JAGUAR CARS LTD.

TECHNICAL DESCRIPTIONS
AND
SPECIFICATIONS

"E" TYPE
GRAND TOURING MODELS

ADDITIONAL INFORMATION
AND PHOTOGRAPHS
AVAILABLE FROM:-
PRESS OFFICE
JAGUAR CARS LTD.
COVENTRY

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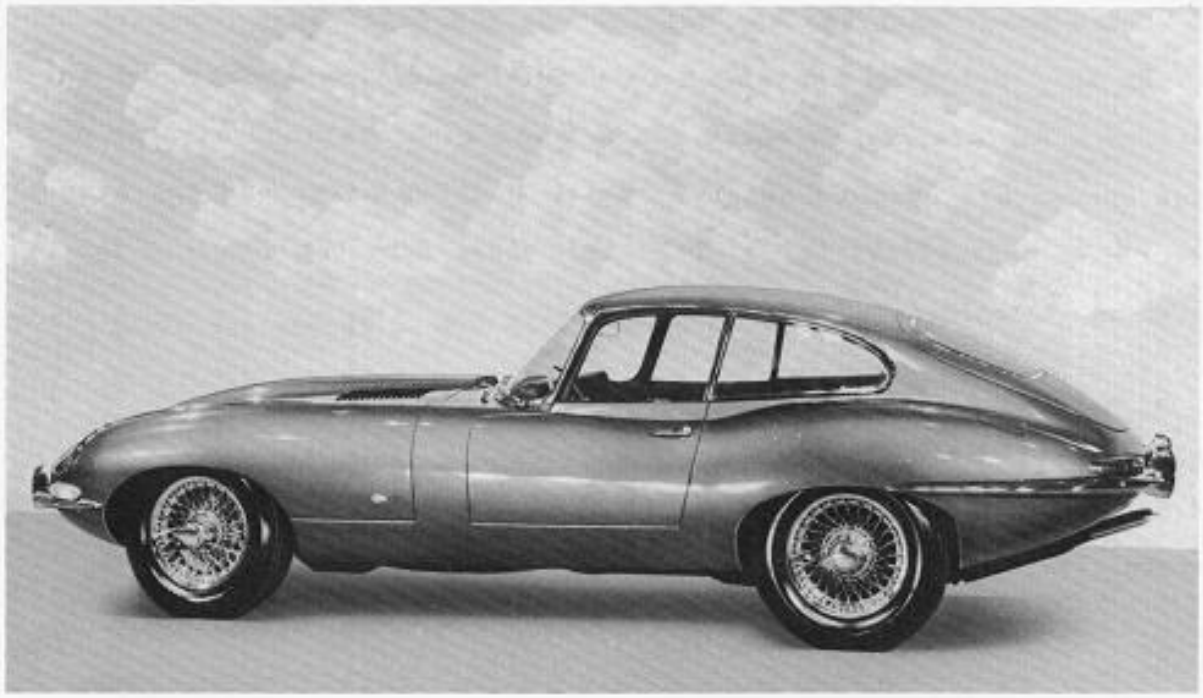
BACKGROUND OF FAME

No more famous background can be found anywhere than that which lies behind the Jaguar " E " Type " Grand Touring " models. Developed from the famous " C " and " D " Type Sports-Racing cars with their illustrious records of successes on the race tracks of the world, the " E " Type cars are presented as fast, elegant and luxuriously appointed road vehicles incorporating very many features derived from the vast store of experience gained in international competitive events.

Thus, the monocoque form of construction featuring a steel stressed shell body stems directly from Jaguar sport-racing car design, whilst an entirely new development is the unique system of independent rear suspension which is the result of many years of research and trial.

The power unit is the world famous 3.8 litre twin overhead camshaft XK ' S ' type engine which produces 265 horsepower and which offers a performance in which ultra rapid acceleration and high maximum speeds are matched by superlative braking power and the highest degree of controllability. Together these attributes invest the car with an extraordinary high safety factor.

A study of the specifications and descriptions contained in this booklet will show that, in every particular, from basic principles to minute details, the Jaguar " E " Type Grand Touring models are, in truth, the most advanced cars in the world.



GENERAL DESCRIPTION

The Jaguar " E" type is offered to the public in two forms: as an open sports car - with or without detachable hardtop, and as a coupe. In both cases, the cars are two seaters and except for minor items of detail, their chassis and body specifications are very closely related.

The general concept of the car has been kept as closely as possible to the 'D' Type car, and in fact all the main construction features of the 'D' Type have been incorporated in this new design. The result is a unique vehicle offering a combination of performance and handling far ahead of any other production car together with a degree of flexibility and silence which is one of the most important characteristics of the Jaguar range of cars.

Amongst the more important features in the design are a number of items exclusive to Jaguar - the most interesting being the method of construction of the body. This is based on monocoque principles where a stressed skin structure forms the main body shell. A tubular steel front subframe carries the engine and its ancillaries together with the suspension, and a fabricated steel rear subframe carries the rear suspension and final drive units. There is no chassis, all loads being taken by the body and subframe assemblies.

The body shell is produced almost entirely of 20 gauge steel sheet and the rounded form of the panels - resulting from the streamlined shape of the car - make a major contribution to the immense stiffness of the structure. In addition, the whole shell is welded up to form a single unit and thus all panels - including the outer panels - are load carrying. The result is a unit offering a degree of lightness in relation to stiffness which cannot be achieved by any other method of construction.

The front subframe is fabricated from square section steel tube and is bolted to the main body structure. In order to facilitate manufacture, and reduce the cost of replacement in the event of damage, the subframe is, in fact, a built up unit consisting of two triangulated side members and a deep front cross member. These are bolted together and replacement of any of the individual units does not necessitate removal of the whole assembly. As explained, the subframe carries the engine and all ancillaries together with the front suspension and steering gear. These units are shrouded beneath a fabricated front section, which is hinged to the forward end of the subframe, and performs the same functions as do the bonnet and front wings on a car of more conventional design. This arrangement provides a superb degree of accessibility for all major components.

The power unit is the world famous 6 cylinder XK engine which is used, in various capacities and specifications, throughout the Jaguar range. Its extreme reliability has been proved, time and time again, in races and rallies all over the world, and its high power output and efficiency have set standards by which other engines are judged.

Briefly, the XK engine is of twin overhead camshaft design with direct operation of the valves through inverted tappets. The cylinder head is of aluminium alloy and features hemispherical combustion chambers which together with the carefully designed inlet ports, and three S.U. carburettors results in a high power output and modest fuel consumption. Fuel is supplied by a submerged type Lucas electric pump incorporated in the petrol tank. This pump is of entirely new design, and operates on the recirculation principle. Its main features are a high pumping capacity and an ability to prevent vapour locking in the petrol pipes.

The massive crankshaft runs in seven large bearings and is made of high tensile steel. It is statically and dynamically balanced during manufacture, and in addition, the complete assembly of crankshaft, clutch and flywheel is also balanced prior to the assembly of the engine. The main and big end bearings are of lead indium material. The steel connecting rods are of 'H' section and incorporate oilways to lubricate the gudgeon pins and little end bearings. Aluminium alloy pistons are fitted and give a compression ratio of 9:1 (8:1 optional). Apart from the rigid inspection of all components during manufacture, it is interesting to note that each and every engine is individually bench tested prior to installation in the car.

GENERAL DESCRIPTION

The pressurised cooling system incorporates several interesting features. One of these is the use of an electric fan in place of the more conventional engine driven unit. This system ensures a high rate of air flow through the radiator at low car speeds and the temperature of the coolant can thus be maintained within close limits. A thermostatic switch is employed which switches in the fan at 80°C and switches it out at 72°C. The radiator is of the high efficiency cross flow type and is mounted on the front subframe. A separate header tank is fitted and is mounted between the engine and the radiator.

As fitted to the 'E' type, the 3.8 litre 'S' type engine develops 265 B.H.P. at 5,500 r.p.m. with a torque figure of 260 lbs/ft. at 4,000 r.p.m. The power is transmitted by a hydraulically operated single dry plate clutch of 10 ins. diameter to a four speed gearbox. This is manually operated by a centrally positioned gear lever and synchromesh is fitted to top, third, and second gears. A short stiff propellor shaft continues the drive to the hypoid rear axle which, together with the rear suspension, is mounted in a subframe. The axle unit is fitted with a limited slip differential which greatly reduces wheelspin and consequently gives improved traction on slippery roads.

The front suspension follows the design used so successfully on the 'D' type competition cars, and utilises a system of independent suspension based on transverse wishbones and torsion bars. The front ends of the torsion bars are mounted in extensions of the lower wishbones thus making it possible to remove the bars without disturbing the rest of the suspension. Telescopic dampers are fitted and an anti roll bar links the two lower sets of wishbones.

The independent rear suspension is of completely new design. Location of the wheels in a transverse plane is achieved by the use of two tubular links of which the top link is the half shaft - universally jointed at both ends. The lower link is also a tubular structure pivotted at the wheel carrier and at the subframe adjacent to the differential casing. To provide maximum rigidity in a longitudinal plane the pivot bearings at both ends of the lower link are widely spaced. The suspension medium is provided by twin coil springs enclosing telescopic hydraulic dampers and these are mounted on each side of the differential casing. The whole assembly is carried in a fabricated steel subframe which is easily and quickly detachable from the body structure. This subframe is located in the body by four " Vee" rubber blocks - and by a radius arm on each side of the car between the lower link and a mounting point on the body structure. The radius arm pivots are rubber bushed and, as a result, the whole suspension assembly, including the subframe, is allowed a carefully predetermined degree of movement - the amount being controlled by the characteristics of the rubber used to make the Vee blocks and radius arm pivots. Not only does this result in the insulation of the whole assembly from the body structure but, more important, it eliminates all transmission roughness and noise - two of the main disadvantages of fully independent suspension systems.

In a car having a high power to weight ratio and an aerodynamic body of low drag characteristics, a first class braking system is of paramount importance. The " E" type Jaguar is fitted with the race proved Dunlop disc brake system on all four wheels - a system capable of providing smooth fade-free braking in all conditions. The front brakes are mounted on the wheel hubs whilst the rear brakes are mounted inboard of the half shafts and adjacent to the differential unit. The brakes themselves are of single pair pad design in which the friction pads are quickly replaceable. They are operated by a pedal actuating twin master cylinders through a compensating device which divides the system into entirely independent circuits to front and rear brakes. Thus damage to one circuit does not result in a total loss of braking and this is an extremely important safety factor. Each master cylinder has its own reservoir and low-level warning system, which operates a red light on the facia panel. A Dunlop bellows-type servo is fitted and operates direct onto the brake pedal, thus providing maximum retardation with low pedal pressures.

Accuracy of steering is of prime importance on any high-performance car, and special attention has been paid to this subject on the " E" type. Rack and pinion

GENERAL DESCRIPTION

steering is fitted, and a turning circle of 37 feet is provided with only 2½ turns from lock to lock. The lightweight steering wheel is of polished alloy and has a wood rim. A somewhat unusual feature these days is the fact that it is separately adjustable for both height and reach.

The interiors of both cars have been specially studied from the viewpoint of drivers accustomed to high-speed cars. Large windows combine with the wide wrap-round windscreen and thin screen pillars to provide superb all-round visibility. Bucket seats, adjustable for reach and a steering wheel adjustable for both height and reach, enable a driver to select his own ideal driving position - an important safety factor. A full set of instruments is provided and the speedometer and revolutions counter are positioned directly in front of the driver. The electrical equipment is controlled by a row of tumbler switches, all of which fall readily to hand and are clearly labelled. At night, instrument panel illumination is provided by internal floodlighting controlled by a two-position dimmer switch. Long-range headlamps are controlled by a dip switch mounted on the facia panel and a separate lever actuates the headlamp flasher equipment. For adverse weather conditions, triple blade two-speed windscreen wipers and electrically operated windscreen washers are provided.

Despite these high standards of operating efficiency, comfort has, in no way, been sacrificed. The seats are upholstered in finest quality leather and pile carpets with underfelt cover the floor. A high efficiency fresh air heating and multi-point demisting system is provided, the temperature and volume of air being regulated by controls mounted on the facia panel.

