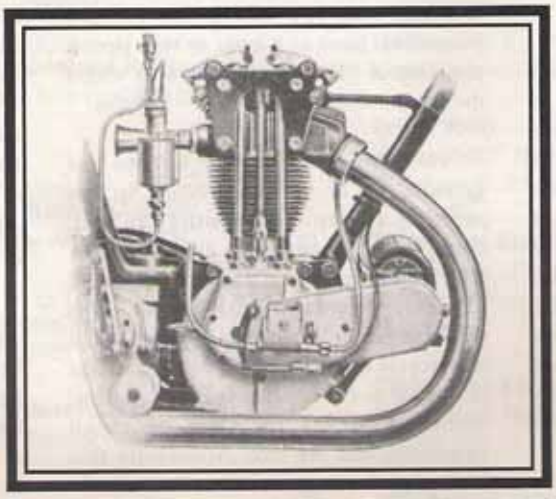
SUSSING OUT the "Big Port" A.J.S FLAT TANKERS 1923 – 28

Three consecutive Junior TT wins and a never-to-be-equalled Senior class win on a 350cc machine isn't such a bad way to attract the kind of worship that legends are made of. That indeed, was the record established by A.J. Stevens & Co.Ltd between 1920 and '22. Their trim 349cc OHV singles proved themselves in the heat of competition and were entirely the work of the talented Stevens brothers, four men who new the motorcycle business inside out.

This phenomenal run of racing success wasn't without its critics however, even cries of foul play! After all, weren't the Tourist Trophy series in the Isle of Man meant to prove the worth of catalogued models, generally available to the buying public? AJS didn't list an OHV 350, their post-WWI range relied entirely on side-valve power and the "Overhead" was undoubtedly a factory special. More, in each of the three Island winning years the layout was different and obviously experimental; culminating in 1922 with an exhaust port and pipe of enormous proportions exiting horizontally from the head. A "Big Port".

The company laid the complaints to rest though, in the Autumn of 1922, when they released details of a new super sports model with an engine based on the TT machines. A combination of experiences if you like, because the catalogued design was not exactly the same as any of its pure racing predecessors. Its official name was the "2 3/4 hp Three Speed Overhead Valve T.T. Model", soon to be listed as Model B3; unofficially of course it immediately became the "Big Port" Ajay and, as a sign of its lasting enchantment, it still is today.

For the following six years the "Big Port" continued, with many changes, but always retaining its basic rightness for everyday and sporting use. In 1929 the makers, one year behind most of the industry, changed the format considerably and away went the Vintage flat tank look and with it much of the lightness and vitality that had made the machine so exciting. The years in between have left today's enthusiast with a choice of desirable mounts from which to choose BUT, can you tell a '23 from a '27; a '25 from a '26? Do you know if you're buying an original bike or a mixture, even a mix of SV/OHV parts perhaps. Read on and you will know a flat tank "Big Port" from your elbow and, for all time! Remember, we're only concerning ourselves with production models, the factory went on racing one-off OHV specials for most of the Twenties.

