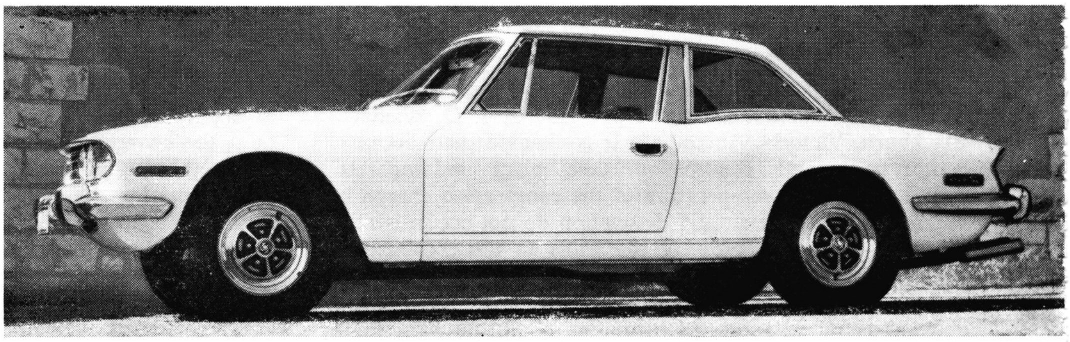
TRIUMPH STAG

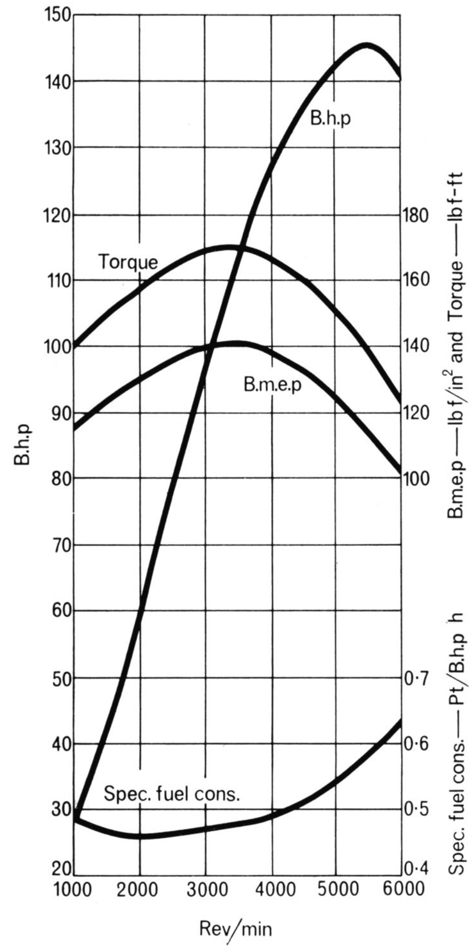


A new 2 + 2 seat Grand Tourer with a rigid convertible body, 2 997 cm^3 overhead camshaft, V-eight engine, semi-trailing link independent rear suspension, and power assisted rack and pinion steering

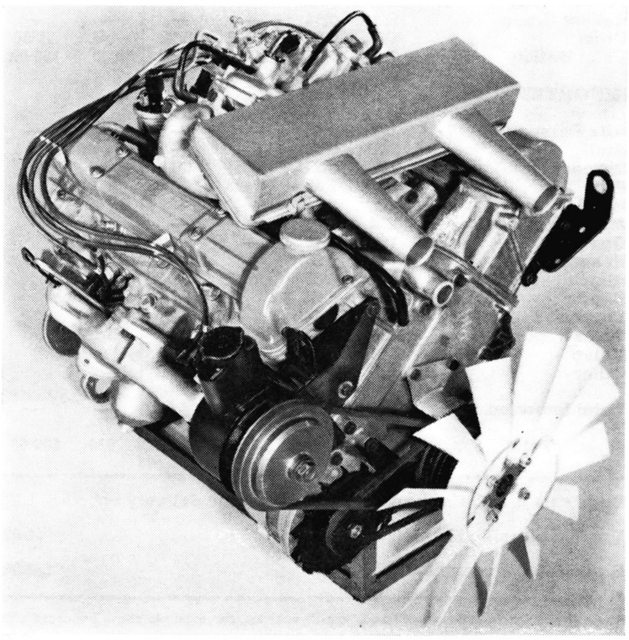
RIGIDITY in the unitary body structure for an open car is as important as in that for a saloon, but the problems in attaining it, without the penalty of excessive weight, are well known. The solution adopted in the Triumph Stag, of adding a superstructure integrated with the rear pillars and the windscreen frame, together with the use of double box-section sills, is interesting. A readily detachable steel hardtop is also available for this body. Since this new model is in the luxury Grand Tourer class, features such as an adjustment for the vertical position of the front seats, a steering column adjustable in respect of the height and axial position of the wheel, and electrically raised and lowered door glasses have been included.

Basically, the new overhead camshaft engine is an eight-cylinder version of the PE 104S, 1 709 cm^3 four-cylinder unit produced since 1968 for installation in SAAB 99 cars, and was designed and developed concurrently with the smaller engine. Hence, the same transfer machines are used for the production of components for both units.

With minor differences, the gearbox, the final drive unit, and the strut-and-link type front, and semi-trailing link



Below: Because of the V-arrangement of the cylinders and the small stroke, the overall height of the engine is only 26 in. The overall length is 27·58 in, and the width between the two exhaust manifolds is 23·82 in. In the condition as shown, the engine weighs 446 lb dry. Left: Net performance curves for the 2 997 cm^3 engine of the Triumph Stag. Opposite page: A transverse sectional illustration of the engine in the plane of the coolant pump. The impellor is driven at engine-speed by a spiral gear on the jackshaft, and outlet passages for coolant are cored in the cylinder block



rear suspension assemblies are the same as those installed in the Triumph 2000 Mark 2 model. Independent actuation of the front and rear servo-assisted brakes has been adopted, and a power-assisted rack-and-pinion steering gear is standard.

