



its full travel in each direction, a potentiometer may be out of range at one end or the other - its wiper may have passed the end of the resistance track to an open-circuit position and is no longer able to provide a feedback voltage. In this condition, the red LED will not illuminate.

Failure of the red LED to illuminate may also indicate that one of the potentiometers is faulty. This condition must be diagnosed and rectified.

4. The following diagnostic procedure may be used to determine which potentiometer is out of range.

## B. DIAGNOSTIC PROCEDURE

**Begin the diagnosis with all seat movements set to the mid-position of their travel.**

1. Drive the front cushion height adjustment motor to its upper stop position. Depress the memory set button. If the LED fails to illuminate, then the feedback from the front cushion height potentiometer is incorrect and requires adjustment.
2. If the LED illuminates during step 1, drive the front cushion height Adjustment motor to the lowest position. Again depress the memory set button. If the LED fails to illuminate, then the feedback from the front cushion height potentiometer is incorrect and requires adjustment.

Illumination of the LED with the front cushion height in both fully up and fully down positions indicates that this potentiometer setting is correct, and that another potentiometer is the source of the failure to operate.

**Reset the front cushion height movement to mid-position before continuing.**

3. Repeat steps 1 and 2 for the other seat functions, attempting to Set Memory at the extremes of travel of each function. **Reset the movement to mid-position before continuing to the next function.**

Squab Recline Movement

Seat Fore/Aft Travel

Rear Cushion Height

Headrest Raise/Lower

4. Check **all** of the above before disconnecting and removing the seat from the vehicle. Although unlikely, it is possible that more than one potentiometer could be incorrectly adjusted or faulty.

A failure of the red LED to illuminate identifies the feedback potentiometer which is out of synchronization with the travel mechanism. Once identified, proceed to ADJUSTMENT below.

## C. ADJUSTMENT

1. Drive the seat fully forward, allowing the rear seat slide securing bolts to be removed.
2. Drive the seat rearward, allowing the front securing bolts to be removed.
3. Reposition the seat within the vehicle to allow access to the seat mechanism.
4. Gain access to the multiplug SM2 (22 way, White) which connects to the Seat Control Module (SCM). The multiplug must remain connected to the SCM.

5. Carefully connect the negative lead of a digital volt/ohmmeter (DVOM) to the logic ground at pin SM3-1D (black/pink wire) and probe the appropriate pins, indicated in the table below, with the positive lead of the DVOM to check the voltage signal from the appropriate potentiometer wiper. (Refer to the XJ Series Sedan 1998 or 1999 Electrical Guide.)
6. Drive whichever function requires adjustment fully to one end of its travel, while observing the indication on the digital voltmeter.
7. Then drive the function to the opposite end of its travel.
8. The highest signal voltages observed (approximately 10.0 volts) should occur with the mechanism at the limit of travel as listed below. At the opposite limit of travel, a voltage of approximately 1.0 volts should be indicated.

CONN.-PIN NO.	FUNCTION	WIRE COLOR	POSITION	SIGNAL
SM2-11D	Squab - recline	White/Red	Fully forward	10.0 volts
SM2-11D	Squab - recline	White/Red	Fully rearward	1.0 volts
SM2-12D	Seat Travel fore/aft	White/Yellow	Fully forward	10.0 volts
SM2-12D	Seat Travel fore/aft	White/Yellow	Fully rearward	1.0 volts
SM2-10D	Rear of seat, raise/lower	White/Orange	Fully raised	10.0 volts
SM2-10D	Rear of seat, raise/lower	White/Orange	Fully lowered	1.0 volts
SM2-9D	Front of seat, raise/lower	White/Blue	Fully raised	10.0 volts
SM2-9D	Front of seat, raise/lower	White/Blue	Fully lowered	1.0 volts
SM2-8D	Headrest	White/Purple	Fully forward	10.0 volts
SM2-8D	Headrest	White/Purple	Fully rearward	1.0 volts

9. If out of adjustment (i.e. the maximum or minimum voltage does not occur with the travel limit given in the table above) run the appropriate seat movement to the end stop, identify the potentiometer involved, and carefully rotate the white adjuster screw of the potentiometer to obtain the correct position of the potentiometer. A small electrician's screwdriver will be required to rotate the adjuster screw.

The adjustment is very sensitive - care will be needed.

**Note:** To adjust the potentiometers for squab recline or headrest motors, remove the rear trim panel from the squab to gain access.

10. Verify adjustments and memory settings:
  - Set **all** seat movements to their lower limits:
    - Depress the Memory 1 Button. The LED should illuminate and a tone should be heard as Memory 1 sets.
  - Set all seat movements to their upper limits:
    - Depress the Memory 2 Button. The LED should illuminate and a tone should be heard as Memory 2 sets.
11. Failure of a memory to set, or of the LED to illuminate, indicates that a potentiometer is incorrectly adjusted or is faulty.

