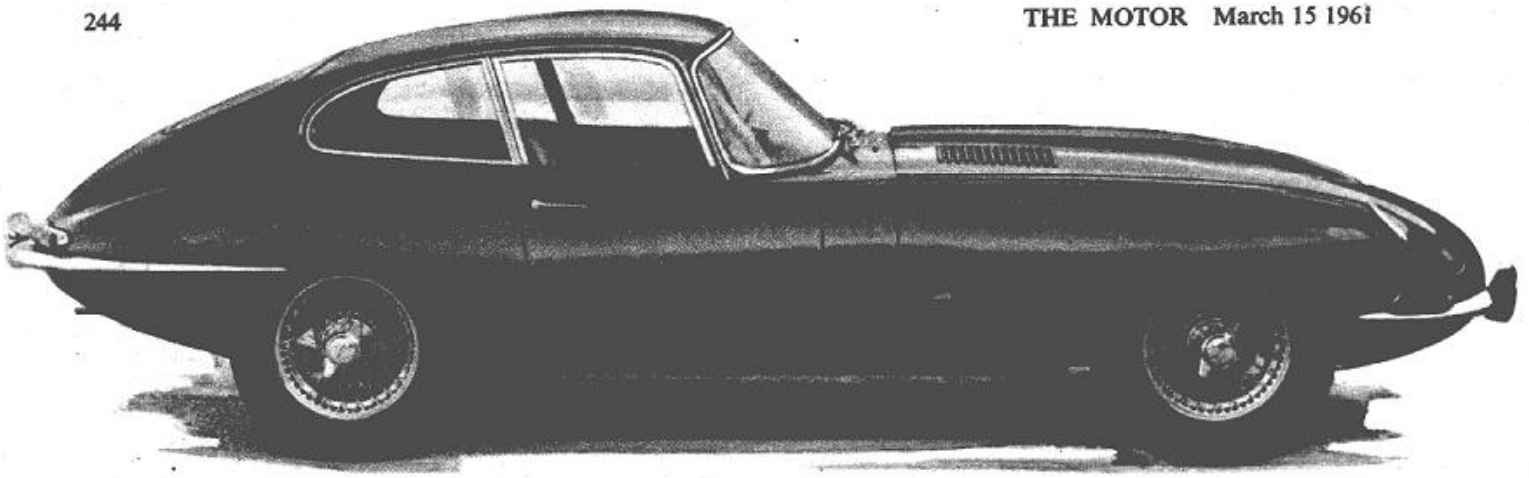


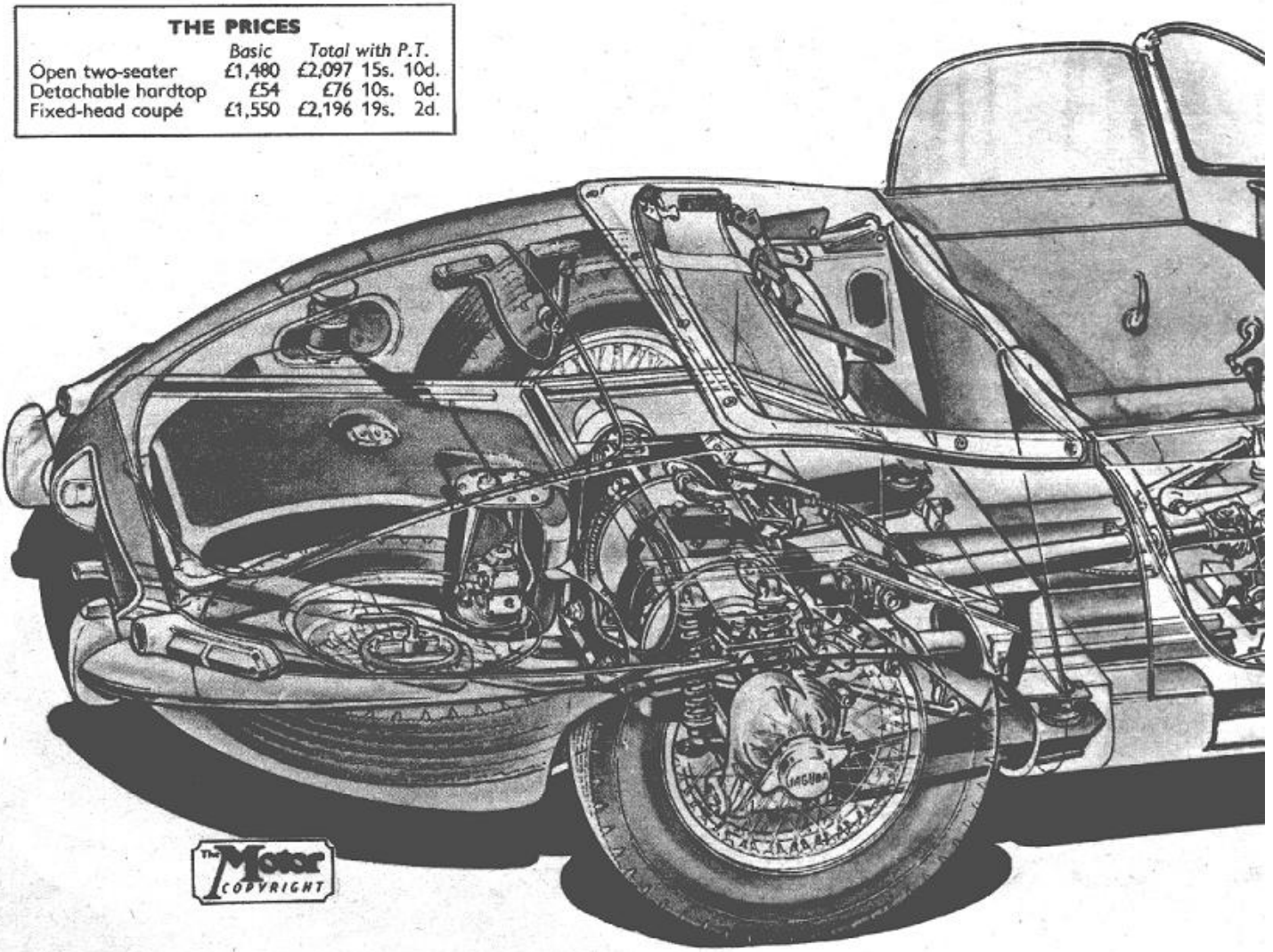
1961 CARS

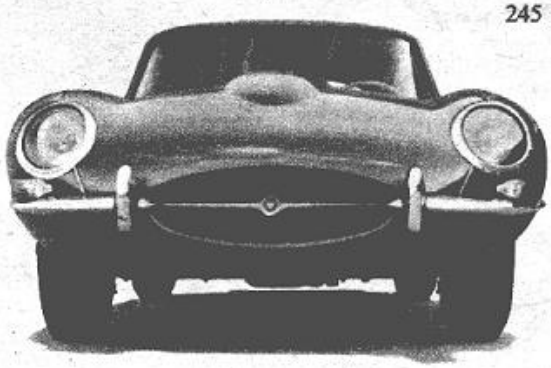
The New 150 m.p.h. JAGUAR

FIRST FULL DESCRIPTION OF THE E-TYPE GRAND TOURING MODELS

THE PRICES

	Basic	Total with P.T.
Open two-seater	£1,480	£2,097 15s. 10d.
Detachable hardtop	£54	£76 10s. 0d.
Fixed-head coupé	£1,550	£2,196 19s. 2d.





FULL details can now be made public of the new E-type Grand Touring Jaguar after months of rumours here and abroad that the Coventry company had such a car in active development. With a maximum speed of approximately 150 m.p.h. in standard trim, the new Jaguar marks a big step forward in performance. Nevertheless, it should be stressed that the E-type is not intended as a sports-racing car (although some owners will doubtless use their cars in that way), but as a practical means of high-speed everyday transport suited to the needs of both sports enthusiasts and business or professional motorists who require to be as nearly in two places at once as modern engineering can devise.

The main features of the E-type are the well-tried XK engine in 3.8-litre, 265 b.h.p. "S" form, conventional synchromesh transmission, all-independent suspension, disc brakes and a combination of stressed-shell body construction allied to a tubular space-frame type of front end carrying the engine, front suspension and forward-hinged nose. With a dry weight of only 22 cwt. for the two-seater, unusually good aerodynamic shape and the power quoted above, the exceptional performance is readily understood. Detail points of unusual interest include a thermostatically controlled, electrically driven cooling fan and a new type of Lucas fuel pump submerged in the petrol tank.

The E-type is offered both as an open two-seater (for which a detachable hardtop is available) and as a two-seater fixed-head coupé. These models are introduced as additions to the current Jaguar range and do not supersede the existing XK150 models.