On the open two-seater, the door lights disappear completely when fully lowered, and when raised make a perfect weatherproof fit with the hood which is made of a specially damped material to reduce noise and vibration at high speeds. The hood mechanism has been specially designed to permit single handed erection and storage. In the latter position, the hood is concealed beneath a removable cover. A fibre-glass hard top, incorporating a large rear window, can be fitted without having to remove the stored hood. Luggage accommodation is provided in the tail, and the opening of the boot lid is controlled from inside the car.

In the coupe, the whole of the body to the rear of the front seats is available for the carriage of luggage. The flat floor is fitted with rubbing strips to protect the luggage, and at the front a hinged panel acts as a luggage retainer. If the maximum floor area is required, this panel can be lowered - a luggage retaining lip still being provided. Behind the seats, there is a shelf to carry small parcels etc. Access to the luggage compartment is provided by a large hinged panel which also incorporates the rear window. The release catch is operated from inside the car. In addition to the door lights which disappear completely when fully lowered, hinged quarter lights are also provided and these can be used as air extractors if required.

Both models abound with many more interesting features, and the time spent in a careful perusal of the specifications found elsewhere in this booklet will be amply rewarded.

PERFORMANCE DATA - "E" TYPE COUPE

Engine:	3781 c.c
Compression Ratio:	9:1
Axle Ratio:	3.31:1
Barometer:	29.78" Hg.
Weather Conditions:	Wet
Test Ground:	M.I.R.A
Driver:	N.Dewis

ACCELERATION THROUGH GEARS

0 - 60	7.0 secs.
0 - 100 m.p.h	16.0 secs.
Standing ¼ mile:	14.8 secs.

TOP GEAR ACCELERATION

10 - 30 m.p.h	5.7 secs.
20 - 40 m.p.h	5.2 secs.
30 - 50 m.p.h	5.3 secs.
40 - 60 m.p.h	5.0 secs.
50 - 70 m.p.h	5.4 secs.
60 - 80 m.p.h	5.3 secs.
70 - 90 m.p.h	5.5 secs.
80 - 100 m.p.h	5.7 secs.
90 - 110 m.p.h	6.3 secs.
100 - 120 m.p.h.	8.2 secs.

TECHNICAL APPRAISAL

The Jaguar "E" Type car is not just another Sports car in the conventional sense of the word. It is an entirely new concept of high speed motoring. The object has been to produce a car having a performance equal to the most specialised of sports cars combined with the same standard of comfort and smooth running that are the outstanding characteristics of the Jaguar saloon car range. Thus the "E" Type, whilst being capable of speeds in excess of 150 m.p.h., can still be driven in top gear at 10-15 m.p.h. without the slightest trace of roughness, hesitation, or snatch.

The following appraisal of the design of the car has been prepared since it is felt that this background information will be of considerable interest.

ENGINE. The "E" Type car embodies the latest development of the famous XK engine. This unit, which was first introduced as a 3½ litre engine developing 160 h.p., has been developed to a stage where the present 3.8 litre "S" type version gives 265 h.p. It must be emphasized that, although an increase in horsepower of 65% over the original engine has been achieved, such was the factor of safety incorporated in the basic design that it has not been found necessary to make any modifications to either the cylinder block, the cylinder head, or the crankshaft - the main components of the engine. This increase in power stems largely from the development work carried out on valve ports, valve sizes and induction passages. In addition an increase in the bore size from 83 m.m. to 87 m.m. has raised the cubic capacity from 3442 c.c. to 3781 c.c.

Dealing with the cylinder block first, the increase in bore size made it necessary for the bores to be siamesed into two sets of three and considerable experimental work took place before we were satisfied that this had no adverse effects on the cooling system.

All the 3.8 litre engines are fitted with special cast iron cylinder liners with a high resistance to wear. To ensure adequate cooling of the liners in the upper region of the cylinder bore - where the maximum heat is dispersed - two horizontal gaps are cut in the walls of the cylinder block, between adjacent bores, which allows a jet of cold water to circulate around the top of the bores. These passages are sealed when the liners are pressed in and this not only eliminates any adverse effects that might be experienced with siamese bores, but actually gives an advantage, in that the flow of cooling water is concentrated around the point of maximum heat. This patented feature was developed by Jaguar Engineers and is exclusive to the XK engine. Another improvement, made to take care of the increase in power, was the replacement of the cast iron bearing caps on the main line with those made from steel stampings, thus giving a much greater rigidity and, as a result, a longer bearing life. The connecting rod big end bearings together with the main bearings are of lead bronze with an indium coating, and are capable of carrying very high loads.

Piston design is constantly improving and, as a result of racing experience, a high duty piston is fitted with deep cross ribbing under the head to dissipate, much more quickly, the heat from the piston crown. Piston rings have also been the subject for considerable experimental work. Quite early in the life of the engine a chromium plated top ring was introduced which gave even greater life to both cylinder bores and pistons. The second ring - also a compression ring - has a tapered face which gives quick seating during the running-in period and ensures better oil control and sealing throughout the life of the engine. These rings are supplemented by a scraper ring which also helps to regulate the oil consumption, whilst metering sufficient oil for lubrication purposes.

The connecting rods have remained basically unchanged throughout the life of the engine. These are a high tensile steel forging, and their machining has been the subject of a special study in our Production Department. As a result we are able to maintain the extreme accuracy of bore sizes and centres which is necessary if long life for the precision finished bearings is to be obtained. Every forging is checked for tensile strength and is polished on the highly stressed outer faces of the "H" section. Each rod is crack detected to make sure that no forging flaw can possibly get through to the finished engine and it should be noted that all engines used for competition work are fitted with connecting rods taken from the production line.

The crankshaft, as already stated, remains basically unchanged. Minor improvements have been made, however, to the drilling of the oil ways and to the high surface finishing of the journals.

The changes in the cylinder head have not been as great as might have been imagined from the increase in horse power obtained. It is cast in aluminium alloy and features hemispherical combustion chambers which carry the inlet and exhaust valves flush and tangential to the surface of the chamber and disposed at 35 degrees from the vertical centre line. This type of combustion chamber is acknowledged to be the most efficient in the world, and it was for this reason it was decided to concentrate on producing an engine based on this layout when Jaguar embarked on the XK range. The reasons for its superiority are firstly, that with the valve disposed tangentially in the sphere, a far better flow of gas into the combustion chamber can be obtained, than if the gas has to enter the cylinder head and suddenly turn a corner; or if, as in certain types of combustion chamber, half the working aperture of the valve is obstructed by the cylinder head walls - thus restricting the flow.

Secondly, cooling water can be circulated around the valve, thus giving equal cooling all round the seat and ensuring freedom from valve distortion. The inlet ports in the cylinder head are slightly off set so that, as the gas enters the

chamber, a swirl in the gas is produced which ensures adequate mixing of the charge and rapid and even burning when this is ignited. The valve seats are of a special quality cast iron having a high coefficient of expansion, and are pressed in position after the cylinder head has been heated to a certain temperature. The valve seat material expands at a similar rate to that of aluminium and the seats thus retain their intimate contact with the surrounding aluminium, passing the heat from the valve head to the cylinder head casting and thus to the water.

Because of its considerable strength under high temperature conditions and its resistance to lead attack when used with high octane fuels, the exhaust valves are of austenitic steel. The valves are carried in cast iron guides which are also pressed into the cylinder head with the head in a heated condition. Interposed between the end of the valve and the overhead camshaft are the tappet cups, which are made of a special grade cast iron, having a chill hardened face against which the camshaft operates. The bores for these tappets are machined in line with the valve guides and the valve seats, thus giving a direct thrust on the valve and so eliminating any thrust on the valve guide. This elimination of side thrust on the valve is one of the main reasons for adopting the overhead camshaft design. It gives a valve life and a freedom from tappet adjustment that cannot be achieved by any other means. Furthermore, in view of the fact that there is no rocker or push rod, it means that for an equivalent engine speed the strength of the valve springs can be considerably lighter, thus avoiding undue hammering on the valve seats which could cause premature failure.

The twin overhead camshafts, which are mounted directly in the cylinder head, are carried in four white metal bearings which eliminate spring over the length of the shaft and enable the engine to be run at high speed without distortion. These camshafts are driven by two chains: the primary chain which runs from the crankshaft to the intermediate gear and the secondary chain which runs from the intermediate gear to the camshaft wheels. The primary chain is tensioned by a hydraulic damper which has a neopreen face in contact with the back of the chain. The secondary chain has an eccentric adjustment sprocket situated between the two camshaft wheels.

This twin overhead camshaft type of engine, whilst it is basically more expensive to manufacture, gives a service life and combustion efficiency that is impossible to obtain by any other design and, for that reason, is universally employed for all engines where the highest possible efficiency is required.

It is noteworthy that the Climax Engines which have been responsible for winning practically every major Grand Prix during the past two years have followed, very closely, the Jaguar design.

BODY. When setting out to design the " E " Type body, Jaguar naturally took, as a basis, the " D " Type and the XK.SS bodies which had been used so successfully for racing. The shape of the body is, of course, governed to quite a large extent by the disposition of the main units and, although during the original design work an unconventional position of the engine was considered, it was decided that for general handling, combined with an efficient shape for the body and correct weight distribution the conventional engine position gave the most satisfactory results in a car designed mainly for use on the road in the hands of both expert and general drivers.

First of all, the positions of the power unit, driver and passenger, seating and steering were determined, together with the minimum wheel base that would give the correct weight distribution and, around these, a streamlined shape was developed that would enclose them all with the lowest drag that could be devised.

As soon as the basic body form was arrived at, a 1/10th size model was built for wind tunnel tests. A model has to be extremely accurate if it is to be of any use and it must be hollow to permit air to circulate through the radiator and be expelled afterwards. It is also important that the underside of the model should represent, as nearly as possible, the underside of the finished car. This model is then tested in the wind tunnel. The forward resistance is measured and any modifications which appear to reduce the drag are incorporated in the model until a minimum drag figure is achieved. The model is then checked for the effect produced by a side wind. To do this, the body is placed in the air stream at varying angles and pivoted at the point of the centre of gravity over the complete car. This has already been assessed by calculation and, from this, the centre of pressure of the body is obtained. The effects of cross winds from different directions and intensities are studied by varying the angle at which the car is set. In addition to these figures, which are taken in a horizontal plane, it is also necessary to check the shape of the body for forces produced by the air in a vertical plane. It is most important that the vertical forces so produced should not tend to lift the tail or depress the front of the car unduly, as this would make the car unstable at high speed, since the alteration in attitude of the body to the air stream can increase the drag by a very considerable amount. The upswept underside of the body at the rear is functional in this respect and, in fact, the general streamlining of the body has been carried to an extent where it is believed that any further alterations would impair the suitability of the car for the purpose for which it is intended - that is the fast, safe and comfortable transportation of two people and their luggage.

BODY STRUCTURE. With any car capable of travelling at high speed and particularly in the case of a car with an open body, the rigidity of the whole structure in both bending and torsion is of the utmost importance, firstly to ensure that all the unsprung weight of the car moves together as a single unit and, secondly, to ensure that the

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forces transmitted from the road are taken by the road springs and not by a flexing of the frame and/or body. Otherwise it is impossible to get a good consistent ride and a quick and accurate response from the steering wheel to the road wheels.

The basic structure of the " E " Type body consists of two large diameter longitudinal tubular members, which run the length of the main fuselage, and which are constructed from the outer skin panel and the inner rocker panel. At the front, two large vertical box sections are welded onto the top of the longitudinal members and these are built into a very deep box section cross member which forms the scuttle of the body. At the rear, a deep box section cross member is continued upwards to form a diaphragm between the rear wheel arches, whilst the panel across the top of the wheel arches is similarly boxed in for additional stiffness. The rear section of the body is built up as a stressed skin unit with the addition of heavy gauge stiffeners which comes up from the rear cross member and form the base to which the rear suspension and drive units are mounted.

