CAMS

5th CATEGORY - HISTORIC RACING

GROUP Na

APPROVED VEHICLE SPECIFICATION

This form details the approved specification of individual vehicle models in the Sa and Sb production sports car groups. To be issued with an Historic log book, cars need to comply with these specifications, the physical appearance shown in the illustrations and the general historic rules as detailed in the current CAMS manual.

Make of car: FORD ZEPHYR **Model:** MARK II

Period of manufacture: 1956 - 1962

CAMS Historic group: Na

Date of issue of this Document: 3/6/1996

SECTION 1 - CHASSIS

1.1 CHASSIS FRAME

Description :	UNIT BODY SHELL		
Manufacturer :	FORD	Period of manufacture:	1956 - 1962
Chassis nos. from :		to:	
Material :	MILD STEEL		
COMMENTS :	NIL		

1.2 FRONT SUSPENSION

Description :	IFS McPHERSON STRUT		
Spring medium :	COIL		
Damper type :	TUBULAR (STRUT)	Adjustable :	NO
Anti-sway bar :	YES	Adjustable :	NO
Suspension adjustable	NO	Method :	N/A
COMMENTS :	SPRING RATES AND RIDE HEIGHT UNRESTRICTED		

1.3 REAR SUSPENSION

Description :	LIVE AXLE		
Spring medium :	SEMI ELLIPTIC LEAF		
Damper type :	TUBULAR	Adjustable :	NO
Anti-sway bar :	NO	Adjustable :	N/A
Suspension adjustable	NO	Method :	N/A
COMMENTS :	SPRING RATES AND RIDE HEIGHT UNRESTRICTED.		

1.4 STEERING

Type :	WORM & PEG	Make :	FORD
COMMENTS :	NIL		

1.5 BRAKES

	Front	Rear
Type :	DRUM	DRUM
Dimensions :	9" x 2.5"	9" x 1.75"
Material of drum :	CAST IRON	CAST IRON
No. cyls / pots per wheel :	2	1
Actuation :	HYDRAULIC	HYDRAULIC

Drum make :	GIRLING		
Master cyl make :	GIRLING	Type :	SINGLE
Adjustable bias :	NO		
Brake servo :	NO		
COMMENTS :	TANDEM M/CYL ALLOWED SERVO ALLOWED		

SECTION 2 - ENGINE

2.1 ENGINE

Make :	FORD		Model :	206E	
Engine no. range :					
No. cylinders :	6	Configuration :	IN LINE		FOUR stroke.
Block material :	CAST IRON				
Bore ; original :	82.6 mm		Max. allowed :	84.1 mm	
Stroke ; original :	79.5 mm		Max allowed :	79.5 mm	
Capacity ; original ;	2557 cc		Max. allowed :	2651 cc	
Cooling method :	WATER				
Identifying marks :	NIL				
COMMENTS :	NIL				

2.2 CYLINDER HEAD

Make :	FORD				
No. valves per cyl :	2	Inlet :	1	Exhaust	1
No of ports, total :	7	Inlet :	3	Exhaust	4
No of camshafts :	1	Location :		BLOCK Drive :	GEAR
Valve actuation :	OHV				
Spark plugs per cyl. :	1				
Identifying marks :	-				
COMMENTS :	NIL				

2.3 LUBRICATION

Method :	WET SUMP	Oil tank location :	N/A
Dry sump pump type :	N/A	Location :	N/A
Oil cooler standard :	NO	Location :	N/A
COMMENTS :	OIL COOLER ALLOWED		

2.4 IGNITION SYSTEM

Type :	DISTRIBUTOR AND COIL	Make :	LUCAS
COMMENTS :	NIL		

2.5 FUEL SYSTEM

Carburettor ; Make :	ZENITH	Model :	36WLA	No. :	1
Size :	36mm				
Fuel injection ; Make :	NO	Type :			
Supercharger :	NO	Type :			
Make :	N/A	Drive :			
COMMENTS :	THREE ZENITH CARBURETTORS ALLOWED THROAT SIZE UNRESTRICTED				

SECTION 3 - TRANSMISSION

3.1 CLUTCH

Make :	BORG & BECK	Type :	COIL	Dia. :	8.5"
No. of plates :	1				
Actuation :	HYDRAULIC				
COMMENTS :	NIL				

3.2 TRANSMISSION

Make :	FORD	Model :	
Case material :	CAST IRON		
No. forward speeds :	3	Gearchange Type	COLUMN CHANGE
Gearbox location :	BEHIND ENGINE		
COMMENTS :	RATIOS FREE		

3.3 FINAL DRIVE

Make :	FORD	Model :	
Wheel drive :	REAR		
Ratio :	3.90 : 1		
Differential :	FREE	Type :	HYPOID BEVEL
COMMENTS :	RATIOS FREE		

3.4 TRANSMISSION SHAFTS (EXPOSED)

No.	1	Location :	TAILSHAFT
Description :	TUBULAR		
COMMENTS :	NIL		

3.5 WHEELS AND TYRES

Wheel , type; original :	DISC	Material; original :	STEEL
Allowed :	DISC	Allowed :	STEEL
Fixture method :	BOLT ON	No. studs :	5

		Front	Rear
Wheel dia. & rim width	Original :	13 x 4.5"	13 x 4.5"
	Allowed :	13 x 5"	13 x 5"
Tyre section :	Original :	6.40 x 13	6.40 x 13
	Allowed :	205 x 13	205 x 13
Aspect ratio, minimum :		65%	

COMMENTS : TYRES MUST BE FROM THE APPROVED TYRE LIST

SECTION 4 - GENERAL

4.1 FUEL SYSTEM

Tank location :	IN BOOT FLOOR	Capecity, litres :	45
Fuel pump; type :	MECHANICAL	Make :	AC
COMMENTS :	NIL		

4.2 ELECTRICAL SYSTEM

Power supply :	GENERATOR		
Battery; location :	R/H SIDE FIREWALL	Voltage :	12
COMMENTS :	NIL		

4.3 BODYWORK

Type :	SEDAN	Material :	STEEL
No. of seats :	5	No. doors :	4
COMMENTS :	NIL		

4.4 DIMENSIONS

Track; front ;	1345 mm	Track, rear :	1321 mm
Wheelbase;	2717 mm	Overall length :	4534 mm
Dry weight :	1221 kg		
COMMENTS :	NIL		

4.5 SAFETY EQUIPMENT

Fire Extinguisher :	REQUIRED
Seat belt :	REQUIRED
Roll bar :	REQUIRED
Battery cut off switch :	RECOMMENDED
Safety fuel tank :	RECOMMENDED
COMMENTS :	NIL

With identical seating capacity for all three models, individuality is conferred by the use of distinctive front and rear treatment. The Consul is in the centre, the Zodiac on the left and the Zephyr on the right. A low, wide appearance has been achieved by simple treatment without the use of excessive adornment. White wall tyres are standard on the Zodiac but optional extras on the two other models. The rims of the head lamps at the front and the cluster lights at the rear are clearly visible from the driver's seat, which assists manoeuvrability in confined spaces

THREE NEW FORDS FROM DAGENHAM

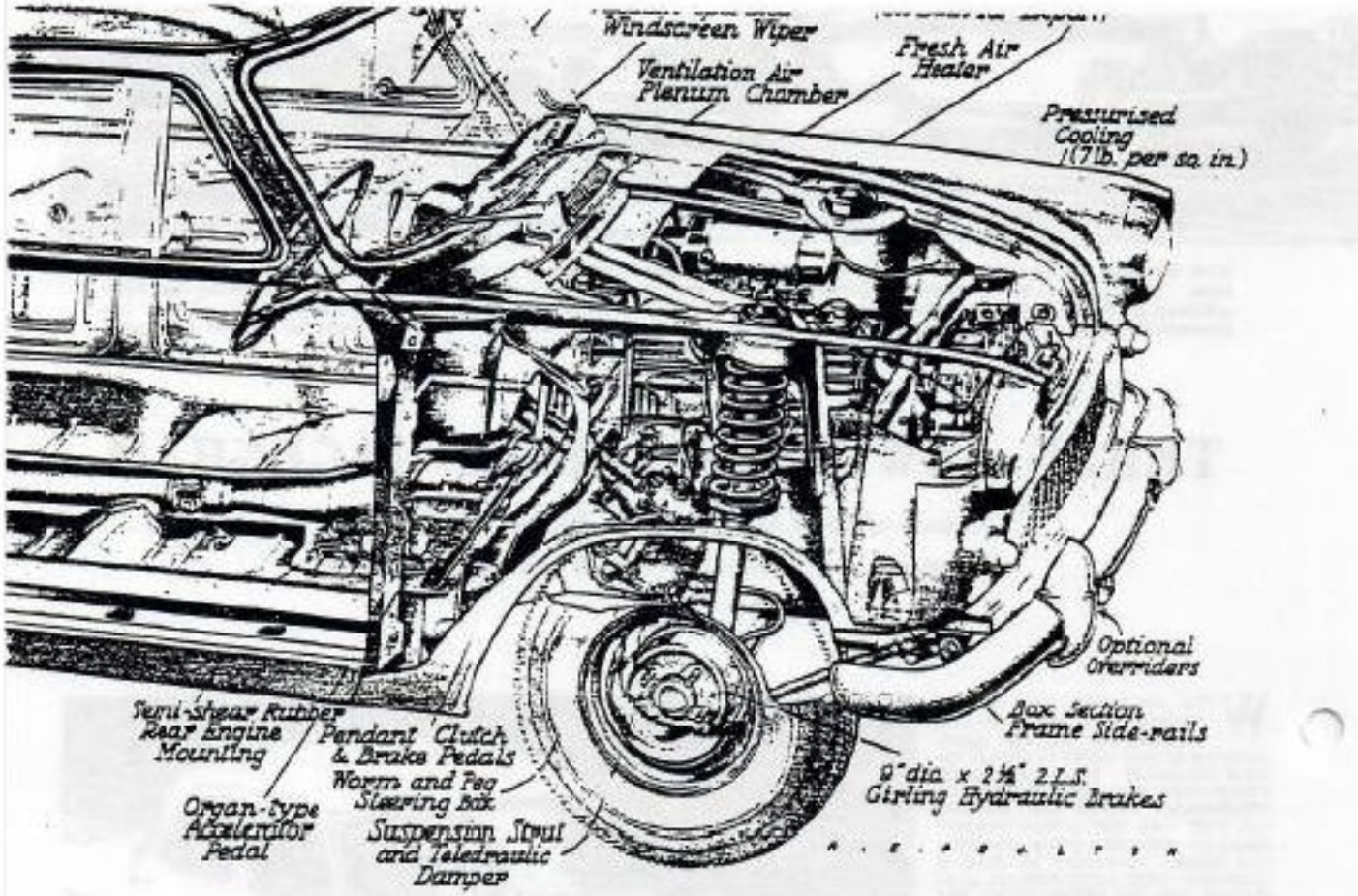
Details of the Latest Consul, Zephyr and Zodiac: Increases in Accommodation and Engine Size

WITH the present high level of tooling costs for mass production, the big car manufacturers cannot afford to change designs frequently. When the need for change must eventually be faced, the modifications offered must be such that they will meet future requirements for some four years. The three new models announced by Ford of Dagenham offer improvements in all respects over the models which they replace, and in each case little other than the familiar name of Consul, Zephyr or Zodiac is retained.

The new cars provide a considerable increase in capacity and comfort, being full six seaters, with plenty of leg and head room in front and rear compartments. Handling has been improved by better weight distribution, attributable to increases in wheelbase and track; these have not reduced manoeuvrability as the turning circles are less.

Braking efficiency has been increased by the use of much wider front shoes in conjunction with the existing drum diameter. Changes in engine proportions should result in higher performance and economy, particularly as the overall weight of

(Below) A wide variety of dual colour schemes for paintwork and upholstery is available in the Zodiac, which is the most expensive in the range. The specification of the Zodiac includes a combined heater and demister with fresh air ventilation, a fitment which is an optional extra on the other models. (Right) Hooded head lamp treatment is used on all models, identical with the Consul shown here. Flashing indicators are incorporated in the side lights, but at the rear separate amber flashes are used. Bumper overrider are an optional extra for the Consul



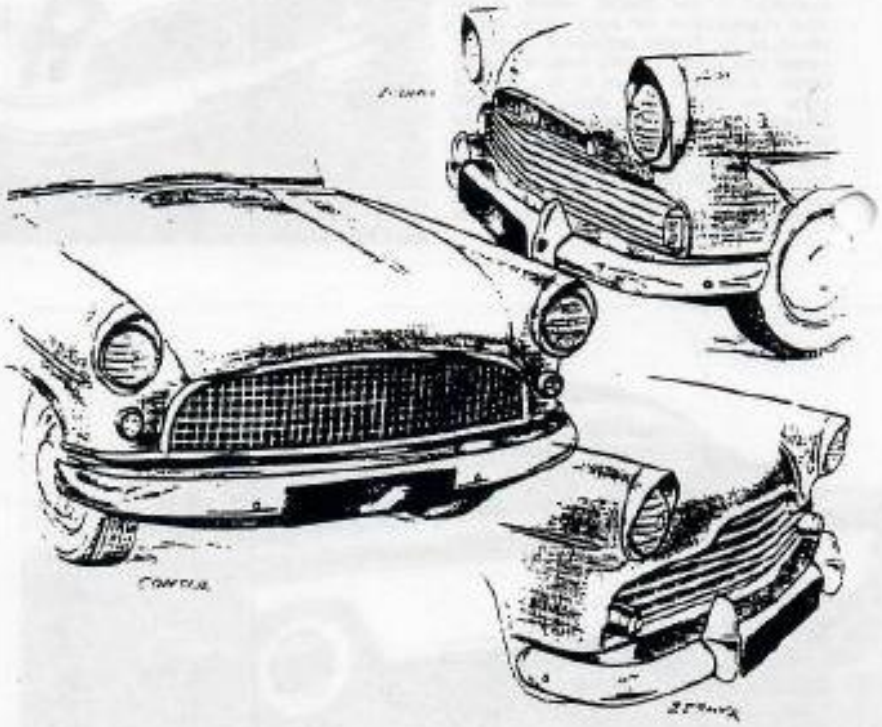
capacity and improved road-holding the track has been increased by 3 inches, now being 4 feet 5 inches at the front and 4 feet 4 inches at the rear for all models. The wheelbase of the Consul has been increased by 4½ inches to 8 feet 8½ inches, and of the Zephyr and Zodiac by 3 inches, now becoming 8 feet 11 inches. The dimension from the centre line of the rear axle to the rear face of the engine flywheel is identical on all models, so that the differences in wheelbase are embodied in the section forward of this point. These increases in basic sizes have had a considerable effect on weight distribution, and should give much improved handling and road-holding.