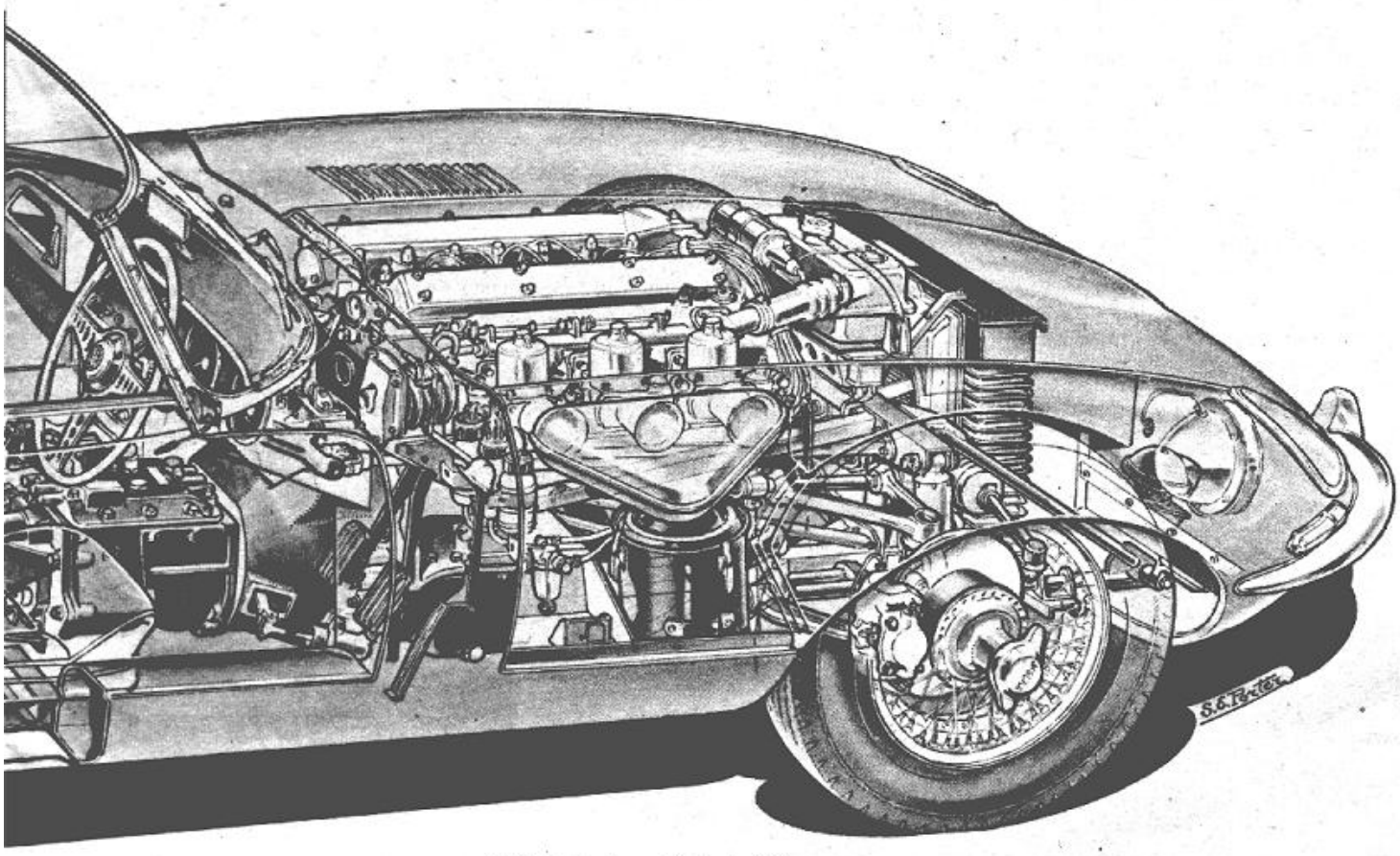
• • •

To begin with the basic structure, this is entirely new, although bearing obvious evidence of previous experience with the D-type. The main portion takes the form of a welded, stressed shell built up almost entirely of 20-gauge steel sheet.

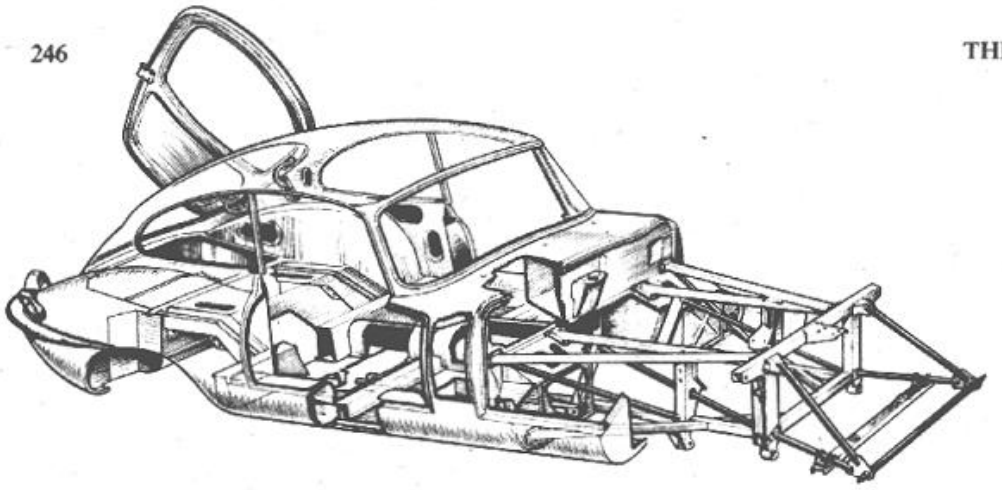
The method of construction is shown in an accompanying drawing from which it will be seen that its strength comes largely from the mating series of large box sections. At the front, a horse-shoe-shaped box surrounds the scuttle, its ends joined to deep hollow sills which, in turn, link with a substantial hollow member passing across the car just forward of the rear suspension. At floor level, the deep propeller-shaft tunnel (the rear portion of which is fully enclosed) and a square-section transverse member form a linking cross with the scuttle, the sills and the rear box member, the latter in turn mated with longitudinal, inverted-top-hat sections which are welded to the boot floor and provide a mounting for the rear suspension/final-drive unit. Further longitudinal top-hat sections are welded to the underside of the cockpit floor.

