Tech editor Norbye saws his way around Silverstone in prototype—test car was mechanically a Vantage, but had standard bodywork.

ASTON MARTIN DB-4 Vantage

David Brown & Co. find breeding improves the breed—the Vantage out of DB-4 by DB-4 GT

One year after the introduction of the DB-4 Vantage with the Special Series engine, this model absorbs the largest part of the production capacity of Aston Martin Lagonda Limited. It differs visibly from the standard DB-4 only in the headlights, which are covered by plexiglass in their recessed position in the fenders, as on the DB-4 GT. But the Vantage has the long wheelbase of the normal DB-4 and a rear seat, while the GT is strictly a two-seater.

The Special Series engine is an intermediate step between the standard and the GT. It uses two-inch SU carburetors in common with the standard DB-4, but three of them instead of two, while the GT has three Weber instruments. The four-liter version of the same engine, as used in the Lagonda Rapide, has two compound Solex carburetors, so the carburetion setup provides a quick reference to the different engine designations and power outputs of the David Brown cars.

Of course the actual differences go much deeper. In comparison with the standard DB-4, the Special Series engine has a high-compression head, special pistons, larger inlet and exhaust valves (Special Series intake valve diameter 2.0 inches vs. 1.875 standard; exhaust 1.875 inches vs. 1.70 standard), KLG FE 80 spark plugs (instead of FE 75), modified advance curve on the distributor, modified intake manifolds, modified throttle linkage, air intake plenum chamber instead of individual air cleaners, modified brake servo air-cleaner assembly, and an oil cooler placed below the radiator. The valve timing is the same on the standard and Special Series (while the GT has special camshafts) with the following opening periods:

Intake opens	28° BTC
Intake closes	68° ABC
Exhaust opens	62° BBC
Exhaust closes	22° ATC

The cylinder block is an aluminum casting with centrifugally cast chrome-vanadium iron top-seating wet liners. Light-alloy in-line sixes are extremely rare in Europe—Aston Martin shares this distinction only with the AC Ace and the Mercedes-Benz 300-SE. The seven-bearing crankshaft, manuractured by Laystall, is a nitrided chrome-molybdenum steel forging, statically and dynamically balanced. The main bearings are 2¾ inches in diameter, with steel-backed copper-lead bearing shells.

Strangely enough the same basic head is used on all versions of the engine, regardless of the number of carburetors. This is made possible by converting water passages into manifolding ports for the three-carburetor engines and blocking the original ones. Variations in compression ratio are obtained by machining the head and installing special pistons. The cylinder head is an aluminum-alloy casting with fully machined hemispherical combustion chambers. The ports are flow-tested and the valves are inclined at an included angle of 80°. All exhaust-valve guides are surrounded by water. Valve operation is taken care of by two overhead camshafts driven by two-stage Duplex roller chains with manually adjusted tensioners. No adjustment of the cyanide-hardened nickel-molybdenum steel tappets is necessary.

Pistons are die-cast aluminum alloy with two compression rings, the upper chromium-plated and the lower taper-faced, plus one twin-segment oil-control ring. The connecting rods are forged in manganese molybdenum steel and weight-graded before balancing with the piston assembly. Aston Martin engines are hand-made to the extent that piston and con-rod assemblies are made up in sets of six with zero tolerance, the exact weight being recorded in case the customer should at some point in the later life of the car find it necessary to replace one piston and con-rod which the factory will then supply to match the other five.

Engine assembly takes place in a fairly large shop with stations and sub-stations for each component or sub-assembly making up a form of assembly line. As the number of engines in assembly is invariably greater than the number of fitters in the shop, several engines may stand for hours without being worked on, but the concern for cleanness is such that plastic sheets are placed over all engines and parts that have to wait before reaching the next stage of completion. Gearbox assembly takes place under the same stringent circumstances.

