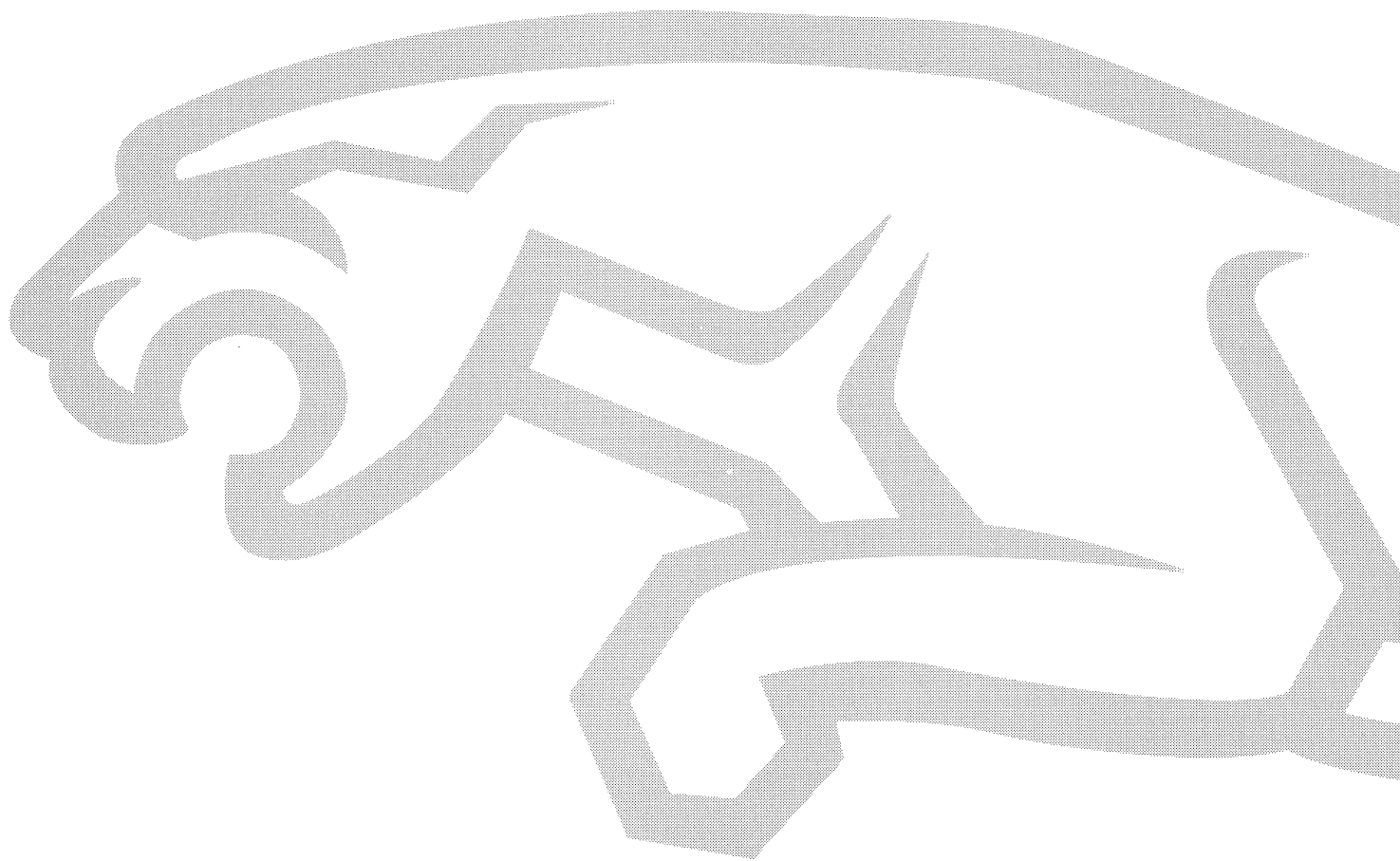

XJS Range
Model Year Update

1994




XJS Range
Model Year Update

1994

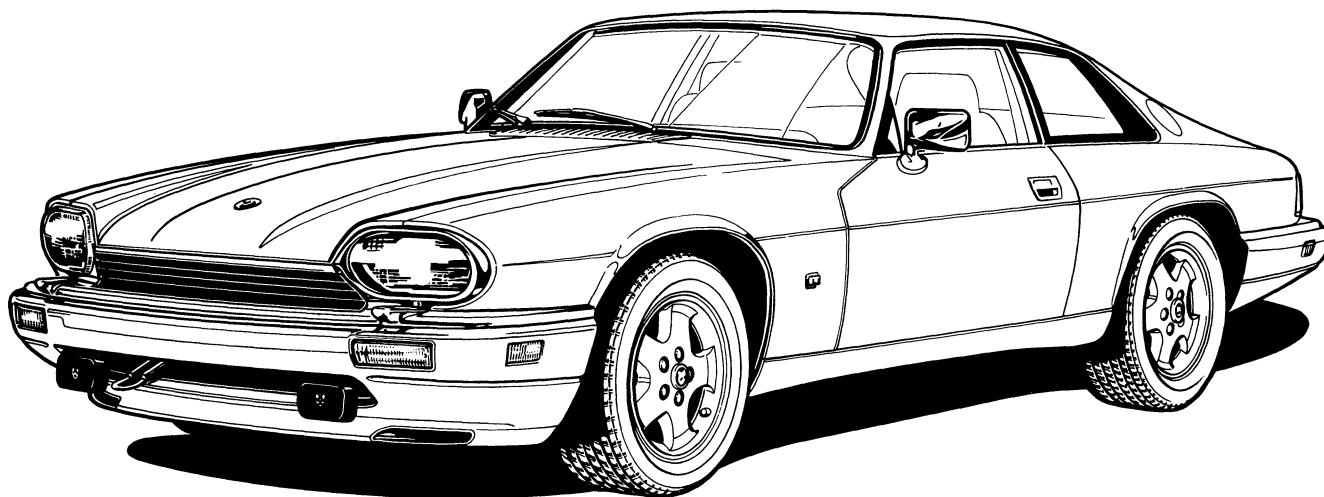
Publication number S-83

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The 1994 Jaguar XJS Range, consisting of XJS and XJS V12 models, is readily distinguished by its newly styled color-keyed bumper system. The addition of a 2+2 convertible with seating for two occasional passengers will extend the appeal of the range. The XJS V12 employs the new 6.0 litre V12 engine coupled to the Hydra-matic 4L80-E4 four-speed electronically controlled automatic transmission introduced in the XJ12 Sedan.

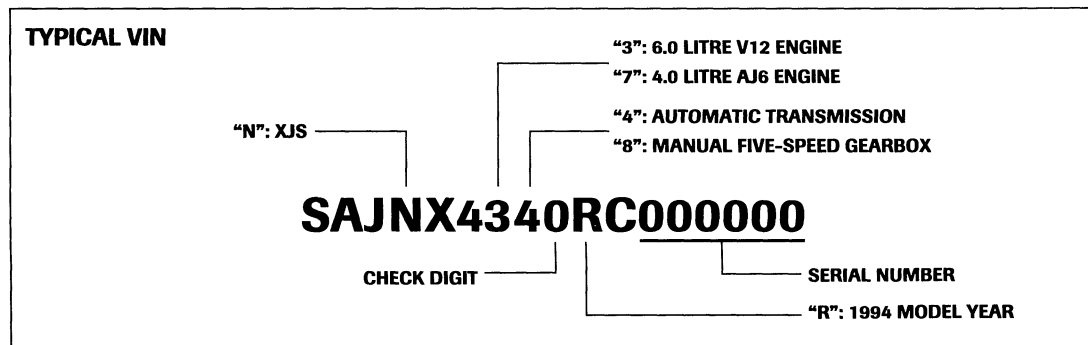
Revisions in the suspension and braking systems complement the new range of power plants and transmissions. In addition to improved overall vehicle road performance, improvements to panel and trim fitment and materials, and the refinement of existing systems result in an enhanced environment for driver and passengers and ease vehicle serviceability for the technician.

The 1994 model year XJS will have a phased launch that includes model configuration and technical features. Initially, convertibles will be two-place only. After the 2+2 convertible becomes available, the two-place convertible will be discontinued. The XJS V12 will not be available at the beginning of the model year. In addition, certain features such as HFC air conditioning systems will be phased-in during the first months of production.

IMPORTANT: This Model Year Update publication will describe the technical features, upgrades and improvements for 1994 as the vehicle will be configured when the launch is complete.

The 1994 model year technical information contained in this publication should be considered as preliminary information.

Vehicle Identification Number (VIN)



1994 XJS Range

The 1994 Jaguar XJS Range is made up of two model groups – the XJS and the XJS V12. The AJ6 4.0 litre powered XJS is available in both coupe and convertible form and is available with a four-speed automatic transmission or an optional five-speed manual gearbox. The XJS V12 is also available in both coupe and convertible form and is powered by the new 6.0 litre V12 engine introduced in the XJ12 Sedan. The XJS V12 is available only with a four-speed automatic transmission. Early 1994 convertibles will be two-place models as in previous years. A 2+2 convertible will replace the two-place model later in the model year.

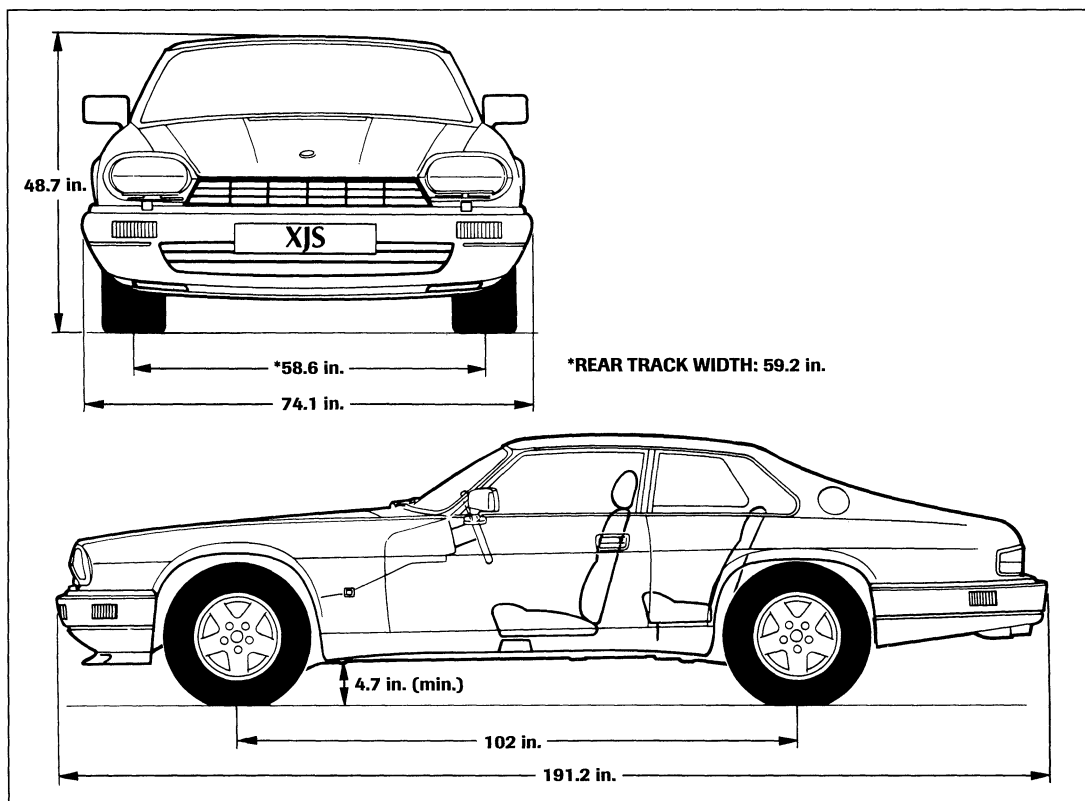
X Standard equipment **O** Optional equipment **N/C** No cost option **CDN** Canada

Technical Feature	XJS	XJS V12
Driver and front passenger air bag supplementary restraint systems	X	X
All metric body fasteners	X	X
4.0 liter 219 hp AJ6 engine	X	
Four-speed electronically controlled ZF automatic transmission with Normal, Sport, and Delete First modes (A4)	X	
Five-speed manual gearbox (M5)	N/C	
6.0 liter 278 hp V12 engine		X
Engine management system with ECM air injection and canister purge control		X
Twin fuel pump modules with phased control		X
Low loss exhaust system		X
Four-speed electronically controlled Hydra-Matic automatic transmission with Normal and Sport modes		X
Gear shift interlock with manual override	X	X
"Lattice" alloy 15 inch wheels with 235/60 ZR 15 tires	X	
"Diamond turned gold" five-spoke alloy 16 inch wheels with 225/60 ZR 16 tires		X
"Space saver" spare wheel		X
Full size spare wheel	X	O*
Rear suspension with outboard brakes	X	X
HFC air conditioning system	X	X
Revised climate control ECM and control panel	X	X
Revised climate control vacuum system	X	X
High output generator – 120 amp	X	X
Electrical system "multi-function unit"	X	X
Self-regulating heated power wash jets	X	X
Security system (dealer accessory option available)	X	X
Front seat heaters	O	X
Rear deck spoiler		X
Connolly Autolux leather interior		X
Sports suspension and steering	X (M5); O (A4)	
CD autochanger	O*	O*
Cold Climate package (heated front seats, headlight power wash, engine block heater)	O (X CDN)	O (X CDN)
Metallic paint	O (N/C)	O (N/C)

* Dealer installed option

NOTE: All Canadian vehicles are equipped with the Cold Climate package and a Canadian compliance package including: daytime running lights, European metric speedometer / odometer, ISO brake warning symbol, Canadian VIN, metric certification, and glove box label.