In addition to the strength provided by these box sections, the panels contribute still further to the rigidity of the whole as almost without exception they are of curved formation.

At the front, a part-welded, part-bolted structure of Reynolds 541 square-section steel tubing forms a sub-frame which carries the engine, front suspension and forward-hinged nose. This sub-frame is in three sections—two side assemblies and a front transverse assembly—each of welded construction, but bolted together to form a whole which, in turn, is bolted to the main



The New 150 m.p.h. JAGUAR



BASIC STRUCTURE of the new E-type. The stressed-shell main portion obtains its strength largely from the deep box sections of the body sills, propeller-shaft tunnel and cross members (including the horse-shoe-shaped scuttle), but additional rigidity is given by inverted top-hat sections welded to the floor and by the curvature of the panels. The front tubular structure, which carries the engine, suspension and front-hinged nose, is detachable. The open model is similar apart from the head and opening rear panel.

shell. Thus major overhauls or accident repair are facilitated; also, the whole front-hinged nose piece consists of three panels—two sides and the centre piece—which are bolted together with the joint concealed by a chromium-plated moulding.

The front suspension—by means of torsion bars and wishbones of unequal length—follows D-type practice rather than XK150 design in that the torsion bars are mounted in inner extensions of the lower wishbones instead of in the wishbone pivots. This arrangement, which results in the torsion bars bending slightly as well as twisting, enables them to be removed without disturbing the remainder of the suspension. As at the rear, an anti-roll bar is provided.

The principal advantages of independent rear suspension are well known, namely improved wheel adhesion owing to the absence of weight transference effects under driving torque, reduction of unsprung weight (with further adhesion and road-holding advantages in both driving and braking conditions, as well as increased comfort) and (dependent on the geometry adopted) increased cornering power. It is of interest that E-type independent rear suspension was fitted to a Mark 2 Jaguar for development work and showed a reduction of no less than 190 lb. (more than 50%) in unsprung weight compared with the standard solid axle.

Although the E-type layout differs in a number of important respects from that of the special experimental car entered at Le Mans last year by Briggs Cunningham, an examination of the design shows that much of the development work on that car has borne fruit on the E-type. On the new car, however, the final drive unit, the inboard disc brakes and the half-shafts and hub carriers are all assembled, together with the suspension elements, to form a virtually self-contained unit carried by a massive bridge-piece fabricated from steel pressings.

This bridge-piece is attached to the underside of the body structure via a pair of V-disposed rubber mountings on each side, and as both the anti-roll bar and the longitudinal radius arms are also attached by rubber mounting points to the body structure, the result is to eliminate all metal-to-metal contact between the final-drive/suspension unit and the body, thus isolating the latter completely from high-frequency transmission and road vibrations.

Equally important is the fact that the V-disposition of the rubber mounting points above the axle, coupled with the special rubber mountings at the forward ends of the radius arms (which permit a slight expansion and contraction of their effective length) are designed to allow a controlled degree of rotational movement of the axle casing—actually a maximum of 5 degrees under driving torque and 3 degrees under braking. The result (which corresponds roughly to the movement permitted to a solid axle mounted on semi-elliptic springs) is to provide a cushion effect and cut out transmission judder.

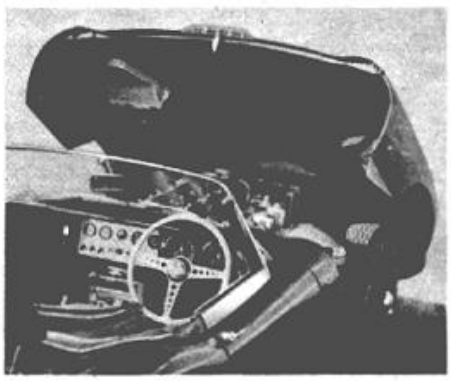
The Final Drive

A Salisbury 4HU hypoid-bevel final drive unit incorporating a Powr-Lok differential is used, its casing rigidly mounted at top and sides in the bridge member, and a pair of universally jointed tubular half-shafts convey the drive to the hubs. Needle-roller universal joints which require no lubrication are used and, because the half-shafts also serve as the upper suspension links, no sliding joints are employed and the half-shafts are of large diameter. To cater for transverse loads, taper-roller bearings are used at both ends of the half-shafts and the hubs themselves are housed in light-alloy castings which are extended downwards to provide pivot points for the lower links which are below, and parallel with, the half-shafts.