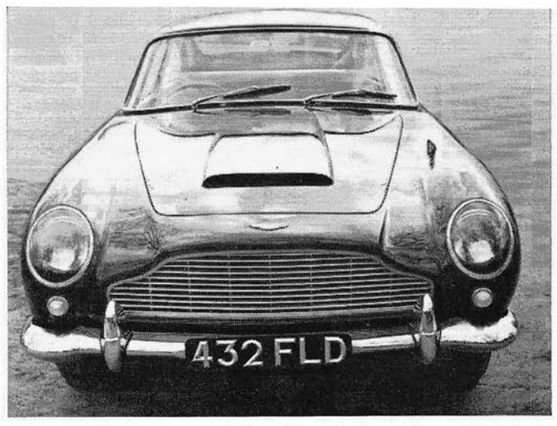
But while the engine reaches a superlative level of response and reliability throughout its range of torque and power, the gearbox remains a capricious piece of machinery. It is a four-speed all-synchromesh unit by specification, designed by the David Brown transmission people, and assembled by Aston Martin at Newport Pagnell. Unfortunately, the baulk-ring synchromesh is unpredictable on downshifts into first, especially at standstill. The usual trick of getting second and then just snicking it into first usually works, but only usually—and the cause of the occasional grinding noises must be a mechanical error, not a human one.

The clutch deserves top marks, however. It is a Borg & Beck 9-inch, twin-plate unit with hydraulic operation and a self-adjusting device for free pedal travel. Prior to chassis number 766, a 10-inch clutch was used, but the new one gives better results. It has an intermediate driving plate between two lined driven plates attached by three spring-steel straps to the flywheel, and gives a firm but gradual grip. Hard springs make high pedal pressures a necessity, but for normal driving this is never objectionable. In heavy traffic, however, it can become annoying; especially in view of the uncertainty of getting first gear on the first try.

In contrast with current trend, Aston Martin uses a large graphite release bearing, which, according to both factory and independent testimony, stands up extremely well to all kinds of use and abuse: no release bearing has been replaced on a DB-4 since it came on the market late in 1958 because of failure of the bearing itself—any such replacement has been in connection with clutch or gearbox repairs.

Clearly Aston Martin cannot afford to ignore the dissatisfaction and complaints of many owners over the gearbox. We are assured that development of an improved transmission is well under way, and we suspect that an all-new five-speed gearbox is being designed. Being part of the David Brown group, Aston Martin is more or less tied to group products for manual transmissions, although the company has very good relations with Borg-Warner, who supplies the high-input torque converter and planetary transmission for the Lagonda. So, using the T-10 (Corvette-type) is out of the question, even as a makeshift solution. The existing unit is perfectly acceptable itself as a makeshift solution, with comfortably short movements and a highly precise gate.

The Vantage is distinguished by faired-in headlights, like the GT; all models are distinguished by clean Anglo-Italian lines.



Blend of DB-4 and DB-4 GT is evident in front view, with faired headlights smoothing the lines and unifying the overall design.

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When John Wyer, the technical director of Aston Martin and Lagonda, assigned the design of a new engine in the three-to-four-liter class to his associate T. Marek back in 1955, the idea was that the new car was to use an existing chassis with a rectangular-section girder-type steel frame. But before a DB-4 prototype was built, it was decided that the car should have a platform frame, in deference to the body designers (Carrozzeria Touring of Milan, who shortly before had granted a manufacturing license to Tickford, a coachbuilding company affiliated with David Brown).

The resultant platform frame is both lighter and stronger than the conventional frame originally intended for the car, and offers increased rigidity, thus minimizing the movement between the body framework and the body panels in the Superleggera structure. The framework is made up of small-diameter light-gauge steel tubes welded to the chassis platform and offers a basis for firm attachment for doors and windows. The light-alloy body panels are not firmly attached to this framework but fastened only by clinching them around angle plates welded to it. Some flexibility is therefore possible, without the sad results, such as leaks and drafts, often associated with steel bodies whose chassis lack rigidity.

