Battery 101 for S-Type Jaguar

Background notes and links for S-Type Owners ...

Any write-up of issues about a car battery, and procedures for its testing and replacement, would seem to be eminently ignorable, and yet … here on the S-Type forum, many hundreds of threads and posts have either been focused from the outset or later delved beyond any superficial issues of apparent faults in sub-systems (instruments, EPB, climate control, and even transmission) to identify the real culprit … a failing battery.

The S-Type Jaguar …

From its inception, the S-Type Jaguar joined a growing list of modern, contemporary vehicles whose digital control technology places high demands on the vehicle's battery, especially during cranking and starting when voltage drop may leave little headroom for critical electronics. With more vehicles now of an age when their batteries fail, and many S-Types now occasional weekender rather than daily drive, this subject is timely.

The Battery Voltage Mantra …

Using either on-board diagnostics (ETM) or a multimeter set 0-20V DC between battery posts, and measuring at least 12hrs after any recharge to eliminate residual surface charge ... our Golden Rule is …

- **12.6V and above** = Fully charged; OK to start; no battery related problems likely;
- **12-12.5V range** = Only partially charged; car starts but may show faults; recharge/retest battery;
- **below 12V** = Dead or dying battery; it's time to purchase and fit a new replacement.

notes by “cat_as_trophy” for JF in July '14

Battery 101 for S-Type Jaguar ... background notes and links for S-Type Owners ...

The Problem ….

Our 2007 S-Type is a 2.7L Twin Turbo Diesel with VIN in N8xxxx region, making it both quite late production but also one of the rare diesel imports here. Rare, because Australia (not sure of NZ?) was the only ROW market outside UK&Euro to ever see this variant. I guess high compression imposes more cold cranking (cc) demand, so battery specs are higher than for any S-Type petrol variant.

This S-Type had been traded at Autohaus, but swapped out of that division into the second hand lot of its sister Ford dealership who were keen to quit the Jaguar and cut a great cash deal including making good any defects. Once inspected and test driven, I felt that all it needed was to refurb the 18" Mercury wheels. They did agree to this, the cash discount, and also a tank of premium diesel.

Then, a major setback during the 2 weeks while getting the wheels unshod, repaired, refurbed, polished, then re-shod … rather than a bunch of photos of the now polished and gleaming car, there also was a very anxious plea to delay my planned purchase and pick-up date because of complete failure of the EPB module and actuator.

Both brake warning lights were lit; that in the gauge flashing; and the amber CEL lit also. Both the control module and actuator were replaced with new parts (total cost $3,000 parts plus labour); took another 2 weeks to complete, but I finally took delivery. The dealer stood by our agreed price and no mention of battery charge issues.

Recent long "rests", with only infrequent charging have seen these faults return … and then disappear with every recharge and reset.

The Research …

Battery World is a specialist in supplying batteries for cars, trucks, tractors and myriad other applications. Apparently, they contract to supply mission critical applications like NSW Ambulance Service vans with Varta Silver Dynamic batteries of premium spec but rated higher than OEM Jaguar Varta unit … and these (plural?) are fitted to each and every ambulance and subject to periodic replacement.

Who cares? Not me … until now! As a somewhat retired health professional, I have been far more focused on what has befallen *who's inside* rather than *what powers* the ambo or its equipment. The compelling point made by a very knowledgeable Jesse at our local Battery World at Coffs Harbour … and be assured I have no affiliation whatever with Battery World or Varta … was as follows ...

With regular fleet service and replacement, even a centre like Coffs (pop 75,000) has 1 or 2 of these expensive batteries in/out of his shop each week. Even with its German manufacture and shipping, tracking showed that all his were made and shipped within the past 2 months, and I could choose from 3 received in the past fortnight.

Wow! What an improvement over the OEM import and dealer sale of my new vehicle to first owner .. that battery was manufactured (or swapped in … see later) in late '06; the car built then Aussie compliance plated June '07 and delivered late '07. This means my OEM battery was already 1yr old when my S-Type was new, but it was now nearly 8 years old, and proving to be quite unreliable.

