

DATE: OCTOBER 1991

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REF: JD 08/91

**XJS**

**ITEM: 49**

## WARRANTY CODES

In the latest edition of the XJS Warranty Code book, codes for the battery and spare wheel covers have been duplicated.

To rectify this situation and prevent further confusion when submitting claims, the following codes have been removed from the warranty system:-

CODE	DESCRIPTION
9DS	Spare Wheel Cover
8PZ	Battery Cover Boot

Therefore, with immediate effect, Dealers should NOT submit further claims for these codes.

All future claims for the above parts should be submitted, using the following codes only:-

9DQ	Battery Cover
9DR	Battery Cover Support Panel
8NU	Spare Wheel Cover

**XJS (FACELIFT)**

**ITEM: 50**

## WARRANTY CODES

The following new warranty complaint code has been allocated to cover the fuel gauge "anti-slosh module", introduced on XJS Facelift models.

Code	Description	SRO
7JU	Anti-Slosh Module	88.25.25

**Jaguar Cars Limited**

**ALL MODELS****ITEM: 51****12 CYLINDER PRESSURE CHECK**

**WARNING:** Would all technicians please note that before performing a cylinder pressure check, Repair Operation No. 12.25.01, all fuel should be purged from the fuel rail.

Purging of the fuel rail may be achieved by disconnecting the fuel pump relay and then cranking the engine for ten seconds.

**XJ6 ALL MODELS & XJS 3.6 / 4.0****ITEM: 52****19 CRUISE CONTROL ACTUATOR LINKAGE ADJUSTMENT**

Should customer complaints be received of an increase in the cruise control response time and a degree of hunting of the set speed, the cruise control actuator linkage adjustment should be checked in accordance with the following procedure, before taking any further action.

Dealers should ensure that the clearance between the end of the actuator to throttle link slot (A Fig 1) and the shoulder bolt (B Fig 1) is 0.5mm to 1mm (C Fig 1).

S.R.O.	19.75.11
Allowance	0.10 hrs
Complaint Code	7VCP

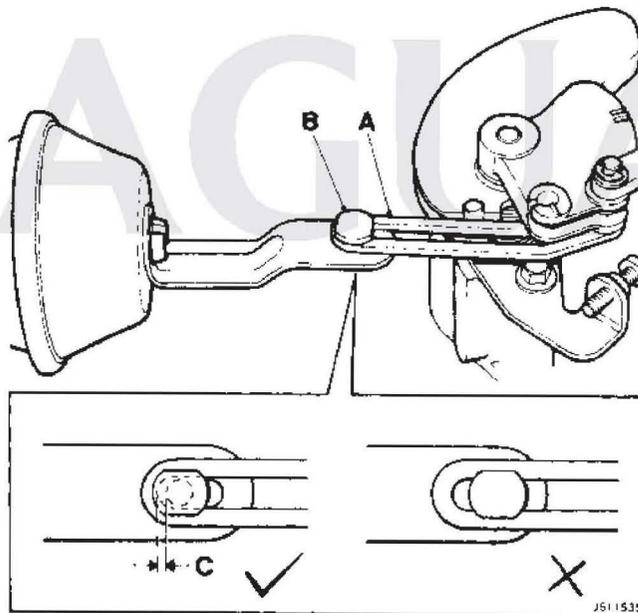


FIG 1

XJS V12

ITEM: 53

## 44 TRANSMISSION OIL COOLER CONNECTION

There have been a number of oil coolers returned with damaged coupling connector bosses, the cause of which can be attributed to poor workshop practice where backing spanners have not been used to support the integral hexagon connector of the oil cooler. This results in a fracturing of the connecting tube when torque is applied upon tightening or loosening the connection.

Technicians should use a backing spanner to hold the integral boss whilst tightening the cooler pipe connection to a torque of 15 – 17 Nm.

XJ6 / XJS / S.III / LIMOUSINE

ITEM: 54

## 60 FRONT HUB END FLOAT ADJUSTMENT

The following instructions supersede all previous instructions provided in service manuals. Manuals will be updated at the next reprint.

Front hub end float on the above models should be set between 0,0254 to 0,0762mm (0.001 to 0.003in). To achieve this in service use the following method:

**Note:** Prior to adjusting the hub end float an absorbent cloth should be placed around the brake fluid reservoir cap.

Slacken the road wheel nuts  $\frac{1}{4}$  turn each.

Jack up the front of the vehicle and support with axle stands.

Remove one wheel nut, mark the wheel relative to the stud and remove the remaining wheel nuts.

Remove the roadwheel and tyre assembly.

Dependent upon model, gently prise the brake pads free or manipulate the brake caliper to ensure the brake pads are free within their mountings, i.e. the disc is free to rotate.

Prise off the hub grease cap (1 Fig. 1).

Fit a Dial Test Indicator (DTI) to the hub (Fig. 2).

Grasp the hub unit. Firmly pull and push the unit, oscillating at the same time, to determine the DTI end float reading.

If the reading is within the specification quoted there is no need to carry out the adjustment. If not, remove the hub nut split pin and cover (2, 3 Fig. 1).

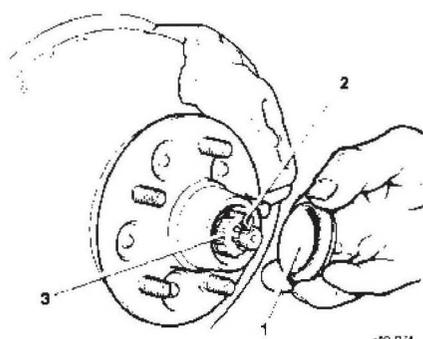


Fig. 1

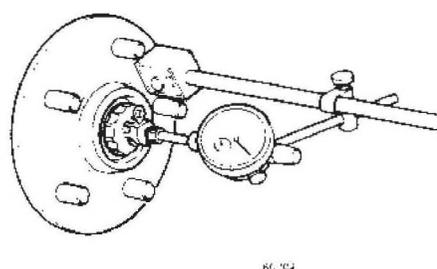


Fig. 2

**Note:** For identification purposes only,  
 Fig. 1 shows XJS, S III & Limo. type hub.  
 Fig. 2 shows XJ6 hub.

Adjust the nut, as necessary, to give a reading of 0,0508mm + / - 0,0254mm (0.002in + / - 0.001in).

**Always** try to achieve the mid-point of the tolerance i.e., 0,0508mm (0.002in).

Align the hub nut cover and secure with a new split pin.

When the new split pin is fitted, ensure the end float is re-checked using the DTI gauge (Fig. 2).

If necessary, re-adjust using the same method, until the end float is correct.

**Always** finish the adjustment by checking with a DTI gauge.

**Always** ensure the end float is within the limits quoted.

Refit the grease cap.

Refit the road wheel.

Carry out the adjustment procedure on the opposite front hub.

When finished, lower the vehicle from the stands.

Ensure the wheel nuts are tightened to the specified torque.

Remove the absorbent cloth from around the brake fluid reservoir cap, ensuring the area is clean and dry.

Before moving the vehicle, pump the brake pedal to centralise the pads.

## ALL MODELS

ITEM: 55

### 77 BODY REPAIR

To avoid the risk of causing permanent damage to vehicle ECUs during body repairs, the following precautions must be observed prior to using any electrical welding equipment.

1. Disconnect the vehicle battery and alternator.
2. Disconnect and remove all ECUs in the immediate area of any panels to be electrically welded. As a general rule, all ECUs within 2 feet of the area to be welded should be removed; for more detailed information, refer to the relevant Service Manual.
3. When using welding equipment, the earth return clamp should be located as close as possible to the area of repair.

## XJ6 ALL MODELS

ITEM: 56

### 82 DRIVER'S BLOWER MOTOR ASSEMBLY

The repair operation time for renewing the driver's side blower motor assembly has changed on all XJ6 Vehicles from VIN 629286.

The repair operation times are now as follows:-

Left Hand Drive Vehicles:

82.25.13	Blower assembly – Left Hand – Renew	01.25 Hours
82.25.13/09	As 82.25.13 (Less J.D.S. Allowance)	00.90 Hours

Right Hand Drive Vehicles:

82.25.14	Blower Assembly – Right Hand – Renew	01.25 Hours
82.25.14/09	As 82.25.14 (Less J.D.S. Allowance)	00.90 Hours

Please amend your repair time schedules accordingly.  
No other repair times are affected.

To achieve these times in service, adhere to the following procedure:–

**REMOVE**

Open the bonnet and disconnect the battery earth lead.  
Remove the driver's side dash liner.  
Remove the retaining clip from the air conditioning unit's pliable trunking.  
Displace the pliable trunking from the air conditioning unit.  
Displace the relay bases from their mounting brackets.  
Cut and remove the ratchet straps securing the brake switch harness.  
Disconnect the vacuum hose from the blower motor assembly servo unit.  
Disconnect the blower motor multi-way connectors.  
Undo and remove the steering column lower mounting securing nuts.  
Undo and remove the steering column upper mounting securing nuts.  
Lower the steering column assembly.  
Retrieve the column upper packing shims.  
Remove the washer bracket from the column.  
Manoeuvre the steering column towards the centre of the vehicle for access.  
Undo and remove the steering column outer stabilizer bar's upper and lower securing nuts.  
Displace and remove the steering column stabilizer bar (Fig. 1).  
Reposition the vehicle harness connectors to gain access to the blower motor assembly securing bolts.  
Undo and remove the blower motor assembly securing bolts.  
Displace and remove the blower motor assembly.  
Remove and discard the unit intake gasket.  
Remove the pliable trunking to assembly securing tape.  
Remove the trunking from the unit.

**REFIT**

Fit and align trunking to the new blower motor assembly.  
Secure the trunking to the assembly with tape.  
Smear the new intake gasket with a suitable adhesive.  
Fit the gasket to the blower motor assembly intake.  
Fit and align the blower motor assembly into its mounting position.  
Connect the pliable trunking to the air conditioning unit.  
Refit and tighten the blower motor assembly securing bolts.  
Fit and align the trunking retaining clip.  
Connect the blower motor multi-way connectors.  
Connect the vacuum hose to the blower motor assembly servo unit.

Fit and align the steering column stabilizer bar and tighten the securing bolts (10 – 14 Nm).

Fit and align the washer bracket to the column.

Loosely fit the steering column upper mounting securing nuts.

Fit the steering column packing shims as necessary.

Fit and tighten the steering column lower mounting securing nuts (20 – 22 Nm).

Fully tighten the steering column upper mounting securing nuts (20 – 22 Nm).

Reposition the brake switch harness to the blower motor assembly.

Secure the brake switch harness to the unit with ratchet straps.

Fully seat the relay bases to their mounting brackets.

Refit the driver's dash liner assembly.

Reconnect the battery earth lead and close the bonnet.

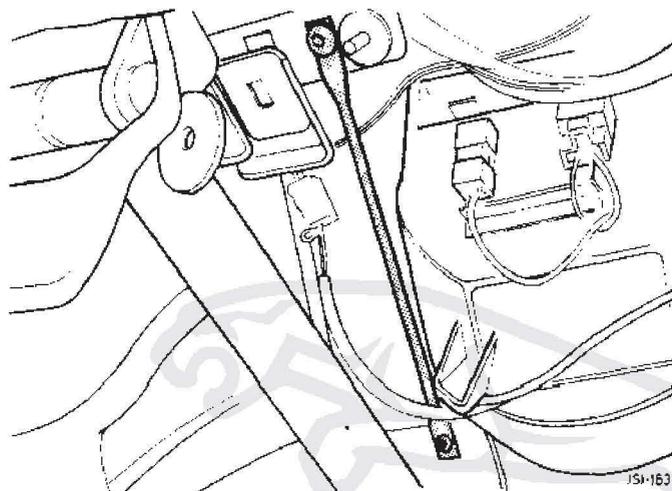


Fig. 1

**S.III, XJS & XJ6 UP TO VINs:-**  
**506664 – USA**  
**506448 – CANADA**  
**507471 – R.O.W.**

ITEM: 57

## 82 AIR CONDITIONING COMPRESSOR (GM A6 TYPE)

Investigations have confirmed the unnecessary replacement of compressors for noise and leaks.

If excessive compressor noise exists, check the following items:-

- . Compressor drive belt tension.
- . Compressor mountings.
- . A/C refrigerant hose routing (ensure that hoses are not in contact with other components).
- . Ensure that the refrigerant charge weight is correct (refer to Section 82 of the Service Manual for additional information).

- Ensure that the compressor is filled to the correct level with oil. A MAXIMUM of 4 ozs (114 cc) of refrigerant oil can be added to the compressor without discharging the refrigerant. Using an oil injector tool (such as 'Snap-on' oil injector tool ACT 111), add oil in 2 oz (57 cc) increments. (Refer to the procedure detailed below).

**NOTE: LOW OR EXCESSIVE CHARGE WEIGHT OR A LOW OIL LEVEL WILL CAUSE COMPRESSOR NOISE.**

- Clutch drag or bearing noise (refer to the clutch replacement procedure, Section 82 of the Service Manual).
- Compressors which leak oil or Freon must have the seals replaced in accordance with the procedure detailed in Section 82 of the Service Manual.

Replace the compressor only after checking all of the above-mentioned items.

**NOTE:** All returned compressors must be complete and sealed, using the blanking plate provided on the replacement unit.

Procedure for compressor oil injector tool usage:-

- Operate the A/C system. Make sure that the system is full of Freon. Refer to Section 82 of the Service Manual for the test procedure.
- Remove the sealing gaps from the high and low pressure A/C charging points.
- Check that the valve on the oil injector tool is closed.
- Remove the threaded end cap from the oil injector tool and add 2 ozs (57 cc) of compressor oil. Replace the end cap.
- Attach the short flexible hose on the oil injector to the low pressure fitting of the vehicle A/C system.
- Attach one end of an A/C system extension hose to the fitting on the side of the valve of the oil injector tool. Attach the other end of the extension hose to the high pressure fitting of the vehicle A/C system.
- Run the engine at idle with the A/C system operating.
- Slowly open the oil injector tool valve until it is fully open. Allow the oil to flow into the compressor for 2 minutes.
- Close the oil injector tool valve. Let the engine run an additional minute, then switch off the ignition.
- Carefully remove the charging hoses from the high and low pressure fittings and install the sealing caps.
- Check the A/C system for compressor noise. If noise still exists, repeat the procedure once more, adding an additional 2 ozs (57 cc) of compressor oil.
- **NOTE: NEVER ADD MORE THAN 4 OZS (114 cc) OF OIL TO THE A/C SYSTEM.**
- Attach a self-adhesive label to the A/C hose (adjacent to the low pressure hose fitting), stating how much oil was added and the date.

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## ERRATA

Would Dealers please note that in Service Bulletin JD 05/91, Item 31 "Forged Alloy Wheels", the Part No. for the XJS road wheels should be CBC 6175 (not CBC 9175).

## XJ6 MODELS

ITEM: 58

### 44 TRANSMISSION FRONT PUMP ASSEMBLY

A new front pump assembly has been introduced which cannot be retro-fitted to earlier models as the intermediate plate is not compatible.

Should this later type be fitted inadvertently to an earlier transmission unit, the internal pressures created will blow-out the pump seal (this is because the ventilation channel is now in a different position).

Part No.	Qty	Description
2.9, 3.2 & 3.6 Litre Models		
Up to Gearbox Serial No. 1158414:		
JLM 1957	1	Front Pump Assembly
JLM 885	1	Intermediate Plate
From Gearbox Serial No. 1158415:		
JLM 2286	1	Front Pump Assembly
JLM 10715	1	Intermediate Plate
4.0 Litre Models		
Up to Gearbox Serial No. 35365:		
JLM 10441	1	Front Pump Assembly
JLM 10448	1	Intermediate Plate
From Gearbox Serial No. 35366:		
JLM 10716	1	Front Pump Assembly
JLM 10717	1	Intermediate Plate

**Jaguar Cars Limited**

**XJ6 4.0 L****ITEM: 59****44 AUTO TRANSMISSION SHIFT QUALITY 1 – 2**

Whilst modifications have been made to improve the transmission 1 – 2 shift quality, with the introduction of transmission ECU 6162/6328 and further enhancement on current vehicles with ECU DBC 10110, it has been established that claims for this complaint on current models have largely arisen because of incorrect engine management set-up at idle.

This has the effect that the transmission ECU receives an incorrect speed signal from the engine which causes the ECU indirectly to increase the transmission oil line pressure beyond that required to sustain the torque output from the engine.

In order to rectify this problem dealers should set the base idle speed with the help of JDS to establish accurate stepper motor operation, ensuring that the air bypass valve is open and correctly calibrated within the bar graph setting on the JDS screen.

**XJ6 3.2 AND 4.0****ITEM: 60****47 DRIVE LINE VIBRATION**

The following improvements have been introduced to help alleviate this concern:-

**A. PROPSHAFT CHANGE**

A new family of XJ40 propshafts have now been introduced onto production to overcome instances of drive line vibration. These propshafts have a metalastik centre bearing. Introduction VIN 646880.

Models:	4.0L with automatic transmission	EBC 9104
	3.2L with automatic transmission	EBC 9105
	3.2 / 4.0L with manual gearbox	EBC 9106

**Note:** These propshafts have M8 weld nuts at the centre bearing; however, a small number of vehicles produced initially had 5/16" UNF weld nuts fitted.

These new propshafts should only be fitted if the alignment actions undertaken below do not resolve the problem.

On vehicles prior to VIN 646880, which exhibit drive line vibration in the mid speed range, the following procedure should be carried out:

1. Slacken the two bolts retaining the anti-twist plate.
2. Move the propshaft to the RHS of the vehicle using hand pressure. When maximum travel is reached (and keeping it in this position) push the anti-twist plate to the LHS and retighten the retaining bolts.