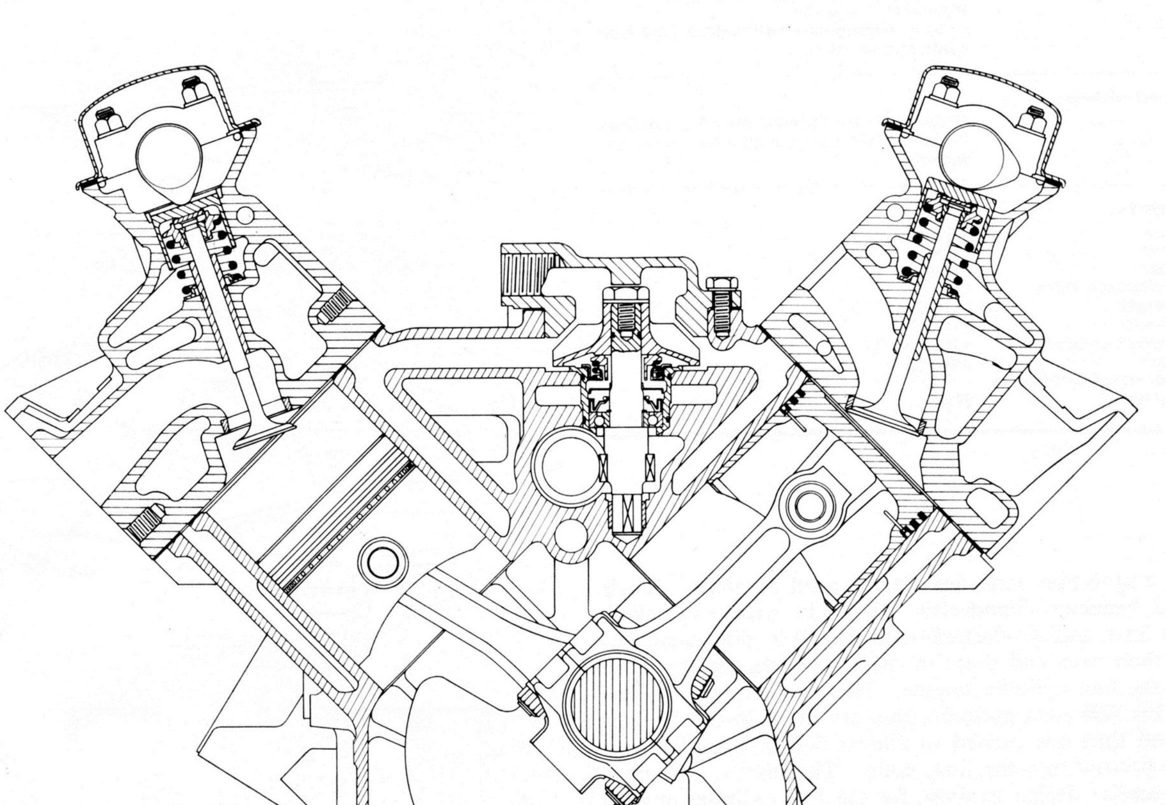
V-eight 2 997 cm³ engine

Because the axes of the cylinders of the PE 104S engine—fully described in *Automobile Engineer*, September 1968—are inclined at 45 deg, the BS 1452 Grade 14 iron cylinder block for the 90 deg V-eight engine is machined on the same equipment. This is also facilitated, of course, by placing the auxiliaries—the lubrication pump, the ignition distributor and the coolant pump—and the jackshaft by means of which they are driven, in the same relative positions on both engines. The arrangement can be seen in accompanying sectional illustrations.

Whereas the cylinder bores of the four cylinder engine are 83·5 mm diameter, those of the V-eight engine are 86 mm diameter and, to provide a swept volume of 2 997 cm^3, the stroke is only 64·5 mm. Hence the stroke: bore ratio of 0·75 : 1 is relatively low, and the mean piston-speed at 5 500 rev/min, at which maximum power is developed, is only 2 330 ft/min. The performance figures are shown graphically and in the accompanying Table. Comparing the maximum brake mean effective pressures for the four- and eight-cylinder engines, we see that for the eight-cylinder engine, in which the valve overlap and the lift are larger, the figure is 140 lbf/in^2 at 3 500 rev/min, whereas it is 144 lbf/in^2 at 3 000 rev/min for the four-cylinder unit. The dry weight of the eight-cylinder engine, without the compressor for air conditioning, is 446 lb.

Between the axes of adjacent cylinders, the dimensions are the same, of course, as those of the four-cylinder unit. They are 3·85 in between the first and second, and third and fourth cylinders in each bank, and 4·00 in between the second and third. The axes of the cylinders in the right-hand bank are 0·78 in forward of those in the left-hand bank. As in the four-cylinder engine, the lower face of the crankcase is $2\frac{3}{4}$ in below the axis of the crankshaft, and the skirt is braced to the housings for the five main bearings by $\frac{3}{16}$ in thick vertical webs. Vandervell VP5 steel shell, copper-lead, indium flashed main bearings are each retained by a BS 1452, Grade 14 cast iron cap and two BS 1768 Code S steel $\frac{7}{16}$ in diameter bolts, with 20 threads per in. The front central and rear bearings are $\frac{15}{16}$ in and the intermediate ones $\frac{5}{8}$ in long. Axial location of the crankshaft is effected by means of two semi-circular steel washers, faced with aluminium-tin, one at each end of the central bearing.

For complete balance, a two-plane type crankshaft has been chosen, in which Nos. 1 and 4 crankpins are in a plane displaced 90 deg from that for Nos. 2 and 3. The crankshaft is an En. 16 steel forging, and counterbalance weights are integral with all webs except those adjacent to the central bearing. As in the four-cylinder engine, the journals are $2\frac{1}{8}$ in diameter and the crankpins $1\frac{3}{4}$ in diameter; the overlap between adjacent journals and crankpins is 0·678 in. A 13 blade, $16\frac{1}{2}$ in diameter nylon cooling fan is driven directly from the nose of the crankshaft by means of a Holset viscous type coupling that limits the torque transmitted to the fan to 46 lbf in and the maximum speed to 2 500 rev/min. It is retained axially by a co-axial bolt: the hub of the coupling, in turn, secures on the crankshaft a Holset inertia type torsional vibration damper, and two sprockets for the timing chains; the drive is transmitted to each by a Woodruff key.