Link to Battery World in Australia … Store List | Battery World

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STEP #1 *What Battery is specified for my 2007 Jaguar S-Type?*

The following chart is from JTIS section 414.01 Published 11-May-2011

Battery Specification	Vehicle Specification		
	Europe	Europe	Rest of World
Engine Specification	**Vehicles fitted without electrical optional extras**	**Vehicles fitted with electrical optional extras**	**All vehicles**
Vehicles fitted with 2.5L engine	80Ah	90Ah	90Ah
Vehicles fitted with 2.7L Diesel engine	95Ah	95Ah	95Ah
Vehicles fitted with 3.0L engine	90Ah	90Ah	90Ah
Vehicles fitted with 4.2L engine	90Ah	90Ah	90Ah

Battery Cold Cranking Specification	Specification
95 Ah Battery Cold Cranking	800 Amps
90 Ah Battery Cold Cranking	680 Amps
80 Ah Battery Cold Cranking	640 Amps

STEP #2 *What Battery was fitted in my 2007 Jaguar S-Type?*

Stamped “06” (top of neg post) labelled with Jaguar Part # = **Varta 4R83-10655-BA** … OEM Rating Label = **12V 90Ah 720A(cc)**.
What happened to the **95Ah 800 A(cc) OEM battery**? Perhaps, it now rests inside some other very worthy car? I hope it's a Jaguar. LOL

STEP #3 *Battery not holding full charge, so get it tested ...*

Battery Voltage measured at = **12.2V** (immediately after recharge, but dropping surface charge overnight to read **11.9V**)
Cold Cranking measured at = **520A** **(**which is **28% less than label rating** …and **35% less than correct OEM spec**)
Battery Voltage during cranking = **7.1V** (captured with a 15sec current draw of half cc spec = **360A**; looking to hold **above 9.2V**).

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STEP #4 *Links to Varta Replacement Batteries for Range and Specs ...*

Battery Data Sheets can be downloaded in pdf format using the following links ...

Link to Varta Silver Dynamic Varta Silver Dynamic

Link to Varta Blue Dynamic Varta Blue Dynamic

Link to Varta Black Dynamic Varta Black Dynamic

Varta Range	ETN Code	Voltage	Capacity	Cold Cranking	%CC of OEM	Weight	Size
Silver Dynamic	600 402 083	12V	100Ah	830A(cc)	122%	22Kg	353x175x190mm
Blue Dynamic	595 402 080	12V	95Ah	800A(cc)	110%	21Kg	353x175x190mm
Black Dynamic	590 122 072	12V	90Ah	740A(cc)	100%	21Kg	353x175x190mm

STEP #5 *Purchasing, testing, charging, then fitting new battery ...*

Varta H3 Silver Dynamic Battery, as recommended …

Quoted RRP incl gst = AU$375 less discounts
Nett new battery price = AU**$340**
Comparative o/s markets = GBP80-90; US$150-190?

New Battery Voltage tested at = **12.66V**
Cold Cranking measured at = **837A** (**61% more than old**)

Fitting into vehicle should be offered if required by the customer.

Charging should be undertaken in-car prior to re-connection of the main negative cable. The positive terminal cap contains a plug that we will not need … the flexible vent tube with its little plastic elbow must be refitted into the vent hole in the nearby upper end of the new battery case … and all fixings torqued to specification.

Be aware that the vehicle (save boot/trunk with its open lid) will be secured and fully armed. Use the key/fob to unlock the car. Final task is now to reset the clock, climate and trip controls; adjust and reset all memory settings for seats, mirrors, steering, pedals, also window and roof controls. Trim and refit the battery post covers.

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STEP #6 *Purchasing and using a new multi-stage "smart" battery charger ...*

If, like us, you already have several chargers, then this discussion about buying a multi-stage "smart" charger solely to maintain your new and expensive car battery, will be easy to ignore, But then I realised that our existing 3-4 chargers were often tied up in use for other tasks … to resuscitate some farm vehicle or other equipment; and the poor Jaguar in town was robbed of a recharge.

In addition, two of these chargers were of the good old "brute force" type … although one would auto-off at full charge. Of the lot, only one would delta sense to maintain a low trickle charge. None had features to suit permanent dynamic monitoring and charging.