**B. DIFFERENTIAL STRUT CHANGE**

These struts (Part No. CCC 3789) are slightly shorter than those previously used. This ensures that the differential pinion is brought into line with the drive line axis. Whilst these units are interchangeable with earlier struts, there is a remote possibility that

a foul condition could exist due to a tolerance build-up in some body / axle assemblies. In the unlikely event of a foul condition occurring, the struts must be removed and the original equipment struts refitted.

Introduction from VIN 643800, although a 100% introduction was assured from VIN 644283 from axle number 485346 and 485268.

## ALL MODELS

ITEM: 61

### 74 TYRE PRESSURES

Complaints have been received of harsh ride on XJS Sports Pack vehicles. Investigations have established that the tyre pressures were too high for normal urban driving.

Would all Dealers please refer to the comfort settings on tyre pressures in the relevant Service Manual/Driver's Handbook before any attempt is made to investigate possible areas that could contribute to the problem.

## XJ6 / XJS / S.III V12

ITEM: 62

### 82 AIR CONDITIONING/HEATER MICROPROCESSOR

Following investigations into the cause of air conditioning/heater unit rotary flaps 'sticking', a concern has been identified with the servo motor drive ICs retained to the heatsink on the microprocessor unit. On a number of ECUs, the earth points have been found to be electrically poor, causing permanent or intermittent failure of the servo drives. The effect of this, in vehicle, is the 'sticking flaps' problem where the flaps appear to be jammed, although it is the ECU which is at fault.

In the event of a vehicle being returned with either an upper or lower rotary flap problem, i.e. intermittent or permanent sticking, the Dealer should carry-out the following procedure before any further action is taken:-

1. Initially determine in what mode the upper or lower rotary flap is jammed, i.e. cooling or heat mode.
2. Remove the necessary trim items from the right-hand side of the unit to gain access to the microprocessor assembly, Fig 1 (A).
3. Switch-on the ignition and air con/heater system. Select manual override. Having already determined in which mode the rotary flap in question is jammed, rotate the temperature demand control in the opposite direction; i.e. if, for instance, the rotary flap is stuck in the cooling mode, turn the

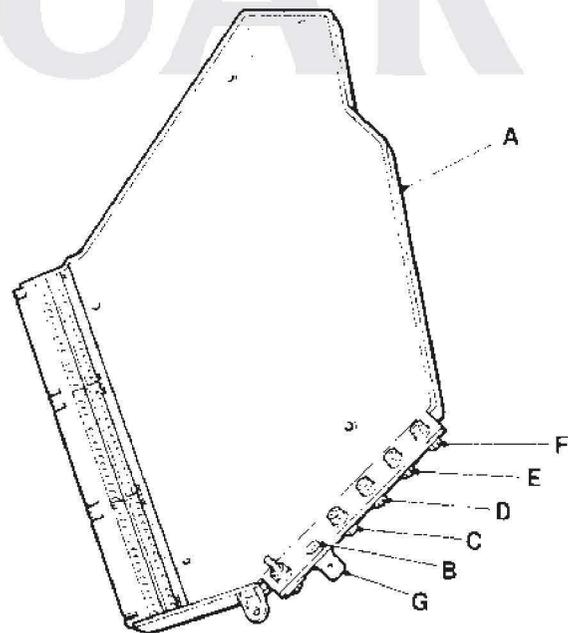


FIG 1

temperature demand control to full heat, or visa versa.

4. Using a digital voltmeter, touch one lead on to the earth rivet Fig 1 (B). Then, in turn, probe each of the four earth connection bolts, Fig 1 (C, D, E and F); if the earth connections are satisfactory, '0' volts will be indicated. If, during probing, any one of the four readings is abnormally higher, this will indicate a poor earth track.
5. If a higher reading is identified, check the tightness of the earth bolt affected. Tighten if necessary and re-check the voltage. (The Dealer may also check the tightness of the other earth bolts as a precaution).
6. If the voltage reading returns to '0' volts, re-check the system operation. (If the fault persists, proceed to point 8).
7. If the voltage reading remains high, turn-off the ignition. Release and remove the earth bolt and check for any signs of contamination, oxidization, etc. Using a very fine abrasive paper (P1000 or above), clean the earth track as shown in Fig 2. Ensure that both the microprocessor heat sink surface (H) and the power transistor bracket surface (J) are cleaned.

**IMPORTANT:** Do not bend the power transistor away from the heatsink as permanent damage may be caused to the PCB connections. Slide the abrasive paper between the heatsink and the transistor bracket.

Replace the bolt, re-tighten, switch-on the ignition and re-check the voltage reading. If the voltage reading indicates '0' volts, the fault should be corrected. Re-check the system operation.

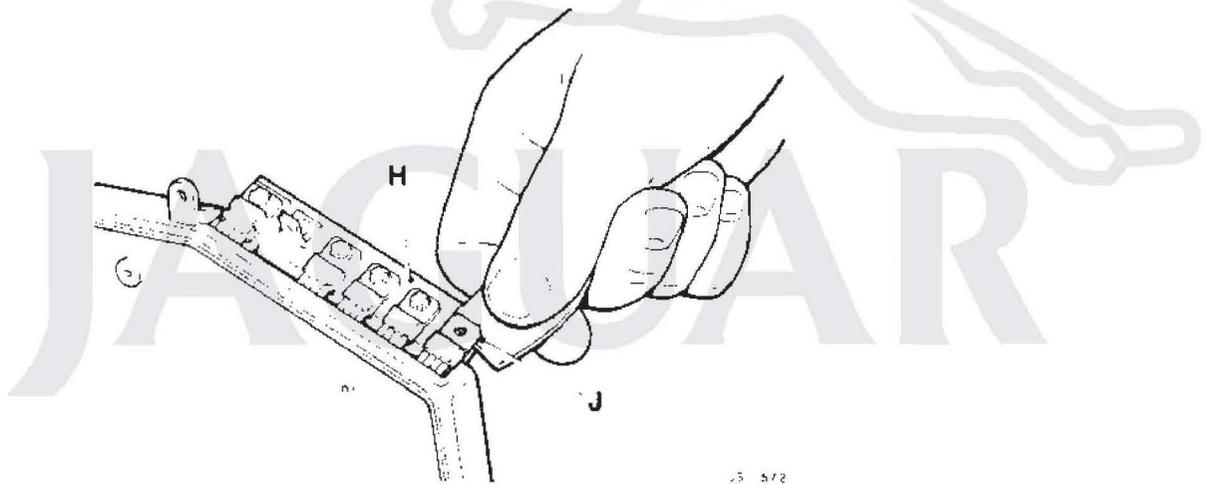


FIG 2

8. It is unlikely that the fault will persist; however, should this occur, the Dealer should then continue with normal diagnostic procedures to determine the cause.
9. In the event that the fault may not be present at the time the vehicle is returned to the Dealer, the following check should be carried-out to determine if a poor earth connection is present.
10. Switch-off the ignition. Disconnect the earth lead from the Lucar connector on the reverse side of the microprocessor earth rivet, Fig 1 (G).
11. Using a digital meter, measure the resistance (Ohms) between the earth rivet, Fig 1 (B) and the four earth connections, Fig 1 (C, D, E and F).

If a good earth connection is present, approximately 0.5 of an Ohm or less should be registered; any abnormally higher resistance reading will indicate a poor earth track.

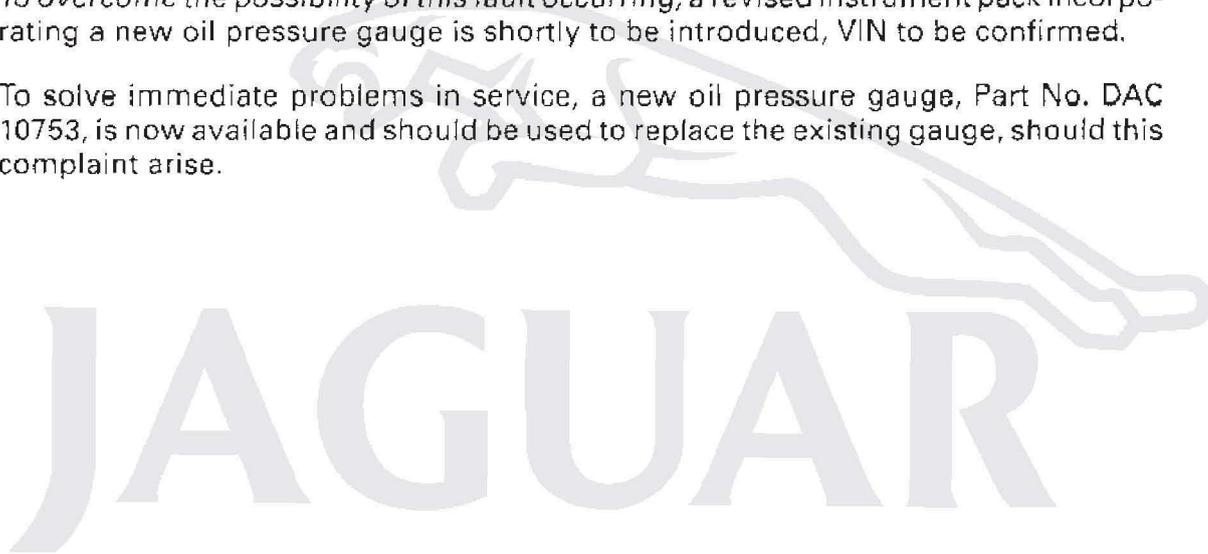
12. If a higher reading is identified, proceed as points 5, 6, 7 and 8, with the exception that all checks should be conducted with the ignition turned-off and measurements taken in resistance (Ohms) mode. Please note that when required in Operations 6 and 7 to check the system, ensure that earth lead Fig 1 (G) is reconnected before commencing the system check.

**XJS 92 MY (FACELIFT)****ITEM: 63****88 OIL PRESSURE GAUGE**

Following the launch of XJS 'Facelift' models, complaints may have been received of the oil pressure gauge indicating zero or dropping into the red band at idle speed, although the oil quantity and pressure is correct.

To overcome the possibility of this fault occurring, a revised instrument pack incorporating a new oil pressure gauge is shortly to be introduced, VIN to be confirmed.

To solve immediate problems in service, a new oil pressure gauge, Part No. DAC 10753, is now available and should be used to replace the existing gauge, should this complaint arise.



JAGUAR

# Service Bulletin



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## NOTE

JD 01/92, which covers XJ-S 92.5 MY preliminary information, has been released for translation purposes only; the English language version will be released nearer to the volume build date of 09.03.92.

### XJ-S FACELIFT

ITEM: 02

#### 00 WARRANTY CODES

The following new warranty complaint code has been allocated to cover the "CD Auto Changer Link Lead":

CODE	DESCRIPTION
7QU	CD Auto Changer Link Lead

### XJ6 & XJ-S

ITEM: 03

#### 00 WARRANTY CODES

To enable Dealers to code more accurately the causes of radio interference, new 4th digit warranty complaint codes have been allocated to the following sections of the XJ6 and XJ-S code books.

XJ6 AND XJ-S COMPLAINT CODE BOOK - 4TH DIGIT ADDITIONS		
SECTION	4TH DIGIT CODE	DESCRIPTION
2G	Y	Radio Interference
4G	Y	Radio Interference
7A	Y	Radio Interference
7B	W	Radio Interference
7C	E	Radio Interference
7U	W	Radio Interference

Please use the appropriate third digit component code within these sections, if that component is the source of the interference.

Reference to codes in Section 7Q should only be made if components within this area are the cause.

**XJ6****ITEM: 04****10 REVISED SERVICING INTERVAL / TIMES**

Servicing times have been re-examined to include inspection of the handbrake shoes and now comply with the following list:

Miles	1000	7500	15000	22500	30000	37500	45000
Kilometres	1500	12000	24000	36000	48000	60000	72000
Hours	1.85	2.05	2.55	2.05	4.05	2.05	2.55

Miles	52500	60000	67500	75000	82500	90000	97500
Kilometres	84000	96000	108000	120000	132000	144000	156000
Hours	2.05	4.70	2.05	2.55	2.05	4.05	2.05

**AJ6 ENGINES****ITEM: 05****12 CYLINDER HEAD REAR COVER GASKET**

As a result of oil and coolant leakage from the cylinder head rear cover gasket, gasket EBC 2568 has been introduced to seal the cylinder head rear cover plate instead of the previously used "Hermetite" sealant.

The gasket is of the Dow Print type (ie: it has a sealing bead on one side) and should be fitted with the beading facing the cylinder head. No additional sealant is needed.

This gasket supersedes the paper gasket EBC 1131.

SRO: 12.29.16

TIME: 1.4 Hours

**XJ6 2.9****ITEM: 06****18 SPARK PLUG (SERVICE REPLACEMENT)**

For service replacement purposes, Champion N4C spark plugs are recommended to overcome problems of misfire / uneven running conditions which may be experienced with XJ6 2.9 models.

N4C plugs are now available through Parts Operations, under Part No. EBC 8523, and supersede the previously-recommended N3C plug, Part No. EAC 8344.

PLEASE NOTE THAT N4C SPARK PLUG PART NUMBER EBC 8523 SHOULD ONLY BE FITTED TO XJ6 2.9 MODELS.

XJ-S V12 (92 MY)

ITEM: 07

## 19 FUEL PRESSURE TEST

A fuel pressure test adaptor, JD181, has been developed for use on 92MY XJ-S V12 systems (from VIN 179740).

The adaptor has identical end fittings to the fuel rail and fuel supply hose. It also has a  $\frac{1}{4}$  BSP end gauge fitting to be used in conjunction with pressure gauge YWB 107 (Epitest equipment pressure gauge).

Using the following procedure, pressure test the fuel system observing all the safety precautions detailed in the Service Manual:

Open the luggage compartment and displace the right hand trim liner.

Displace the fuel pump relay (Fig. 1) silver relay on black / yellow base) from its mounting, adjacent to the E.C.U. and remove the relay.

Crank the engine to depressurise the fuel system.

Refit the fuel pump relay.

Open the bonnet and fit wing protection.

Undo the union nut (1 Fig. 2), remove the fuel supply hose from the fuel rail and remove the 'Viton' seal.

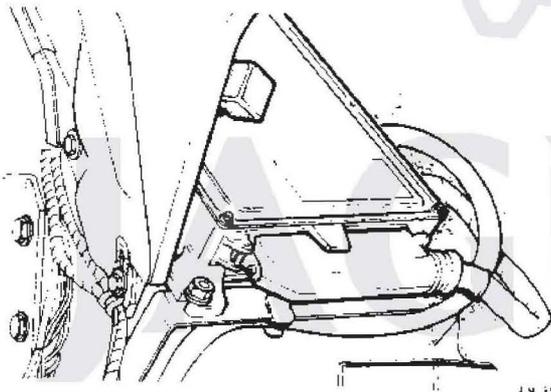


FIG 1

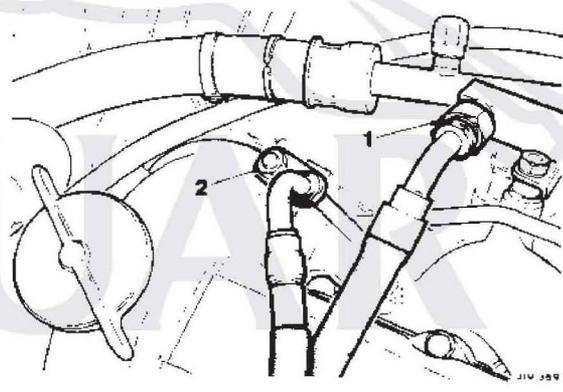


FIG 2

With the seal in place, fit the pressure test adaptor JD 181 to the fuel rail and tighten the union nut.

Fit the seal to the supply hose and connect to the pressure test adaptor. Tighten the union nut.

Fit and tighten the pressure test gauge, YWB 107, to the adaptor (Fig. 3). Ensure a sealing washer is in place.

Disconnect the vacuum hose from the base of the fuel pressure regulator valve (1 Fig. 4).

Run the engine.

Monitor the fuel pressure :  $2,5\text{bar} \pm 0,1\text{bar}$ .

Switch off the engine.

Depressurise the engine as detailed above.

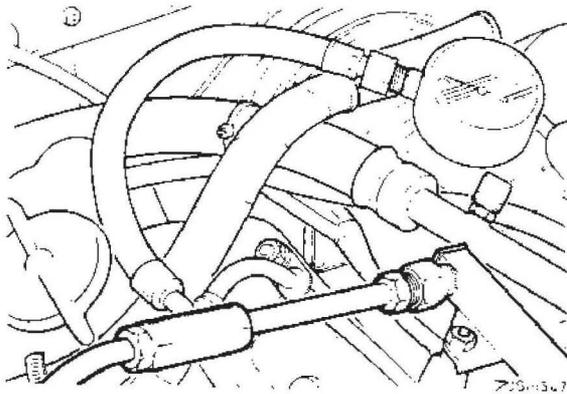


FIG 3

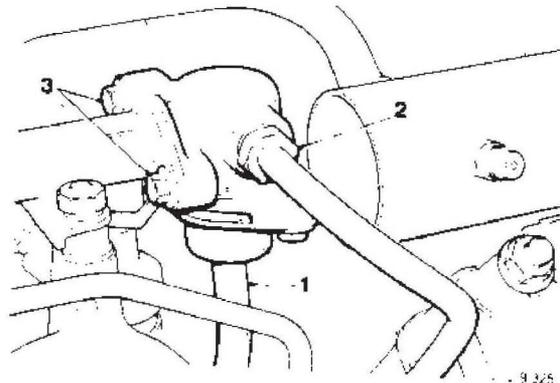


FIG 4

Remove the pressure test adaptor and gauge (Fig. 3).  
 Fit a new 'Viton' seal and refit the supply hose to the rail. Torque tighten the union nut to 10 to 12 Nm.  
 Connect the vacuum hose to the fuel pressure regulator valve.  
 Refit the fuel pump relay and re-position the trim liner.  
 Remove wing protection, close the bonnet and the luggage compartment.