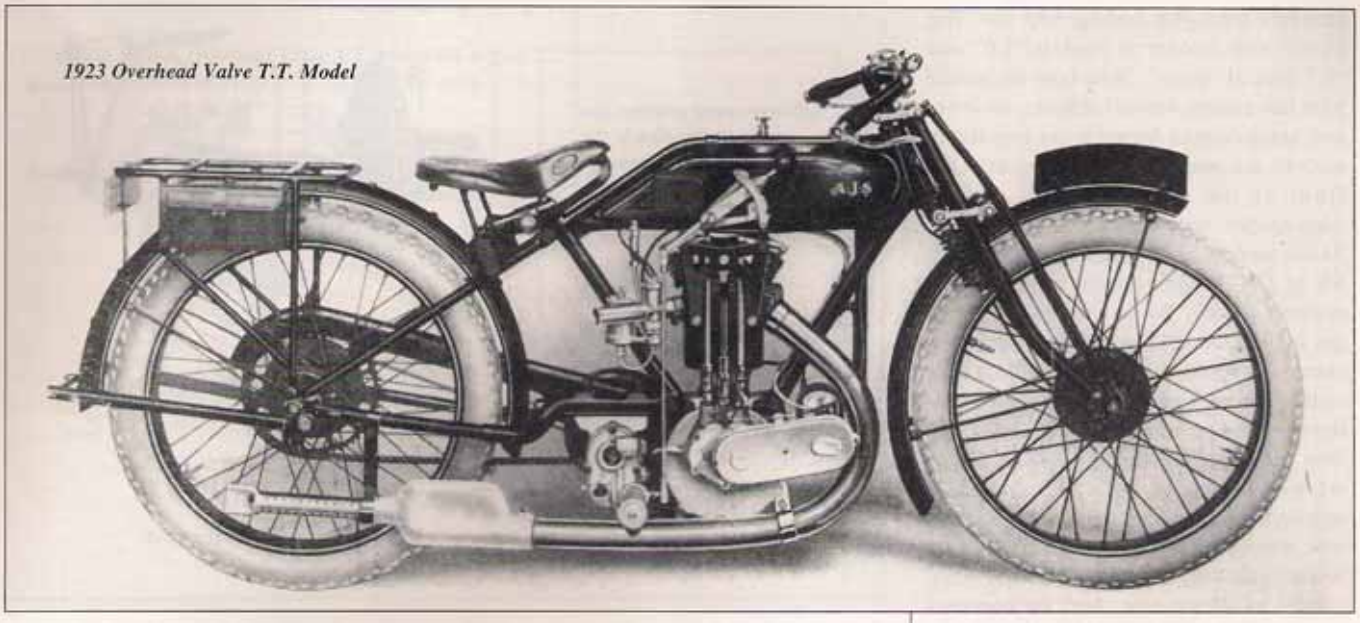


1927 Model H6 in close-up, note the enlarged timing chest enclosing the exhaust valve lifter and sight-feed Pilgrim oil pump

Let's set ourselves a marker first off - when you go to look at a flat tank Ajay and want to know whether its vital parts have been with it since birth, how can you tell? Well, it was the makers practice to stamp engine, gearbox and frame of each machine with the self-same letters and numbers (the engine and gearbox identities usually being stamped into a brass tag riveted to the castings, while the frame code was stamped into the offside of the saddle tube top lug). Differing series of stampings on any of these three components will indicate a change having been made at some time during the past seventy years. From 1925-on, Ajays adopted a year letter prefix to their numbering systems so, you can readily tell whether or not the main bits even started life in the same model year. Keep these prefix letters firmly in your head: E = 1925; G = 1926; H = 1927; K = 1928. Before 1925 you will need to be familiar with design changes and numberings, as the letter "B" followed by a model number was the simple coding system used.

Looked at outwardly, the 1923 and '24 "Big Ports" may seem to be identical, they share the same frame layout, head and barrel profiles and so on, but there were a number of significant changes made. The catalogue specification for the 1923

1923 Overhead Valve T.T. Model



The first production 349cc OHV model from the A.J.S. factory, was included in their 1923 Preliminary List, issued during November 1992. Following considerable experience with this engine layout for Road Racing during 1920, '21 and '22, the 1923 production machine embodied many of the lessons learned on the track. The actual catalogue specification is given below and should be considered against the various annual changes affecting this machine as it progressed through the "Vintage" years.

Engine:
Single Cylinder 74mm x 81mm Bore and Stroke, 349cc capacity, fitted with detachable head. 1" i.d. Inlet/1 7/8" i.d. Exhaust ports. Aluminium Piston, Roller Bearing to Big End of Connecting Rod. Large Mechanically Operated Overhead Valves. Adjustable Tappets. Efficient Cooling. Large diameter Exhaust Pipe, carried to rear, with Detachable Expansion Chamber. All reciprocating parts are lightened and the Engine is specially tuned and timed for hill climbs and speed events.