For the Consul the weight distribution, dry, is 53 per cent. front and 47 per cent. rear, while with four passengers, each weighing 150 lbs., the weight distribution becomes 49.3 per cent. front and 50.7 per cent. rear. Similarly, the figures for the Zephyr and Zodiac are 55 per cent. and 45 per cent. unladen, and 51.1 per cent. and 48.9 per cent. laden. These figures indicate a considerable improvement over the previous models. In the case of the earlier Zephyr the weight distribution was 60 per cent. front and 40 per cent. rear in the unladen state.

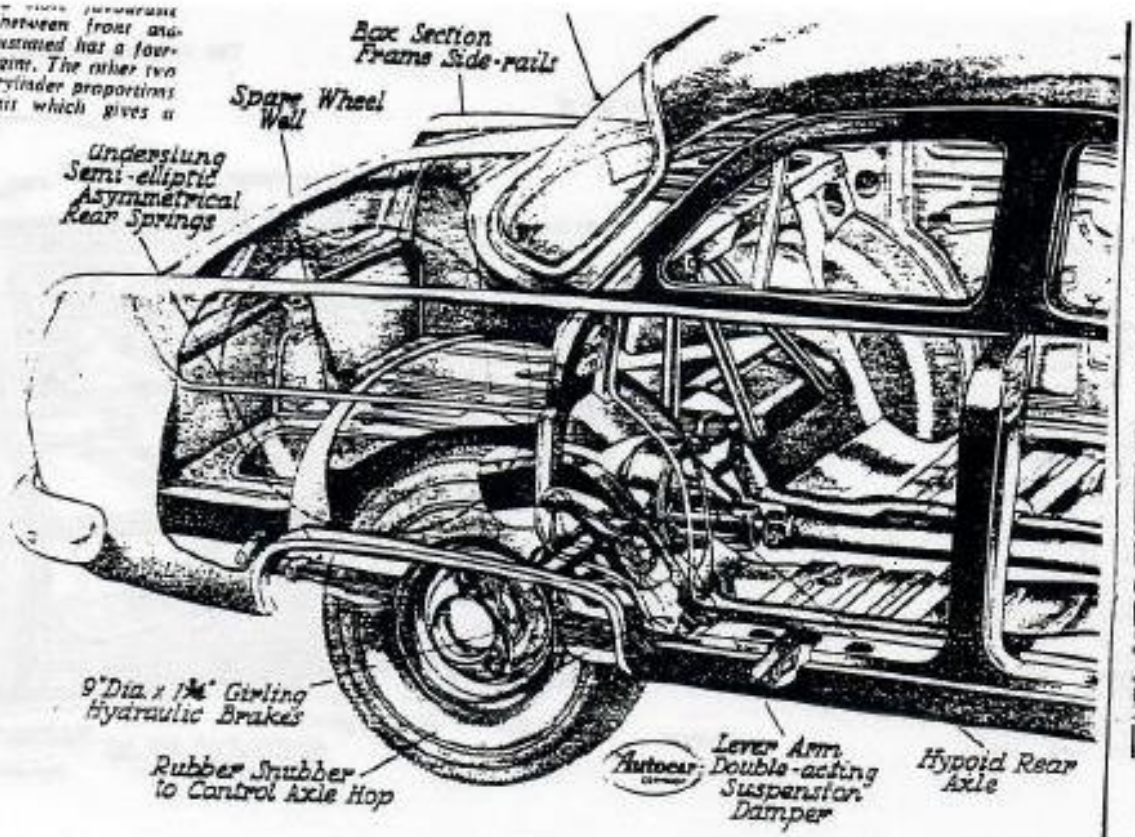
The bodies are of integral construction, and it is interesting to note that they have been designed for production by automation.

Torsional and beam stiffness have been increased by approximately 12½ per cent. The three main structural sections are the rear seat pan structure, the dash section and the for-

Individual frontal treatment is provided for each model. The Consul uses a simple mesh grille with a chrome surround; the Zephyr has horizontal slats which extend beyond the line of the head lamps. The Zodiac uses horizontal treatment with a concave vertical motif on the upper central portion of the grille. The bonnet of each is fitted into the shallow ventilation slot on the leading edge of the scuttle



weight distribution between front and rear. The Consul illustrated has a four-cylinder, 1,703 c.c. engine. The other two models use the same cylinder proportions in a six-cylinder unit which gives a capacity of 2,553 c.c.



THREE NEW FORDS *continued*

each model has gone up by only some 80 lb. despite the increase in both passenger and luggage accommodation. Detailed improvements in suspension and body structure will ensure reductions in road noise and vibration.

By the use of clean and simple lines, the cars achieve distinction and individuality without the use of excessive chromium and non-functional adornment. Front and rear ends of each model are distinctive, and the Zodiac is no longer a basic Zephyr with additional trappings. Each model has been styled to give a low, wide look by clever yet simple horizontal treatment.

The centre or greenhouse section of the body is identical on all three models, and thus the designers have sensibly recognised that if six people are to be accommodated in comfort, the same cubic capacity of seating is required. A semi-wrap-round screen is used; it may be asked why not a fully wrapped round type, as seen on American and Italian models?

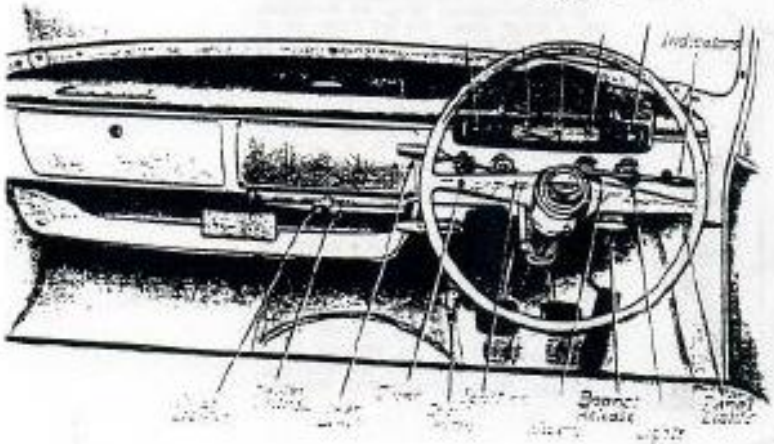
With American proportions, this can be achieved without sacrificing ease of entry due to restricted door width, but not with the British size of motor car. On their individually-built bodies, the Italians are prepared to sacrifice a lot of creature comfort to achieve distinctive style. Fords seem to have retained both, in conjunction with good visibility.

In broad figures the new models are 2 inches wider, 6 inches longer and ¾ inch lower than their predecessors, but it must not be inferred that the seating capacity has been altered by the mere ratio of these bare dimensions. In fact much more effective use has been made of the space within this framework. In the front compartment the relative positioning of pedals and seat has been improved, and at the rear the general floor level has been dropped below the body sills. In this way an unusual amount of head room has been provided for the size of the vehicles, and it is easy for the tallest passengers to enter and sit without the removal of head gear; the interior trim and fitments vary with each model.

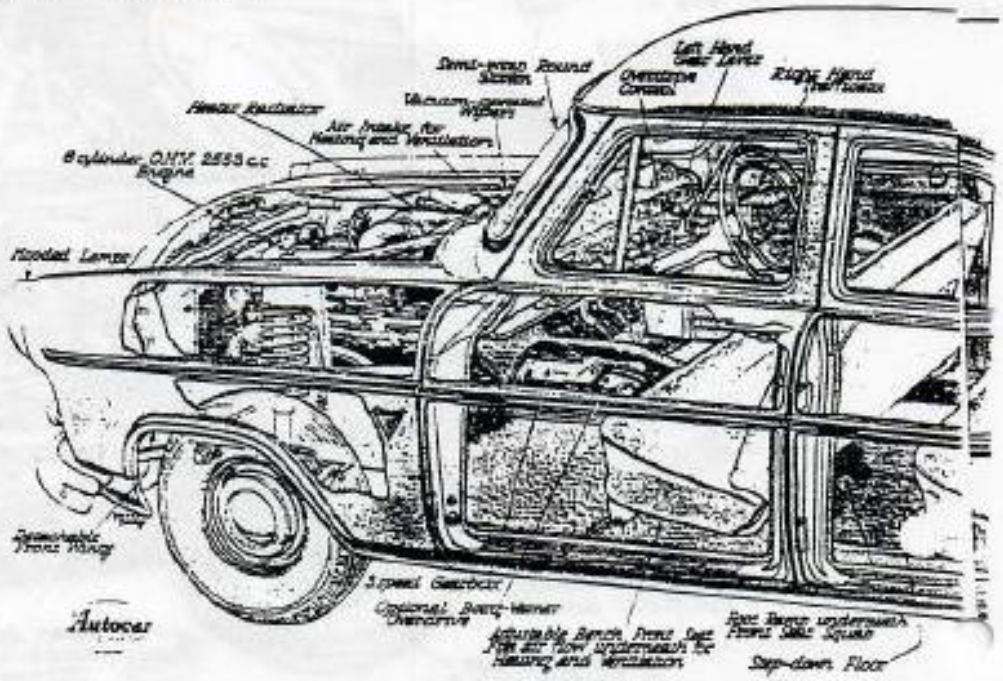
Dished, two-spoked steering wheels are used and are fitted with a complete horn ring, while the change for the three-speed gear box is mounted on the column. Clutch and brake pedals are of the pendant type and have been stiffened considerably; at the same time pedal travel has been increased to reduce operating loads (now 23 lbs. on all models). A long pendant-type pedal is provided for throttle operation.

To achieve the increased passenger

Instruments and controls are grouped around the steering column. A pistol-grip type hand brake lever, placed below the facia, is operated by the left hand. A lockable compartment is provided on the left-hand side of the fascia, with a parcels tray below it. Pendant pedals are used for clutch and brake operation and an organ type pedal, with rod linkage, for the throttle.



THREE NEW FORDS *continued*



This drawing of the Zephyr illustrates the methods used to achieve good seating capacity and comfort. At the rear the floor level is dropped and a foot ramp is provided beneath the rear squab of the tubular-framed front seat. This provides good head room and also permits a free flow of ventilation and heating to the rear compartment. There is a spacious parcels shelf between the rear seat and the wrapped-round, sloping rear window. Swivelling ventilation panels are used in the windows of each four-panel-hinged door. A Borg-Warner overdrive with kick-down engagement is an optional extra on each model.

ward bulkhead member at the radiator. This bulkhead is merged into the wing vallances and tied to the dash with a semi-diagonal member at each side at the upper anchorage point of the front suspension unit. Beam stiffness is obtained from the sills (or rocker panels) down each side. Inboard of these are two side rails running fore and aft, which meet at a common junction point under the front seats where the ramp for the feet of the rear passengers forms a substantial cross member.

The tubular framed seats, without vallances, permit the rear passengers' feet to be tucked underneath to give more room, and also allow a free flow of air to the rear compartment from the ventilating system. Many heating systems cook the front passengers, while those at the rear freeze; not so with the Fords, as there is a free flow of air throughout the car from the optional 3½ kw. heating system.

Ventilating air enters through an unobtrusive grille at the front edge of the scuttle. It is quite shallow and styled into the bonnet with diminishing flutes towards the forward edge. From the duct, air is fed into a plenum chamber the same width as the scuttle. Any water which may enter is drained through a rubber flap valve.