**XJ6 MODELS**

**ITEM: 08**

**57 STEERING RACK, PINION VALVE ASSEMBLY SEALS – RENEW – 57.10.09**

A set of Service Tools has been developed (JD 184, JD 185, JD 186 and JD 187) to assist in renewing the steering pinion valve energised seals; Service Tool JD 120, steering rack centralising pin, is also needed to carry out the operation.  
 As a general guide, if lack of steering assistance from cold is experienced, renew the seals. A seal kit is available, Part No. JLM 10839.  
 To renew the seals, proceed as follows:

**Note:** Energised pinion seals should only be fitted to steering racks with plated pinion bores. Plated bore racks were fitted from VIN 597940. The plated racks are also identified by the part number stamped on the plate on the underside of the rack (Fig. 1). Part No. CBC 9052 – Right-hand drive vehicles. Part No. CBC 9053 – Left-hand drive vehicles. Energised seals were introduced from Part No. CCC 5650, XJ6 and Part No. CCC 5660, XJS.

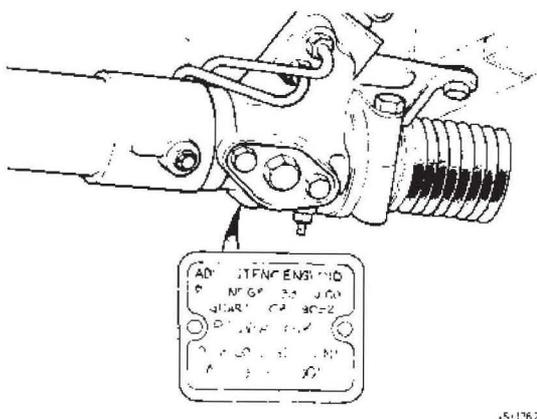


FIG 1

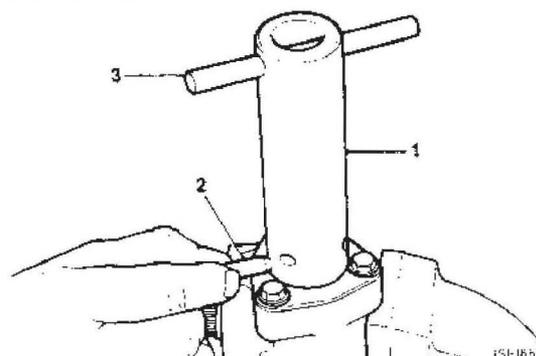


FIG 2

Remove the steering rack as detailed in operation 57.10.01.

Clean the steering rack pinion housing area.

Secure the rack in a vice, ensuring the vice jaws clamp across the pinion housing lugs and taking care not to trap any pipes.

Remove the dirt / dust excluder from the steering rack pinion shaft.

Ensure Service Tools JD 184, JD 185, JD 186 and JD 187 are free of any scores, burrs or marks which could cause damage to components.

Fit the body and handle of tool JD 184 to the pinion shaft (1, 3 Fig. 2). Align the tool with the pinch pin cut-out and fit the brass pinch pin (2 Fig. 2).

Place a suitable container below the pinion housing. Unscrew and remove the blanking plugs from the pinion housing, fitted during operation 57.10.01.

Operate the steering rack from lock to lock to remove any residual steering fluid. Wipe any remaining fluid from the pinion housing.

Unscrew and remove the tapered plug from the steering rack centralising pin-hole. Insert Service Tool JD 120 (centralising pin) into the pin-hole, maintaining light thumb-pressure.

Gently operate the steering rack until the pin is engaged. Remove the centralising pin, JD 120, then refit and lightly tighten the taper plug into the centralising pin-hole. Remove the brass pinch pin from tool JD 184 and remove the tool from the pinion shaft. Mark a line on the edge of the top plate and onto the pinion housing. Ensure it is in line with the centre of the pinion pinch pin cut-out (Fig. 3).

Unscrew, but do not remove, the support plate bolts to give a 10 mm gap between the plate and the pinion housing (Fig. 4).

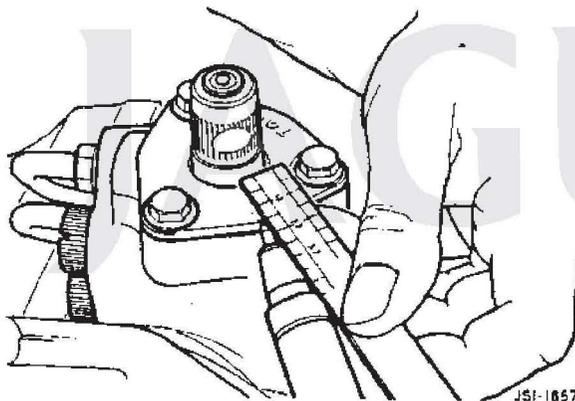


FIG 3

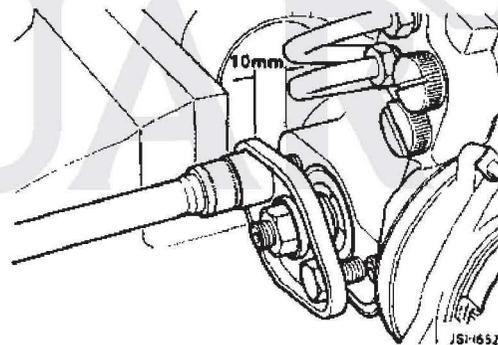


FIG 4

Unscrew the bolts securing the top plate and remove the top plate and shims (Fig. 5). Fit tool JD 184 to the pinion shaft with the brass pinch pin in place, as previously described.

Fit and align tool JD 186 with the taper of the bore towards the pinion housing face. Fit and tighten the cap head screws, securing tool JD 186.

Fit the tool handle and using hand-pressure only, pull the pinion valve assembly partially away from the pinion housing and into tool JD 186 (Fig. 6). Ensure the assembly is kept aligned during this operation.

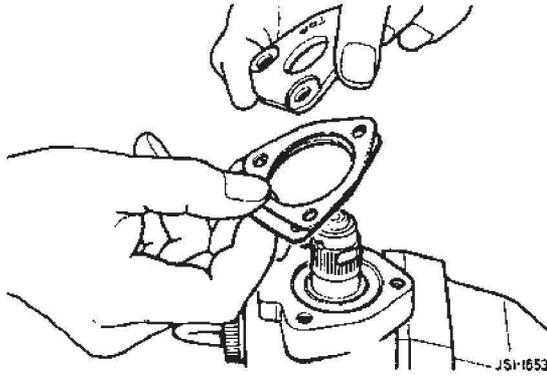


FIG 5

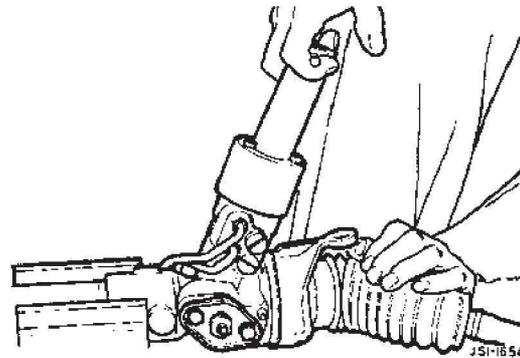


FIG 6

Remove the tool handle. Unscrew and remove the cap head screws, securing tool JD 186 to the pinion housing. Carefully remove tool JD 186 from the pinion valve. Refit the tool handle to tool JD 184. Keeping in alignment, gently pull and rotate the pinion valve assembly until fully removed from the housing. Remove tool JD 184 from the pinion valve assembly.

Remove the thrust washer package from the assembly as follows:  
Square section outer seal, P.T.F.E. inner seal and 'O' ring seal.

Clean the thrust washer and place safely to one side.

Remove and discard the quad seal from the pinion or pinion housing.

Clean and inspect the pinion housing bore for any scores or damage.

Cut and remove the P.T.F.E. sealing rings from the pinion valve (Fig. 7). Ensure the valve walls are not marked or scored whilst carrying out this operation.

**Note:** A suitable tool can be made by grinding a broken hacksaw blade to a narrow chisel shape (1 Fig. 7).

Remove and discard the sealing ring energisers.

**Note:** Older type seals in unplated racks had no energiser ring. All plated racks are fitted with energised seals.

Clean the pinion valve ready for re-assembly.

Lubricate, fit and seat a new quad seal into the pinion housing.

Lubricate the bore of the pinion housing.

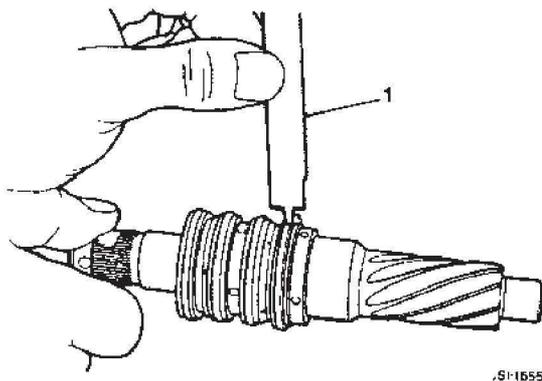


FIG 7

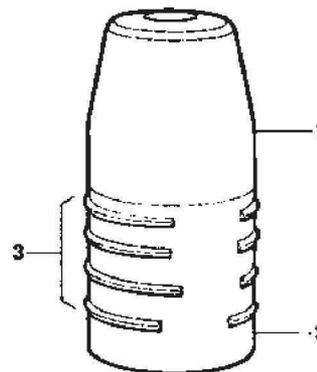


FIG 8

Fit the tapered mandrel of tool JD 185 (1 Fig. 8) into the zinc-plated sleeve (2 Fig. 8). Load four new sealing ring energisers onto the zinc-plated sleeve, leaving a gap between each (3 Fig. 8).

**Note:** Service Tool JD 185 is a three-piece tool comprising: a tapered mandrel, a zinc-plated sleeve for fitting sealing ring energisers and a black machine-finish sleeve for fitting sealing rings.

Remove the mandrel from the zinc-plated sleeve; carefully fit the loaded sleeve onto the pinion valve and align the tool end parallel with the first seal groove. Slide the energiser from the zinc-plated sleeve into the first seal groove (Fig. 9). Continue until all four energisers have been placed in the four seal grooves.

Remove the zinc-plated sleeve from the pinion valve and place safely to one side.

Fit the tapered mandrel of tool JD 185 (1 Fig. 10) into the black-finish sleeve (2 Fig. 10).

Load four new P.T.F.E. sealing rings (blue) onto the black-finish sleeve, leaving a gap between each (3 Fig. 10).

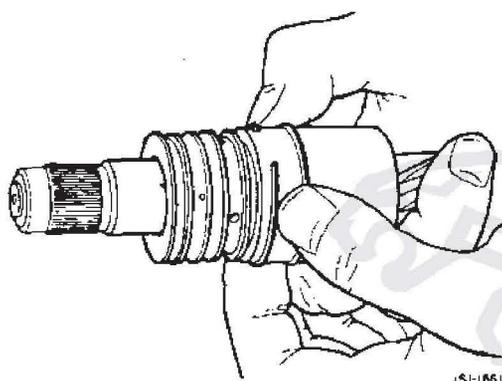


FIG 9

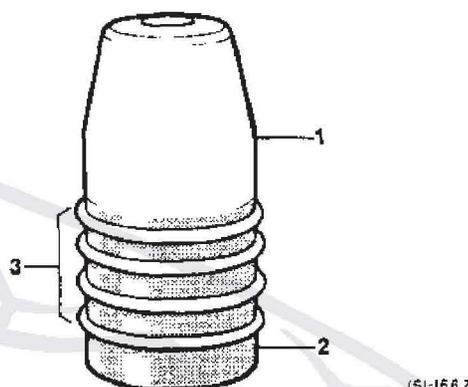


FIG 10

Remove the mandrel from the black-finish sleeve; carefully fit the loaded sleeve onto the pinion valve and align the tool end parallel with the first seal groove.

Slide the seal from the black-finish sleeve into the first seal groove (Fig. 11). Continue until all four seals have been placed in the four seal grooves.

**Note:** The P.T.F.E. sealing rings should only remain on the black-finish sleeve for the minimum time possible.

Remove the black-finish sleeve from the pinion valve and place safely to one side.

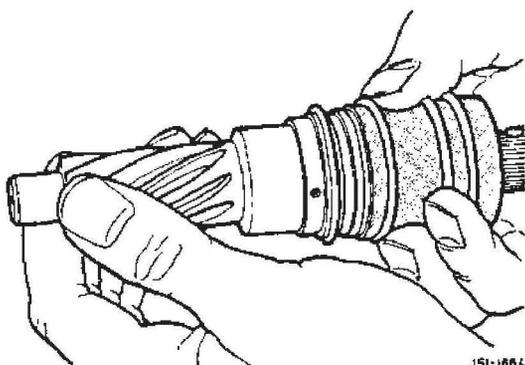


FIG 11

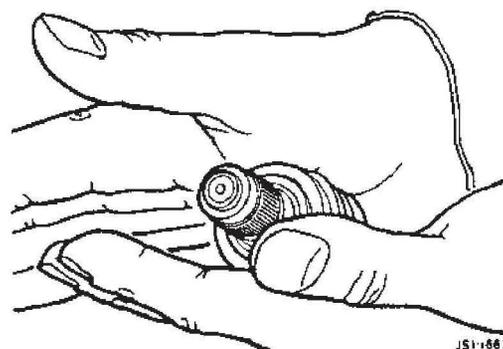


FIG 12

Grasp the pinion valve and rotate between the palms of the hands to compress the P.T.F.E. sealing rings fully onto the energisers (Fig. 12).

**Note:** Ensure that the P.T.F.E. sealing rings fit fully and evenly over the steel energisers.

Lubricate the P.T.F.E. sealing rings and pinion valve assembly.  
Fit tool JD 186 over the pinion valve by passing the tapered bore of the tool over the geared end of the pinion. Pass the pinion through the tool several (five) times to size the sealing rings (Fig. 13).

**Note:** During the sizing operation, ensure the P.T.F.E. sealing rings do not become trapped or bent over the grooves, thus causing possible damage.

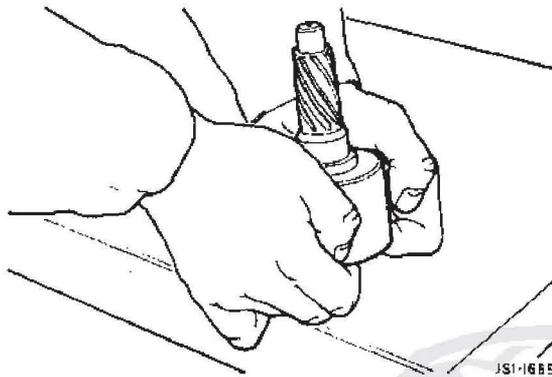


FIG 13

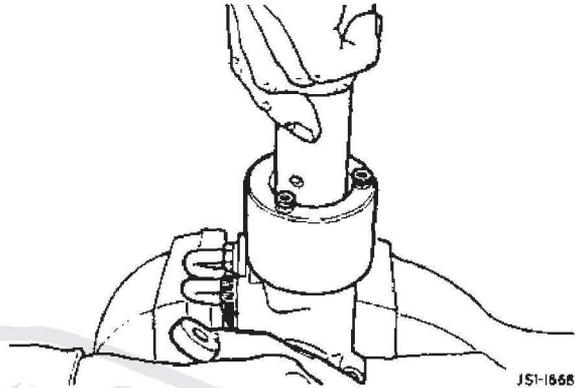


FIG 14

After sizing, position the pinion valve in the parallel part of the tool bore.  
Fit and align the pinion and tool assembly to the steering rack housing.  
Fit, but do not tighten, the cap head screws that secure tool JD 186. Ensure that the tool is allowed to self-centre.

Remove the tapered plug from the steering rack centralising hole. Fit the centralising pin, JD 120, to ensure that the rack has remained central.  
Fit and align tool JD 184 with the tool handle and brass pinch pin in position.  
Position the pinion so that, allowing for helix angle rotation (approx. 90°), the pinion arrives at the previously-marked position (Fig. 3).  
Allow the pinion to mesh with the rack gear by gently pulling the rack gear away from the pinion. Carefully push and rotate the pinion to seat the pinion valve assembly fully into the rack housing (Fig. 14).

**Note:** The centre of the pinion pinch bolt cut-out should finally align with the marks on the top plate and housing, shown in Fig. 2.

**Note:** The handle hole in tool JD 184 is parallel with the pinion pinch bolt cut-out to aid the previous operation.

Remove the centralising pin from the rack.  
Fit and tighten the tapered plug into the steering rack centralising pin-hole.  
Remove the handle from tool JD 184  
Unscrew and remove the cap head screws, securing tool JD 186 to the pinion housing.  
Remove tool JD 186 from the pinion housing and place to one side.  
Remove the brass pinch pin from tool JD 184.  
Remove tool JD 184 from the pinion.  
Ensure that the 'O' ring seal has remained seated in the rack support assembly bore.  
Tighten the support plate securing bolts.  
Align tool JD 186 to the pinion housing with the tapered end of the bore away from the housing. Fit, but do not fully tighten, the cap head screws securing the tool (this will allow the tool to self-centre).  
Fit a new set of seals to the thrust washer, i.e. square section seal, 'O' ring seal and

stepped seal.