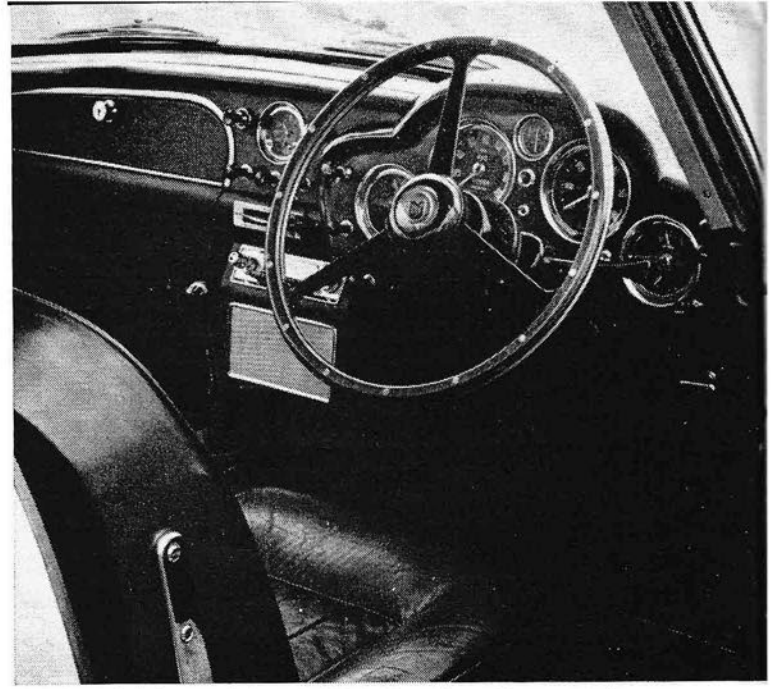
Body structure as well as shape no doubt has a great deal to do with the car's silence at speed and over bad roads. Its absence of vibration and the durability of the thin light alloy panels are remarkable. Again, body repairs on DB-4s only come from accident damage or from mechanical repairs causing damage, never from rattles and squeaks, rifts or cracks.

Sound-dampening materials are used moderately on the DB-4 Vantage, heavily on the Lagonda Rapide and sparsely on the DB-4 GT. The Vantage is, in the manner of the 3500-GT Maserati, a fast luxury car rather than a sports car. A number of special (optional) items are offered, such as a rear-window defroster, electric windows, and air conditioning. When the air conditioning is fitted, it is placed behind the rear seat where the fuel tank normally lives, while the tanks are repositioned in the fenders where the battery is usually located (the battery goes inside).

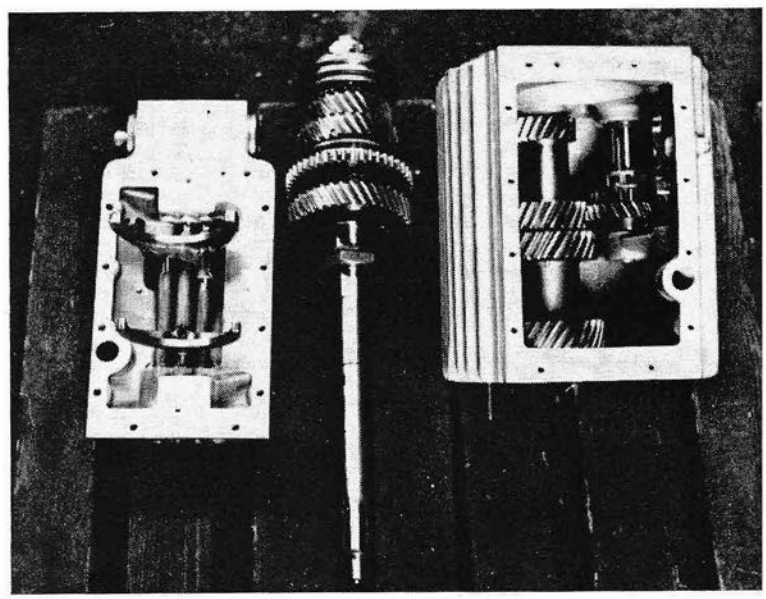
If the Vantage has all the amenities of a town carriage, it still remains an extremely masculine car. The steering tends to be heavy, the gearshift needs considerable muscular effort, and pedal pressures are relatively high. Drivers with a strong sporting sense will derive a great feeling of satisfaction from mastering this car, but the less enthusiastic may begin to talk of power steering and automatic transmissions. (The only automatic DB-4 ever built was for a customer with a leg disability.)

A rewardingly full set of instruments confronts the keen driver. The seating can only be described as excellent for the front seats and dubious for the rear ones, depending on the amount of legroom required by the people in front. With the front seats far forward, the rear seat becomes perfectly acceptable for considerable distances; but with a long-legged driver, the rear seat becomes as occasional as that of an Austin-Healey. To provide comfort for all, the front seats have a fore-and-aft travel of 9½ inches, and the backrests have infinitely variable adjustment. The seats are above the British average in width, and seem to have the right combination of softness where wanted and firmness where needed.

