The XJ6 Jaguar from Bumper to Bumper

by

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"The Small Print"

This book covers the XJ6 Jaguar from 1968 to 1986 (1987 in countries other than the USA). Even though the later Jaguar sedans are marked on the back with an XJ6 badge they are more commonly known as the XJ40. This book does not cover the XJ40.

NOTE: A statement followed by ....8-) indicates that the statement is made "tongue in cheek" and is not meant to be taken seriously.

There are jokes in this book, don't take them seriously.

If I state that something is "expensive" I mean it has been expensive in the area where I live. By expensive I mean that it costs much more than an equivelent part for a more common automobile.

Suggestions that something "can be done" are not recommendations that it "should be done." Any modifications to the original car are made at the owners risk.

This book is not meant to replace a proper repair manual. This book is a supplement to a good manual. If something in this book does not make sense to you then use your own judgment, that's what it's there for.

The author has made every reasonable attempt to ensure that the information in this book is correct, however no liability will be accepted by the author or the publishers for loss, damage or injury caused by any errors in, or omissions from, the information given.

The XJ6 Jaguar From Bumper to Bumper
Help for the Jaguar XJ6 owner
by Jim Isbell

This book contains things that a Jaguar XJ6 owner should know, but doesn't know who to ask. This book is directed at the TRUE XJ6 and not at the XJ40 which was made after 1986 but had an "XJ6" badge on the back. However owners of other Jaguars may also benefit, as much of the cars are similar. In general, it is written for those who do their own maintenance, although those who don't can still benefit from it.

Some of the contents of this book was contributed by members of the Jag-Lovers list on the internet. Where known, their names are noted.

Major sections include maintenance tips, modifications, and sources for parts. The information is not intended to replace a repair manual, but rather to supplement it.

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If you have a question I may be able to help with, you are welcome to call me at the above number. Please don't call collect, I wont accept the charges.

Those who get the book are welcome to copy or print it for their friends and fellow Jag owners. I only request that changes, comments, corrections, additions and updates be sent to me so we can all benefit.

My first experience with automobile maintenance was at the age of 12 when I bought a 1929 Model A Ford for $40(US). I had never looked under the hood (bonnet) of an automobile before and this one needed an overhaul. Needless to say, I had no more money after the purchase.

I pulled it into the back yard to begin my first overhaul. The first thing I did was to dig a hole three feet deep, three feet wide and 6 feet long. Then I pulled to car over the hole so I would be able to work under it, I had no jack.

The second thing I did was done out of a realization that I knew nothing about what I was doing. I got three 12 foot long 1x12 planks out of the woodpile and laid then alongside the car. Then as I pulled each part, bolt, washer, etc. off the car I laid it, in sequence, along the planks. I knew that if I put everything back on in the reverse order of removal, leaving nothing out, that I could reassemble it.

The process worked and my overhaul was a qualified success. I say a qualified success because there were three things that I learned the hard way during the overhaul. These three things are general in nature so I will repeat them here so any "new" mechanics may benefit from my experience.

The first thing I found was that some merchants are not as honorable as you are. I took my brake shoes to a local parts house and asked for a quote to re-surface them. The quote was $6 (remember, that was a long time ago, I am an old codger) so I left them for the work to be done. I returned several days later to get the brake shoes to find the price was now $12. My father burned up the phone lines and the price was reduced to $6. I had just paid the price, though I couldn't afford it, and left. I learned from that that you have to stick up for yourself and question everything. This is especially true today with the quality of help that many automotive shops employ. And it is doubly true with a Jaguar since so few mechanics have any idea what they are doing when it comes to the Jaguar.

The second thing I found was the rule about tightening bolts on something that has several to tighten. The thermostat housing and radiator hose mount was a cast iron part with two bolts holding it to the head with a gasket in between. I merrily tightened one side down firm and then proceeded to the second side. The result was that the part split right down the center. Even back in pre-historic times those things were hard to find. Remember, always, when tightening down pieces with multiple bolts you must tighten each bolt in turn, a little at a time. The usual sequence is to tighten bolts across from each other in the pattern, but this can vary such as on a head. The correct sequence is usually documented in your standard manuals on the automobile you are working with.

The third thing I learned was scary. After rebuilding the front end I took the car for a drive. The car had been parked at the curb side for the front-end work so when I got in it was already pointed straight down the street. I started the car and headed for the corner. When I got there I found that the steering would not turn! After

manhandling the car around the block with almost super human effort required I finally got it parked in front of the house again and went inside to my father to seek advice.

I discovered that my mistake was that when the king pins would not fit into the axle ends I should not have used a hammer to drive them in. There was tool called a reamer that I should have used to size the new bushings before putting in the king pins. This taught me that what you buy at the parts house is not always ready to use, and it also taught me that if it doesn't fit, seek advice, don't force it.

The above three lessons were learned by me on one automobile in one overhaul and they have stood by me well over the years, heed them.

A fourth lesson, one I use daily, came directly from my fathers mouth, "You can do anything you want to do, you can put a quart of piss in a pint jar if you want to bad enough." Remember that the mechanic who charges you $40 an hour puts his pants on one leg at a time, just like you do, and he isn't any more intelligent than you are.

A few years ago there was a condemned prisoner who willed his body to science to have it cut up in very thin slices from head to toe so that a computer program could be made of the information gained. This book will follow that format with the slices starting at the front bumper and moving back. At each slice I will try to cover all the important information as to what is there and what maintenance needs to be done and how to do it in general terms. The "how to" will not necessarily be a step by step so much as an "essential information that may not be in the manual" sort of thing. It is assumed that you will have some sort of manual to work with, preferably the factory manual.

I strongly recommend you get Kirby Palms XJ-S book if you have a modern Jaguar.

His book is available from the internet or directly. It is full of general auto repair information. See the APPENDIX at the end of this book.

The Front Bumper

The first thing you come to when you start at the front of the car is the license plate. If the law in your locality allows it, you can remove it. The license plate on the front of an XJ6 seems to have been an afterthought. As the design was conceived the car had an adequate cooling system and perhaps in England where the summer temperatures rarely reach 80F degrees, let alone 105F degrees, the addition of a license plate meant nothing. But in warm climates where you need every bit of help you can get, the license plate can rob you of 10 degrees (C) of cooling capacity.

My 1982 XJ6 ran at 85C to 90C on the highway at 70 mph. When I got to the track I would remove the front license plate and the car would run at 75C even though I was running at 120MPH on the straight and averaging over 85MPH for the entire road course.

In order to get sufficient air flow through the radiator you need a smooth flow under the car to draw it through the engine compartment. The license plate destroys that smooth flow and the air tends to pile up somewhat in the engine compartment so get rid of it if you can or at least you can bend it under against the bottom of the bumper.

Next back are the horns which are fastened in the center just below the front bumper. The horns are not anything spectacular. They are just a standard vibrating diaphragm powered by an electromagnet that switches on and off when the horn button is depressed. These are repairable and are not complicated. Anyone can open one up, clean it out, clean the contacts, replace the gasket and put them back in operation. Their location near the road makes them susceptible to getting full of all sorts of junk the gets pushed back to the diaphragm and jamming up the works. The gaskets are paper and tend to deteriorate quickly allowing water into the inner workings of the horn. You should use one of the liquid silicone gasket materials when you put it back together as they will last longer than a paper gasket. BUT.... new horns made of plastic are so cheap that repairs are hardly worth the time unless you are just into the pure satisfaction of being able to say "I did it". I recommend doing it once if you are new to auto repair, it will give you a project that you can do and feel proud of.

If the electromagnet is badly rusted or the coil is burned, I don't recommend trying to repair it but it can be done.

Also, I might mention that as Kirby says, "12 volts is 12 volts" so any 12 volt horn from a "chebby" or any other car will work just as well.

Continuing back, to the headlight wipers. Not all XJ6s have this feature. If you have it you may not be happy with it as it seems they do not always function. If you don't have it and want it, it can be added by acquiring the parts from the dealer or from a junk yard (breaker) in a country where the feature was available. In this case, I know only that England and Australia had this feature. There are probably others.

From the advice I got when I sought to add this feature to my XJ6 the consensus was that you don't want to add it. More thought on the subject revealed to me that I could not remember when the last time was that I had to wipe the headlights on my car, so the feature may not be really needed unless you go off-road with your XJ6.

Moving further back we come to the headlights themselves. In Europe, England and Australia at least the outer set of headlights are 7" diameter and the inner set is 5" diameter. Because of the wonderful foresight of our glorious leaders here in the US the XJ6 was supplied to the US with an adapter that allows 5" headlights in all four positions. The air intake for the cockpit comes through a screen in this adapter. A change in the law since then would now allow the 7" headlights again.

On the models with the 7" headlights there were two types of trim, one with the air intake screen and one without the air intake screen. This depended upon whether the car used the headlights for an air intake or not. In converting a US model to the 7" headlights, a step I highly recommend, you should try to get the trim with the air intake screen.

Converting a US model to 7" headlights does two things. First it looks great. The designers knew what they were doing when they put 7" headlights on the outside. Second, you can now use the H4 Halogen 7" headlights with the replaceable elements made by Hella in Germany. I don't have the part number on these, but some numbers from the front of the lens may help. Mine are marked "1R7/R20" just below the center of the lens. Around the perimeter are the markings "111 603" and " MADE IN GERMANY- SAE MP 76". These bulbs have a very sharp, flat, top that allow you to use them on the highway without blinding oncoming traffic. The top of the beam is so flat and defined that the first time I drove down a country road at night, where there were trees where the beam could be defined, I ducked as it looked like I was running under a low bridge. But you will get used to it.

The conversion can be done with all new parts from the dealer, about $350(US), or you can do as I did and find a friend in Australia who will haunt the junkyards for the parts and send them to you. There are also non Jaguar dealers who can find the parts for you, sometimes at a discount.

I have been told, but cannot confirm that the buckets are pretty standard English fare and can be scavenged off Triumphs with 7" headlights, but the trim would still be a problem.

Do not get the bulbs from another country if they drive on the opposite side of the road from where you live. The dip will be to the wrong side if you do. 7" bulbs in your own country will work perfectly and are still easy to get.

A/C condenser: The A/C condenser is a very conventional item that you will have no difficulty in obtaining if it needs to be replaced. The usual failure mode of these is a crack in one of the welds that causes a leak. They can be repaired but I don't recommend it since the cost of R12 has gone through the roof it makes more sense to bite the bullet and pay the $150(US) to get a new one from the local parts house. It should be good for 10 years whereas the repair job will probably fail within 3 years. Now this is not true of the evaporator coil and I will expand on the economics of this when I get to that slice at the windshield where the evaporator resides.

Replacing a condenser coil is easy and straight forward if the system is already devoid of freon which it should be if you have a leak in the condenser. If there is pressure in the system though it is best to take it to a refrigeration shop and have them recover the freon before you begin work on it. Whenever the system is without freon it is a good idea to unplug the compressor clutch at the A/C compressor to make sure it does not accidentally get turned on. If the compressor were to be run when there was no freon/lubricant in the system it could destroy the compressor and there goes another $200(US).

The new condenser will come with the inlet and outlet pipes sealed. These seals should remain in place until you are ready to connect the hose to the pipe. This will keep moisture out of the system. When you remove the old condenser you should seal the hose ends with stoppers to prevent moisture laden air from entering the system. And it is always recommended that the drier be replaced when ever the system is opened. A new drier will set you back $30(US) to $50(US) but it is worth it, again because to cost of recharging the system, if you have to open it again, will be in excess of $150(US).

The condenser itself is a delicate item and you should refrain from dinging up the radiator fins and don't bend the inlet and outlet tubing as it can break a weld and defeat the purpose of your repair.

The condenser can be replaced without removing the hood (bonnet), but I don't recommend it at all. It is too easy to damage the condenser as it is very light aluminum and easy to ding.

From B.J.Kroppe I received the following suggestions on replaceable parts for the **Air Conditioning system:**

Part: Air conditioning receiver/drier (long tube style)
Manufacturer: SCS/Frigette
Part Number: 207-640 XH9 Desiccant
Cost: US$41.00 in 1995, from a local a/c shop

Models:
78-79.5 XJ12 from VIN 2R58346
79.5-82.5 XJ6 to VIN 330665 (although my car is '82 VIN 3441782 and it fits)
XJS ?????

Part: Air conditioning compressor
Manufacturer: General Motors, Harrison Division Part Number: A-6
Cost: US$125 in 1995 from a local a/c shop (rebuilt unit)

Models:
Not sure exactly but some SII XJ6/XJ12 and maybe all SIII XJ6/XJ12.
XJS???"

The radiator: The radiator on an XJ6 is and excellent piece of engineering. It works well when kept clean and there is no real reason for an XJ6 to overheat if it is properly maintained. BUT... there is one catch. Jaguar, for some reason known only to them, maybe they owned part of "Stop Leak"....8-), recommended for years that when refilling the coolant there should be some sort of leak sealer included in the procedure. In the US at least this meant that "Stops Leaks" was added every year or so. Over the years the stuff collected in the bottom of the radiator forming a soft brick like material.

When the radiator on my, then 10 year old, newly acquired, 1982 XJ6 was removed and cleaned there was at least a quart of solidified "Stops Leaks" in the bottom of the radiator. When the car was purchased it was running 120C on the gauge. After cleaning the radiator it dropped to 85C. Which brings me to a very important fact. The green arc on the temperature gauge does not mean "GOOD". Your XJ6 should not run above 95C in normal conditions.

If you are having overheating problems, have the radiator cleaned. This includes removing both tanks and having it rodded. A simple flushing WILL NOT DO.

Removing the radiator is straight forward and it can be done by just disconnecting the end of the hood (bonnet) restraint so that the hood (bonnet) can move forward more to a vertical position. But be careful that you don't damage the grill work on the bumper. I had no help so I took this route. But if you have help, removing the hood (bonnet) altogether will be safer and give you more room. The

time to remove the hood (bonnet) will be more than repaid in the time you save by being able to get to things.

Watch when you remove the radiator that you plug the transmission lines when you remove them so that dirt does not get into your automatic transmission and screw it up. The cost of a new BW 66 being around $1200(US) at the time of this writing makes care a cheap commodity.

While you have the radiator in the shop I would suggest new belts, new coolant (without any leak sealants) and new hoses. Now is the time they are easy to get to and alot more pleasant to do it now rather than in August on a back country road when the ambient temperature is 105F and you have on a three piece suit. I recommend new hoses and belts every two years whether you think you need them or not. If you don't, someday you will wish you did when you are walking home.

The cooling fan and clutch and the horn relay:

First I will make just one comment on the horn relay and we will move on to the fan/clutch. The horn relay is mounted on the inside front fender (wing) well and on two of my cars it was mounted "bottom side up", that is the terminals pointed skyward. This mounting scheme meant that water could collect in the thing and eventually short it out. On both of these cars I remounted the relay with the terminals pointing down. I never had any more trouble with the horn relay.

There are two styles of fan and clutch. The earlier cars had a four bolt attachment fastened the fan to the clutch the later series 3 had a single bolt in the center. The change happened sometime in the early series 3. My 1982 series 3 has the older four bolt style. This is important when you decide to replace it because the salesman at the parts store will most likely only stock the one you don't need....8-)

There are several things here that need attention on occasion. If you are having a problem with overheating it could be the fan clutch if the over heating is at idle and at low speeds such as around town but goes away at highway speeds. A properly operating fan clutch will allow the fan to slip. With the engine turned off you should be able to turn the fan with your hand while the pulley stands still. If you cannot then the fan clutch is seized (if the pulley slips in the belt then your belt is too loose as well!). In this condition you should hear a distinctive roar from the engine bay when the engine is running since the fan is pulling too much air. On the other hand you don't want a clutch that slips too much either. If when you spin it by hand it continues for much more than 3/4 of a turn it may be too loose.

The clutch can be removed and the fan removed without removing the fan shroud. It takes a bit of a contortionist and skinny fingers to manage it but it can be done.

Kirby Palm has suggested that an electric fan in front of the radiator would be more efficient than the mechanical one behind it. It would probably have to be bigger than the usual 16" size to be an improvement over the mechanical one but perhaps two fans could do the job. The advantage to this is removal of a horsepower drain and removal of the fan shroud which effectively blocks some of the airflow. No one has yet admitted to doing it yet, so I have no idea whether it would work, but it should.

Another noise that can come from the fan is caused by the tips of the fan blades hitting the fan shroud. If it happens continuously it can mean that the bushing was left out when a fan clutch was replaced and the fan is off center. This should be visible to the naked eye as a wobble. Another cause could be an incorrectly installed motor mount or transmission mount, or a defective mount.

Usually with a **motor mount** you will hear the fan hit the shroud when you are either accelerating or braking. The motor shifts on the bad motor mount and the fan hits the shroud. A bad motor mount needs immediate attention since it can cause throttle binding which can be very scary.

I had a car once that when you made a hard left turn the throttle jammed wide open. It took me by surprise the first time then I learned to hit the ignition switch quick. It turned out to be a broken motor mount.

I know of another incident where the motor actually fell out of a car when the motor mounts rotted through.

The water pump, the air pump, (if you have a US emissions reduction system) the alternator, the power steering pump, the AC compressor and the belts and pulleys:

As I recommended earlier, all the belts should be replaced every two years, or if it is only 18 months since the last replacement and you are planning a 3000 mile trip. Never start on a long trip without near new hoses and belts. Every time I have done it I have regretted it. The extra strain of 6 to 8 hours of continuos driving daily will finish off weak hoses and belts in short order and it is no fun to be spending your vacation under a car on the side of the road or spending your vacation money on a tow truck and garage fees.

The water pump is a readily available item in most big cities in the US. It ain't cheap, but it is available. Replacing it is, again, straightforward. The hood (bonnet) is the only problem here and it can be handled as it was in the previous section on the radiator replacement.

One really nice thing, about at least the series 3, (Hey folks, I own a series 3 and that is what I go look at when I need help on writing this book) is the way the various accessories are adjusted to get the belts tight. The screw adjustable tensioners beat

the heck out of the normal US type of tensioner where you have to use a pry bar and three hands to adjust the tension. The only one that is difficult is the alternator which is only accessible from beneath the car and for which the range of acceptable belts is very narrow. For the alternator belt I suggest that you check the adjustment position on your old belt then decide if you can use a shorter or longer belt. Remember, you will have some stretching in the first couple of months of usage, so aim short. This way when you find out they don't have just the right belt you will know which way to go to get the next size. In the case of the alternator belt, ALWAYS carry the old belt with you so you can compare the length at the counter before you walk out!