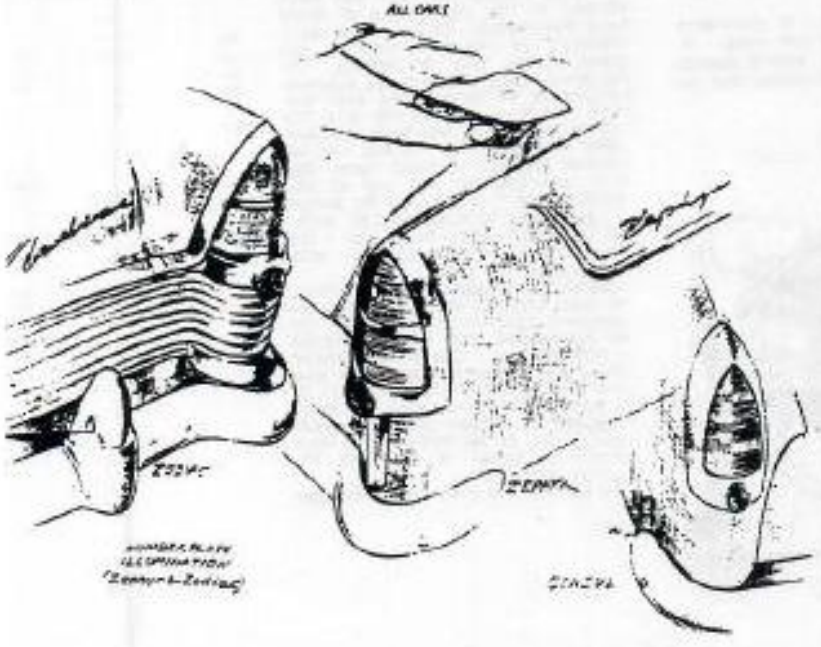
In parallel with increased passenger capacity, the luggage compartment is also greater. It has a capacity of 20 cubic feet, and although it houses the spare wheel in a floor well on the right-hand side, the proportions allow ample baggage space for four people. An 11-gallon fuel tank is mounted under the floor of the luggage compartment, and is provided with a central filler reached by hinging forward the spring-loaded rear number plate. In this position the filler spout does not encroach on the usable luggage space.

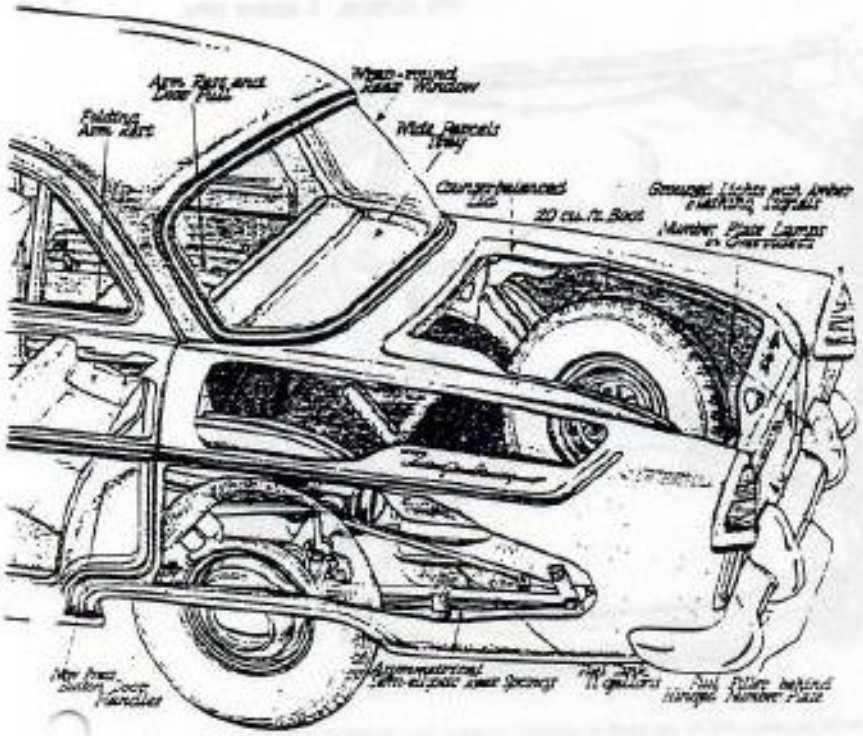
If ready access is to be provided for a large boot, the lid must be of substantial size. For ease of operation the Ford lids are spring-assisted, and opened by releasing a central button.

The bonnet is hinged at the scuttle and is spring-loaded so that no fixing stay is required. It is released from a primary catch by a T-handled control below the facia inside the car. Full opening is obtained from the secondary safety latch reached by hand above the front grille. Access to the top of the engine and electrical installations is adequate for routine servicing.

The major change in the new engines is the increase of the bore and stroke by ¼ inch, which gives capacities of 1,703 c.c. for the four-cylinder and 2,553 c.c. for the six-cylinder. This 12.5 per cent. increase

The rear treatment of the Zodiac is a waistband panel finished in gold, stretching across the width of the car. The bezels around the rear cluster lights are chrome-plated and have gothic arch treatment. Chrome bezels are also provided on the Zephyr rear cluster lights, but those of the Consul are painted to match the colour of the car. Pull-type door handles incorporate a press button beneath





in capacity has made possible an equivalent reduction of engine speed and at the same time allowed a slight increase in performance, with a compression ratio increased to 7.8 to 1 on all models. A lower optional ratio of 6.9 to 1 is available to permit running on lower grade fuels.

The Consul develops a peak power of 59 b.h.p. at 4,200 r.p.m., and the Zephyr and Zodiac have outputs of 86 b.h.p. at 4,200 r.p.m. One of the main objects in this adjustment of engine proportions has been to obtain a more favourable fuel consumption, the cruising speeds of the cars having now been arranged to occur on the most economical parts of their fuel consumption curves.

Main and big end bearing diameters have been increased, proportional to the increase of piston area. A fully-floating gudgeon pin, retained by circlips in the piston bosses is another innovation. Each aluminium alloy piston incorporates a cast-in steel strut to control expansion and maintain the same clearances under hot or cold running.

The new cast-iron crankshaft has hollow flying webs between the cylinders where a main bearing is not provided. Over-square engines demand fairly wide spacing of cylinders. The modern thin wall bearing, with its high load capacity, has a considerably larger diameter than length. The combination of these two features means that the flying webs of the crankshaft are rather long and tend to become heavy if sufficient metal is used to obtain stiffness.

By using a cast-iron crankshaft, the flying webs can be made very substantial in section, yet as a result of hollowing out the metal in their centres, light in weight also. A similar design is used for the German Ford Taunus crankshaft. In addition to the stiff, light construction achieved, a very important advantage is that internal as well as external hard skins, unbroken by machining, are retained. The benefit of this has been proved by laboratory research carried out by M.I.R.A. The crank pins are also lightened by means of an offset diagonal hole. In consequence the mass of their counterbalance weights can be reduced.

A damper is again used on the short-centre timing chain. This is similar to the one introduced on the later production runs of the superseded models. It is of spring-blade type, to which is moulded a hard rubber block which maintains tension on the links of the slack side of the chain. Tension is provided from a spring-loaded plunger, acting on the heel of the blade.

The in-line valves are placed at an angle of 14 deg. to the vertical, and operate in conjunction with a wedge-type combustion chamber in which the squish is directed towards the sparking plugs. The valves operate direct in the cylinder head without the use of guides. This, it is claimed, gives better cooling by providing a more direct heat path.

The valve stem bearing area is large and this should keep wear to a minimum. Should excessive wear eventually take place, a range of valves with oversize stems is available, so that it is necessary only to ream through the existing guide holes and re-cut the seats.

The induction manifolds are new, with a modified hot-spot arrangement which has a greater mass of metal in this region. Siamesed inlet ports require a two-branch induction manifold on the four-cylinder engine and a three-branch manifold on the six-cylinder engine. Exhaust ports are separate, and connect into the steel tube manifold which is fixed to the head with saddle and clamp joints. The carburettors are of the downdraught pattern, the four-cylinder having a Zenith 34 WIA type and the six-cylinder a 36 WIA of the same make.

Pressure lubrication, in conjunction with a full-flow type oil filter, is arranged to crankshaft and camshaft bearings. Gudgeon pin lubrication is by splash, and squirt holes are drilled in the connecting rods to provide lubrication of the cylinder walls.

Considerable development work has been undertaken on the cooling system which operates at 7 lb. per sq. inch, maintained by the pressure filler cap of the radiator. With an eye on overseas markets, the problem of boiling in mountainous conditions has received particular attention and at 20 m.p.h. with wide open throttle it requires 120 deg. F. (49 deg. C.) temperature rise above ambient before boiling takes place.

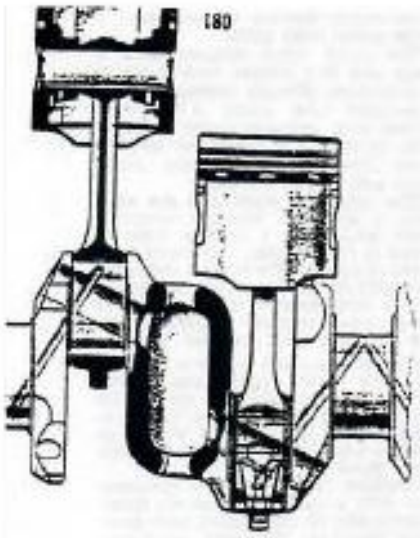
Attention has been focussed on light pedal loads, and the clutch has been re-designed with this in view. It is of single dry plate design with a woven lining; that for the four-cylinder is 8 inches in diameter and for the six-cylinder 8½ inches in diameter.

Fords design and manufacture their own clutches, and the new one incorporates knife-edge operation of the withdrawal fingers to reduce friction. Deep-drawn pressed covers are used to combat deflection. The cluten plates incorporate springs for torsion damping, and there are also hysteresis damping washers to damp out the natural frequency of these springs. A ball-type release bearing is used, and this is grease packed for life to obviate servicing.

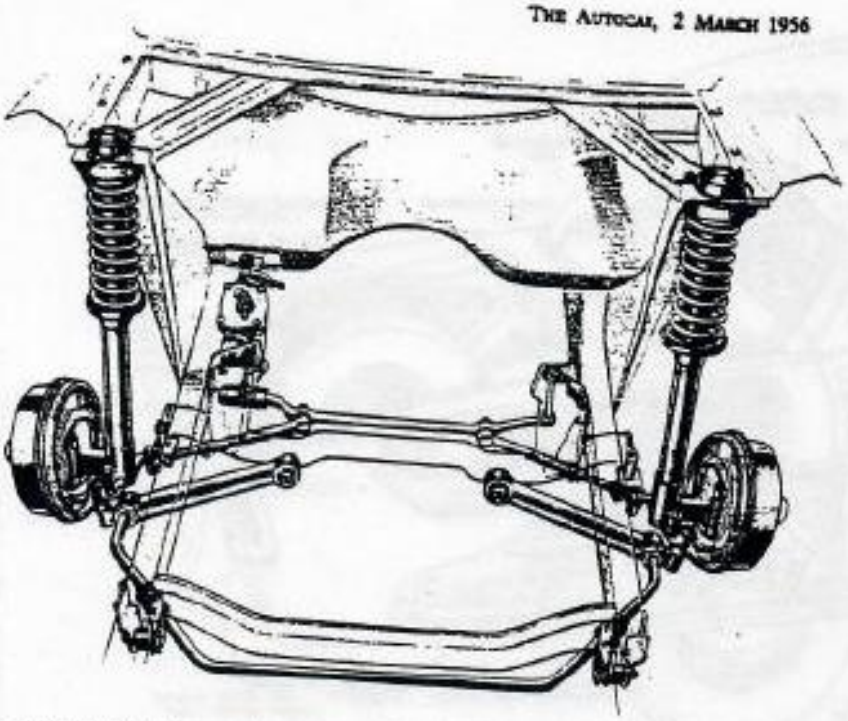
Hydraulic release in conjunction with a dash-mounted pendant pedal is used, and the brake pedal is of a similar pattern. To maintain low operating loads on the six-cylinder cars, which have heavier springs for greater torque, an over-centre helper spring is incorporated in the pedal linkage.

Detailed design modifications only

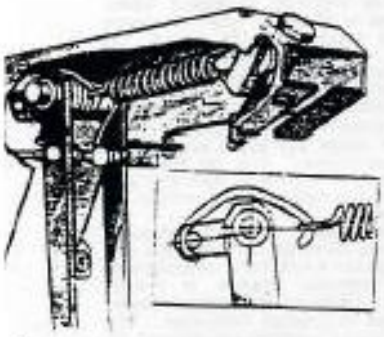
The outline of the seating accommodation can be appreciated from this scale diagram. The passengers shown are 5ft 10½in in height and weigh 12 stones, a standard which has been fixed after much market research. The difference in length of the six-cylinder models is embodied forward of the pedals and scuttle structure



A cast-iron crankshaft with hollow firing webs permits a soft yet light construction. The crank pins also are hollowed out to reduce the weight of counter-balance. Gudgeon pins are now fully floating and retained by circlips in the piston bosses



The same basic front suspension as on earlier models is used but detailed modifications have been made to increase rigidity and improve life. The top abutment mounting is rigidly braced into the scuttle structure. A forward facing anti-roll bar also forms the front arm of the bottom wishbone mount. This system permits a higher roll centre than the more orthodox double wishbone arrangements



An over-centre spring assists the clutch pedal operation

have been made to the three-speed gear boxes, which have synchromesh on the two upper ratios. To accommodate the greater engine torque, output and input shaft sizes have been increased.

Borg-Warner overdrive is optional on all models. On the Consul it necessitates a lower axle ratio, but development experience has proved this unnecessary on the Zephyr and Zodiac due to the deliberate tailing off at the top range of the power curves.

A plunging joint to take changes in length due to wheel movement is retained for the gear box extension shaft and propeller shaft front end; it is now provided with a metal shroud to protect the oil seals from dirt.