Carburettor:
A.M.A.C. Two-Lever.

Frame:
Scientifically Constructed, Lightness with Strength.

Tank:
Improved Design, 1 1/2 gal. Petrol. 1qt. Oil.

Lubrication:
Semi-Automatic Hand Pump.

Ignition:
"Lucas" Magneto, Handlebar Controlled.

Chains:
"Hans Renold" 1/2" Pitch x 5/16" Wide. A Shock Absorber is fitted to the engine shaft.

Chain Guards:
The top half only of the Chain is covered, providing easy access to the Sprocket and Transmission.

Gear Box:
A.J.S. Countershaft Three-Speed Gear, fitted throughout with Ball Bearings. Operated by our Patent Gate Change Speed Lever. The Gear Box is of the close ratio type, giving 5.52, 6.78 and 10.3 to 1, with a 21-tooth Sprocket.

Clutch:
Hand-Controlled, Multiple Plate with Cork Inserts.

Wheels:
Flat Base Rims, Rear Wheel A.J.S. Patent Quick Detachable.

Tyres:
650 x 65mm Hutchinson Heavy Rubber Studded.

Mudguards:
Straight Guards, without Side Valances.

Brakes:
Front and Rear Internal Expanding Type. Rear Brake operated by Pedal on left hand side of the machine, Front by Lever on Handlebar, both are extremely powerful and smooth acting.

Forks:
Latest Pattern, "Druid".

Handlebars:
T.T. Racing Type.

Foot Rests:
Fitted instead of Footboards.

Stand:
Fitted to Rear Wheel only, "Kick-up" Type.

Carrier:
Built of Steel Tubing, with Welded Flush Joints. The Carrier can be detached for speed events and hill climbs.

Tool Cases:
Two Pannier Bags, with Full Kit of Tools.

Starting:
No Kick-starter is fitted.

Finish:
Finest Black Enamel, Four Coats on Special Rust Preventative Process, including the Handlebars, only a few parts are Nickel-Plated.

Measurements:
Wheel Base 4 feet 5 1/2"
Height of Saddle from Ground, 28"
Ground Clearance 5"

Weight:
Approx. 204lbs.

Speed Approximately 70 M.P.H.

PRICE – £87

machine is given in full here, to establish a benchmark against which all later alterations may be considered.

For 1924 double (inner & outer) parallel valve springs replaced single conical springs to each valve. Valve stems were grooved to accept split collets for retaining the spring top collars, rather than the drilled hole and round pin fixing used in the first year. Note, for both years, that the barrel finning is symmetrical top to bottom and that the inlet port in the head is cranked well to the offside, to clear the saddle down tube; Amac two-lever carbs were standard wear. Druid pattern side-spring front forks had friction dampers added to the rear of the top links in '24, but as a conversion set was listed by the works to update earlier models, they could easily feature on a 1923 model today. The rider's footrest hangers were suspended from a single through-rod during '23, whereas the next season a system of two rods passing through the engine plates, one above the other, replaced the earlier design. Naturally, to keep the footrests at the same height, the 1924-on hangers had to be of unequal length. Whilst the 1923 "Overhead Valve T.T. Model" came without kickstarter, in '24 for a short time at least, there was a choice in this matter. Two model variations were listed - the "T.T. Model B3" now with a foot pedal starter housed in a rearwards extension of the gearbox casting and, the "Special OHV Model B4", push start only, stripped of its rear carrier and with a high-comp piston for Sprint work. Probably less than 150 of the B4 were actually made.

