AND THREE-PIECE TRACK ROD

WHEELS AND TYRES

DATA TABLE

Year	Model	Wheel type	Tyre type and size	Pressure, lb/sq. in.	
				Front	Rear
1956-8	328 Sports	5-point fixing	Michelin 5-20 × 12	14	12
1957-8	492 Sports	5-point fixing	Michelin 5-20 × 12	16	14

Wheels are special lightweight type with five-point stud fixing on split-type wheel rims. Refer

to general section for information on tyre servicing.