At the front of the car, a triangulated structure of high tensile steel tubes forms a frame which is bolted to the main body structure. For the sake of simplification in manufacture and servicing, this frame is made of three major units - two fully triangulated side members and a single, plain, front cross member. This frame carries the engine, the front suspension and, on an extension to the front of the frame, the radiator and front body section. This form of construction results in an extremely light structure with exceptional strength in both torsion and bending.

FRONT SUSPENSION. This is of the double wishbone type using ball pins around which the stub axle moves. This method of mounting the stub axle has been used by Jaguar since the introduction of the Mark V in 1948, and gives a better control of the wheel than that which can be obtained by any alternative method.

STEERING. The steering is by rack and pinion. The rack is spring loaded against the pinion teeth to ensure silence and smoothness in operation. The whole steering unit is mounted on rubber - in sheer - which permits a small amount of movement of the steering box as a whole, and prevents any direct shocks from the wheel being passed through the steering mechanism. This feature makes it possible to use a rigid track rod without any spring loading of the ball pins.

REAR SUSPENSION. For the first time Jaguar are offering a car with independent suspension on all four wheels. It has been developed during the past four or five years and it is believed that this new suspension has all the advantages of other types of suspension yet has avoided the major pit-falls which have restrained most manufacturers from fitting independent suspension for so long.

The suspension uses the half shaft as the upper link, whilst the lower link - another tubular member - not only forms the lower support in the vertical plane, but also protects the stub carrier from torsional movement. Fore and aft movement is controlled by means of a radius arm which runs forward from the outer end of the lower link to the rear box section cross member at the back of the body. The most novel feature of the layout however, is that the whole unit embodying the suspension, the differential casing which carries the inboard brakes, and the mountings for the lower wishbones are all carried in a single fabricated subframe which is supported at its outer ends on V rubber mountings located in the body frame directly over the rear axle. The use of this flexibly mounted rear axle unit has completely eliminated all harshness of drive as well as the road and transmission vibrations which are usually associated with independent rear suspensions.

HANDLING. The question of handling is regarded by Jaguar Engineers as being of paramount importance. Not only has the car to be stable and precise in its handling at maximum speed, but it has also to be capable of holding any desired curve accurately without the danger of front or rear breakaway. These characteristics are a function not only of weight distribution and spring stress, but also of the balance of springing and rate of roll between front and rear suspension. Careful selection of shock absorber settings is also necessary to ensure that they are capable of meeting every condition.

At the same time, the Company set itself the task of producing a car that was comfortable to drive in the city and on the open road and there is no question that this has been successfully achieved and that the car, as now presented, meets all the requirements for town use, fast touring in the country, as well as participation in Sports-car racing events.

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GENERAL SPECIFICATION

ENGINE. Six cylinder twin overhead camshaft 3.8 litre XK Jaguar 'S' type engine. 87 m.m. bore x 106 m.m. stroke (3.425 in. x 4.1732 in.) Cubic capacity 3781 c.c. (230.6 ins.) Compression ratio 9 to 1 (8 to 1 optional). Power output (9 to 1): 265 B.H.P. at 5,500 R.P.M., torque: 260 ft.lbs. at 4,000 R.P.M. Three S.U. carburetters, type HD.8 with manual choke control. Forced lubrication by submerged pump system incorporating a full flow filter. Chrome iron cylinder block fitted with dry type cylinder liners. Special 'straight port' cylinder head of high tensile aluminium alloy featuring hemispherical combustion chambers and twin overhead camshafts operating large valves of 70° included angle. Aluminium alloy pistons. Steel connecting rods fitted with lead indium big end bearings. 2⅜ins. diameter counterweighted crankshaft carried on seven large lead indium bearings. Pressurised cooling system with thermostatically controlled electrically driven fan.

TRANSMISSION. Manually operated four speed, single helical synchromesh gearbox. Ratios: Top 3.31. 3rd 4.25. 2nd 6.16. 1st 11.18. Centrally positioned change speed lever. Synchromesh on Top, Third and Second gear ratios. Borg and Beck 10 ins. single dry plate clutch with hydraulic operation. Hardy Spicer Needle Bearing propellor shaft. Hypoid rear axle fitted with limited slip differential. Ratio (Standard): 3.31 to 1. Optional ratios: 2.93 - 3.07 - 3.54. Differential unit mounted in subframe carrying the rear suspension.

SUSPENSION - FRONT. Independent front suspension incorporating transverse wishbones and torsion bars controlled by telescopic Hydraulic dampers. Anti roll bar fitted to lower wishbones.

SUSPENSION - REAR. Fully independent rear suspension incorporating, on each side, a lower transverse tubular link pivotted at the wheel carrier and subframe adjacent to the differential case and, above this, a halfshaft universally jointed at each end. These serve to locate the wheel in a transverse plane. Longitudinal location is provided by the rubber mountings locating the subassembly in the body structure and by a radius arm between the lower link and a mounting point on the body structure. Twin coil springs, each enclosing a telescopic hydraulic damper provide the suspension medium. The whole assembly together with the differential unit is carried in an easily detachable subframe which is located in the body structure by rubber mountings.

BRAKES. Dunlop bridge-type disc brakes featuring quick change pads, are fitted to all four wheels. Front brakes fitted on wheel hubs, rear brakes fitted inboard of halfshafts adjacent to differential unit. Bellows type brake servo operating directly onto brake pedal. Pedal operates twin master cylinders through a compensator device which divides the system into two entirely independent hydraulic systems to front and rear brakes. Centrally positioned handbrake operates on rear wheels only. Brake fluid level warning light operates on both systems.

STEERING. Rack and Pinion. 16 in. steering wheel with separate adjustments for height and reach. Number of turns, lock to lock - 2½. Turning circle 37 ft. diameter.

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WHEELS AND TYRES. Wire spoke wheels with centre lock hubs fitted with Dunlop 6.40 x 15 type RS.5 tyres and tubes. Dunlop R5 Racing tyres available as optional equipment. 6.00 x 15 front. 6.50 x 15 rear on special wheels.

FUEL SUPPLY. By Lucas electric pump fitted into tank of 14 Imp.Gall. capacity. Petrol filter incorporated into fuel line and located in engine compartment.

ELECTRICAL EQUIPMENT, INSTRUMENTS & FITTINGS. Lucas 12 volt system. Large capacity battery giving 57 amp.hours at 10 hour rate with current voltage control. Ventilated dynamo. Eight fuse control box, fully labelled, located behind hinged central facia panel for ease of access. Side lamps. Lucas PL 700 headlamps with hand operated dipping control on facia. Separate lever actuating headlamp flashing. Separate Stop/ Tail direction and reflector units mounted in a single assembly. Rear number plate lamps. Flashing direction indicators with self-cancellation and warning light on facia. Instruments and labelled switches illuminated by internal floodlighting controlled by a two position dimmer switch. Map reading light. Interior light. Twin blended note horns. Triple blade two-speed self parking windscreen wiper unit. Electrically operated windscreen washers. Cigar lighter with luminous socket. Starter motor. Vacuum and centrifugal automatic ignition control. Oil coil ignition. 5 ins. diameter 160 m.p.h. speedometer incorporating total and trip distance recorders. 5 ins. diameter electrically operated revolution counter incorporating an electric clock. Ammeter. Electrically operated water temperature gauge, oil pressure gauge, fuel gauge with low level warning light. Choke warning light. Combined handbrake and brake fluid low level warning light. Wiring harness in quickly detachable front body section connected to main circuits through an eight pin connector.

BODY CONSTRUCTION. Stressed shell steel body of unique patented monocoque construction. Front subframe of square section steel tubing carries engine unit, suspension and forward hinged front section.

HEATING AND DEMISTING. High output fresh air heating and multi-point windscreen demisting system incorporating a two speed fan controlled by switch on facia. Temperature and volume of air to windscreen and car interior regulated by controls mounted on facia panel. Ducts direct air to each side of compartment.

SPARE WHEEL AND TOOLS. The spare wheel is carried beneath the boot floor in a separate compartment and is readily accessible. The tools are housed in the spare wheel compartment together with the jack and wheel hammer.

JACKING. Centrally located jacking sockets enable the front and rear wheels on either side of the car to be raised simultaneously by means of the manually operated screw type easy lift jack.

PRINCIPAL DIMENSIONS. Wheelbase 8ft.0ins. Track, front and rear 4ft.2ins. Overall length 14ft. 7.5/16ins., overall width 5ft.5¼ins.

GENERAL SPECIFICATION

Overall height 4ft.0in. Ground clearance (laden) 5½ ins. Dry weight (approx.) Open Two Seater: 22 cwts. Fixed Head Coupe 22½ cwts.

BODY - OPEN 2 SEATER. Two door two seater body of extremely low drag characteristics resulting from intensive wind tunnel testing. The folding hood incorporating a large rear window is of finest quality mohair, mounted on a special frame to permit single handed erection or stowing. When stowed the hood assembly is completely concealed by a separate detachable cover. Fibreglass detachable hardtop available as an optional extra. Hardtop can be fitted without removing stowed hood. Counterbalanced, forward opening front section provides excellent accessibility to all mechanical components. Wraround windscreen and thin pillars provide superb forward visibility. Door lights completely concealed within doors when fully lowered. Wraround bumpers with overriders at front and rear. Twin bucket seats, adjustable for reach, upholstered in finest quality Vaumol leather over Dunlopillo foam rubber cushions. Three panel facia. Facia and screen rail in matt grained finish to eliminate reflection. Comprehensive instrumentation with revolution counter and speedometer positioned in front of driver. Central panel contains separate instruments for oil pressure, water temperature, fuel gauge and ammeter, together with a row of labelled tumbler switches controlling ancillary equipment. Separate housing beneath panel contains a radio and twin speakers (optional extra) together with an ashtray. When no radio is fitted, the speaker grilles are retained and the radio control panel aperture is blanked off with an escutchion. Panel in front of passenger contains an open fronted glove compartment and grab handle. Three spoked polished alloy lightweight steering wheel with wood rim and central horn push. Wide angle vertically adjustable rear view mirror incorporating anti dazzle secondary mirror position. Deep pile carpets over thick felt underlay. Luggage accommodation provided in tail of car with boot lid controlled from inside the car.

BODY - FIXED HEAD COUPE. Two door two seater body of extremely low drag characteristics resulting from intensive wind tunnel testing. Counterbalanced forward opening front section provides excellent accessibility to all mechanical components. Large counterbalanced panel at rear, with release catch located in car, incorporates rear windowand gives unobstructed access to luggage compartment, spare wheel and tools. Lipped shelf provided immediately behind seats for small parcels etc., and whole of body behind seats available for luggage. Hinged luggage retainer at front of compartment drops down to increase floor space if required. Large window area together with wraround windscreen and thin screen pillars provide superb all round visibility. Door lights completely concealed within doors when fully lowered. Hinged rear quarter lights act as air extractors if required. Wraround bumpers with overriders at front and rear. Chrome finishers on rain guttering and windscreen frame. Twin bucket seats, adjustable for reach, upholstered in finest quality Vaumol leather over Dunlopillo foam rubber cushions. Three panel facia together with screen rail matt grain finished to eliminate reflections. Comprehensive instrumentation with revolution counter and speedometer positioned in front of driver. Central panel contains separate instruments for oil pressure, water temperature, fuel gauge and ammeter, together with row of labelled tumbler switches controlling ancillary equipment. Separate housing beneath panel contains a radio and twin speakers (optional extra) together with an ashtray. When no radio is fitted the speaker grilles are retained and the radio control panel aperture is blanked off with an escutcheon. Panel in front of passenger contains an open fronted glove compartment and grab handle. Three spoke polished alloy lightweight steering wheel with wood rim and central horn push. Sun visors for driver and passenger. Wide angle vertically adjustable rear view mirror incorporating anti dazzle secondary mirror position. Deep pile carpets over thick felt underlay. Special roof lining to roof panel to provide maximum headroom.

TECHNICAL SPECIFICATION

ENGINE.

Number of Cylinders.	6 in Line.	
Bore.	3.425"	87 mm.
Stroke.	4.1732"	106 mm.
Capacity.	230.64 cu.in.	3781 ccs.
R.A.C Rating.	28.15 HP.	
Compression Ratio	8 or 9 to 1.	
Piston Area - Total.	55.28 sq. in.	356.6 sq. cms.

