

*With*

**BALANCED DRIVE**

*now comes*

**BALANCED RIDE**

SOLE DISTRIBUTORS

INSTITUTE

8 BROOMIELAW.

GLASGOW.



*How*

**BALANCED RIDE**

*is achieved*

**Revs**  
**INSTITUTE**

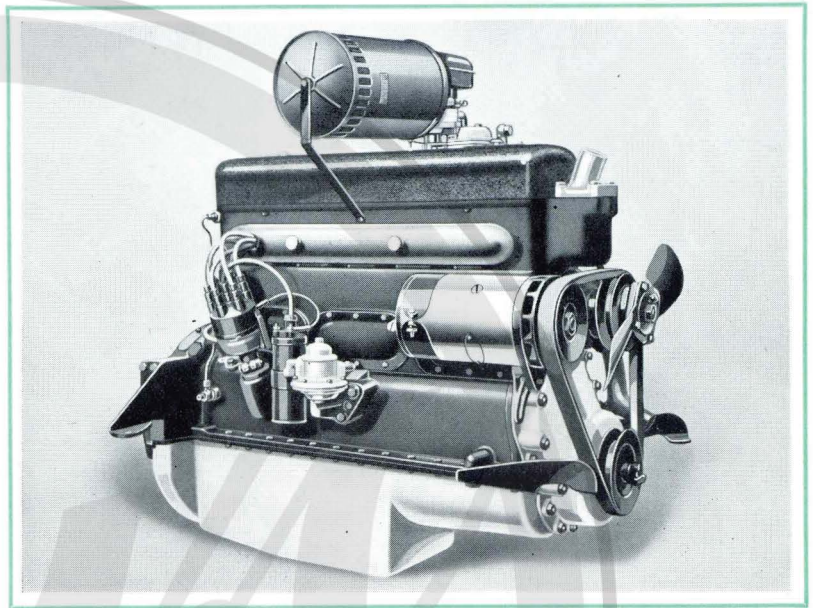
**ARMSTRONG SIDDELEY  
MOTORS LTD., COVENTRY**  
LONDON—10 OLD BOND ST., W.1

Agents in all centres

QUIETNESS  
FLEXIBILITY  
SMOOTHNESS  
EASE OF CONTROL  
EXTREME COMFORT  
EFFORTLESS PERFORMANCE

*These are the characteristics of*

**BALANCED RIDE**



**I**T all begins with the engine. You can well imagine that in an aeroplane engine nothing is spared to make it as smooth and vibrationless as possible. In the new Armstrong Siddeley cars you have engines built to a design based on aero-engine experience. The combustion head is arranged so as to give an even distribution of petrol vapour throughout the range of power, with an entire absence of flat spots. Similarly, the natural tendency on the part of baffled exhaust gases to cause vibration is eliminated by clever designing of the manifold to extract the gases without loss of power through back pressure. The inherent smoothness is further assured in the design

of the new engines, by the use of counter-balanced crankshafts fitted with four detachable strip metal bearings of large diameter, giving perfect balance both statically and dynamically.

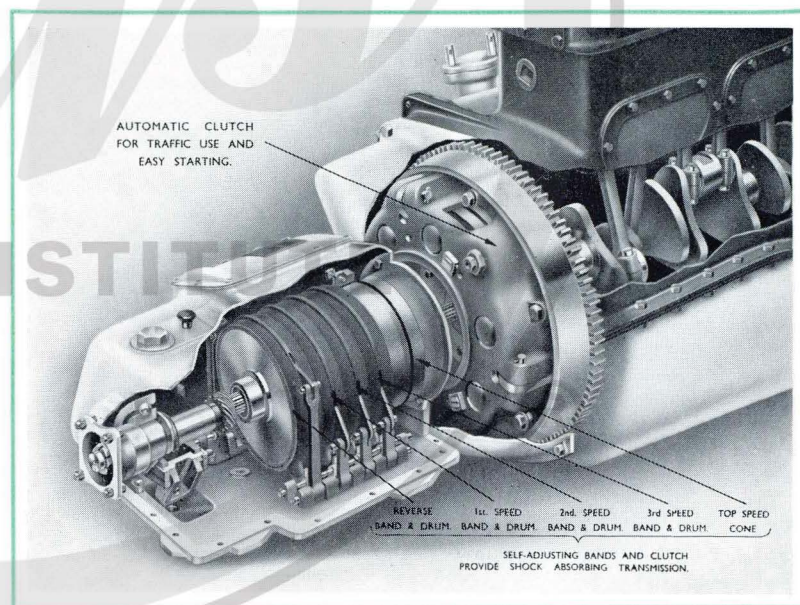
Most impressive is the complete silence of the engine, whether idling in traffic or at its maximum revolutions. The down-draught carburation is fully silenced, and the multi-silencer system is insulated and mounted on rubber. Next, we come to the "Balanced Drive," which has proved such a successful feature of Armstrong Siddeley cars. It plays an extremely important part in Balanced Ride. It is the means by which any unevenness in the torque or turning power of an engine is damped down and eliminated from the consciousness of the occupants of the car. By making the transmission unit an integral part of the engine assembly, the separate flywheel can be abolished and the running gear of the transmission employed most effectively in its stead. The result is a vastly increased smoothness, for the flywheel effect is concentrated closer to the propeller shaft, eliminating torsional flexing in the gear shafts and gear trains.

