

# Technical Feature - Wheels (Part 1)

There are three distinct stud patterns used on Jaguars. Some wheels are interchangeable and some are not.

## Mark V to XK 150

The first Jaguars to be fitted with bolt-on steel wheels were the Mk V and XK 120 of 1948, and although their 5x16 inch rims might seem spindly today, they were a huge step forward from the 18 inch wires fitted to the Mk IV and SS cars. The stud pattern (PCD = Pitch Circle Diameter) was 5x5 inch, indicating five studs arranged in a 5in circle. The studs themselves were  $\frac{1}{2}$  inch UNF with RH threads.

From the end of 1952 the rim width increased to  $5\frac{1}{2}$  inch, initially identifiable by small indentations either side of the valve and then the characters "5 $\frac{1}{2}$ K" stamped into the rim. Standard fitment tyres were 6x16 inch on both rim widths.

There is one other characteristic to be aware of in that chrome dressed rims cannot be fitted to early wheels, as the slots are not big enough to permit the special clips to pass through. However, all hubcaps are interchangeable. There is no reason why a later, wider rim cannot be fitted to an early car.

## Mark 1 and Mark 2

With a further reduction in wheel diameter to 15 inches, a smaller PCD must have seemed appropriate, and so 5x4 $\frac{3}{4}$  was chosen as the Mark 1 was introduced (though the larger PCD was still used on the XK and Mark VII-IX range).

This new PCD choice has proved to be quite fortuitous, as it is the same as that used by many General Motors cars right through until the early '80s and some, including the Corvette, to the present day, thus making available a huge array of aftermarket alloy wheels.

One thing to note, the metric conversion of 5x4 $\frac{3}{4}$  inches is 120.65mm, very close to the Euro standard of 5x120 as used by BMW etc. There might only be half a millimetre or so in it, but fitting 5 x 120 wheels will render a Jaguar technically unroadworthy and can cause vibration and balancing problems.

The Mark 1 and early Mark 2 cars were initially fitted with 4 $\frac{1}{2}$ x15 inch rims, but in late 1960 the width was increased to five inches, identifiable both through the size stamping and the step now visible where the hub and rim pressings meet.



The first Jaguars with bolt-on wheels were the Mark V and XK 120.



From 1953, the 16 inch rim width increased from 5 to  $5\frac{1}{2}$  inches



The Mark 1 and early Mark 2s had 4 $\frac{1}{2}$  x 15 inch wheels, but the later cars up, to the 240 (shown above), had 5 x 15 inch rims.

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Chrome hub caps were standard but spring-loaded dress rims remained an option, as did the all-enclosing Ace wheel covers. This wheel remained in use to the end of 240 production in 1968, with a nominal tyre size of 640/H 15 which translates (closely) into the radial size 185/H 15.

## Mark X and 420G

For the Mk X of 1961, Jaguar again reduced the wheel size to 5½x14 inches in an attempt to standardise with the American tyre sizes of the time.

The resulting ER70/14 tyres were both wide and tall, allowing a soft ride with reasonable grip. However, 14-inch tyres, though still available, are a rarity these days and it is common practice to fit the later 15 inch XJ wheels instead, but in some cases (with 215/70/15 tyres) it is necessary to flatten out the bulge in the inner rear wheel arch directly behind the recess for the door edge.

The original wheel size remained constant right through to the end of 420G production, though the rims on 4.2-litre cars were of a slightly different profile to clear the revised brakes.

## XJ6 and XJ12

With the XJ6 came the advent of the modern low profile tyre, and a 6 x 15 inch wheel rim (incorporating eight distinctive slots) to go with it. Initially specified as an ER70/15, the Dunlop SP Sport tyres were developed in conjunction with Jaguar to be a perfect match for the car.

The XJ12 of 1970 brought with it ventilated front discs together with a revised steel rim to clear the wider calipers and an improved SP Sport tyre, this time in the modern size of 205/70VR15. The distinctive 'fluted' wheel allowed greater ventilation, required a smaller hubcap, could be painted silver or optionally chromed, (in which case no dress rim was fitted) and was also the wheel used on Series 2 and 3 E-types in lieu of the customary wires.