VALVES.

Layout.	Twin Overhead Camshafts. Chain Drive. Top Chain: Reynolds Duplex Roller 3/8 (9.5 mm) pitch - 100 pitches. Bottom Chain: Reynolds Duplex Roller 3/8 (9.5 mm) pitch - 82 pitches.
Valve Material - Inlet.	Sil. Chrome Steel E.N 52.
Exhaust.	Austenitic Steel Fox 1282.
Face Angle.	Inlet 45° Exhaust 45°
Lift.	Inlet 3/8" (9.5 mm) Exhaust 3/8" (9.5 mm).
Tappet Clearance (Cold).	Inlet .004 (.1 mm) Exhaust .006 (.15 mm).
Timing.	Inlet opens 15° BTDC. Inlet closes 57° ABDC. Exhaust opens 57° BBDC. Exhaust closes 15° ATDC.
Valve Insert.	Inlet and exhaust - Nickel Iron (Brimol).
Valve Head Diameter.	Inlet 1¾" (44.4 mm). Exhaust 1⅝" (41.3 mm).
Timing Mark Location.	On Crankshaft Damper marked in degrees.

IGNITION.

Breaker Gap.	.014" - .016" (.36 - .41 mm).
Firing Order.	1.5.3.6.2.4 numbered from Rear end.
Timing - 9:1.	10° B.T.D.C.
Control.	Automatic. Vacuum/Centrifugal.
Vacuum advance - Max. Range.	18°
Centre . Max. Advance.	34° - 38°
Cam Angle.	35° ± 2°
Timing Mark Location.	On Crankshaft Damper marked in degrees.

CARBURATION.

Carburettor - Make and No.	S.U Type HD.8. 2". Three.
Choke Control.	Manual.
Air Cleaner.	A.C Delco (Paper).
Fuel Pump - Make & No.	Lucas - One.
Type No.	2 F.P.
Petrol Filter.	Glass Bowl Type in Fuel Line.
Carburettor Needle.	U.M (9:1 C.R).

LUBRICATION

Engine Oil - Summer.	S.A.E No.30.
Winter.	S.A.E No.20.
Normal Pressure.	50 PSI at 3000 RPM when hot.
Filter.	Tecalemit Full Flow.

TECHNICAL SPECIFICATION

ENGINE PARTS.

Cylinder Block.	Chrome Iron Castings.
Cylinder Head.	Aluminium Alloy Casting.
Cylinder Liner.	Brico Dry Type.
Oil Sump.	Aluminium Casting.
Crankshaft.	High Tensile Steel Stamping.
Connecting Rod.	High Tensile Steel Stamping.
Crankshaft Damper.	Metalastik on front of Crankshaft.
Bearings - Main.	7 Lead Indium.
Bearings - Big End.	Lead Indium.
Camshaft.	Chilled Cast Iron.
Camshaft Bearings.	Steel Backed - White Metal.
Pistons.	Aluminium Alloy Die Casting.

PERFORMANCE DATA.

9:1.

Max B.H.P at R.P.M.	265 at 5500.
Max B.M.E.P (P.S.I).	172
Max B.M.E.P ($Kg.CM^2$)	12.09
Max Torque (Ft. Lbs).	260 at 4000.
Max Torque (M.Kg).	36 at 4000.
B.H.P per Sq. In. Piston Area.	4.79.

CLUTCH.

Make and Type.	Borg and Beck 10" Single Dry Plate. Malleable pressure plate and rivetted linings.
Control.	Hydraulic.

SYNCHROMESH GEARBOX.

	RATIOS.	
	IN BOX.	OVERALL.
Top.	1:1	3.31:1
3rd.	1.283:1	4.246:1
2nd.	1.86:1	6.156:1
1st and Reverse.	3.377:1	11.177:1

PROPELLOR SHAFT.

Hardy Spicer - Needle Bearing.

REAR AXLE.

Hypoid.

Ratio.	Standard: 3.31:1. (Optional 2.93 - 3.07 - 3.54).
Differential.	Differential fitted with limited slip unit.

BRAKES.

Dunlop Disc with Servo assistance.

Operation.

Front Brake Discs are mounted on the Wheel Hubs. Rear Brake Discs are mounted inboard adjacent to the differential case.
The foot pedal actuates two hydraulic master cylinders, through a compensator which divides the system into two entirely independent circuits to front and rear brakes.
Failure in one circuit does not affect the other.
The hand brake actuates separate pads on the rear discs through cables and a compensator.
A warning light situated on the facia is illuminated if the level in the Brake Fluid Reservoir becomes low.

TECHNICAL SPECIFICATION

FRICTION PAD.	FRONT.	REAR.
Face Dimensions (ins).	2.125 x 1.870	2.125 x 1.870
Thickness (ins).	.656	.656
Area per face (sq. ins).	3.974	3.974
Area per Disc (sq. ins).	7.947	7.947
Area per Car (sq. ins).	31.80	
Material.	Mintex M40	

BRAKE DISC.		
Diameter. (ins.).	11" (279.4 mm).	10" (254 mm).
Thickness.(ins.).	3/8	3/8
Brake Disc Area Rubbed:-		
Per Face. (sq. ins.).	60.56	54.75
Per Disc. (sq. ins.).	121.12	109.50
Per Car. (sq. ins.).	461	
Operating Cylinder Dia. (ins).	2⅛" (53.9 mm)	1¾" (44.45 mm)
Operating Pressure. (Lbs/sq.ins)	1050	1050
Braking Ration (%).	60	40
Master Cylinders dia. (ins).	Twin 5/8	

SUSPENSION - FRONT.

Independent, Wishbones, Torsion Bars, Hydraulic Telescopic Dampers.

Castor Angle.	1½° - 2° pos.
Camber	0° - ½° pos.
Alignment.	1/16" - 1/8" Toe - In. (1.6-3.2 mm).

SUSPENSION REAR.

Independent Suspension Unit incorporating a transverse link pivotted at subframe, adjacent to differential case and wheel carrier respectively, and a half shaft universally jointed at each end. These locate the wheel in the transverse plane. Twin coil springs and hydraulic telescopic dampers each side. The suspension unit and differential case are mounted in a subframe which is flexibly attached to the body through rubber mountings and trailing torque links.

Camber.	½° - 1° neg.
Alignment.	0° - 1/8" Toe-In. (0 - 3.2 mm).

EXHAUST SYSTEM.

Twin Pipe System with twin Silencers and expansion chambers.

COOLING SYSTEM.

Pressurised system, By-Pass Thermostat control. Fan electrically driven and thermostatically controlled from cross flow radiator.

ROAD WHEEL AND TYRES.

Wheels.	Wire, Knock-off, 72 spoke.
Tyres.	Dunlop 6.40 x 15 type R.S 5 with tubes.
Rolling Radius (30 MPH).	12.75" (323.8 mm).
Tyre Revs/Mile.	791.

Note: Dunlop R5 Racing tyres available as optional equipment.

6.00 x 15 Front
6.50 x 15 Rear (on special wheels).

TECHNICAL SPECIFICATION

STEERING.	Rack and Pinion. 16" dia Steering Wheel. Turn lock to lock - 2½.
BODY CONSTRUCTION.	Stressed shell steel body of patented monocoque construction.
ELECTRICAL EQUIPMENT.	
Starter.	Lucas Type M.45 G.
Dynamo.	Lucas Type C.45. (Type C.42 after first 500 cars).
Coil.	Lucas Type HA.12.
Distributor (9:1).	Lucas Type DMBZ.6. Curve ECM.683.
Control Box.	Lucas Type RB.310.
Battery.	Lucas Type FRV.11/7.
Spark Plugs.	Champion Type N.5.
CAPACITIES.	
Engine - Refill.	11 pints. (6¼ Litres).
Engine - Total.	13 pints. (7½ Litres).
Gearbox.	2½ pints. (1½ Litres).
Rear Axle.	2¼ pints. (1½ Litres).
Cooling System.	22 pints. with Heater.
Petrol Tank.	14 gallons. (63½ Litres).
DIMENSIONS	
Wheel Base.	8'0" (2.44 M).
Track Front.	4'2" (1.27 M).
Track Rear.	4'2" (1.27 M).
Overall Length.	14'7.5/16" (4.45 M).
Overall Width.	5'5.1/4" (1.66 M).
Overall Height.	4'0.1/8" (1.22 M).
Road Clearance (laden).	5½" (140 mm).
Turning Circle.	37 ft. (11.28 M).

WEIGHT.	OPEN	COUPE
Dry (Lbs).	2464	2520
Distribution %. (Car complete with oil, water, 3 gals fuel and driver (170 lbs).	50	50

* * *

PRODUCTION OF THE "E" TYPE

The " E " type body is constructed basically from 20 gauge sheet metal, and several techniques, new to Jaguar, have been incorporated in its production. The main external panels are produced on a stretcher press - i.e. by stretching the metal over formers - whilst the majority of the detail parts are produced either by the normal mechanical press or on a rubber die press.

The body is of monocoque all welded construction and several new techniques are incorporated in the welding processes, including the use of CO_2 wire welding equipment. The various details and panels are built up in jigs into main sub assemblies; e.g. dash structure, rear end structure, floor, etc., and the various sub assemblies are then brought together in the main assembly jig.

The completed body is then taken on a mechanical conveyor to the Paint Shop. During its passage along this conveyor various joints in the body are metal finished and the whole of the external contour is checked prior to painting.

On arriving at the Paint Shop the body shell, together with its bonnet and subframe, is taken through the phosphating plant in order to clean the metal thoroughly prior to the painting operations. It then passes through the underbody dip to ensure that the whole of the underside of the body is protected against rusting. This is followed by the application of two coats of primer which, after baking, is followed by the application of sound deadening compound. The body is then mounted in a rotary transporter for its passage through the Paint Shop where it is flatted and given a sealer coat followed by two final coats of synthetic enamel. The painted body is then subjected to a detailed and minute inspection on specially lighted tracks after which it is passed to the assembly track.

The method of assembly of the " E " type car is rather different from the other cars in the Jaguar range. On arrival at the assembly track, the front body section is removed from the main shell and transported on a separate conveyor along which various sub assembly operations are carried out prior to it rejoining the car at the end of the assembly track. The front subframe is also detached from the body and this goes to the sub-assembly section where the engine and front suspension are assembled as a unit. Similarly the independent rear suspension assembly and differential unit is built up in its subframe as a separate assembly. At the same time, the electrical harness, petrol tank, rear bumpers, rear lamps, body insulation, etc. are fitted to the main body shell. These two major sub-assemblies then meet the body at the beginning of the assembly track where the three are assembled together on a high level staging. This facilitates the coupling up of the propellor shaft and other items which have to be fitted from underneath the car. The castor and camber of the front wheels is checked, after which the wheels are fitted, and the car then continues along the high level ramp for completion of all mechanical operations, i.e. pedal box assembly, windscreen washer units, air filter system, exhaust system etc., etc. The car is then lowered onto the trim and finishing track where the various body details are added: instrument panel, bumpers, lamps, carpets, underfelt, seats etc. At the end of the assembly track the car is driven off for the final finishing operations, including the fitting of the hood on open two seater cars.

From the assembly tracks, the cars are handed over to the Test Department whose drivers take the car on the road and carry out a very thorough test. Their report, together with the car, then pass to the Rectification Department, where mechanics deal with any items requiring attention. The car is then re-tested by another driver and, if passed, continue to the Final Line for further rigorous inspections of body and paintwork before the car is finally passed for delivery to the customer.