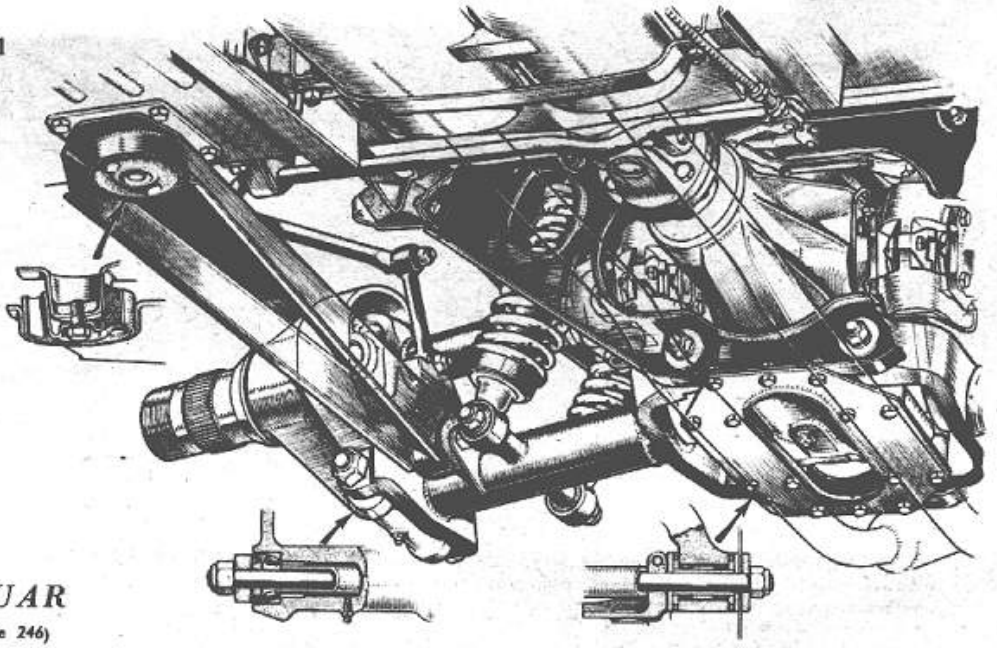
The lower links take the form of single tubular members of 2½ in. outside diameter with fork-shaped forged ends providing widely spaced bearings. At the inner ends, the bearings are of the double needle-roller type spaced approximately 11 in. apart, whilst approximately 5 in. separates the taper-roller bearings used at the outer ends. Connecting the axle ends of the radius arms (and also rubber mounted) is an anti-roll bar.

As will be seen from the drawings, the coil springs (which embrace Girling hydraulic dampers) are duplicated on each side, the idea, of course, being to economize space, as the two springs can be accommodated one on each side of the half-shaft. They are mounted on lugs on the tubular lower links, with upper

(Continued on page 247)



IMPRESSIVELY LONG, the bonnet (made in three pieces), is hinged near the front for access to the engine.



WORMS-EYE VIEW of the final drive and independent rear suspension. Points to note include the inboard Dunlop disc brakes, the twin coil springs on each side, and the way in which the half-shafts also serve as upper suspension links. Inset details show the special forward rubber mountings of the radius arms (see text), the taper roller bearings at the outer ends of the lower links and the double-needle-roller bearings used at the inner ends of these links.

The New 150 m.p.h. JAGUAR

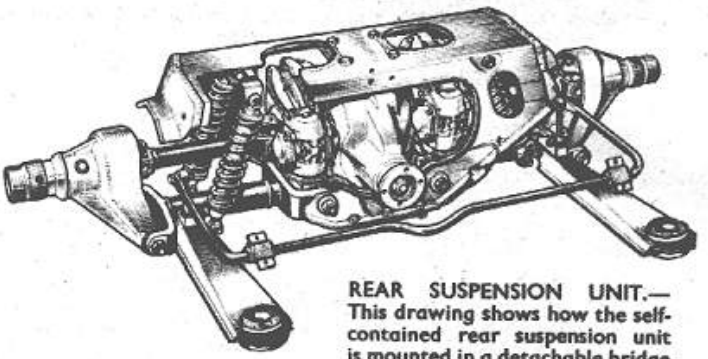
(Continued from page 246)

abutments on the bridge member. Progressive rubber bump stops are used.

As the lower links are longer than the parallel half-shafts which form the upper links, the arrangement offers a compromise in which variations in camber and track are both restricted to a reasonable minimum. In the static condition, the roll centre is 5 ⅜ in. above ground level and the camber angle ½ to 1 degree negative. The geometry is such that variations in track have been virtually eliminated if one wheel hits a bump on roll, whilst the effect of roll on camber angle of the outer wheel is extremely small; as a result, the disturbing effects of road irregularities on corners are minimized and the cornering power of the tyre is not appreciably affected by adverse wheel camber.