Dimensions



V12 Engine

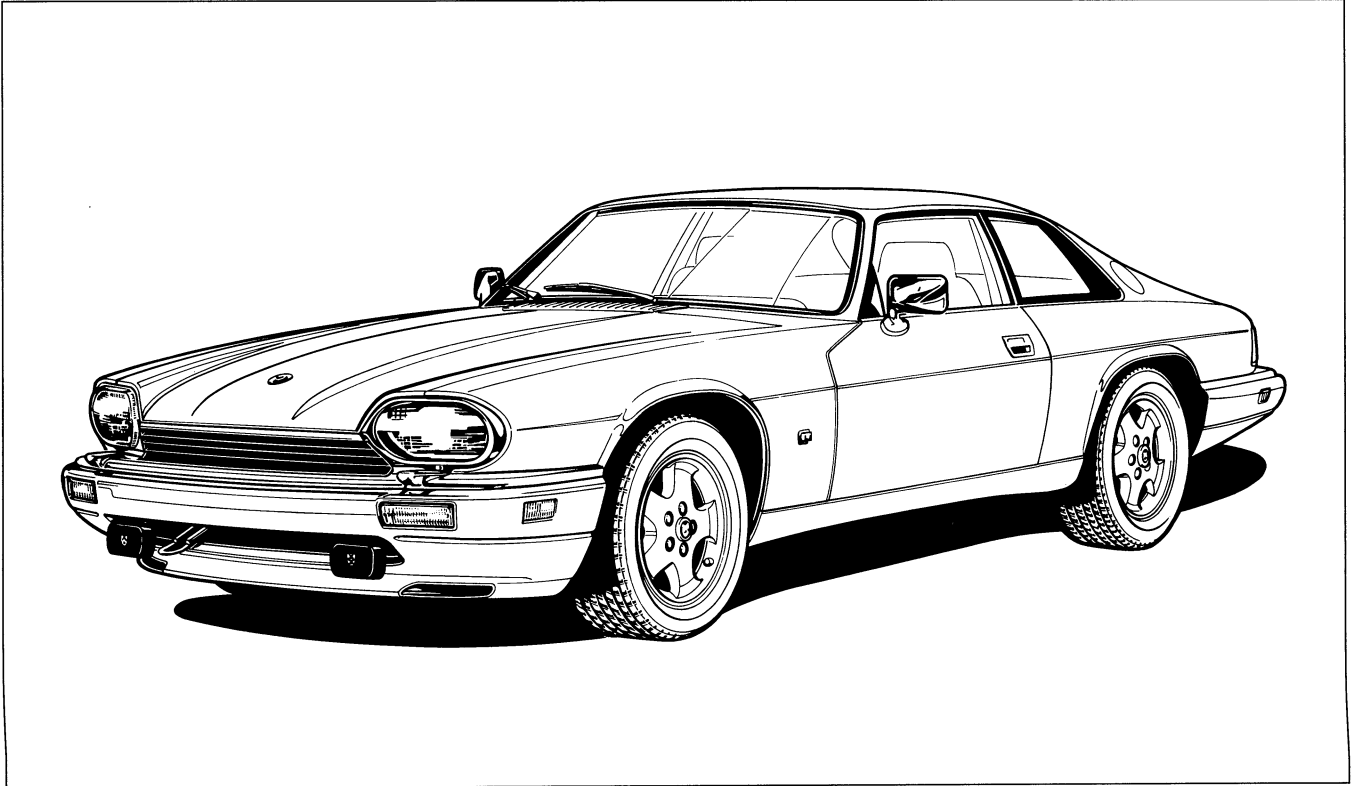
Configuration	12 cylinder, 60 degree Vee
Cylinder head	2 valves per cylinder
Displacement	5994 cc
Bore / stroke	90 mm x 78.5 mm
Compression ratio	11.0:1
Power (DIN)	278 hp @ 5400 rpm
Torque (DIN)	334 ft lbs @ 2800 rpm
Spark plugs	NGK BR7 EF – 0.025 in gap (0.64 mm)
Fuel requirement	Unleaded gasoline – 95 RON octane rating
Engine oil capacity (with filter)	10.5 quarts (10 litre)

V12 Transmission

	1st	2nd	3rd	4th	REV
Gear ratios	2.48 : 1	1.48 : 1	1 : 1	0.75 : 1	2.07 : 1
Max engine speed	6000 rpm	6000 rpm	6000 rpm		
Transmission fluid	Dexron II 'E' – approximate capacity from dry: 13.5 quarts (12.8 litre)				
	Drain and refill		7.7 quarts (7.3 litre)		
	Min – Max difference		0.3 quart (0.3 litre)		

Body Design

The XJS Coupe, Convertible and Convertible 2+2 bodies have many similarities and still retain the classic Jaguar XJS styling. Over 100 body panels are new or redesigned to accommodate new mechanical systems and add refinements to noise, vibration, and seam sealing control.



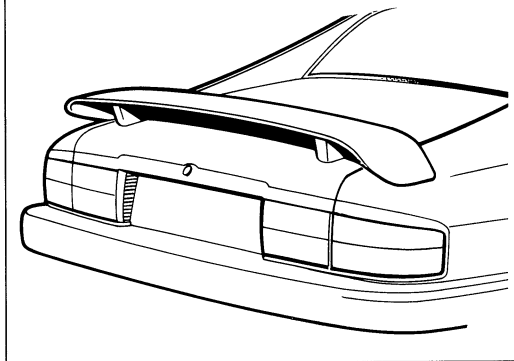
Rear spoiler: XJS V12

The XJS V12 is distinguished by a rear spoiler. To avoid radio antenna damage while opening the trunk, an antenna retraction override circuit has been added. When opening the trunk with the antenna extended, the operator must unlatch the lid and then wait for the antenna to retract completely before continuing to open the trunk.

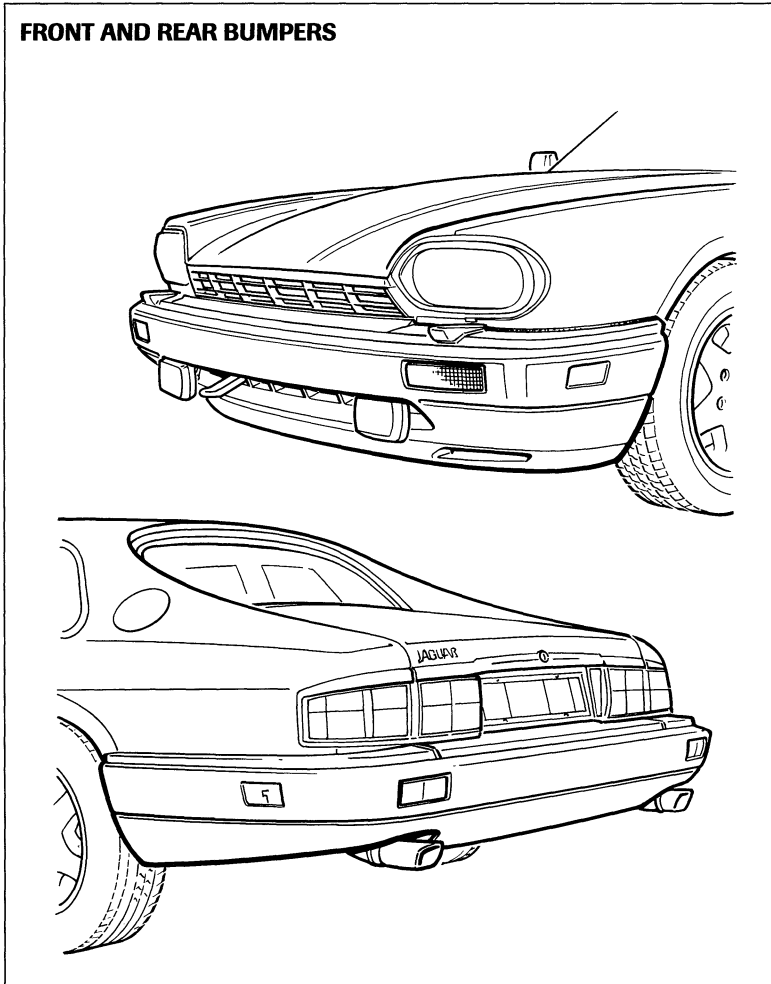
The rear spoiler is available as an accessory option for the XJS (4.0).

⚠ CAUTION: Damage will result if the antenna is not fully retracted when the trunk is opened.

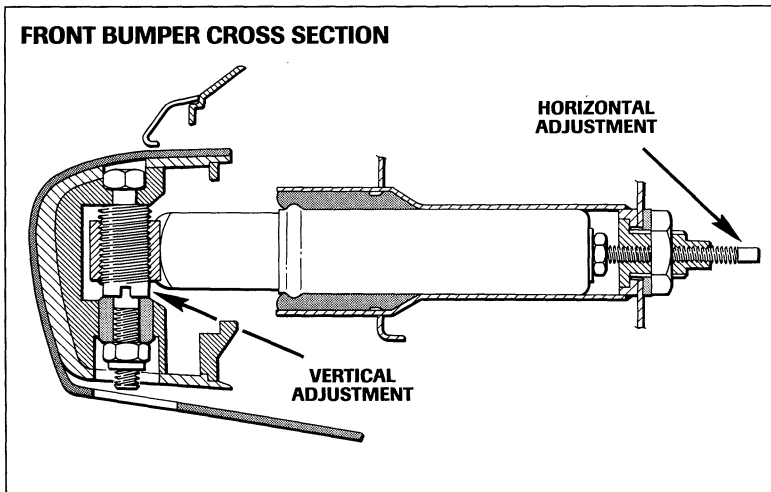
REAR SPOILER: XJS V12



FRONT AND REAR BUMPERS



FRONT BUMPER CROSS SECTION



Body Design (continued)

Color-keyed bumper system and body components

Molded polyurethane bumper covers are color-keyed to the vehicle finish on all XJS models. In addition, headlight surrounds, rear view mirrors and the grill (V12 only) are color-keyed to the vehicle finish. Bumper cover paint damage can be repaired with standard refinishing materials. The bumpers are adjustable for height and extension.

Bumper adjustment Extension adjusters are located at the inboard ends of the energy-absorbing struts. Height adjusters are threaded sleeves at the outboard ends of the struts. The bumper must be removed to access the height adjusters. Bumper attachment and adjustment are similar for the front and rear bumpers.

Locks

For 1994, the entire XJS Range shares the one-key system. The vehicle key set includes three keys:

- Master key with integral flashlight
- Master key with plain black head
- Valet key with green head

The master keys open all locks and operate the ignition. The valet key opens the doors only and operates the ignition. If the trunk or glove box is locked using the valet key, they can only be unlocked with one of the master keys.

Fuel filler locks

Convertible model fuel fillers are equipped with Tibbe locks to provide the same one-key operation as found on Coupe models. The fuel filler manual release for the Coupe is located behind the trunk left side panel.

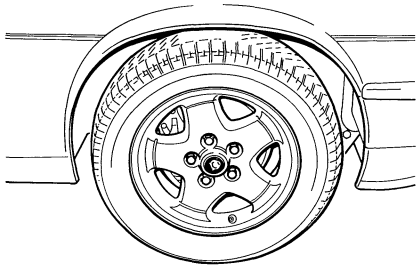
Tires and wheels

The two XJS model groups, XJS (4.0 litre AJ6) and XJS V12 (6.0 litre V12), have different wheel and tire specifications.

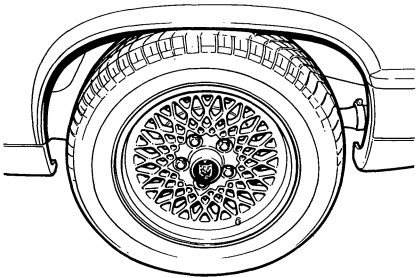
XJS Coupe and Convertible The 4.0 models retain the previous cast alloy "lattice" 6.5 x 15 inch road wheels fitted with Goodyear Eagle NTC 60 235/60 ZR 15 tires.

Sports suspension The sports suspension package includes alloy-painted five-spoke 7 x 16 inch road wheels fitted with Pirelli 225/55 VR 16 tires.

XJS V12 Coupe and Convertible The V12 models have cast alloy "diamond turned gold" five-spoke 7 x 16 inch road wheels fitted with Pirelli P4000E 225/60 ZR 16 tires.

WHEEL STYLES

**XJS V12:
"DIAMOND TURNED GOLD" FIVE-SPOKE WHEEL**



XJS: "LATTICE" WHEEL

Body Structure**General**

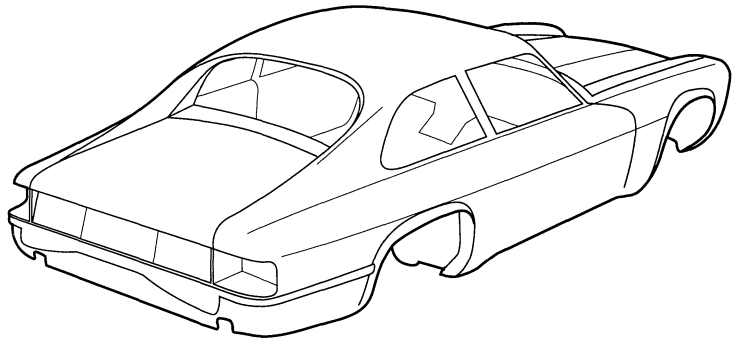
Corrosion resistance has been significantly improved for the 1994 model year. Zinc coating of panels has been increased to 60 percent from the previous 40 percent. Drilled holes have been eliminated or incorporated in panels during forming, and all weld studs have been standardized. Improvements to joint seams and sealing, molded sound insulation material, and simplification of panel design have contributed to a quieter more secure interior environment.