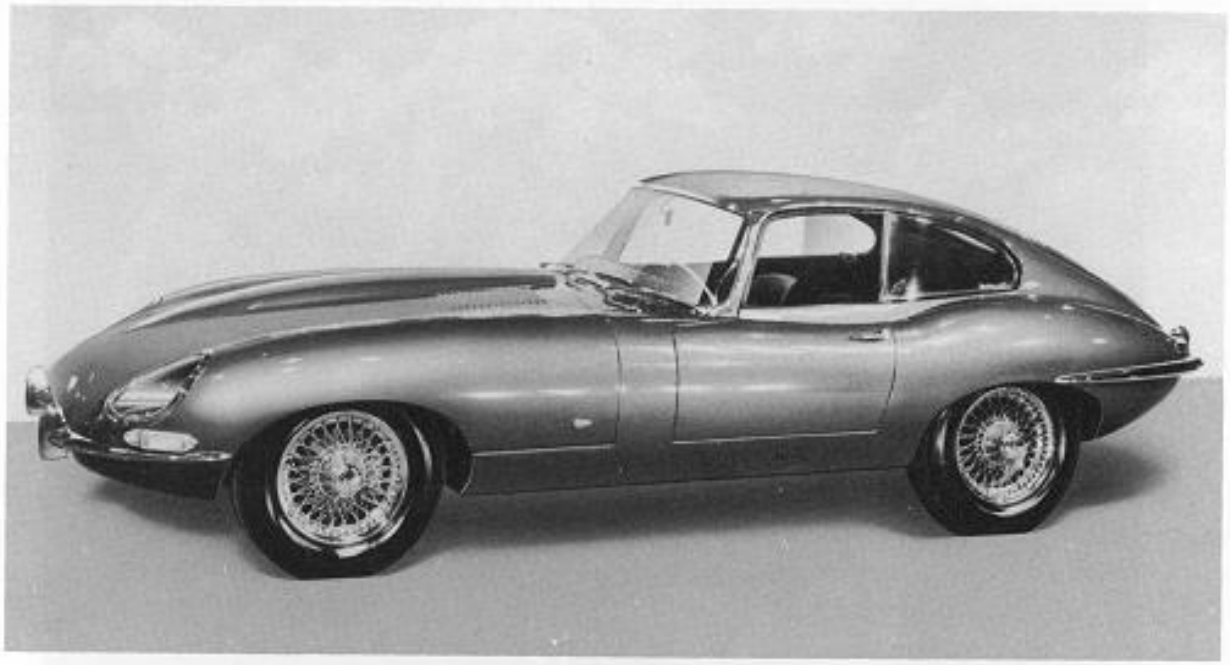
It is important to note that each and every car goes through this procedure, thus ensuring that all cars leaving the factory are to the highest standard possible. This is but the final stage in a long series of rigorous inspections to which the car has been subjected during the course of its production.

NOTE

The photographs on the following pages have been printed on paper of which the reverse side is blank. This has been done so that you can, if necessary through pressure of time, detach the page in order to use the illustration for making of blocks. If time permits, however, we would urge you to apply to us for original glossy photographs suitable for blockmaking. It is only necessary for you to quote the code letters and quantities of the photos required, and we will despatch immediately.

Code A

Code C



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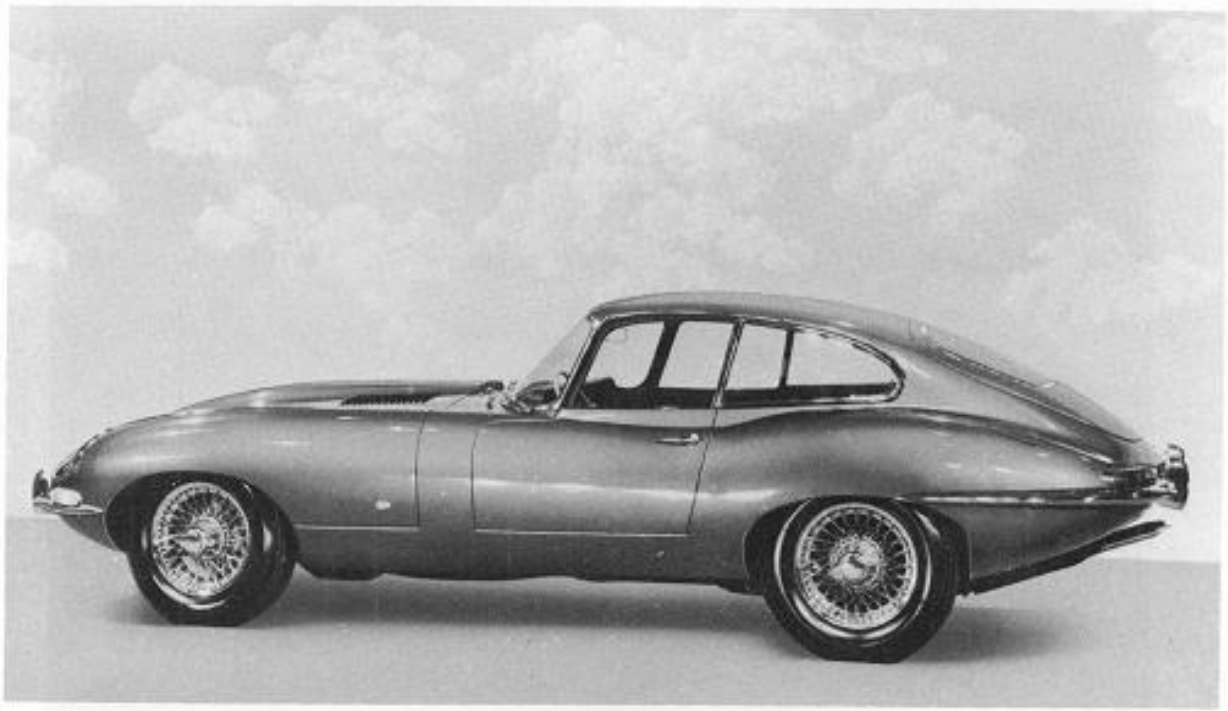

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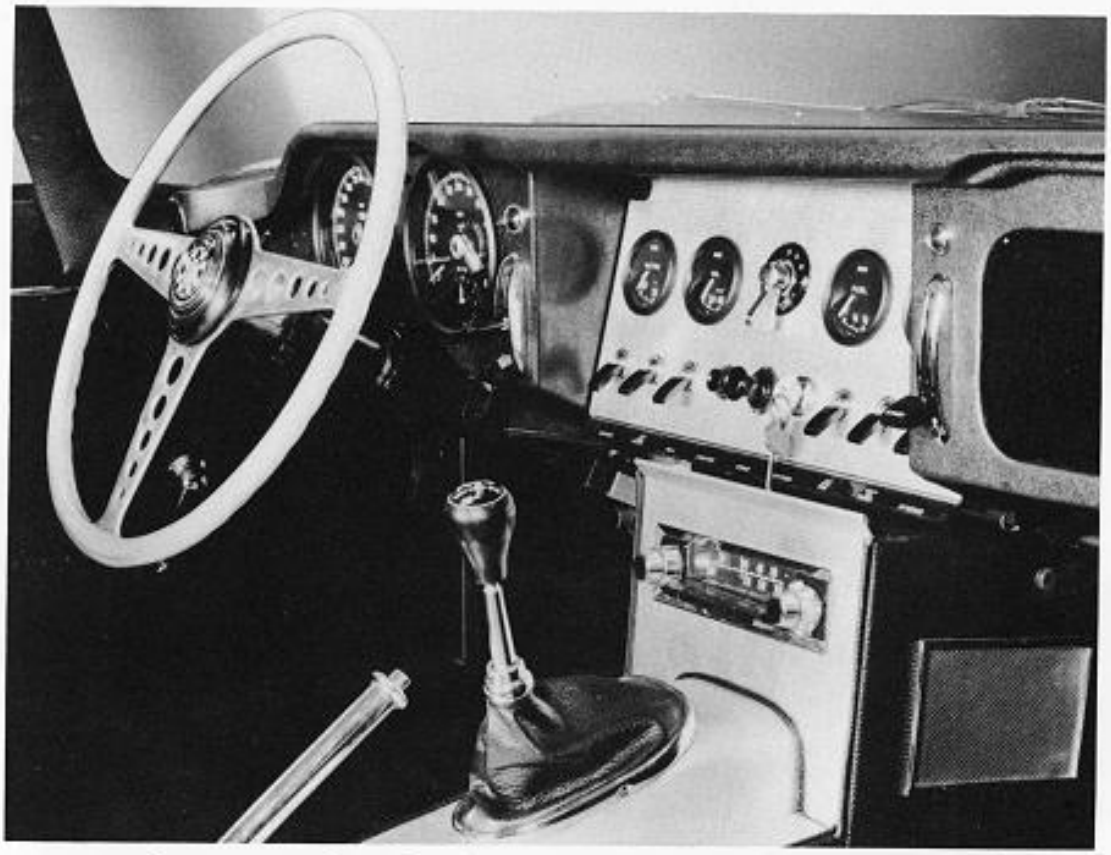
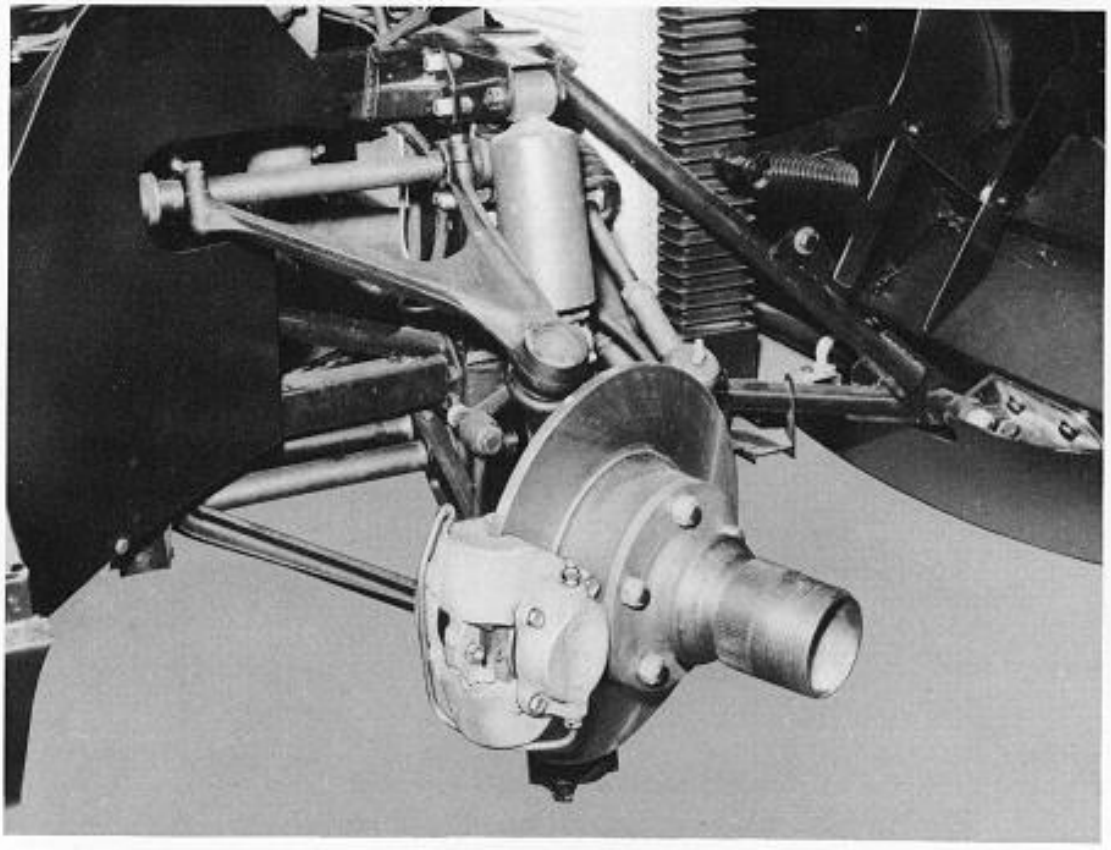
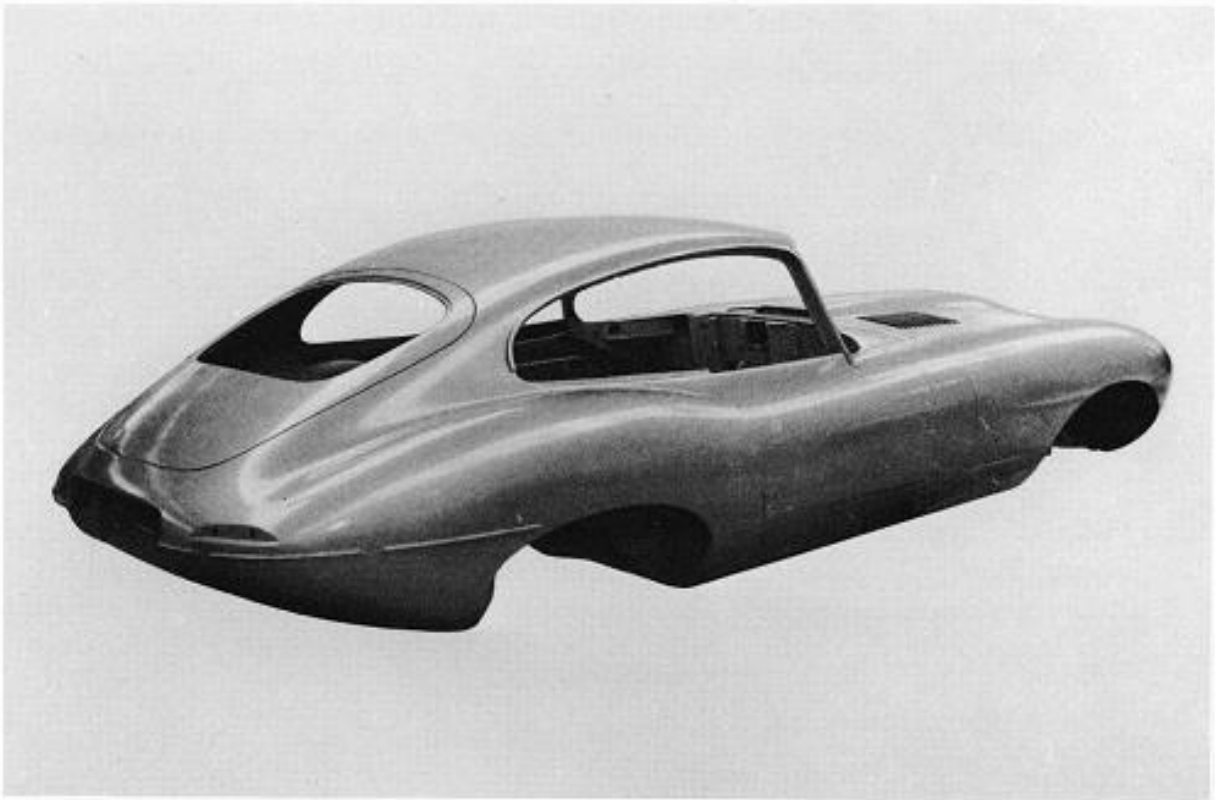