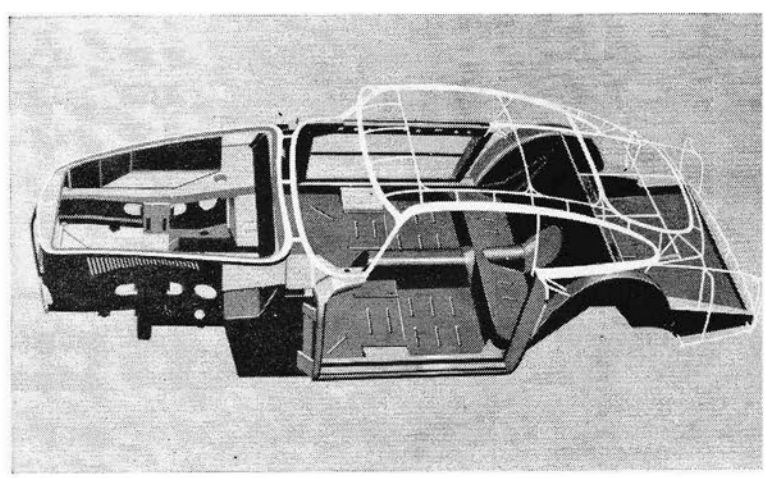
The pedals have the old-fashioned arrangement (hinges under the floor) and are most convenient in use. We were most of all in love with a separate pedal to the left of the clutch which has no other function



An ideal driving position (with fully adjustable seats) is combined with lavish instrumentation and a clear all-around view.



Despite the strong gears, the David Brown transmission is the weak link in the pleasure of driving the latest Aston Martin.



Superleggera body construction means "super light", but it has unusual strength thanks to resiliency of tubular framework.

than to provide a footrest at the proper height—it seems essential on hard cornering and we found ourselves using it even in traffic.

Cold starting is not always immediate, but when hot the engine springs to life without delay. The plugs did not care for long periods of idling, such as in a traffic jam or at a railroad crossing, but a steady depression of the accelerator to give at least 3,000 rpm for a few seconds would clear them. Experiments have been made recently with the four-electrode Lodge HF plugs in London traffic with such excellent results that some alteration in plug recommendations may be made.

The large organ-type accelerator pedal is coupled to a carefully designed linkage. The main throttle operating shaft incorporates two self-aligning needle roller bearings, reducing linkage friction and giving improved control.

When you have one of the very fastest cars on the road it is good to know that you can also stop faster than anyone else. Aston Martin's DB-4 Vantage has a top speed of about 150 mph and can be brought to a complete standstill from that speed in about 10 seconds. Stopping times from a mere 100 mph are amazingly short, varying between 3.5 and 4.5 seconds. While there are cars which can achieve first-class deceleration from, say, 130 mph to 30, they demand a lot more effort to get from 30 to 0 mph (due to choice of lining or pad material). The Aston Martin has balanced braking throughout its speed range, with even pedal pressures and even retardation.

Very large Dunlop discs with servo assistance have given the DB-4 this kind of braking. Actually, the braking efficiency improves when the discs are warmed up, as the hard pads do not get the same bite when everything is cool. Rain does not affect the brakes themselves at all, and has a surprisingly small effect on the stopping power (skid resistance) of the RS-5 Dunlop tires.

Noisy? Yes. The Vantage is noisy in the same way that a 707 or a DC-8 is noisy—you sit inside in relative quiet while all the noise goes out the back. The two fairly large tail pipes can purr sweetly as you weave your way through traffic in second gear, let out a sexy roar at full-throttle acceleration, or hum in a deep bass on the overrun. Cruising—well, the car has no cruising speed. You can cruise at 80, 100 and 120 mph, and it makes no difference to the engine. At steady speeds it is always quiet, with a water-temperature reading of about 180° F, an oil-temperature reading of just over 100° F, and an oil-pressure reading of 55 psi.

The high-speed silence of the car is remarkable. Road noise (with high tire pressures) is low, wind noise—with all windows closed—is unusually low, and the whole car benefits from an absence of vibration which seems peculiar to in-line six and V-12 engines. The result is that conversation in the car is possible at all speeds, and the radio, which Motorola builds especially for Aston Martin, has enough volume to be heard under any circumstances.