#### D. ADJUSTMENT AFTER REPLACING COMPONENTS

Procedures for replacement of potentiometers are detailed in Sections E - G of this Bulletin.

1. **Before** replacing a potentiometer or drive motor assembly, or disturbing the relationship of a motor/potentiometer/seat mechanism, run the appropriate mechanism to the position listed on the previous page or assemble with the mechanism in the following position:

Cushion Front Adjustment Motor	Fully Raised
Cushion Rear Adjustment Motor	Fully Raised
Fore/Aft Movement	Fully Rearwards
Squab Recline Movement	Fully Forwards

2. **Before** engaging the replacement potentiometer with its drive mechanism, use a DVOM to measure the resistance between the feedback wire of the potentiometer and the White wire.
3. Rotate the hexagonal drive of the potentiometer to obtain the resistance value listed below. Engage the potentiometer with the drive mechanism as close to this position as possible. Make any fine adjustments after the potentiometer has been secured to the drive, by turning the white adjuster screw on the potentiometer.

<b>Mechanism</b>	<b>Position</b>	<b>Color of feedback wire</b>	<b>Resistance between potentiometer feedback wire and white wire</b>
Cushion Front	Fully Raised	White/Blue	141 - 188 $\Omega$
Cushion Rear	Fully Raised	White/Orange	141 - 188 $\Omega$
Fore/Aft Adjustment	Fully Rearwards	White/Yellow	141 - 188 $\Omega$
Squab Recline	Fully Forwards	White/Red	4512 - 4559 $\Omega$

4. Position the seat in the vehicle with motors and potentiometers in the positions as indicated above and connect the multiplug.
5. The voltage readings listed on page 3 should then be obtained. If necessary, make fine adjustments using the white screw on the potentiometer.
6. Confirm that all movements function correctly and that the memory set check (section C, step 10) is correct before finally reinstalling the seat.

#### E. REPLACING A CUSHION RAISE/LOWER POTENTIOMETER

Before disconnecting and removing the seat from the vehicle, run both front and rear cushion raise/lower mechanisms to the top limits of their travel.

1. Remove the seat from the vehicle and remove the securing clips from the motor. Displace and remove the potentiometer retaining plate.
2. Release the harness multiplug from the mounting bracket.
3. Cut the tie-strap which secures the motor drive cable.
4. Displace the anti-backout device on the multiplug.

5. Identify the potentiometer terminals and release them from the multiplug using Special Tool 418-014. Make a note of the relationship of wire colors to multiplug terminal locations to assist in reassembly later.
6. Before installing the replacement potentiometer, refer to section D, steps 2 - 3. Set the potentiometer resistance reading to the required value. Engage the potentiometer with the drive mechanism with the required resistance value still showing, or as near to this value as possible.
7. Install the potentiometer retaining plate.
8. Align the motor and install the retaining clips.
9. Engage the terminals in the multiplug, using Special Tool 418-014 to fully seat each terminal in the location previously noted in step 5. Reinstall the anti-backout device.
10. Place the multiplug on its bracket.
11. Install a new tie-strap to secure the motor cable.
12. Reconnect a DVOM between the feedback wire and white wire of the potentiometer. Adjust the white screw on the potentiometer to make a fine adjustment to obtain the resistance reading detailed in section D, step 3.
13. Reinstall the seat in the vehicle and check the memory function for correct operation.

#### F. REPLACING A SQUAB RECLINE POTENTIOMETER

Before disconnecting and removing the seat from the vehicle, run the squab recline mechanism to the fully forward limit of its travel.

1. After removing the seat from the vehicle, release and remove the finisher pad from the backrest.
2. Remove the clips that secure the squab cover to the frame. Reposition the material to gain access.
3. Remove the right hand gearbox drive shaft securing clip.
4. With a suitable drift displace the drive shaft from the gearbox and potentiometer.
5. Remove the securing screws. Remove the retaining plate and potentiometer.
6. Release the harness multiplug from the mounting bracket.
7. Displace the anti-backout device on the multiplug.
8. Identify the potentiometer terminals and release them from the multiplug using Special Tool 418-014. Make a note of the relationship of wire colors to multiplug terminal locations to assist in reassembly later.
9. Before installing the replacement potentiometer, refer to section D, steps 2 - 3. Set the potentiometer resistance reading to the required value. Engage the potentiometer with the drive mechanism with the required resistance value still showing, or as near to this value as possible, with the backrest still in the fully forward position.
10. Install the potentiometer retaining plate.
11. Connect a DVOM between the feedback wire and white wire of the potentiometer. Adjust the white screw on the potentiometer to make a fine adjustment to obtain the resistance reading detailed in section D, step 3.