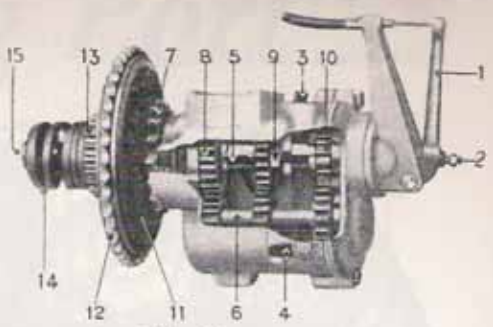
Revisions to the frame and cylinder barrel layout are immediately evident on the 1925 models, first season of the

factory's letter-year coding, with the "Big Ports" now known as models "E6" and "E7 Special Sports". Note how the saddle tube has a more vertical attitude, its lower end being lugged between the two fixing slots on the gearbox bracket (it went to the front of the slots in 23/24). Frame dimensions became common to all the 349cc models in the AJS range, so either SV or OHV engines could henceforth be accommodated. Previously you couldn't get a 1923/24 OHV motor to fit into the same year's side-valve frame. Try it! Other cycle parts remained unchanged, however the petrol/oil tank had its filler caps moved onto the nearside, while oval shaped cups were soldered to both sides to take redesigned rubber knee grips; the tank was now supported on two lugs brazed to the lower tank rail, having previously been clipped to the top tube. And, for concours perfectionists, note should be taken of the "stylised" rear licence plate which first appeared this season and featured on all AJS machines until the advent of electric lighting sets.

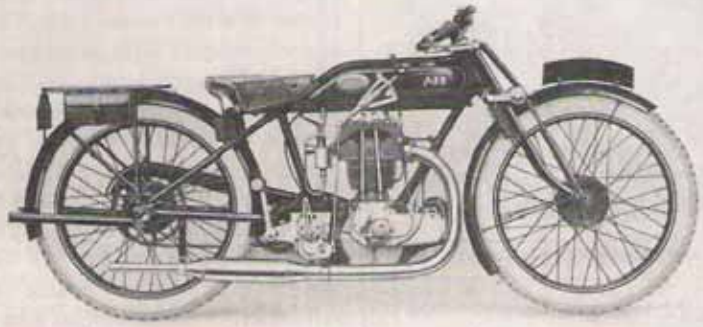
Revised gearchange gate and lever for 1926, plus a good view of the oval knee grips adopted from 1925 on.

Tapered finning towards the barrel base was a new feature and the inlet port was brought round onto the centreline of the bike, giving a more or less straight through passage for the gases. The repositioned saddle tube allowed for this mod and there was a change in maker for the carburetter, with Binks of Eccles becoming the company's supplier. The 2-jet Binks was standardised, with the 3-jet version at extra cost. Binks cast-in the AJS logo on all float chamber tops, for the Wolverhampton firm and stamped the mixing chamber bodies with the AJS model and year codes. Twin head steadies appeared, running to a single clip on the front down tube and a positive feed to the big end was introduced, via a drillway in the driveside crankcase, with the option of mechanical lubrication being offered for the first time. An AJS/Pilgrim pump, mounted on the magneto drivecase and driven from the exhaust camshaft cost an extra £1.15.0 (£1.75). The impecunious continued to rely on the good old hand pump within the oil tank compartment. Port sizes were tinkered with, to bring the exhaust to 1.50" i.d. and the inlet to 1.25" i.d., something which will have the purists telling you that real "Big Ports" were only made in 23/24; believe what you will. Rocker return springs were deleted and new one-piece rocker arms in Dural replaced the earlier built up steel items but, the changeover wasn't 100%, as late as 1927 the earlier design was still being fitted by the makers. The "E7 Special Sports" followed this general layout but, down in the bottom-end there were worthwhile improvements because the mainshafts and timing gear ran on ball/roller bearings, so the cases won't interchange with the plain bearing E6 engines. 26"x2¼" tyres replaced the 650mmx65mm on the E6 and, just possibly, you could come across an E7 with wired-edge tyres. Dunlop had a range on the market by March 1925 and the AJS