The belts can be removed and replaced without removing the fan shroud or the fan. It takes a bit of twisting and threading to get the belts around the fan blades but it can be done. If you are replacing the belts and already know you have the right belt in hand or have transportation while the Jag is down so that you can go get another if you have the wrong one (the automotive equivalent to not painting yourself into a corner or sitting on the branch you are sawing off), you can just cut the old belts and pull them out the easy way. Then you only have one set of belts to snake in around the fan blades.

The power steering pump is easily found in most larger US cities. It is also relatively easy to replace. The pump is rebuildable, but I have never been able to find a rebuild kit when I needed one.

The pump is of the integral reservoir type so the plumbing is simple, one outlet and one inlet. In the series 3 they changed to metric threads on the pump so if you are using a new pump on an earlier model the fittings will have to be changed also. The main failure mode on these is a leaking seal. In the beginning the cost of power steering fluid is cheaper than a new pump and many times a power steering sealer can be added to the fluid that will soften the old hardened seal and make it work at least for a while. But, eventually you will have to replace it.

If you use a sealer, read the directions. I once added a whole bottle of sealer to a power steering pump before reading the directions that said "add one ounce". And remember it is only a stop gap. You WILL replace the pump.

I recommend that unless you are into pain in a big way, i.e. you sleep in leather with a whip beside the bed, take your car to an **alternator** shop to have the alternator replaced. Usually they will do it for free if you are buying the alternator from them.

If you do it yourself, be forewarned that it must be done from under the car and it will probably be covered with dirt and lots of oil from that front seal that was made to leak by the designers as an anti-rust system....8-) I will never again do one myself, it just isn't worth the blood, sweat and tears.

The front of the engine: Here we are into the engine itself, **the timing chains.** There are both an upper and a lower timing chain. These items are so inexpensive that I have a new set on the shelf ready to use if I ever need them. This will probably protect me from ever having to replace them. Murphy's law always says that the part you don't have or can't get or is most expensive is the one that will break. These are cheap and easy to get.

The first indication that you have a problem will be a noise from the front of the engine. If the tensioner becomes worn or becomes dysfunctional you will hear the chain slapping around. If it gets loose enough the valve timing will be affected such that the car does not run smoothly.

The head: One of the weak points of the 6 cyl engine is that the valve tappet followers will eventually loosen up so that they do not stay seated in the head. It is an easy fix and should be done before they start slipping around.

If the tappet follower come loose there is a ticking noise from under the cam covers. The sound can be likened to the sound of a sewing machine. Oddly enough I have heard people say, "Its so smooth, it sounds like a sewing machine." In this case, that is not good. A loose follower can cause all kinds of damage to the engine, mostly in the head.

Many XJ6s have had the stakedown kit installed already and you can tell if yours has one by reaching your finger deep into the oil filler hole on the cam cover and if it is there you can feel it. I must admit I could not find it when I felt, but a mechanic friend of mine felt and assured me it was there. By the way, don't try this if the engine is warm.

A stakedown kit will run about $300(US) installed at 1995 prices. It is a cheap piece of insurance. If it hasn't been done, do it before you trash your engine!!!

While we are on the subject of the heads, there is alot of work that can be done here to improve the performance of the XJ6, especially the series 1 and series 2 versions. By the time the series 3 came out the head had been very much improved from the MK VII head from which it evolved.

I have heard it said that you can gain 50HP just on head improvements alone.

From Julio Loza I received the following advice on removing the head when it is stuck.

> "While rebuilding the cylinder head (it was warped and leaking water to the cylinders) I found the studs frozen in place. No matter how hard I tried I could not pull the head

off with the studs on. I tried soaking them in various solvents to dissolve the rust but to no avail. At the suggestion of the local Jaguar shop, I tried an impact wrench to 'loosen' the studs but this did not work. Here is what a friend suggested and worked:

1. Buy a few of nuts that fit the studs. (I got mine at PepBoys)
2. Take two nuts and tighten them on one of the frozen studs.
3. When they are both in far enough, take two wrenches and try to undo the bottom one while tightening the top one. You are basically compressing the two nuts against one another.
4. Once they are as tight as they will get, try undoing the bottom one only. This may require a long pipe to get enough torque. If the nuts are tight enough the frozen stud should begin to turn. If the top nut begins to turn instead, tighten them more.
5. This procedure took all of the studs off and none were damaged. After a couple of uses, the nuts will begin to strip and need to be replace with new ones. This procedure will only take an hour or so and will make the removal of your cylinder head a lot easier."

I had a head stick on a 1968 420. We took all the nuts off then squirted WD40 into every nook and cranny. Then we hooked a hoist to the head as though we were going to remove the engine. We lifted the car so that the front wheels were 2" off the ground and let it hang. Every day we would squirt in more WD40. After three days the head slipped off and the car came down with a thump.

The exhaust side of the XJ6 head is just about as good as you need it to be no mater how radical you get on improving the engine. Some of the D-type heads had huge exhaust valves by comparison, but they are not necessary. There is little to be gained on the exhaust side, so spend your money on the intake side where it can use some help.

The first thing you want to do is the porting and polishing. You do this first so that the crap and dust that it creates will be washed away after the machine shop does their job. You don't want it getting into the new valve guides and other goodies you will be adding later.

Porting and polishing will make the biggest single difference on the heads of an XJ6.

You have two levels that you can aspire to in porting and polishing. The first level is to just smooth out the intake ports so that they are smooth and without lumps and casting imperfections in the walls. Finish the job with 80 to 100 grit sanding drums. This is probably all you will want to do for a strictly street machine. Enlarging the ports on a street machine just hurts the low end performance.

If you are into racing you may want to enlarge the ports to just under the size of the gasket openings. You can do this by placing a gasket against the head and marking the openings on the head. Then enlarge the ports to about 1/16" smaller than the gasket openings. Be careful though as there are water passages in the head and they are closer to the surface as you approach the valve seats and if you cut too deep you could be in big trouble. The cut is mostly at the port and should taper off quickly toward the valve seat to prevent disasters.

Polishing is probably not done on a street machine, but if you are into racing then you want to polish the ports down to a 1200 sand paper. They should be almost a mirror finish when done. This has to be done gradually from the 80 grit in the first step to the 1200.

Now we come to improvements of the head. There are several improvements that can be made by the machine shop that cost very little. First, the valve guides that stick out into the gas flow can be smoothed flush with the port wall. This will improve the gas flow immeasurably.

Having the heads "cc'd" will make the engine smoother and there may be an increase in power. You can do it yourself. Place the head on its back with the spark plugs installed and the valves installed Then make sure the mating surface where the head meets the block is level. Now fill the depressions in the head at each cylinder with light oil till it is level with the gasket surface. Use a syringe to remove the oil from each depression and measure what you take out very carefully in a graduated container. Write down the number for each cylinder. What you want to do now is to take your Dremel tool and sand away enough material from the inside of the head so that all the cavities are as large as the one that held the most oil. Do not grind on the one that was the biggest! You should remove the material evenly around each cylinder head. When they are all the same size you are done. Your head has been "cc'd". With all combustion chambers the same size the engine will run smoother.

The racing engine should have the heads glasspeened to relieve stress. You can do it on any engine and it is inexpensive.

Increased size on the intake valves can improve even a street car, and they are almost mandatory for a car that will be raced seriously. The intake valve size on a

series 3 XJ6 is 1 7/8". This is a good size for street use and the valves are stock Jaguar items so are easy to get. The early XJ6 had 1 3/4" intake valves and increasing to the 1 7/8" series 3 intake valves will improve these engines. It is possible to increase the valve size to 1 15/16" without changing the size of the spark plug. If you go to a 2" intake valve you will have to change to a 10mm spark plug. You should not go to a 2" valve unless you are seriously racing the car.

Remember though that with the stock dual carburetors you will gain nothing with the big intake valves. The big intake valves require more breathing room, like 45DCOE Webers.

The best compromise for a street car is the 1 7/8" valves of the series 3 with improved carburation. In the series 3 of course, there is nothing to do as it already has this capability and the EFI to feed it.

While you are doing this valve work, plan on replacing all the valve springs. You will be putting in a hotter cam and the stock valve springs will float at 5500 RPM. There is no reason to do this much work and then scrimp on costs. The new valve springs won't cost that much. Use a stronger set of racing springs and you will then be able to use a hotter cam without valve float.

If you are racing the engine you will want to replace the stock steel valve spring retainers with the lighter weight alloy retainers. On a street head, these will do nothing for you, but at high revs, 6000 up they will make a difference.

Replace all the valve guides. You don't want to waste all this time then find that you have to replace a valve guide in the near future. The head is off, so replace the guides now. Use bronze valve guides as they lubricate the valve stems better and will last longer for that reason.

Considering the cost vs the improvement, one of the cheapest things you can do is to have the shop cut "triple angle" valve seats when they install the new valve seats and valves.

The new valve seats should be "hardened" seats so they can withstand the rigors of unleaded gasoline. Even if unleaded is not mandatory where you live now, it probably will be someday so get a head start on it now.

I recommend that you do your own valve lapping, the last step in this head restoration/improvement. The shop will not spend the necessary time to do it right and you will because you know that its your money down the drain a year from now when you have a burned valve and your compression is down.

From Gregory Andrachuk I received the following advice on **spark coils:**

> "The faulty or fault-prone coils are not he LUCAS coils, but the DUCELLIER coils made in France. My 82, in fact, has a DUCELLIER coil, which I presume is original, and it

operates perfectly, with no leaking of oil. I think the failure is an oil seal failure to begin with. My coil has an internal ballast resistor, or so I assume, since there is no resistor mounted beside it as on other cars I have seen. I believe that the DLC 102 coil used as a replacement requires an EXTERNAL resistor, but the sales reps don't seem clear about this. I think one should suspect coil trouble with sudden engine misbehavior, but replacing perfectly
good coils seems unnecessary."

The first piston and cylinder. There is not alot to say here except to praise the quality of the XJ6 bottom end. The main and rod bearings are very tough and will last forever. It is a testament to their strength when you consider how many horsepower can be coaxed out of this engine without any change in the bottom end at all.

Jaguars are often asked to run with low oil supplies (they leak the stuff out) and on turning corners it is not unusual to see the oil pressure light flicker. This is not good and should be attended to, but it never seems to damage the bottom end of the engine to have these temporary losses of pressure.

You may have heard that Jaguar considered going into the manufacturer of refrigerators at the end of the second world war but they changed their mind when they couldn't figure out how to make them leak oil....8-)

Some owners will try to get more horsepower from their engines by increasing the compression ratio by using hi compression pistons. This is not really necessary and it makes it hard to run on the fuels available at the pump without causing damage to the engine. Here is where you can damage the bottom end. If your compression ratio is too high and the car "pings" you may not notice it and it will be beating your crank and bearings to death.

You can gain more at lower cost by reworking the head and changing the cams and you will do it with less possibility of causing damage to the engine.

The distributor and the oil pressure sender and the oil pan. All of these have peculiarities worth mentioning.

The oil pressure sender is infamous for its inaccurate readings. This item is a very expensive sender at the dealer. After my first edition of this book hit the stands I recieved a phone call from one of the dealers listed at the back of the book telling me he could supply it for 60% of the price the Jaguar dealer was asking, so look around. Inside the housing is a wire wound resistor that has a wiper connected to it from a diaphragm that measures the pressure. The diaphragm is moved by a piston that

can get stuck with crap from dirty oil. If this happens you may get a flat topped reading that hits a peak and goes no higher or it may get stuck so that there is a reading of pressure when the engine is not turning. Sometimes cleaning out the input end with a blast of pressurized air will make a difference, but usually it wont.

The wire on the wire wound resistor will wear and after many miles will either break or will begin sliding around on the form. When this happens you will get very quirky readings, sometimes high, sometimes low. If you start getting low pressure readings and the idiot light is not confirming the low pressure, this may be the problem.

If you go to the parts house and they tell you they have a pressure sender for your jag and it seems cheap, they are talking about the pressure sender for the idiot light. It is cheap, but it wont work in the gauge. You can tell the two apart as the light sender is only about 1" in diameter and 1.5" tall. The pressure sender for the gauge is about 3" in diameter and 3" tall and looks like a small tuna can fitted to a piece of pipe with an electrical connector on the other end.

This item is expensive and not readily repaired so the only alternative is to bite the bullet and get one from Jaguar or one of the suppliers in the back of this book. The one consolation is that it will probably last another 70 thousand miles.

One of these days I am going to attempt a repair on one that has had the wire break. I will report the results in this book, but I doubt that it will be economical, it will just be to see if I can do it.

The oil pan is another place where things go wrong. Being of cast alloy it is soft and many a PO (Previous Owner) has tightened an oil pan plug too tight and stripped out the threads. One car I bought, the PO had used epoxy glue to glue the plug in place and then he changed oil using a pump. Of course he neglected to tell me this when I bought the car.

There are several ways to solve this problem. All have their advantages. All are relatively inexpensive and all of them work.

I have already mentioned the pump thing so I will skip it. Besides, I don't see any real advantage to that one. The next possibility is to put a helicoil into the old threads to rebuild the threads to accept the old drain plug. This works sometimes, if there is enough material around the hole to do the repair. It usually requires removing the oil pan which on an XJ6 requires removing the engine from the car.

The second method is to drill out the hole to a larger size and retread it. Again this requires removing the oil pan since you want to be able to remove any metal chips so they don't get swept into the engine oil passages.

There are rubber stoppers that expand into the threads when a bolt is tightened they are sometimes available in the parts stores. I don't like this solution since oil

and rubber don't really mix and I would be suspicious of how long the rubber could handle the heat of the engine oil.

The best solution I have found is to install one of those "quick drain" plugs. The ones with either a remote trigger or with a lever on the plug that allows you to drain the oil without removing the plug. This way you can put a good grade epoxy glue on the plug when you install it to glue it in permanently and yet you can still drain the oil when the time comes. I like the remote trigger type and consider installing those even if I didn't have a problem to begin with. Its alot more pleasant to change the oil if you don't have to crawl under the car, not to mention, alot safer, since a jag is so low you have to jack it up to change the oil.

The distributor is just a standard points and condenser type of distributor on the series 1. (the series 2 and 3 used contactless electronic ignition) It is adjusted in the normal way with a screw driver to loosen the arm and to pry the points apart or together and a feeler gauge to measure the gap.

It needs to be lubricated on the pivot post, through the base plate opening at the cam and on the center screw with a dab of engine oil. On the cam it should be lubricated with grease or Vaseline.

There is a vacuum advance diaphragm on the side. The most common failure of this part is the rubber vacuum hose that connects to the advance diaphragm. The rubber deteriorates with age and starts to leak so that there is no advance as the engine reaches cruise speed. This can cause overheating and loss of economy by running the engine in a constantly retarded condition. If the hose is OK you can check the advance by putting the ends of the hose in your mouth and sucking. This should cause the distributor points plate to rotate slightly as you watch it with the distributor cap removed. If it doesn't rotate and the hose is good then there is a bad diaphragm in the advance mechanism and it needs to be replaced.

The course timing is set in the usual way by first removing the #6 (the front cylinder) spark plug and turning the engine by hand until the compression stroke can be detected by the pressure escaping around your thumb as it is held over the spark plug hole. Now continue rotating the engine in the same direction until the appropriate timing mark is in alignment with the timing cover pointer. The correct direction to rotate the engine can be easily determined by looking at the fan blades. The engine rotates such as to make the fan suck air through the radiator, i.e. the fan rotates so that the leading edge of the blades are the edge to the front of the car toward the radiator. Now set the vernier screw to the center of its position. Then loosen the distributor clamp so that the distributor can be turned stiffly. Set the distributor timing as close as you can get it while using a light across the points to detect the opening of the points. You want the points to just open. Clamp the

distributor in this position. The car should now run well enough that you can continue with the fine timing.

The fine timing adjustment is a knurled nut on the opposite side of the distributor from the advance diaphragm. To adjust the fine timing a timing light (strobe) is held on the crankshaft damper timing marks and while watching the alignment of the marks with the timing cover pointer the knob can be adjusted to fine tune the spark timing.

The front suspension:

Many people are intimidated by suspension work. On the Jaguar there is no real reason to be. The suspension is straight forward and easy to work on if you have a good manual and the proper tools.

The **front disc brakes** are also in this area and I will start with some comments on them.

If you are experiencing a terrible shaking when you brake from high speed and you have been blaming it in the front suspension, try the brakes first. The brakes are easier to work on and cheaper to repair and when all is said and done, the front suspension is probably not the culprit. The most likely problem is warped front discs. Even if they are fairly new they can be warped and it does not take much to cause a real wild shake. The usual cause of warped discs is a rapid cooling after being overheated. This can happen on the way home from the dealer with a new car. All it takes is hard braking and a very cold day or a mud puddle to spray water on the disc while it is hot.

Luckily it is a very cheap and easy fault to cure. The removal of the front discs is so simple that it will take less than 30 minutes per side even on your first attempt. There are two types of front disc brake calipers on the XJ6. The removal of the disc is different for the two different types.

The beginning of the procedure is the same for both types. After jacking up the car and stabilizing it on stands the front wheels are removed.

On the cars with the 4 piston calipers it will then be necessary to remove the calipers so that you can get the discs off. After removing the calipers they can be tied back and supported out of the way while still connected to the brake system. Do not allow the calipers to be supported by the brake line as this stress can break the line. There is no need to bleed the system if they are left connected. To remove them it will be necessary to depress the brake pads away from the disc. This can be done with a screwdriver as a pry bar. They only need to be pushed back enough to slide the caliper off the disk. When doing this the excess brake fluid is pushed up into the reservoir. It may be necessary to remove some of the fluid to prevent it running over. When the calipers are removed it is necessary to note the position of all shims between the steering arm and the caliper. Be sure there are none still

sticking to the caliper that will fall off later and leave you wondering where they came from. They must be put back on just as you found them.