Floor panels

New front floor panels, required for the Hydra-Matic 4L80-E4 automatic transmission, are reshaped and have fewer seams. The rear floor panels have been similarly revised.

Body fasteners

The replacement of all existing imperial fasteners with metric sizes will standardize the vehicle and ease service and repair.

BODY STRUCTURE

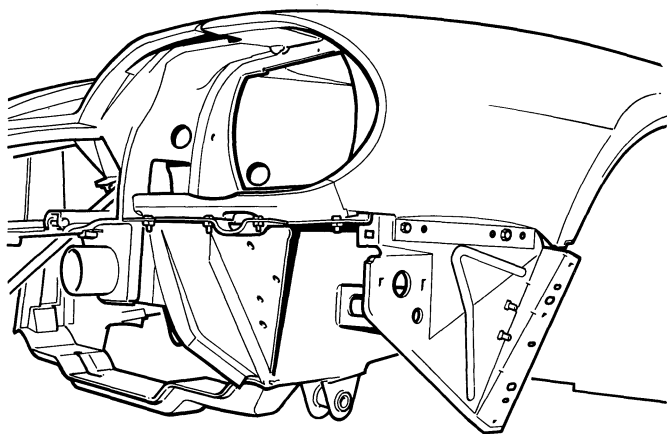
- ZINC COATING OF PANELS INCREASED TO 60%
- NEW FLOOR PANELS
- ALL METRIC FASTENERS

Body Structure (continued)

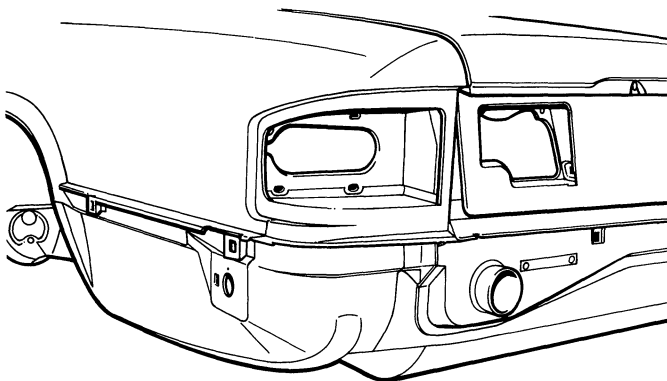
Bumper mounting

The new bumper mounting arrangement necessitated changes to the front and rear of the body structure panels.

FRONT AND REAR BUMPER PANEL CHANGES



FRONT

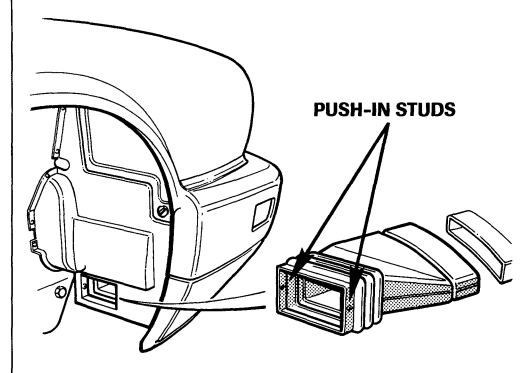


REAR

Front brake cooling ducts

The forward wheel arch baffle in each front fender well has a rectangular hole to fit brake cooling ductwork. Each cooling duct is anchored with two push-in studs.

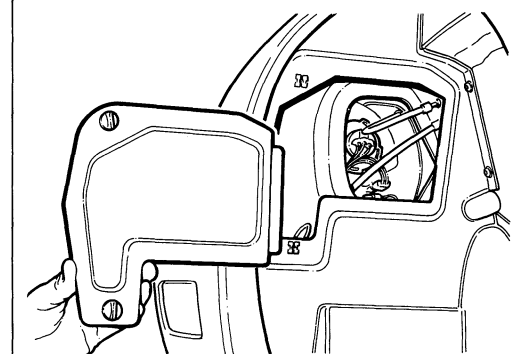
BRAKE COOLING DUCT



Headlight / side marker access

A panel at the top of each front wheel arch baffle allows access to the side marker and headlight bulbs. The access panels are held with quarter-turn fasteners.

HEADLIGHT ACCESS PANEL



Sound deadening

Molded sound-deadening panels are used throughout the vehicle. The panels have formed recesses for the vehicle electrical harnesses.

Convertible 2+2

With its top up, the new Convertible 2+2 looks like the two-seat convertible. The only visible difference is the shortened rear window. The revised rear window allows the 2+2 top to fold neatly behind the rear passenger seats while maintaining the folded top profile of the two-passenger convertible.

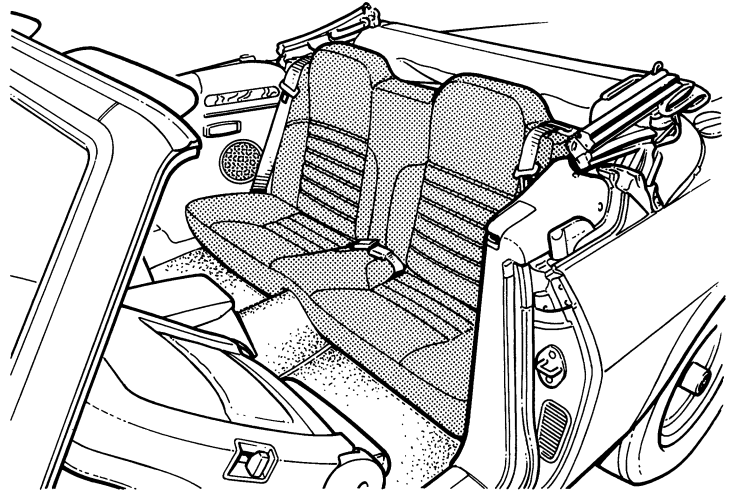
Rear seats

The Convertible 2+2 has a unique rear pan, trim, and carpeting, to accommodate occasional seating for two additional passengers.

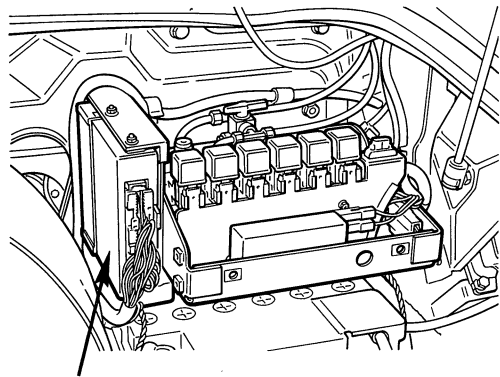
Hydraulic and electrical components

The Convertible 2+2 hydraulic pump, relays, fuses, and manual switch for the convertible top are in the trunk, concealed by a modified battery cover. Unique carpeting and trim cover the components. Note that the transmission control module (TCM) relocates to this area.

CONVERTIBLE 2+2

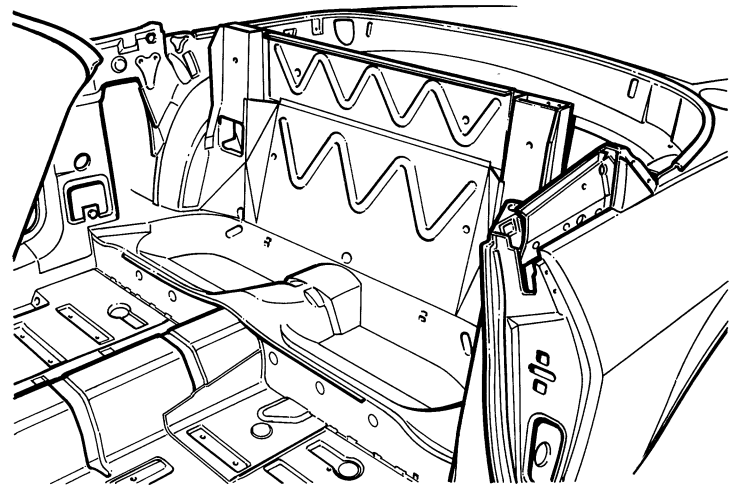


CONVERTIBLE 2+2 HYDRAULIC AND ELECTRICAL COMPONENTS



TRANSMISSION CONTROL MODULE

CONVERTIBLE 2+2 REAR SEAT PANEL



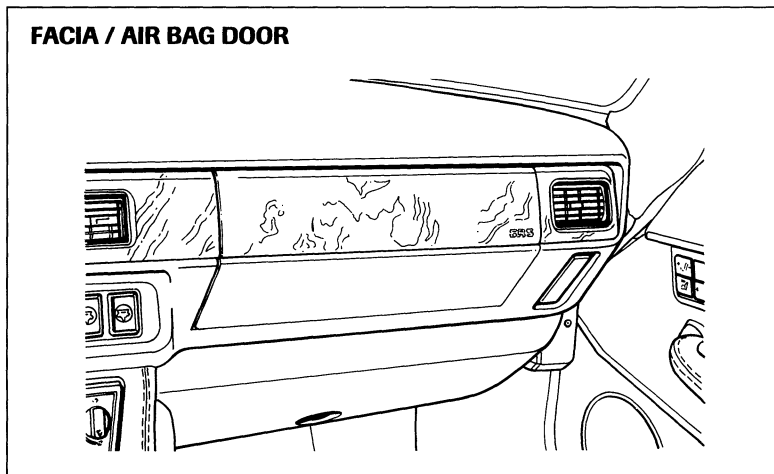
Interior Design

All-leather seats

All-leather seats are standard equipment throughout the XJS Range. A full Connolly Autolux leather interior with unique seat design is standard equipment on V12 models.

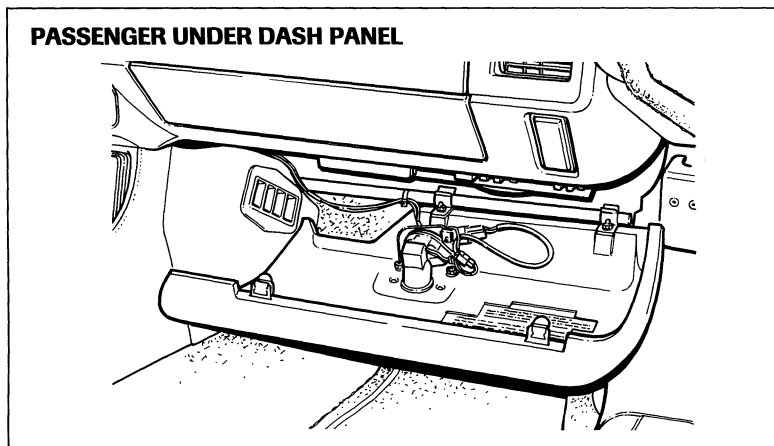
Facia and components

The facia construction is revised to accommodate the passenger side air bag. The air bag deployment door has an "SRS" (Supplementary Restraint System) logo on its right lower face. Numerous detail changes to the facia, its fastening hardware and its veneer sets improve appearance, serviceability and fit. The width of the facia mounting slots has been increased to provide improved panel fit and alignment.



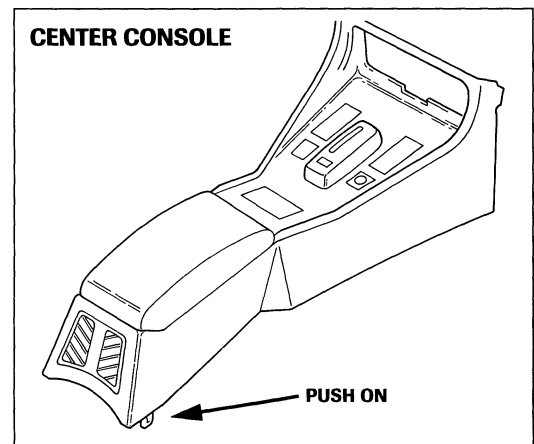
Passenger under dash panel

The passenger under dash panel has been revised to incorporate a knee bolster as part of the passenger supplementary restraint system (SRS). The knee bolster (under dash panel) is retained by clips and swings down for access to the right component panel.



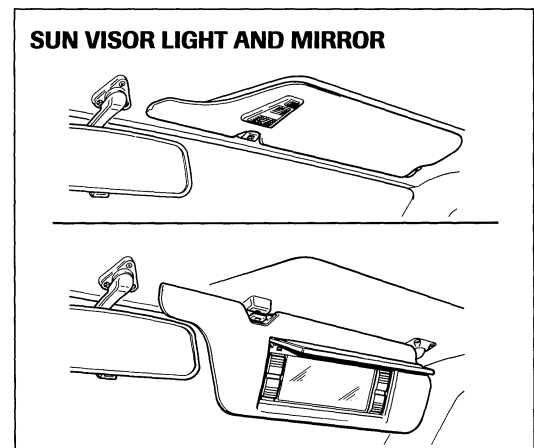
Center console

Improvements to the center console include: revisions to accommodate the seat belt tear-loop mechanism, a new non-adjustable rear air vent connected directly to its ducting instead of a separate air box as previous, injection molded glove box, and an SAE standard cigar lighter with illuminated glow ring. Rear fastenings have been simplified and improved. Push-on fittings to welded studs on the transmission tunnel replace the screws, washers and nuts of previous models.



Sun visor light and mirror

Driver and passenger sun visors are fitted with interior lights and separate illuminated vanity mirrors. The previous interior light, located above the rear view mirror, has been deleted. The new interior lighting provides courtesy illumination for the convertible and standardization throughout the XJS Range.