SPECIFICATION DATA—TRIUMPH STAG

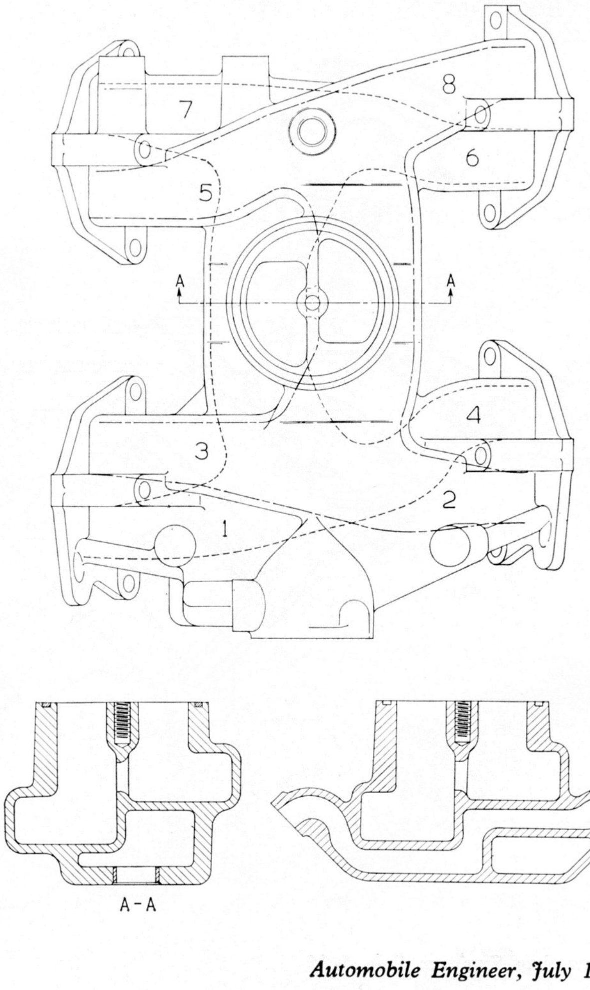
Engine:	
Number of cylindera	8 in 90 deg vee
Bore	86 mm (3·385 in)
Stroke	64·5 mm (2·539 in)
Swept volume	2 997 cm³ (182·9 in³)
Compression ratio	8·8:1
Maximum b.h.p. net	145 at 5 500 rev/min
Maximum b.m.e.p. net	140 lbf/in² at 3 500 rev/min
Maximum torque net	170 lbf ft at 3 500 rev/min
Crankshaft	Forged steel, two-plane type, carried in five bearings
Valves	In line in heads, actuated by overhead camshafts and piston type tappets
Carburettor	Two Stromberg type 175-CDS
Combustion chamber type	Wedge shape in heads
Dry weight	446 lb
Transmission:	
Type	Four forward speeds and reverse, central control
Clutch	Laycock 9 in diameter diaphragm spring type
Gear ratios:	
fourth	1:1
third	1·386:1
second	2·10:1
first	2·995:1
reverse	3·369:1
Overdrive	Optional, Birfield unit, ratio 0·82:1
Final drive	Hypoid bevel gears
Ratio	3·7:1
Suspension:	
Front	Armstrong strut and transverse link, helical spring, anti-roll bar
Rear	Single semi-trailing arm, helical spring
Steering:	
Make and type	Alford and Alder Pow-a-Rak rack-and-pinion, power-assisted
Turns, lock-to-lock	4
Turning circle between kerbs	34 ft
Brakes:	
Make and type	Lockheed, independent hydraulic actuation of front and rear brakes, vacuum servo
Front	$10\frac{5}{8}$ in diameter discs
Rear	$9\times2\frac{1}{4}$ in leading-and-trailing shoe type with automatic adjustment
Tyres and wheels:	
Size	Michelin 185 HR 14 radial ply XAS, tubeless
Wheel	Pressed steel disc, 5 stud attachment, 5 in wide rim
Dimensions:	
Wheelbase	8 ft 4 in
Track, front	4 ft $4\frac{1}{2}$ in
Track, rear	4 ft $4\frac{7}{8}$ in
Ground clearance, laden	4 in
Overall length	14 ft $5\frac{3}{4}$ in
Overall width	5 ft $3\frac{1}{2}$ in
Overall height, unladen	4 ft $1\frac{1}{2}$ in
Dry weight	2 640 lb
Front:rear weight distribution, normal laden	50:50

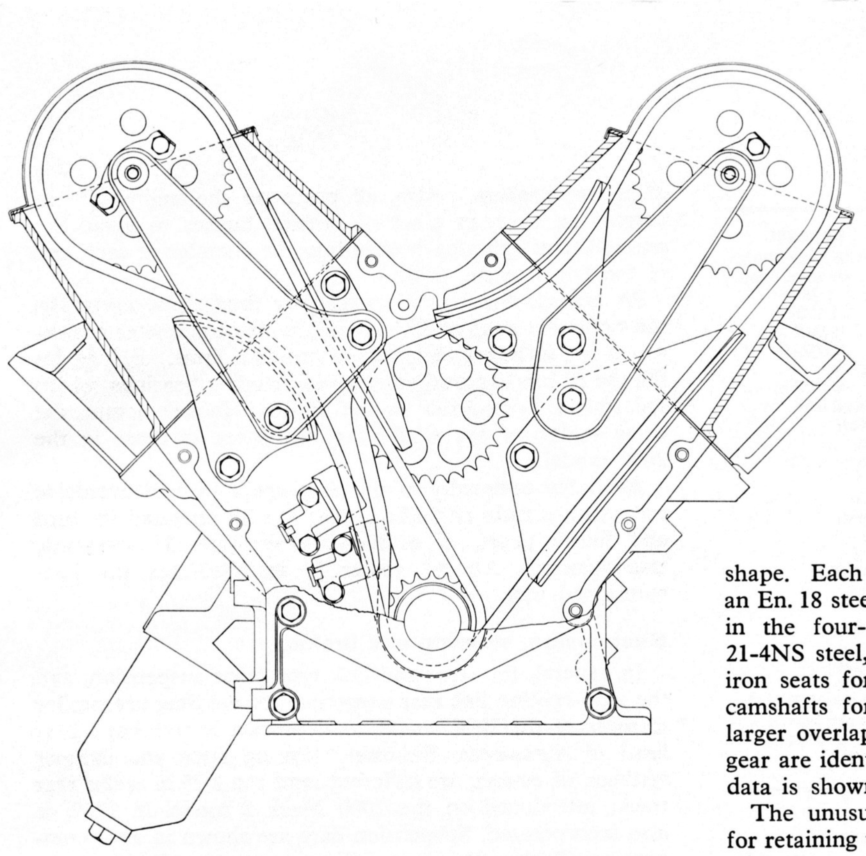
The connecting rods are En. 8R steel forgings. Their big-end bearings—Vandervell VP5, $\frac{3}{4}$ in wide steel shell, copper lead, indium-flashed—and the $5\frac{1}{8}$ in dimension between their axes and those of the little-ends, are the same as for the four-cylinder engine. However, larger $\frac{7}{8}$ in diameter En. 32B steel gudgeon pins are fitted in the V-eight unit, and they are carried in Clevite VP10 $\frac{15}{16}$ in diameter bushes pressed into the little ends. The pistons and rings are of similar design to those for the four-cylinder engine.