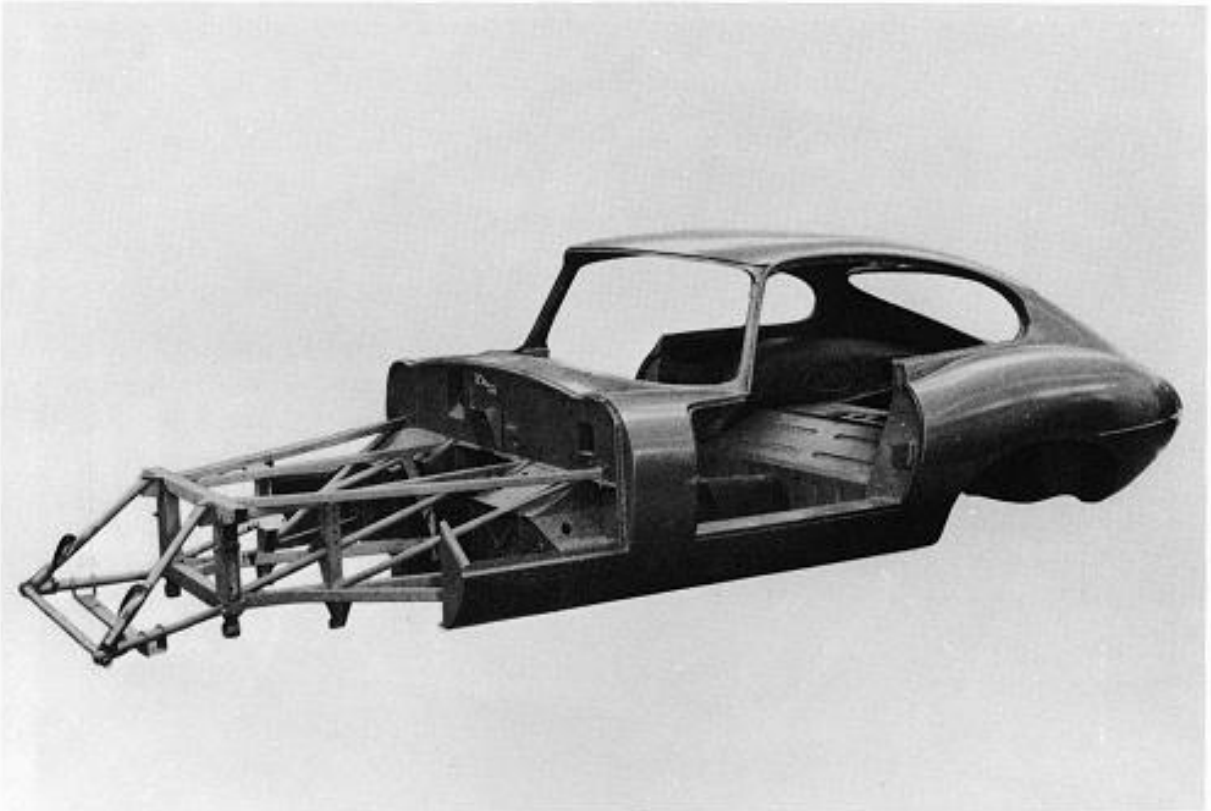
Instrument Panel - Open and Coupe Models. Code E



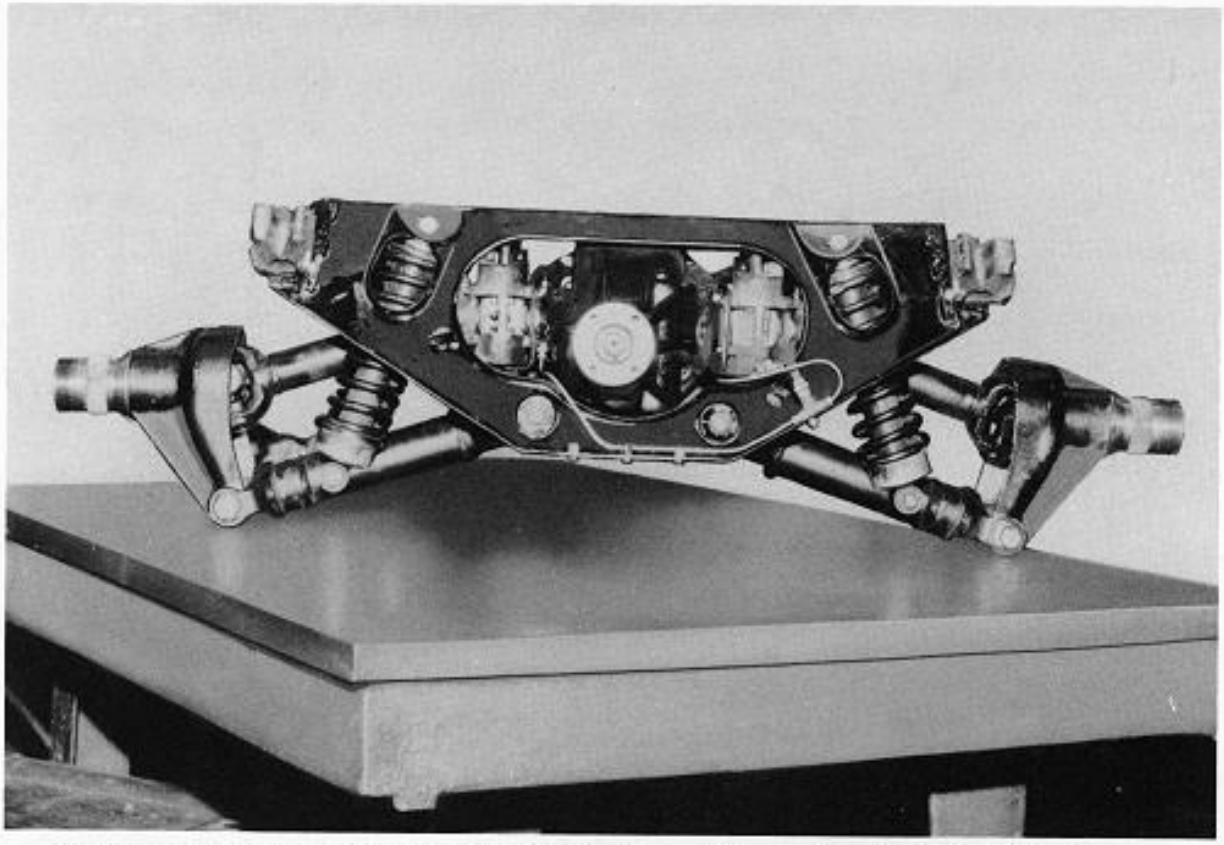
Independent Front Suspension - Showing Wishbones, Torsion Bar - Disc Brake Assembly. Code F