When Aston Martin raced officially, it was known as the best-handling of all the big sports cars, and it repeatedly won at Nürburgring against cars of higher power output. The DB-4 differs basically from the competition cars in suspension design, but excellent road-holding qualities have been achieved, even with a rigid rear axle. In order to provide reasonable ride comfort, the axle must be able to move up and down (one wheel up, the other down, or both up and down together). It must be effectively prevented from moving forward and backward in relation to the chassis, and should have minimal freedom to move laterally in relation to the chassis. In addition, it must not be allowed to rotate more than a very few degrees on its own axis. Chassis designer Harold Beach has achieved the desirable results by four radius rods, two on each side, one above the other, which take up the driving and braking torque as well as restricting the twisting of the axle on its axis. A Watt linkage behind the axle locates it laterally in a very positive manner. Vertical coil springs are placed behind the axle housing, as close as possible to the wheels. Other manufacturers may know as much about the behavior of rigid rear axles as Aston Martin, but there are many who refuse to make use of this knowledge. With today's high-powered engines, Hotchkiss drive (with leaf springs as the sole means of attachment) is sadly inadequate.

It struck us as a little strange that Aston Martin continues to use a rigid rear axle on all models of the DB-4 even when the company has developed and is producing an excellent de Dion rear suspension for the Lagonda Rapide—a heavier and more luxurious car of little or no sporting appeal—where a rigid axle would matter less than in the very-high-performance DB-4s. We suggest they swap, quite simply, and increase the roadability of the Aston Martin range to the point where it is no longer rivaled by other fast touring cars with well-tied-down rear axles such as Ferrari and Maserati.

However, the relatively high unsprung weight in the rear end of the DB-4 does not make itself felt under any circumstances since the axle is so well tied down, and only on the acceleration tests did the limitations of the rigid axle show up in the form of wheelspin.

Front suspension of the DB-4 has unequal-length wishbones and coil springs, in contrast with the DB-2 series which used trailing links until it was discontinued in 1960. The first Aston Martin wishbone front end was used on an experimental DB-3S at Nürburgring in 1958 and the design was adapted for the DB-4 (as well as for the Grand Prix car then being designed).

With a 51/49 weight distribution, the DB-4 Vantage has nearly neutral steering characteristics, with some initial understeer. Not that there's any delay in steering response—you just have to overcome the high directional stability of the car. The amount of understeer is adjustable by merely varying the tire pressures, and the "normal" recommendations give steering characteristics that are definitely unpleasant when entering traffic circles or motoring on twisty, narrow roads. For our track driving and performance tests we put the tire pressures up even beyond the "high-speed" recommended figures (38/40 psi instead of 32/35). We kept them at this level even for city driving without any noticeable deterioration in ride comfort but with an improvement in steering and handling at all speeds.

If the DB-4 Vantage represents a sizable investment it is also one of the most desirable cars in current production and one of the very few really high-speed cars that can carry four people, plus a fair amount of luggage. It is a real driver's car, without neglecting the passengers. It can outperform many out-and-out sports cars, with incredible elegance, and is simultaneously one of the safest cars on the road. This safety is achieved not only by facilitating accident avoidance but also by generous padding and the absence of sharp objects where your heads, knees, or hands are likely to be projected.

With a production capacity of about 600 cars a year, shared between Aston Martin and Lagonda, it is doubtful that supply will ever equal demand. Expansion plans are vague, so Aston Martins will remain as exclusive in the foreseeable future as they are today.

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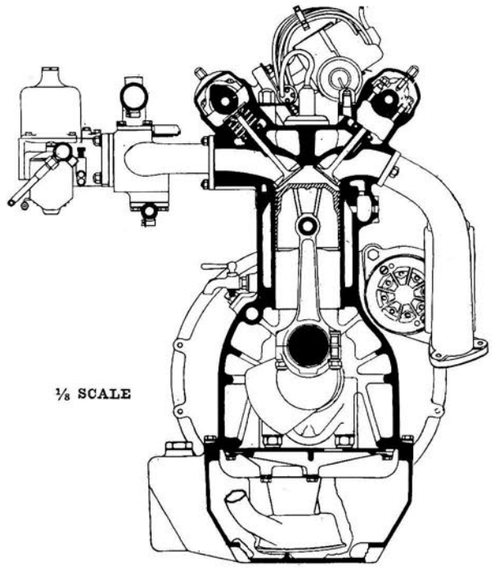
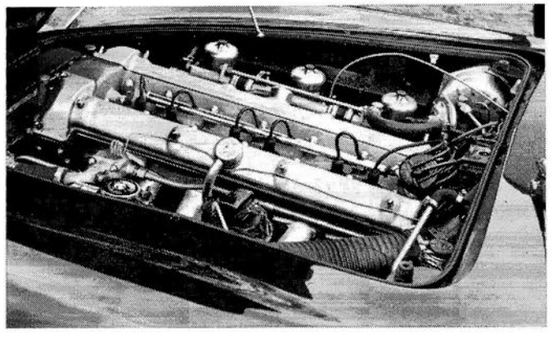
Road Research Report
Aston Martin DB-4 Vantage