Ensure that the stepped side of the seal faces inboard in its final fitted position.

Lubricate the thrust washer and seal assembly.

Fit the seal protector, JD 187, onto the pinion spline. Fit the thrust washer assembly onto the seal protector taper with the step side facing inboard.

Using the handle end of tool JD 184, with hand-pressure only, push the thrust washer assembly into the pinion housing (Fig. 15).

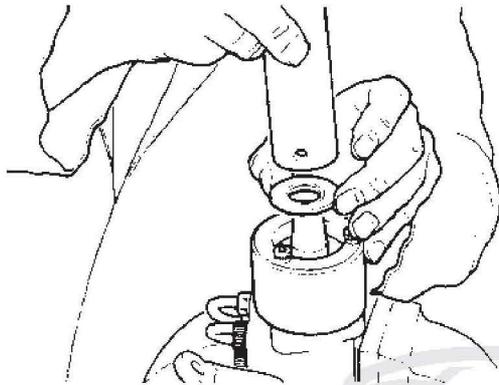


FIG 15

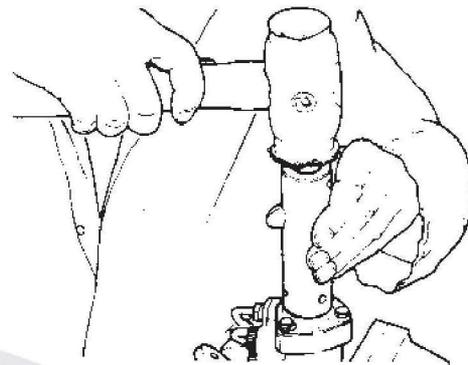


FIG 16

**Note:** The handle end of tool JD 184 is machined out for the purpose of fitting the thrust washer assembly.

Remove tool JD 184 from the pinion.

Remove the seal protector from the pinion shaft and place safely to one side.

Remove the cap head screws, securing tool JD 186 to the pinion housing.

Remove tool JD 186 and place safely to one side.

Fit the shims to the pinion housing.

Fit the top plate, ensuring it is aligned with the previous markings (Fig. 3).

Centralise the top plate around the pinion shaft and fit and tighten the securing bolts.

Fit a new dirt / dust excluder to the pinion shaft.

Position the brass pinch pin end of tool JD 184 over the pinion and up to the dirt / dust excluder.

Using a soft-faced mallet, carefully drive the dust / dirt excluder onto the pinion shaft (Fig. 16).

Ensure the top face of the dirt / dust excluder is 4,0 to 4,5 mm away from the top face of the top plate (Fig. 17).

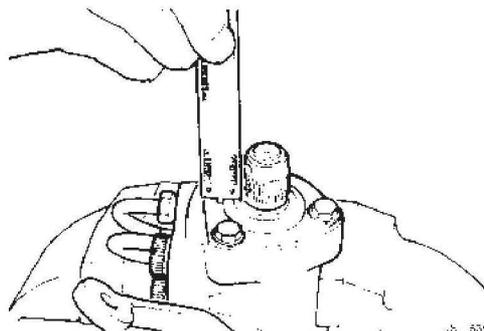


FIG 17

Remove tool JD 184 and place safely to one side.

Remove the container from below the pinion housing; remove the steering rack assembly from the vice and refit to the vehicle (57.10.01).

For vehicles within warranty, the following information applies:

Warranty Claim Code	:	5AAN
S.R.O.	:	57. 10. 09
Time Allowance	:	2.40 hours LHD vehicles
	:	2.35 hours RHD vehicles

XJ40

ITEM: 09

## 60 FRONT CROSSMEMBER BUSHES – RENEWAL

Should the eccentric bushes, securing the rear of the front crossmember assembly need renewing, proceed as follows:

Remove the front crossmember by following the instructions detailed in operation 76.10.05.

Place the bush replacement tool, JD 143, on to a suitable press. Fit and align the adaptor ring, JD 143-1, to the replacement tool.

Carefully position the front crossmember / bush on to the press / tool.

Fit and align the bush remover tool, JD 143-5, to the bush and using the press, displace and remove the bush from the crossmember.

Remove the crossmember from the press.

Remove the opposite side crossmember bush in the same manner.

**Note:** The bushes originally used were termed as 'six-shooter' bushes. These have now been redesigned / replaced by the 'smiley-faced' bushes currently being used, see Fig. 1 for identification.

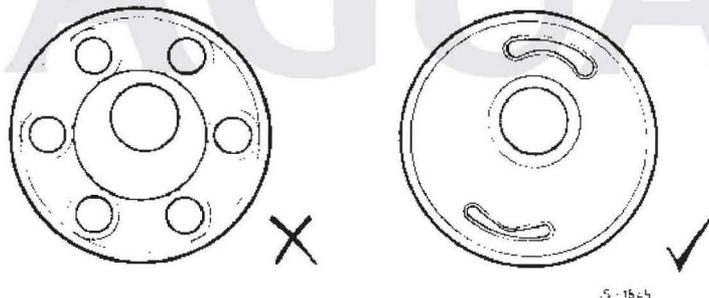


FIG 1

To aid assembly, prior to fitting new bushes, it is **important** they are correctly aligned with the crossmember.

The bush rubber identification pip **must** be 30° clockwise from the top dead centre of the crossmember mounting hole (the horizontal is parallel with the bottom face of the crossmember) see Fig. 2.

Once aligned, scribe a marker line across the crossmember and bush.

When the alignment marks have been scribed, the crossmember is ready for reassembly.

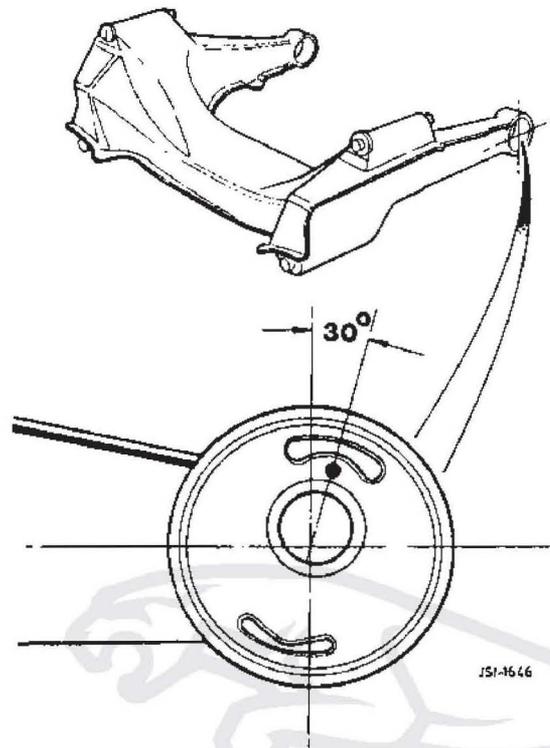


FIG 2

Carefully align the crossmember to the press / tool.  
 Fit and align a new bush to the crossmember, ensuring that the scribe mark matches to the mark on the crossmember.  
 Fit and align the replacer tool, JD 143-5, to the bush.  
 Using the press, fully seat the new bush into the crossmember.  
 Remove the replacer tool, JD 143-5, and place to one side.  
 Remove the crossmember from the press and repeat the procedure to fit the other new crossmember bush.  
 When the new bushes are correctly aligned and fully fitted to the crossmember, refit the crossmember to the vehicle, as detailed in operation 76.10.05.  
 On completion, check that the steering geometry is correct, prior to re-using the vehicle.

XJ-S / S.III / LIMOUSINE

ITEM: 10

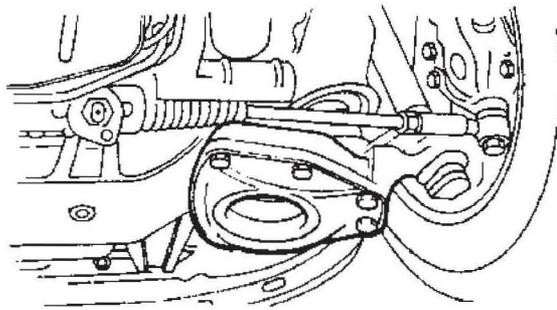
## 60 FRONT HUB SEAL REPLACEMENT

A tool has been developed and is now available for replacing front hub seals on the above models

To renew a seal, carry out the following procedure:

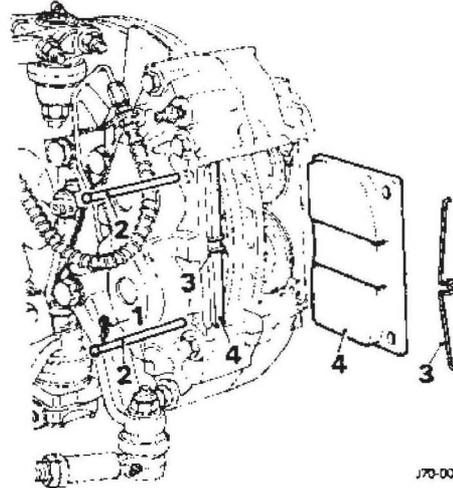
**Note:** Prior to carrying out the procedure, an absorbent cloth should be placed around the brake fluid reservoir cap

Slacken the road wheel nuts  $\frac{1}{4}$  turn each.  
 Locate a trolley jack below the front spring pan (Fig.1).



J08 005

FIG 1



J70-007

FIG 2

Jack up the vehicle. Place an axle stand below the appropriate jacking spigot. Lower the vehicle / jacking spigot on to the axle stand. Leave the jack in position as a precautionary measure. Remove one wheel nut, mark the wheel relative to the stud and remove the remaining wheel nuts. Remove the roadwheel and tyre assembly.

Remove the spring clips (1 Fig. 2) securing the brake pad retaining pins (2 Fig. 2); withdraw the pins.

Remove the anti-rattle springs (3 Fig. 2) and withdraw the brake pads (4 Fig. 2).

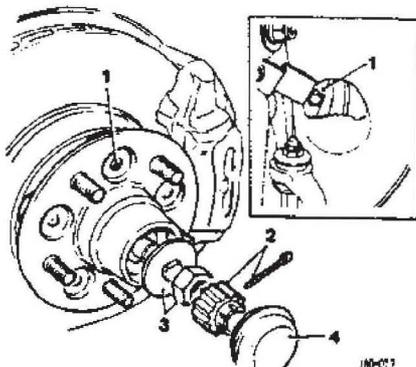
**WARNING:** BRAKE LINING DUST CAN CONTAIN ASBESTOS WHICH, IF INHALED, CAN DAMAGE YOUR HEALTH. ALWAYS USE A VACUUM BRUSH TO REMOVE DRY BRAKE LINING DUST. NEVER USE AN AIRLINE.

Ensure the brake caliper piston is fully retracted and remains in that position until the pads are refitted.

Position the steering rack to 'full lock' outward. Rotate the brake disc to gain access to the securing bolts through the aperture in the disc shield (1 Fig. 3). Remove the bolts and washers securing the hub assembly to the brake disc.

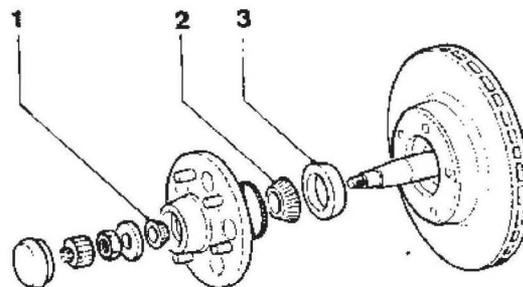
Prise of the hub grease cap (4 Fig. 3). Remove the hub nut split pin and cover (2 Fig. 3). Remove the hub nut and 'D' washer (3 Fig. 3). Carefully remove the hub assembly from the stub axle. Remove the outer bearing (1 Fig. 4) from the hub assembly.

Displace and remove the brake disc from the stub axle carrier assembly. Remove the inner bearing (2 Fig. 4) from the stub axle, then, using a suitable pry bar, remove and discard the hub seal (3 Fig. 4).



J60-011

FIG 3



J60-086

FIG 4

Clean all components and examine for wear and damage. Replace as necessary if worn or damaged.

Pack the hub bearings with grease and fit them to the hub assembly. Coat the stub axle shaft with grease.

**Note:** Lubricate the new hub seal and ensure grease is applied to all the seal lips.

Fit the new hub seal to the fitting tool, JD 180 (Fig. 5). Using the tool, drift the seal fully on to the stub axle shaft (Fig. 6).

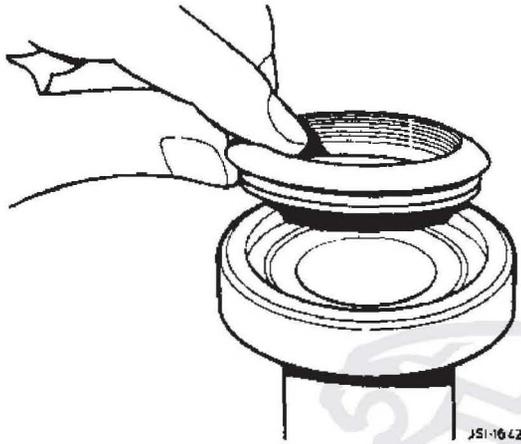


FIG 5

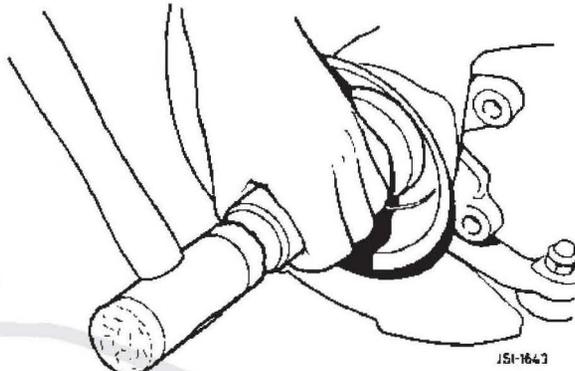
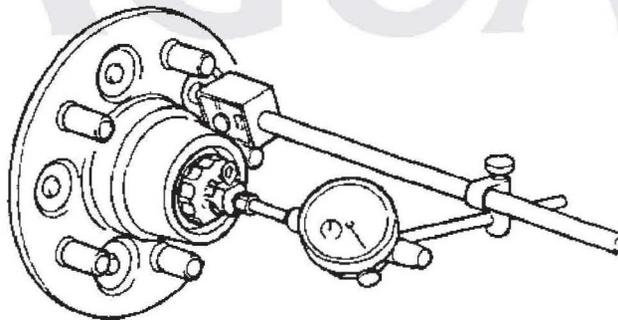


FIG 6

Fit and position the disc to the carrier assembly. Fit and fully seat the hub assembly, complete with bearings and the 'D' washer to the stub axle. Fit, but do not tighten, the securing nut.

Position the hub to align the brake disc mounting holes. Fit and tighten the brake disc to hub securing bolts.

Set the hub and end float between 0,0254 and 0,0762 mm (0.001 to 0.003 in). To do this, fit a magnetic base Dial Test Indicator (DTI) to the hub (Fig. 7).


 X60-101  
 FIG 7

Grasp the hub unit. Firmly pull and push the unit, oscillating at the same time, to determine the DTI end float reading.

Adjust the hub nut as necessary, to give a reading of 0,0508 mm  $\pm$  0,0254 mm (0.002 in  $\pm$  0.001 in).

If possible, **always** try to achieve the mid-point of the tolerance i.e. 0,0508 mm (0.002 in).

When set, align the hub nut cover and secure with a new split pin.

When the new split pin is fitted, ensure the end float is re-checked using the DTI gauge (Fig. 7).

If necessary, re-adjust using the same method, until the end float is correct.

**Always** finish the adjustment by checking with a DTI gauge.  
**Always** ensure the end float is within the limits quoted.

Refit the grease cap (4 Fig. 3). Return the steering rack to the straight ahead position and refit the brake pads (4 Fig. 2), retaining pins (2 Fig. 2), anti-rattle springs (3 Fig. 2) and retaining pin securing spring clips (1 Fig. 2).

Refit the road wheel, then lower the vehicle from the axle stands and torque-tighten the wheel nuts.

Pump the brake pedal to centralise the pads.

**WARNING:** APPLICATION OF THE BRAKE PEDAL MUST BE CARRIED OUT, AS THE BRAKES WILL NOT OPERATE EFFICIENTLY UNTIL THE PADS ARE CORRECTLY POSITIONED.

Remove the absorbent cloth from around the brake fluid reservoir cap, ensuring the area is clean and dry.

XJ6

ITEM: 11

## 60 FRONT HUB SEAL REPLACEMENT

A tool has been developed and is now available for replacing front hub seals on the above model.

To renew a seal, carry out the following procedure:

**Note:** Prior to carrying out the procedure, an absorbent cloth should be placed around the brake fluid reservoir cap.

Slacken the road wheel nuts  $\frac{1}{4}$  turn each.

Jack up the vehicle and support with axle stands.

Remove one wheel nut, mark the wheel relative to the stud, and remove the remaining wheel nuts.

Remove the roadwheel and tyre assembly.

Carefully displace and remove the brake caliper anti-squeal spring (1 Fig. 1).

Displace the pad wear sensor multi-plug from the retaining clip, then disconnect the harness multi-plug (2 Fig. 1).

Remove the caliper securing bolt dust caps, then remove the socket head securing bolts (3 Fig. 1).

Remove the caliper from the carrier and safely secure the caliper to one side.