An SAE 8620, LD steel jackshaft, of $\frac{7}{8}$ in nominal diameter, is carried in two bearings machined in a tunnel cored in the block, between the banks of cylinders, and is driven at $\frac{2}{3}$ crankshaft speed by the roller chain for the left-hand camshaft. Two spiral gears are machined on the shaft: one drives a vertical spindle for the impeller of the coolant pump at crankshaft-speed, and the other a laterally inclined spindle at $\frac{1}{2}$ crankshaft-speed, for the lubrication pump and the ignition distributor. The diameter of the impeller for the coolant pump is $\frac{3}{16}$ in larger than that for the four-cylinder engine and, to ensure adequate oil pressure at idling speed, the Hobourn-Eaton four lobe rotor type lubrication pump is of larger capacity. A Lucas type 35D8 ignition distributor, with centrifugal and vacuum advance controls, is installed.

An accompanying illustration shows the arrangement of the chain drive for the camshafts and the jackshaft. Two Renold single-strand roller chains, with $\frac{7}{32}$ in wide rollers of $\frac{3}{8}$ in pitch, are each driven by a 20 tooth sprocket on the crankshaft. Each chain drives a 40 tooth sprocket on the camshaft, and that for the left-hand camshaft also drives a 30 tooth sprocket on the jackshaft. Between the axes of the crankshaft and the camshafts the dimension is $13\frac{1}{4}$ in, and between those of the crankshaft and the jackshaft it is $5\frac{1}{4}$ in. The driving run of each chain is straight and is damped by a nitrile rubber pad. Acting on the opposite run of each chain are a Renold hydraulic tensioner, and a nitrile rubber faced arcuate guide. To allow the cylinder heads to be removed without upsetting the valve timing, each camshaft sprocket can be detached from the camshaft, and secured

Two separate induction tracts, each served by one carburettor, are shown by the broken and chain-dotted lines in this plan view of the induction manifold. The manifold is heated by coolant—section A-A. A similar section, bottom right, of the alternative manifold—to meet the U.S. emission regulations—shows the transverse duct below the risers, for additional heating by exhaust gases





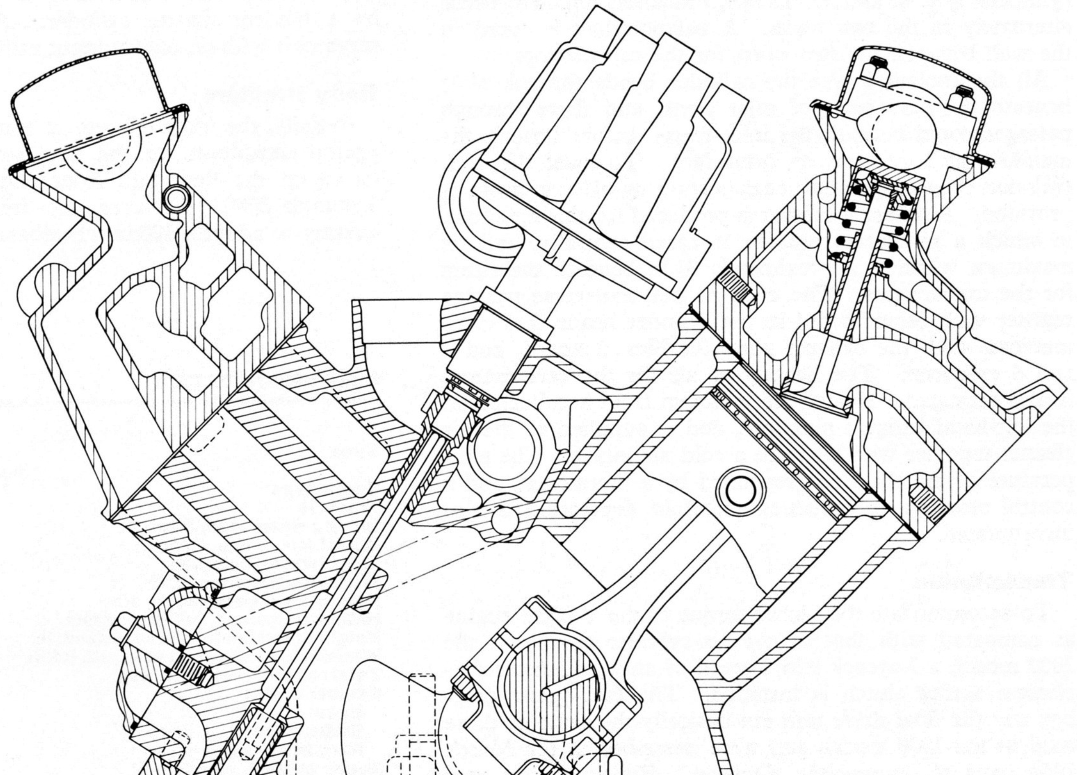
Below: The rotor type lubrication pump and the pressure relief valve are mounted externally on the crankcase, and the pump is driven by a hexagonal quill-shaft. Full-flow filtration is employed, and the main oil gallery is beneath the jackshaft. The housing for the camshafts and the tappets are integral with the aluminium alloy castings for the cylinder heads. Left: Of the two single-stage roller chains that drive the camshafts, one also drives the central jackshaft at 2/3 crankshaft speed. Nitrile rubber pads damp each of their long runs

by a nut to an adjacent pressed steel bracket bolted to the front face of the cylinder block.

Although it is not possible to utilize the same BS 1490, LM4 aluminium alloy diecastings for the cylinder heads on both engines, the coring of the ports and coolant passages is the same, with the exception of the positions of the inlet and outlet ports for the coolant in the head for the right-hand bank. The in-line valves are inclined as shown at 26 deg, and the combustion chambers are wedge shape. Each exhaust valve in the V-eight engine comprises an En. 18 steel stem to which a 21-4N steel head is welded; in the four-cylinder engine, the exhaust valves are of 21-4NS steel, with Stellite faced seats. Brico 307 sintered iron seats for the valves are inserted in the heads. The camshafts for the V-eight unit give a higher lift and a larger overlap. In all other respects, the valves and valve gear are identical to those for the four-cylinder engine, and data is shown in an accompanying Table.