Dunlop disc brakes are used all round and, as mentioned earlier, the rear discs are located inboard, with provision for cooling via a large aperture in the suspension bridge member. The callipers are forward mounted with the usual quick-change pads, and the separate hand-brake callipers are situated above, with an adjuster accessible from under the car.

Twin master cylinders with a compensating link of limited travel are used so that failure of the front brakes leaves the rear still in action and vice versa. Each master cylinder has its own reservoir and each is fitted with a low-level warning device, coupled to a single warning light on the facia panel. Servo assistance is given by the latest Dunlop bellows-type mechanical booster which was fully described in *The Motor* of December 28, 1960, and which has the advantage that no fluid seals are involved and that it is not necessary to bleed the hydraulic system if service to the booster is necessary.



REAR SUSPENSION UNIT.—This drawing shows how the self-contained rear suspension unit is mounted in a detachable bridge piece.

So far little has been said about the engine because this is already well known, being the XK unit in its largest and most powerful form with "S" type head and twin exhausts, each with two silencers. A point of interest is that the three carburetters are fed from a horizontal rear tank beneath the boot floor by a new Lucas electric pump which is unusual in working completely immersed in the fuel. *This is fully described elsewhere in this issue* (*see P. 228*).

Another innovation on the E-type is the use of an electrically-driven cooling fan, also of new Lucas design. This has been fitted partly because it is easy to install, but also because a conventional engine-driven fan is a source of both power loss

JAGUAR E-TYPE SPECIFICATION

ENGINE

Cylinders	6 in line with 7-bearing crankshaft.
Bore and stroke	87 mm. × 106 mm. (3.425 in. × 4.173 in.).
Cubic capacity	3,781 c.c. (230.64 cu. in.).
Piston area	55.28 sq. in.
Compression ratio	9/1 (8/1 optional).
Valvegear	Inclined o.h.v. operated by twin chain-driven overhead camshafts and located at included angle of 70 degrees in hemispherical combustion chambers in "straight port" aluminium-alloy cylinder head.
Carburation	Three type HD8, S.U. carburetters, fed by Lucas Model SFP pump located within 14-gallon tank.
Ignition	Lucas 12-volt coil, centrifugal and vacuum timing control, 14 mm. Champion N5 sparking plugs.
Lubrication	Tecalemit full-flow filter; sump capacity 11 pints (plus 2 for filter).
Cooling	Pressurized water cooling with pump, thermostat and electrically driven fan; 11-pint water capacity (incl. heater).
Electrical system	12-volt, 57 amp. hr. battery charged by 360-watt generator.
Maximum power	265 b.h.p. (gross) at 5,500 r.p.m., equivalent to 165 lb./sq. in. b.m.e.p. at 3,825 ft./min. piston speed and 4.8 b.h.p. per sq. in. of piston area.
Maximum torque	260 lb. ft. at 4,000 r.p.m., equivalent to 170 lb./sq. in. b.m.e.p. at 2,780 ft./min. piston speed.

TRANSMISSION

Clutch	Borg and Beck 10-in. s.d.p., hydraulically operated.
Gearbox	Four-speed; with direct-drive top and synchromesh on 2nd, 3rd and top gears.
Overall ratios	3.31, 4.246, 6.156 and 11.177 (reverse 11.177). Alternative final-drive ratios: 2.93, 3.07 and 3.54.
Propeller shaft	Hardy Spicer open.
Final Drive	Salisbury hypoid bevel with Powr-Lok limited-slip differential; casing attached to bridge member rubber mounted on body structure.

CHASSIS

Brakes	Dunlop discs all round, inboard mounted at rear. Hydraulic operation by twin master cylinders. Dunlop bellows-type vacuum servo.
Brake dimensions	Fronts discs 11 in. dia.; rear, 10 in. dia.
Brake areas	31.8 sq. in. pad area working on 451 sq. in. rubbed area of discs. Front/rear braking ratio, 60/40.
Front suspension	Independent by torsion bars and unequal length ball-jointed wishbones; Girling telescopic dampers; anti-roll bar.
Rear suspension	Independent by twin coil springs each side incorporating Girling telescopic dampers; wheel location by parallel transverse links of unequal length (half-shafts acting as upper links) and longitudinal radius arms; anti-roll bar.
Wheels and tyres	Centre-lock wire wheels and 6.40-15 Dunlop RS5 tyres and tubes. Dunlop RS racing tyres (6.00-15 front and 6.50-15 rear) available as optional extra on special wheels.
Steering	Rack and pinion, with adjustment for height and reach.