It will be noticed that the units of the "Balanced Drive," the engine crankshaft, the centrifugal clutch and the self-changing gear box are all working round the same axis of rotation. The epicyclic gear box has a considerable advantage over other types of gear boxes in that the planetary assembly of the gear wheels gives a gyroscopic

effect in all gears. Each train of gears is perfectly balanced about the central axis of the gear box. Further, the propeller shaft with universal joints is balanced as a unit after assembly before it is placed in the chassis.

At the rear axle the same attention is given to the elimination of vibration. By the fitting of pre-loaded bearings in the spiral bevel mounting, roughness due to displacement is prevented.

Reference must now be made to the new method of chassis frame construction to give the maximum rigidity without undue weight. A box section is one of the strongest forms of construction ; it is obtained by attaching the body to the chassis in such a way that the two,



# *With "Balanced Drive" now comes "Balanced Ride"*

The "Balanced Drive" transmission, making engine crankshaft, centrifugal clutch and self-changing gears an integral unit.

Fully silenced down-draught carburation.

Exceptional power attained by cylinder head design, following aero engine experience, to give even distribution of petrol vapour throughout the speed range.

Rear axle fitted with "pre-loaded" bearings giving perfectly smooth drive and total absence of vibration.

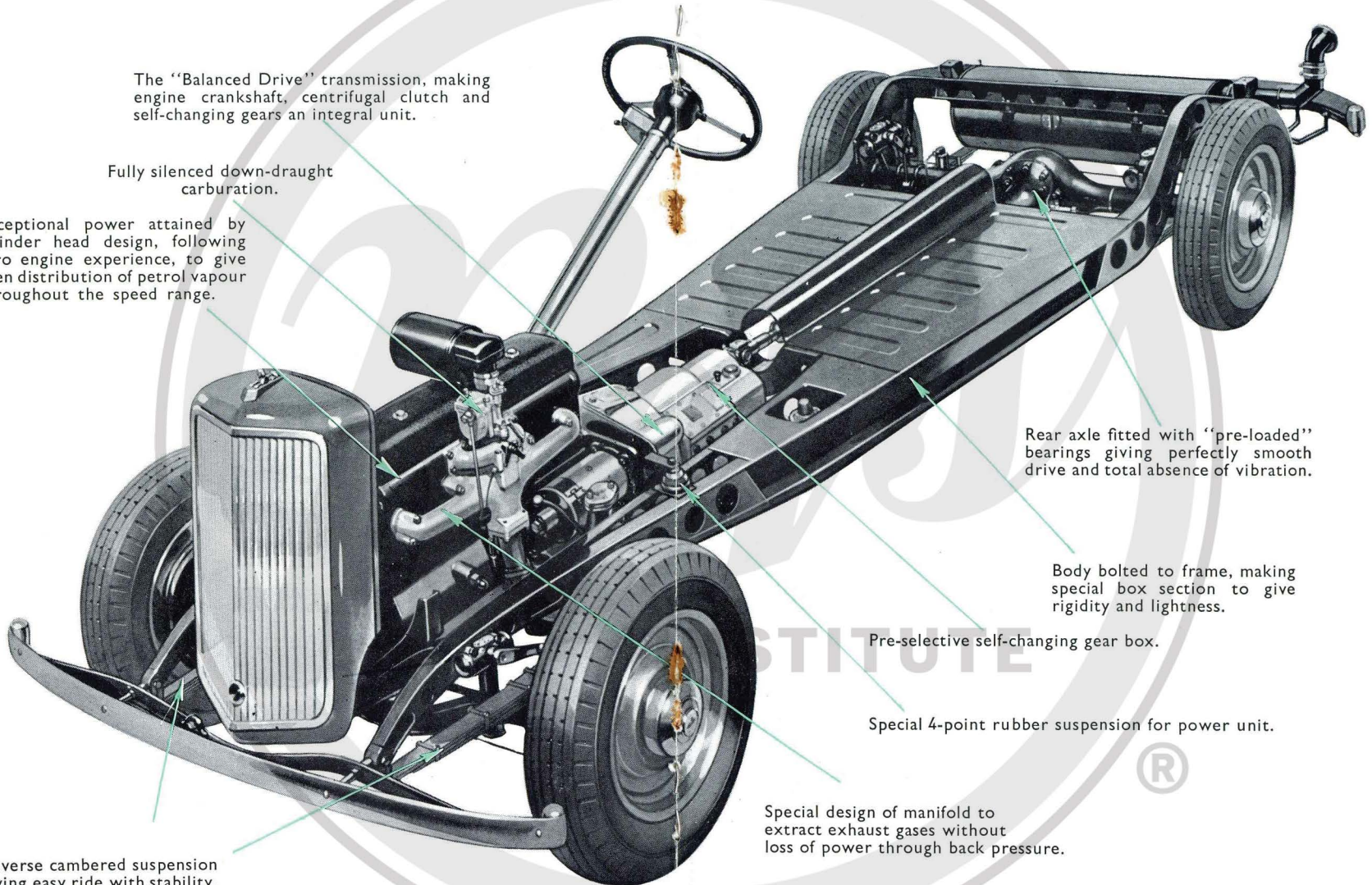
Body bolted to frame, making special box section to give rigidity and lightness.