The unusual arrangement—common to both engines—for retaining the cylinder heads comprises five bolts parallel with the axes of the cylinders, and five studs inclined at 16 deg to these axes. Each cylinder head is completely assembled, and the valve clearances set, before it is installed, and this arrangement affords easy access to the bolts and studs. To sustain the component of the force on the studs that acts parallel with the face of the head, the clearance between the studs and reamed holes in the head is 0·010-0·019 in.

The cylinders are numbered, from the front of the engine, 1, 3, 5, 7 in the right-hand bank, and 2, 4, 6, 8 in



VALVE DATA

	Inlet	Exhaust
Material	En.52 steel	En.18 steel stem, 21-4N steel head
Head diameter	1·44 in	1·28 in
Throat diameter	1·385 in	1·175 in
Stem diameter	0·311 in	0·3103 in
Diametral clearance in guide	0·0015 in	0·0022 in
Seat angle	89 deg	
Face width on valve	0·0913 in	0·1112 in
Seat material	Brico 307 sintered iron	
Spring material	En.49D steel	
Mean diameter of coil	0·962 in	
Wire diameter	0·162 in	
Number of active coils	$3\frac{3}{4}$	
Spring rate	296 lbf/in	
Spring surge frequency	39 450 c/min	
Spring length, installed	1·44 in	
Spring load, installed	40-50 lbf	
Stress at installed length	29 000-36 000 lbf/in^2	
Valve lift	0·363 in	
Maximum acceleration of tappet on flank of cam	0·00075 in/deg^2	
Maximum negative acceleration of tappet on nose of cam	0·00025 in/deg^2	
Valve crash speed	6 640 rev/min	
Valve opens..	16 deg B.T.D.C.	56 deg B.B.D.C.
Valve closes	56 deg A.B.D.C.	16 deg A.T.D.C.
Tappet clearance, cold	0·008 in	0·018 in
Ignition timing	16 deg B.T.D.C.	

the left-hand bank; the firing order is 1, 2, 7, 8, 4, 5, 6, 3. An accompanying illustration shows the arrangement of the tracts in the aluminium alloy induction manifold, to which two Stromberg type 175-CDS carburettors are bolted. One carburettor supplies an H-shape tract for cylinders 2, 3, 5 and 8, and the other a separate similarly shaped tract for cylinders 1, 4, 6, and 7. Hence, induction impulses occur alternately in the two tracts. A balance duct is cored in the wall between the two risers for the carburettors.

All the coolant leaves the cylinder heads through slots beneath the rear pairs of inlet ports, and flows through passages cored beneath the inlet tracts, before leaving the manifold at a port on its front face. To meet the U.S. emission regulations additional heating by exhaust gases is provided. A different casting is produced for this manifold, in which a transverse passage is cored centrally, and its maximum width is approximately $3\frac{1}{4}$ in beneath the risers for the carburettors. The ends of this transverse passage register with others cored in the cylinder heads that communicate with the exhaust ports for Nos. 3 and 5, and 4 and 6 cylinders. The heating of air for the carburettors is also arranged. Heated air is drawn from a collector on the left-hand exhaust manifold, and is supplied to the air cleaner together with air from a cold air intake. The temperature of the the air is regulated by a thermostat, and a control sensitive to induction manifold depression is also incorporated.

Transmission

To accommodate the higher torque of the V-eight engine as compared with that of the six-cylinder engine in the 2000 model, a Laycock 9 in instead of an $8\frac{1}{2}$ diameter diaphragm spring clutch is installed. The four-speed gearbox and the final drive unit are basically the same as those used in the 2000 model, and were described in the March 1964 issue of *Automobile Engineer*. However, first gear ratio has been changed to 2·995 : 1, and a larger capacity needle roller bearing for the layshaft is installed at the end adjacent to first gear. Axial loads on the layshaft are sustained by Torrington needle roller thrust bearings instead of thrust washers. Also, all gears on the mainshaft are carried on steel, in place of bronze, bushes to avoid the possibility of spinning bronze into the chamfer at each end of the bores in the gears.

As regards the hypoid bevel gear final drive assembly, the reduction ratio is 3·7 : 1, and the $7\frac{1}{2}$ in diameter crownwheel is $\frac{1}{4}$ in larger than that in previous units. Except for the use of Ina 18 mm diameter needle roller bearings, which are staked in position in the B.R.D. Hooke's joints, the drive shafts for the wheels are the same as those in the 2000 model.

Available optionally in the Stag are a Birfield overdrive unit, with a ratio of 0·82 : 1, that can be operated in third and fourth gears, or a Borg-Warner type 35 automatic transmission. An oil cooler is installed for the last-mentioned unit.

Suspension, steering and brakes

In general, the strut-and-link type front suspension, and the semi-trailing link rear suspension of the Stag are similar to those of the 2000 model, as described in the April 1964 issue of *Automobile Engineer*. Spring rates and damper settings, of course, are different, and the 2·25 in wider rear track, introduced on the 2000 Mark 2 model in 1969, is also incorporated. Suspension data are shown in an accompanying Table. Revised resilient mountings for the sub-frame that carries the front of the final drive unit, and the pivots for the rear suspension arms, have been introduced on the Stag. Each of these two mountings comprises a cylindrical bonded rubber bush, $2\frac{5}{8}$ in diameter and 3 in long, which sustains vertical loads in shear.

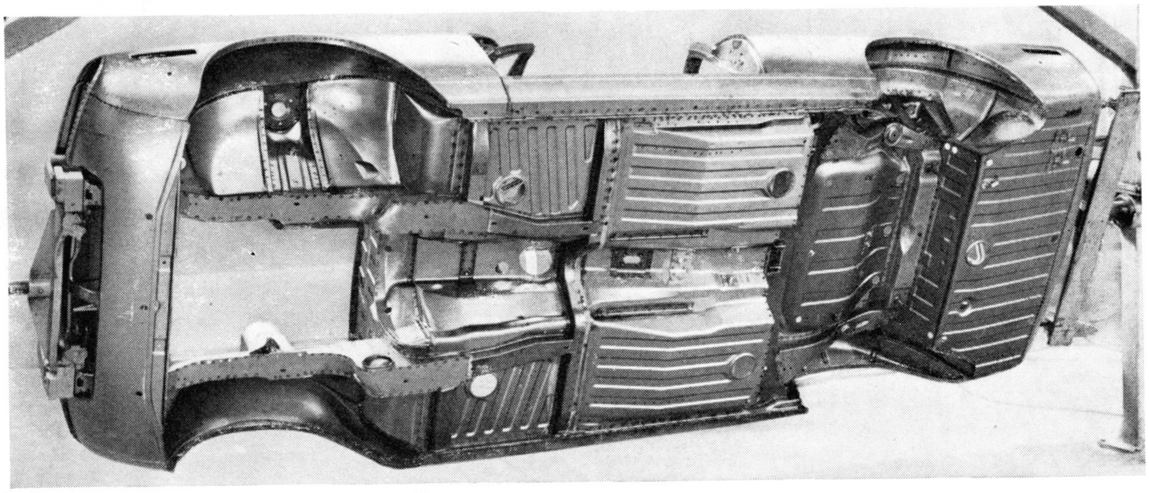
A Pow-a-Rak power-assisted rack-and-pinion steering gear—*Automobile Engineer*, November 1968—is installed as standard, and oil is supplied by a Saginaw type 125S-P-155 hydraulic pump. Lockheed front disc brakes, with $10\frac{5}{8}$ in diameter discs, and 9×2·25 in leading-and-trailing shoe self-adjusting rear brakes are actuated independently by a tandem master cylinder. A direct-acting vacuum servo unit with an output:input ratio of 3:1 is also installed.