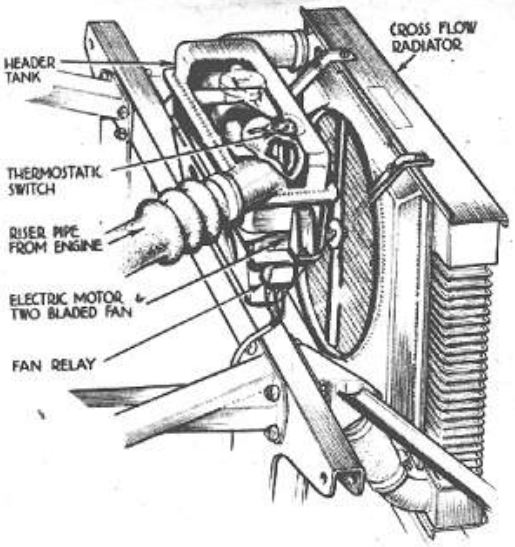
DIMENSIONS

Length	Overall 14 ft. 7 ½ in.; wheelbase 8 ft. 0 in.
Width	Overall 5 ft. 5½ in.; track 4 ft. 2 in.
Height	Coupé, 4 ft. 0½ in.; 2-str. and hard top, 3 ft. 10½ in. Ground clearance 5½ in.
Turning circle	37 ft.
Kerb weight	Coupé, 22½ cwt.; 2-str. 22 cwt. (without fuel but with oil, water, tools, spare wheel, etc.). Front/rear weight distribution, driver only, 50/50; fully laden, 46/54.

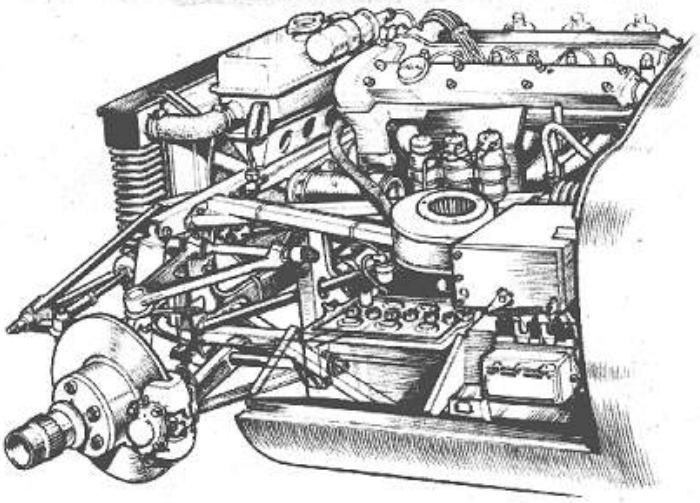
EFFECTIVE GEARING*

Top gear ratio	22.8 m.p.h. at 1,000 r.p.m. and 32.8 m.p.h. at 1,000 ft. min. piston speed.
Maximum torque	4,000 r.p.m. corresponds to approx. 91-92 m.p.h. in top gear.
Maximum power	5,500 r.p.m. corresponds to approx. 126 m.p.h. in top gear.
Probable top gear pulling power	500 lb./ton approx. (Computed by *The Motor* from manufacturers' figures for torque, gear ratio and kerb weight, with allowances for 3½ cwt., load, 10% losses and 60 lb./ton drag.)

*Note.—These calculations apply to the coupé model fitted with the Dunlop RS5 tyres supplied as standard and the normal 3.31/1 axle ratio; they have been worked out on the rolling radius at 30 m.p.h., tyre growth at high speeds having been ignored for this purpose.



COOLING INNOVATIONS on the E-type include an electrically-driven fan which operates only when required and is brought into action by a thermostatic switch located in the water flow from the cylinder head. The flow is ducted through the header tank which serves merely to provide for expansion and contraction.



FRONT END details of the E-type shown in this sketch of a left-hand drive model include the arrangement of the torsion i.f.s., the rack-and-pinion steering, the disc brakes and the reservoirs for the hydraulic clutch operation and for the twin brake master cylinders. Connections for the warning lights for the brake reservoirs can be seen and also the top of the Dunlop mechanical booster. The engine is the 3.8-litre "S" type.

The New 150 m.p.h. JAGUAR

and noise. On the E-type, a Lucas 3 GM motor is used and is controlled by a thermostatic switch in the header tank which (with a tolerance of plus or minus 2 degrees F.) is designed to switch on the motor when the temperature of the water from the head reaches 80 degrees F. and to switch it off when the temperature falls to 73 degrees F. The motor, which drives a slender two-bladed fan located in a cowl, runs at approximately 2,300 r.p.m. and consumes 6-7 amp.

Further points of interest in the cooling system are the way in which the hot water from the head is directed within the header tank to the outlet, only a small gap between the internal ducts allowing for contraction and expansion. The radiator is of the cross-flow type and air to it is ducted direct from the nose of the car, other ducts providing cool air for the carburetters and fresh air for the body heating and ventilation system.