With the introduction of the Series 3 XJ range the same steel wheel was retained, but in most applications was covered by a stainless-steel trim with exposed wheel nuts that echoed the underlying shape.

These wheels lacked the three hubcap mounting pins that will damage the trim if it is fitted to an earlier wheel by mistake. Exceptions were certain Daimler models that also included a hubcap.



**The Mark X/420G were fitted with 5½ x 14 inch wheels, but it is common practice to fit the later 15 inch XJ wheels and tyres instead. (As above).**



**XJ Series 1 (left) and XJ Series 2 pressed steel wheels look fairly similar and share the same stud pattern, but the later wheel has a distinctive 'flute' to allow greater ventilation requiring a smaller hubcap.**



**The first Jaguar alloy wheel was this "Kent" type. Initially 6 x 15 inches, it was standard on the early XJ-S.**

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## From Steel to Alloy - "Kent"

Still with the same PCD, Jaguar's first bespoke alloy wheel (the commonly used Wolfrace and Minilites were always an aftermarket fitment), became known as the 'Kent' after the division of engineering giant GKN that produced it.

Initially 6x15in, it was fitted as standard to the XJ-S (optional on V12 saloons) and featured dark grey painted recesses between polished spokes, with an outer ring of rectangular holes for ventilation.

This same design had a second lease of life in the 1980s when it was widened to 6½ inches, painted grey/silver and fitted to the Daimler Double Six.



## "Starfish"

The XJ-S HE of 1981 abandoned the 'Kent' alloy in favour of a domed five-spoke wheel commonly known as the 'Starfish', which for the first time in over a decade increased the rim size, even if only by half an inch in width (from 6-6½ inch). The tyre profile remained at 70, so the increase in tyre width from 205 to 215 also produced a slight increase in height.

Pirelli had by now supplanted Dunlop as Jaguars preferred supplier, though a spate of sidewall failure in the new P5 would test the relationship severely.

These 'Starfish' alloys will fit a saloon, but must be swapped together with the special extended nuts used on the XJ-S.



## "Pepperpot"

The introduction of the Jaguar Sovereign in 1982 brought with it another GKN wheel, the 6 x 15 'Pepperpot', which featured two rings of twenty holes each.

Fitted to both six and twelve-cylinder cars, it remained current until the end of Series 3 production in 1992, and was also standard fitment on the 3.6-litre XJ-S prior to the 1987 update.

'Pepperpots' can be fitted to any XJ model without modification, and can use the same (chromed) wheel nut as required for the original Series 3 stainless trim.



## "Lattice"

One important aspect of the 1987 XJ-S update was the introduction of a new 7 x 15 inch 'Lattice' style wheel, wearing 235/60/15 rubber.

Now commonly available second-hand and interchangeable between all XJ models, they are a bit of a mixed blessing with the obvious handling benefits of a lower wider tyre offset by the obtrusive road noise of the standard fit Pirelli P600s - a situation compounded by the lack of a viable alternative tyre now that 16 inch wheels have become the norm.

There was, in fact, a 16 inch version of the 'Lattice' wheel, fitted to the Le Mans special edition XJR-S, but although undoubtedly elegant, these are now few and far between.



## Metric Adventures - XJ40

Some things just aren't meant to succeed. Take the BetaMax video recorder for example. All the experts agreed it was the better format, but for a variety of reasons, VHS was the one people bought.

A similar situation developed in the late 1980s within the automotive world when it was decided that as most cars (USA excepted) were built to metric dimensions, why not make the wheels metric as well, not to mention taking the opportunity to improve the way in which the tyre bead was secured to the rim, and so help maintain vehicle control in the event of sudden deflation. A brilliant idea all round then? Well, perhaps not.

The 390mm metric Dunlop TD rim incorporated an extra groove into which the enlarged tyre bead locked, helping prevent the tyre from coming adrift should it deflate.