Rear storage compartment: Convertible 2+0

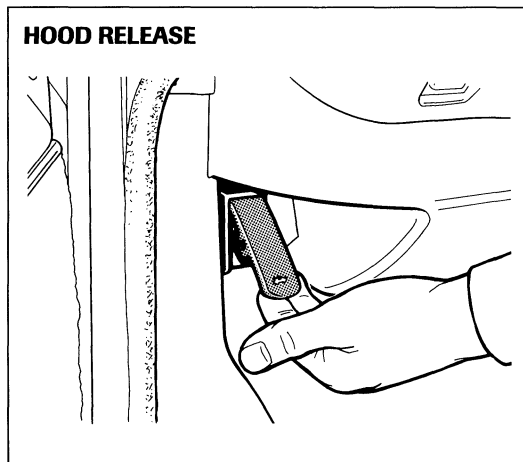
The front wall of the storage compartment has been revised to accommodate the new floor panels.

Engine Compartment

Hood release

The 1994 XJS hood release mechanism has been simplified to function as on the Sedan Range. To open the hood, simply pull the black hood release handle and lift the hood. A safety catch is not required. To close the hood, simply slam it shut. The hood release cable is now used only to release the hood, not retain it as on previous model year vehicles.

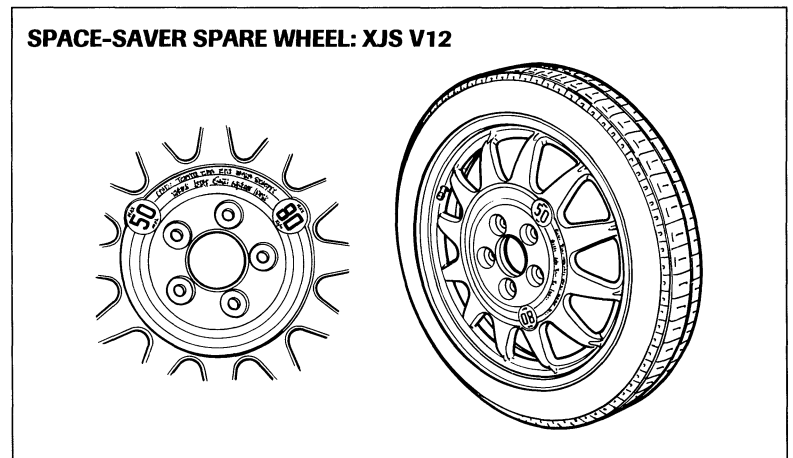
⚠ CAUTION: Do not bend the latch strikers in an attempt to adjust the hood profile.



Spare wheel: XJS V12

A space-saver spare is fitted to the XJS V12. The Pirelli T115/85 R18 spare tire is mounted on an alloy 5-spoke 3.5 x 18 styled wheel. A road wheel that has been removed from the vehicle will stow neatly in place of the space-saver spare. Remove the center badge and reverse the wheel; secure it with the mounting bolt.

⚠ WARNING: Observe all warning label instructions associated with the space-saver spare tire.



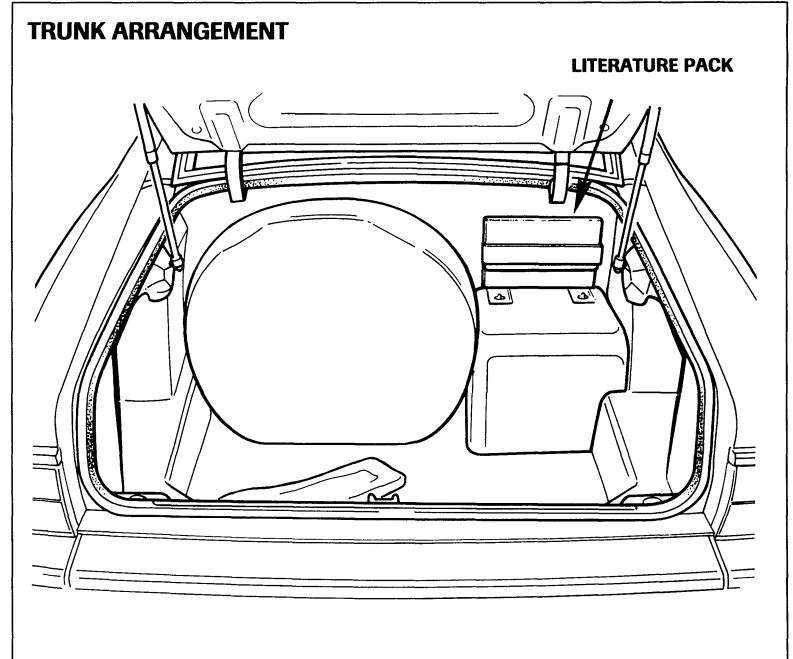
Trunk

Trunk liner

Revised "interlocking" carpet panels and a molded floor carpet improve fit. The new battery cover fits with tabs that locate in the floor. The back of the trunk is re-profiled to provide clearance for the adjustable bumper strut mounts.

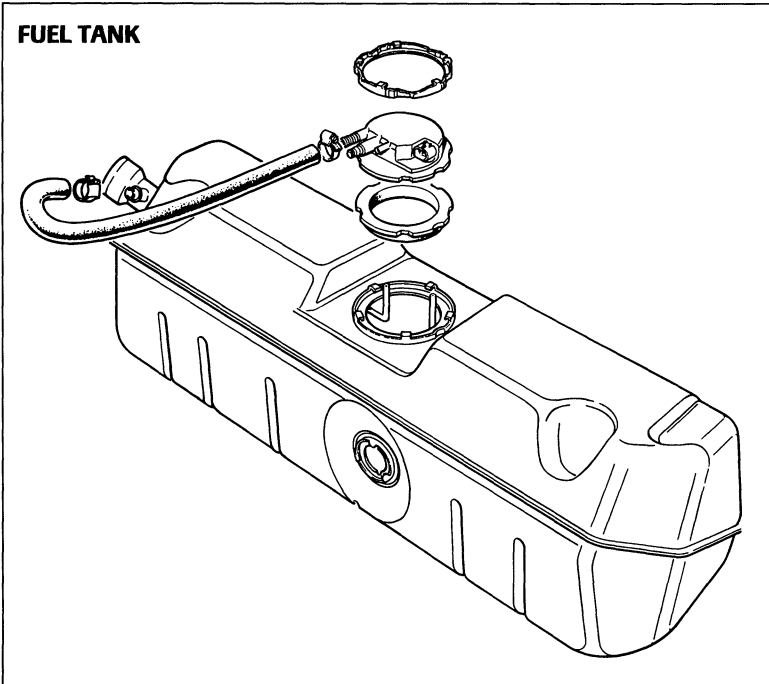
Literature pack

The literature pack is split into two sections. The driver's handbook is reduced in size but still covers essential driver's information. It is intended to be stowed in the interior. The remainder of the literature is contained in a slimmer wallet and is stowed in the trunk above the battery cover.



Fuel Supply (all models)

FUEL TANK



Fuel tank

The fuel tank for the 1994 XJS Range features improved corrosion resistance. The tank is nickel flashed then lead coated and no longer requires painting.

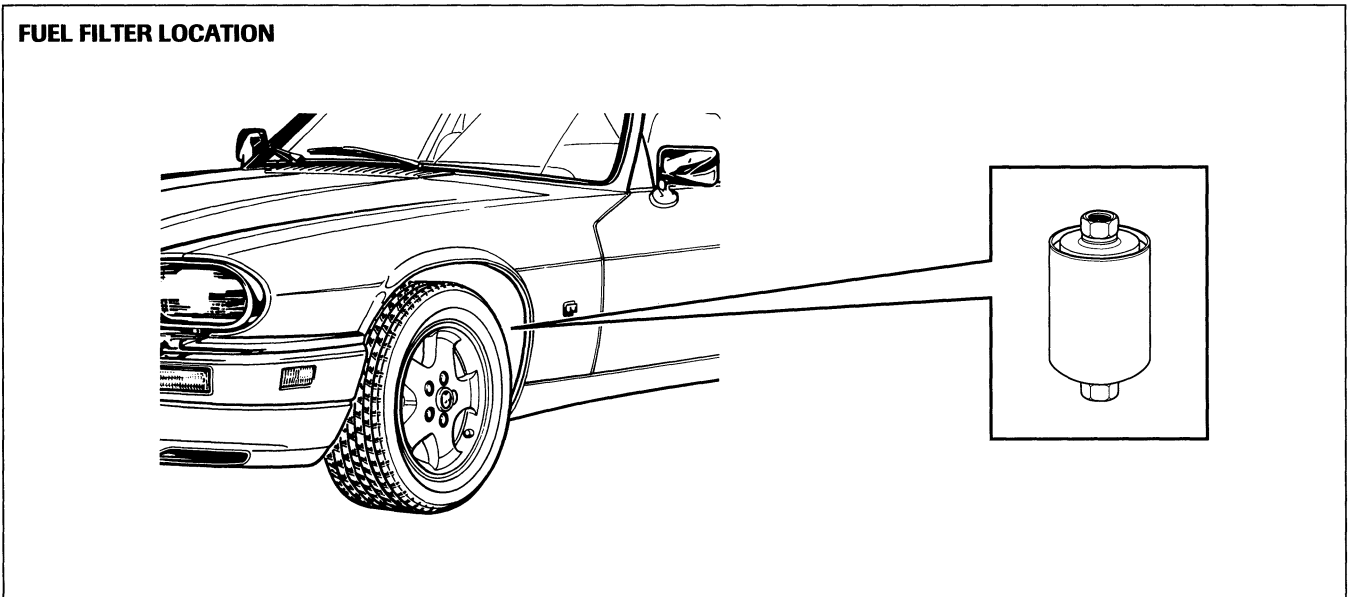
Fuel piping

A new under-floor fuel pipe cluster consisting of fuel feed, return and vapor pipes is used.

Fuel filter

The fuel filter is relocated to the rear of the left front wheel well. A plastic shield covers the filter and allows easy access.

FUEL FILTER LOCATION



AJ6 4.0 Litre Engine

Mechanical improvements have been made to the AJ6 engine. These changes improve serviceability and appearance, simplify construction and aid in reliability.

NOTE: The AJ6 changes will be phased into production during the launch period.

Camshaft cover

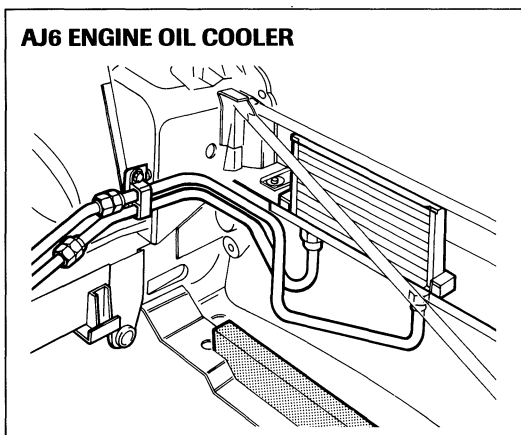
The revised camshaft cover incorporates the engine oil filler and features a new gasket made of improved materials. The number of camshaft cover bolts has been increased from 7 to 13. These changes improve cover sealing and overall appearance.

Throttle housing

The throttle housing is heated by engine coolant to improve cold weather breather performance. A standardized throttle quadrant and return spring from the XJ6 replaces the previous version.

Oil cooler pipework

Oil cooler pipes have been relocated to improve fit and avoid relocation of the horns.



EGR pipework

The exhaust gas recirculation system has been improved by the introduction of a flanged connection at the EGR valve. The flared connection at the intake manifold is retained.

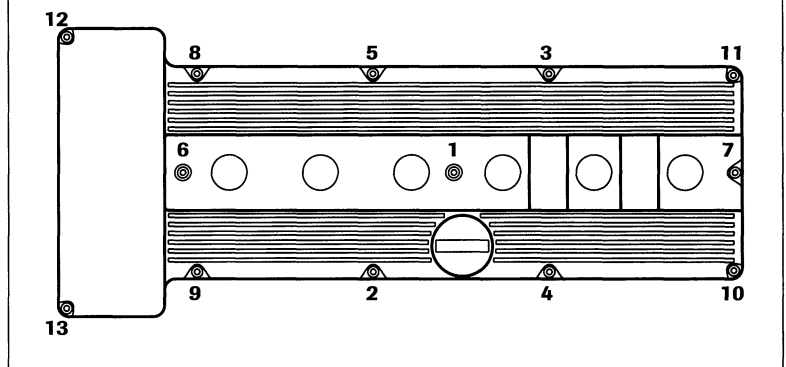
Engine breather system

Design changes to the intake manifold eliminate the need for an electrically heated breather system.

Exhaust system

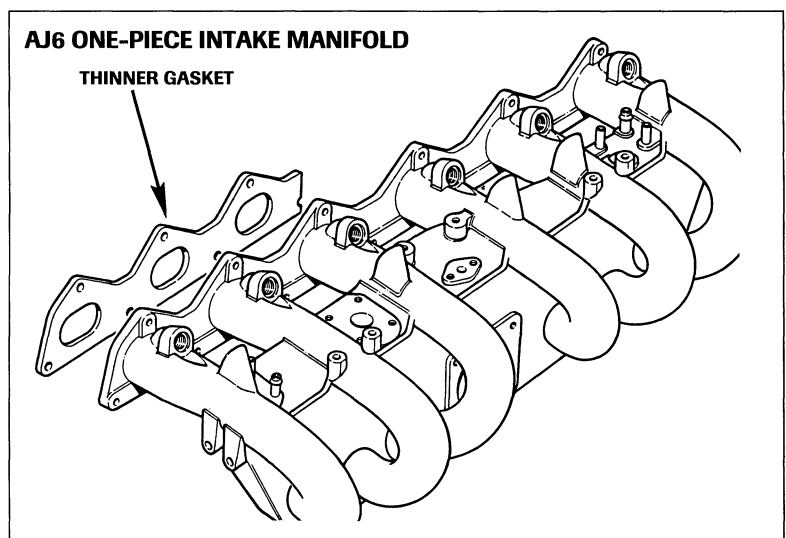
The rear mufflers have been revised to accept the new rectangular section exhaust finisher.