Completing the mechanical features of the E-type are a normal Borg and Beck single-dry-plate clutch and the remote-control Jaguar gearbox which has been used for many years past.

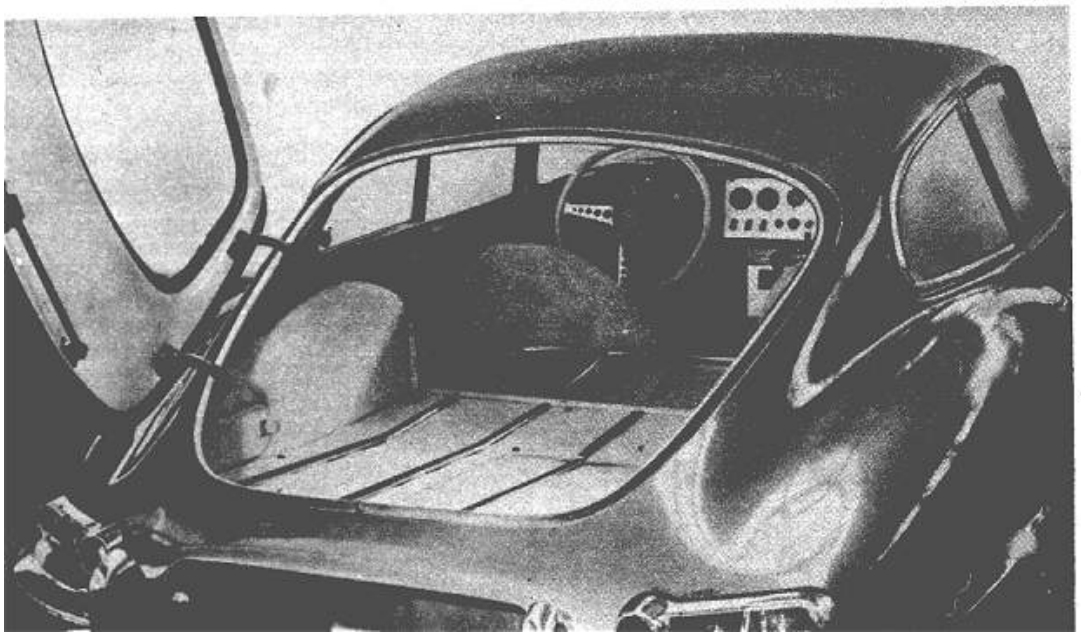
To turn now to the coachwork, both bodies are pure two-seaters, with no attempt at occasional seating. There is a useful space behind the separately adjustable seats for small parcels and this is partitioned off in the case of the open model, which has a separate boot with a normal front-hinged lid. The depth of the luggage space is naturally somewhat restricted by the low build of the car and the presence of the tank and spare wheel beneath the near-flat floor.

In the fixed-head coupé, considerably greater luggage space is available owing to the sweep of the roof, and a hinged luggage retainer at the front of the boot can be swung down to increase the floor area if required. The rear of the body is reached through a large side-hinged panel which contains the sharply sloping rear window.

Seating dimensions are the same in both cases, key dimensions being a shoulder width between doors of 49 in., a fore-and-aft cushion measurement of 20 in., and headroom of 35 in. The front-hinged doors extend below the deep, sharply raked windscreen, which has a very pronounced wrap-round and is provided with a new two-speed Lucas screenwiper with three blades. Thanks to thin pillars, vision is excellent and the winding windows (of both the open model and the coupé) disappear completely into the doors. The rear quarter lights of the coupé are hinged for ventilation.

The hood of the open car is designed for single-handed erection. Special attention has been paid to obtaining a good seal at the screen in the interests of both weather protection and high-speed security, and the forward portion of the mohair covering is reinforced by a metal plate; when furled, the hood is concealed by a detachable cover. A detachable glass-fibre hardtop is available, and, a good point this, the folded hood can be left in place when it is fitted.

As one expects from Jaguar, fittings and furnishings are comprehensive and of high quality. A three-panel facia board is used, with a large clear-faced 160 m.p.h. speedometer and matching rev. counter immediately in front of the driver, and the smaller dials (oil pressure, water temperature, fuel gauge and ammeter), together with labelled tumbler switches for the ancillary equipment, occupy the centre panel; the latter is hinged to give access to the wiring when required. On the passenger's side are an open glove locker and a grab handle. Other features in the very extensive range of equipment include a light-alloy steering wheel with wood rim, a fresh-air heating and demisting system, and provision for radio. In short, the term Grand Touring has a far wider meaning when applied to this new ultra-high-performance Jaguar than the somewhat narrow significance defined in the International Sporting Code.



ACCESS to luggage on the fixed-head model is provided from both within and without. Highlights on the body show the sweeping curves of the rear wing/rear quarter junction.