By the early 1990s, any technical advantages were taking a back seat to the fact that TD tyres, at the time produced only by Dunlop and Michelin, were around twice the price of a conventional tyre and offered no real-world advantages. Having introduced metric wheels with the XJ40 in 1986, by 1992 Jaguar was beating a hasty retreat and reverting to a traditional 15 inch rim (in the same styles), except of course in the US market where government regulations had always insisted on imperial wheel sizes.

TD tires are still obtainable but remain fairly expensive. 15 inch tyres should on no account be forced on to a 390mm metric wheel. Except those chasing a perfect concours score, a set of later 15 inch or 16 inch wheels with conventional tyres, really is the only viable option.



**Metric 390 x 180 TD35 "Teardrop" rim fitted to XJ40 Sovereign and Daimler from 1986 to 1992**

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## XJ40 1993 Model Year

The XJ40 continued the practice of fitting steel wheels with covers to the XJ6, and alloys on both the "Sovereign" (nuts exposed) and the "Daimler" (nuts hidden), but with the 1993 Model Year upgrade came both an increase in rim size across the board to 16 inches and the introduction of a new model — the "Sport", positioned between the XJ6 and "Sovereign". The 3.2S and 4.0S models were immediately identifiable by their egg crate grille and five spoke alloys — similar, but not quite the same as those fitted to concurrent XJS models.



XJ40 Sport "Five Spoke" Alloy

## Steel Wheels vs Alloy

The period 1992-1994 can in fact be pinpointed as the time when the alloy wheel surpassed its steel counterpart as the mainstream fitment, with an ever increasing (and confusing) array of styles.

Steel rims would remain an option right through to the end of X300 production, but with the alloy-equipped Sport variants offering so much more for relatively little extra money, the steel wheel XJ6 effectively became a fleet special.



XJ40 steel wheel "Egg Crate" trim.

## XJ-S

Fortunately, XJ-S and V12 Series 3 owners were spared the TD experience, with the mainstream XJ-S models retaining the 15x7 inch 'Lattice' rim well into facelift production (an exception to this rule being the Le Mans special edition of 1988 which used a 16 inch version of the 'Lattice' wheel), and the saloons continuing to use either the 'Pepperpot' or 'Kent' alloy until they ceased production in 1992.

One possible reason for this is that the XJ40 wheel adopted a different offset, with the rim positioned further inwards in relation to the hub flange. This means that an XJ40 (or later) rim fitted to an earlier XJ model can foul the inner wheel arch and/or suspension components, while an early wheel fitted to an XJ40 or later saloon will probably catch on the wheel arch lip.

For the 1993.5 Model Year a new "Five-Spoke" 16 inch alloy wheel became standard fitment on the XJ-S for most markets, and these rims are now highly sought after by owners of earlier cars due to the increasing range and lower prices of 16 inch tyres.



1993.5 XJS "Five Spoke" 16" alloy

For the 1994.75 Model Year, the five-spoke wheel was supplemented by a more elaborate 20-spoke design on V12 cars, while most of the final 'Celebration' cars received diamond turned 'Aerosport' wheels, previously seen on the facelift 6.0-litre XJR-S.

*A word of warning to those on the lookout for second-hand wheels; with the five-spoke, 20-spoke and 16 inch lattice wheels manufactured in both XJ-S and XJ40 offsets, it is vital to establish the vehicle of origin before buying.*



1994.75 XJS "20 Spoke" design

## TWR XJR-S

When the TWR-based XJR-S began, the standard XJ-S wheel size was 15x7 inch. Tom Walkinshaw turned to Speedline, manufacturer of the wheels fitted to his ETCC championship winning racers.

Of similar appearance but lacking the central locking nut, the new wheels were 16x8 inch in size, and on the XJ-S required a different offset front to rear in order to clear both the bodywork and suspension — the front track of an XJR-S is therefore wider than the rear.



XJR-S 16x8 "Speedline" wheel



XJR-S 16x8 "Aerosport" wheel

**Next month - Part 2 starting with the X300.**