AJ6 CAMSHAFT COVER WITH NEW TIGHTENING SEQUENCE

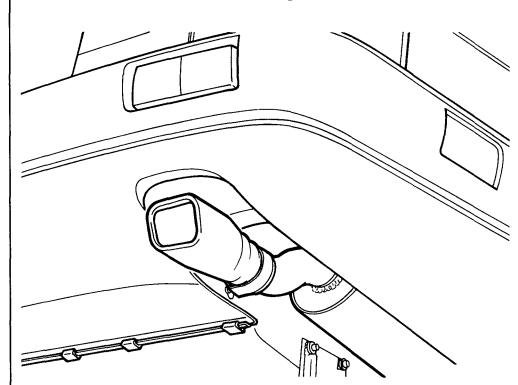


Intake manifold

A new, simplified one-piece intake manifold with an integral coolant heated breather restrictor is fitted in conjunction with a thinner manifold gasket.

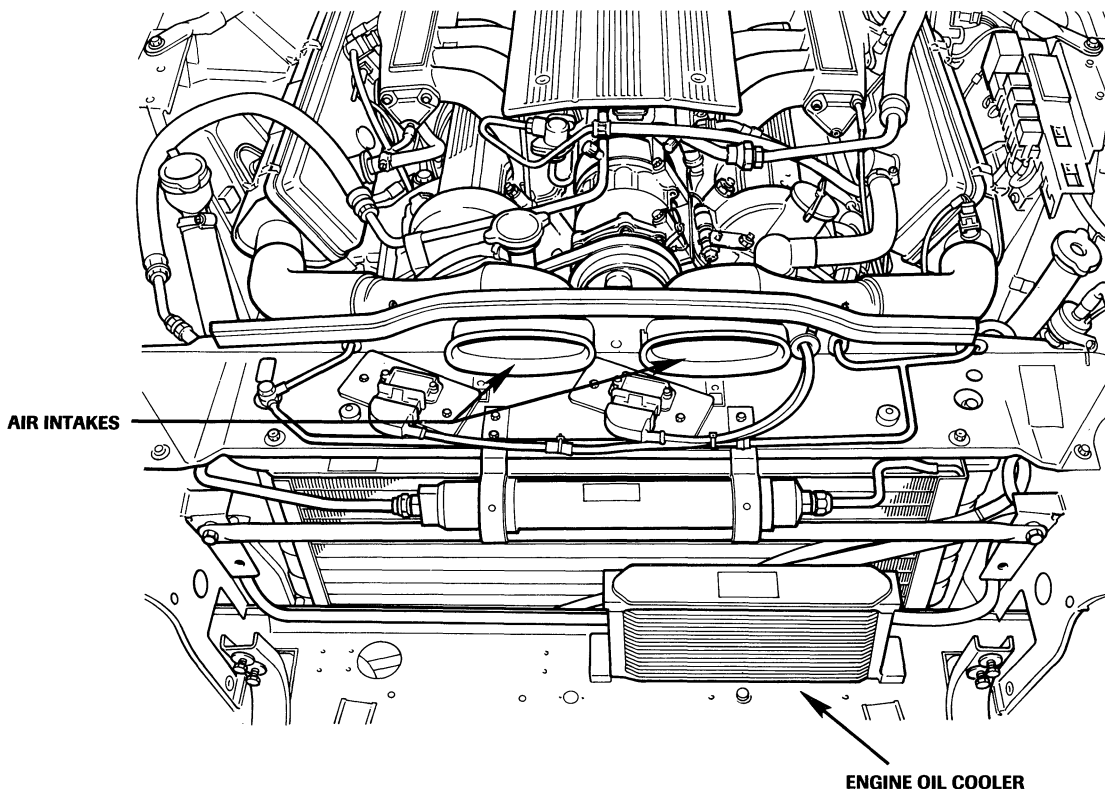


REAR MUFFLER AND SQUARE FINISHER



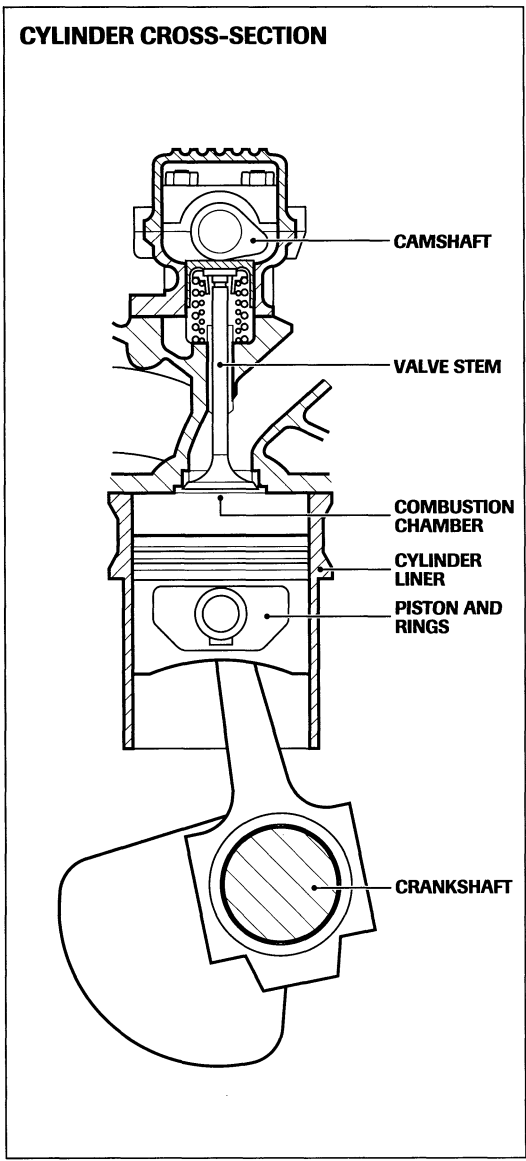
Engine Design / Construction**6.0 Litre V12 engine**

The 6.0 litre V12 engine provides a substantial increase in power and torque over the previous 5.3 litre engine. The engine size increase is achieved by lengthening the stroke to 78.5 mm (5.3 L: 70 mm stroke). The changes described here are based on the previous 1992 XJS V12 5.3 litre engine installation. Engine performance is improved by a low restriction air intake system drawing air from inlets located in front of the radiator. This arrangement supplies the engine with ambient temperature air instead of hot air off the back of the radiator.

6.0 LITRE V12 ENGINE

The following engine internal modifications are made:

- Revised cylinder block to accept the new transmission
- 78.5 mm stroke forged steel crankshaft with heavier webs
- Cylinder liners 0.135 in. shorter than previous (to clear the connecting rods)
- Pistons with reduced pin-to-crown dimension
- New piston rings to reduce combustion blow-by and oil consumption
- Camshafts with modified cam profiles to reduce noise at higher engine speed
- Enlarged combustion chambers to achieve 11.0:1 compression ratio
- Shorter stem intake valves to accommodate enlarged combustion chambers
- Redesigned oil pan with a shallow sump area and lengthened oil pick-up tube
- Crankshaft shield (windage tray) modified to clear the crankshaft and conform to the new sump
- High integrity engine gaskets



Oil sump and dip stick

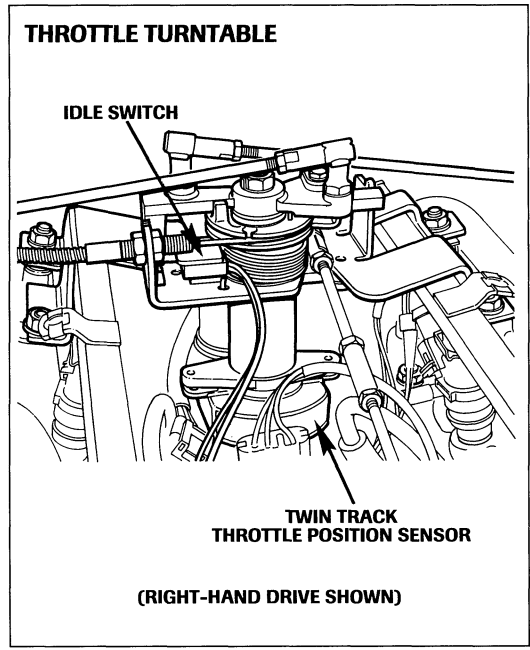
The engine oil pan is shallow to accommodate the XJS installation. The level dip stick has been relocated to the left rear of the cylinder block.

Engine mounts

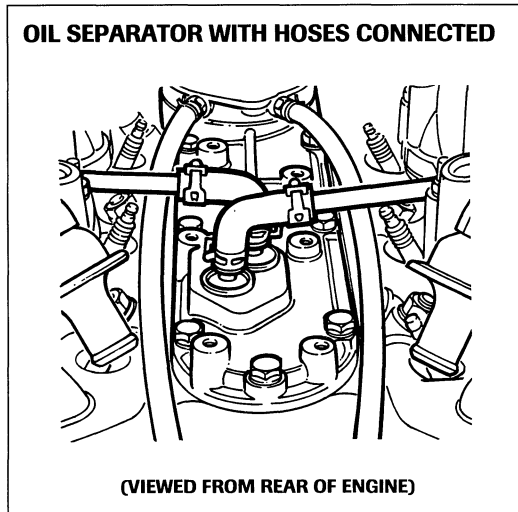
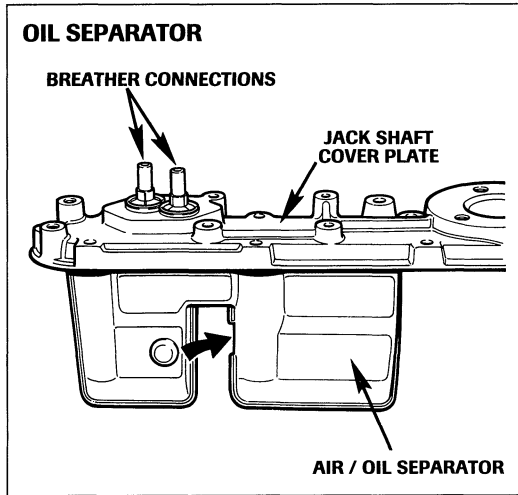
The front engine mounts are conventional rubber / metal mounts that bolt to the suspension sub frame.

Throttle turntable assembly

The throttle turntable has a smaller diameter pulley and is supported by a bracket spanning the intake manifold stubs. A twin track throttle position sensor is mounted beneath the turntable. The ignition idle switch has been relocated to the turntable.



Engine Design / Construction (continued)

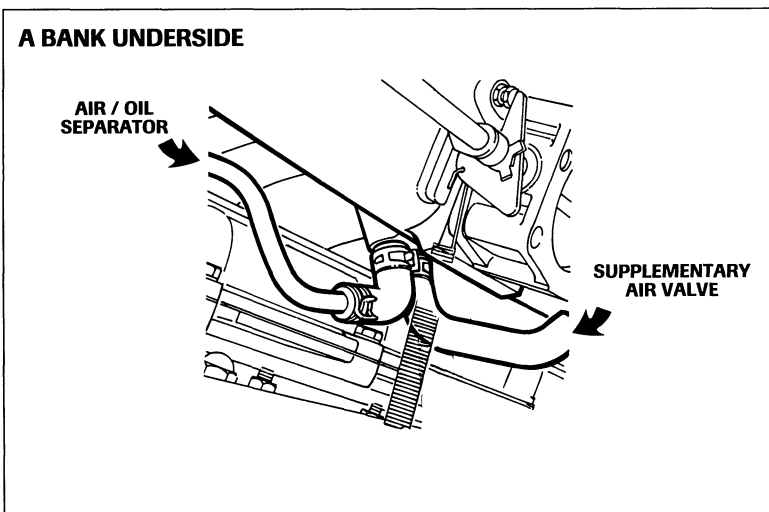
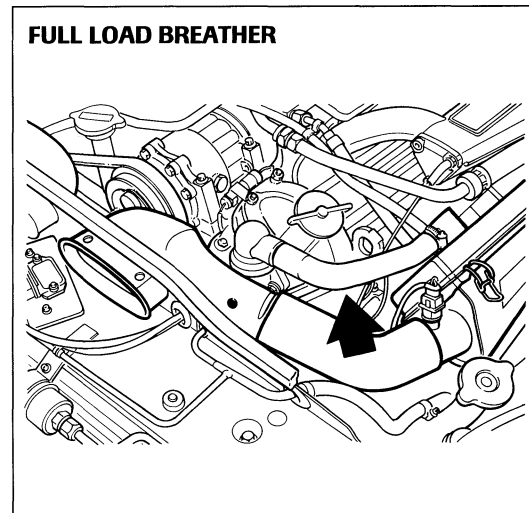


Part-load engine breather system

The part-load engine breather system consists of an air / oil separator chamber, integral with the jack shaft cover plate. The system connects to the rear of the intake manifolds down stream of the throttle housings.