On cars with the three piston calipers the calipers do not need to be removed. It is only necessary to remove the brake pads. As in the previous paragraph it is only necessary to spread the pads slightly and then they can be removed.

Now you can check the runout with a dial gauge or by using a feeler gauge and a fixed point to measure to. The dial gauge is the easiest and most reliable. The runout should not exceed one tenth of a millimeter. If it does they need truing up.

If you are going to continue to remove the disc (the runout was excessive) on both types, remove the dust cover from the axle end, remove the cotter pin and remove the nut and thrust washer from the end of the axle. Do not, as some books will tell you, unbolt the hub from the disk. It isn't necessary and its a hell of a job if it is still on the axle because you have to feel around through a hole in the backing plate to get to the bolts. It is much easier to separate the two with the hub and disk on the bench where you can get to it. The disc and hub can now be slid off the end of the axle and out from under the caliper.

Put the whole thing on the bench and separate the hub from the disc. By doing the job on the bench instead of on the car you can get the bolts torqued down properly when you reassemble the two. On the car it is virtually impossible.

After the discs are removed take them to a shop and have them turned for pocket change. Remount the discs and your shaking front end will be cured. If it isn't, then you need to then check out the ball joints etc. You needed to resurface those discs anyway and it didn't cost much.

When you put the wheels back on, don't forget to use some anti-seize on the hub and on the lug bolts. Jaguar wheels being of different metal than the hubs are prone to seize and be difficult to remove. If you do have a stuck wheel the best solution is to put pressure on the bottom of the wheel by prying against the lower ball joint mounting in the front or a similar spot in the rear.

The front end geometry of the Jaguar is very simple if you understand what they are trying to do. There are three terms that need to be explained first. These are castor, camber and toe in.

Castor is the fore and aft tilt of the axis about which the front steering is rotated. If the castor is positive (the axis is tilted forward at the top toward the direction the car is traveling) the car will be stable and tend to run in a straight line. If the castor is negative (the bottom of the axis is forward of the top of the axis) then the car will be unstable and want to run to one side or the other of the road. Thus the castor must always be positive for safety. The amount of positive castor determines, to an extent, the energy needed to turn the car . If the castor is too much positive then the car will require more work to turn it away from the straight line and it will return to a

straight line very quickly. This should be avoided. If the castor is not enough then the steering will feel light and "squirly". Race cars usually use less castor than street cars since they want a very light touch to the steering. The castor is adjustable using shims in front of and behind the upper ball joint. ALWAYS when removing the upper ball joint, take note of the number and position of the shims and put them back where you found them. You will have to take it to a front end shop later to have it checked, but always start where it was before the repair.

Camber is the outward tilt of the wheel as looked at from the front of the car. A positive camber means the top of the wheel tilts to the outside and the bottom of the wheel seems to point in. Slight positive camber is desired as the camber will decrease toward negative as the weight of the car is increased such as when going around a banked turn. Camber can affect the wear on the tires and the stability during cornering. The camber is adjusted using shims on the inside mounting end of the upper wishbone arms. Again whenever disturbing them, note where they were and replace them then get a fresh alignment.

The **toe in** is the tendency of the tires to look toward each other as crossed eyes. The front of the tire looks in. Since toe in decreases with speed it is desired to have a slight "static" toe in. At road speed the toe in may be neutral, if it is correctly adjusted, thus maximizing tread life. The toe in is adjusted by adjusting the length of the tie rod. This is one adjustment you can do at home with a ruler but I don't recommend it since it affects your tire wear. The cost of a professional alignment is about the cost of one tire but without it you will wear all four tires unnecessarily.

The entire system consists of the upper wishbone, the lower wishbone, the body of the car and the stub axle. These four components make up a rectangle. The idea being that as the load on the wheel increases or decreases the wheel will essentially stay straight up and down as it moves up and down. This as opposed to how the older VW swing axles allowed the camber to vary from very negative under heavy load and very positive under light load. The ball joints allow the wheel to turn right or left as they are pushed by the tie rod which is in turn connected to the steering.

I will not go into the exact procedure for working on the front suspension since I will assume that you have a proper manual. If you don't, get one. This book is not meant to replace a manual, only to educate you to the general ease with which you can maintain your own car. I will however tell you of one thing I did not find in the Haynes manual when I put in upper ball joints.

When I put the new one in I made the mistake of tightening the nut on the ball joint that fastens it to the stub axle upright of the wheel. The manual did not warn against that. Once it is tightened it is almost impossible to loosen unless the two horizontal bolts into the suspension arm have already been installed. And if they haven't it is next to impossible to compress the rubber stoppers enough to get them in. Catch 22! So, don't tighten the nut at first!

Instead, place the nut on the end of the tapered shaft just enough to hold the stub axle upright together, place the two horizontal bolts into the ball joint, then, and only then, tighten the ball joint to the stub axle upright.

Andrew Kalman offers the following suggestions when replacing the upper and lower ball joints:

> "1) If you choose to do the job without removing the brake lines, calipers or rotors, make sure you have a nice, steady means of supporting this assembly without putting stress on the brake lines. I did it this way, and saved some time, but it's more aggravating than having the whole unit off. Careful - this hub / rotor / brake assembly is _heavy_!
>
> 2) Disconnect the anti-sway bar.
>
> 3) You will need a small tie-rod separator, the kind that pushes with a screw against the object held by two "grabbers". I rented one at Grand Auto for a few bucks to do the upper one - for the lower one I used a similar type, but with moveable jaws. It's pretty tight in there. I could hardly believe how much force was needed to pop the joints loose.
>
> 4) I did not remove the _metal_ lipped cup (C 30952) from the lower ball joint "body" - in retrospect, using an XJ-40 lower ball joint would have been better. I used a Dremel tool to cut out the phenolic cup (one radial cut).
>
> 5) The upper ball joint is much easier to deal with.
>
> 6) You'll find a jack quite handy in repositioning the front suspension while disassembling and reassembling.
>
> 7) After a few miles re-check the circlips that hold the rubber boots on - one of mine "walked"."

The lower ball joints are adjustable to get the desired clearance in the socket. The adjustment is done using shims. The newer XJ40 lower ball joints are said to be an exact replacement for the earlier XJ6 lower balljoints.

The upper ball joint is only replaceable, there is no adjustment when it gets worn.

Another area where wear occurs and can cause a loose front end is the inner bushes on the upper and lower wishbone mountings. The upper bushes are especially prone to wear. You can replace all of these yourself with a good manual and tools such as a spring compressor.

In Bela Orbans APPENDIX ON FRONT END REPAIR at the end of this book you will learn about the **little bits of rubber** on the Anti-roll bar and the inner bushes of the upper and lower wishbones**.**

The **steering rack bushings** are a source of alot of looseness in the steering of the XJ6. When they get old and worn the steering can get very loose.

From Julio Loza I received the following advice on replacing the steering rack bushings.

> "The other suggestion I have is for changing the infamous steering rack bushings on the XJ6 with polyurethane ones. While doing this job, I found that there is a metal sleeve on the original bushings. It was not obvious at first that they were there since the metal sleeve looked like it could have been part of the steering rack. Only after I compared the size of the new bushings(which come with no metal sleeve) and the rack mount holes did I realize that these must be sleeves. Since they were tight in place and could not be removed, I took a saw to them. I cut two lines along the sleeves that release the pressure and allowed me to punch them out with a punch and hammer. Care must be taken when sawing so that you saw through the sleeve but not the steering rack itself."

Kirby Palm warns that cutting the sleeve out can be dangerous especially if it is still on the car. If you so much as nick the aluminum lug it can cause it to crack later. He suggests that cutting them should be a last resort. Kirby suggests first trying two 3/8" drive sockets, one the same OD as the bushing and one large enough that the bushing will fit inside it. Thread a 3/8" bolt through the two then draw it tight with a nut to pull the bushing out.

When maintaining the front end there are **9 grease points** that need attention on a regular basis to prevent wear. The upper and lower ball joints all have a grease

fitting unless the upper ball joints have been replaced. Some replacement upper balljoints are "lifetime" lubricated. I don't know whose lifetime, but they don't come with a grease nipple. There is a grease nipple on both the wheel hubs and on both the tie rod ends. The last grease nipple is on the steering rack.

The radiator expansion tank: Some XJ6s have only one radiator filler cap on the header tank while others have an expansion tank with a filler on it as well. On the cars with the expansion tank a lesser known cause of coolant loss and overheating is to have a pressure cap on the header tank as well as on the expansion tank. The cap on the expansion tank should be a pressure cap while the second cap should not be a pressure cap. If you have a pressure cap on the header it will release fluid that will be lost and not recoverable. This constant loss of fluid every time the car comes up to pressure will cause overheating.

Also here is the filler for the engine oil. The engine requires almost 9 quarts of oil when changing the oil filter. To an American who is used to all engines requiring 4 quarts, this is one hell of a lot of oil. On the other hand with an engine that leaks oil like the 4.2 does it may all be needed. The interesting thing is that if it falls only a quart low it will trigger the low oil pressure light on hard deceleration or hard cornering. Generally this is not a problem as long as the condition only lasts a few seconds. The crank and rod bearings are not supported by oil pressure, they just ride on the surface of a molecule thick layer of oil so as long as the pressure comes right back up no harm will be done. But... you should correct the problem as soon as practical and try to refrain from extreme maneuvering until it is corrected.

I recommend using a synthetic oil. I had a mechanic once tell me that if I used synthetic oil it would cure the oil leaks. I didn't believe him, but since I knew him to be a good mechanic, I tried it. It worked. I don't know why, but it worked. The reduction in lost oil and the fact that I could leave the oil in for three times longer before changing it made up for the increased cost. I now use only synthetic fluids throughout the car.

The carburetors and EFI are in this area also. The series 1 and 2 cars are carbureated while the series 3 has Electronic Fuel Injection (EFI).

The carburetors require very little maintenance. Keeping the fuel screen clean and topping up the oil in the dampers is all that is required. Some books recommend using SAE 20 engine oil for this purpose. I have used automatic transmission fluid, olive oil, corn oil all with no noticeable difference in performance. Be forewarned that if you use corn oil and spill some on a hot engine part it will smell like you are making popcorn and will keep you hungry whenever you drive.

EFI requires even less maintenance than the carbs. The only maintenance I have done on my '82 XJ6 EFI in 70 thousand miles was to replace the injection hoses that the PO had installed. The injection hoses, the hose from the fuel distribution rail to the injectors MUST be of high pressure type. It looks just like the standard fuel line, but don't use standard fuel line, it wont last. The system is under very high pressure and the hoses will begin to leak very soon if you don't use high pressure hose designed for fuel injection systems.

The first indication (hopefully) that you have a leak is a smell of fuel when you stop the car at the end of a run. The hoses will be leaking onto the top of the head and the heat will cause evaporation that you will smell as soon as you walk around to the front of the car. Don't ignore this or you may have an under hood (bonnet) fire which will really ruin your day. Replacing these hoses is easy and will only require 45 minutes to do all 6 of them. The main thing to remember is to tighten the clamps so that they don't leak under pressure and don't tighten them to the point that they damage the hose.

You should open the hood (bonnet) on a regular basis right after driving the car to look at the hoses. They will be wet with fuel if they are leaking, but 5 minutes later there will be no indication as the fuel will have evaporated. Always replace all 6 hoses together so you know the age of the hose. Using hoses of mixed age just makes for more work in the long run.

You should make it a practice to walk around the front of your car when you exit it at the end of a drive. Doing this just takes a little extra effort and it is worth the information you can gain. You don't even have to slow down as you walk by to notice such things as the electric fan running, the smell of fuel, the smell of hot antifreeze, the smell of a hot rubber hose, the sound of bubbling coolant in the radiator or the sound of steam escaping. Catching these warning signs early will save you much grief. I recently saved myself from a big pain by walking around the front and hearing a hissing sound. I opened the hood (bonnet) to investigate and found a pinhole leak in a radiator hose spraying onto a hot engine. If I had not caught it early I would have had problems a week later and probably not in my driveway where it was easy to repair.

The cruise control bellows is a common mode of failure on the series 3 cruise control. The rubber bellows gets loose around the end plates and the vacuum escapes. You can either seal it with silicon rubber sealant or you can use some long "tie-wraps" and wrap around the ends of the bellows to clamp it to the end plates. I have seen three, supposedly dead, cruise controls fixed this way.

The brake booster and master cylinder:

I do not recommend rebuilding a master cylinder. It can be done and it is not difficult. I do all mine, but I have been doing it for years. It requires hospital cleanliness, small fingers and sometimes a great deal of patience. But unless you are very sure you know what you are doing you can mess it up. The last thing on your car that you want to mess up is the master brake cylinder. Having an engine that quits is not nearly as dangerous as having a brake system that quits. And besides a rebuilt master cylinder is not that expensive. Someone called me after the first book and said rebuilt master cylinders were not available. I bought one two years ago so either I was lied to, or they were available two years ago. A new one can be had according to this caller at less than $100(US). The time and pain you will save is worth the extra cost.

Replacing one though is easy. First remove as much fluid from the brake reservoir as possible with a suction bulb. Then to remove the master cylinder you need only to disconnect the rigid lines to the cylinder and plug them so they wont get dirt in them. On the series 1 and series 2 disconnect the two hoses to the reservoir and plug them so they wont get contaminated. Now remove the two bolts that bolt the master cylinder to the brake booster.

With the series 3 the fluid reservoir is mounted on the top of the master cylinder and it comes away with the cylinder.

The now famous "assembly is the reverse of disassembly" applies here. Cleanliness is the watchword when working with the brake system. A small amount of contamination can cause brake failure and we don't want that. Remember that any time you open the brake system hydraulic lines for any reason it will be necessary to bleed the air from the system. If you don't you will have NO BRAKES.

The brake booster is a vacuum servo that amplifies your foot pressure on the brake. If it is working all is well, if it is not, you will have a real feeling of helplessness at the next stop. It is possible to drive the car with the booster inoperative. I once did it for 2 weeks. It is dangerous to do so. The booster allows you to stop the car in half the distance you can under only human pressure. DON'T DRIVE WITH AN INOPERATIVE VACUUM BOOSTER.

There are warning signs when a booster starts to go out. One of the first indications is a sound that can only be described as the sound of one venting gas when you put your foot on the brake. There is no other way to describe it. The second, more ominous indication is the day you are braking for a stop and you realize that it took you more time to stop that you thought it would. Or the feeling that in the last 20 feet of stopping the engine suddenly started pulling and you almost hit the bumper of the car in front of you. Don't wait, drive CAREFULLY to the nearest place where you can get off the road and do so.

The trouble may be as simple as a bad or loose vacuum hose from the engine to the booster.

Some versions of the booster are rebuildable with a kit (aparently all of the series 3 are rebuildable) from the Jag parts house. Other versions are not. If you have a rebuildable unit then I would rebuild it when it fails. It can also be rebuilt by a qualified mechanic for about one half the cost of a new one. A new one is so expensive it will take your breath away. They can be found in junkyards (breakers) and if they are operational then go ahead and use a "previously owned" booster.

Removal of the vacuum booster is easier than the Haynes manual tells you, at least on the series 3 with LHD. I will describe the experience I had when I changed the thing in a hotel parking garage with just my small tool set for traveling.

The Haynes manual says that you have to remove the entire assembly with the master cylinder and the pedal box assembly all in one piece. This requires that the brake system be opened with its attendant bleeding after reassembly. It is also a bitch of a job.

When I read the manual and realized I would have to bleed the brakes by myself I decided to find out if there was a better way. There is, at least on a series 3 with LHD. In looking at other models you may want to make sure that the master cylinder will move out of the way and that you can get to the clevis pin.

First remove the two bolts that fasten the master cylinder to the booster. Then remove the vacuum hose from the booster. Now comes the ticklish part. There is a rubber plug on the side of the pedal box that when removed gives access to the booster clevis pin. There is a rubber plug on both sides, remove them both. Now with a pair of needle nose pliers or a screw driver or anything you can get into the hole, remove the cotter pin (split pin) from the end of the clevis pin. Be very careful here since anything you drop will not be recoverable. Don't drop the pin, or the washers on the clevis pin. Withdraw the clevis pin and the booster is now disconnected from the brake pedal.

Now remove the nuts from the four studs that fasten the booster to the pedal box. Again, be careful here as things you drop may never be found again. Once these are all removed the booster can be pulled forward. It takes a little jiggling and twisting, but it will snake off the studs. The clamps that hold the brake lines to the inside of the fender (wing) well will have to be removed to give you enough slack to move the master cylinder. You will have to slightly, CAREFULLY, GENTLY bend the brake lines to move the master cylinder out of the way. Be very careful here as you don't want to crimp a brake line.

Putting the thing back in is a little tricky as it will only snake back in in one way. Its like those little wire puzzles that when you find the trick are easy, but are impossible without knowing the trick. Just wiggle it around till it goes on. It can help to get one nut on a stud then wiggle the thing around until the remaining studs go in. A slight amount of prying with a big screw driver can help, but you should be very cautious with this it can result in breaking something.

Once it is back in position get the nuts on all the studs but don't tighten them yet. Now re-attach the master cylinder and the clevis to the brake pedal. Again, I warn you, for Gods sake don't drop anything while putting the clevis pin back in or you will have to remove the pedal box to retrieve it. When the clevis is reinstalled with a new cotter pin (split pin) you can tighten everything back up and reinstall the vacuum line and the rubber plugs and top up the brake fluid resevoir.

A bunch of interesting little bits and pieces and some little things that make a big difference with your comfort:

The heater water control valve is here on the engine side of the firewall. Also on the engine side of the firewall is the expansion valve for the air conditioning evaporator coil. Directly on the firewall is the main power buss from the battery "+" terminal.

NOTE:
All my information shows all XJ6 to have a negative ground (earth). If yours is positive ground you must reverse all the references to polarity.