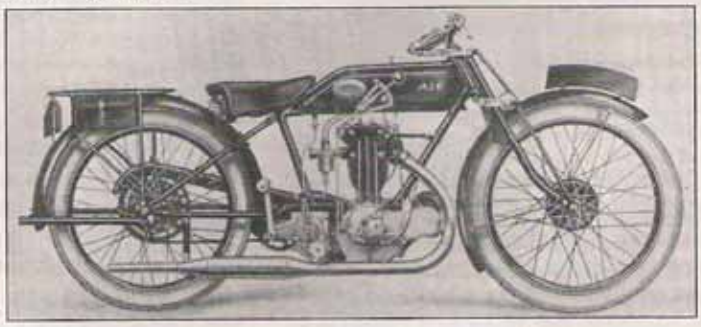
Three-speed gearbox and centre spring clutch, the basic design was common to all flat-tank years; this view shows the 1927-on end cover and clutch operating arm.



1. Clutch operating lever
2. Clutch push rod adjusting screw
3. Oil filler cap
4. Oil level indicator
5. Mainshaft
6. Layshaft
7. Sprocket for transmitting drive to rear wheel
8. High gear dog wheel
9. Sliding Sleeve
10. Low gear dog wheel
11. Clutch fixed plate
12. Clutch sprocket receiving drive from engine
13. Footstarter ratchet wheel
14. Clutch spring
15. Clutch spring adjusting nut

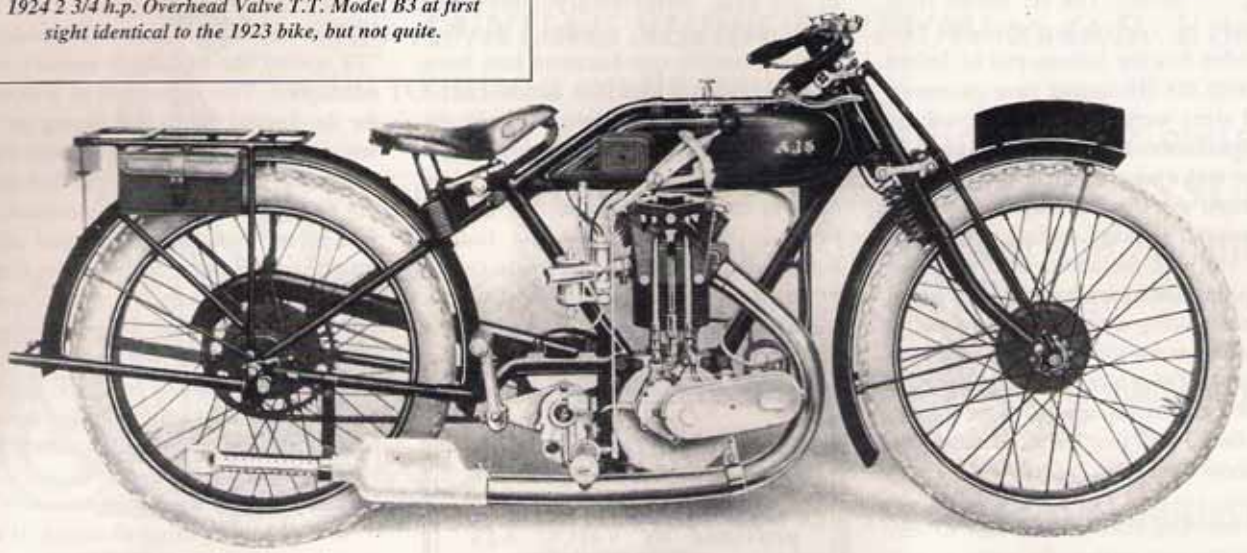


1928 Model K6, last of the flat-tank "Big Port" models, chunkier in outline, but still a Vintage Thoroughbred.

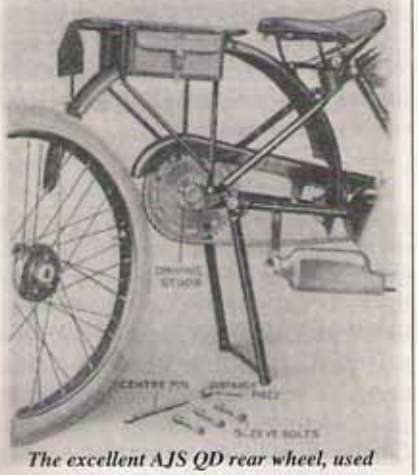


In 1927 (H6) the Terry spring top saddle was standardised, along with twistgrip control and mechanical pump lubrication as standard – at last!