Full-load engine breather

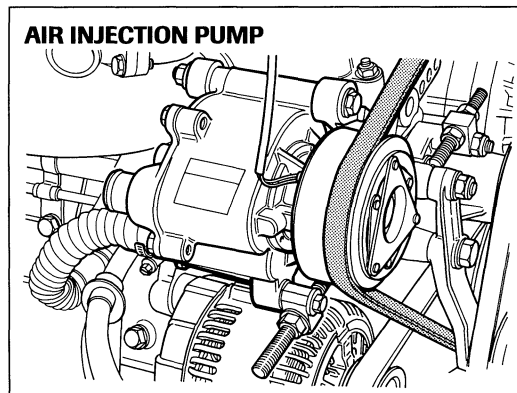
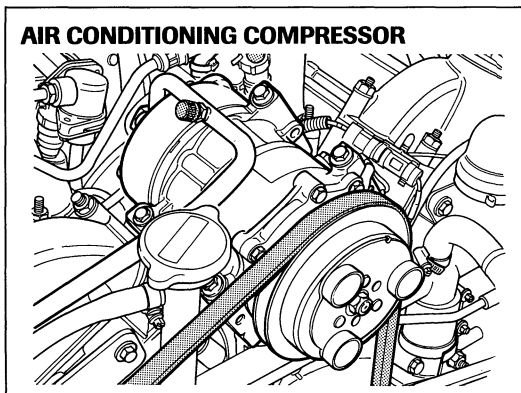
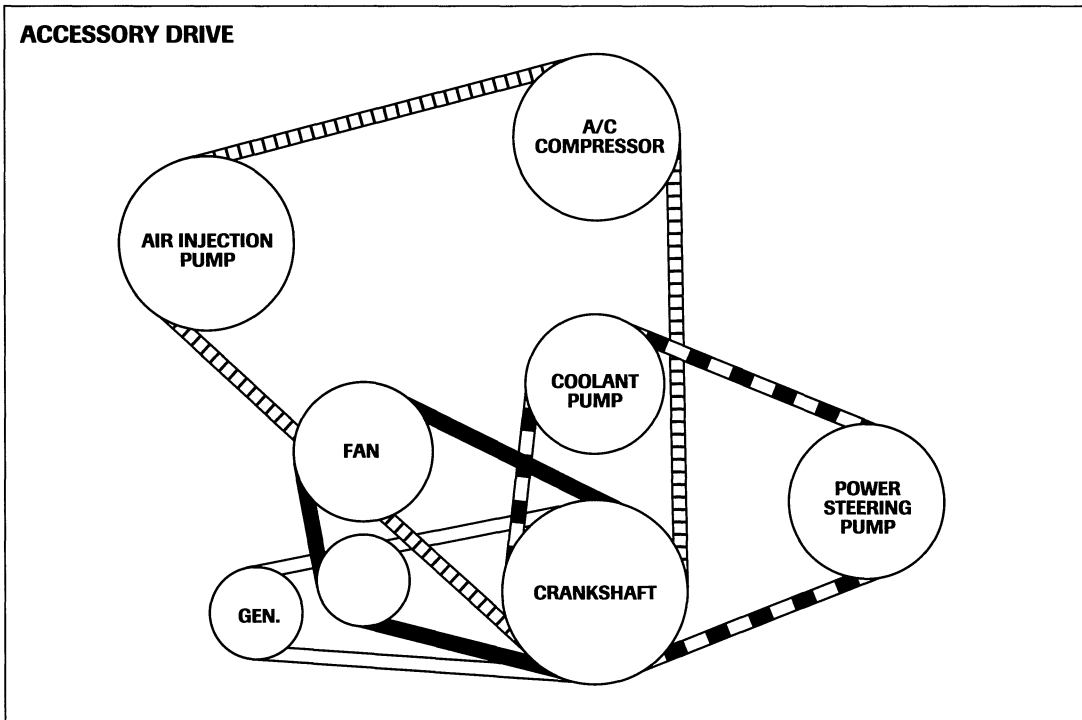
The full load breather is connected from the B bank timing cover to the B bank air cleaner housing.



Engine Accessory Drive

Accessory drive belts

The accessory drive arrangement is unchanged from the previous XJS V12 engine installation. Four single vee belts drive the various accessories. New accessories include: the air conditioning compressor, air pump and 120 amp generator. The power steering pump with an integral reservoir has been retained from previous XJS V12 models. Each belt is tensioned by an individual jack screw.

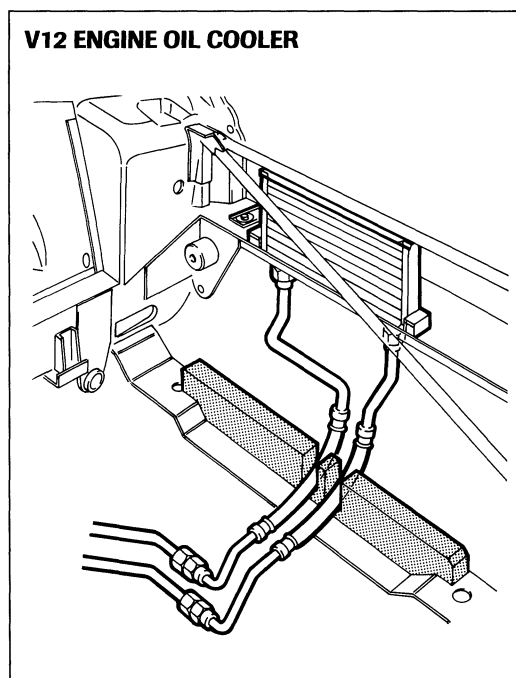
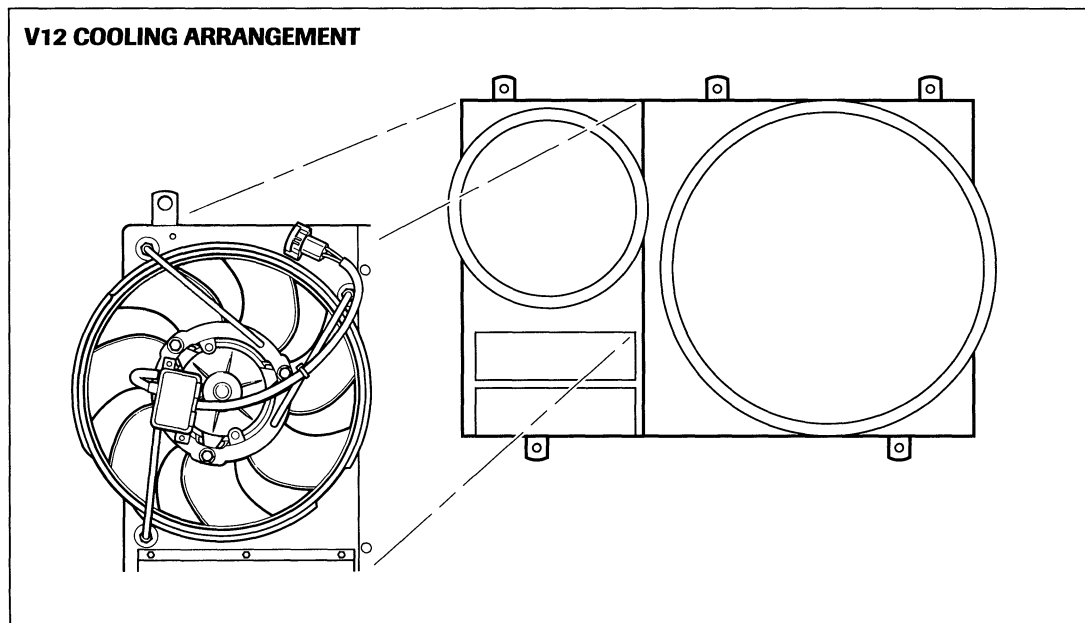


Belt tension specifications:

	New belt	In-service belt
Air conditioning compressor and air injection drive belt (measured midway between the air injection pump and the air conditioning compressor)	160 lbs.	140 lbs.
Power steering and coolant pump drive belt (measured midway between crankshaft and power steering pump)	160 lbs.	128 lbs.
Generator drive belt (measured midway between crankshaft and generator)	175 lbs.	90 lbs.
Fan drive belt (measured midway between crankshaft and fan)	149 lbs.	119 lbs.

Cooling System

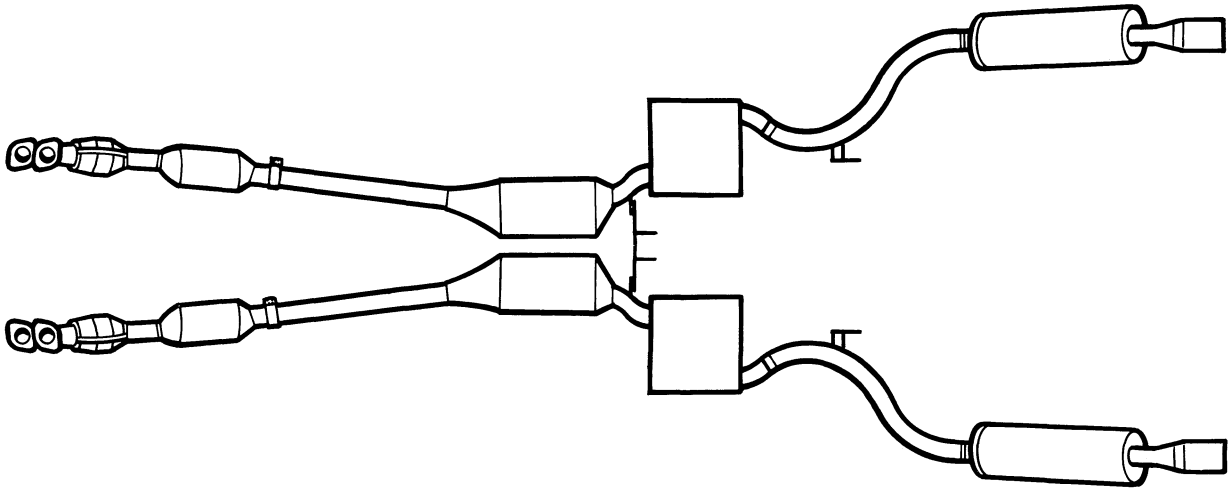
The 1994 XJS V12 uses an engine-driven viscous-coupled cooling fan in combination with a single electric auxiliary cooling fan mounted behind the radiator. The auxiliary cooling fan operates via a radiator thermal switch. The radiator includes "oil-to-water" coolers for the transmission and power steering fluids. A separate external engine oil cooler is mounted ahead of the air conditioning condenser.



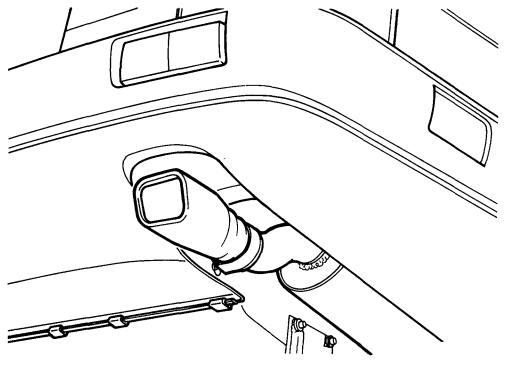
Exhaust System

The 6.0 liter low-loss exhaust system incorporates three catalysts and two mufflers for each cylinder bank. Oxygen sensors are located upstream of the primary catalysts. Increased catalyst area and relocation closer to the engine has resulted in lower HC emission. Less restrictive mufflers and catalysts combined with larger bore over-axle pipes reduced the exhaust system back pressure to improve engine performance. The use of slip-joint exhaust pipe joints and new clamps allows easier system alignment and increased integrity. Rectangular section exhaust tail finishers match the bumper aperture.

V12 EXHAUST SYSTEM

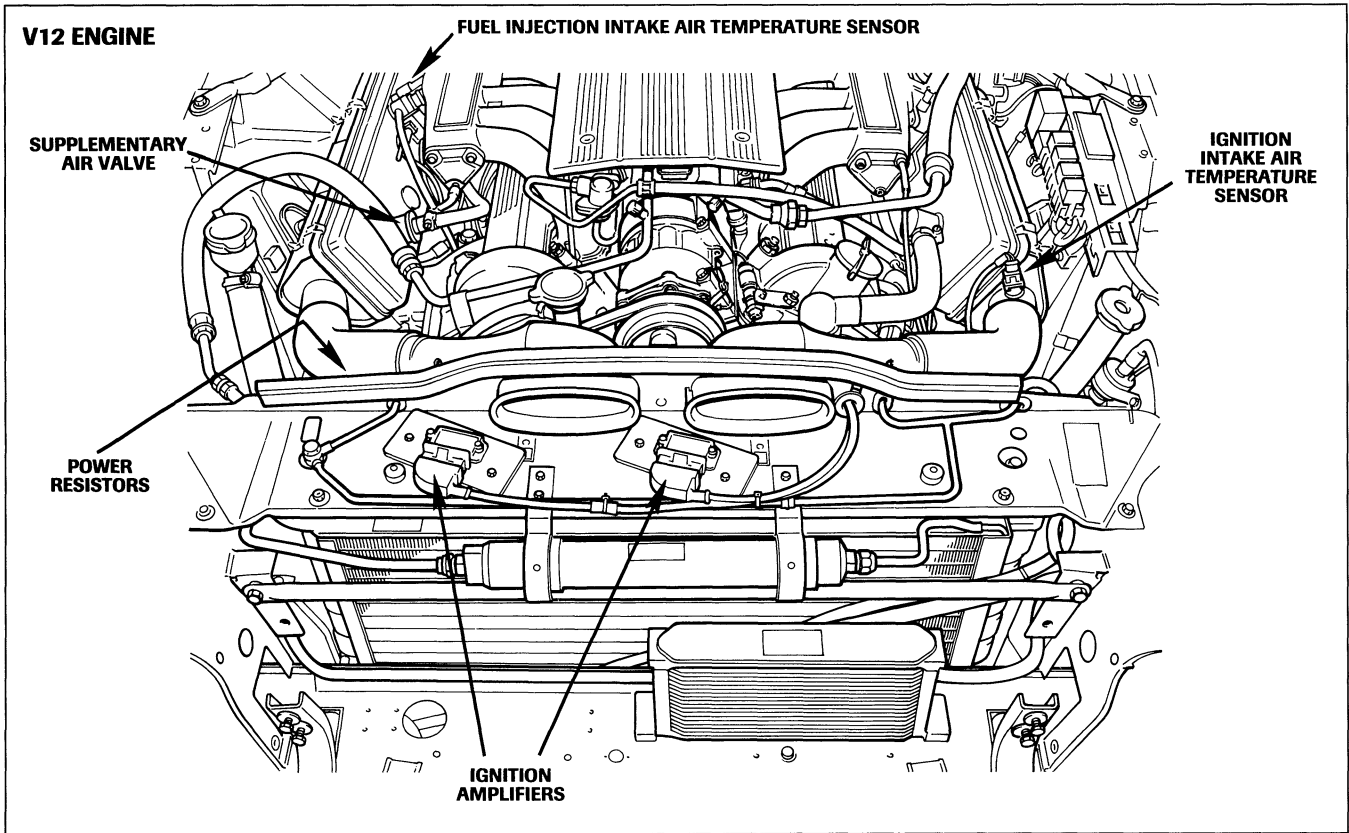


REAR MUFFLER AND SQUARE FINISHER



V12 Engine Management System Overview

The 6.0 V12 engine management system is the same for both the 1994 XJS V12 and the XJ12 Sedan. This system employs a combination Lucas / Marelli fuel injection / ignition system that incorporates revisions to include new and expanded functions over the previous XJS V12 system. In addition to revised ECM functions, subsystems that are not ECM controlled have been revised.