12. Engage the terminals in the multiplug, using Special Tool 418-014 to fully seat each terminal in the location previously noted in step 8 above. Reinstall the anti-backout device.
13. Relocate the multiplug to its bracket.
14. Reinstall the squab rear cover material and clips. Reinstall the squab finisher pad.
15. Reinstall the seat in the vehicle and check the memory function for correct operation.

#### G. REPLACING A FORE/AFT MOVEMENT POTENTIOMETER

Before disconnecting and removing the seat from the vehicle, run the seat frame to the fully rearward limit of its travel relative to the seat mounting runners.

1. After removing the seat from the vehicle, remove the securing bolts from the front and rear of each seat runner. Remove the seat belt anchor and buckle mounting brackets.
2. Disconnect the drive cables from the gearboxes of the front and rear seat raise/lower mechanisms.
3. Release the harness from its securing clips. Drill out and remove the pop rivets from the left hand seat runner.
4. Release and remove the left hand seat runner from the seat motor gearbox and potentiometer.
5. Release the harness multiplug from the mounting bracket.
6. Displace the anti-backout device on the multiplug.
7. Identify the potentiometer terminals and release them from the multiplug using Special Tool 418-014. Make a note of the relationship of wire colors to multiplug terminal locations to assist in reassembly later.
8. Before installing the replacement potentiometer, refer to section D, steps 2 - 3. Set the potentiometer resistance reading to the required value. Engage the potentiometer with the drive mechanism with the required resistance value still showing, or as near to this value as possible, with the mechanism still in the fully rearward position.
9. Position the left hand runner on the gearbox and secure with new pop rivets.
10. Connect a DVOM between the feedback wire and white wire of the potentiometer. Adjust the white screw on the potentiometer to make a fine adjustment to obtain the resistance reading detailed in section D, step 3.
11. Engage the terminals in the multiplug, using Special Tool 418-014 to fully seat each terminal in the location previously noted in step 7. Reinstall the anti-backout device.
12. Relocate the multiplug to its bracket.
13. Reconnect the drive cables to the gearboxes of the front and rear seat raise/lower mechanisms. Relocate the harness to its retaining clips.
14. Position the seat belt buckle mounting bracket. Insert, but do not yet fully tighten the bolts.
15. Position the left hand seat belt anchor bracket. Insert, but do not yet fully tighten the bolts.
16. Start the front securing bolts in the runners.
17. Check the alignment of the runners and brackets, then fully tighten the securing bolts.

## Parts Information:

The following should be ordered via Jaguar Parts, as required. It should be noted that the motors and potentiometers listed are supplied separately, except in the case of the headrest adjustment where the motor and potentiometer are supplied only as an assembly. Unless there is a positive diagnosis of failure of a motor or its drive gearbox, it is likely that **only the potentiometers** are required.

<u>DESCRIPTION</u>	<u>PART NUMBER</u>	<u>QTY</u>
Front Raise/Lower motor	GNA 4710AB	A/R
Front Raise/Lower potentiometer	JLM 21117	A/R
Rear Raise/Lower motor	GNA 4710BB	A/R
Rear Raise/Lower potentiometer	JLM 21118	A/R
Fore/Aft Movement motor	GNA 4710CB	A/R
Fore/Aft Movement potentiometer	JLM 21119	A/R
Seat Recline motor	GNA 4710DA	A/R
Seat Recline potentiometer	JLM 21120	A/R

## Warranty Information:

<u>FAULT CODE</u>	<u>R.O. NUMBER</u>	<u>DESCRIPTION</u>	<u>TIME ALLOWANCE</u>
SZ BB **	86.75.33	Driver Seat Fore/Aft Potentiometer - Replace	1.00 hrs.
SZ HB **	86.75.33	Pass. Seat Fore/Aft Potentiometer - Replace	1.00 hrs.
SZ CM **	86.75.30	Driver Seat Squab - Recline Potentiometer - Replace	0.90 hrs.
SZ JM **	86.75.30	Pass. Seat Squab - Recline Potentiometer - Replace	0.90 hrs.
SZ BM **	86.75.31	Driver Seat Cushion - Front Height Adjustment Motor Potentiometer - Replace	0.60 hrs.
SZ HM **	86.75.31	Pass. Seat Cushion - Front Height Adjustment Motor Potentiometer - Replace	0.60 hrs.
SZ CB **	86.75.32	Driver Seat Cushion - Rear Height Adjustment Motor Potentiometer - Replace	0.65 hrs.
SZ JB **	86.75.32	Pass. Seat Cushion - Rear Height Adjustment Motor Potentiometer - Replace	0.65 hrs.