Importer:	J. S. Inskip, Inc. 304 East 64th Street New York 21, N.Y.
Number of U.S. Dealers:	4 distributors
Planned annual production:	200
Value of spare parts in U.S.:	$85,000



⅛ SCALE



PRICES:

Basic price	$11,200 P.O.E. N.Y.
Overdrive	$180.00
Limited-slip differential	$105.60
Optional axle ratios (3.54, 3.77)	$ 33.00
Motorola radio (manual aerial)	$131.00
Motorola radio (power aerial)	$201.30
Fog lamps (pair)	$ 49.50
Chrome wheels (5)	$171.95
Whitewall tires (5)	$ 39.60
Exterior mirrors (pair)	$ 13.50
Spark-plug holder	$ 6.95
Rear window defroster	$ 99.00
Electric window lifts	$264.00
Richmond safety harness (front)	$115.50
Britax seat belts (front)	$ 49.50
Non-standard paint	$ 66.00
Non-standard leather	$ 66.00
Brayblock heater	$ 32.50
Normalair air-conditioning unit	$875.00
Sundym glass (all windows)	$ 49.50

OPERATING SCHEDULE:

Fuel recommended	Premium
Mileage	14-22 mpg
Range on 22½-gallon tank	315-495 miles
Crankcase capacity	10½ quarts
Oil-change interval	2,500 miles
Number of grease fittings	12
Lubrication interval	2,500 miles
Most frequent maintenance	1,250 miles—top up carburetor dashpots and check tire pressures.

ENGINE:

Displacement	224 cu in, 3,670 cc
Dimensions	6 cyl, 3.62-in bore, 3.62-in stroke
Valve gear	Chain-driven dual overhead camshafts
Compression ratio	9.0 to one
Power (SAE)	304 bhp @ 5750 rpm
Torque	255 lb-ft @ 4500 rpm
Usable range of engine speeds	1000-6000 rpm
Carburetion	Triple SU HD 8 carburetors

CHASSIS:

Wheelbase	98 in
Tread	F 54 in, R 53.5 in
Length	180 in
Ground clearance	6.25 in
Suspension: F:	Ind., wishbones and coil springs, anti-roll bar.
R:	Rigid axle, parallel radius rods and transverse Watt linkage, vertical coil springs.
Steering	Rack and pinion
Turns, lock to lock	3⅛
Turning circle diameter between curbs	34 ft
Tire and rim size	6.70 x 15
Pressures recommended	Normal F: 25, R: 28 psi High-speed F: 32, R: 35 psi
Brakes	Dunlop disc front and rear, 11½-in front, 11¼-in rear, 560 sq in swept area
Curb weight (full tank)	3100 lbs
Percentage on the driving wheels	49

DRIVE TRAIN:

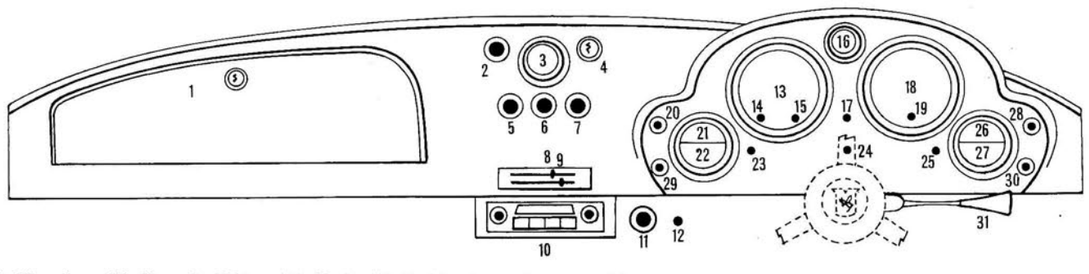
Clutch: 9-in Borg & Beck twin-plate

Gear	Synchro	Ratio	Step	Over-all	Mph per 1,000 rpm
Rev	No	2.52	—	8.35	—9.6
1st	Yes	2.92	37%	9.67	8.3
2nd	Yes	1.85	48%	6.14	13.0
3rd	Yes	1.25	25%	4.14	19.3
4th	Yes	1.00	—	3.31	24.2