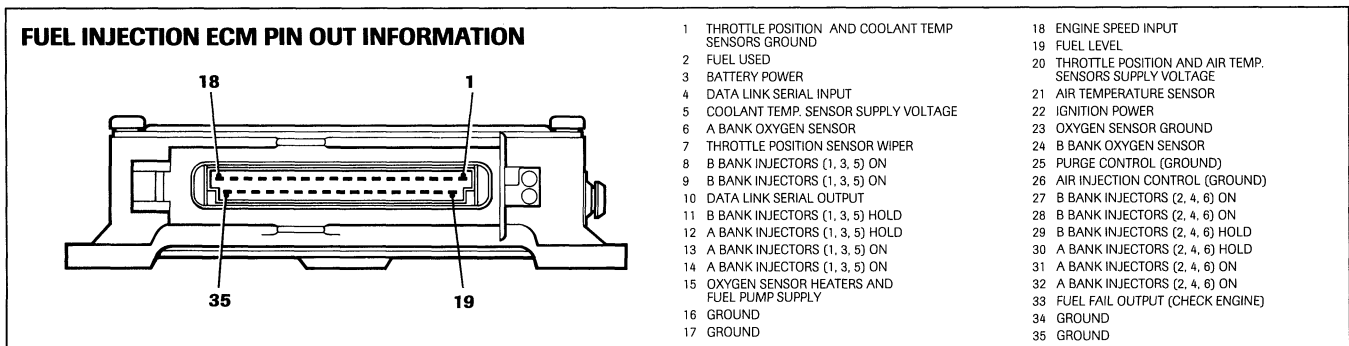


Engine Management System: Fuel Injection

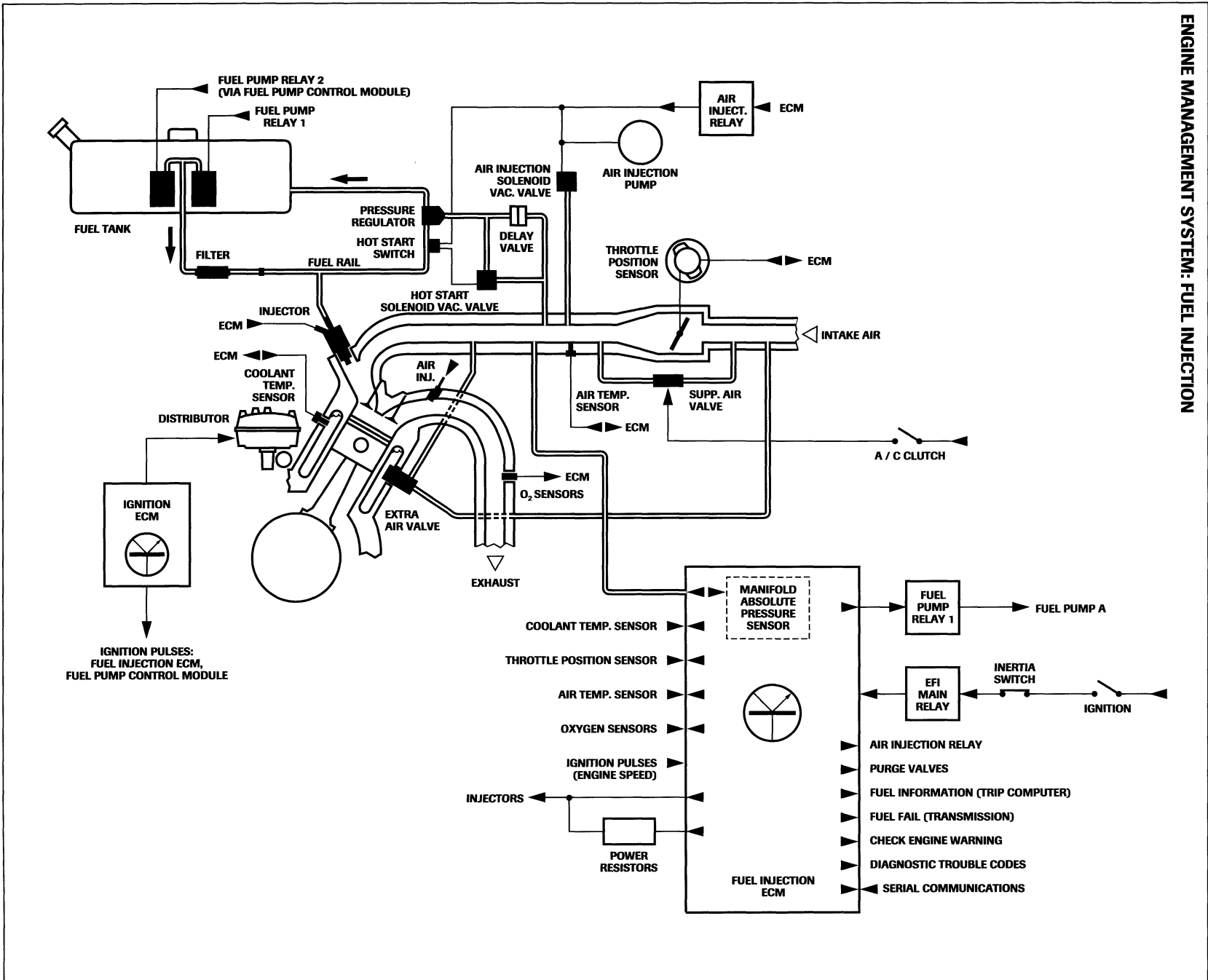
Engine control module (ECM): Fuel Injection

The fuel injection ECM (36CU) is revised to include the following new features:

- Evaporative canister purge control
- Adaptive idle fueling trim
- Air injection control
- Hot start system timing
- Expanded On Board Diagnostics (OBD)
- Fuel level sensing
- Fuel fail output to the transmission control module



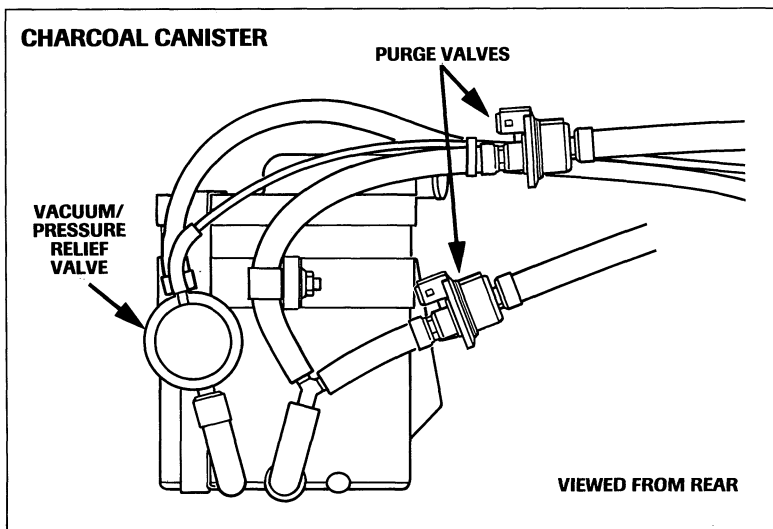
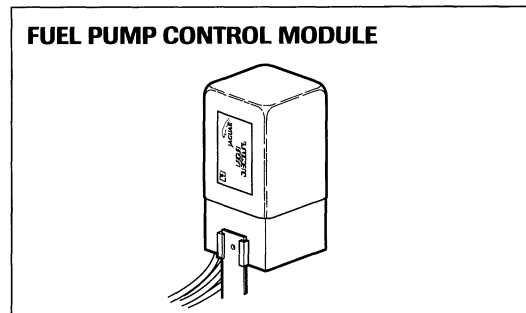
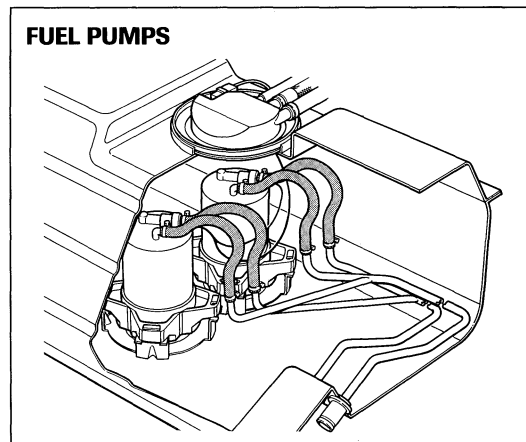
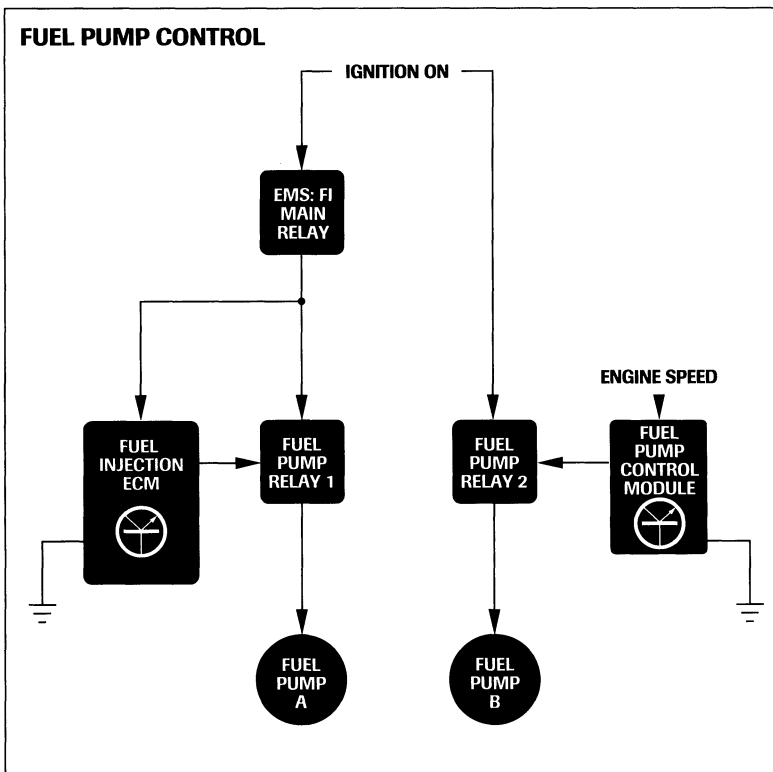
ENGINE MANAGEMENT SYSTEM: FUEL INJECTION



Engine Management System: Fuel Injection (continued)

Fuel delivery

In order to meet the fuel requirements of the 6.0 liter engine, two fuel pump modules are used. The modules are identical but operate independently with staged control. One pump runs continuously when the engine is running, the other is activated when the engine speed exceeds 2840 rpm. Each pump is activated by a separate relay. Fuel pump relay 1 is switched by the fuel injection ECM. Fuel pump relay 2 is switched by the fuel pump control module. The fuel pump control module, located on the trunk right side, receives an engine speed input from the Ignition ECM and switches the relay 2 coil ground as follows: when the engine speed reaches 2840 rpm, the ground is completed; as the engine speed decreases, the ground is interrupted at 2000 rpm. Switching of fuel pump B requires just 1/4 of a second, ensuring instant response for additional fuel delivery.