The propeller shaft is fixed to the rear axle pinion shaft by U-bolts instead of the normal compression straps. This is to reduce run-out and resultant vibrations as it elimin-

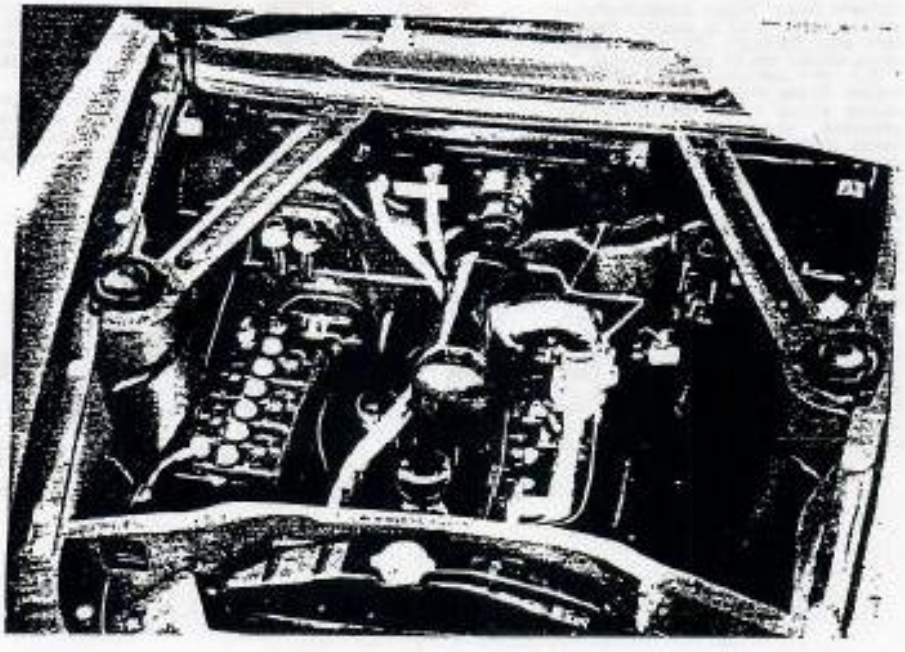
A spring-loaded bonnet prop provides access to the top of the engine compartment. Manual models use a wetted gauze type of air cleaner, but an oil bath type is available for export. The battery is mounted on the right-hand side, remote from exhaust heat

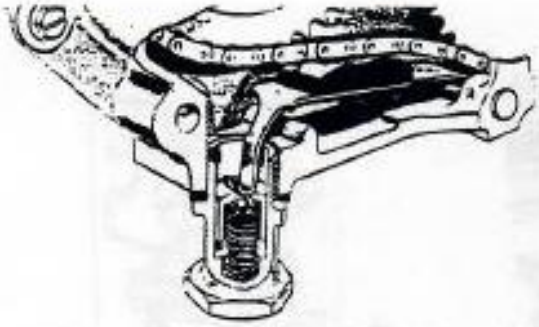
inates the two spigots of the previous design.

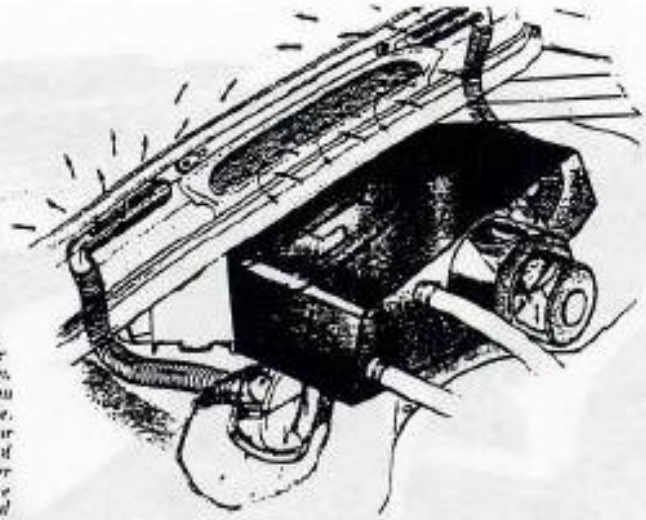
The rear axle is a completely new design, with a larger size differential and increased diameter of axle shafts and input pinion shafts for the greater torque. Wide angle, taper roller bearings are used for the hypoid bevel pinion, and the capacity of the differential bearings has been increased by the addition of another roller in the cage assembly.

Support of the crown wheel has been improved by arranging for the attachment flange of the differential cage to be placed behind the gear teeth; previously the teeth were overhung from the attachment flange. The axle casing has been stiffened by providing a larger radius where the tubular outer sections merge into the central oblate section housing the nose piece assembly. The wheels are mounted on single, plain ball bearings and these are of 6mm. greater diameter than previously.

The half-elliptic rear springs, from which the axle is insulated by rubber pads, have been increased in effective length and width. This has slightly lowered the periodicity, and a similar softening of the suspension has been undertaken at the front. Towards the front anchorage of each rear spring a rubber snubber is fixed to the frame side channels. At high spring deflections the snubbers vary the spring rate, and are also arranged to control axle hop which might result from spring wind-up due to torsional reaction at low torque. Rubber bushes are used in







(Above) A spring-loaded chain tensioner with a hard rubber block is fitted on the slack side of the timing chain to prevent, thrash. (Right) Air entry for the internal ventilation system is provided by a wide, shallow duct at the front of the scuttle. It connects to a plenum chamber and can either enter the car direct or through a heater unit if required. Two flap control valves permit distribution of the air either to the passenger compartment or to the screen for defrosting. Although the heater unit is provided with a booster fan it is not required at speeds above 40 m.p.h

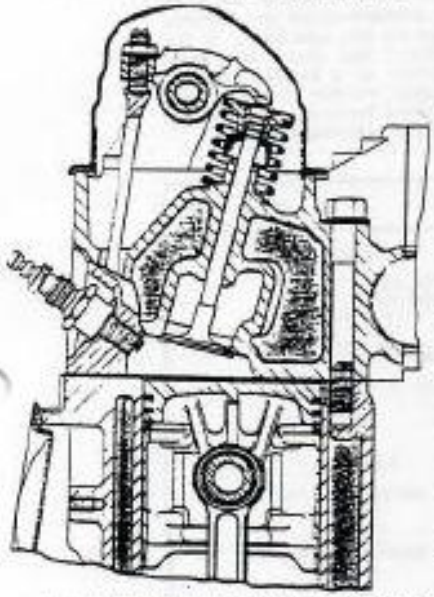
the front and rear spring eyes, and the main leaf is shot-peened for long life.

Braking efficiency has received considerable attention. Girling hydraulic brakes, with two-leading shoes at the front and leading and trailing at the rear, operate in 9 inch diameter drums as hitherto. The same width (1¾ inch) is retained at the rear, but the width of the front shoes has been increased to 2¼ inches, which has enlarged the swept area of the brake drums by 21.5 per cent. With this emphasis on braking, rigorous standards were set. During the development stage for carrying out fade tests, which consisted of 20 stops from 100 k.p.h. (62.5 m.p.h.) at 1g decelerations, accomplished in about 10 minutes. These rather rigorous tests resulted in a loss of pedal travel of only 50 per cent. of the total of 6 inches provided.

An interesting construction is used for the bi-metal drums. The cast iron rim is moulded to a pressed steel plate by which the drum is attached to the hub. The outer rim of the attachment plate is flanged over, and this is slotted to provide a good key to the cast-on rim.

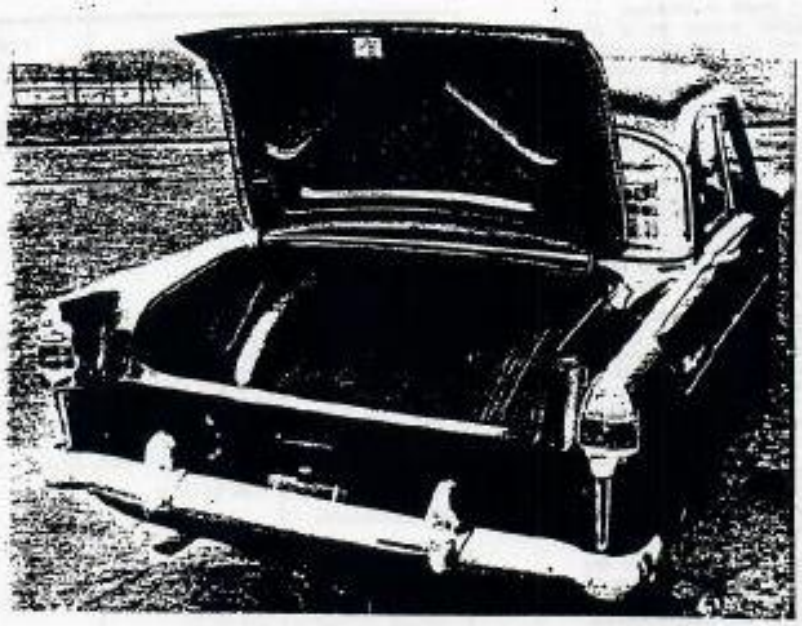
The standard tyre size for the Consul is 5.90 × 13 inches, but there is sufficient wheel clearance for the fitting of 6.40 inches oversize tyres if required. Similarly, for the Zephyr and Zodiac 6.40 × 13 inches is the standard size, but 6.70 inches can be fitted.

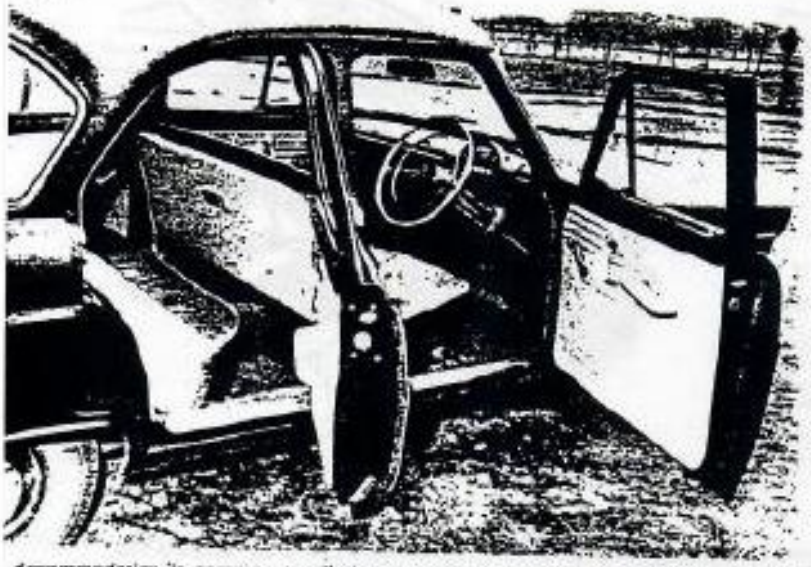
The basic layout of the front suspension, developed from the original McPherson system, is retained, but important modifications to improve rigidity and life have been incorporated. Basically the layout consists of a long, hollow king pin which also acts as the cylinder of an hydraulic damper. The upper of the two widely spaced pivot points consists of two opposed taper roller bearings mounted in a rubber bushed housing; the lower one is a single spherical ball joint. The attachment for this has been stiffened by mount-



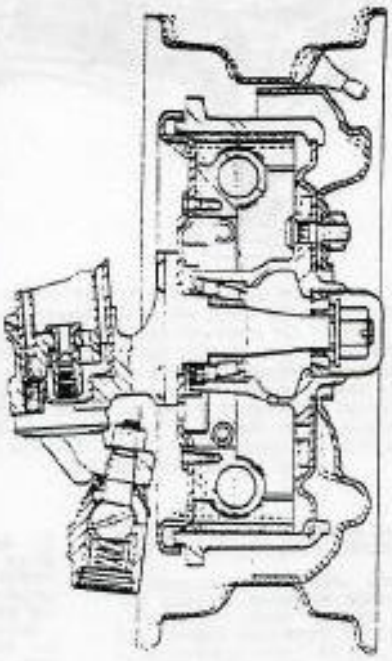
A wedge type combustion chamber with squish directed towards the sparking plug is used. Guides have been dispensed and the valves run direct in the cylinder head to obtain improved cooling. A rubber thread below the valve collar prevents oil escaping from the rocker gear down the valve bores

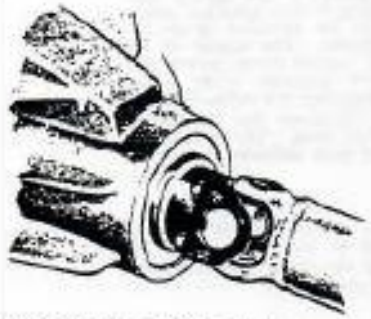
The luggage locker lid is spring-loaded, and released by a push button: 20 cu ft of useful space is provided in addition to that occupied by the spare wheel. The centrally-placed petrol filler is reached by hinging forward the spring-loaded number plate, the mounting for which is shown in this picture





Accommodation is common to all three models, but the style and quality of trim varies. Entry to front and rear seats is good, three abreast being accommodated on each bench seat, the dropped floor providing ample head room. The two-spoked steering wheel is dished for safety. Combined door pulls and arm rests are standard on the Zodiac and Zephyr (illustrated here) but optional on the Consul





The propeller shaft is attached to the final drive bevel pinion by a U-bolt around two of the trunnion bearings. The object is to reduce the run-out by eliminating the two companion flanges previously used

ng it to a forging, bolted to the one-piece member forming the wheel spindle and lower abutment of the telescopic suspension strut.

There are single arms at each side to control the track, and the anti-roll bar is also a structural member of the suspension system as it forms the front leg of the wishbone assembly on each side.

The internal bore of the damper cylinder is Parker-Luberized to prevent pick-up of the working surface. The cast-iron piston is rolled to work-harden it, and a piston ring has been added to prevent excessive leakage. An additive for lubrication purposes is incorporated in the working fluid. A re-designed rubber sealing cap for the top abutment of the suspension strut is incorporated to prevent ingress of water to the springs—an earlier fault.