The next Eureka moment happened during a visit to our local Jaycar Electronics store, where the manageress recalled an earlier discussion we had concerning the need for a really "smart" charger … one that not only cycles down from full power to trickle charge and even turn off … but if necessary, would then crank back up to maintain full charge irrespective of drain or lack of vehicle use.

I was aware of the **C-TEK** units, but put off by relatively high cost.

Now, I learned about the new **Powertech Plus** chargers … both a 5 step 5A unit that caters for up to 120Ah … and the 7 step 7A unit that is aimed toward a maximum of 230Ah batteries and duplicates all the features of the more expensive C-TEK competitor units.

This latter unit (**MB3606-CA**) includes some highly sophisticated modes that cater not only for Wet, Flooded, AGM and Gel, but also settings for new Lead Calcium technology, full diagnostic analysis, and rescue of batteries with sulphated and stratified acid issues.

Jaycar Electronics … I have appended a link to the online Jaycar catalogue entry and pricing

Powertech MB3606 Smart Charger

I have attached separate PDFs of **Features** and **Product Manual** for the Powertech Plus MB3606-CA, and now integrated into this PDF, a detailed **Pictorial** of new battery installation and charger.

A very useful feature is the inclusion of both the two usual crocodile clamps at the end of one lead-set … but also another lead-set with eyelet terminations for permanent connection into the car's wiring.

Each lead-set has a socket into which the charger lead plugs via polarised connector. The fixed lead includes inline fuse and a soft rubber cap that prevents dirt entry when not in use … a better fix than I had planned … and this allows the boot/trunk lid to be shut and car locked to achieve shut-down and minimise quiescent drain … with the lid closing over lead and with no damage to lead or car.

This makes use of the permanent fit lead-set a very effective and tidy option. Once removed from AC supply and disconnected, this smart charger can be stored in the foam wheel bin. Otherwise, via permanent connection, fully automated battery monitoring and automated charging, will ensure maximum life from the battery.

Jaycar's quoted purchase price ranges from **about $119 to $149** depending on quantity, loyalty or trade discounts. This brings total combined battery+charger package to a **total of $460 to $500**, or about **$50pa**. Expensive, but good value for S-Type peace-of-mind when compared to **$3,000 spent misdiagnosing the EPB failure.**

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Pictorial on Fault Diagnosis involving Battery Testing Battery Replacement and System Reset

Our 2007 2.7L Twin Turbo Diesel in gleaming Liquid Silver … seen here pre-delivery and about to unleash some initially misdiagnosed, and thereby expensive, electronic faults.

Scene of the crime … a spend of AU$3,000 plus (not by me) misdiagnosing and replacing both the EPB module and actuator. The real culprit, dressed in black, is lurking on right of pic. Jaguar and Varta stickers aplenty, but not the correct spec for a 2.7L TT Diesel S-Type battery, and now approaching 8 years old, it was failing to maintain a full charge anyway.

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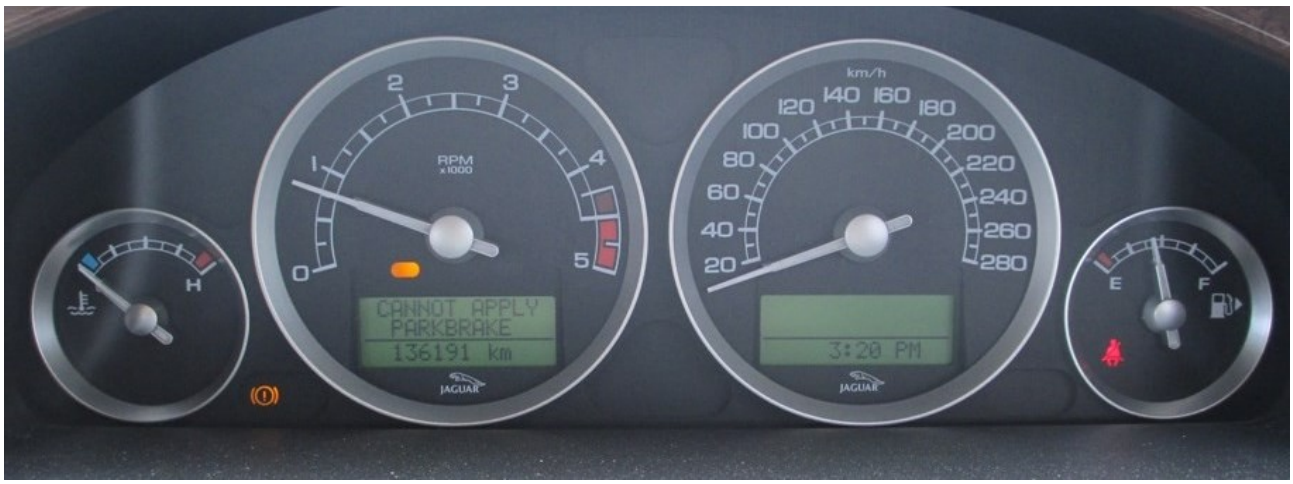