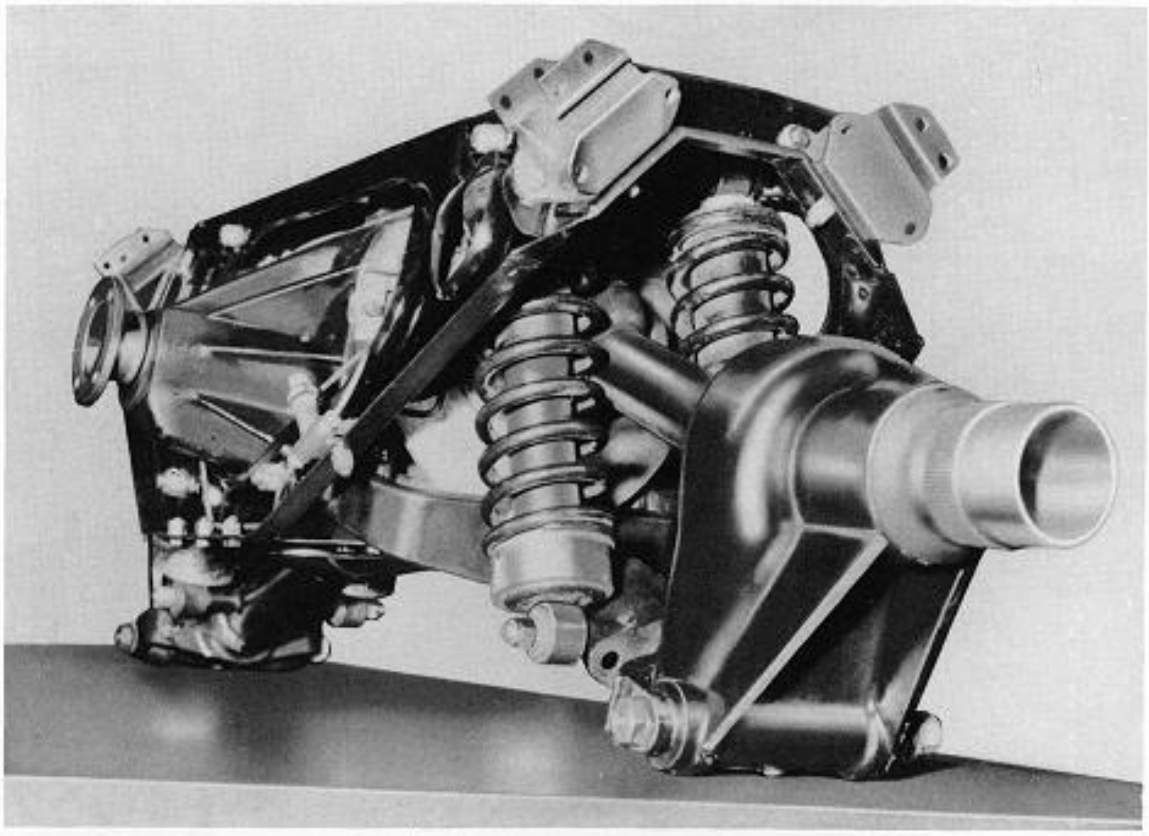
Complete Body Assembly. Code G



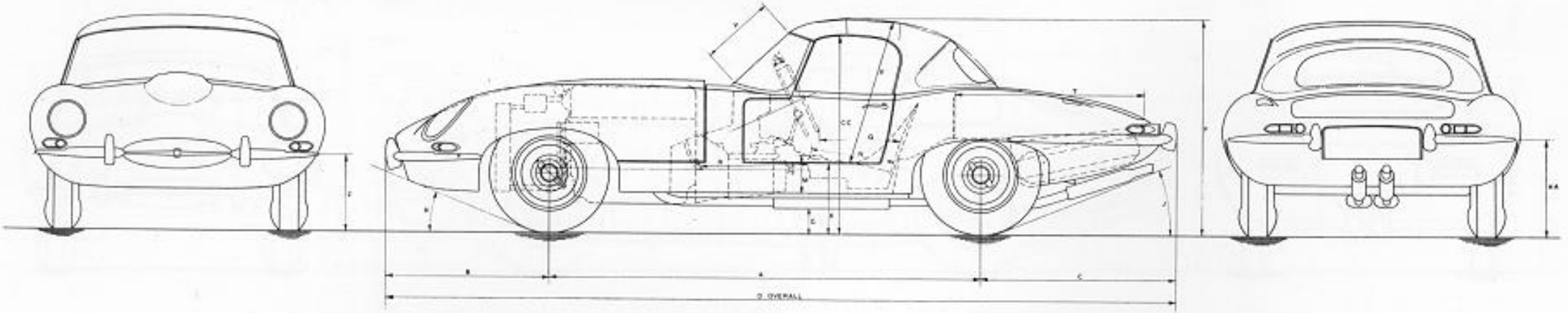
Body Shell and Front Subframe. Code H

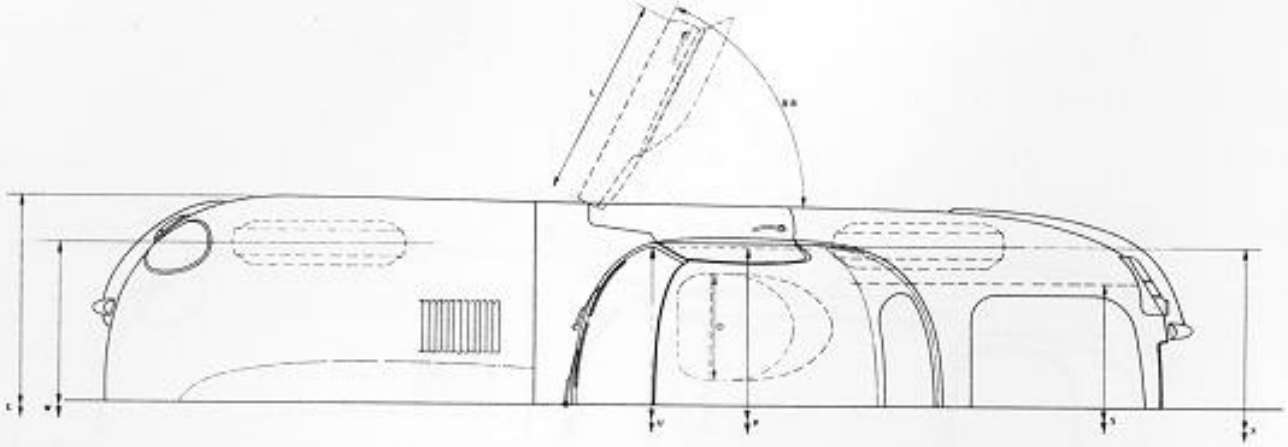


Rear Suspension and Differential Assemblies, Mounted in Sub Frame.
(Suspension shown in full rebound condition). Code J



Rear Suspension showing Transverse Links and Suspension Units.
Code K





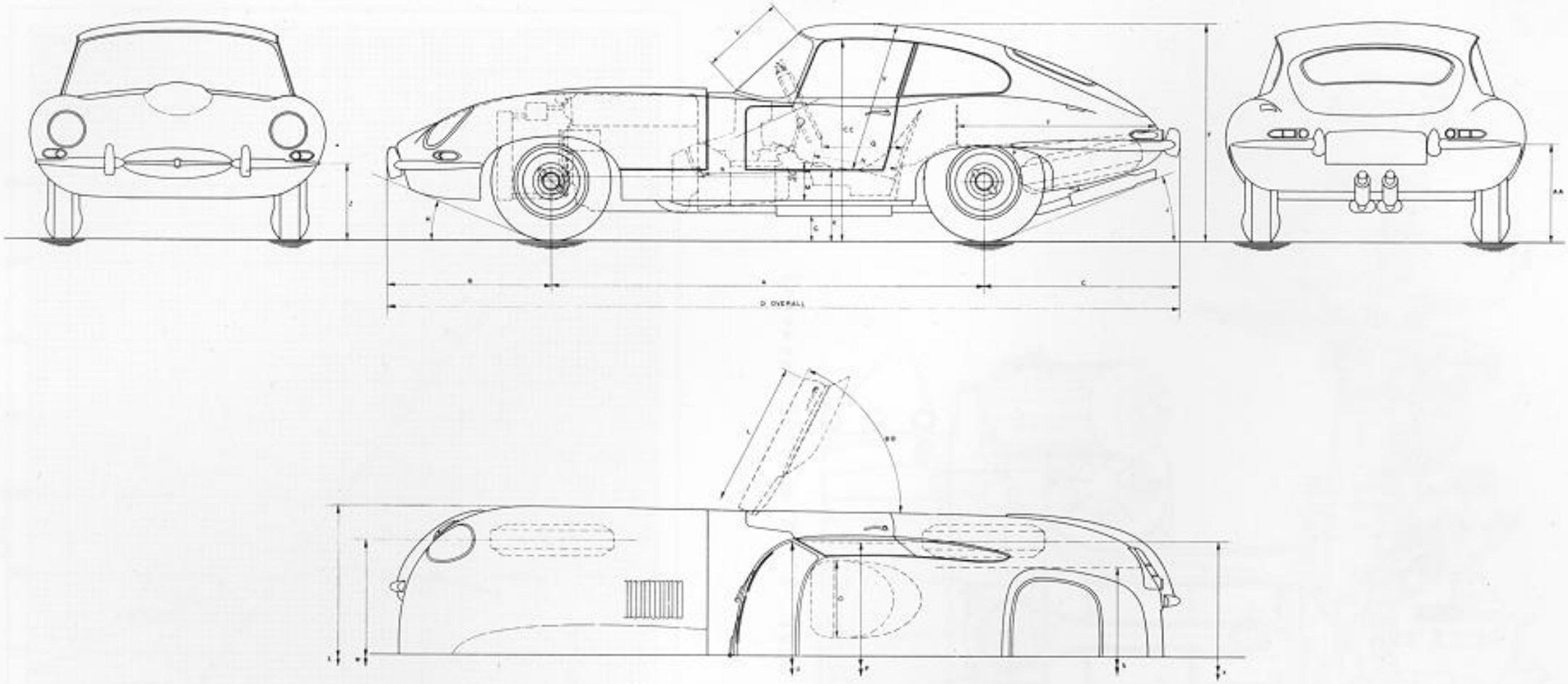
ALL DIMENSIONS ARE IN INCHES

A	WHEEL BASE	96	N	SEAT DEPTH	20	Z	FRONT BUMPER HEIGHT	16 3/4
B	FRONT OVERHANG	36 1/4	O	SEAT WIDTH	18	AA	REAR BUMPER HEIGHT	21 1/2
C	REAR OVERHANG	43 1/8	P	SHOULDER ROOM	49	BB	DOOR OPENING ANGLE	65°
D	OVERALL LENGTH	175 3/8	Q	STEERING WHEEL TO SEAT SQUAB	17	CC	GROUND TO TOP OF DOOR	43
E	OVERALL WIDTH	65 1/4	R	PEDALS TO CUSHION	18			
F	OVERALL HEIGHT	48 1/8	S	MAX TRUNK WIDTH	39			
G	GROUND CLEARANCE	5 1/2	T	MAX TRUNK LENGTH	41			
H	FRONT CLEARANCE ANGLE	21°	U	WINDSCREEN WIDTH	50			
J	REAR CLEARANCE ANGLE	21°	V	WINDSCREEN DEPTH	15 1/2			
K	DOOR STEP HEIGHT	16	W	FRONT TRACK	50			
L	DOOR OPENING	32 3/8	X	REAR TRACK	50			
M	SEAT HEIGHT	8	Y	HEAD ROOM	34			

ALL DIMENSIONS ARE FOR A LADEN CAR.