**Note:** Ensure the caliper is placed where the brake hose and harnesses are not stressed.

Displace and remove the brake pads (4 Fig. 1).

**WARNING:** BRAKE LINING DUST CAN CONTAIN ASBESTOS WHICH, IF INHALED, CAN DAMAGE YOUR HEALTH. ALWAYS USE A VACUUM BRUSH TO REMOVE DRY BRAKE LINING DUST. NEVER USE AN AIRLINE.

Ensure the brake caliper piston is fully retracted and remains in that position until the pads are refitted.

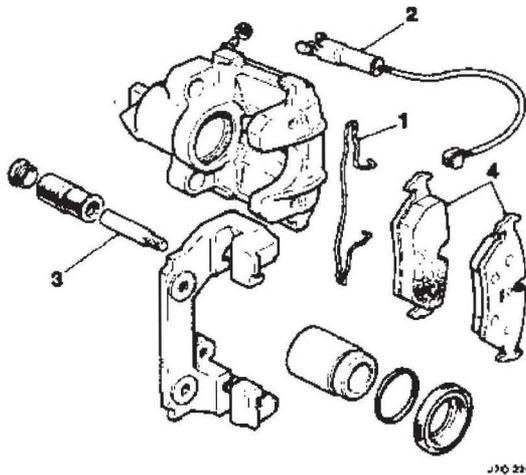


FIG 1

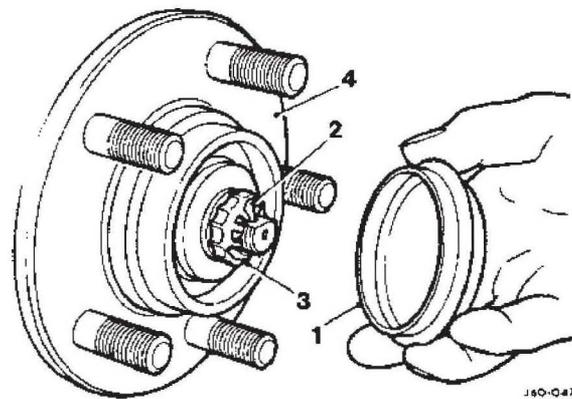


FIG 2

Cut and remove the carrier securing bolt lockwire.  
 Unscrew the carrier securing bolts and remove the carrier.  
 Remove the disc securing screw and remove the disc.  
 Prise off the hub grease cap (1 Fig. 2).  
 Remove the hub nut split pin and cover (2, 3 Fig. 2).  
 Remove the hub nut and 'D' washer.  
 Carefully remove the hub assembly (4 Fig. 2) from the stub axle.  
 Remove the inner bearing from the stub axle, then, using a suitable pry bar, remove and discard the hub seal.

Clean all components and examine for wear and damage. Replace as necessary if worn or damaged.  
 Pack the hub bearings and coat the stub axle shaft with grease.

**Note:** Lubricate the new hub seal and ensure grease is applied to all the seal lips.

Fit the new hub seal to the fitting tool, JD 179 (Fig. 3).  
 Using the tool, drift the seal fully on to the stub axle shaft (Fig. 4).  
 Place the inner bearing on to the shaft and ensure it is pushed fully up to the new hub seal.

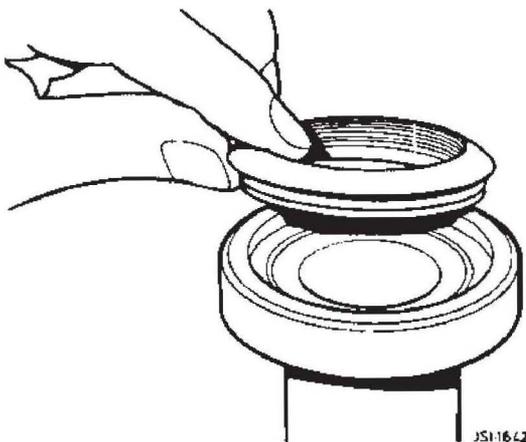


FIG 3

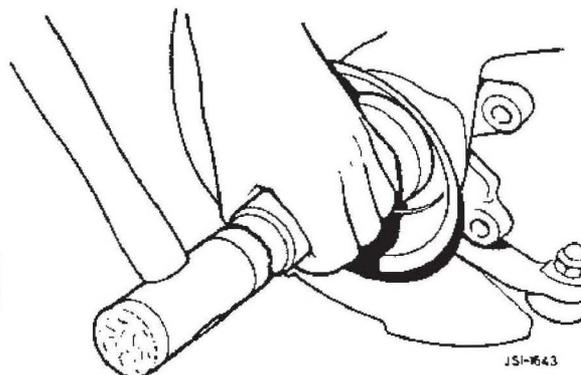
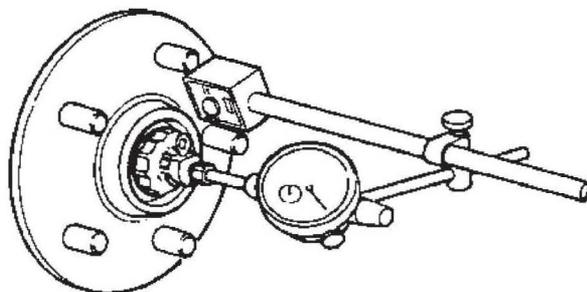


FIG 4

Fit and fully seat the hub assembly, outer bearing and 'D' washer to the stub axle. Fit, but do not tighten, the securing nut.

Set the hub end float between 0,0254 to 0,0762 mm (0.001 to 0.003 in). To do this, fit a magnetic base Dial Test Indicator (DTI) to the hub (Fig. 5).



60 102

FIG 5

Grasp the hub unit. Firmly pull and push the unit, oscillating at the same time, to determine the DTI end float reading.

Adjust the hub nut as necessary, to give a reading of 0,0508 mm  $\pm$  0,0254 mm (0.002 in  $\pm$  0.001 in).

If possible, **always** try to achieve the mid-point of the tolerance i.e. 0,0508 mm (0.002 in).

When set, align the hub nut cover and secure with a new split pin.

When the new split pin is fitted, ensure the end float is re-checked using the DTI gauge (Fig. 5).

If necessary, re-adjust using the same method, until the end float is correct.

**Always** finish the adjustment by checking with a DTI gauge.

**Always** ensure the end float is within the limits quoted.

Refit the grease cap.

Refit the brake assembly, disc, carrier, pads, caliper and all multi-plugs and connectors.

Refit the road wheel then lower the vehicle from the axle stands and torque-tighten the wheel nuts.

Pump the brake pedal to centralise the pads.

**WARNING:** APPLICATION OF THE BRAKE PEDAL MUST BE CARRIED OUT, AS THE BRAKES WILL NOT OPERATE EFFICIENTLY UNTIL THE PADS ARE CORRECTLY POSITIONED.

Remove the absorbent cloth from around the brake fluid reservoir cap, ensuring the area is clean and dry.

XJ6

ITEM: 12

## 60 LOWER WISHBONE, BUSH – RENEW – 60.35.22

Part of the above operation is to renew the wishbone bushes, but the description for this part of the operation is not specific; therefore, to renew the bushes, proceed as follows:

**Note:** Prior to carrying out the procedure, an absorbent cloth should be placed around the brake fluid reservoir cap.

Slacken the road wheel nuts  $\frac{1}{4}$  turn each.  
Jack up the front of the vehicle and support with axle stands.

**Note:** Ensure the vehicle is high enough to access Service Tool JD 115.

Remove one wheel nut, mark the wheel relative to the stud, and remove the remaining wheel nuts.

Remove the road wheel and tyre assembly.

Fit the lower adaptors to Service Tool JD 115, then fit the tool to the front spring (Fig. 1). Engage the dowel in the slots in the suspension turret top.

Ensure that the dowel is seated correctly.

Tighten the tool to tension the spring until the load is taken off the spring pan.

Remove the spring pan securing bolts, slacken off the tool wing nut to release the tension on the spring and release the tool from the suspension turret.

Remove the tool from the suspension assembly.

Remove the spring plates and road spring from the tool.

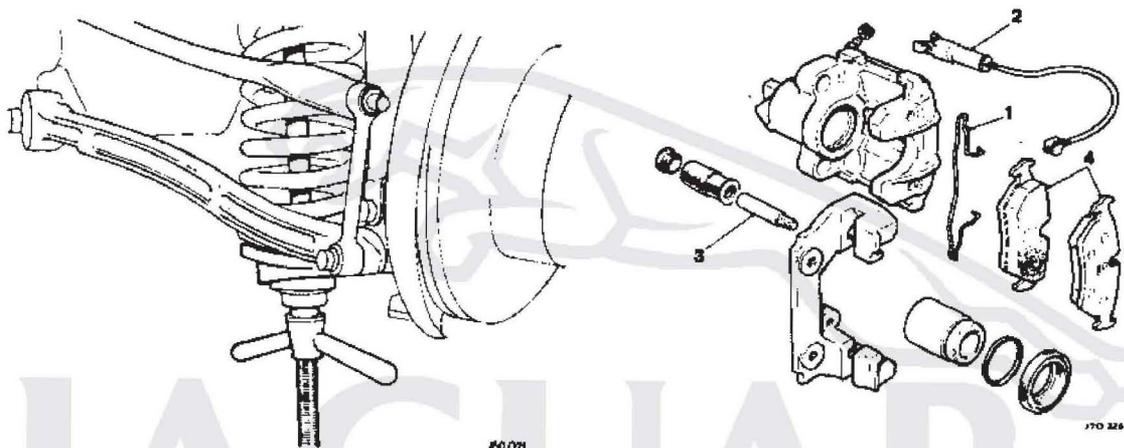


FIG 1

FIG 2

Carefully displace and remove the brake caliper anti-squeal spring (1 Fig. 2).

Displace the pad wear sensor multi-plug from the retaining clip then disconnect the harness multi-plug (2 Fig. 2).

Remove the caliper securing bolt dust caps then remove the socket head securing bolts (3 Fig. 2).

Remove the caliper from the carrier and safely secure the caliper to one side.

**Note:** Ensure the caliper is placed where the brake hose and harnesses are not stressed.

Displace and remove the brake pads (4 Fig. 2).

**WARNING:** BRAKE LINING / PAD DUST CAN CONTAIN ASBESTOS WHICH, IF INHALED, CAN DAMAGE YOUR HEALTH. ALWAYS USE A VACUUM BRUSH TO REMOVE DRY BRAKE LINING / PAD DUST. NEVER USE AN AIRLINE.

Ensure the brake caliper piston is fully retracted and remains in that position until the pads are refitted.

Undo and remove the track rod end to steering arm securing nut.

Fit Service Tool JD 100 to the track rod end joint.

Tighten the tool bolt to break the taper.

Undo the tool bolt and place the tool aside.

Undo and remove the steering rack to front crossmember securing nuts and bolts, and remove the spacers.

Undo and remove the anti-roll bar link arm lower securing nut and bolt.

Undo and remove the upper ball joint securing bolts, note the position and collect the castor shims.

Reposition the stub axle assembly outwards.

Displace and remove the split pin securing the fulcrum shaft nut.

Undo and remove the fulcrum shaft nut.

Remove the shock absorber lower mounting securing bolt / nut.

Carefully lower the wishbone / stub axle assembly to the floor.

Displace the pivot bolt to allow removal of the front wishbone, remove the front wishbone.

Remove the serrated spacer.

Manoeuvre the steering rack to give clearance, displace and remove the fulcrum bolt.

Remove the rear wishbone/stub axle assembly.

Remove the remaining serrated spacer.

Using a suitable workbench with a vice:

Secure the front wishbone arm in the vice, ensuring that the top hat of the bush faces upwards.

Using a suitable hacksaw, cut and remove the bush top hat sides (Fig. 3).

Undo the vice.

Position the wishbone arm between the press adaptor plates.

Fit and align bush removal tool JD 143-4 to the bush (Fig. 4).

Using the press, displace and remove the bush.

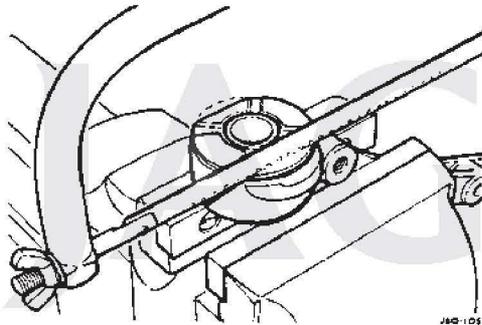


FIG 3

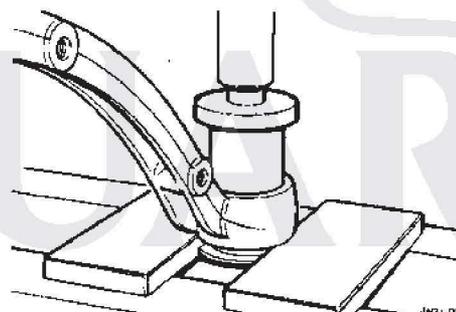


FIG 4

Place tool JD 143 to the press.

Fit and align the adaptor ring JD 143-1.

Fit and align adaptor tool JD 143-2 to the adaptor ring, ensuring that the narrow end of the tool is uppermost.

Install the wishbone in the press and align the new bush to the wishbone.

Align the large diameter of the bush replacer tool JD 143-3 to the bush (Fig. 5).

Using the press fully seat the bush into the wishbone.

Remove the wishbone front arm and bush replacer tool from the press.

Align tool JD 143-3/2 to the press.

Carefully align the wishbone rear arm / hub assembly to give the best / most surface contact between the wishbone and the narrow leg of tool JD 143-3/2.

Align removal tool JD 143-3/1 to the bush (Fig. 6).

Using the press, carefully displace and remove the bush.

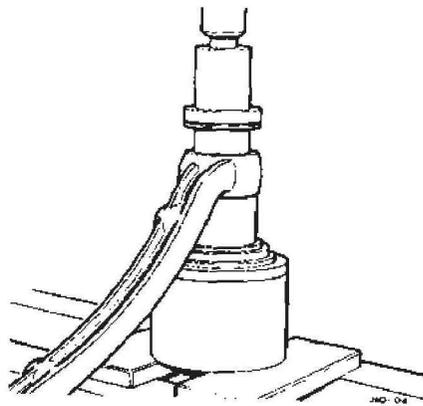


FIG 5

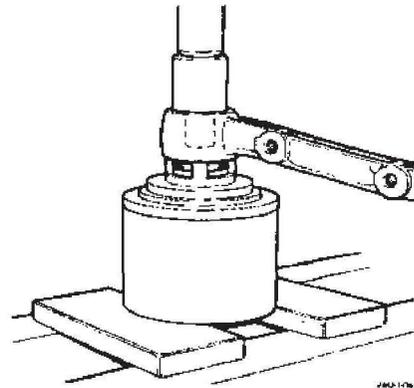


FIG 6

Remove the wishbone assembly from the press.

Using a suitable cleaning agent, clean the wishbone arm faces.

Reposition tool JD 143-3/2 in the press.

Align the wishbone rear arm / hub assembly to give the best / most surface contact between the wishbone and the narrow leg of tool JD 143-3/2.

Carefully align the new bush to the wishbone.

Align bush replacer tool JD 143-3/1 to the bush (Fig. 7).

Using the press, fully seat the bush into the wishbone arm until the upper face of the bush is level with the upper face of the wishbone (see detail in Fig. 7).

Remove the wishbone assembly and the tools from the press.

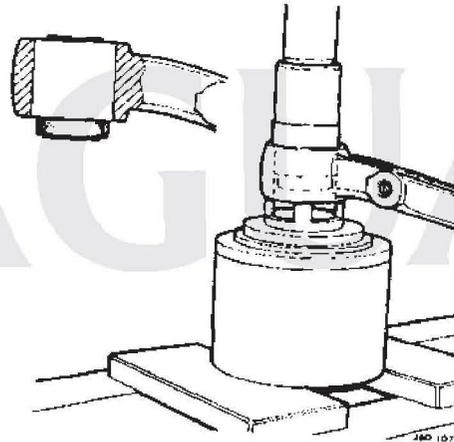


FIG 7

Repeat the procedure on the opposite front side of the vehicle.

When all bushes have been replaced, reverse the removal procedure to refit the wishbones, brake assemblies and road springs.

Refit the road wheels then lower the vehicle from the axle stands and torque-tighten the wheel nuts.

Pump the brake pedal to centralise the pads.

**WARNING:** APPLICATION OF THE BRAKE PEDAL MUST BE CARRIED OUT, AS THE BRAKES WILL NOT OPERATE EFFICIENTLY UNTIL THE PADS ARE CORRECTLY POSITIONED.

**Note:** Ensure the steering geometry is checked and set correctly.

Remove the absorbent cloth from around the brake fluid reservoir cap, ensuring the area is clean and dry.

XJ6

ITEM: 13

## 76 DASH LINER REMOVAL TOOL

A quantity of dash liners has been replaced due to damage caused by their removal. A Service Tool (JD 188) has now been developed to assist with this procedure. To remove a dash liner, driver's or passenger's side of vehicle, proceed as follows:

Open the appropriate door to gain access to the dash liner.  
Undo and remove the dash liner securing screws (Fig.1).

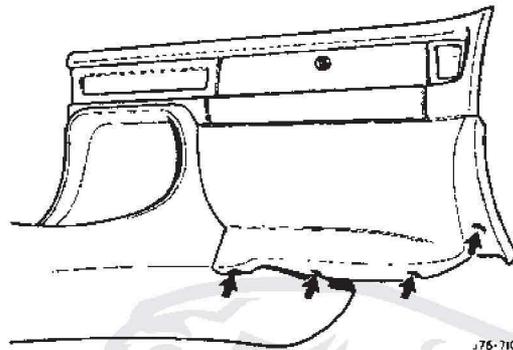


FIG 1

Insert Service Tool JD 188 behind the dash liner. Locate onto the upper flange with the 'V' cut-out in the tool either side of the first fir tree retainer (Fig. 2). Displace the fir tree retainer from the plastic retainer socket by gently twisting the tool handle (Fig. 2). Remove the remaining retainers in the same manner.