Body structure

Initially, the intention was to commission Michelotti, the styling consultant for the new model, to design a body based on the floor and front end sub-assemblies of the Triumph 2000. However, the decision was made subsequently to adopt a 100 in wheelbase—6 in shorter than that

SUSPENSION DATA

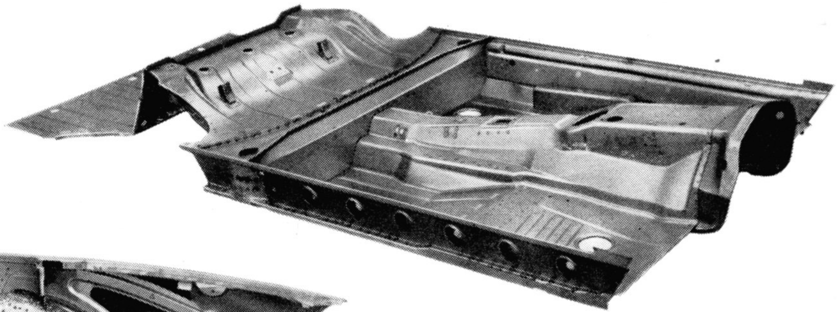
	Front	Rear
Type	Strut and transverse link	Single semi-trailing arms
Spring type	helical	
Track, in	52·5	52·88
Sprung wheel load, laden, lb	777	777
Wheel rate, bump, lbf/in	88	114·5
Wheel travel, bump, in	3·30	3·03
Wheel travel, rebound, in	3·46	4·22
Natural frequency, laden, c/min	63·2	72
Natural frequency, unladen, c/min	67	85
Height of roll centre above ground, in	7·04	5·75
Wheel rate of anti-roll bar in roll, lbf/in	80	—
Total roll stiffness, lbf ft/deg	335	233
Camber angle:		
Bump	—2 deg	—6 deg
Static laden	$-\frac{1}{4}$ deg	$-1\frac{1}{2}$ deg
Rebound	$+3\frac{3}{4}$ deg	+5 deg
Castor angle	$2\frac{1}{2}$ deg	—
Castor trail at axis of hub	0	—
Toe-in	$\frac{1}{16}$-$\frac{1}{8}$ in	0-$\frac{1}{16}$ in
Rolling radius of tyre	12·3 in	
Calculated roll angle at 0·5 g lateral acceleration	3 deg 15 min	

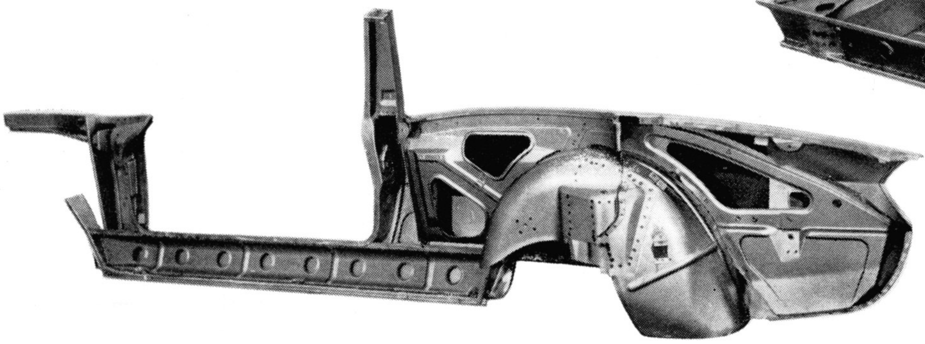


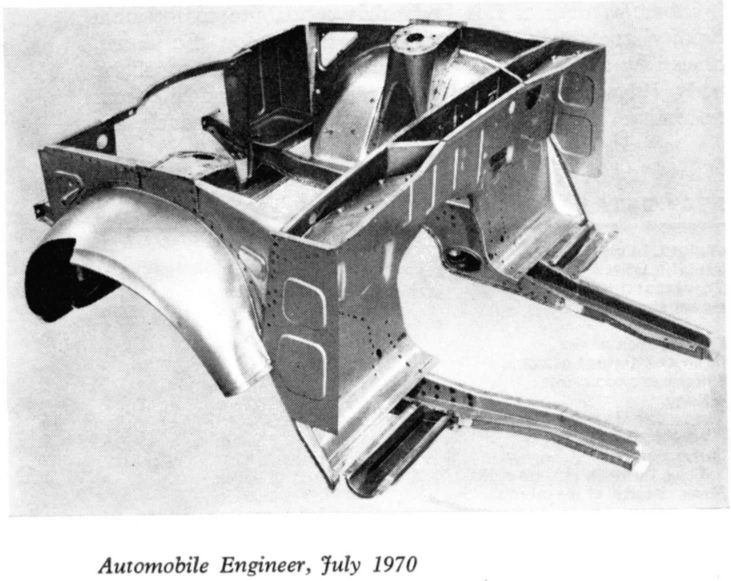
of the 2000 model—and many other design changes were required, so that virtually new sub-assemblies were evolved as a basis for the body. The only pressings in the final design that are common to both models are the front longitudinal members, one transverse member in the floor, the front valance assemblies, and stiffeners for the rear wheel-arches.

Details of the sub-assemblies, the assembled body, and the principal sections can be seen in accompanying illustrations. Bodies are assembled, painted and trimmed at the Standard-Triumph works in Liverpool, and are despatched to the Coventry factory for the assembly of the cars.