In addition to the saloon models, there is a convertible version of the Consul and Zephyr, with a choice of power operated or manually operated hoods on both models. A similar body style for the Zodiac is at present under development but not yet available.

The prices are, Consul saloon, basic £620, total £781 7s.; convertible with manually-operated hood, basic £630, total £946 7s.; with power-operated hood, basic £680, total £1,021 7s. Zephyr saloon, basic £580, total £871 7s.; convertible with manually-operated hood, basic £690, total £1,036 7s.; with power-operated hood, basic £740, total £1,111 7s. Zodiac saloon, basic £645, total £968 17s. Heater £14, including purchase tax, standard on Zodiac, optional extra on Consul and Zephyr. Overdrive, optional extra on all models £63 15s., including purchase tax.

The front brakes have been increased to 2¼in wide on all models and are of the two-leading shoe design. A two-piece brake drum is used in which the cast iron rim is moulded to the pressed steel plate by which it is attached to the hub. Rigidity of the front suspension has been increased by abandoning the steel pressing formerly used for the attachment of the suspension lower ball joint. It is now mounted directly to a forging attached to the one-piece member forming the wheel spindle and lower abutment of the telescopic suspension strut

MODEL:	Consul	Zephyr	Zodiac
ENGINE:	4-cylinder	6-cylinder	
Bore		3.23in (82.55 mm)	
Stroke		3.125in (79.30 mm)	
Displacement	103.6 cu in (1,698 c.c.)	155.8 cu in (2,553 c.c.)	
Comp. Ratio	7.6 standard (6.9 optional)		
Maximum power	50 at 4,200 r.p.m.	86 at 4,200 r.p.m.	
Max. B.M.E.P. p.s.i.	134 at 2,800 r.p.m.	132 at 2,000 r.p.m.	
TRANSMISSION:			
Clutch, single dry plate	8.0in dia.	8.5in dia.	
Gearbox	3-speed synchromesh second and top		
Ratios: First	2.86	3.64	
Second	1.662	1.942	
Top	1.000	1.000	
Rear Axle: Ratios	Hypoid bevels 4.11	Hypoid bevels 3.08	
BRAKES:			
Hydraulic	9 by 2¼in S.L.S. front, 9 by 1¾in L. and T. rear		
TYRES:	5.90 by 13in	6.40 by 13in	
DIMENSIONS:			
Wheelbase	8ft 8¼in	8ft 11in	
Track: Front	4ft 5in	4ft 5in	
Rear	4ft 4in	4ft 4in	
Length overall	14ft 3in	14ft 10½in	15ft 5in
Width overall	5ft 7in	5ft 7in	
Height overall	4ft 12¼in	4ft 11¾	
Turning Circle	34ft	36ft	
Kerb Weight:	2,459lb (1,116 kgs)	2,648lb (1,201 kgs)	2,721lb (1,234 kgs)

WORKSHOP MANUAL

FOR

CONSUL AND ZEPHYR MARK II

MODELS: 204E-CONSUL — 206E-ZEPHYR

YEARS OF MANUFACTURE: 1956-1962

SCIENTIFIC MAGAZINES PUBLISHING COMPANY PTY LIMITED

SYDNEY

SPECIFICATIONS

Model	204E—Consul; 206E—Zephyr
Years of manufacture	1956-1962
Number of cylinders	4—Consul; 6—Zephyr
Valve arrangements	Overhead, pushrod operated
Bore and stroke	3.25" x 3.13"
Piston displacement	103.9 cu in—Consul; 155.8 cu in—Zephyr
Compression ratios	6.9, 7.8—Consul; 6.9, 7.8—Zephyr
Maximum BHP at 4400 rpm	59 (7.8), 56 (6.9)—Consul; 85 (7.8), 81 (6.9) —Zephyr
Maximum torque at rpm	91 ft/lb at 2300 (7.8); 87 ft/lb at 2300 (6.9)—Consul 133 ft/lb at 2000 (7.8); 127 ft/lb at 2000 (6.9) —Zephyr
Maximum bmep	132 psi (7.8); 127 psi (6.9)—Consul 129 psi (7.8); 123 psi (6.9)—Zephyr
Compression pressure (hot and at starter speed 400 rpm)	125 psi (6.9)—Consul; 150 psi (7.8)—Zephyr
Firing order	1, 2, 4, 3—Consul; 1, 5, 3, 6, 2, 4—Zephyr
Engine mounting	3-point suspension on rubber mountings in shear
Crankcase ventilation	Direct flow via road draught tube on right-hand side of engine
Engine weight	330 lb—Consul; 435 lb—Zephyr

CYLINDER BLOCK

Type	Cylinders cast integral with top half of crankcase
Material	Ford cast alloy iron
Cylinder offset	.060"
Bore (Mfg)	3.250" to 3.251"
Cylinder wall finish	Honed mirror finish
Block bore for tappets	.499" to .500"
Main bearing liner bore dia	2.5210" to 2.5215"
Block bore for standard cylinder liners:	
Standard	3.3745" to 3.755"
.020" oversize	3.3945" to 3.3955"
Oversize liners available	.020"

CYLINDER HEAD

Material	Ford cast alloy iron
Retaining method	Bolts
Valve angle	14°
Valve face angle	45°
Angle of seat, cylinder head	44½°

CRANKSHAFT

Type	Fully counterbalanced 4-throw—Consul Fully counterbalanced 6-throw—Zephyr
Material	Special Ford cast alloy steel
End thrust taken by washers at	Centre main bearing—Consul Rear intermediate main bearing—Zephyr
Crankshaft length	21.57"—Consul; 29.93"—Zephyr
Number of main bearings	3—Consul; 4—Zephyr

WHEELS AND TYRES

Wheel size	4J x 13—Consul; 4½J x 13—Zephyr
Tyre size	5.90—13—Consul; 6.40—13—Zephyr
Ply	4
Pressure	28 psi—Consul; 24 psi—Zephyr
Rated loading	672 lb at 28 lb pressure—Consul 675 lb at 24 lb pressure—Zephyr

REAR SUSPENSION

Type of springing	Semi-elliptic leaf
Number of leaves	6
Width of leaves	2″
Thickness of leaves	2 at .235″ and 4 at .255″
Length, eye to eye, loaded	41.94″ to 42.06″ at 640 to 680 lb
Height:	
Free	7.26″
Loaded	1.42″
Camber:	
Free	5.898″
Loaded	.058″

PART 1 — MANUAL TRANSMISSION

SPECIFICATIONS

Type	3 speed selective sliding gear and synchromesh		
Ratios:			
1st	2.84 to 1		
2nd	1.642 to 1		
3rd	1.00 to 1		
Reverse	3.86 to 1		
Main drive gear bearings	Radial ball		
Inside diameter	1.3775" to 1.3780"		
Outside diameter	2.8340" to 2.8346"		
Width	.6643" to .6693"		
Pilot bearing (front mainshaft)	Straight rollers (13)		
Mainshaft, rear bearings	Radial ball		
Inside diameter	1.1807" to 1.1811"		
Outside diameter	2.4403" to 2.4409"		
Width	.6249" to .6299"		
Countershaft bearings	Straight rollers (20 each end)		
Reverse idler bearing	Bronze bush		
Main drive gear:			
Number of teeth	17		
Inside diameter (gear end)	.9725" to .9730"		
Wear limit	.976"		
Intermediate gear:			
Inside diameter	1.127" to 1.1275"		
Wear limit	1.133"		
End float	.003" to .012"		
Mainshaft, pilot end diameter	.5960" to .5965"		
Countershaft:			
Diameter	.68175" to .68225"		
Wear limit	.677"		
Countershaft gear:			
Number of teeth	34-28-19-14		
Gear, inside diameter	.933" to .934"		
Wear limit	.937"		
End float	.005" to .018"		
Thrust washer thickness:			
Front (bronze, steel backed)	.0615" to .0635"		
Wear limit	.0565"		
Rear (bronze, steel backed)	.061" to .063"		
Wear limit	.056"		
Rear (steel)	.0615" to .0635"		
Wear limit	.0565"		
Reverse idler gear:			
Bushing inside diameter	.62275" to .62375"		
Wear limit	.62475"		
Shaft diameter	.61925" to .61975"		
Wear limit	.615"		
Gearbox speeds (approx):	**1-2**	**2-3**	**3-2**
Light throttle	10 mph	21 mph	16 mph
Full throttle	20 mph	36 mph	31 mph
Kick down	34 mph	55 mph	45 mph

GENERAL SPECIFICATIONS

Turning circle	35′—Consul; 36′—Zephyr
Location of engine number	Top face of right-hand engine mounting pad
Track:	
Front	4′ 5″
Rear	4′ 4″
Wheelbase	8′ 8½″—Consul; 8′ 11″—Zephyr
Ground clearance	6½″—Consul; 6¼″—Zephyr
Height	5′ 1½″—Consul; 5′ 2″—Zephyr
Width	5′ 7″
Length	14′ 2″—Consul; 14′ 10½″—Zephyr
Weight	2,504 lb—Consul; 2,691 lb—Zephyr

TORQUE SPANNER FIGURES

	(Ft/lb)
Main bearing	55 to 60
Connecting rod	20 to 25
Cylinder head	65 to 70
Rocker shaft support	30 to 35
Sump	3 to 5
Manifold (Inlet and Exhaust)	9 to 11
Clutch pressure plate to flywheel	12 to 15
Main drive gear bearing retainer to housing	12 to 15
Selector housing to gear housing	12 to 15
Gearbox extension to housing	40 to 45
Differential gear to differential case	30 to 35
Differential carrier to axle housing	25 to 30
Differential bearing cap	70 to 80
Differential bearing nut lock plate	15 to 20
Pinion bearing lock nut	100 to 120
Universal joint coupling flange	25 to 30
Spring U-bolt nuts	40 to 45
Generator pulley nut	50 to 70
Stabiliser clip nuts	20 to 30
Ball joint stud nuts (7/16″)	25 to 30
Inlet manifold bolts	9 to 11
Track control arm to spindle support ball joints	25 to 30
Track rod end ball joints	22 to 25
Oil filter stud	8 to 10

CAPACITIES

	Quantity	SAE No
Engine—Consul (with filter)	7½ pints	Above 90°F—40 Moderate summer and moderate winter—20
Engine—Zephyr (with filter)	8½ pints	
Gearbox	2½ pints	90EP
Rear axle	2½ pints	90EP
Fuel tank	11 gal	
Cooling system	16½ pints—Consul 20½ pints—Zephyr	

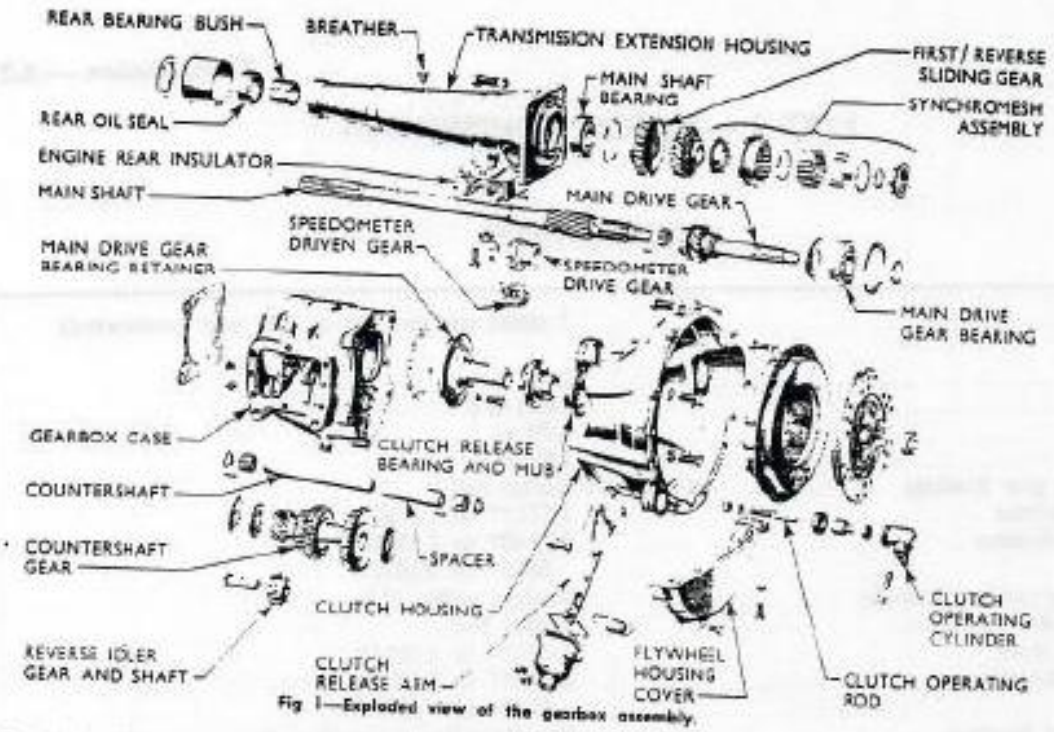


Fig 1—Exploded view of the gearbox assembly.

(25) Instal the drain plugs to the gearbox (and overdrive if fitted).

(26) Refill the overdrive unit (if fitted) with ¼ pint of SAE 80 EP gear oil and instal the level plug.

(27) Refill the gearbox with 2¼ pints of SAE 80 EP gear oil and instal the level plug.

(28) Reconnect the battery terminal, road test the car and then check the level of oil in the gearbox only. Top up if necessary.