—·—·— DENOTES DETACHABLE HARDTOP

Code L



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A	WHEEL BASE	96	N	SEAT DEPTH	20	Z	FRONT BUMPER HEIGHT	16 3/4
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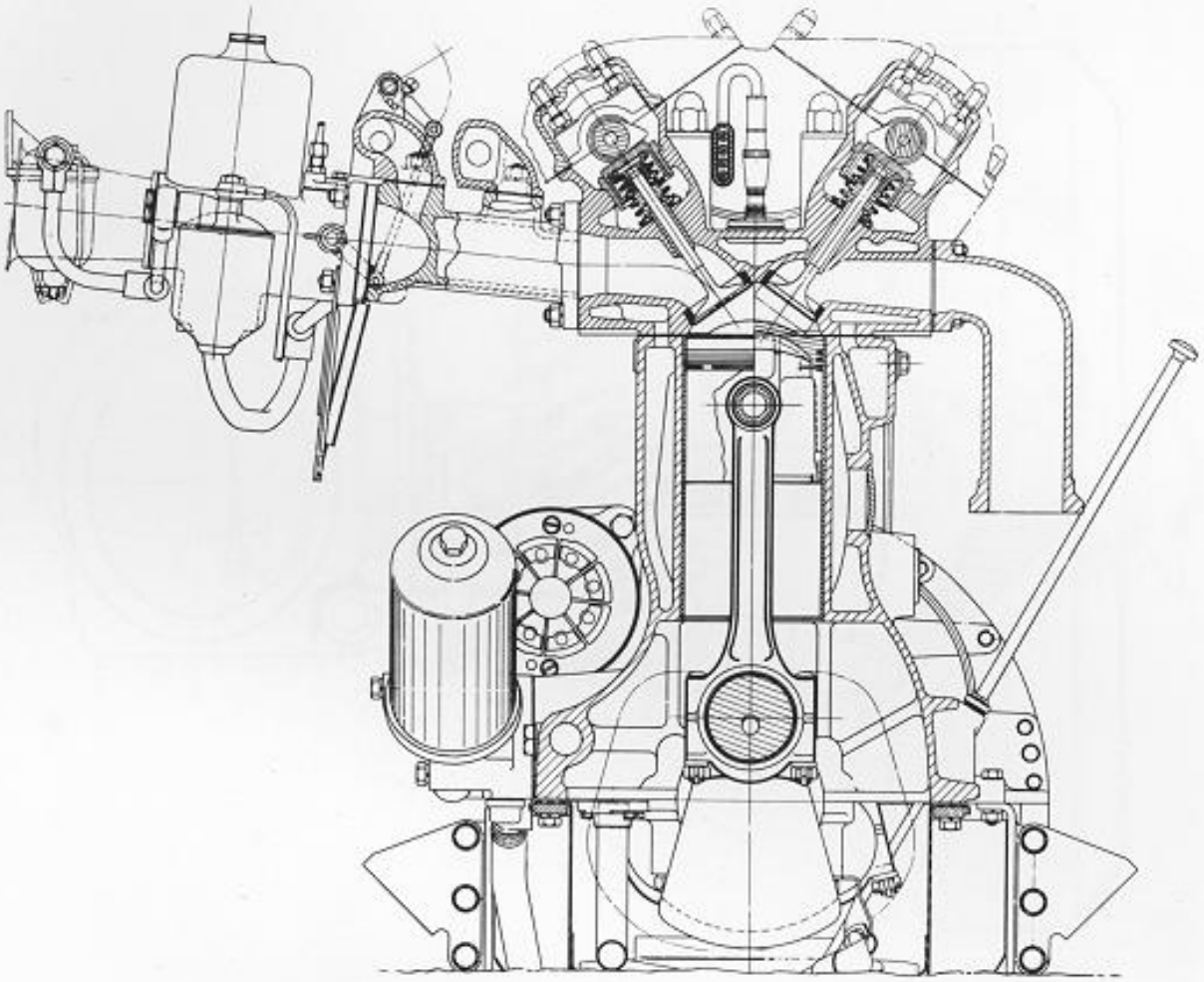
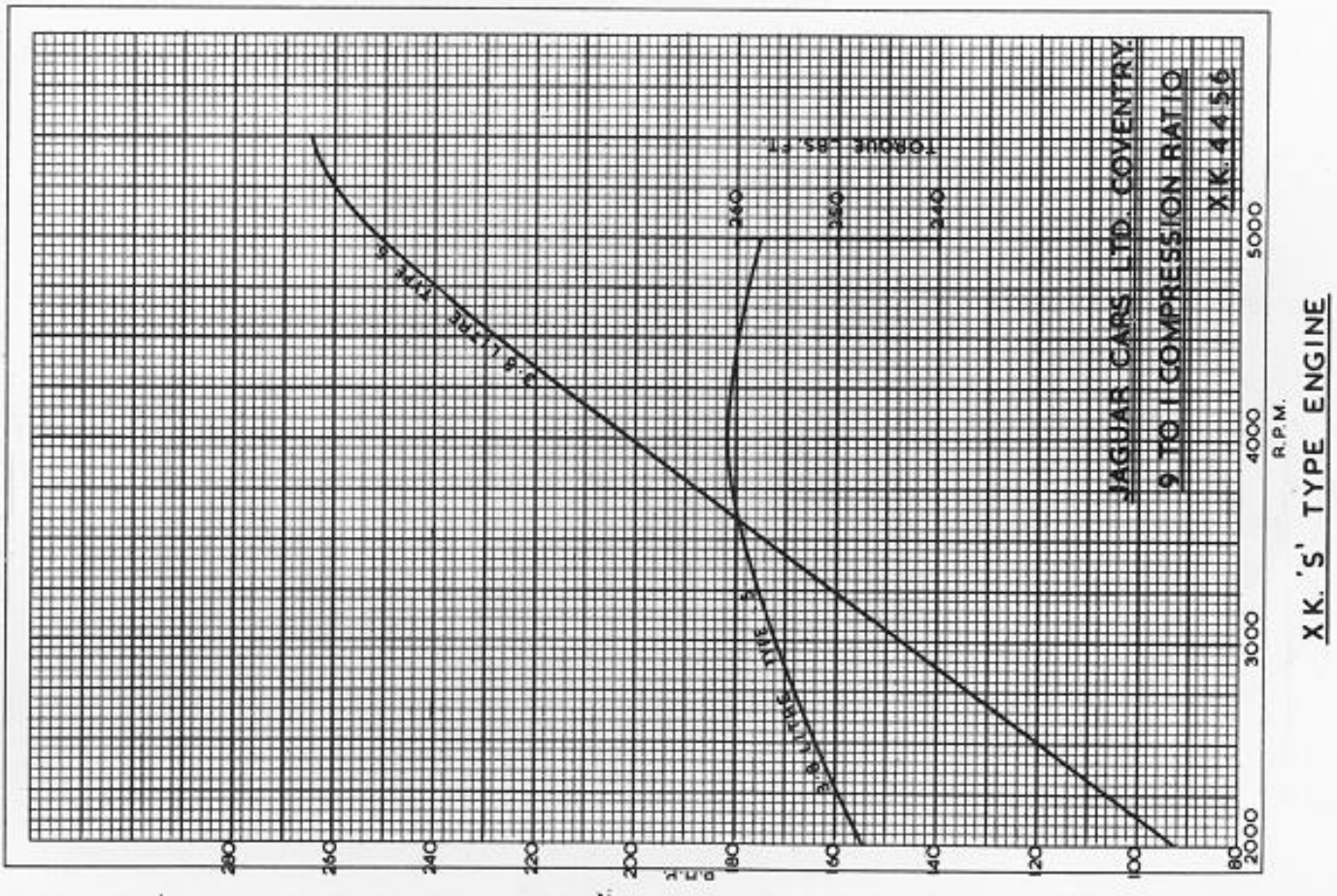
H	FRONT CLEARANCE ANGLE	21°	U	WINDSCREEN WIDTH	50			
J	REAR CLEARANCE ANGLE	21°	V	WINDSCREEN DEPTH	18			
K	DOOR STEP HEIGHT	16	W	FRONT TRACK	50			
L	DOOR OPENING	32 3/8	X	REAR TRACK	50			
M	SEAT HEIGHT	8	Y	HEAD ROOM	35			

ALL DIMENSIONS ARE FOR A LADEN CAR

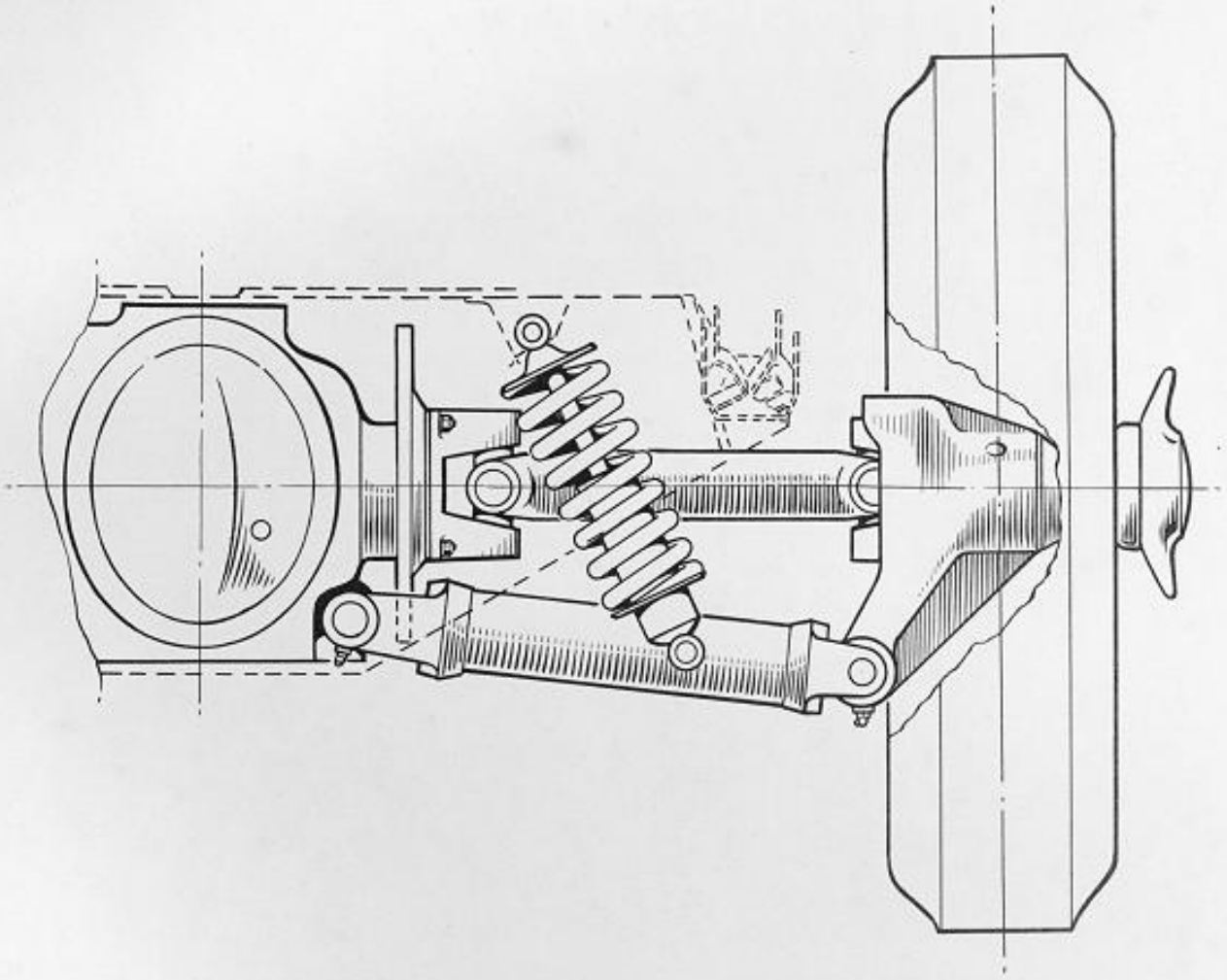
Code M



Traverse Section XK 'S' Type Engine. Code N



Power and Torque Curves - 3.8 Litre 'S' Type Engine. Code O



Rear Suspension Layout. (Dotted Line Indicates Subframe Outline).

Code P

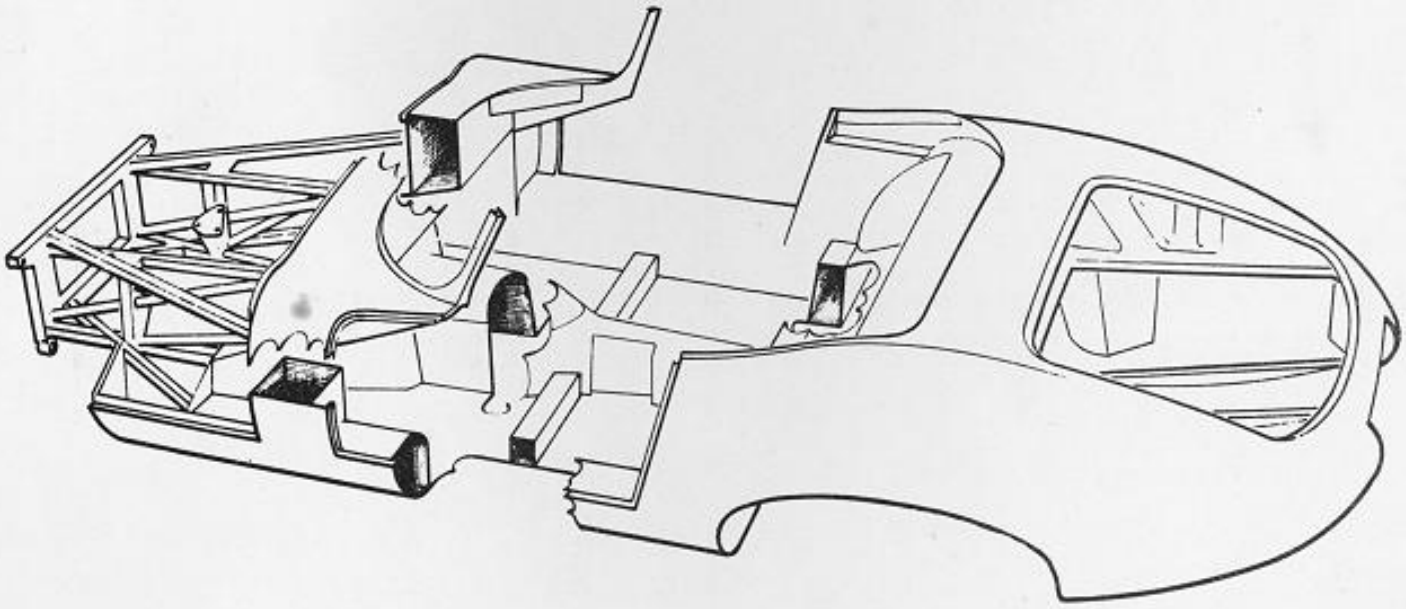


Diagram of Body Structure. Showing Main Boxed Sections and Subframe.

Code R