To compensate so far as possible for the contribution to torsional rigidity made by the roof and pillars of a saloon, which is absent from an open body, double box-section sills have been adopted. To the edges of the large deep drawn 0·036 in thick pressing—incorporating the transmission tunnel—for the central portion of the floor, are welded two 0·064 in thick channel section pressings, one inside the other forming a $\frac{3}{4}$ in wide box section of 6·8 in maximum





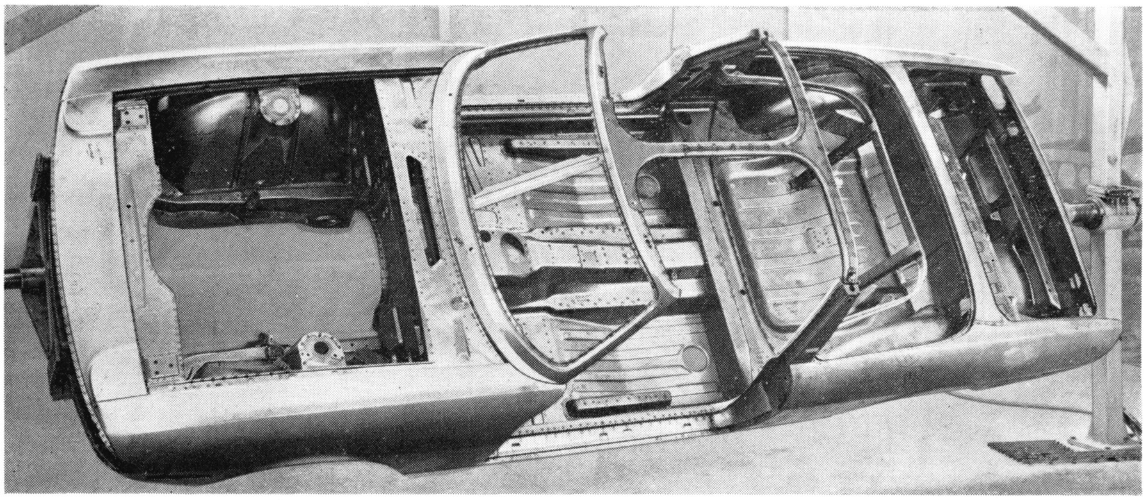


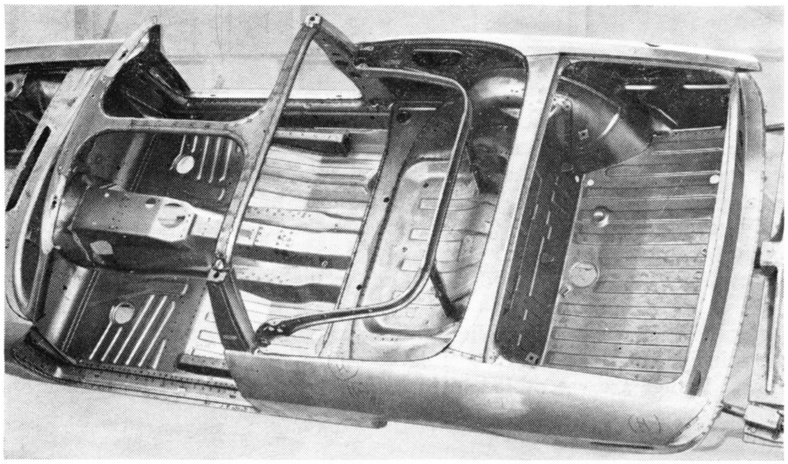
Top: Fabricated 0·064 in thick pressings comprise the front longitudinal box-section members that carry the engine, the lower pivots for the front suspension, and the steering gear. The front valances are reinforced for the upper mountings for the suspension

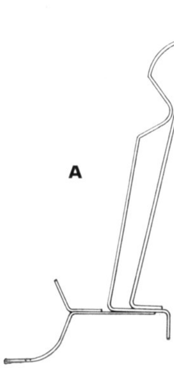
Above right: A single deep-drawn 0·036 in thick pressing comprises the central portion of the floor, to which the inner box-section sills are welded

Above left: An outer box-section member for one of the sills can be seen in this illustration of the sub-assembly of a side of the body. A double-skin structure extends from the rear pillar to the tail

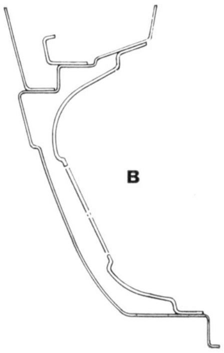
Left: In the sub-assembly of the front end of the body, the longitudinal members and the valances are the same as those in the Triumph 2000 model. The double-wall dash comprises 0·035 in thick pressings







A



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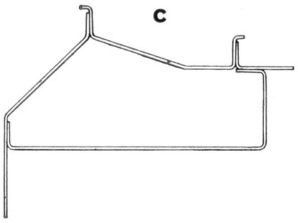
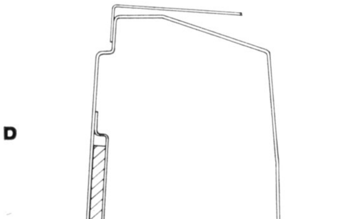


C

E

Top and above: In these two illustrations of an assembled body shell can be seen details of the roof member, which is bolted to the rear pillars and the windscreen header rail. This member contributes 1 360 lbf ft/deg to the torsional stiffness of the body. Opposite page, top: That the height from the sill to the waist is small is evident in this illustration of an assembled body. Opposite page, centre: The positions of the seats and the steering wheel are fully adjustable. Two switches for the electrically operated door glasses are on the central console



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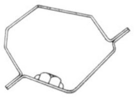


F

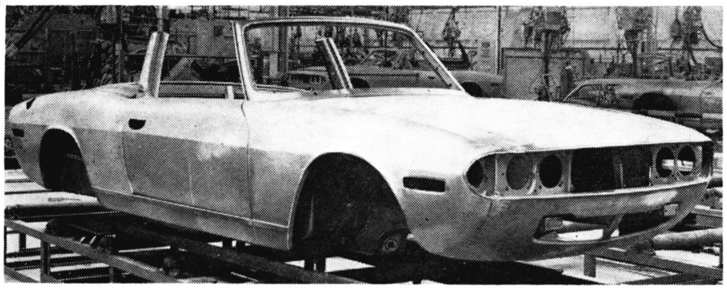
These illustrations of body sections, drawn to the same scale, are: A *inner sill, 6¾ in deep;* B *outer sill;* C *transverse member at the rear of the main floor;* D *rear pillar below waist level;* E *windscreen pillar;* F *windscreen header rail*