And on the exhaust manifold on the left side down low is the oxygen sensor. This item can affect your fuel mileage. If fuel consumption is high and you have not replaced the sensor in over 40 thousand miles, change it. The end of the sensor gets eroded away by the exhaust gas in 30 to 40 thousand miles and the EFI won't work properly unless the O2 sensor is working properly. A wrench, a pair of pliers and maybe some WD-40 is all it will take to do the job. When you install the new sensor make sure you use some anti-seize compound on the threads. The new sensor that you get from the parts store will have one wire coming out of the end of it. The box will include a connector so that you can snip off the old sensor and use the connector to put on the new one (after you have tightened it down!!) If you connect it first you will not be able to twist it in without twisting the wire.

The main power terminal is a large stud that is mounted just inboard of the battery on the firewall. It can be found by following the lead from the "+" terminal of the battery to the stud. This connector is often the cause of "dead" cars. If you have a fresh battery and when you turn the key to start nothing happens, the first thing you should do is check to see what it hot to the touch. Do not do this while trying to start the car! Be careful since some things get very hot very fast under high current. But touch, gently with a finger tip, then more forcefully by gripping, each of the two battery terminals and the main power terminal on the firewall. If any one of them is either hot or substantially warm you have a bad connection at that place. The bad connection is a high resistance that is dropping the majority of the battery's voltage

and not allowing it to get to the starter where it needs to be. The starter is very low resistance, so it does not take much of a resistance to drop the entire battery voltage somewhere else. If you have a hot or warm terminal you must first disconnect the ground (earth) terminal from the battery.

The reason to disconnect a battery starting first with the ground terminal is that if you slip with your wrench and touch the chassis it will cause no harm. But if the ground terminal is connected and you are working on the "+" terminal and you slip with the wrench there is enough energy in the battery to fry your hand or even remove a finger if the current flows through a wedding band or some such. It is even possible that if you dead short a fresh battery that the battery will explode. Regardless of what it might do to you, think what all that battery acid will do to the paint on your beautiful Jaguar.

After disconnecting the ground side of the battery, disconnect the "+" side and if it was the terminal on the firewall, remove the nut from the stud. Clean all the connections with a safe solvent and then reassemble all the connections. After everything is tightened down spray all the terminals with WD-40 or a similar product to prevent corrosion.

Also on the firewall is the **heater water control valve.** This valve is vacuum operated and will turn on or off the flow of water to the heater. Vacuum on turns the valve off. Thus if you remove the vacuum hose from the valve or it deteriorates with age it will cause the heater to be on all the time. If your AC is not working up to snuff you should check to see that this valve is operating as it should and that it is not leaking. The AC system will in certain circumstances run hot water through the heater coil when the AC is running such as when you are in defrost mode so just making sure that vacuum opens and closes the valve and that when closed it does not flow is all that is necessary the computer will decide when to open or close it.

I have used a wine bottle cork in the hose from the block to the valve to seal off the hot water during the summer. This is a practice I don't recommend since the cork could deteriorate and get into the cooling system. If you do this, take precautions to keep the cork from moving by putting a clamp around it or something else. You don't want the cork to get loose and run around in your cooling system where it could block a water passage and overheat something..

The older valves were metal and many of the the replacement valves you get today are made of plastic. Personally I don't like them but I am told that they are better than the older valves. Ask for a metal valve from the supplier. If they cant get one try another supplier or take a chance with early replacement by using a plactic valve. Maybe they don't corrode internally. But, I just don't trust plastic to control hot water.

The expansion valve for the AC evaporator coil (the coil that gets cold) is on the firewall just behind the engine. If it is correctly done it is covered in a tar like substance and the capillary tube is back against the firewall out of the way. On my '82 XJ6 the capillary tube was against the back of the engine head and the entire system was uninsulated. This heat on the capillary tube caused the expansion valve to open fully allowing the freon to move through the system too fast and moving the cooling effect down stream completely past the evaporator coil and out of the cabin into the engine compartment. Needless to say I prefer to air condition the cabin, not the engine. Insulating it and moving it away from the engine made the AC work much better.

Here at the firewall there is another item that can cause consternation. There are **two braces that run from the center of the fenders** (wings) to the center of the firewall forming a "V" shaped brace. These keep the fenders from flexing. If the bolt on either end of these braces is loose it can cause a "clunking" sound that will drive you nuts trying to trace it down. If you have a "clunk" on either decelerating or accelerating that comes from the front of the car, check these bolts first. If that doesn't do the job then check the front shock absorber mounts on both ends and of course the upper wishbone inboard bushings.

The **hood (bonnet) latches** are in this area:

A hood (bonnet) that wont stay down is a common problem with the XJ6. This is usualy caused by a missaligned latching mechanisum. There are two common reasons for missalignment. First, if one side stays down but the other pops up it can be caused because one of the two latch pins in not in proper vertical alignment. Check by sighting across the car to see that the two pins are parallel. Adjust the one that is not holding until it matches the good one. A coupple of whacks with a rubber mallet either toward the windshield or toward the grill may fix your problem. If the problem is not missaligned latch pins it may be either a loose and missaligned latch or the hinge at the front. The loose latch is easy to find and correct the hinge is less obvious. There are three bolts thatat hold the
hinge to the bonnet. With age and a high humidity location like England, area around where these bolts go through the hood (bonnet) into the captive nuts becomes rusty and the holes get larger. The hood (bonnet) begins to shift around until it does not aligh with the latches. This can result in the hood (bonnet) getting stuch shut. If this is the problem, grabbing the rear edge of the hood (bonnet) and the headlight in opposite hands and shaking the unit back and forth will eventualy free the latch. Obviously something needs to be done to correct the problem after you have it open.

Moving back just an inch or so we will come to the windshield and the transmission interface to the engine:

The windshield on the XJ6 is an area of constant leaking if you live in a hot climate where the rubber deteriorates quickly. Replacing the rubber gasket every 5 years should keep it from leaking. But who wants to do that especially when you are 100 miles from home and the water leaks only over your spouses lap, but not on your side of the car. There is a quick fix if the leak is coming from the top of the windshield. This fix will tend to become permanent, at least until your spouses lap gets wet again. I have found that the plastic electricians tape, black, will seal the top of the gasket nicely. The tape should be placed mostly on the rubber gasket with about 2mm extending onto the roof of the car. If you take a razor and carefully trim the ends the tape will be almost invisible. Be sure to clean the area well before putting the tape on and press the tape down firmly to make sure it will stick tight and not come loose when a 120 mile an hour wind starts blowing over the edge of the windshield.

While in this area, lets talk about **windshield wipers:**
Gregory Andrachuk submitted this analyses of the problem of windshield wipers not parking:

> "about wipers on Series IIIs. A weak point. Non parking can be due to: failed parking switch on wiper motor (easy and inexpensive to replace, but not usually the problem), or a problem with excessive end float in the wiper motor itself, causing the parking switch not to be properly contacted, or MOST LIKELY, a broken ground wire in the column switch itself. This seems to be the problem on my own car; I replaced the parking switch to no avail, and the wiper motor is rebuilt"

The Starter:
In Lawrence Bujas APPENDIX ON STARTER DIAGNOSTICS at the end of this book you will learn more than you ever needed to know about diagnosing starting problems involving the starter.

Wow, here we are at **the transmission** interface! Here is where all the controversy begins, or maybe ends if you are talking about the "chebby lump". Johns Cars in Dallas Texas makes conversion kits to replace the entire jaguar engine with a Chevrolet V8. For myself, I wonder why one would do that since the cost of the conversion and the later cost of the worse fuel mileage will cost as much as

overhauling a Jaguar 6 cyl engine. At the time of this writing the cost either way is about $3000(US). Is it more reliable than the 4.2 Liter 6? I don't think so. Jaguar engines are reliable if cared for as are most engines no mater what their origin. What about top end? No, a Jag can keep up with it. Acceleration? Well, here you have me, probably so. But it seems alot of money to get a little acceleration.

A similar kit from Johns will allow the replacement of the Borg Warner 66 automatic transmission with a GM TH350 transmission but retaining the Jaguar engine. This conversion makes sense from every direction.

For the purist, remember that Jaguar didn't make the BW 66. If they had it would have been beefy enough to handle the power from the Jag engine. It isn't. Besides Jaguar obviously liked the GM TH since they put the TH400 into the XJ-S. And you cannot tell from the outside that it has been done unless you look carefully at the back of the engine and see the 1" thick aluminum adapter plate. For those that want to pull any kind of trailer it is almost required. I tow a race car on a trailer behind my XJ6 and I would never be able to do that with a BW transmission.

From the reliability standpoint, there is just no contest.

From the cost standpoint it is also no contest if your BW 66 is not repairable. If your BW is trashed and you need a new transmission it will cost about $2000(US) to buy the new BW 66 and install it at shop labor costs at the time of this writing. (To rebuild the BW 66 will cost about $850(US) in 1996 at Pauls Discount Jaguar Parts. There may be others who can do it as well) The price of a new one is almost the same for a conversion and a TH350 transmission. The payback is 5 years down the pike when you need an overhaul or a new transmission. The TH350 can be had almost anywhere in the world for 1/3 the price of the lesser BW 66. If it were just availability it would not be a good swap, but the transmission is much better and cheaper at the same time. I found that my highway mileage improved slightly with the TH350.

There is another kit that will allow the importation of the GM 700R4 transmission which has an overdrive gear. Real nice if you are on the road alot. I have no experience with this one so can't comment on it except to say if I had known about it when I put in the TH350 I would probably have gone that route.

From Dellow in Australia there is a conversion bellhousing that can adapt the Toyota 5 speed manual gearbox to the XJ engine. If you are souping up the engine to race specs, this makes sense. I have heard that the top end gear on this box will get you up to around 150MPH if you have the horsepower. That would be a fast XJ6.

The 5 speed box is available in the US and I am sure anywhere Japan has sold cars at a very reasonable price from the junkyard (breaker). In 1995 I found on in good shape for only $100(US).

The conversion will likely make the car look different because of the different location of the gearshift knob positioning and it will require some cutting on the transmission hump. But if you are racing just a little it would be very nice.

I understand there is also a Jaguar transmission that can be fitted at a somewhat higher price.

If you are still running a Borg Warner unit, Tom Graham sends this information on the fluid to use:

> "There are varying opinions re whether to use Type F or Dexron. (A lot of Jag mechanics around here like to use Dexron because it gives a softer feeling shift). The Jag manual says Type G. I think we had an answer that Type G is same as Type F. Also, our local Jag club sent a letter to Jag HDQ in Mahwah, NJ with just this question. They responded with, use Type F in BW 65 and 66."

While on the subject of the transmission, the following comments apply whether you have a Borg Warner or a GM transmission. The shift linkage on an XJ6 is a flexable cable with a rather thin rod at the end that pushes and pulls things around. If you park on a hill, expecialy with the nose pointed up, do not use the Park position to hold the car. Always set the parking brake first, then put the transmission into park so that there is no pressure on the interior transmission pawls. If you dont you could bend the shift rod as you try to pull the transmission out of the park position. The cost is beyond belief to repair this. The labor in 4 hours and the cable is not cheap either. Then there is the tow truck fee to get your car to the mechanic since you will not be able to get the car out of park once the rod is bent.

On the front of the firewall there are two soft rubber hoses that seem to come out of the firewall and go nowhere (bending down). These are **drains for the cowl vent.** If these get plugged the water will end up on your feet in the footwell. Usually on your wife's feet when she is in her best bib and tucker. Usually they will rot away before they plug up, but if you park under trees alot they may be a problem.

Another source of water on the feet is the **sun roof drains.** These plug up commonly. They are relatively easy to unplug. Open the sunroof and then with a long soft piece of wire with a loop bent into the end of it (the loop prevents the wire from digging into the side of the soft rubber tube and tearing it) look into the front two corners and push the wire down the hole you find there. This should clean out the drains for several years.

While on the subject of wet footwells and drains, there are **two drains from the AC unit under the dash** that are prone to get plugged up. These two drains can be reached from beneath the car where they come down on either side of the transmission or from the cabin by removing the footwell vents from the side of the AC unit and reaching down inside the unit. It is much harder this way and I don't recommend it.

You will usually find this problem when you make a tight corner and the spouse lets out a squeal as the water sloshes out the vent onto her new shoes. It is a much better indicator than a light on the dash because it demands attention...NOW.

The dashboard:

First lets talk about preserving it. Greg Meboe submitted this procedure to the list:

> "I believe the veneer finish on our cars' dashboards and consoles can be protected. I would guess that the primary failure mode of the clear coat is not by UV degradation, but rather from the plasticizers evaporating out of the finish. As the wood expands and contracts beneath it, the once-flexible-now-brittle finish begins to crack. That's my thought anyway. Perhaps UV degradation plays a role in this, but the cracked sections of the dashes I look at don't seem to be yellowed or cloudy, only cracked.
>
> To prevent this, a plasticizer could be applied to the surface of the finish, perhaps every few months. I've done this to our car with the hope that it will prolong the life of the clear coat. I'm using a commercially available "new-car scent", since the 'alluring' scent in new cars is plasticizer evaporating out of every plastic molded piece in the interior. It smells awful though, and we had to drive with the windows cracked for a few days :-(I'll begin to look for a more effective (and less perfumed) plasticizer when I need some more.
>
> Apart from that, I'd just say don't let your interior get too hot, as this would allow plasticizer to escape the finish more easily.
>
> No direct sunlight on the wood etc.
>
> I believe most car waxes are designed to fill irregularities in the paint work to achieve a shine. The only

product I know of that advertises to "feed the paint" is Meguiars #7. It's kind of oily, so it may contain a mild plasticizer."

There are many gremlins lurking here in the dash, the dreaded "horn on all the time" gremlin, the "Oxygen sensor light" gremlin, the "what does the sliding lever with the red and blue arrows do" gremlin, the flickering oil pressure gremlin and many others.

The series 3 XJ6s supplied to the US came with an **oxygen sensor** in the exhaust to help it run low emissions. The oxygen sensor light in the dash is tied to a circuit (which is in the trunk, by the way) that measures the miles since it was last reset. It is meant to be reset by the mechanic when he replaces the oxygen sensor. The idea is that your oxygen sensor is only good for 40 thousand miles. Actually this is being optimistic. I find that mine needs replacement at 30 thousand miles.

You should not use the light on the dash to tell you when to replace the oxygen sensor. You should instead use your fuel mileage and common sense. If you fuel mileage begins to suffer and you don't know why, pull out the O2 sensor and look at it. If the end is eroded away it is time to replace it. If you wait for the light to come on the sensor will have eroded away months before!

The problem most home mechanics have is that they don't know how to reset the circuit after they have replaced the sensor. The two manuals I have seen do not tell how this is done. If the light remains on it will deteriorate the housing from the heat and the light will fall out of the dash!

The reset button is in the trunk (boot) on the later models and is reset by pressing a recesed button in the unit. On earlier cars it is under the hood and is reset by a knob.

I had a problem with the **cruise control** engaging 10 MPH above where I set the thing. When I pushed the set button the car would accelerate ten miles per hour and then settle down into cruise control.

Greg Moboe sent this information on setting the thing:

"Your cruise problem can be fixed easily. Remove the cruise amplifier mounting screws (behind the RH glove box). Pull the amp down and remove the cover. When you get the circuit board exposed, note the potentiometer nearest the corner. This is the desired-speed adjustment. Adjust it while driving the car and playing with the cruise. It is very sensitive. Some cruise amp covers have a cut-out

> to access this potentiometer without disassembling the cruise amp."

John Proctor adds this further information on the cruise control:

> "There are two pots in the electronic control unit and these adjust the pull in point and the hysteresis of the control loop. I don't have any schematics for the unit so I can't tell you which one is which but one will adjust the difference between the speed you set and the speed the controller maintains, your problem, and the other will adjust the delay between loosing speed and the point at which the control loop tries to bring the speed back to nominal. The controller is located under the passenger side scuttle below the glove box (car). A small black plastic box with a lot of wires emanating from it via a single connector.
> The engage switch represents a weak link as the wire coming back to the switch body seems to break frequently. I just kept repairing it until I got sick and tired of it and the turn signal switch gave up too. I replaced that several months ago and it is still working ok, touch wood!

I would suggest that if you do this while driving you should have a friend do the adjusting while you drive or vice versa.

The radio on the 1985 and newer XJ6 has a built in theft prevention device that makes the radio un usable if it is stolen. It can also make it unusable id YOU disturb the radio. To get it back in service is easy if you know your radio CODE. If you dont, now is the time to contact Jaguar and find out what it is for your vehicle.

With that information in hand you can reset the anti theft device. Turn on the radio and if the word Code is displayed on the screen, enter the code numbers by pushing the appropriate buttons on the front of the pannel. The code will include numbers from 1 throught 5 as there are no larger numbered buttons on the radio. If this does not do the trick then you will have to turn off the radio and turn it on again. This time touch nothing until it has been on for AT LEAST 65 minutes. Then carefully enter the code.

Now, what does that **sliding lever below the radio** do, the one marked with a red and a blue arrow on opposite ends? Well, as someone on the Jag-Lovers list said once, "If it doesn't seem to do anything it is working." There is alot of truth to

this. It is supposed to regulate the temperature of the air exiting at the vents in the dash. If you put it to the blue arrow the air at the dash is cooler than the air in the footwells. If you put it at the red arrow the air at the dash is warmer than the air in the footwells. At least that is what the book says. In real life the difference is hard to detect. I put mine at the blue arrow all the time on the belief that in summer I want AC in my face and in winter I want heat at my feet. Movement of this slider does NOT change the temperature in the car, it just changes the relative temperature between the dash and the footwells.

Another gremlin that haunts the XJ6 is the **flickering oil pressure light** and the sudden drop in oil pressure sometimes sensed on hard deceleration and cornering. This sudden drop in pressure means you are low on oil. Add a quart and it will go away. If you filled it when you started it may mean that there is a leak or it may mean you have gone too many miles and need to change the oil as well. It may also mean that you have oil pump problems, but usually if that is the case it will not occur only when cornering and stopping.

My experience with Jaguars in general is that if you can get 1000 miles to a quart of oil you are doing OK. Many Jaguars do much better than that. Those are the ones without the anti-rust/oil leak system....8-) When the consumption of oil gets to 500 miles to a quart it is time to find out why and do something about it.

A big expensive bug in this area is the **horn that stays on**, or honks when you turn the steering wheel. There used to be a kit to fix this bug but it is no longer available. When it was available it was only really good for a few years. Now the only repair is to replace the upper steering column. A new upper steering column is expensive so you want to know that it is the steering column that is at fault before you replace it. A used parts dealer can usualy provide one for about half of the cost of a new one.