Instrument cluster at cold idle … ABS and amber CEL both lit and EPB showing LH msg CANNOT APPLY PARKBRAKE but missed the flash of brake warning in temp gauge. Two weeks later at dealer expense, new EPB module and actuator appeared to fix the problem.

Lousy pics but … 2 months later, EPB again. Ignition on while pressing trip; then release. Ignore warning lights (but now flashing brake light in gauge). RH message confirms ETM.

ETM display of battery voltage one day after full recharge. Aim for 12.6V or higher. 11.9V needs a new battery, immediately! Despite easy start of high compression diesel, the EPB is only first of the climate, audio, transmission and other systems that will now report faults.

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Varta Silver Dynamic series 12V H3 AGM Battery rated (and tested) in excess of Jaguar's specs for any S-Type (even the TTD) and heart and soul of NSW Ambulances. RRP $375. Note battery post caps not yet trimmed for cables; POSITIVE cap to right carries injection moulded plug (use original vent tube, not plug); central carry handle; and no cell fill caps.

The moulded rim at base of battery casing matches the OEM, as do the o/a dimensions of 353x175x190mm, so fitting of the bolt-down battery strap is straightforward and secure. Note that POS battery terminal is to right, so this is view of side remote from spare wheel.

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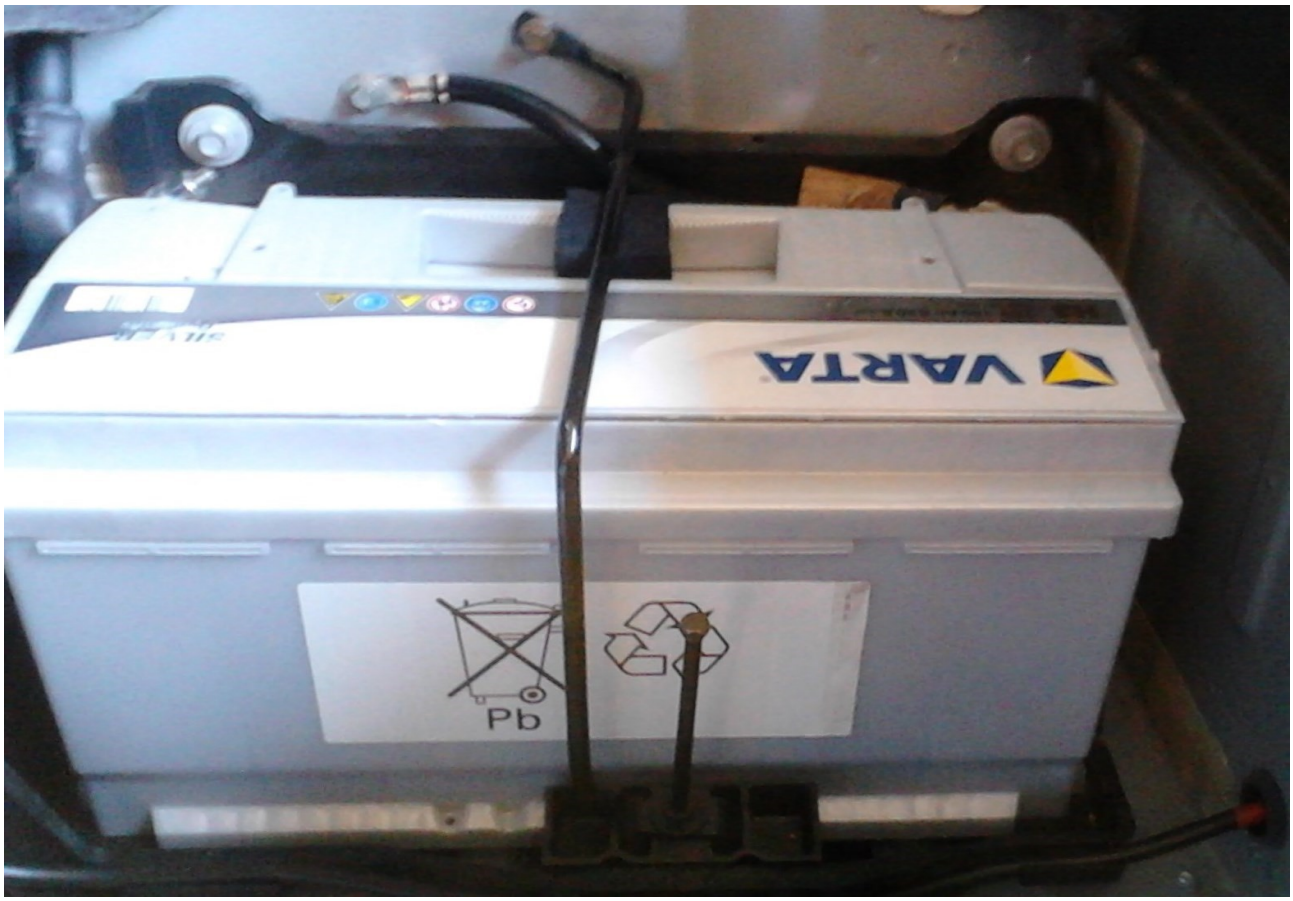