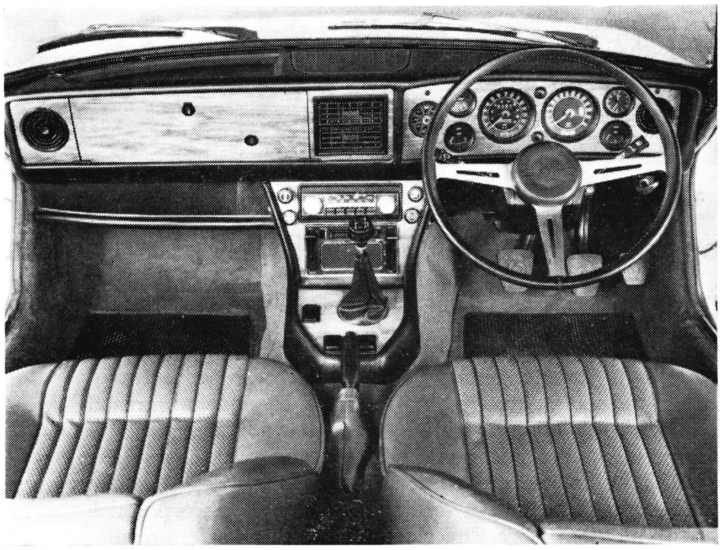
depth. A similar box-section sill, comprising 0·048 in thick pressings, is incorporated in the base of each side assembly for the body, and is spot-welded to the inner sills during assembly. Front longitudinal box-section members, comprising 0·064 in thick pressings, carry the mounting brackets for the engine, the lower pivots for the front suspension, and the steering gear, and they extend rearward as far as a transverse member beneath the front seats. A rectangular shape frame for the rear floor of the body comprises two transverse and two longitudinal box-section members, each fabricated from 0·064 in thick pressings. At each corner the frame is reinforced to receive the resilient mountings for a sub-frame that carries the final drive unit, and the pivots for the rear suspension arms. Other reinforcements on the longitudinal members provide the upper seats for the rear suspension springs.

Other features of this body that contribute to torsional rigidity are the substantial front pillars for the doors, braced by a double-wall dash, and the construction of the body sides between the large rear pillars and the rear extremity. In this entire region, the external panels are

BODY DATA

Weight, in white	670 lb
Weight, with glass and trim	1 452 lb
Torsional rigidity	4 400 lbf ft/deg
Beam strength	Maximum deflection with 1 682 lbf load, 0·082 in
Frontal area of car	17·3 ft²
Drag coefficient of car	0·471
Thickness of panels:	
floor	0·036 in
side panels, roof, dash, and wheel arches	0·035 in
Outer panels:	
door, bonnet, and boot lid	0·035 in
Main structural members	0·064 in





braced by pierced and swaged internal pressings that are welded to the pillar, the sill, the wheelarch and the floor of the boot. A deep transverse member at the front, and others at the rear of the boot, tie the body sides together. The rear pillars for the doors are of box section, and extend to roof height. To the upper end of each, and to the header rail of the windscreen, is bolted a fabricated member of sufficient rigidity to augment the torsional stiffness of the body, and afford some protection for the occupants in the event of the car rolling over. It comprises three $1\frac{3}{16}$ in external diameter, 0·080 in thick mild steel tubes, to which 0·080 in thick steel plates are spot welded to form box sections. It is secured to each pillar by a $\frac{7}{16}$ in diameter bolt, and to the header rail by four $\frac{1}{4}$ in and one $\frac{5}{16}$ in diameter bolts, and is assembled after it has been padded and trimmed.

As an indication of the contribution this roof member makes to torsional stiffness, measured between the axes of the front and rear wheels, the results of tests are 4 400 lbf ft/deg with the member fitted, and 3 040 lbf ft/deg without it. These figures are for a fully-assembled body in white; the equivalent result for the body of the Triumph 2000 Mark 2 saloon is 6 000 lbf ft/deg. The weight of the body of the Stag, in white, with doors, bonnet and boot lid is 670 lb, and when finished in the condition for the assembly of mechanical components 1 452 lb. A detachable hardtop, fabricated from 0·035 in thick steel pressings, weighs 49 lb in white, and 97 lb with glasses and trim. The glasses in the rear quarters are hinged at their front edges, and can be opened for ventilation, while an electrically heated rear light is installed. Electrical connections for this heater are made at the top of each rear pillar when the hardtop is locked in position.

BRAKE DATA

	Front	Rear
Type	Disc	Drum
Size	10·625 in diameter	9×2·25 in
Effective radius of pad	4·16 in	—
Lining area	24 in²	78 in²
Swept area	220 in²	127 in²
Actuation	Hydraulic	
Ratio of effort, front:rear	66 per cent	34 per cent
Ratio of servo assistance	3:1	
Diameter of master cylinder	0·875 in	
Diameter of wheel cylinders	2·25 in	0·8125 in

A soft folding hood, the frame members of which are covered by plastics mouldings, is stowed in a well behind and at each side of the rear seat, which is 40 in wide. A pressed steel cover for the well is hinged at its rear edge. These hinges are co-axial with those for the adjacent counterbalanced boot lid, and if this lid is opened while the cover is raised, the cover is closed. A.C.-Delco electrical actuation of the glasses, and Wilmot-Breeden anti-burst locks are installed in the doors. A lamp, operated by a courtesy switch, in each arm rest on the doors, shows a red light to the rear, and a white light downwards to illuminate the ground beside the car. Both front seats are fully adjustable for longitudinal position, the rake of the squab, and for vertical position, the last-mentioned adjustment being effected by rotating a handle on the front edge of the seat. Full adjustment of the position of the steering wheel can be made by releasing one clamp by means of a lever, to allow the upper portion of the steering column to be moved 4 in axially, and raised or lowered through a total travel of 2 in in a guide attached to the pressings for the instrument panel.

STEERING DATA

Overall ratio, straight ahead position	19·5:1
Turns lock-to-lock	4
Diameter of steering wheel	16 in
Angle of wheel at full lock:	
inner	38 deg
outer	36 deg
Ratio of steering gears	1 revolution of pinion = 1·3 in travel of rack
Axial travel of rack, lock-to-lock	5·20 in

With the hardtop removed, the permanently fitted roof member, which is padded and trimmed, can be seen. A hinged pressing covers the well in which the soft hood is stowed