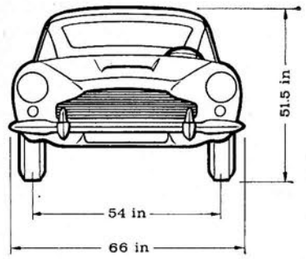
Final drive ratio: 3.31 to one

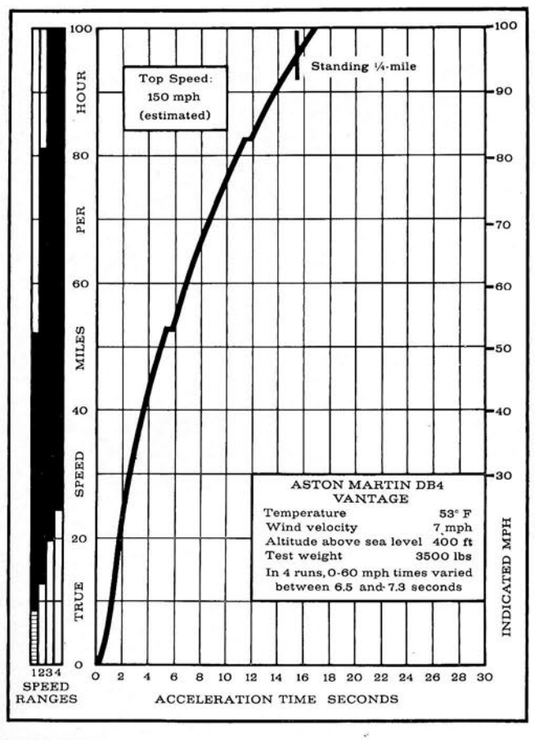
ACCELERATION:

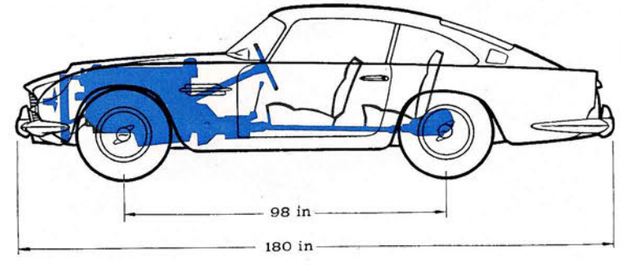
Zero to	Seconds
30 mph	2.6
40 mph	3.8
50 mph	4.8
60 mph	6.8
70 mph	8.5
80 mph	11.0
90 mph	13.7
100 mph	16.8
Standing ¼-mile	15.4

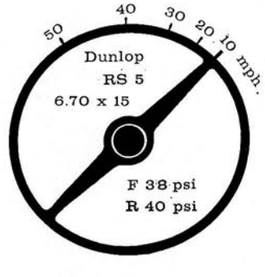


(1) Glove box; (2) Cigarette lighter; (3) Clock; (4) Ignition key and starter; (5) Left-hand fog light; (6) Reserve fuel tank switch; (7) Right-hand fog light; (8) Heat control; (9) Heater fan control; (10) Radio; (11) Rear window defroster switch; (12) Rear window defroster warning light; (13) Speedometer (with odometer); (14) High beam warning light; (15) Battery charge warning light; (16) Ammeter; (17) Handbrake and brake fluid level warning light; (18) Tachometer; (19) Fuel reserve warning light; (20) Windshield wiper and washer; (21) Oil pressure gauge; (22) Oil temperature gauge; (23) Turn signal warning light (left); (24) Heater fan warning light; (25) Turn signal warning light (right); (26) Water temperature gauge; (27) Fuel gauge; (28) Instrument panel light switch.



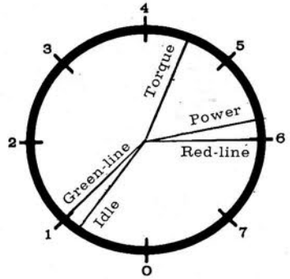






Steering Behavior

Wheel position to maintain 400-foot circle at speeds indicated.



Engine Flexibility
RPM in thousands