POSITIVE end of new battery showing vent hole at centre right, ready for inserting vent tube elbow, and as yet untrimmed POS terminal cap at left. This trimming out of caps to fit around cables, is a matter of choice and possible debate … with caps neatly trimmed and reinserted, there is protection against accidental shorting, but others will discard them so that the more visible terminals and cable connections are more likely to be maintained.



New battery fitted into tray; bolt down strap secured; cable ends checked and reattached; terminal caps have been trimmed to fit around cables and then refitted into top of case.

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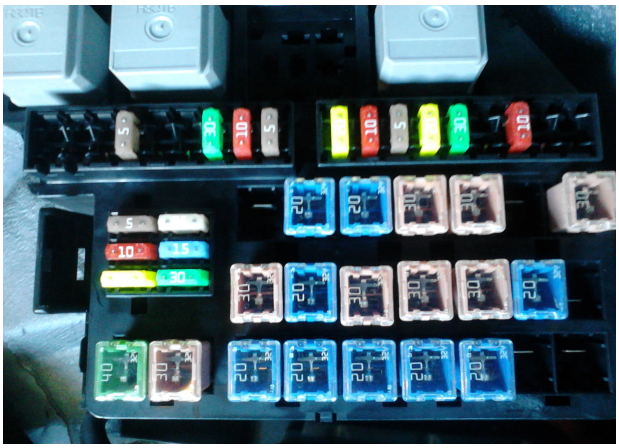
Vent tube elbow fitted into new battery (at left) and detail of trimmed terminal cap (at right). Note clean, well maintained cable terminations ... all evidence of a well maintained vehicle.



Rear Power Distribution Fuse Box (at left) showing vacant #8, #9 at lower right end; and #38, #39 at upper right end … although any post connected directly to BATT POS will be suitable for installation of 10A fuse required for permanent connection of charger lead. Pic (at right) shows charger lead passing into locked boot/trunk, over soft, spongy dust seal.

Powertech Plus 7A “intelligent” charger at work. Lower LED indicates it is set to Mode 4 at 14.7V while upper LEDs indicate that at 75%, “bulk” charge is now switching to “trickle”. A final top LED will light or flash forever as charge moves in and out of “maintenance mode”.

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