Pre-selective self-changing gear box.

Special 4-point rubber suspension for power unit.

Special design of manifold to extract exhaust gases without loss of power through back pressure.

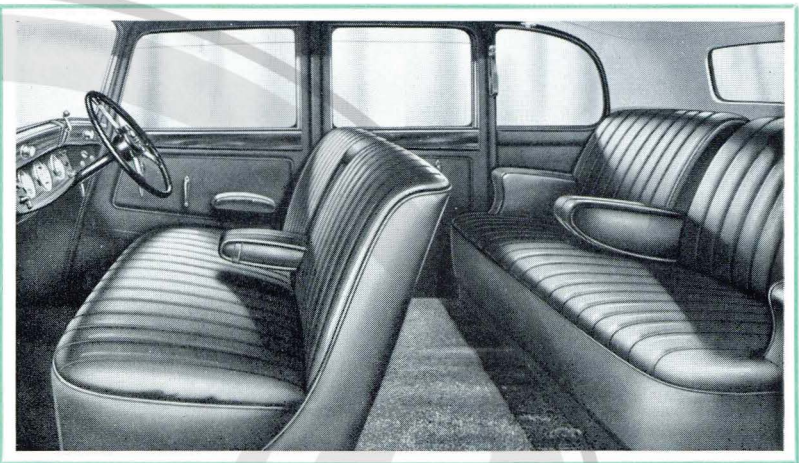
Reverse cambered suspension giving easy ride with stability.



when bolted together, form a perfect box section. Still greater rigidity is secured at the front end by substantial cross members, which are further braced by auxiliary members carrying the engine, clutch and gear box. It has been found that the torque re-action characteristics of the combined engine and transmission unit can be absorbed by a special method of mounting on rubber. The four points of support have a very particular relationship to the components of the forces at work in the unit, and have been found as the result of much patient research.

This rigidity of frame is the foundation for new systems of suspension carefully designed to give a smooth floating ride without flexing or roll. Experiment has resulted in the adoption of the most appropriate type of suspension to the chassis in question, but whether they be reverse cambered, semi-elliptic or independent coil, the springs give the same qualities of combined stability and flexibility. The fitting of oil-less bearings throughout the suspension systems and the use of double-action piston-type shock absorbers result in an ease of riding which is all that can be desired.

While models of different horse power require different treatment to ensure the most efficient braking, the same layout of the braking gear is used to ensure equalised application of the brakes. In addition to self-compensating mechanism, an automatic control is fitted to allow all



normal braking forces to be equally distributed between all the brakes, and secondly to ensure that the braking torque is automatically distributed between front and rear axle in accordance with the weight transfer caused by the higher rates of deceleration when emergency braking is necessary.