**Note:** On vehicles fitted with a steel armature, the tool **must** be inserted between the dash liner and the steel armature (Fig. 3).

The number of dash liner retainers is different between Federal and U.K. vehicles. To avoid any damage to the dash liner, always ensure all retainers have been carefully displaced before removal.

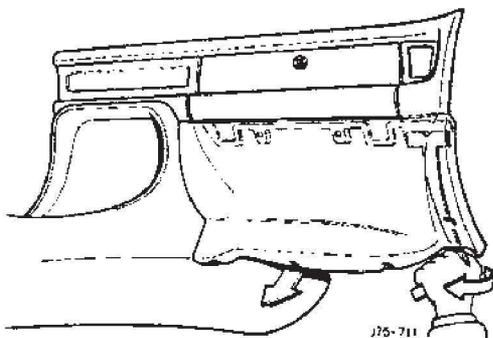


FIG 2

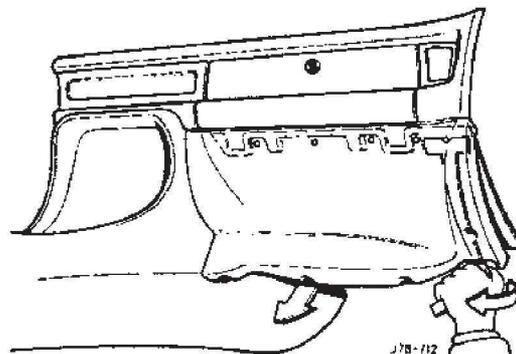


FIG 3

**Note:** The illustrations show L.H.D. passenger's side only. The procedure for the driver's side and R.H.D. vehicles is carried out in the same manner.

**XJ6****ITEM: 14****80 HEATER BLOWER MOTOR ASSEMBLY – DRIVER’S SIDE**

The repair operation time for renewing the driver’s side heater blower motor assembly has changed on all XJ6 vehicles from VIN 629286.

The repair operation times are now as follows:

**LEFT-HAND DRIVE VEHICLES**

80.20.12	Blower Assembly Left-Hand – Renew	01.25 Hours
80.20.12/09	As 80.20.12 (Less JDS Allowance)	00.90 Hours

**RIGHT-HAND DRIVE VEHICLES**

80.20.11	Blower Assembly Right-Hand – Renew	01.25 Hours
80.20.11/09	As 80.20.11 (Less JDS Allowance)	00.90 Hours

Please amend your repair time schedules accordingly.

No other repair times are affected.

To achieve these times in service, adhere to the procedure detailed in Service Bulletin JD 08/91, Item 56.

The bulletin item refers to “air conditioning blower motor assembly”, but the procedure for renewal of the heater blower motor assembly is identical.

**XJ6****ITEM: 15****82 HEATER TO AIR CONDITIONING RETRO-FIT CONVERSION**

When installing the air conditioning retro-fit kit to vehicles built prior to VIN 607111, the following additional parts are required to supplement main kit JLM 10755 in order to provide efficient and stable air conditioning operation:

- CBC 9133 Electric motor assembly.
- JLM 1947 Motor assembly installation kit.
- JLM 10793 Sensor assembly to A/C unit link harness.

These vehicles are not equipped with a motorised aspirator / in-car sensor as original equipment; the above parts comprise the service fit aspirator / sensor assembly.

Full details of installation of the aspirator / sensor assembly can be found in Service Bulletin JD 09/89, Item 47 and an addendum sheet to be included with main kit JLM 10755.

In addition to the above modification, system installation necessitates replacement of the crankshaft damper/pulley assembly on earlier vehicles.

- 2.9 vehicles produced prior to engine number 107821 require fitment of damper assembly EBC 2225.
- 3.6 vehicles produced prior to engine number 106424 require fitment of damper assembly EBC 1441.

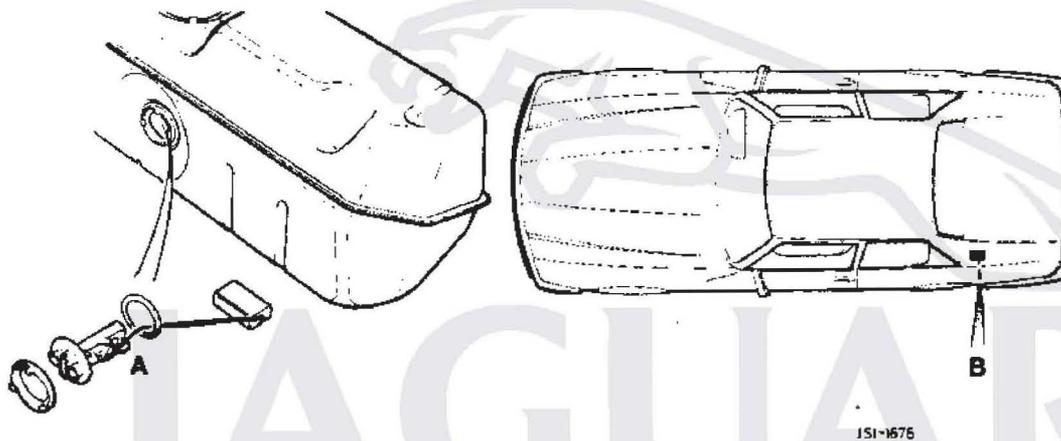
**XJ-S FACELIFT****ITEM: 16****86 ANTI-SLOSH MODULE / FUEL TANK SENDER UNIT – FAULT DIAGNOSIS**

With the introduction of the XJ-S Facelift range, an anti-slosh module has been incorporated into the fuel gauge circuit, which damps the gauge needle movement and controls the low fuel warning indication.

Following isolated concerns with this circuit, some Dealer confusion has arisen during fault diagnosis, which has resulted in the unnecessary replacement of components.

In order to assist Dealers, this Bulletin has been designed to identify possible fault conditions which may occur and details the correct diagnosis procedures.

**PLEASE NOTE** that the following information refers only to the anti-slosh module and the fuel tank sender unit; it is not a fault diagnosis of the fuel gauge.

**COMPONENT LOCATION**

A – Fuel Tank Sender Unit

B – Anti-Slosh Module

**ANTI-SLOSH MODULE TERMINAL VOLTAGES**

The five terminals of the anti-slosh module have the following voltage ranges at normal operating voltage of 13.5 V :

Pin 1	Gauge	2.49 V to 11.08 V dependent on fuel quantity
Pin 2	Low Fuel Warning	Battery voltage (13.5 V) when off; 0.1 V to 1 V when on
Pin 3	Ignition	Battery voltage (13.5 V)
Pin 4	Sender Unit	2.49 V to 11.08 V dependent on fuel quantity
Pin 5	Ground	0 V

**POSSIBLE FAULT CONDITIONS****Loss of damping**

Turn off the ignition. Remove the upper wire from the fuel sender unit and connect the wire to ground.

Turn on the ignition and check the gauge; the pointer should rise rapidly to a position above the "full" mark.

Disconnect the upper wire of the sender from ground and check that the fuel gauge starts to fall. If the low fuel warning light illuminates within 12 seconds of this operation, replace the anti-slosh module.

Turn off the ignition and reconnect the fuel sender unit correctly.

No low fuel warning lamp with gauge reading empty.

Turn off the ignition. Remove the upper wire from the fuel sender unit.

Turn on the ignition. Check that the gauge reads empty and that the warning lamp is on.

If the warning lamp fails to illuminate, check the voltage on the warning lamp output of the anti-slosh module (pin 2). If the voltage is less than 0.9 volts, the fault does not lie in the anti-slosh module; therefore, check the lamp and harness. If the voltage is more than 0.9 volts, change the anti-slosh module.

Turn off the ignition and reconnect the sender unit correctly.

Low fuel warning lamp stays on over the full range of the gauge.

Turn off the ignition. Remove the anti-slosh module and turn on the ignition.

If the warning lamp goes out, replace the anti-slosh module. If the warning lamp stays on, check the vehicle wiring.

Too slow to reach final position when the ignition is turned on.

If the fuel gauge takes longer than 15 seconds to display its final position on the gauge when the ignition is turned on, replace the anti-slosh module.

Fuel gauge constantly reads full.

Turn off the ignition. Remove the upper wire from the fuel sender unit. Turn on the ignition.

Check that the gauge reads empty and that the warning light is on.

If the gauge reads full, turn off the ignition and remove the anti-slosh module. Switch the ignition back on; if the gauge reads empty, replace the anti-slosh module. If the gauge reads full, check the vehicle wiring and the gauge.

Turn off the ignition. Refit the anti-slosh module and reconnect the sender unit correctly.

Fuel gauge always reads empty.

Turn off the ignition. Remove the upper wire from the fuel sender unit.

Turn on the ignition. Check that the gauge reads empty and that the warning lamp is on.

Turn off the ignition. Connect the upper wire of the sender unit to ground.

Turn on the ignition and check that the gauge rises to full. If the gauge does not rise to full, turn off the ignition and remove the anti-slosh module. Connect the fuel gauge to ground. If the gauge rises to full, change the anti-slosh module. If the gauge does not rise to full, check the vehicle wiring, the sender unit and the gauge.

Turn off the ignition, refit the anti-slosh module and reconnect the sender correctly.

Fuel gauge reads above empty when tank is empty.

DO NOT remove the sender unit from the tank.

With either a new sender unit or a 250 Ohm resistor connected in place of the existing sender unit, check that the gauge drops to empty. If it is above empty, replace the anti-slosh module. If the gauge reads empty, check the sender unit or the gauge.

Check for normal operation.

#### SENDER UNIT FAULT DIAGNOSIS

Gauge flickers and swings to zero intermittently.

The likely fault with this symptom is an intermittent open circuit on the sender unit. It is difficult to diagnose this with the sender unit in the fuel tank. The recommended test is to obtain a new sender unit and connect it to the car and holding it in the same orientation as the vehicle, move it through its full travel slowly, watching the gauge for normal operation. If all appears well, the sender unit in the tank should be changed for the new one. If the symptoms persist, check the wiring and the gauge.

**Note:** During heavy cornering, i.e. traffic islands, etc, needle movement will occur towards the empty position, particularly on right-hand manoeuvring.

Recovery to the correct fuel gauge indication after the cornering manoeuvre will be slow due to the operation of the anti-slosh module. This is normal and should not be interpreted as a fault.

**XJ-S COUPE / CONVERTIBLE – 92 MY**

**ITEM: 17**

#### 86 ALARM SYSTEM OPERATION

Investigation into Dealer reports of poor operation of the alarm system on XJ-S 92 MY vehicles has shown that a final operation has been omitted from the supplied installation instructions. Therefore, where customer complaints are received, the following action should be taken.

1. Remove the right-hand rear quarter lower trim pad assembly.
2. Identify the alarm antenna coiled in the harness (refer to Fig 1).

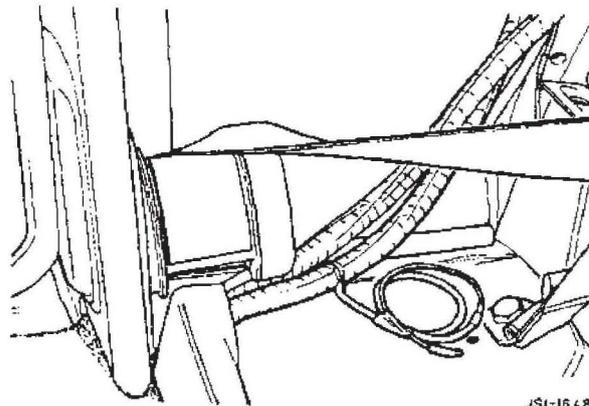


FIG 1

3. Remove the adhesive tape from the antenna, uncoil and straighten.
4. Position the rear quarter trim panel assembly to the vehicle.
5. Attach the straightened antenna to the rear of the trim panel in vertical attitude, using suitable adhesive tape (refer to Fig 2).

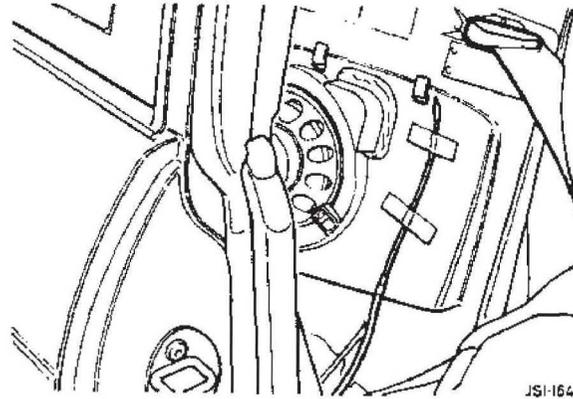


FIG 2

6. Refit the trim panel.

The above action only applies to VIN range 179737 onwards.

Parts Warranty claims for this work should be made using Complaint Code 9SSX and quoting SRO 86-91-42 (Coupe) or 86-91-42/70 (Convertible).

Total time allowance is 0.20 Hours (Coupe) and 0.25 Hours (Convertible).

Dealers and Importers using electronic claim submissions should use Claim Type 03.

It is intended that this operation will shortly be integrated into the vehicle build and an appropriate VIN will be issued in a future Service Bulletin.

### **XJ6 LHD ONLY**

**ITEM: 18**

#### **86 72AH BATTERY**

A larger capacity 72aH battery has been introduced on all left-hand-drive XJ6 vehicles from VIN 653463.

This new battery (Part Nos: DBC 6429 [wet] and JLM 10455 [dry]) is not interchangeable with either previous left-hand-drive or right-hand-drive vehicles.

### **XJ6 / XJ-S**

**ITEM: 19**

#### **86 18 EM IGNITION AMPLIFIER**

Investigation of recent warranty returns has identified instances of ignition amplifiers being changed and, in the process, being removed from their base-plates.

These parts should not be separated and must only be replaced as a complete assembly. Under no circumstances should they be dismantled.

Any parts returned through warranty will be rejected if incomplete or if attempts to split the assembly have been made.

# Service Bulletin



DATE: APRIL 1992

PAGE: 1 of 4

REF: JD 03/92

Owing to revised information received from Engineering, pages 11 of Service Bulletin JD 01/92, 3/4 and 9/10 of Service Bulletin JD 02/92 are being re-issued and are provided at the end of this Bulletin, marked " \*Issue 2\* ".

Existing pages of the above should be removed and discarded to be replaced with the revised version.

**XJ6 3.2 & 4.0**

**ITEM: 20**

## 03 ADDITIONAL REPAIR OPERATION TIME

The following Repair Operation Times are now available:

12.29.16 – Cylinder Head Gasket Rear Blanking Plate – Renew – 1.40 Hrs  
Gasket

12.29.17 – Cylinder Head Rear Blanking Plate – Renew – 1.40 Hrs

Please amend your Repair Operation Time Schedule accordingly.

No other Repair Times are affected.

**XJ6 / XJS**

**ITEM: 21**

## 10 BRAKE SYSTEM SERVICE RECOMMENDATIONS

With the introduction of new brake components on the above models, the brake servicing recommendations have changed.

No routine replacement of system seals is necessary as the seals are designed to last for the life of the vehicle.

The braking system must still be inspected for satisfactory operation and condition at the regular service intervals.

Brake fluid to be renewed at 2 years or 30 000 miles (48 000 km) intervals, whichever is the sooner. For North America only, 18 months or 30 000 miles (48 000 km).

**Note:** Service Manuals will be up-dated at the next reprint.

**ALL AJ6-ENGINEED VEHICLES****ITEM: 22****26 WATER PUMPS**

A revised water pump assembly has been introduced on AJ6 engines. The assembly now has a gasket between the two halves, instead of RTV sealant as previously used.

The revised assembly is fitted from the following engine numbers:

3.2 : 107696

4.0 : 157275

The part number of the new assembly is EBC 8550 and replaces EBC 4437. The part number of the gasket is EBC 9220.

**Note:** THE GASKET CANNOT BE RETRO-FITTED TO RTV-SEALED WATER PUMPS. IF A LEAK BETWEEN THE TWO HALVES IS APPARENT, THE OLD STYLE PUMP ASSEMBLY MUST BE REPLACED BY EBC 8550.

When EBC 8550 has been fitted to an engine, the bolts securing the two halves together must be re-torqued to 21.5 Nm – 28.5 Nm, to overcome the possibility of gasket relaxation.

**XJ6 / XJ-S / S.III****ITEM: 23****80 AIR CONDITIONING/HEATER MICROPROCESSOR****82**

Refer to Service Bulletin JD 09/91, Item 62.

To improve the retention of the air conditioning/heater servo drive motor ICs (integrated circuits) secured to the microprocessor unit heatsink, the supplier has now changed the process to "Rivscrews".

This modification commenced during mid-November 1991 and replaced the previous bolt-type fixings.

Air conditioning/heater units fitted with revised microprocessors were progressively introduced from VINs:

XJ6	-	659029
XJS	-	183501
S.III	-	486299

**XJ6****ITEM: 24****84 WINDSCREEN WIPER ARM AND BLADE**

From VIN 657725, all XJ6 vehicles have been fitted with a revised wiper arm and blade assembly.

These new parts are interchangeable with cars built prior to this VIN, when changed as an assembly only. Dimensional changes prevent the fitment of a mixed condition of arm and blades.