2. GEARBOX OVERHAUL

To Remove Clutch Operating Mechanism

(1) Slide the release arm out of the spring clips on the release bearing hub and, lifting the arm off the fulcrum pin, slide the release bearing off the main drive gear bearing retainer.

(2) Remove the clutch release arm and gaiter.

(3) Unscrew and remove the five bolts and lockwashers securing the clutch housing to the gearbox case.

(4) Detach the starter motor drive cover and/or drive out the clutch release arm fulcrum pin if necessary.

To Remove Selector Housing

(1) Turn the gearbox on the stand, extension (or overdrive) housing uppermost, place the gear-change levers in first gear and remove the six retaining bolts and lockwashers.

(2) The housing is located by two dowels. Detach the housing and gasket and lift out the selector forks.

NOTE: The first/reverse selector fork is offset forward over the first/reverse sliding gear.

To Dismantle Selector Housing

(1) Unscrew the self-locking nuts securing the change levers to the selector shafts.

(2) Remove the flat washers and change levers.

NOTE: The gear-change levers are cranked out from the housing, and the top/intermediate lever is slightly twisted. The levers are also stamped with their respective part numbers.

(3) Remove the selector shafts one at a time, together with the interlock sleeve, balls and spring.

(4) Extract the selector shaft oil seals.

The first/reverse selector cam has wider spaced teeth than the top/intermediate selector cam.

To Remove Extension (or Overdrive Housing and Mainshaft Assembly)

(1) Unscrew the four bolts securing it to the gearbox case. Place an oil tray beneath the housing as some oil may be retained in the extension (or overdrive) housing.

NOTE: Lockwashers are fitted to the bolts used for the extension or overdrive housing. None are required with the overdrive fitted to some models as these bolts are self-locking.

(2) Slide the synchromesh sleeve forward on its

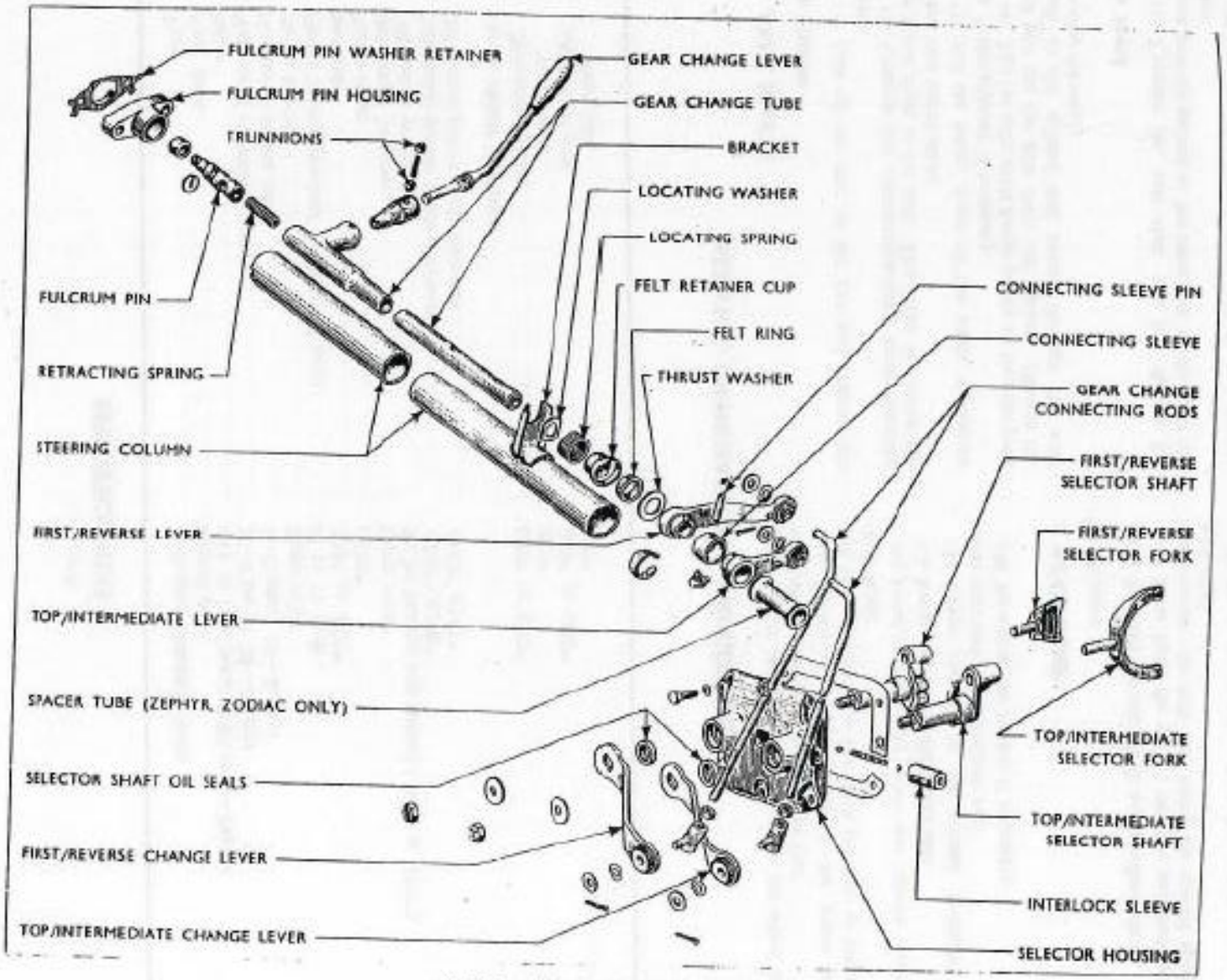


Fig. 7—Gearchange mechanism (early type)

SPECIFICATIONS

Type	¾ floating Hotchkiss drive
Final drive	Hypoid gears
Ratio	4.11 to 1—Consul; 3.90 to 1—Zephyr
Number of crownwheel teeth	37—Consul; 39—Zephyr
Number of pinion teeth	9—Consul; 10—Zephyr
Pinion bearings	Taper roller
Pinion bearing pre-load (without oil seal)	12 to 15 in/lb
Backlash	.005" to .007"
Pinion offset	1.375"
Differential bearings	Taper roller
Differential pre-load	Set by bearing cap spread (.005" to .007")
Differential pinion inside diameter	.6280"-.6290"
Differential pinion shaft diameter	.6240"-.6245"
Thrust washer thickness:	
Differential pinion	.030" to .032"
Wear limit	.027"
Differential gear	.030" to .032"
Wear limit	.027"

SERVICE INFORMATION — PROCEDURES

1. AXLE SHAFTS

To Remove

(1) Jack up the rear of the car and remove the wheel.

(2) Unscrew the countersunk-head screw securing the brake drum to the hub. This screw is located between two wheel studs.

(3) Pull the brake drum off the studs, slackening the brake adjuster if necessary.

(4) Tap the axle shaft flange gently to free the joint and pull out the axle shaft and gasket. (Rotate the shaft as the splined end passes through the axle housing oil seal.)

To Instal

(1) Examine the axle shaft and hub flanges for burrs and the splines at the inner end of the shaft for wear.

(2) Locate a new gasket on the hub flange, aligning the brake drum screw hole with the tapped hole in the hub.

(3) Slide the axle shaft into position, rotating it slightly as it passes through the axle housing oil seal.

(4) Locate the axle shaft flange on the wheel studs with the retaining screw holes in line.

(5) Locate the brake drum on the wheel studs with the screw hole in line with the hole in the axle shaft flange.

(6) Instal the retaining screw and tighten securely.

(7) Instal the wheel and wheel nuts.

(8) Lower the car to the ground, re-check the wheel nuts and instal the hub cap.

(9) Re-adjust the brakes if necessary.

2. REAR HUBS

To Remove

(1) Remove the axle shaft as described above.

(2) Bend back the tab of the hub nut lockwasher and unscrew the hub nut, using the special spanner A/H 4252.

(3) Place the thrust pad in the axle housing end and locate the hub puller A/HT 1116-A on the wheel studs, securing it with wheel nuts.

(4) Tighten the centre bolt of the tool to remove the hub.

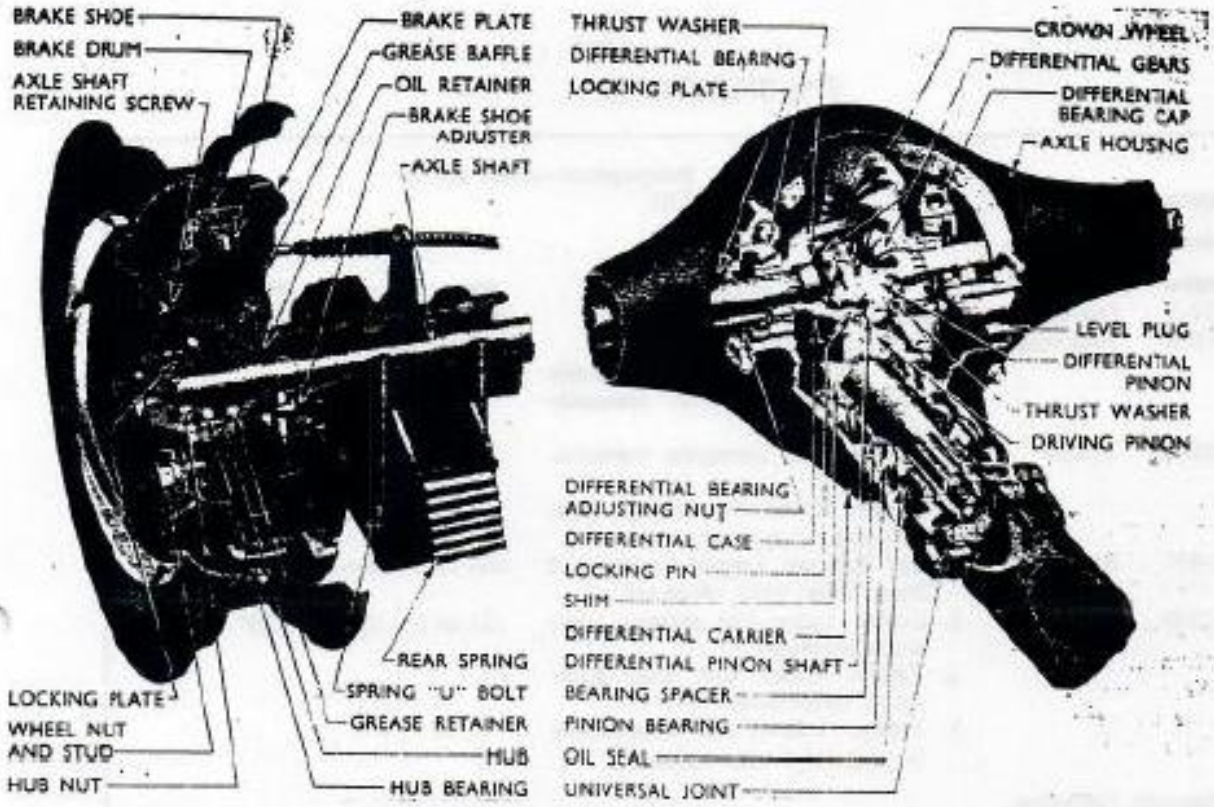


Fig 2—Cut-away view of the rear axle.

4. OIL SEALS

To Remove Pinion Bearing Oil Seal

The oil seal at the front of the differential carrier may be renewed without removing the carrier from the axle housing.

(1) Disconnect the rear end of the drive shaft.

(2) Unscrew the pinion nut and withdraw the coupling flange.

(3) Lever the oil seal out of its location in the front of the differential carrier.

To Instal Pinion Bearing Oil Seal

(1) Locate a new oil seal around the pinion and tap it into place, using an old bearing cup.

(2) Instal the universal joint coupling flange on the pinion splines and a new self-locking nut. Hold the coupling flange and tighten the nut to 100 to 120 ft/lb.

(3) Instal the drive shaft as described previously.

To Check Rear Axle Oil Seals

Pinion oil seals are sometimes replaced for leakage when actually only a small amount of seepage has taken place. Presence of oil around the pinion oil seal does not necessarily indicate leakage in the broadest sense.

A certain amount of seepage must occur at any oil seal if it is to function properly, otherwise the seal will run dry, with possible over-heating and burning of the sealing lip and shaft.

If in doubt as to the extent of leakage, a check should be carried out in the following manner before replacing the seal.

(1) First, check the lubricant level and if this level is approximately correct, and the unit has not been refilled for a considerable period of time prior to inspection, then there is little possibility of leakage existing.

(2) Next, remove all traces of oil from the floor pan, oil seal and axle housing, etc, and test the car at normal driving speeds.

(3) If, upon re-examination, the seal shows signs of oil seepage and there is oil on the floor pan, the seal should be replaced in the usual manner.

To Replace Axle Housing Oil Seals

If oil is found to be leaking on to the brake shoes, either the axle is over-filled or an axle housing

SPECIFICATIONS

Make	Girling hydraulic	
Type:		
Front	Two leading shoe	
Rear	Floating expander housing	
Drum diameter	9″	
Lining:		
Material	Woven	
Length	8.65″ front and rear	
Width	2.5″ front; 1.75″ rear	
Thickness	.190″ front and rear	
Area (total)	86.48″ front; 60.52″ rear	
Total area of all brakes	147 sq in	
Handbrake	Cable operated to rear wheels	
Foot pedal free travel	¼″ to ½″	
Master cylinder:		
Diameter	.750″	
Piston travel	1.5″	
Braking ratio	65% front to 35% rear	
Brake fluid	M-3833-D	
Front brake shoe return springs:	To April, 1957	From April, 1957
Color	Black	Yellow
Free length	4 1/32″	4 13/32″
Number of coils	26	12
Rear brake shoe return springs (adjuster end):		
Color	Green	Green
Free length	3 13/16″	3 7/16″
Number of coils	40	40
Rear brake shoe return springs (expander end):		
Color	Black	Black
Free length	4 1/16″	4 1/16″
Number of coils	38	36
*Rear brake shoe return springs (trailing shoe):		
Color	Black	
Free length	4 13/32″	
Number of coils	24	

*Fitted prior to April, 1957, on trailing shoe only.