The principles underlying "Balanced Ride" are by no means confined to the chassis. The coachwork is just as important, and here we find provision made for inter-axle seating, which means that all the occupants of the car sit between the two axles, where it will be appreciated, there is the minimum movement over uneven roads.

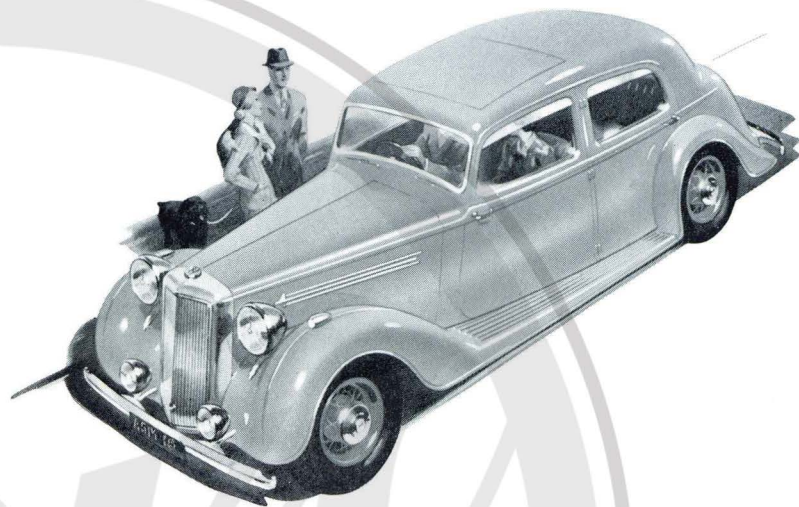
It is an accepted axiom that the comfort of seating may be gauged by the depth of the springs, and it will imme-

diately be noticed that both the squabs and the cushions of the seats are deeper than are usually found. Furthermore, they are constructed on a special design of inter-coupled springs.

It will be seen that in "Balanced Ride" as much care has been taken to ensure quietness and ease of control as the smoothness, which is its chief characteristic. This feature of quietness is also particularly noticeable in respect of the coachwork. The doors are all lined with a soft rubber section, making them completely draughtproof. Sound-deadening material is used throughout and the coachwork is entirely insulated from the engine.

In the case of the "Sixteen" chassis, there is a special fume-proof floor, and in the case of the "Twenty," an exclusive dashboard construction completely cuts off under-bonnet fumes, which are exclusively conveyed to beneath the chassis by an extractor.

It is in such details that the Armstrong Siddeley coachwork excels. Last, but not least, there is the delightful ease of control. Visibility is an important factor. The driver has a wide deep view of the road ahead, including his near side wing. A positive pre-selective gear control is at his finger tips and he has the advantage of well-arranged instruments on a raised fascia board. There is plenty of leg-room, elbow-room and head-room, and there is above all a feeling of spaciousness and restfulness which is enjoyed by driver and passengers alike.



### *"Balanced Ride" on the Road*

A flow of even power so perfectly balanced as to create an absence of mechanical energy, it is a sensation which can be appreciated only by those who experience it.

First and foremost, there is a balanced take-off. Second gear having been pre-selected and engaged by a light movement of the gear change pedal, the car glides forward on the depression of the accelerator, as the automatic clutch smoothly engages. The increased power of the engine at low speeds is responsible for an extremely rapid get-away.

The "Balanced Drive" allows the car to be run up to the maximum speed of any of the intermediate gears.

One can imagine the effortless acceleration which is thus attained. On the other hand, there is just as smooth a pick-up at lowest speeds on the higher gears. The car can be driven at walking pace on top gear, and will pick-up and accelerate right up to its maximum without falter or hesitation. So, it will be seen that "Balanced Drive" gives a complete flexibility on all gears. Miles of give-and-take traffic can be negotiated in third gear alone. In thick traffic, owing to balance in the lower gears, one can literally creep about without the slightest sound or fuss. The automatic disengagement and engagement on the centrifugal clutch as the engine revolutions fall and rise, is ideal for traffic work. Every change of gear is perfect. The bands of the epicyclic gear box are adjusted with a predetermined amount of "slip," which effectively prevents any gear engagement shock.

The car has a delightful feel on the road. Steering is keenly accurate, the braking very responsive and the new suspension is such that the car seems to float along without any excessive rise and fall.

The Armstrong Siddeley is indeed a most effortless car to drive—and most comfortable to ride in. Of this there could be no better proof than the absence of fatigue which is experienced at the completion of the longest journey.



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