Another, less expensive, repair is to place a button under the dash near the steering column where you can reach it easy and bypass the switch in the steering column with a wire from the new switch to the horn relay. This is not elegant, makes the horn hard to find when you are in a hurry and offends my sense of beauty, but it can be done.

One owner wrote to tell me that he found that the nut that held the upper end of the horn rod in place had come loose on his car and just removing the cover from the center of the wheel alowed him to tighten the nut and cure his problem.

Another gremlin that many older XJ6s suffer from is the **bad bulb indicator** on the speedometer that lights up when a bulb burns out. This indicator really does not know if a bulb is burned out or not. It just knows if the current drawn by one side of

the circuit is greater than the other side. Thus if you put the wrong size bulb in one of the parking lights it will light, but it may take more current than the correct bulb. This will light the indicator which senses an imbalance. If all your bulbs are burning but the indicator says otherwise, check to see that all the bulbs are matched pairs.

The series 3 XJ6 came with an **inertia operated fuel cut off switch** that will cut off the fuel pump in case of an accident that created enough impact to trigger it. This switch is at the far end of the dash on the left in RHD cars and on the right in LHD cars. It is against the door post between the door post and the dash end. On top of the switch is a manual override switch to be used to reset it. This device may or may not make the car safer to drive, but it makes a nice theft deterrent. You can manually switch off the fuel pump when you leave the car so that any thief that may gain entry to the car will be unable to start the engine. The only problem I had with this is that occasionally I would return to the car and forget that I had set the switch to off.

One of the big items in this area is the **air-conditioning and heater box under the dash**. There is alot of technology here and alot of expense when it comes to fixing it. Perhaps the single most expensive repair on an XJ6 is the replacement of the evaporator coil. It requires many hours of labor to disassemble the dash, remove the front seats, etc. All this is required to just get access to the heater and evaporator cores. The Evaporator coil itself is a very small part of the expense, the labor counts for almost 5 times as much.

If you are told that you need a new evaporator you should first check to see if it is true. If there is still freon in the system you should be able to "sniff" a leak at the center vent in the console with a hand held freon sniffer. These devices are very sensitive and they are available very reasonably from parts houses. I purchased mine from J.C.Whitney in Chicago and checked the garages diagnoses. They were right and the sniffer set of the alarm when ever I got it near the center vent but made no noise when I checked several other junctions in the system. The cost of the sniffer is well worth it if you find you don't need an evaporator coil and if you do need one, then at least in the future you will be able to diagnose your own freon leaks.

The valving and flappers on this system are very complicated, but they are repairable and adjustable and their diagnoses is rather straight forward if you have the proper information to work from. The flapper valve system in the XJ-S is identical to the system in the XJ6. Kirby Palm, in his book, "Experience in a book" for the XJ-S owner, does a great job of explaining this system and its adjustment. If you are going to tackle this job I would strongly suggest that you get his book from the internet or from him. In the back of this book you will find his addresses and ordering information for his book.

I find that in trying to diagnose the heating/AC system, a small thermometer is very useful. Preferably one that can be inserted into the vents without fear of dropping in it. A dial type with a probe on it works well since the dial will not allow it to pass all the way through the vent screen.

Using a thermometer will allow you to make reliable measurements of the results of any repairs you make. Temperature as measured by "feel" is such a subjective thing that you really have to have a thermometer to know what you are feeling.

Some interesting temperatures: If the AC is working properly the temperature out of the center vent when measured several inches inside should be below 60 degrees F and can be actually below 32 degrees F. I have measured 30F in my AC at times!

Be careful with the thermometer when putting it into the center vent. There is a vacuum operated flap that can snap shut on your thermometer and damage it. If the system is set to the lowest temperature and the fan is on "HIGH" it is not likely that the flap will close.

Larry Lee sent me an entire installation procedure for an after market **cruise control for the XJ6.** It uses the Dana cruise control available from Sears. There is an appendix at the end of this book describing his installation.

Moving on back a few inches we come to the **footwells for the front seat passenger and driver.** In this area it is common to find rust due to the sun roof drains, the cowl drains, the AC drains, and the windshield leaks. All of these have been previously mentioned. With all these ways for water to get into the footwells, it does. Jaguar in their wisdom glued strips of sponge rubber to the floor in little groves. These appear to be designed to trap and hold water so that the floor will rust out. The backing of the carpet is also made of sponge rubber to retain water,

I am still searching for a substitute for the strips. One person has suggested Styrofoam strips. The main purpose of these strips seems to be to make the floor level so I suppose wood would do the job as well.

If you have rust there and it is not yet all the way through, it is repairable. I pulled the carpets up and dried out the entire area. Then I removed the sponge strips and again dried the area. After it was good and dry I chipped up all the scale and vacuumed up the dust. Then I got serious with a wire brush on a hand drill to get everything that was loose. Again I vacuumed and followed with a wipe with an alcohol dampened cloth.

Now after everything was dry I coated all the places that no longer have paint with Duro Extend to fix the surface. after it dried I sanded and cleaned the surface

again and reapplied the Duro Extend. After the second coat dried I painted it with several coats of enamel paint.

Treating it this way should prevent further deterioration barring more water in the footwell. If you continue to have water in the footwell there is nothing that will protect the metal forever that is why it is important to eliminate the source of the water at the same time as you repair the damage.

Now the interior: The beautiful leather and vinyl interior has a tendency to deteriorate in almost all climates. In wet climates leather will rot and in hot dry climates the stitching dries out and fails. Here in Texas the problem is the latter.

To prevent the leather from getting hard and dry I rub in mineral oil occasionally. This keeps my leather soft. To prevent the deterioration of the stitching I have made a cover for the cockpit that keeps the sun out. It is best if you can keep the car garaged, but I have too many cars and not enough garage. I also try to keep a blanket draped over the back seat back which is the area that is hit most by the sun. The dash top on an XJ6 is so easy to replace that I don't worry about it.

Greg Meboe submitted this piece on **how to dye your leather:**

> "In reply to several list members who requested a description of how the seat re-dye job was performed, here it is.
>
> I started by pulling all of the seats. It was easier than I imagined. Once they were on the bench, I brushed them off, and we began by putting a little of the water-based, non-caustic CT-600 cleaner on a rag and wiping down all of the surfaces. This was followed with a few damp cloth rinses, then drying with another rag.
>
> This however, didn't seem to pull the dirt out of the leather 'grains'. So we put the CT-600 in a spray bottle, lightly coated the seats with it, and scrubbed lightly with a soft nylon scrubbing brush.
>
> This we followed with a few damp cloth rinses, and finished by drying with another rag. The leather was so clean and supple after this cleaning, we could have stopped right there if there weren't patches where the original dye had worn off.
>
> We cleaned the vinyl sides of the seat with lacquer thinner and a scrub brush, which was quick and effective. Gerard warned against using lacquer thinner or other

organic solvents on the leather itself, since the wait time for all of the thinner to evaporate from the leather would be more than a week, whereas with the water based cleaner it was not a problem if rinsing was thorough.

We waited a few hours to apply the dye. We used cheap disposable foam brushes, and did about three or four thin coats to all of the leather surfaces, waiting 1/2 to 1 hour between coats. The atmosphere was warm and dry (in-law's kitchen table). We coated the vinyl with two to three thicker coats, as the grain of the vinyl was much more pronounced than that of the leather.

I used a Bissel carpet cleaner on the carpets and headliner, and we re-installed the seats. Overall working time for Dianne and me was 4 days. We had to disassemble the rear seat bottom (a moderate pain, but we did it in front of the TV so it went quickly), to replace a corner piece of leather which had a gash in it. Reassembly of the rear seat bottom was not difficult, just time consuming to ensure a wrinkle free cover.

Again, we're very happy with the results. We'll wait a few more days, then soak the seats with Lexol Neatsfoot Oil to try to moisten the leather all the way through. This should keep them in good shape for awhile.

There were some cracks in the seats, and the dye was able to fill these to a degree. Gerard mentioned that he could use a leather crack filler, but I decided not to go with that. For this job, I wanted to maintain the softness and suppleness of the leather, at the expense of a few cracks. Perhaps the crack filler would have been just fine, but I kept imagining wallboard filler paste, so we decided to stick with the dye. I think it's flexible enough to stay in the cracks for some time.
We'll see how it goes.

The interior really does look brand new. Even the vinyl has the proper flatness, or 'leather sheen' to it. I've seen 3 or 4 different interior leather dyes, and I believe this one is the best so far. The cost came out under $100, or just over that if you count the $32.50 the upholsterer charged me to sew the leather piece into the disassembled cover.

> So we're happy. I imagine when I get out of school and get a real job, and the kids (future) have trashed the leather, I'll spring for new leather covers altogether, but until then we have a very much presentable interior at a fraction of the cost. I was even thinking I'd make vinyl upholstery for the baby seat and dye it to match the rest of the interior. Perhaps I'll put a leaping kitty on the front 'grab rail' of the baby seat?"

Despite all the precautions the interior will deteriorate and after 14 years it was necessary to replace the seat covers in my '82 series 3 XJ6. Obtaining the materials is not hard, there are many suppliers of quality interior materials. The set I purchased came, ultimately, from the Jaguar factory though I purchased them from Pauls Discount Jaguar Parts of Ft. Lauderdale, Florida. The cost was about half of what some of the bigger name places were asking for NON Jaguar replacements.

I elected not to install them myself when I found that a local upholstery shop would do it for less than 25% of the material cost. The job was done fast and accurately even though it required some modification of the seat covers as received. These things are hand cut and so it is possible to get one that was incorrectly cut and does not match. If it does not you can return it to the supplier for replacement or just have it made to fit as I chose to do.

If you decide to do your interior I would suggest that you consider strongly getting new seat cushions as well. They are the rubber foam filler in the seat bottoms. The old ones are usually in very poor condition after 10 to 12 years and it makes no sense to replace the cover and leave the cushions sagging. You should purchase ready made ones from the place where you buy the covers since they are especially shaped and would be very difficult to fabricate by yourself. It is my understanding, but I have not confirmed this, that PDJP is the ONLY place where you can still get these original Jaguar foam cushions.

The leather parts of the seats and the vinyl parts on the sides are what you will get when you order them. There are vinyl panels on the backs of the front seats as well. These you may not get unless you ask for them. If yours are badly faded it is not expensive to get them and then everything will match.

The dash, after about 10 years of sunshine will develop cracks in the varnish. In some cases the veneer will actually crack away from the base wood. If only the finish has been damaged it can be renewed. However if it is bad enough to bother you it is probably worth replacing it completely since the labor to remove the dash is great and the cost of a new dash is, by comparison, low. I found when I ordered my new one it had a heavy burl in the wood while the original had been a straight grain. This

alone was worth the price of the new piece. You will be doing a great labor to take it out and replace it so why not go for a new one rather then even more labor to refinish the old one? Pauls Discount Jaguar Parts has these as well and again at far less than anyone else I priced. But always shop around. In some parts of the world, some parts are cheaper than in others, so always check out your local suppliers but always compare apples to apples and don't get sold some cheap oranges if you want apples.

The drivers seat power control on the series 3: After getting the upholstery done the car came back and the power seat didn't work. It turns out that all that was the mater was that the wires had not been reconnected to the switch after the seat was returned to the car. Naturally I had no idea where they went. But you will, because I have since found the answer and will pass it on to you here along with the location of the fuse. This information is, alone, worth what you paid for this book.

Looking at the back of the switch there are four terminals wired as such. The upper left side connector is wired to the white wire, the upper right side is wired to the green wire, the lower right side is wired to the brown wire and the lower left is wired to the red wire. Notice I started at upper left and went clockwise around the switch with White, Green, Brown, and Red.

Now what if it still doesn't work? Check the fuse. OK, but where is the fuse, its not mentioned in the manual? Like many fuses in the Jaguar this is an inline fuse that is under the left side of the console. On RHD cars I would imagine that this fuse is on the right side of the console but I don't know that for a fact. To get to it you will need to remove the vinyl cover on that side.

While on the subject of the inline fuses and the center console, there is another on the opposite side of the console from the seat fuse. It is the fuse for the cigar lighter. If you use a mobile phone or other such accessory that gets plugged into the cigar lighter you may blow that fuse one day with a non standard cigar lighter plug. I did. Now you know where it is so you can replace it.

I have heard of several people who have had trouble with the window riser switches. So far, in four Jaguars, I have not had any problems with them. But if I did, they can be expensive, in some areas of the world, I think I would go to an electronics store and buy a complete set of rocker switches that fit the holes and replace them all at the same time so they would all match. There is also the possibility of getting them from a used parts supplier, and I have heard a complete set can be had at a very good price. If you can't find them from any of the suppliers, there must be hundreds of different size rocker switches, some of them even illuminated, and I am sure there is at least one that comes close enough to the

proper size that the hole could be modified for a fit. I have seen one that is just a little too big that could be accommodated with a file.

Kirby Palm suggests using the switches to operate ralays so that they do not have to pass the full current of the window risers. Thus the switches would last longer and the windows would move faster. If he ever does it I will get him to add an appendix to this book on how to do it.

Back seat footwells: Here I don't think you will have any trouble with rust unless you park your car with the nose high so that all the water runs to the back. There does not seem to be a problem with leakage in the back of the car.

Do you have a cowbell in the back seat? If you don't know what I am talking about, you don't have one. There is an air flow flap behind the back seat somewhere that should have some rubber on it to make its operation silent. If this rubber falls off from age it will sound like a cow is following you home. The labor to repair this is much more than it is worth. I have never even tried after the shop told me what the labor cost would be. Actually they didn't tell me what it would be, they just told me I didn't really want to know. I can take a hint. Some day when I have more time than I can use I will investigate this further, but for now, know that it is not lethal nor will it cause the car to suddenly stop moving.

In Rob Reillys APPENDIX ON TRANSISTORIZED **FUEL PUMP** you can find instructions on improving your fuel pumps on series 1 and series 2 (non EFI) XJ6s

Behind the rear seat in the trunk (boot) is where the **fuel tanks** reside. One of the big problems with the XJ6 is leaking fuel tanks. This is because of water getting into the tanks and sitting in the bottom until it rusts through. Water in fuel is not uncommon and if you do not keep your tanks topped up water laden air will fill the empty space. In the evening when the air cools the water condenses on the sides of the tank and runs down the side. Since the water is heavier than the fuel it sinks to the bottom so that even if the air heats up in the morning it does not pick the moisture back up. It is a one way pumping system that deposits water on the bottom of the tank. This is why pilots, who just can't afford a dead engine, ALWAYS top up their tanks before putting the bird to bed.

There are products that will dissolve the water into the fuel. Usually they are just a mixture of perfume and alcohol. The alcohol will combine with the water and will then mix with the fuel. It works, but I worry about pushing water, a non compressible liquid, through the injectors. I know raw water will hurt them and I am concerned that water and alcohol may also be detrimental to the injectors small orifice.

Once you have a leaking tank there are products that will repair it if it has not gone too far. Most of the good products are epoxy mixes that come in two parts and are mixed ant then sloshed in the tank to coat the entire inside with a plastic coating that is impervious to gasoline.

The trick to making them work well is a through cleaning of the fuel tank first. After removing the tank the scale and rust must be removed. You can take the tank to someone with pressure steam cleaning equipment or possibly to a radiator shop to have it dipped.

DO NOT try to use a wire brush, either a hand brush or one on a flexible cable on a hand drill. There will be gas fumes in the tank and a spark from two pieces of iron being rubbed together or from the motor brushes on the drill could ignite the fumes. I have also heard of people trying to get rid of the fumes using an electric blower. Again, a spark from the blower motor could ignite the fumes and it would blow you to kingdom come. DON'T DO IT.

If you decide to weld or braze the holes there is only one safe way to do it. You must fill the tank with water (completely full, no air pockets) and weld or braze while the water is in the tank. Its a tricky process and probably is not worth the trouble if you are not a professional welder.

I would suggest that if you cannot afford a professional welder or a new tank and the holes are too big to seal with a sloshing seal you might try a fiberglass patch made with a fuel resistant epoxy resin. It won't look pretty. Regular fiberglass like you buy for body work is not fuel resistant to submersion in fuel though it will take having fuel splashed on it. Don't use a resin that you cannot be sure will resist fuel or you may get a trunk full of fuel when the patch gives way.

Sometimes the problem is not a leak, but an **overflowing fuel tank:**

Nick Johannessen offers this advice:

> "Sounds like the return valve is shot. A way to check this is to start the car up, go back to the fuel filler cap and using, say, a ball-point pen (no-name brand works fine) poker the flap open and see if fuel is returning to the correct tank. You should be able to see the returning fuel quite clearly. Try this for both tanks.
>
> When this happened to me I had only had the car a couple of weeks, and immediately took the car to a Jaguar-specialist to have it looked at. After buying the service manual I found that changing this valve is a trivial job. Those valves aren't the cheapest of parts though.

> I just started thinking though... was it the change-over valve or the return-valve that needed replacing? Looking back at the bill for the job it was the change-over valve.
>
> Looking at the procedure for changing it the job is trivial, clamp and swap."

Here at the back of the trunk (boot) we come to the **trunk (boot) interior light**. I slammed the lid down once. (You don't have to slam the lid, just push it down and if it is properly adjusted it will latch!) When I did it was against something and it broke the interior light.

I priced a new lens and was shocked at the price. Then I discovered that the interior lamp for the VW beetle is almost the same light ($2.95). A little fiddling around with a file and I was able to make it fit. It even has an on/off switch incorporated into the lens which is handy if you need to keep the lid open because there is something under it that is too big. By switching off the lamp it will prevent your draining the battery as I also did ONCE. Be careful to properly insulate the connections so they don't touch the metal inside of the lid.

The tail/brake/turn/backup lights are at the end of the line. Today I opened both of them up because the little "one of your lights is out" indicator on the speedometer was lit. All the lights were working, but the left tail light looked brighter. No wonder, the PO had a 12 watt lamp on one side and a 5 watt lamp on the other. Imbalance corrected the lamp on the dash went out.