SERVICE INFORMATION—PROCEDURES

1. ADJUSTMENTS

To Adjust Front Brakes

There is one hexagonal-headed snail-cam adjuster for each brake shoe (i.e., two on each brake plate).

(1) Raise the front wheels clear of the ground.

(2) Turn the adjuster of one shoe anti-clockwise to bring the lining away from the drum.

(3) Turn the other shoe adjuster clockwise until the drum is locked and slacken back until the wheel is just free to rotate without binding.

(4) Repeat this procedure on the first shoe, rotating without binding.

NOTE: This adjustment must be done accurately to ensure minimum clearance between the linings and the drum, if minimum pedal travel is to be obtained.

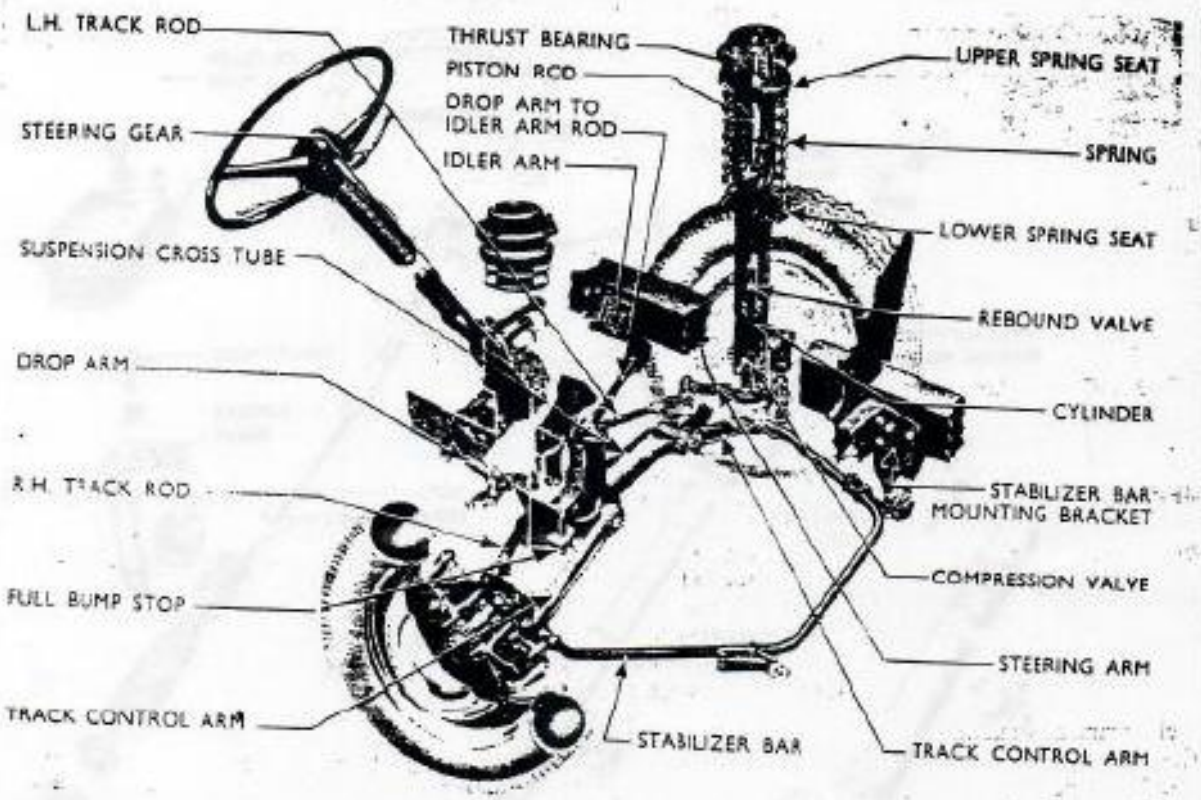


Fig 1—Front suspension

2. FRONT WHEEL HUBS

To Test Hub Bearings

(1) Jack up the front of the car.

(2) Grasp the wheel at two diametrical points, preferably at the top and bottom. If it is possible to move the wheel and brake drum on the spindle, the hub bearings require adjustment.

To Adjust Hub Bearings

Excessive play in the hub bearings can be removed by tightening the bearing nut as follows:

(1) Remove the hub cap.

(2) Remove the grease cap. This is a press fit in the hub and should be gently tapped to free it from its location.

(3) Remove the split pin locking the adjusting nut.

(4) Turn the wheel in its normal direction of rotation, tightening up the bearing adjusting nut until a heavy drag can just be felt.

(5) Turn back the nut, one castellation at a time, until end float can just be felt, and then carefully tighten the nut to remove the end float. The wheel must be rotated during this operation.

(6) Instal the split pin.

(7) Repack the grease cap and tap it into its hub location.

(8) Instal the hub cap.

Never allow the car to be driven with the grease cap missing, otherwise dirt and grit can penetrate to the hub bearings and cause wear.

To Remove Hubs

(1) Lever off the hub cap and slacken the wheel nuts.

(2) Jack up the front end of the car, placing supports beneath the front suspension cross-tube.

(3) Remove the wheel nuts and detach the wheel.

(4) Slacken back the brake adjusters if necessary.

(5) To remove the hub, detach the grease cap, which is a press fit in the hub, by tapping lightly with a hammer.

(6) Remove the split pin, bearing adjusting nut, thrust washer and outer bearing cone. The hub assembly can now be pulled off the spindle.

To Dismantle Hubs

(1) Lever the grease retainer from the inner end of the hub.

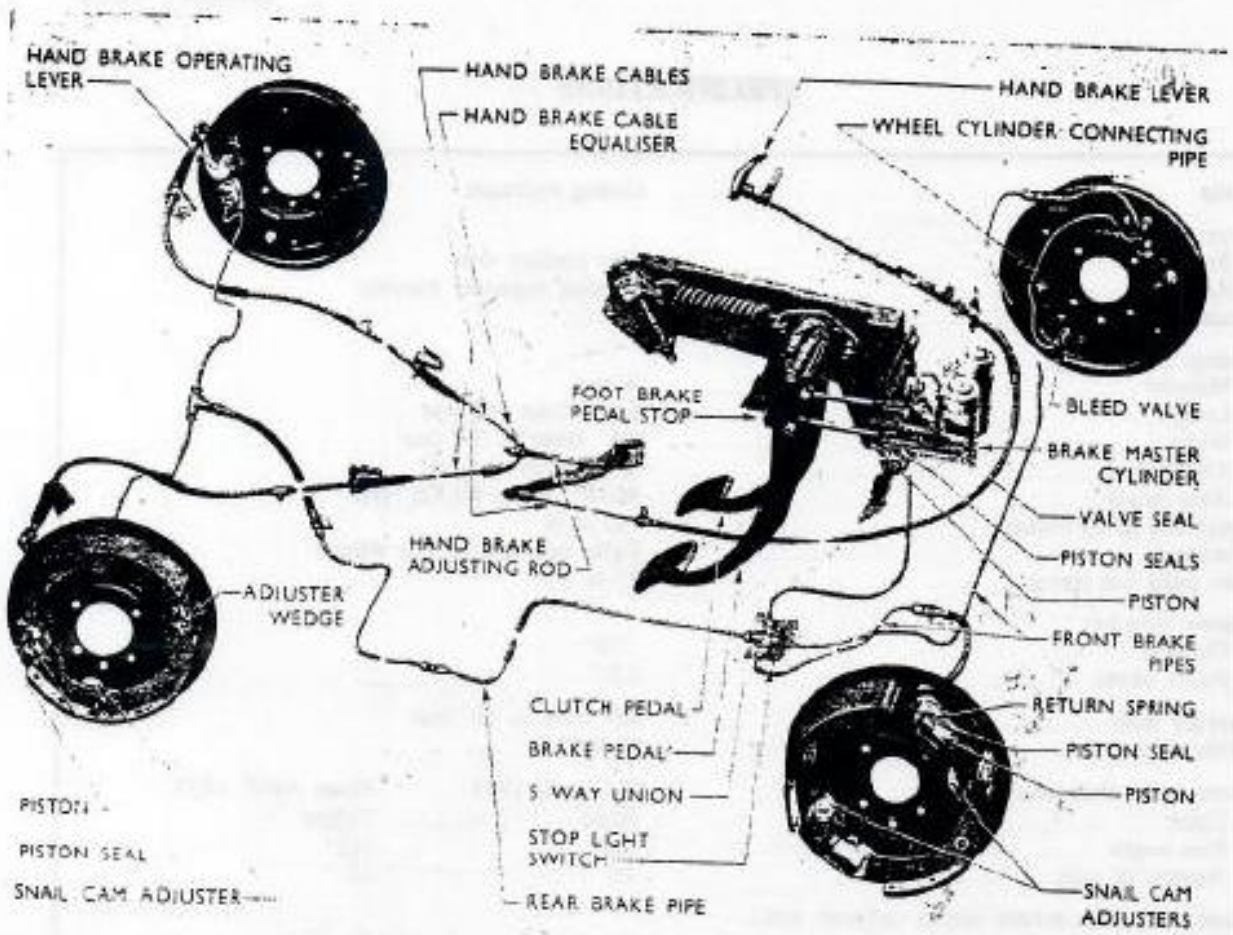


Fig 1—Braking system layout.

To Adjust Rear Brakes (Early Type)

One square-shanked adjuster for both shoes is provided on the back of each brake plate, to the rear of the axle housing.

(1) Raise the rear wheels clear of the ground.

(2) Turn the adjuster clockwise until the shoes bind in the drum, then slacken off until linings are just clear.

(3) Repeat on the other brake plate and rotate each wheel in turn, when the opposite wheel should turn in the reverse direction an equal number of turns through the action of the differential. If this does not happen, a shoe is binding and the adjuster should be slackened back until it is clear.

For adjustment details of later assemblies see under Modified Braking System.

To Adjust Handbrake Linkage

(1) Before commencing the adjustment, check that no sharp bends exist in the handbrake cables, and that they are secured by U shaped retaining washers in the abutment bracket on the engine rear support cross member, the abutment bracket on each body side member, the two nylon guides on the floor pan, and in the rear spring seats on the axle housing.

(2) Examine the handbrake operating levers on the rear brake plates for signs of stiffness.

(3) Ensure that each rear wheel expander is free to slide in the brake plate slots when the brake is applied.

(4) Examine the clevis pins and renew where necessary.

To adjust, proceed as follows:

(5) Fully release the handbrake lever.

(6) Tighten the rear brake wedge adjusters to lock the rear brakes.

(7) Slacken the lock nut on the handbrake adjusting rod, and tighten the adjusting nut (see Fig 2) on the rod until all play is taken out of the handbrake cable. Tighten the lock nut.

(8) Slacken the rear brake adjuster wedges as for a normal brake adjustment to obtain minimum running clearance for the shoes.

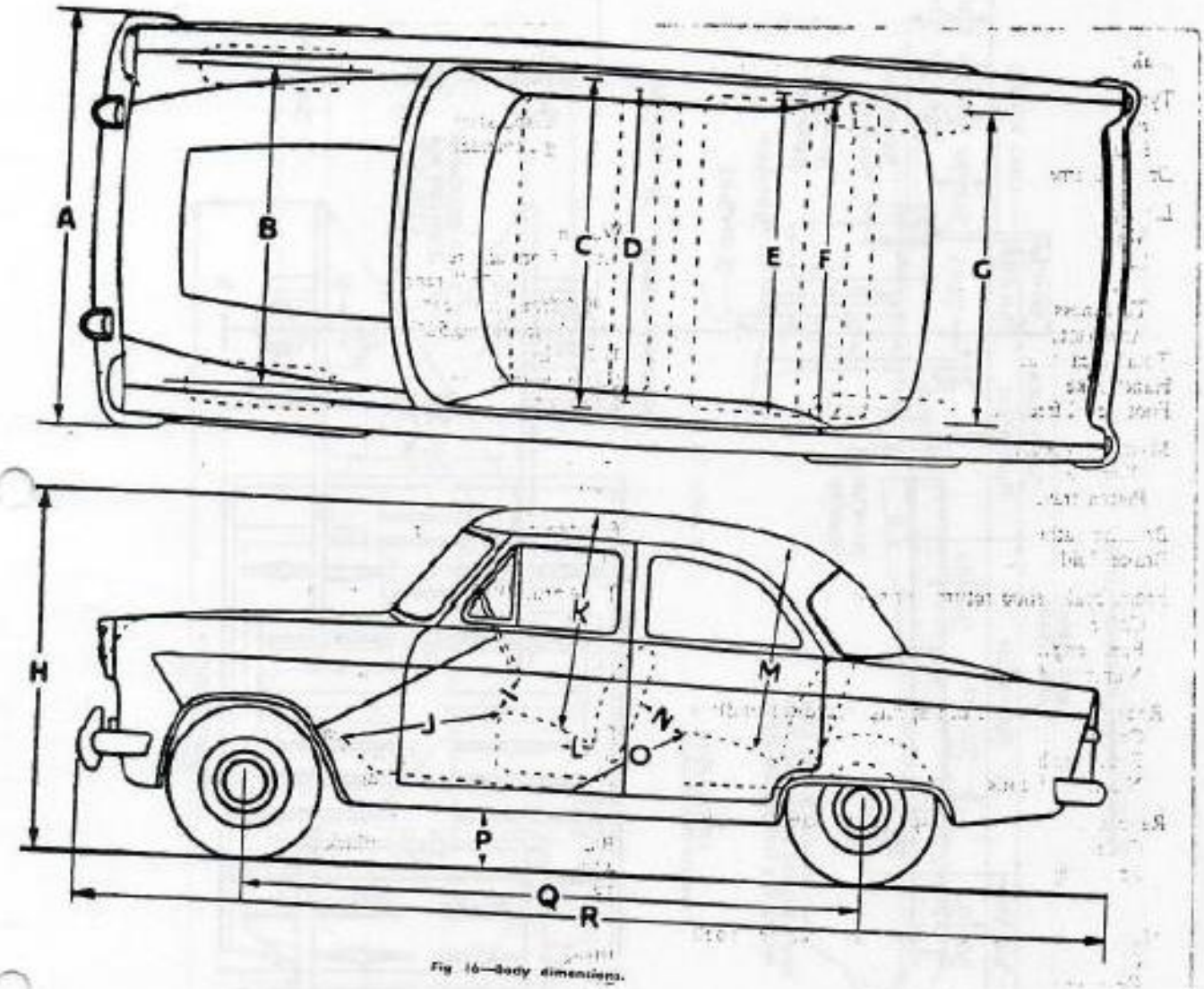


Fig 16—Body dimensions.