1924 2 3/4 h.p. Overhead Valve T.T. Model B3 at first sight identical to the 1923 bike, but not quite.



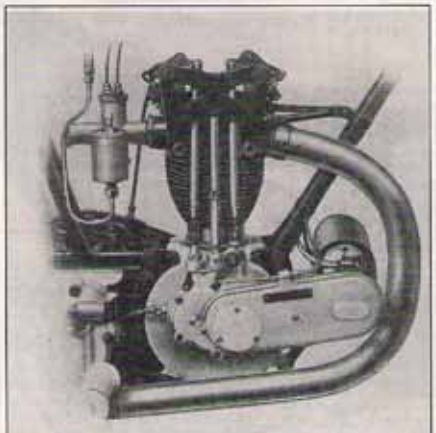
team used them in the T.T. races, some evidence does exist that late season E7 models may have adopted them too. Oh, one last feature you're unlikely ever to see, as it was thrown away in disgust by every right thinking fast lad - Ajays exhausted the gases from the E6 into a transversely



The excellent AJS QD rear wheel, used throughout the maker's range.

mounted touring type silencer on the earliest 1925 bikes. Strewth! The optional curved pipe with rear mounted lozenge shaped silencer and pinched tailpipe were soon reinstated but, purists again note, the lozenge silencer was fashioned from steel pressings and finished in Britannia plate. It might look like the cast-alloy versions of 1923/24 but it wasn't, not quite.

The model range was increased for 1926, "G6" being the standard machine, "G7" the special sports version and "GR7" the new "Special Racing" model. Further thinking on port sizes took place, the inlet remaining at 1.25", the exhaust increasing to 1.5625" i.d., additionally the external diameter of the exhaust port was now threaded to take a screwed pipe retaining ring. The simple looking inverted "U" bolt securing the head and barrel was changed to a 3-piece goalpost affair, with the crossbar bearing upon a location point on the top centre of the head. Mechanical pump lubrication continued as an extra. The tankside gear change lever and its gate was completely redesigned and the gearbox mainshaft changed to splined type. An option was listed for the very Vintagey leather pan saddle, either a Terry spring top, or the Brooks Supple Seat (a leather top with mattress springing) being offered. Tankage was attended to, the standard combined 1½ gall petrol/2 pint oil flat tank, could be replaced by either a larger combination tank (1¾ gall/2 pint) or a separate 2 gallon petrol and saddle tube mounted oil tank with foot pedal operation of the manual pump; the pedal being positioned beneath the offside footrest. Spec variations on the G7 and GR7 included roller/ball bearings to main and timing gear shafts, high-compression



The 1926 engine, with revised head and barrel fastening and screwed exhaust port of just 1.5625" i.d.

pistons, 26"x 2¼" tyres on G7 and 26"x2.375" on GR7, plus on GR7 only a specially finished cylinder head, T.T. handlebars, alloy clutch plates and chainwheel.

In 1927 the "Big Ports" were back to just two models, "H6" and "H7 Special Sports". Port sizes couldn't be left alone so down went the inlet to 1" i.d. and up went the exhaust to 1.875", with a steepened exit angle and finning of the stub, leading into a sweeping pipe with a long tubular silencer and plain tailpipe. At the bottom-end, the timing case was redesigned so that the exhaust valve lifter mechanism was now concealed within the case and the crankshaft on the standard model became supported by roller bearings. Not true bearing races though, the rollers ran directly on the mainshafts with hardened steel cups forming the outer track in the crankcase halves. A new Pilgrim mechanical pump with sight feed (non-sight on the 1925/26 AJS/Pilgrim optional pump) was now a part of the catalogue specification. There were distinct changes too to the clutch operating lever on the gearbox end-cover and a gear set of heavier section was adopted, interchangeable with that of the 500cc machines first seen in 1926.