Dealers are reminded that wiper blade replacement remains a part of the 7500 mile (12000 km) service schedule for all vehicles.

XJS

ITEM: 25

## 86 STOP LIGHT FAILURE SENSOR MODULE – LOCATION

From VIN 179737 (92MY Facelift XJS), the stop light failure sensor module is located in the boot of the vehicle, attached to the inside of the boot side reinforcement panel (drainage channel) L.H. (Fig. 1).

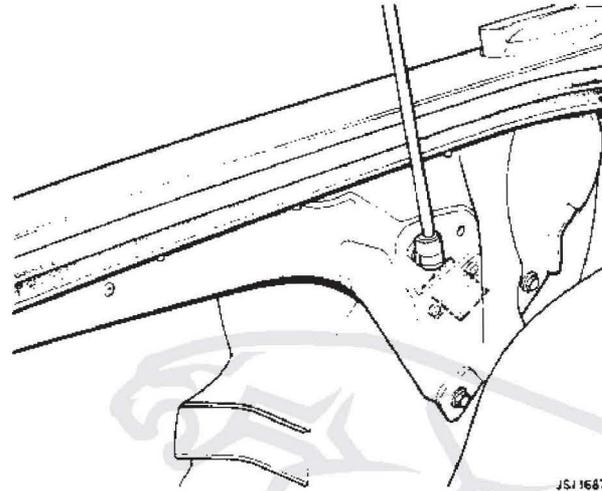


FIG. 1

Prior to VIN 179737 (90MY XJS), the module is located beneath the centre console veneer finisher, attached to a bracket in front of the stowage compartment (Fig. 2).

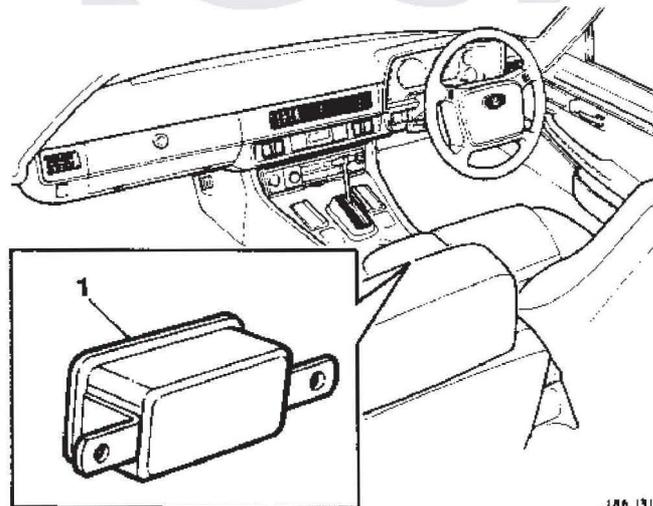


FIG. 2

XJ6

ITEM: 26

## 88 EXTERNAL SPEED SENSOR BRACKETS – IDENTIFICATION

Two external speed sensor brackets are available for use on XJ6 models. To avoid any confusion, they are identified as follows:

Bracket Part No	Description Of Use
CAC 9884	For all Drive Units prior to the introduction of EBC 9750 and EBC 9751 (no colour identification).
EBC 9820	For all Drive Units from the introduction of EBC 9750 and EBC 9751 (identified by a "spot" of <b>blue</b> paint).



# Service Bulletin



ISSUE NO: JD 04/92

APRIL 1992

SHEET: 1 OF 1

S.R.O: 82-25-13  
82-25-14

- MODEL : XJ6 / XJS / S.III V12 (AIR CONDITIONED MODELS)
- SUBJECT : BLOWER MOTOR ASSEMBLIES
- CUSTOMER CONCERN : Brush gear noisy operation, ie: low speed ticking / squeak.
- ADVICE TO CUSTOMER : Installation of revised blower motor assemblies incorporating a new 'P35' motor will overcome the noise concerns.  
New blower motors have been introduced from the following VINs:  
XJ6 (Air Con) - 657163  
XJS - 183290  
S.III - 486002
- DEALER ACTION : Yes
- REPAIR METHOD : Blower Assemblies incorporating the new motor are interchangeable on vehicles prior to the above VINs (see Parts Information below for model year variations).  
Replacement of blower motor assemblies should be carried out in accordance with the following Service Manual instructions:  
XJ6 - Volume 4, Section 82, Page 82-38/82-39  
XJS - Volume 4, Section 82, Page 82-62/82-63  
S.III - Section 80-82, Page 82-39/82-40
- SERVICE TOOLS : N / A
- PARTS INFORMATION : Owing to the introduction of 'PM5' harness connectors on blower motor assemblies fitted to XJ6 and XJS models from VINs:  
XJ6 - 629286  
XJS - 179737  
Part Numbers for replacement units on vehicles PRIOR to the above VINs are as follows:
- |     |          |          |
|-----|----------|----------|
|     | RH       | LH       |
| XJ6 | CBC 8966 | CBC 8967 |
| XJS | CCC 5546 | CCC 5547 |

Part Numbers for replacement units on vehicles FROM the above VINs are as follows:

	RH	LH
XJ6	CCC 5400	CCC 5401
XJS	CCC 5544	CCC 5545

S.III V12

The harness connector on Series III blower motors has not changed. For replacement units incorporating the new motor, the following Part Numbers apply:

	RH	LH
S.III	CCC 5546	CCC 5547

ADMINISTRATION  
INFORMATION

: WARRANTY CODES

XJ6 ) 7TA (RH)  
XJS ) 7TB (LH)  
S.III 7S4

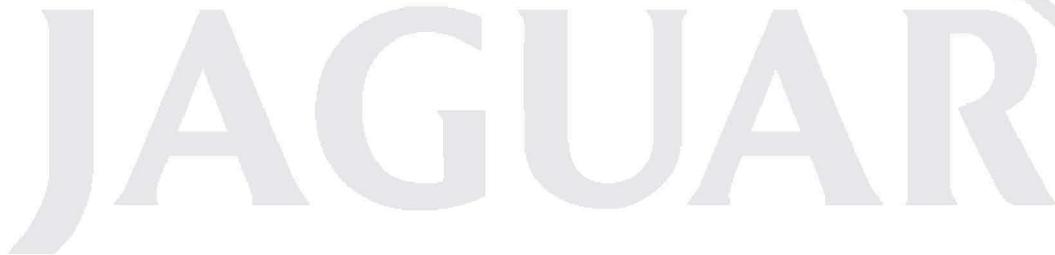
REPAIR OPERATION CODES

XJ6 / XJS MODELS:

SRO 82-25-14 (RH)	SRO 82-25-13 (LH)
(SRO 82-25-14/09	(SRO 82-25-13/09
LESS JDS ALLOWANCE)	LESS JDS ALLOWANCE)

S.III:

SRO 82-25-14 (RH)	SRO 82-25-13 (LH)
-------------------	-------------------



DATE: OCTOBER 1992

PAGE: 1 of 8

REF: JD 16/92

## ERRATA

Owing to revised information, the torque figure for the coolant temperature transmitter to engine, XJS models, is 14,5 to 19,5 Nm.

The torque figure given in Service Bulletin JD 10/92 and Section 88 of XJS Service Manual, JJM 10 04 06/20, should be ignored and only the revised figure used.

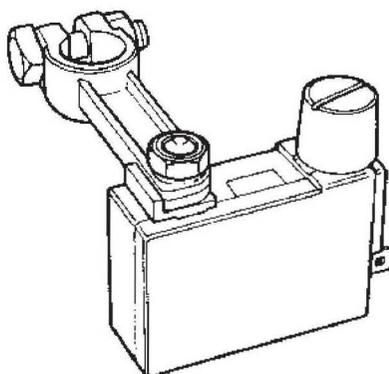
Service Manuals will be amended at the next reprint.

**XJ6 93 MY (FROM VIN 667829)**

**ITEM: 44**

### BATTERY TRANSIT RELAY – REMOVAL

Owing to the relocation of the battery into the boot at 93 MY, a revised battery transit relay has been introduced, (see Fig 1).



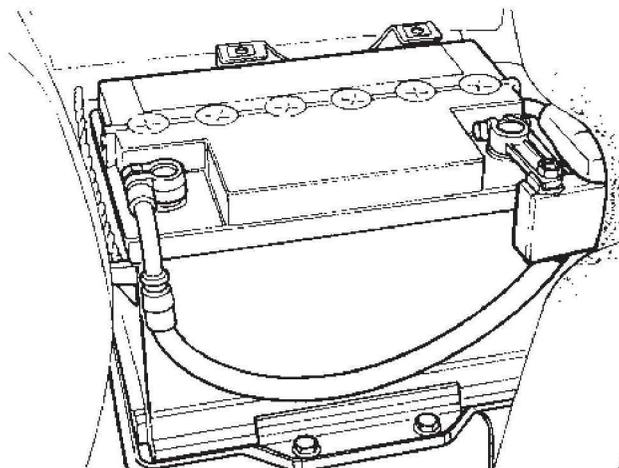
J5I-1773

FIG 1

The procedure for the removal of this new relay is as follows:

#### WITH THE IGNITION OFF:

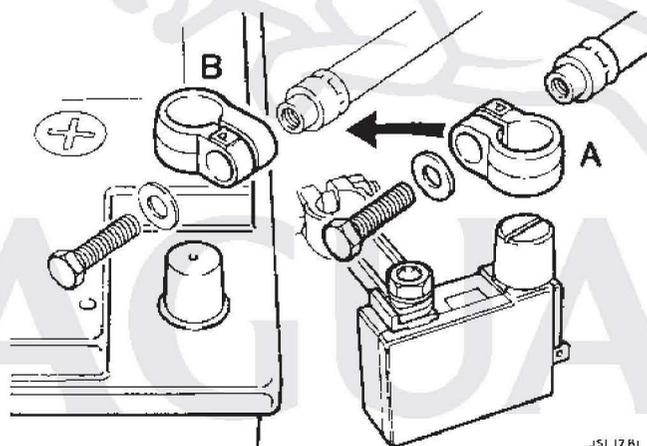
1. Open the boot and remove the battery cover, (see Fig 2).
2. Remove the negative lead from the battery.
3. Disconnect the transit relay from the battery.
4. Remove the white / yellow (W/Y) ignition wire from the transit relay.



J51 1778

FIG 2

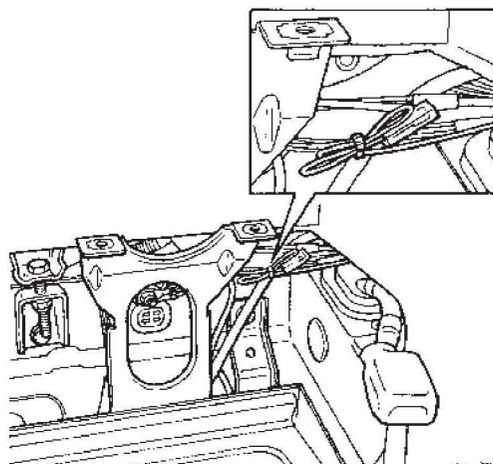
5. Remove the positive lead from the transit relay terminal post, (A, Fig 3).
6. Reverse the positive lead clamp and refit the clamp to the positive lead (B, Fig 3).



J51 1781

FIG 3

7. Displace the battery.
8. Tie back and secure the white / yellow (W/Y) ignition wire, (see Fig 4).



J51 1780

FIG 4

9. Refit the battery.
10. Refit and secure the positive and then negative lead of the battery.
11. Replace the battery cover.

**NOTE: ALL UK DEALERS MUST CONTINUE TO RETURN THE DISPLACED TRANSIT RELAYS.**

**REMOVAL OF THE TRANSIT RELAY SHOULD BE CARRIED OUT NO LONGER THAN 24 HOURS BEFORE THE VEHICLE IS HANDED OVER TO THE CUSTOMER.**

**THE RADIO AND TIME CLOCK MUST BE RESET AFTER THE RELAY IS REMOVED.**

**IMPORTANT: UNDER NO CIRCUMSTANCES SHOULD THE RELAY BE USED OR RETAINED AS AN ISOLATION DEVICE FOR ROAD USE.**

XJS

ITEM: 45

### 03 REPAIR OPERATION TIMES

#### Air Conditioning Blower Motor Assembly

The repair operation times for renewing the air conditioning blower motor assemblies have been re-studied on 1992 MY vehicles.

The new operation times for vehicles from VIN 179737 are as follows:

#### Right-hand drive vehicles

82-25-13	Blower Assembly – Left-Hand – Renew	0.95 Hrs
82-25-13/09	As 82-25-13 (Less JDS Allowance)	0.60 Hrs

82-25-14	Blower Assembly – Right-Hand – Renew	1.60 Hrs
82-25-14/09	As 82-25-14 (Less JDS Allowance)	1.25 Hrs

#### Left-hand drive vehicles

82-25-13	Blower Assembly – Left-Hand – Renew	1.60 Hrs
82-25-13/09	As 82-25-13 (Less JDS Allowance)	1.25 Hrs

82-25-14	Blower Assembly – Right-Hand – Renew	0.95 Hrs
82-25-14/09	As 82-25-14 (Less JDS Allowance)	0.60 Hrs

Please amend your repair times accordingly.

No other repair times are affected.

**XJ6 / XJS****ITEM: 46****10 BRAKE SYSTEM SERVICE RECOMMENDATIONS**

**Note:** This bulletin supersedes Item 21 of Service Bulletin JD 03/92.

With the introduction of the ABS brake system, from the following VINs, the brake servicing recommendations have changed:

1. XJ6 from VIN 594576.
2. XJS (5.3 convertible) from VIN 147269.
3. XJS (5.3 coupe) from VIN 148782.
4. XJS (3.6 coupe) from VIN 148945.

No routine replacement of system seals is necessary. The system and components, which are sealed for life, require no maintenance. Repair is by replacement.

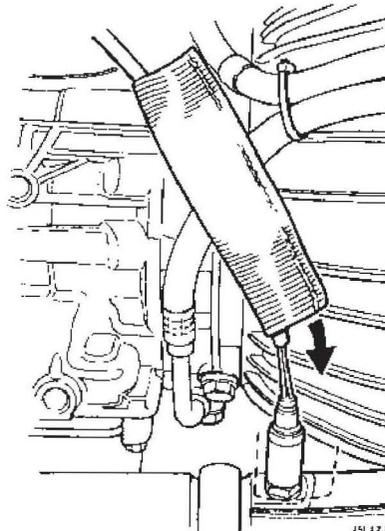
The braking system must still be inspected for satisfactory operation and condition at the regular service intervals.

Because of its hygroscopic nature, brake fluid must be renewed at 2 year or 30 000 mile (48 000 km) intervals, whichever is sooner.

**XJ6 ALL MODELS****ITEM: 47****18 LAMBDA SENSOR SPLASH-SHIELD**

Following reports of the intermittent display of "Fuel Failure 44" on the instrument pack, it was found that this symptom could be caused by water penetrating the lambda sensor.

A lambda sensor splash-shield has been introduced from VIN 664941, which can be fitted retrospectively and should be installed whenever a lambda sensor is changed. This will reduce the possibility of water ingress.



SLEEVE  
C. 33139/4

The six-inch silver heat-proof sleeve is fitted by sliding it over the sensor, prior to its replacement. After the sensor has been fitted, Dealers should ensure that the sleeve is pushed fully back down to cover the whole sensor.

**ALL MODELS****ITEM: 48****18 IGNITION SPARK PLUGS**

Spark plugs have been returned under warranty with a yellow / brown stain visible on the insulator housing. Dealers have incorrectly interpreted this as leakage of combustion gases between the insulator and metal housing and the cause for spark plug misfire. The following is an explanation for the staining and the more likely cause for spark plug misfire.

During most atmospheric conditions a form of static discharge, common to high voltage conductors, can occur, which is commonly known as "Corona discharge".

Ignition systems are particularly prone to this effect during wet weather, when the air space surrounding the spark plugs becomes charged with a gas composed of electrons, ions and air particles, forming a state of general ionization. Too much ionization counteracts the spark plug insulation and causes a partial discharge, which in turn gives out a blue light.

Under normal circumstances this will in no way affect the running of the car, providing the spark plug insulators are kept clean.

Running problems would normally only occur if the spark plug insulators were coated in a film of dirt, which would allow high voltage tracking, known as "flashover", between the spark plug terminal stud and earth, thus causing a misfire.

However, protection is provided against this eventuality by the inclusion of "ribs" along the insulator body. To identify whether or not the spark plugs have been subjected to Corona discharge, plugs should be examined in daylight for the presence of a yellow / brown stain at the base of the insulator, next to the metal housing.

The actual stain is caused by oil-contaminated particles, in suspension around the spark plug insulator, receiving the electrostatic charge of ionization and fusing themselves to the plug. The stain is quite harmless and can usually be wiped off easily.

Corona discharge will cause no deterioration in service or malfunction of the spark plug.

Moisture or dirt may cause "flashover" but Corona discharge does not. Cleanliness is vital, therefore, spark plug insulators should be kept clean and dry at all times.

**Note:** Spark plugs returned under warranty may be rejected as "no fault found" for the reasons given above.

**XJ6 ALL MODELS****ITEM: 49****64 REAR SHOCK ABSORBERS**

Jaguar Cars Limited 2005

From VIN 667829, a new rear shock absorber is fitted to all non-ride-levelling vehicles. This new part is fully interchangeable with all previous components when

This new part, number CCC 6923, should be used in all cases where rear shock absorbers are replaced, with immediate effect.

**Under no circumstances** should this new part be mixed with old condition parts on a vehicle axle.

When failures are identified in service, single shock absorbers only need to be changed if the parts have less than 25,000 miles (40,000km) service use.