A—69.0" (Zephyr)
68.7" (Consul)
B—53.0"
C—66.5"
D—53.5"
E—55.9"
F—61.8"
G—52.0"
H—62.0" (Zephyr)
61.8" (Consul)
I—5.6"
J—43.8"
K—35.5"
L—5.0"
M—34.5"
N—9.8"
O—40.4"
P—6.75" (Zephyr)
6.5" (Consul)
Q—106.5" (Consul)
107.0" (Zephyr)
R—169.9" (Consul)
178.4" (Zephyr)

SPECIFICATIONS

Type	Independent—direct acting
Type of spring	Coil

Spring identification:

Part Number	Color	Model	Spring Rate	Wire Diameter
204E-5310-B	Orange	Consul Saloons and Convertibles	90-100 lb/in	.472" to .478"
206E-5310-B	Aluminium	Consul Estate Cars Zephyr Saloons and Convertibles (except with automatic transmission)	100 to 110 lb/in	.487" to .493"
206E-5310-C	Yellow	1. Zephyr with automatic transmission 2. Zephyr Estate Car (except with automatic transmission)	107 to 117 lb/in	.495" to .501"
204E-5310-C	Blue	Consul Saloons (export only) and Convertibles when requested	109 to 119 lb/in	.487" to .493"
206E-5310-D	Brown	1. Consul Estate Car (export only) when requested 2. Zephyr Estate Car with automatic transmission 3. Zephyr Saloons and Convertible (export only) when requested	121 to 131 lb/in	.500" to .506"

Wheel alignment (unladen):

Castor angle	0° to + 1¼° (— ¼° to — ¾° before Sept, 1956)
Camber angle	¼° to 2¼°
King pin inclination	3¼° to 4¼°
Toe-in	1/16" to ¼"
Toe-out on turns, with inner wheel at 20°	1¼° to 2¼°

SERVICE INFORMATION—PROCEDURES

1. GENERAL DESCRIPTION

The front suspension assembly consists of two vertical shock absorber units, one each side of the car, which are surrounded by coil springs. At the upper end of each suspension unit is a rubber mounted thrust bearing which is secured to a reinforcement under each mudguard. At the lower end of each suspension unit is a spindle support plate carrying the front wheel, spindle body, brake plate and hub assembly.

The spindle support plate carries a ball joint to which is connected the track control arm mounted on the front suspension cross-tube.

A stabiliser bar is connected between the outer end of each track control arm and is secured at the front to attachment feet on brackets under the body sidemembers.

A steering arm is secured in a slot in the bottom of each suspension unit. Two adjustable track rods connect these steering arms to the drop-arm to idler arm rod. The idler arm forms an idling link at one end of this rod and is parallel to the drop-arm at all times.

The steering lock is determined by stops on the body sidemember.

The wheel bearings, castor angle, toe-in and toe-out on turns can be adjusted, but camber and king pin inclination angles are set in production and cannot be altered.

Whenever repairs are being carried out to any part of the front suspension system, it is essential that spring clips are fitted, otherwise extreme difficulty will be experienced in dismantling and reassembling the parts. The wheel alignment should always be checked after carrying out repairs to the suspension units or linkage.

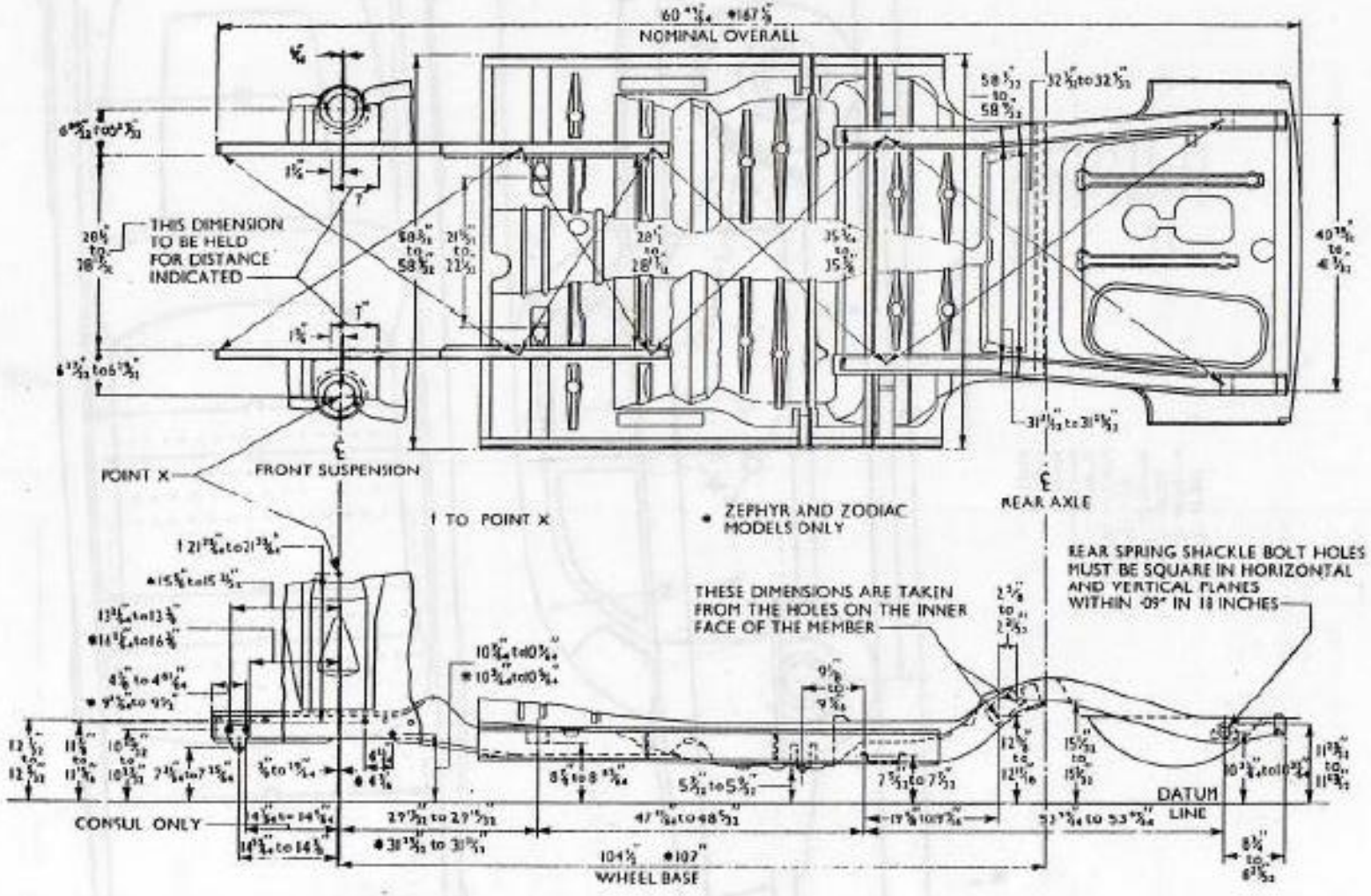


Fig 17 — Underbody tolerance diagram.

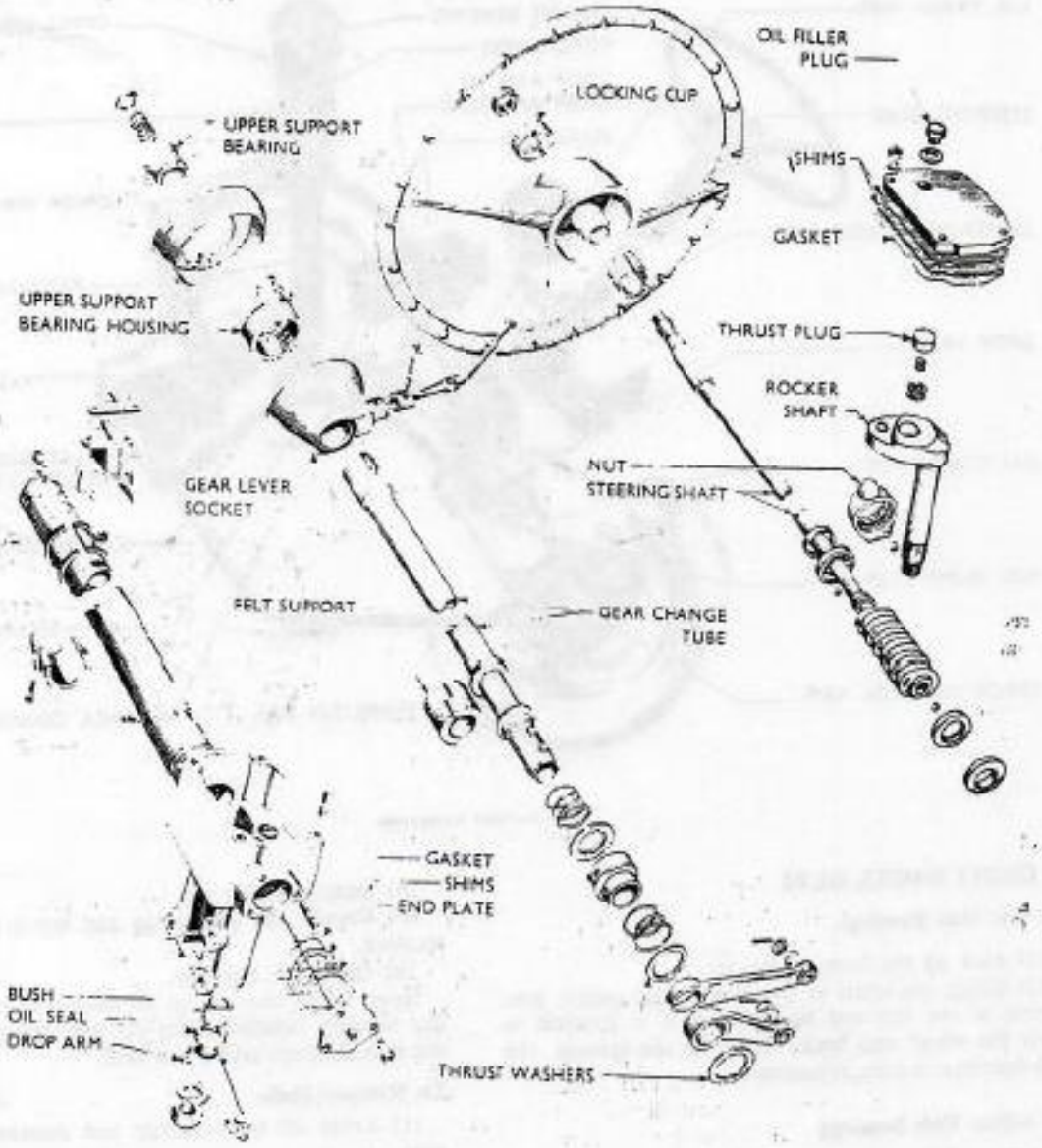


Fig 4—Recirculatory ball steering box.

gear lever socket and press out the bearing if necessary.

(7) Pull out the horn wire from the centre of the steering shaft.

(8) Remove the four nuts retaining the housing coverplate and remove the plate, shims and gasket.

(9) Drain the oil from the box and pull out the rocker shaft.

(10) Unscrew the three nuts retaining the end plate and remove the end plate, shims and gasket. Retain the lower bearing and spacer washer when removing the end plate.

(11) The lower bearing consists of a cup and fourteen loose balls, take care not to lose these balls, and remove the spacer washer and lower bearing.

(12) Rotate the steering shaft anti-clockwise at the upper end, right-hand drive vehicles (clockwise for left-hand drive vehicles) and screw it out of the nut and remove the shaft. The steering shaft upper bearing is of the same construction as the lower one, and the balls will fall out as the worm is removed. Take care not to lose the balls.

(13) Remove the steering nut from the box, again taking care not to lose the twelve balls fitted in the nut.