On the cycle side the frame headstock was enlarged in diameter with an improved type of headrace, this also permiting an increase in handlebar stem diameter from ⅞" to 1"; which might help to explain why that pair of bars you bought recently for a Vintage AJS just fell into the headstem of your 1927-on bike. Friction dampers on the forks were now moved to the forward ends of the bottom links and the Terry type of saddle was standardised. Wired-on tyres had certainly become the norm by '27 and

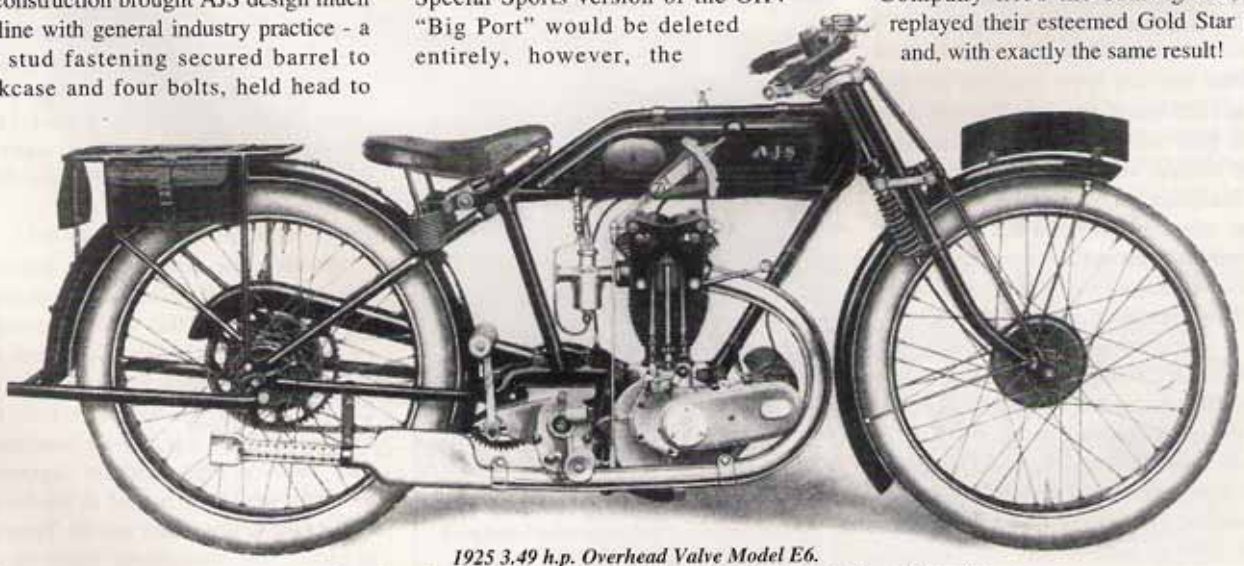
the H6 was fitted up with a pair of 26"x2.75" covers. The H7 varied from standard by continuing with the full ball/roller bearing bottom-end of before (but with the H6 timing case changes), wheel sizes were 26"x2.375", toolbags were fitted either side of the rear guard (no carrier) and a separate alloy rear sprocket on a light steel brake drum/hub helped save weight. Tankage options were as for 1926, but with the addition of a pair of huge pannier tanks enclosing the frame top tube and holding a total of 3½ gallons; a rectangular metal toolbox was added atop these tanks. Other niceties common to both models were twistrip control of the throttle and a finned lock ring for the exhaust pipe to cylinder head joint.