The new units, which have a black finish, can be easily distinguished from the previous parts by a new sealed gaiter, which will reduce dirt ingress.

### **XJS 6CYL / V12 AND SERIES III V12**

**ITEM: 50**

#### **82 RECEIVER DRIER BOTTLE**

When replacing the receiver drier bottle, Part Number CAC 1881, it is essential that the receiver drier bottle is mounted with the sight glass vertical. This is to ensure that the pick-up tube inside the drier bottle is always immersed in liquid refrigerant. If the receiver drier bottle is mounted at angles in excess of +/- 20 degrees from the vertical, there is a risk, under certain conditions, that vapour rather than liquid may enter the pick-up tube. Should this occur, erratic air conditioning performance may result.

### **XJS 4.0L / V12**

**ITEM: 51**

#### **86 LOW COOLANT WARNING LIGHT FAULT DIAGNOSIS**

Dealer investigations into low coolant warning light concerns have resulted in a high number of low coolant probes and control units being replaced unnecessarily, as most probes and control units tested by the supplier reveal no faults. In order to reduce this unnecessary replacement, the following electrical checks should be carried out by Dealers before condemning or replacing components where the cause is found to be low coolant level. The checks should include inspection of the coolant system for leaks, which is best achieved by pressure testing the coolant system to locate the source of the leak.

Coolant leaks may be caused by: loose hose clip connections, worn or damaged pressure cap seals, or damaged hoses. Lack of coolant recovery from the atmospheric recovery bottle may be a further reason for low coolant level in the header tank.

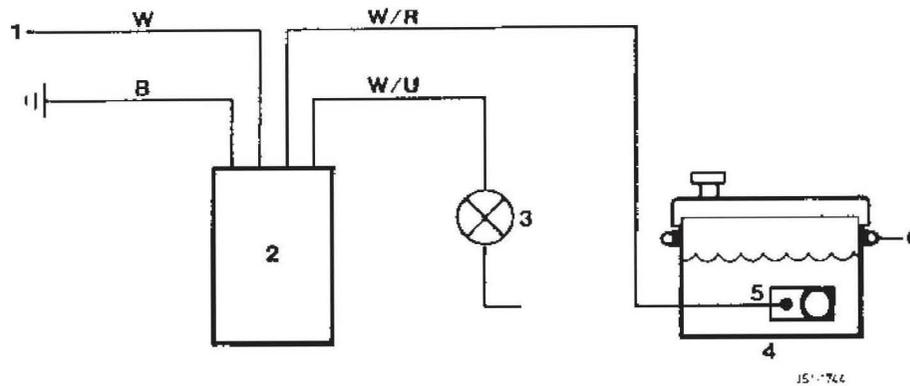
Transfer of coolant from the atmospheric recovery bottle relies on the presence of a vacuum, as the coolant contracts when the engine is turned off. Checks should be made to ensure that the recovery bottle and its connections through to the header tank are leak-free and unrestricted. In addition, the vacuum valve in the header tank should be checked to ensure that it operates correctly and does not stick.

### **ELECTRICAL CHECK PROCEDURE**

#### **CIRCUIT / SYSTEM DETAILS**

Jaguar Cars Limited 2005

The system operates by measuring the resistance of the coolant. With resistance below 5,000 Ohm, the warning light is off. The light will illuminate with the resistance



**COMPONENT / CIRCUIT CODE**

**WIRING CODE**

- 1 – Ignition (IGN) supply
- 2 – Low coolant control unit
- 3 – Warning light (W/L)
- 4 – Header tank
- 5 – Low coolant probe
- 6 – Header tank earth via fixing bolts

- W – White
- W/R – White / Red
- W/U – White / Blue
- B – Black

FAULT	CAUSE	ACTION
W/L does not illuminate at any time. (Bulb check does not occur i.e. @ 1 sec on following ign)	Blown W/L or open circuit on W/L wire	Check by shorting white / blue (W/U) wire to earth – W/L should come on.
	Earth wire at unit open circuit	Check resistance to good chassis ground – less than 2 Ohm.
	Ign supply to unit open circuit	Check supply at unit, should be battery voltage.

If the above checks are satisfactory replace faulty low coolant unit.

W/L on all the time with ign	Low coolant	Check and top up as required
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If the coolant level is satisfactory, the following check will determine which part of the circuit is at fault.

Disconnect the probe wire at the tank and short to ground. If the W/L goes out, proceed to (A). If the W/L stays on, go to (B).

(A)	Poor connection, tank body to earth	Check resistance of tank body to good chassis earth – should be less than 2 Ohm.
	Poor connection on Lucar connector Red / White wire. Lucar rivet loose on low coolant probe	Visual check – clean, replace as required.
	Low coolant probe / plating contaminated	Remove probe from tank – clean with wire wool if probe Lucar is damaged or loosened during re-

(B)	Short to earth in W/L wire or W/L bulb-holder pack	Unplug low coolant unit. If the W/L goes off, circuit OK – If W/L remains illuminated – locate short circuit.
	Short to earth on probe wire White / Red (W/R)	With unit and probe disconnected, check the White / Red wire resistance to good chassis earth – should be above 20,000 Ohm.

If all of the above checks are satisfactory, replace faulty low coolant unit.

W/L flashes on, then goes off	Low coolant level	Check – top up as required.
	Intermittent open circuit, on White / Red (W/R) low coolant probe wire	Ground probe wire at tank – test drive vehicle. If fault recurs, check harness / connectors, locate open circuit
Less likely causes but may in certain conditions, with an out of specification unit, cause a fault	Bad connection tank body to earth	Check resistance of tank body to good chassis earth – should be less than 2 Ohm.
	Poor connection on Lucar connector Red / White (R/W) wire. Lucar rivet loose on low coolant probe	Visual check – clean replace as required.
	Low coolant – probe / plating contaminated	Remove probe from tank, clean with wire wool – if probe Lucar is damaged or loosened during removal replace probe.

# Service Bulletin



# JAGUAR

# Daimler

DATE: DECEMBER 1993

PAGE: 1 of 6

REF: JD 44/93

XJS 4.0 LITRE 1994 MY FROM VIN 190528

ITEM: 46

30 EXHAUST SYSTEM - DETAIL CHANGES, USA & CANADA ONLY

Prior to the above VIN, for the USA and Canada markets ONLY, the exhaust system basically consisted of:

- downpipe
- plain intermediate ('Y') pipe
- twin catalytic convertors
- over-axle pipes
- rear silencer assemblies

Commencing at the above VIN, the exhaust system layout becomes:

- downpipe
- intermediate ('Y') pipe with integral single catalytic convertor
- twin plain silencers
- over-axle pipes
- rear silencer assemblies

The following part numbers are applicable to the later condition, from VIN 190528:

<u>NEW PART NOS</u>	<u>DESCRIPTION</u>	<u>MARKET APPLICATION</u>
EBC 10144	Intermediate ('Y') pipe with integral catalytic convertor	USA & CANADA
EBC 9782	Intermediate silencer assembly RH	USA & CANADA
EBC 9783	Intermediate silencer assembly LH	USA & CANADA

## 76 BONNET RELEASE MECHANISM

Coinciding approximately with the introduction of XJS 1993.5 Model Year vehicles, a revised pattern of bonnet release catch has been introduced as a running change. In the course of development of the new type of catch, a method of gaining access to the engine compartment has been established to overcome the problem which would arise in the rare event of release cable failure.

This method allows the bonnet to be released and opened without panel or paintwork damage to the bonnet itself or adjacent panels. The bonnet release problem may then be traced and rectified.

Strict observance of the following method is essential to avoid cosmetic damage:

1. Ensure that the radio code is known prior to disconnection of the battery. Open the boot. Remove the battery cover and disconnect the battery.
2. Apply masking tape to the outside edges of the bonnet and adjacent panels, wrapping the tape as far as possible around the panel edges. Fit wing covers.
3. Remove the front grille.
4. Remove the bolts retaining the bonnet hinges.

**Important:** Have an assistant ready to prevent the front end of the bonnet being raised by the action of the gas struts as the bolts are removed.

5. Allow the front end of the bonnet to be raised through a short distance by the gas struts, the rear end meanwhile pivoting on the strikers still engaged to the catches.

Continue to raise the front end slowly and carefully until access is available to the bonnet ball-joint of each gas strut.

Carefully release each ball joint from its pivot ball.

**Important:** Ensure that the assistant holding the bonnet appreciates that as each strut is released (and allowed to extend), there will be a change from holding the bonnet down to the need to support the bonnet.

6. Have the assistant raise the front end of the bonnet a short distance further, until access is available to the catches. Care is required that the rear corners of the bonnet do not contact the plenum panel below.

7. Release the RHS catch by operating the latch arm directly by hand.
8. Using the locally-made release tool illustrated in Fig. 1. below, the LHS catch may be released after passing the release tool across the top of the engine. The notch on the end face of the tool prevents slippage from the catch.
9. Remove the bonnet by lifting it up and away from the engine compartment aperture.
10. Trace and rectify the release problem.
11. Refit and adjust the bonnet to the aperture.
12. Refit the front grille.
13. Reconnect the battery and refit the battery cover.
14. Re-code the radio; re-set the clock.

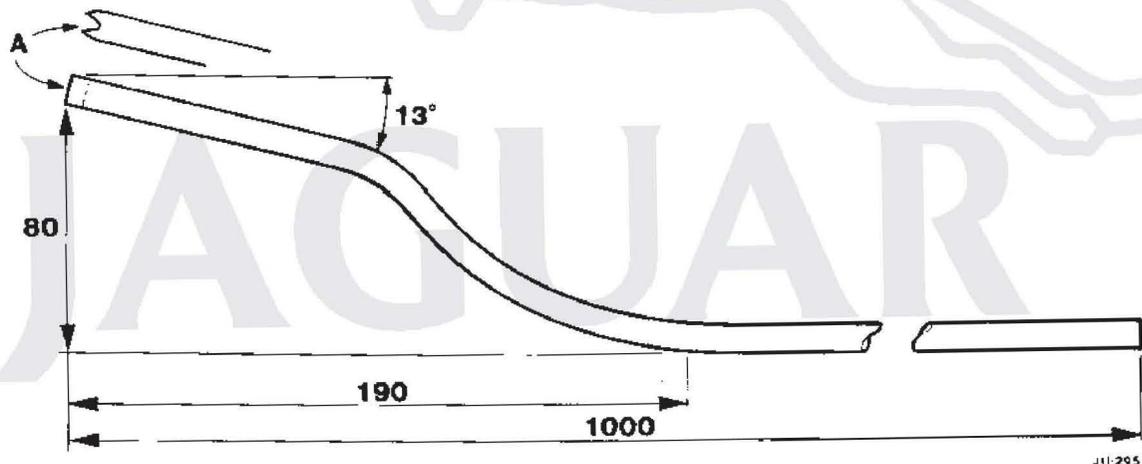


Fig. 1.

The tool illustrated above should be locally manufactured from a length of steel rod, 6.00mm diameter, approximately 1000mm long. The overall length, however, is not critical, provided that the tool is sufficiently long to provide access across the engine compartment.

## 76 USE OF LISTED 'PLASTIC PADDING' BODY REPAIR PRODUCTS

Being widely available through Body Refinishing trade suppliers, Jaguar make the following recommendations as a result of laboratory tests carried out on the two products concerned:-

'Plastic Padding'	WB2000 Stonechip
'Plastic Padding'	'ULTIMA' Universal Body Filler

WB STONECHIP

This is a sill-coat repair product, spray applied as a water-based emulsion. Though primarily an air dried product, it may be force dried if necessary.

It is confirmed that this material MAY be employed as a repair product on Jaguar and Daimler vehicles, where the repair will be the subject of Warranty.

Tests indicate, however, that the product will give a coarser finish than that given by the original factory finish sill-coating. Two coats of the product are recommended to give a minimum dry-film thickness of 400 microns.

Colour finishing by the conventional 2K process should be force-dried at 60°C maximum. (Low bake at 90°C may produce 'fine-boil' effects.)

It should be noted that repairs adjacent to clear coat must be preceded by thorough flattening of the clear coat (360 grit paper) to achieve satisfactory adhesion and anti-chip performance.

'ULTIMA' UNIVERSAL BODY FILLER

This is a filler product, to be knife-applied over etch-primed metal surfaces. After appropriate sanding, a conventional 2K colour process may be applied.

This product is NOT APPROVED for body repairs which carry Warranty.

The product is assessed as 'equivalent to other similar materials' of the catalysed polyester type, and shares with them the tendency to produce micro-blistering around the interface between the repair and original materials, particularly in high humidity conditions. Hence, on Jaguar and Daimler vehicles its use must be confined to repairs which do not carry Warranty.

## 82 BLANKING PLUGS FOR REFRIGERATION CIRCUITS

Attention is drawn to the need for connections on Refrigeration Circuit components to be blanked off, whenever the circuit is disturbed for servicing or component replacement, in order to prevent contamination of the circuit by the ingress of moisture and 'foreign' material. As well as being necessary for on-vehicle components, this also applies to components being returned under Warranty, since subsequent investigation of these components is often compromised by contamination of their interior before receipt at Jaguar.

Components being returned to Jaguar should be blanked off using the blanks installed on the replacement part. Components on the vehicle should be blanked off using suitable internal line plugs and external line caps.

A set of plugs and caps found suitable for most of the components in the Refrigeration Circuit is the Vacuum and Fuel Line Plug Set, available from Snap-on Tools, under their Part No. THX 312. It is recommended that Dealers should obtain sets of these, or their equivalent, from their local distributors.

In addition, certain connections can be blanked off using a Bonnet Stop, Part No. BD 10224, available via Jaguar Parts Operations.

It is important to note that plugs and caps kept for repetitive use on Refrigeration Circuits should be kept segregated from those used for other purposes, such as blanking off fuel or hydraulic components.

## 82 RECEIVER DRIER ASSEMBLY

Current instructions require that the Receiver Drier Assembly be replaced whenever the Refrigeration Circuit is opened, even though there may be no reasons to suspect the serviceability of the Drier. This Service Bulletin revises that requirement and permits the Drier to remain in service provided:-

- blanks are installed on component and refrigerant line connections immediately after disconnection.
- blanks are only removed from component and refrigerant line connections immediately prior to reconnection.

**Note:** 1. Refer to Item 49 above of this Service Bulletin for details of the blanking plugs and caps required.

2. Refer to Service Bulletin JD 45/93 for details of the latest standard 'O' ring seals for R134A systems on XJ6 and XJ12 models.
3. When reconnecting the refrigerant line, new 'O' ring seals, lubricated with the recommended refrigerant oil, must be used.

However, the Receiver Drier Assembly must still be replaced if:-

- it is suspected that there is swarf, or some other contaminant, in the Drier as a result of a component failure in the Refrigerant Circuit.
- the Drier is blocked, damaged or leaking.
- there is corrosion in the Drier or in the Refrigerant lines (indicating the presence of moisture in the system).



# Service Bulletin



# JAGUAR

# Daimler

DATE: MARCH 1994

PAGE: 1 of 2

REF: JD 26/94

ALL JAGUAR AND DAIMLER VARIANTS WITH AIR CONDITIONING

ITEM: 22

XJ6 &amp; XJ12 VIN RANGE 507471 TO 667578

XJS VIN RANGE 100001 TO 190527

SERIES III 1985 MY TO VIN 487641

## 82 CONVERSION TO HFC 134A REFRIGERANT FROM CFC R12

As refrigerant R12 becomes increasingly less available world-wide, in favour of refrigerant HFC 134A which is more environmentally friendly, it will become necessary to convert the refrigeration systems of certain vehicles, which were originally manufactured with a refrigeration system filled with R12 refrigerant, to accept HFC 134A refrigerant.

While the above situation may arise following component damage due to collision, or from component failure, Dealers may also be requested by customers to change their vehicle to the later refrigerant. Apart from these situations, vehicles equipped with CFC R12 systems should continue to be serviced using R12 refrigerant, and only retro-fitted to HFC 134A standards when R12 is no longer available or cost-effective.

The principal change involved is the replacement of the existing compressor lubricating oil (compatible **ONLY** with R12 refrigerant) by an oil compatible with both HFC 134A refrigerant and with residues of the earlier lubricating oil, which it is not possible to eliminate completely from the refrigerant system. In addition, it is also necessary to replace the input shaft seal of the compressor by a seal compatible with the later refrigerant.

Full details are contained in a Technical Guide, which is being issued at the same time as this bulletin.

The necessary Parts for the above conversions are available from Jaguar Parts Operations in kit form:

KIT PART NO.	MODEL	APPLICATION
J1M 11610	All XJ6 & XJ12	up to VIN 667578
J1M 11611	All XJS	up to VIN 190527
	Series III models	Post 1984 MY

## Jaguar Cars Limited

Service Operation and Labour Time Allowance

The following Fitting Operation Times apply:

MODEL	VIN RANGE	COMPRESSOR	R.O.T.
XJ6, XJ12	507471 - 593883	SANDEN 810	3.10 hours
	593884 - 667578	SANDEN 709	
XJS 3.6L	112586 - 179739	HARRISON	3.00 hours
XJS 4.0L	179740 - 190527	SANDEN 709	3.35 hours
XJS 5.3L	100001 - 188104	HARRISON	3.10 hours
XJS 6.0L	188105 - 190527	SANDEN 709	3.45 hours
SERIES III 5.3 LITRE	PRIOR TO 487641	HARRISON	3.10 hours

Details of the retro-fit procedure are contained in the Technical Guide, "Air Conditioning System - HFC Refrigerant Retrofit".

# JAGUAR