The Back Bumper

Larry Lees APPENDIX ON CRUISE CONTROL
for Series 1 and 2

As I promised, below is what one should need to install a Dana Corp. cruise control in a Series II XJ6. My car, one of the last Series IIs built in 1979, has a 4.2 l engine and dual SU HIF7 carburetors, so there will likely be some minor differences for other bodies and/or engines, but they should be minimal and rather obvious.

The particular unit I installed was purchased from Sears, Model 318.20309. This model came with a turn signal lever that can replace an existing one (if no other switches are on it), but Model 318.20308 included a clamp-on control switch. Other than the control switch design, the two units are identical. I installed it in 1987. The manual for this unit does not say "Dana" anywhere in it, but I recognized the system as very similar to other Dana units (also purchased from Sears, but marked "Dana Electronic Speed Control Kit 250-1000") I had installed on other cars as far back as 1978. There have been some changes over the years--such as a change from two drive shaft magnets to one, and deletion of an inertial deceleration switch--but all of them that I have seen are installed essentially the same way.

The installation manual (I still have two of these) is quite complete and easy to follow. It includes an electrical schematic and a pictorial drawing that shows how the various components and cables connect. The cable plugs are all different, so improper connections are difficult to make.

Follow the manual instructions to install:

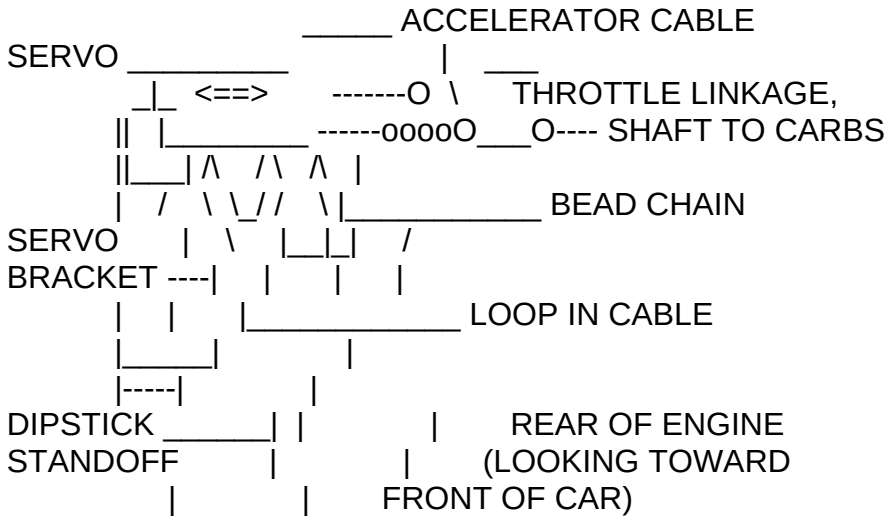
Drive shaft Magnet.
Road Speed Pick-up Coil.
Servo.
Disengagement Switch & Valve Assembly (Brake Switch).

Some judgment must be exercised when mounting the various components.

I attached the Drive shaft Magnet not far behind the transmission-drive shaft flange, and mounted the Road Speed Pick-up Coil (using the L-

bracket provided) on the driver's side of the body. There is ample, protected space in this area on an XJ6.

I mounted the Servo (using the multi-hole bracket provided) to the oil dipstick standoff, using the same bolt that holds the dipstick tube. The bracket sticks up almost vertically, and the Servo is mounted to point across the rear of the engine. Since the Servo throttle cable is longer than needed, make a loop in it behind the engine. Attachment of the bead chain to the throttle linkage, using a vacant hole near where the accelerator cable attaches is straight forward. The Servo bracket is strong enough to work well in this position, and there is still ample room to remove the transmission dipstick (I have a BW 12). A rough ASCII-art sketch follows.

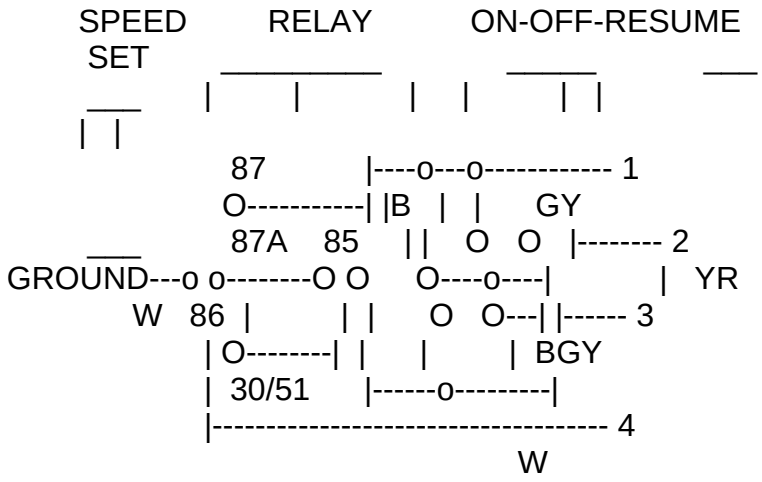


To get a custom Jaguar look inside, do NOT use the Dana (Sears) Control Switch. Instead, one needs the following from a Series III XJ6:

Turn signal switch assembly with cruise set button.

Transmission shift quadrant with cruise on-off-resume switch and console panel.

Remove the 4-wire plug from the Dana Control Switch cable. Connect the Jaguar switches to it as follows. This sketch shows ONLY wires that are different from the Dana (Sears) schematic. Colors for new wires match Jaguar standards as closely as possible as do the terminal numbers on the relay. Numbers on the 4-wire plug match the Dana numbers.



The Dana cable from the Regulator to this plug has wire colors as follows:

1 Red
2 Brown (2 wires)
3 Dk. Green
4 Yellow

How the Jaguar switch functions replace the Dana switch functions should be clear from the Dana schematic. The Jaguar switches are physically located in two places, but that makes no electrical difference. A good ground for the Set Speed switch is essential (as is a good ground for the Servo), but it can be located just about anywhere.

Once the unit is installed, the check-out procedure described in the manual should be followed without any changes. Use the electrical schematic to sort out any errors in the new wiring. Hopefully, this will not be necessary.

The pictorial drawing in my manual showed one UNLABELED adjustment screw on the Regulator. It should be labeled "Minimum Speed Adjust." The manual describes how to make all set-up adjustments. I set the Minimum speed at 30 mph, which enables the unit to maintain a set speed anywhere between about 30 mph and 90 mph. Others may prefer a different range.

Once everything has been tested and adjusted, push the Regulator and excess wiring up behind the under scuttle panel below the steering wheel. I have not found it necessary to fasten the Regulator to anything.

One should now be able to enjoy miles of foot-off driving!

APPENDIX OF PRODUCTION NUMBERS OF EACH SERIES AND MODEL

According to the person submitting these to the list, "These production figures are those supplied by Jaguar and should include all known cars including prototypes"

I am sorry, I do not have the name of the person who submitted these to the list so cannot give the credit where it is due.

Series I
Jaguar XJ6 2.8 / Daimler Sovereign 2.8 - Sept. 68 -> May 73
Total made Jaguar: 19.426 (rhd: 13.301 lhd: 6.125)
Total made Daimler: 3.221

Jaguar XJ6 4.2/ Daimler Sovereign 4.2 Sept. 68 -> July 73 (lwb from Oct 72)
Total made Jaguar: 59.556
(rhd/swb: 33.467 rhd/lwb: 583 lhd/swb: 25.505 lhd/lwb: 1 !)
Total made Daimler: 11.918 (swb: 11.522 lwb: 396)

Jaguar XJ12 5.3/ Daimler Double Six - July 72 -> Aug 73
Total made Jaguar: 3.235
(rhd/swb: 720 rhd/lwb: 750 lhd/swb: 1.762 lhd/lwb: 3)
Total made Daimler: 808 (Sovereign: 466 Vanden Plas: 342)

Series II
Jaguar XJ6 3.4/ Daimler Sovereign 3.4 - April 75 -> Feb 79 (LWB only)
Total made Jaguar: 6.490 (rhd: 5.040 lhd: 1.486)
Total made Daimler: 2.347

Jaguar XJ6 4.2/ Daimler Sovereign 4.2 - Sept 73 -> Feb 79
(Nov 74 onwards; lwb only)
Total made Jaguar: 63.282
(rhd/swb: 7.463 rhd/lwb: 26.236 lhd/swb: 4.907 lhd/lwb: 24.676
Total made Daimler: 17.807
(swb: 2.431 lwb: 14.498 VDP: 878)

Jaguar XJ6C 4.2/ Daimler XJ6C 4.2 - Sept 73 *) -> Nov 77
Total made Jaguar: 6.505
(rhd: 2.606 lhd: 3.899)
Total made Daimler: 1.676
*) Launched but not produced.

Jaguar XJ12C 5.3 / Daimler XJ12C 5.3 - Sept 73 *) -> Nov 77
Total made Jaguar: 1.873 (rhd: 604 lhd: 1.269)
Total made Daimler: 354
*) Launched but not produced.

Jaguar XJ12 5.3 / Daimler Double Six - Sept 73 -> Nov 79(LWB only)
Total made Jaguar: 14.226
(rhd: 4.157 lhd: 10.069)
Total made Daimler: 4.292
(Sovereign: 2.581 Vanden Plas: 1.711)

Series III
Jaguar XJ6 4.2/ Daimler Sovereign 4.2 - March 79 -> April 87
Total made Jaguar: 27.261
Total made Daimler: 20.490

Jaguar XJ6 3.4 / Daimler Sovereign 3.4 - March 79 -> April 87
Total made Jaguar: unknown
Total made Daimler: unknown

Jaguar XJ12 5.3/ Daimler Double Six - March 79 -> (Prod figures up until Sept 90)
Total made Jaguar: 12.404
Total made Daimler: 9.820
(Hereof Vanden Plas: 894 (VDP terminated 1984))

Rob Reillys APPENDIX ON TRANSISTORIZED FUEL PUMP

Hey, just in time for Alastair and Nick, I was putting together a report on how I rebuilt my Mark V fuel pump with a modification.

First, for Dave, your injected car has a different kind of pump from the carburetted cars. SU pumps on carburetted cars have an electromagnet, a diaphragm and a set of points. The steel disc on the diaphragm is what clicks.
Yours is an electric motor which *I think* should whir only when the engine is either cranking or running. If the engine is shut off or if after cranking it fails to start, and the pump keeps whirring, I believe that would indicate a problem in the pump relay or the air flow sensor.

I just finished rebuilding the original pump for my '50 Mark V last week, and this time I added a transistor and a diode according to a scheme published by the Classic Jaguar Association in July '89 and Jan '90. They got it from the Vintage MG folks. Most of your SU pumps will have a capacitor which sorta protects the points for awhile but eventually they burn out. My MkV didn't even have a capacitor, so the points really arced something fierce.
Apparently the MG mod lets the transistor do the coil switching work, so the points last indefinitely, no more tapping the pump with a hammer or slamming the car door to get it going again.

From Radio Shack or another electronics supplier you need: one transistor.....for negative ground get a TIP 32 PNP .....for positive ground get a TIP 31 NPN one diode.....200V 1A micro miniature type 1N4003.....same for either ground (or an alternative diode 1N4002 can be used)

Get these parts from one of the after market Jag parts suppliers.
One contact points set and one diaphragm for a single pump, or two for a double pumper.

You might need: one-way valve discs (some are plastic, and they do break) Notes: get the double contact type points, not the single. There are two lengths for the diaphragm stem, Mark V is the longer one, I think XJ6 should be the shorter one.

Procedure: Remove six screws around diaphragm and gently peel it off the aluminum body. This contact face is a sealing surface, so don't gouge it with a screwdriver like I did my first time. Clean the crud out of the body and check your one way valves (a gozzinta and a gozzoutta). You can push up on the diaphragm to see the toggling

action of the points. Note how much the stem is screwed into the center pivot of the points, and try to duplicate with the new diaphragm, but you don't have to be super accurate about that.
The diaphragm has either a plastic centering spider or 11 centering brass discs to center it in the cast iron coil body. Unscrew diaphragm from old points, replace points and screw in new diaphragm. Push on the diaphragm to check toggling action of the points and bend the tab to adjust the travel of the moving points (I found a couple of new sets of points didn't flip over right, had to bend the coil spring a bit). Bend and/or adjust the stationary points to get a good contact with the moving points. Good contact and good separation is what you're after. Put in centering spider or discs, put fuel sealant on contact faces, and tighten down six screws diagonally and uniformly. Note the small drain hole in the coil body is supposed to point downwards. Bench test it with jumper leads from your battery, it should rattle away at about 3 or 4 cycles per second. Installed, it should fill up the carb bowls and then slow down to like one click every two to ten seconds. At this point your pump is just as good as it ever was.....

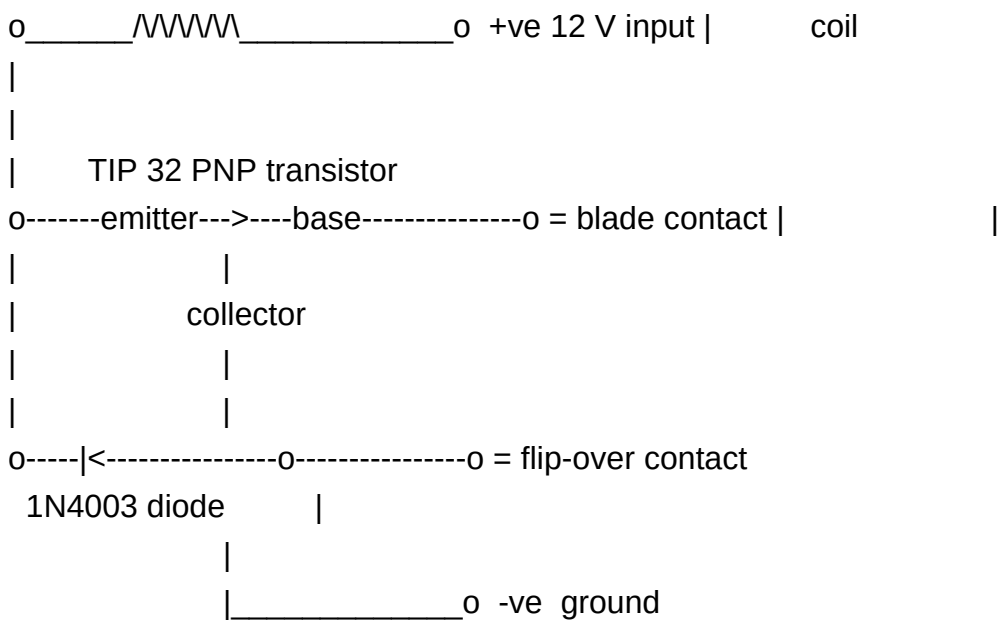
Now for the mod: From this moment it becomes either a positive or negative ground only pump, so decide which you want. First disconnect the one coil wire from the blade contact point small fixing screw, and remove the capacitor. The other coil wire is your 12V input, and stays as is. The transistor has a mounting tab which I drilled out to fit on one of the two existing large mounting screws for the bakelite bridge. Use either one you like, since you won't be reinstalling the capacitor.
Note the transistor has an emitter, a base, and a collector. Regardless of whether you are doing a PNP for negative ground or an NPN for positive ground, the connections are the same.
The collector is grounded to the coil body, as is the wire from the flipover contact points.

The base terminal is soldered to a wire which connects to the small screw which holds the blade contacts.
The emitter is soldered to the coil wire that was removed from the small screw above.
Now for the diode: For both positive and negative ground the diode is soldered between the emitter-to-coil joint and ground, but in opposite directions. The forward direction was shown on the package I bought, looks like an arrow running into a wall.
For negative ground (earth): the diode forward direction is from ground to the emitter.
For positive ground: the diode forward direction is from the emitter to ground.

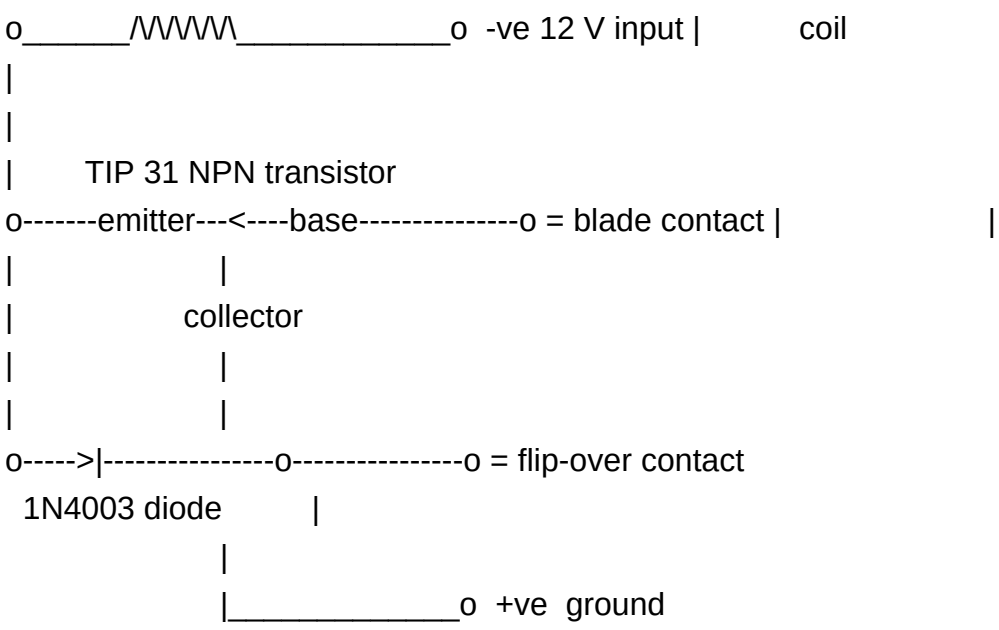
The result is a pump that rattles away with not a bit of visible arcing and sparking at the points"

Second attempt at an ASCII circuit diagram, this time paying more attention to the <space bar>.

This is the negative ground version:



Following is the positive ground version:



Bela Orbans APPENDIX ON FRONT END REPAIR

"Front suspension rubber bits

I have done all of this about two years ago. My memory is rather rusty, but here is what I recall:

>Question is: How much of a job is it to change the 4 bits
>that keep the front suspension in place, and can this be
>done without removing the whole thing? I guess the other
>rubber bits

You can change these bits without removing the whole thing.
Space is fairly tight and it is difficult to access some of the bolts on the rear mounts, but it can be done.