So the "Big Port" moved into its last year of flat tank styling, the world around it was changing, cobby saddle tank designs, heavier maybe, but with eye appeal so far as the buying public were concerned, were beginning to assert themselves. A handful of the big makers, AJS, Sunbeam, Norton, Triumph, hung on for '28, but they realised their mistake quickly and just had to redesign for the next season, simply to stay in business. For '28 then, the models became "K6" and "KR6" and while exhibiting a heavier outline than before, were still relatively spindly and Vintage in character. 26"x3.00" tyres and rims beefed up appearances for a start, the combined fuel/oil tank remained trapped between the frame tubes but extra width now gave a standard capacity of 1¾ gallons of fuel; moreover, the time honoured construction method of soldered tinplate, gave way to welded steel. Frame lugs were widened to accommodate new crankcase and gearbox castings, from 2¼" to 3⅜" and 1⅝" to 2" respectively. Radical changes to the top-end construction brought AJS design much into line with general industry practice - a four stud fastening secured barrel to crankcase and four bolts, held head to barrel; sweeping away the goalpost set up of the past. Surprisingly, port sizes remained as for '27; perhaps a sign that every possible combination had been exhausted (sic) at last! The bottom-end of the K6 now reverted to plain bushes for the crankshaft bearings and two piece oiltight tappets were introduced, along with wider faces to the cams. More beefing up was evident in the gearbox, the longer mainshaft (because of the wider cases) being of increased diameter and with a splined end for the kickstart quadrant, in lieu of the earlier simple square. Side spring forks were retained, but of heavier construction and a front brake drum of pressed steel superseded the earlier cast item. The old single point stem saddle fixing was also altered, into an elaborate 3-point design, part of which formed a T-piece extension to the frame, jutting rearwards from the lower tank rail. With the chain driven OHC model in the AJS range now taking the more sporting, racing role, it might have been anticipated that the Special Sports version of the OHV "Big Port" would be deleted entirely, however, the company's experience with cammy racers in the 1927 TT had not been a happy one, in fact, they were to race OHV models in '28 whilst the camshaft motors were redesigned. This move lead to a reprieve for the Special Sports and during the '28 season Model KR6 was introduced based upon the TT machines. For the first time a dry sump lube system was adopted, the feed/return pump being mounted on the mag drivecase cover, with a direct feed to the cylinder base controlled via a needle valve. The cylinder base flange was thickened and the bottom-end again featured all roller/ball bearings; gearbox without kickstarter provision and separate fuel and oil tanks were all standard KR6 items.

In compiling this article, we must acknowledge the invaluable help and assistance provided by VMCC AJS Marque Specialist Ray Carter, Ivan Rhodes and, above all VMCC Vice-President Les Henshaw whose involvement with the "Big Port" models goes back to when they were new. Les's kindly prodding over the years to get something into print, has been the inspiration behind the research.

In 1929 everything changed, it was almost as though the Design Centre people of the time had suddenly ousted the four Stevens brothers from the stage. Appearance was all, twin-port heads were the vogue, saddle tanks had to be specified - with Magenta coloured panels no less - the slim, black, Vintage projectiles, basic in outline but absolutely functional and perfectly suited to the job in hand were no more. It wasn't the end of the line of course, for the OHV 350 AJS continued on into the Thirties as a mainstay of the range. Not for long though, because the entire Wolverhampton business met its untimely end in the depression of 1931.

Strange to relate, but that was the very year that AJS themselves first used the model name "Big Port", splashed it across their catalogue in fact. Not that the "SB6 Big Port" was from the same mould as the earlier bikes, they were trying to cash in on past glories at a time when sales from anywhere were only too welcome. Forty years later, the Birmingham Small Arms Company tried the same game, they replayed their esteemed Gold Star name and, with exactly the same result!



1925 3.49 h.p. Overhead Valve Model E6.
Note that the tank was supported from the bottom tank rail, not clipped from the top tube as shown in this illustration