>a) small, on either end of a short vertical rod,
>right out by the wheels (roll-bar bushes?)

Yes, these are the anti-roll bar bushes. They are easy to replace. Remember to undo the nuts on the vertical rods on both sides. This allows the anti-roll bar to swing up and out of the way. Replace the anti-roll bar to frame bushings too. (These are in front of the suspension under two half-moon steel brackets.)

>b) the wishbone bushes

The upper ones are easy to do. Compress the suspension. (Lift the car, take the wheel off, put something suitable under the lower ball joint and lower the car.) This compresses the spring enough that you can take out the two bolts that hold the upper ball joint together with the upper wishbones. The whole process is relatively straightforward. (Watch the brake lines! When you undo the upper control arms, the whole hub/brake rotor assembly wants to swing out. Secure it with a piece of wire.)

The lower ones are a whole different story. It is probably best done with the suspension removed from the car. I have done it in place but I would not want to do it again. The shaft that goes trough the lower control arm and the sub frame is LONG. It is usually frozen into the sub frame and you may need to do some serious persuasion to get it loose. The metalastic bushes are pressed in the control arms. You will need to press the old ones out and the new ones in.

On top of this, the steering rack and the oil pan are in the way. I had to undo the engine mounts and the fan and lift the engine as high as I could to get the shafts out. (Of course, you also need to keep the springs compressed or, even better, removed for this operation.)
I recommend that you have a competent shop do this.

>*Thinks back* This business really started when I
>was fed up with the rattle and knocking from the
>front as
>I drove over tram-lines and small holes in the road.
>Am I barking up the wrong tree?

Did you check your shock absorbers? How about their bushings at the top, where they mount to the body? Bad shocks can make quite a racket. If the suspension bushings are worn, they usually don't make much of a racket, but definitely affect the steering feel of the car. Does it feel "loose" on the road?

>How many hours would it take a pro to drop the suspension,
>change all the bits (including balljoints and springs)?
>Would it be worth it? There is no way I will attempt
>this job myself, call me chicken, but if I have to I will
>pay someone to do it...

Lawrence Bujas APPENDIX ON STARTER DIAGNOSTICS

from his Web Page

A week or so ago, Bob Niesse's asked...
{...a wonderful '69 E-Type coupe...but when I turned the ignition key, {all I got was a loud "click" up in the engine compartment sounding as {if some type of relay had been tripped? Hmm... Lucas strikes again!

FAQ time.... As a starting point, I've put the following Guide together from some old posts. If anyone has anything to add or subtract to it, feel free to contribute. In a couple places I've explicitly requested help by [REQUESTING IT IN CAPS].

I'm truly open for any additional input on this. Please feel free to add any ideas you may have rather waiting for someone else to mention something obvious that I might have missed. Remember, I'm no expert, I'm just another shade-tree mechanic like most of the rest of you.

If you have any additions, send them to me embedded in the relevant area of the guide which you think that they should appear. Put your changes in ALL CAPS so that I can easily recognize them. To save everyone's time, don't post them back to the entire jaguar list. I'll integrate all the changes into our final form to the brit-car list for comment.

When it's done, we can put it up on the Jag and British-car archives for the next time this question comes along.

ROUGH DRAFT

A Guide to Diagnosing and Fixing a Reluctant Starter.

Old British-cars with reluctant starters are not at all uncommon. The usual suspects here are: 0) user-error, 1) bad battery, 2) bad connections, 3) bad relay, 4) bad starter. The simplest way to proceed is to check the easiest/cheapest areas first. This guide will attempt to get you to the point where your starter will crank over your engine.
Actually getting your car to run may require some additional resources.

This guide assumes that your engine is not seized and that your ignition switch functions correctly.

To get started let me recommend a couple tools which will make your job much easier:

One of the most basic tools is a copy of a wiring diagram for your car.
Without this map, you can only guess at what the various wires and relays are doing.

Since it's really hard to see electricity, one should have a multi-meter (or at least a little test light) to act as your eyes. For our purposes here, a $20 Radio Shack multi-meters works as well as $200 digital multimeters (DMM). Until I got a DMM, I was electro-phobic and wouldn't touch electrical problems. Now that I have one, I've tracked down and fixed numerous electrical bugs in my Jaguars. I consider a good DMM (Fluke 77) one of my more useful tools and wouldn't be without one. If just once you successfully fix your starting problem without having to pay a mechanic or having to buy an new battery or starter, you've more than recovered your investment.

A set of heavy-duty jumper cables comes in handy for delivering electricity to selected components and for testing your engine ground.

But, the most important tool is common sense. Bad things can happen if your starter decides to work when your car is in gear or you generate a spark near the

battery when there's too much hydrogen loitering around from a recent charging session. So, be careful and try to exercise some basic precautions like:

- wear eye glasses/protective clothing,
- avoid making sparks near the battery or petrol sources,
- be prepared to quickly disconnect the battery if necessary.
- make sure the car is out of gear with the parking brake engaged.
- keep any jumper cables, loose clothes, hair, fingers and any other valued body parts well clear of the fan, pulleys and belts.

Also, having a friend around to think things through with and to keep you from doing something really stupid is often useful too.

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Now, back to the usual suspects: 0) user-error, 1) bad battery, 2) bad connections, 3) bad starter relay, 4) bad starter.

0) User-error

If your car is an automatic, make sure that the gear-shift lever is in Park. For safety, many cars won't start unless Park is selected. Don't overlook this one, one of the best Jaguar mechanics I've ever met once had to have his own XJ6 towed to a garage when his daughter got stuck out of town because it wouldn't start in Drive.

If your car is a manual, then make sure it is in Neutral.

1) Bad Battery:

Batteries can often appear good, by putting out 12 volts, while being near death. With a DMM it is easy to measure voltage, but measuring current, the other necessary component, requires more advanced tools not generally available to the shade-tree mechanic. And just because you successfully measure 12+ volts across the battery terminals doesn't mean that the battery can generate enough current to do hard stuff like turn starters.

A handy tool for measuring current is your headlights. Do your head-lights come on strongly? Their brightness is an indication of the

general health of your battery. If they are bright and stay bright, your battery is probably good. If they dim greatly when you try to start the car, then your battery may near the end of it's life span.

Another thing to check is the age of the battery. If it's more than 5 years old, there's a good chance that it's tired and wishes to retire, if it hasn't done so already. A 4-5 year old battery, if not elderly, is considered rather mature.

Try cranking the motor with your DMM measuring the volts across the + and - battery terminals. The battery voltage should not go below 9-10 volts if the battery is good and fully charged. If the voltage drops below 7 volts and the battery is charged, the battery may be bad or you may have a ground somewhere in the electrical path or the starter bushings may be worn and the starter may be binding.

Try jump starting the car from another car or swap in a known good battery and see if the problem persists (it's considered good form to obtain permission from the replacement battery's owner before doing this). If it starts now, then either both your original battery and whatever method you used to check it are suspect or your battery connections were bad.

2) Bad Electrical Connections.

If the battery appears strong, the next suspect is the connections, particularly for older cars. By connections, I mean both ends of both of the battery cables, any connections at the starter and the relay, any chassis ground straps and even where any of the cable ends are crimped to their connectors. And remember, the bad connection which you are searching for can just as easily be in the ground side as in the hot side.

Bad ground connections are quite common in vintage cars which live in 4-season or wet climates. Temperature fluctuations can make marginal connections even worse. The first thing to do is clean up the battery terminals and the clamps on the wires going to the cables.

A cheap diagnostic for bad ground connections is to run a jumper cable directly from the appropriate battery ground terminal (-/black

for neg grounded cars, +/red for pos ground) to your engine block. Connect the battery side first, then touch the other end of the jumper to the engine block. If you don't get a big nasty spark, you've done it right. If the car starts now, then one of your battery to engine-block ground connections is bad. This trick has worked for me personally in the past when an engine-chassis ground strap, which is underneath the car, lost contact.

Check the integrity of the hot side connections. This is somewhat trickier and requires both care and courage. Disconnecting the hot side connection (+/red for neg grounded cars, -/black for pos ground) from the battery helps to keep this task from getting too exciting. One-by-one, remove a wire from the back of the starter, gently clean the end with fine sandpaper, clean the lead on the starter and then reattach the wire. You can use your DMM to check the resistance's of the various wires to ensure that the end connections of the wire aren't bad. Do them all. The courage part comes in if you are brave enough to try to jumper the starter directly. Usually this isn't necessary since cleaning the hot side connections should have taken care of any problems along this path. In any case, I won't describe the procedure. You're intelligent enough to either figure out a safe way to do it or to be content in the knowledge that you were smart enough to avoid trying to do something really stupid. If it starts now, you got off cheap, 'cause from here on out you're going to be spending money.

[I DON'T DISCUSS DETECTING BAD CRIMP CONNECTIONS. RESISTANCE TEST???]

For more modern, automatic transmission, cars, the fault may lie in a bad Park sensor. As a long-shot, you can try engaging the starter while wiggling the gear lever around in the Park position to see if anything happens.

[CAN ANYONE PROVIDE ADDITIONAL DEBUGGING HINTS HERE???]

3) Bad Relay:

If you just hear a click, find where the click is coming from. If it's a loud mechanical clack emanating from the bowels of your engine

bay, it's probably your starter solenoid engaging. If it's a barely audible click coming from underneath your dash or from a little box in your engine bay, congratulations, you've just found your starter relay. If the click's coming from your solenoid, which is attached to your starter, then you can assume that your relay is good and that either your starter/starter-solenoid or the connections to it are bad. If you trace the click to a relay, then see which wire goes to the starter and test this wire for 12-volts when you try to start the car.

[DOES ANYONE HAVE ANY OTHER RELAY DEBUGGING HINTS?]

[ANY HINTS FOR DETECTING A BAD IGNITION SWITCH?

4) Bad Starter/Starter Solenoid: (much of this comes from a British-cars post by Flemming Larsen flarsen@uclink.berkeley.edu)

Now we are reduced to suspecting either a bad starter or a bad starter solenoid. If you've got too much money, simply have someone install a new starter and solenoid and you are done with it. If you are cheap like me, pull the starter, field test it, attempt to fix it and if all else fails, take it to a local starter shop to be rebuilt.

The solenoid on the starter has TWO windings. Both windings are energized from the starting contacts on the ignition switch when you turn the key to the starting position.

Winding #1 is connected in series with the starter motor itself. That is, the current that comes from your ignition switch has to travel through the winding in the solenoid, through one pair of the brushes, through the commutator, through the armature, through the other pair of brushes, through the field windings and, through the ground of the of the starter, through the ground of the engine, through the ground strap between the engine and the chassis (or through the choke cable, if you forgot to put the ground strap back in the last time you pulled out the engine!) then through the chassis and, finally, through the negative battery cable back to the battery.

If the brushes do not make proper contact with the armature, chances

are that you will hear a _click_ (or nothing at all) instead of a _CLICK_ when you turn the key.

Winding #1 is the one which does most of the work of engaging the pinion with the gear on the flywheel when you turn the switch. This winding is shorted out by the solenoid contacts when the starter is engaged. The contacts then supply the full amount juice from the big fat cable connected to the battery (and back to the battery as described above).

Winding #2 now is left to itself to keep the starter engaged until you release the ignition key.

> On this starter, all wires connect to one post of the solenoid;
> the one that matters most is the battery cable. A couple of brown
> wires bolt to that post too, and a white-brown wire connects to a
> spade lug and runs to the ignition switch. That all works; all
> the ignition-related stuff (lights, fuel pump, etc) work when I
> turn the key.

The big fat wire from the battery supplies the juice from the battery to the starter when you turn the key. Of the other wires connected to the same post, one comes from the generator/alternator (through the ammeter, if you've got one), the other runs to the ignition switch through the fuse box. Basically this terminal is the hottest point, electrically speaking, of the entire car. The white-brown wire is the one that supplies juice to the solenoid winding_s_, as described earlier.

Here's how I would go about troubleshooting your problem:

1. Pull out the starter. Mount the starter in a vice on your workbench.

2. Connect the body of the starter to the negative side of a good battery, using a jumper cable.

3. Connect a cable between the positive side of the battery to the small terminal on the solenoid (where the white-brown wire was).

The solenoid should pull in with a good, solid CLICK and stay in that position until you disconnect the cable.

4. Connect the cable from the positive side of the battery to the _other_ large terminal on the solenoid (not the one you removed the battery cable from, but the one closer to the starter itself).

   The starter should run freely, without the drive pinion being in the extended position. Don't do this for more than a few seconds!

5. Finally, connect the positive cable to the top terminal on the solenoid, run a third wire to the small terminal on the solenoid.

   The solenoid should now pull in, extend the drive pinion, close the contacts and the motor should be spinning. Again, don't do this for more than a few seconds at a time!

If any of these tests fail, you'll need to rebuild the starter. Since you already have the starter out, why not rebuild anyway?

Here are a couple of things to keep in mind, if you decide to take the starter apart:

1. Mark the location of the end plates relative to the starter body with a couple of center punch marks before you dismantle the starter. Some starters have little tabs and notches where these parts go together, some don't. It's important that these parts get put back in the same place, relative to each other, as they were.

2. Mark the top of the solenoid before you remove it. If you put it back the wrong way, it won't work.

3. Don't use emery cloth or any other kind of abrasive material on the commutator. If it needs cleaning or turning, take it to a shop.

Although I have probably half a dozen DMM's, I find it easier to use

an _analog_ voltmeter when working on cars (and boats). My favorite was a Simpson, model 260-7, which I unfortunately loaned to a fellow SOL'er a few years ago, and never got back.

A simple gadget which I find very helpful when troubleshooting 12 volt circuits is an old taillight with a 25 watt lamp in it. I have connected two black wires with alligator clips on one side of the lamp. One wire is about six inches long and is useful for hanging the thing from anything that is grounded, that's nearby. The other black wire is about 20 feet long and is used for testing grounding problems, e.g. to test that dim taillight, I connect the short wire directly to the negative side of the battery and connect the long wire to the socket of the dim taillight. If the taillight gets brighter, I know that there is a bad ground somewhere between the battery and the taillight. On the other side of my test lamp I have a 20 foot red wire with a pointed test probe on the end. If I connect this probe to the hot terminal of the same dim taillight as before and the dim light gets dimmer, I know that there is a problem between the hot side of the battery and the taillight circuit (The additional current drawn by the test lamp = additional voltage drop). The test lamp is also handy for testing corroded fuse holders, flaky starter switch contacts etc., where a Digital Multimeter may happily show 12 volts even though there may be hundreds of ohms of resistance the circuit.

(One modification I would include next time I make one of these gadgets, would be to include a couple of 10 amp in-line fuses in each of the long cables.)

A voltmeter in a car (even in a ZX, whatever make of LJC that may be) is not a very good instrument for troubleshooting. A simple test lamp like the one I just described would work much better. If you hook it up directly across the battery you'll be able to tell, fairly accurately, what condition the battery is in, both under load and no-load. If the light goes from bright to close to nothing when you crank the starter, well let's hope that Sears is having a sale on DieHards this week. If the brightness of the lamp changes only slightly, then the battery is most likely not the problem.

5) Other miscellaneous starter problems:

Heat is bad for starters. Higher temperatures means higher electrical resistance which means higher system current draw when starting hot. This may be enough to keep a marginal starter from working when hot even though it works fine when cold. If you take a cold starter down to a shop to have them check it, it may seem perfectly fine but should be rebuilt anyway. Heat shielding the wires and starter from the exhaust heat can help alleviate hot start problems.

It is possible for the starter push the ring-gear on the flywheel back to the point where the starter will no longer engage the ring gear. The symptoms are a starter that engages and whirs at high speed, but doesn't crank the engine. It has been confirmed that many TR-6 were shipped with ring-gears installed backwards after the factory switched from rear-engaging starters to front-engaging starters, but didn't bother to reverse their stock of already assembled flywheels. This left the beveled side of the ring-gear pointing away from the starter gear rather than toward the starter gear as it should for easier engagement.

I once saw an instance where either the starter relay failed or a wire got shorted in the starter circuit. The starter engaged and ran continually, even though the engine was running and the key was turned off. The noise was horrendous. In this case, I quickly disconnected one of the cables from the battery and let the unfortunate woman call AAA.

Kirby Palms APPENDIX ON HOW TO GET THE XJ-S BOOK

EXPERIENCE IN A BOOK:

Help for the Jaguar XJ-S owner

by Kirby Palm

This booklet contains things that a Jaguar XJ-S owner should know, but doesn't know who to ask. Owners of other late model Jaguars may also benefit, as much of the cars are similar. This booklet is over 100 pages, and includes a few illustrations.

Sections of the booklet address:

- Maintenance and repair
- Performance modifications
- Sources for parts, accessories, etc.

Generally, the booklet offers practical know-how not found in the official repair manuals, and should be considered a supplement rather than a substitute.

There are several ways to obtain this booklet. To receive the very latest version printed out, send US$15 to the author (below). To receive a diskette of the latest MicroSoft Word file so you can print your own copies, send US$7. Add US$1 for Canada, US$2 for other countries outside the US. Be sure to give your name and address.

For InterNet users, the archived file is also available (free of charge) via the World Wide Web page:

http://gcn.scri.fsu.edu/~palmk

This booklet is corrected and updated constantly. If you have learned something about your Jag that the rest of us should know, please write, call or send a message to:

Kirby Palm
Route 1, Box 3498
Havana, FL 32333-9762
(904) 539-7775
InterNet: palmk@gcn.scri.fsu.edu

David Shields Appendix on substitute parts

XJ6 Parts Replacement guide. Inputs captured from the jag-lovers group and my own experience - results not guaranteed.

David J. Shield 11/6/96

During 1996, I've been capturing from the jag-lovers discussions a list of parts that interchange with OEM parts on the XJ6, SI/II/III. The idea is that many of these parts are actually used in other makes of cars. Thus if you knew there was a Bosch or GM equivalent available, you can save considerable money and have original performance/behavior. Example is the fuel injection - Bosch parts are often identical and ~1/2 the price. Secondly, a number of parts are similar enough to parts from other makes, that they can be substituted easily (or not so easily, as in the door lock solenoids below), saving the owner money and giving equivalent performance. Third is the performance category, such as better shocks or sway bars.

As always, you must always check the cross-reference yourself, and inspect that part carefully before installing (always good advice). The usual disclaimers apply, that is, you take the responsibility for these cross-references or any consequences from usage of these parts. Use your own judgement. If you do not want to use such judgement, get the exact original part from the dealer.

The table following is a beginning - I expect that publication will spawn interest this list will quickly increase in comprehensiveness. If you discover bad data here, please notify me. Where the table specifies one series (SII, for example) the application may extend to other series, it's just not been checked. The source of the data is shown and a quote, if any, is given. In some cases there are numerous data sources, I show the one that came to my attention first, or the one who had the best description of the process to convert the part or commentary on performance. Or the most interesting quote. I'll maintain the original MSWord and HTML format files at http://ns.net/~dshield

David
David_J_Shield@ccm.fm.intel.com

References:
Jon Heber (All Jaguar Clubs Of The World web)
jag-lovers members
Kirby's XJS Help Booklet
Jim's XJ6 Help Booklet
XK's Unlimited catalog
A Bosch/Lucas dealer

Air Conditioning Components

Part and Series	Jaguar #	Cross-reference	Exact replacement?	Close or workable replacement	Data source
Compressor SI/II/III	JA-EAC9616X	GM A-6	Almost - see commentary		Shield and others.
	Commentary: Shield: GM A-6 threaded mounting holes are metric - must retap or get correct bolts. Specifics are in Kirby's XJS Help Booklet. I paid $85 USD for a rebuilt with clutch (7/96 DJS). Most sources are higher but still not bad. Kirby: .....the superheat switch will not fit in a compressor that was not made to have one, and most are made for a pressure switch these days. Best bet: just plan on abandoning the superheat switch and the 3-way fuse. By the way, one fundamental difference: the pressure switch is closed when all is OK and opens when pressure is low, so the clutch is generally grounded through it. The superheat switch that comes on the Jag, however, is open when everything is OK and closes to cause a short and blow the 3-way fuse when temp is too high. So, the wiring to the clutch goes through the fuse, and a third wire goes to the superheat switch which must NOT be grounded in order for the system to work. -- Kirbert				
Amplifier SII/III	C45402		Yes		HD Rodgers
	Commentary: Unit is from Australia				
Amplifier SII/III	C45402	Shown as the same in XKU catalog	Yes		XK's Unlimited
	Commentary: Unit is from the U.S.				

Electrical (non-FI or ignition)

Part and Series	Jaguar #	Cross-reference	Exact replacement?	Close or workable replacement	Data source
Alternator SI/II/III			No	GM Alternator	Many
	Commentary: John's Cars supplies a bracket to fit the GM Alternator in. Much less expensive than a new Jag unit. Not easy to replace, in any case.				

Cooling System

Part and Series	Jaguar #	Cross-reference	Exact replacement?	Close or workable replacement	Data source
Heater valve SI/II/III	C41051		Yes	GM	Carlos Madero
	Commentary: Carlos Madera: “I had to replace the heater valve in the car, and found that Chevrolets of late 60's or early 70's use the exact same part.”				
Heater Valve	C41051		Close	‘83 Olds Cutlass	Chad Bolles
	Commentary: Chad Bolles: You should be able to blow air through it while holding it in your hand. The Jag is also normally open.				
Heater Valve	C41051		No	Late model Jag plastic valve	Kirby Palm
	Commentary: Kirby Palm: “Another option is to replace it with a Jaguar valve! The newer XJ's use a valve made entirely of plastic -- no metal at all -- and cost half what the Chevy valves cost. Although some people don’t like plastic, the design of this valve is so superior that it is probably the most reliable choice.”				
Aux. Fan relay (the red one to the left of the radiator) ‘76-’85	LU-SRB411	Hella 4RD003 520-13	Yes		Volker Nadenau
	Commentary: Volker Nadenau: “It is of course 12V and rated for 30Amps. It fits without any modifications in the red Lucas socket.”				
Aux. Fan relay (the red one to the left of the radiator) ‘76-’85	LU-SRB411	Bosch is 0.332.204.105 and for the Potter & Brumfield is VF4-45F11.	Yes		Bob Whiles
Fan Clutch SIII with plastic fan	JA-EAC-4751	Hayden 2765			Shield
	Commentary: Shield: “Worked for 4.5 years, so far. Note that the Haynes manual indicates different bolt patterns - check yours before purchase.”				

Fan Clutch SIII with plastic fan	JA-EAC-4751			1980 Buick 350	Charles Gaudi
	Commentary: Charles Gaudi: “The clutch is a model for the 1980 buick 350 v-8. cost $22.95 u.s. It seems to have made things better..”				

Fuel Injection and Emission Control Components

Part and Series	Jaguar #	Cross-reference	Exact replacement?	Close or workable replacement	Data source
Injector SIII	LU-73179	Bosch 0280150151	Yes		Shield
	Commentary: Replace seals at this time.				
O2 Sensor '78-81	LU73211	Bosch 11051 (old number 0258001051)	Yes		Bosch/Lucas dealer
O2 Sensor '78-81	LU73211		No, but works and fits.	Bosch universal O2 sensor 11025	Brian Sherwood (replacing O2 sensor on XJS, which shows same Lucas part # as XJ6)
	Commentary: Brian Sherwood: **"** BTW- I also replaced both Oxygen sensors this week- used Bosch universal sensor p/n 11025 - cost 20 dollars each at the local discount parts place! They also work great."				
O2 sensor SIII '81-on, 2-wire	LU73210	Bosch 0258001035	Yes		Shield
	Commentary: Shield: "No problem - Bosch part works fine."				
O2 sensor SIII '81-on	JA-JLM2037	Bosch 13032 -or- Bosch 13931 (old number 02580032)	Yes		Bosch/Lucas dealer
	Commentary: Bosch 13032 will supercede to Bosch 13931				
O2 sensor SII/III thru '81	LU-73211	Pending			
Cold start injector	LU-73180	Bosch 0280 170 028			Bosch/Lucas dealer
Thermo-time switch '78-85	LU-SEB119	Bosch 0280 130 220			Bosch/Lucas dealer

Water temp sensor ‘78-85	LU-SNB802	Bosch 0280 130 023			Bosch/Lucas dealer
Fuel Pump relay ‘78-79	LU-33394	Bosch 0332 514 121			Bosch/Lucas dealer (common relay)
Fuel pump relay ‘80-on	LU-SRB304	Pending			
Cold start relay	LU-SRB304	Pending			
Air flow meter bellows	JA-EAC6780	Pending			
	Commentary: Absurdly exensive from the dealer				
Rubber sleeve to Throttle Body & filter	JA-EAC1301	Pending			
	Commentary: Absurdly expensive for a piece of rubber				
Pressure regulator to 8L.139876 (’83)	LU-73177	Bosch 0280 160 200			Bosch/Lucas dealer
Pressure Reg. From 8L.139877 (‘83-on)	JA-EAC4864	Bosch 0280 160 214			Bosch/Lucas dealer
Aux. Air Valve to 8L.98550 (’81)	LU-73174	None known			
Aux. Air Valve from 8L.98551 (’81)	LU-73212	None known			
Control Unit ‘78-’81	03-133524	Pending			
Control Unit ‘82-on	03-133637	Pending			
Airflow meter	JA-EAC3821 = 73172 Lucas	Bosch 0280 203 006			Bosch/Lucas dealer
Thermal Switch SIII	JA-EAC3762	Pending			
Diode Units SIII Red Pektron on firewall	JA-DAC1861	Pending			

Air Injection Pump SI/II	C-40103	Pending			
Air Injection Pump SIII	JA-EAC3645	Pending		GM?	

Ignition Components

Part and Series	Jaguar #	Cross-reference	Exact replacement?	Close or workable replacement	Data source
Amplifier SI/II/III '75-on (earlier were not always converted to ConstantEnergy Ignition)	LU-DAB102		No	GMHEI	Gregory Price
	Commentary: Gregory Price:" The GM HEI electronic ignition module DOES work on my '85 SIII XJ6. I've done no formal testing to make sure it reacts properly in every possible performance scenario, but it runs. I don't present this as an ultimate replacement, but if your Lucas amplifier dies, then you can use a GM unit as a short term (and low cost, US $13.99) solution to hold you over until your (US $240.00) Lucas unit arrives."				

Body

Part and Series	Jaguar #	Cross-reference	Exact replacement?	Close or workable replacement	Data source
Door lock solenoids				Door lock solenoids from JEGS Door Actuator kit #960-80167	Paul Hibbs
	Commentary: Paul Hibbs: “Worm-gear driven, they don’t slam the locks. Significant work required to make mounting brackets. Available from JEGS auto products 1-800-345-4545 (free shipping). The kit and actuators are manufactured by VPA corp., Carson CA 90746; vendor p/n 89-80301 and 89-80291.”				
Power window motors				GM	Carlos Madero
	Commentary: Carlos Madero: “..upon examination, it said "Delco Made in the US". I went to the salvage yard and located an early 70's Cadillac, .. exact same part, I paid 10 dollars..”				
Antenna mast Late 80s Jags using Hirschman	DBC2200			Hirschman or equivalent	HD Rodgers
	Commentary: HD Rodgers: “A replaceable mast is available for the Hirschman brand antennas..the mast is the same for some german cars. I sell the mast mail order for $15.00. The Jaguar equivalent part number is DBC2200...but don't bother checking their price! Mostly late 80s-up cars XJ6 88->, and XJS HE.”				
Antenna Mast SIII, XJS, Japanese-manufactured	DAC3542 or DAC4090		Fits and works	Name and number?	HD Rodgers
	Commentary: HD Rodgers: “The unit that we sell which is a replacement unit, not exactly the original, I usually sell for about $140.00 and you may need a fitting kit as well...It replaces DAC3542 or DAC4090 Jaguar part number which fit XJ6 Series 3, XJS, and early XJS HE.”				

Antenna mast SII electric side-mount mast only	AEU1648				
Outboard headlamp rim(in fenders) SI/II/III 5.5”	DAC2110 is U.S. spec	DAC 10680 is the UK-spec for 7” headlamps - looks much nicer than U.S. spec.	Yes	UK-spec	Shield
	Commentary: Shield: “Get 7” headlamp rims from the UK, Aus. or almost anywhere outside the U.S. Buckets are standard British Leyland - the stickers on the set said ‘British Leyland’. These should be available anywhere. 7” headlamps are easily available in US. As always, Hella is a good source for high-quality (not cheap) lights.”				
Back-up lamps				High-wattage Halogens - specifically sold as back-up lamps	Shield
	Commentary: Shield:” I use these in all my cars - much brighter. Available from many parts stores, even Target (A U.S> discount wares chain). About $10 USD each.”				
Door seals (the fat rubber ones) SI/II/III					Anyone have a source for these?

Brakes

Part and Series	Jaguar #	Cross-reference	Exact replacement?	Close or workable replacement	Data source
Booster (Servo) Late ‘77-’87	GR-74049095	Same part #, XJS ‘77-on (metric fittings)	Yes		Same #, XJS ‘77-on (metric fittings)

Cruise Control

Part and Series	Jaguar #	Cross-reference	Exact replacement?	Close or workable replacement	Data source
Bellows	AUE-4090		Yes		Welsh Enterprises
	Commentary: $29.95 from Welsh Enterprises September 1996 mailer				
Bellows SIII	JA-DAC1994			Help!!!	
	Commentary: The Jaguar part is too expensive for what it does - isn’t there a GM or other part that fits??				

Engine

Part and Series	Jaguar #	Cross-reference	Exact replacement?	Close or workable replacement	Data source
Oil pressure switch SI/II/III	C42200	MGA 1978-79 oil pressure switch	Maybe??	Yes	Jim Isbell
	Commentary: Jim Isbell: “Cost is $4.99 while jag replacement is $60. May have to replace it more often, but I'll bet I wount have to replace it 12 times as often!!”				
Oil Pressure Gauge Sending Unit SI/II/III after ‘76.5	C46272	waiting…..			
	Commentary: Anyone have a low-cost EXACT replacement for this often flaky part?				

Oil pan washers SIII, XJS, XJ40		XJ6 SIII, XJS part # is EBC4896; XJ40 part # is EBC9044			Michael Neal
	Commentary: Michael Neal: "…a metal washer with a type of silicone rubber bonded to the inside. They are reusable and last for several years. These are seals for the banjo bolts on the trans cooler lines and they are worth the $4. The later XJ40s came with these updated seals." Per Ken: "One can get almost any size desired from King Bearing."				
Thermostat All	Various				Michael Neal
	Commentary: Michael Neal: "…use the Jaguar replacement Waxstat brand, none other"				

Interior

Part and Series	Jaguar #	Cross-reference	Exact replacement?	Close or workable replacement	Data source
Speakers SIII - others?				Polk MM4500	Shield
	Commentary: Shield: "Sounds great with stock radio. Easy fit, connectors need replaced. Well-suited for low-power stock radio. For high-power installations, there are speakers better suited than these."				
				Polk MM5520	Shield
	Commentary: Shield: "Sounds better than above. Non-trivial installation - the mounting hole needs to be enlarged, then the leather needs to be glued back again."				
Leather Dye		Genuine Connolly dye	Yes		Rob Weiss-Malik
	Commentary: Rob Weiss-Malik: "…Bill Hirsch Automotive in New Jersey (1-800-828-2061) They distribute genuine Connolly dye (mine came in cans that were labeled Connolly)."				

Suspension and Steering

Part and Series	Jaguar #	Cross-reference	Exact replacement?	Close or workable replacement	Data source
Front sway bar SI/II/III 11/16"		XJS Sway Bar 13/16"	Yes, with 13/16" bushings installed	XJS Sway Bar 13/16"	Shield
	Commentary: Shield: "Improves handling, not easy to install, must partly remove front subframe. Harder than doing the alternator (which is what I was doing when I decided to do this, too."				
Shocks All		KYB KG4540	Essentially		Shield
	Commentary: Shield: "Handles ~ as original."				
Shocks All		Monroe Gas Gas-Matic	Essentially		Gunnar Helliesen

	Commentary: Gunnar Helliesen: “They give the car a whole new feel, much firmer. They also lifted the car just that little bit that was needed. Perfect!”				
Front wheel grease seals SII				Victor 66723 or Federal Mogul 224663	Paul Hibbs no further details
	Commentary: No further details.				
Power Steering Pump				GM Saginaw unit??	Kirby?
	Commentary: Kirby Palm: “The XJ-S power steering pump is a standard GM Saginaw unit. However, it is uncertain whether the Jaguar system operates at the same pressure as a GM; so, if you replace the original unit, it is suggested that you remove the pressure control valve from the Jaguar unit and install it in the new one. The pressure control valve is easily removed by removing the outlet fitting and shaking the unit until it falls out.”				
Rear wheel bearings				Bower/BCA part number 18590-18520 for the inner, and 18690-18620 for the outer	Chad Bolles
	Commentary: Chad Bolles: “… the bearings in the rear wheel carriers are a Bower/BCA part number 18590-18520 for the inner, and 18690-18620 for the outer; available in any auto parts store.”				
Shock Bushings SI/II/III, also XJS				HELP brand shock bushings	Chad Bolles
	Commentary: Chad Bolles: “Go to Autozone, Pep Boys, Advance, and just about any good parts store look for their parts section marked HELP, in red packages look for shock bushings with part no. ending in 18,(cannot remember the first two no's) these will work great and only cost around $3.00 a pair. Then the hard part is installing them, cause you have a gas shock and it is a job to pull it down and remove the old parts and install the new. So if you have a helper great.				
Anti-sway bar bushing kit SII				Part-Master 2K5252	Paul Hibbs

	Commentary: Paul Hibbs: "..(complete with the vertical spacer links) Parts-Master #2-K5252 (made for a chevy truck but works fine, and it's cheeep)."

Miscellaneous XJS parts interchange

Part and Series	Jaguar #	Cross-reference	Exact replacement?	Close or workable replacement	Data source
Throttle Position Sensor	LU-73200			Ford (see below)	Brian Sherwood
	Commentary and instructions (long): Date: Thu, 26 Sep 1996 23:09:48 -0400 Subject: Substitute throttle potentiometer for V12 EFI My '84 XJ-S V12 had suffered from an intermittent surge at cruise speeds; I'd tried for a couple of months to locate the cause. The throttle potentiometer (TPS) was one of the first things I had suspected, but it checked OK with a meter. To shorten a long story, I finally ran wires from the TPS to the inside of the car so I could monitor the voltage while driving the car. And I found when the car was surging, the voltage was erratic, so a new TPS was in order. (I took the old one apart first to see if it was repairable. It's not- the resistance coating was worn down to the bare plastic). Rather than spend 150 USD for a new one, I tried something else instead - from my spare parts pile I found a TPS from a Ford, an '83 3.0L V-6, I think; part number E7DF-9B989-AA. It turned in the proper direction, same degree of travel (90 degrees), and had the same resistance as the original at both ends of it's travel (from .05 to 3.5K ohms). But no, it doesnt bolt right up. I cut a slots in a steel bushing to fit the drive lugs inside the Ford TPS. The other end of the bushing I crimped down to fit the D shape of the shaft on the bottom of the throttle pedestal, that the old TPS used to fit over. A piece of aluminum strap was used to clamp the Ford TPS to the bottom of the pedestal. The TPS fits snugly in the recess underneath, and loosening the strap allows adjustment. I cut the wire and plug from the old one, crimped on some female spade lugs to fit the terminals of the Ford unit (would have been neater to use the proper Ford plug, too, but I couldn't find that.) Red wire=wiper, green=high side of pot, yellow=low side of pot. With new TPS plugged in and igntion on, I adjusted the TPS to give .36 volts measured between red and yellow wires, at idle position. Bolted everything down, and went for a test drive-worked great. Only difference from the original is that now it doesn't surge at cruise anymore! I expect a new Ford TPS would cost about 30 dollars, if you bought a generic one. There might even be something out there that would fit better, this was just convenient for me.				

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