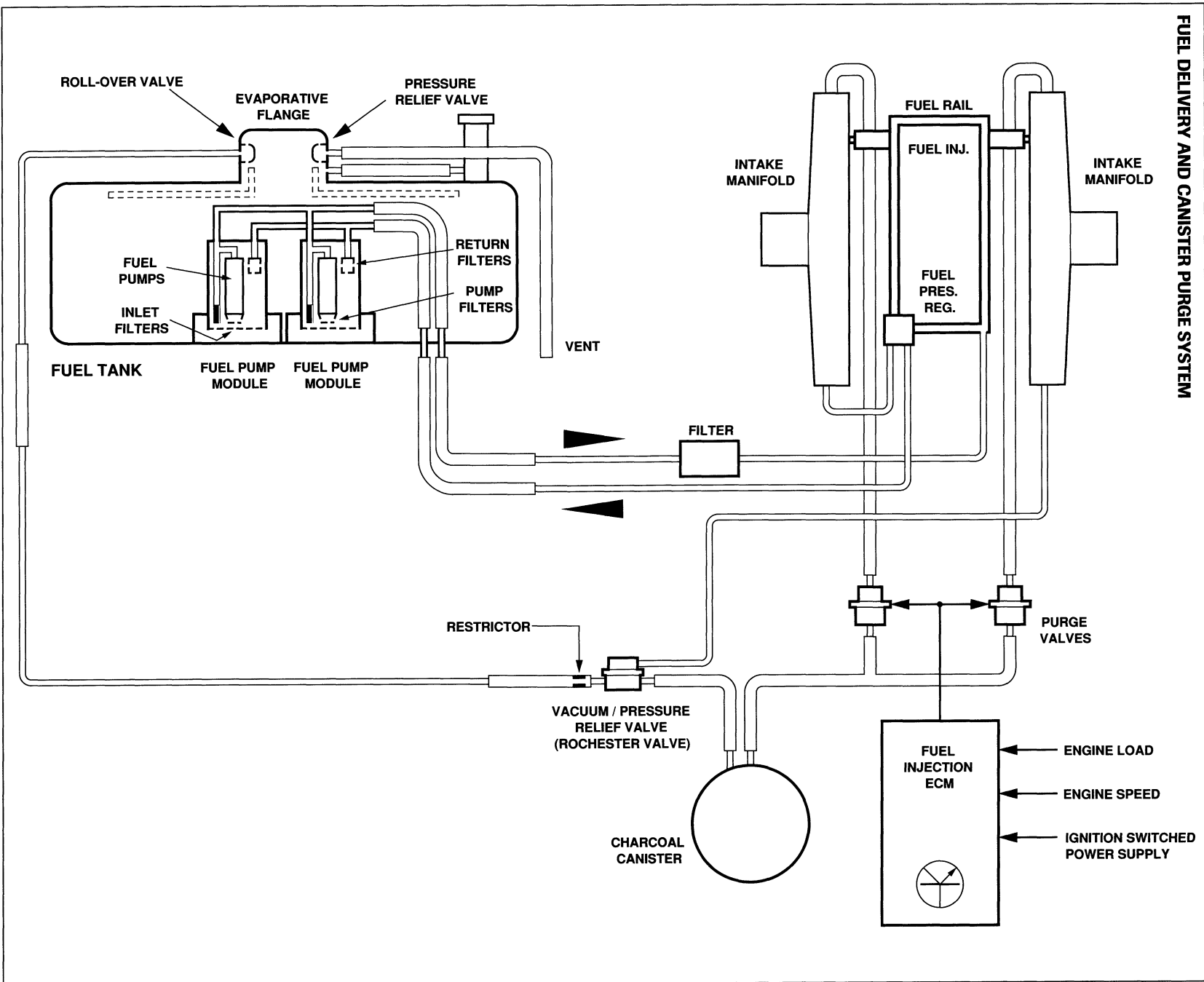


Fuel pressure regulator

The fuel pressure regulator maintains the fuel rail pressure at 44 psi (3 bar), which is much higher than previous 5.3L fuel pressure.

Evaporative emission control

The evaporative emission control system uses the same canister and vacuum / pressure relief valve as the 4.0 liter XJS and the Sedan Range. Two purge control valves, one for each cylinder bank, are located at the charcoal canister. The purge valves are controlled by the Fuel Injection ECM. The ECM opens the valves simultaneously, according to an engine load and speed strategy, allowing purge flow to both intake manifolds. Purge flow is enabled at idle after adaptive idle fueling is completed. The charcoal canister is located at the front of the left front wheel arch.



Engine Management System: Fuel Injection (continued)

Adaptive idle fueling trim

In order to ensure optimum performance throughout the life of the vehicle, the fuel injection ECM software contains an adaptive idle fueling function that automatically trims the fuel injector idle pulse duration strategy. The total available trim to the nominal injector pulse duration is $\pm 20\%$. This function eliminates the manual adjustment of idle trim. Adaptive fueling is performed by the ECM software only when there are no diagnostic trouble codes (DTCs) present and the following preconditions are met:

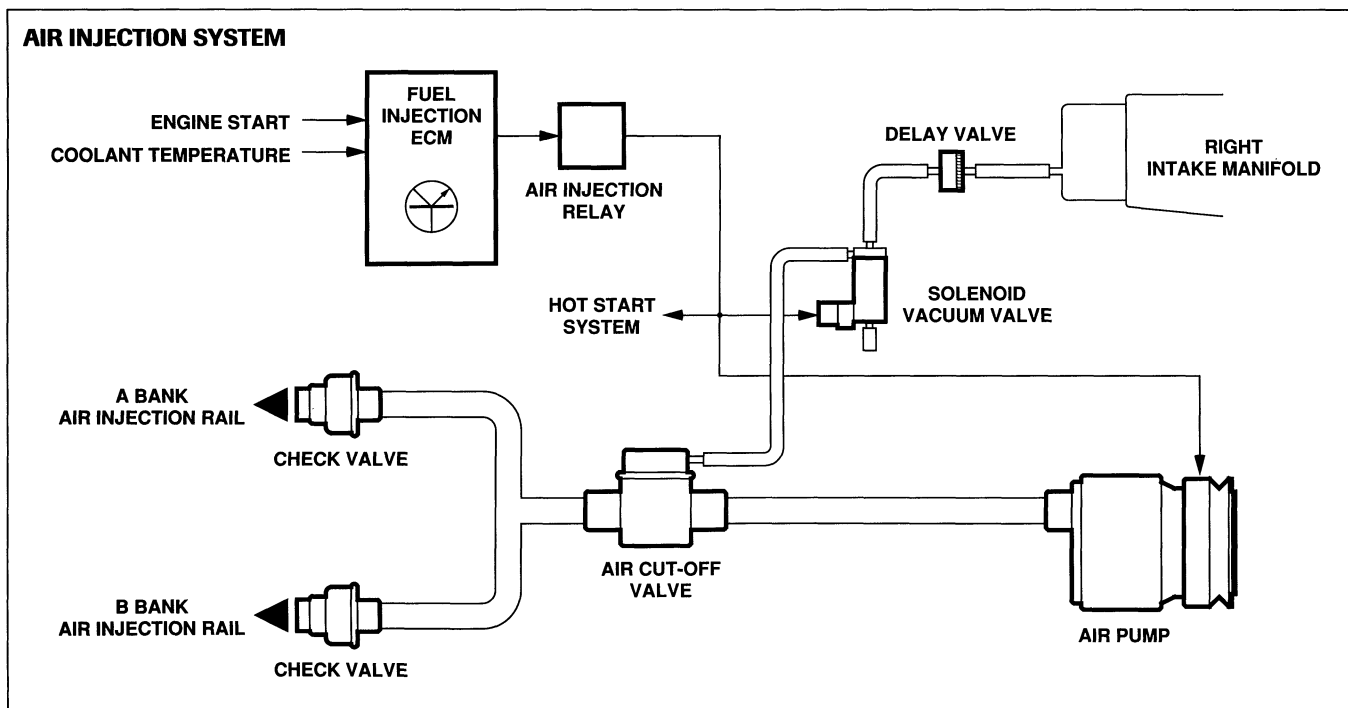
- Throttle closed
- Engine speed below 900 rpm
- Air injection disabled after engine start
- Closed loop fueling control enabled

If there are no DTCs present and the preconditions are met, the ECM cancels purge flow and adapts the idle fueling. Between fueling adaptations, there is a delay of approximately eight minutes during which the preconditions must be met. If the preconditions are interrupted, the delay will be lengthened.

Air injection

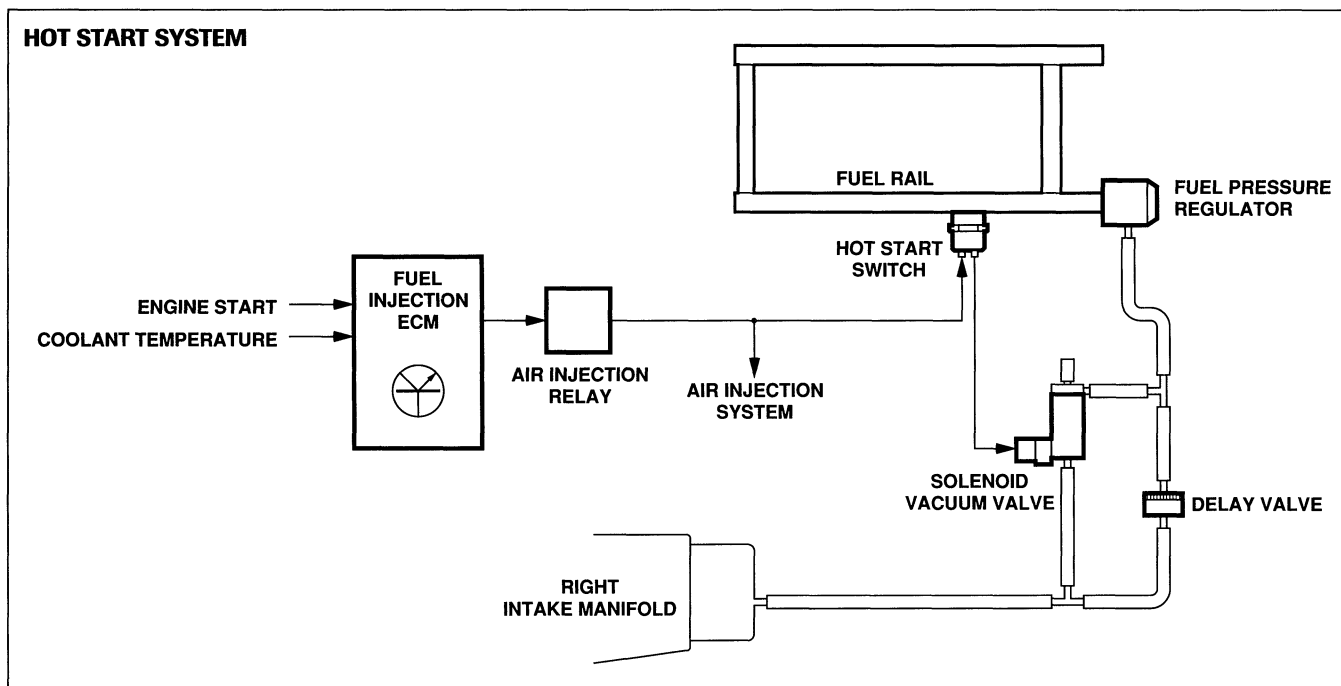
The 6.0 liter air injection system is similar to the AJ6 4.0 liter air injection system. An air injection pump with an electric clutch and a vacuum operated air cut-off valve are controlled by the fuel injection ECM. Air injection is enabled after all engine starts. The ECM uses a strategy comprised of a number of injector pulses versus engine coolant temperature for air injection switch-off. Air injection is enabled following all hot starts and always operates at engine coolant temperatures below 115°F (47°C). The air shut-off valve is operated by vacuum applied by the solenoid vacuum valve when signaled from the ECM.

NOTE: The air injection pump is operationally the same as the XJ12 pump but is manufactured by a different supplier.



Hot start system

The hot start system remains the same as the previous 5.3 liter system with the exception of the timing control. The function of the previous 45-second timer is replaced by fuel injection ECM control. When air injection is enabled, current is applied to the hot start switch. If the fuel rail temperature is 158°F (70°C) or above, the switch closes and activates the solenoid vacuum valve. The solenoid vacuum valve is mounted on the front of the right throttle body. The activated valve closes and directs vacuum to the fuel pressure regulator through the delay valve. The momentary vacuum delay increases fuel pressure to purge the fuel rail.



Idle speed control

Idle speed stabilization is enabled when the air conditioning compressor is operating. The supplementary air valve is activated (opened) when the compressor clutch is activated to allow throttle-valve-bypass air flow to the right intake manifold. The valve operates in all gear selector positions.

On-board diagnostics (OBD)

The OBD system has been expanded to include two new diagnostic trouble codes (DTCs): 67 and 77. In order to prevent the erroneous flagging of codes, a fuel level input (voltage) to the fuel injection ECM is supplied. The ECM will not flag DTCs 13, 18, 19, 23, 34, 36, 44 and 45 when the fuel tank level falls below approximately 1 gallon.

Diagnostic trouble code summary

The available DTCs are listed in order of priority on the following table. Limp home mode is available as indicated. When multiple faults occur, only the highest priority code will be displayed.

DTC	Limp Home Mode	Input or Component Checked	DTC	Limp Home Mode	Input or Component Checked
29		ECM Self-test	19	X	Manifold pressure transducer / throttle position sensor circuit (high throttle voltage / high MAP)
44	X	Oxygen sensor circuit – A bank	23		Fuel metering at idle – A and B banks combined
45	X	Oxygen sensor circuit – B bank	49	X	Power resistors electrical circuits
13	X	Manifold pressure transducer and sensing hose	11	X	Pressure transducer / throttle position sensor circuit
34		Injector electrical circuits – A bank	16	X	Intake air temperature sensor circuit
36		Injector electrical circuits – B bank	67		Air injection operation (oxygen sensor response)
14	X	Coolant temperature sensor circuit	77		Engine speed (loss of input from ignition ECM)
17	X	Throttle position sensor circuit			
18	X	Manifold pressure transducer / throttle position sensor circuit (high throttle voltage / low MAP)			

Clearing diagnostic trouble codes

All DTCs are held in the ECM memory until cleared using serial communication. If the vehicle battery is disconnected, the DTC(s) will be cleared.

Engine Management System: Ignition

Engine control module (ECM): Ignition

The ignition ECM is revised to include a new manifold absolute pressure sensor and new software. The new software controls ignition retard at high intake air temperature, to prevent detonation, with minimal compromise of vehicle performance.

Intake air temperature sensor

An intake air temperature sensor located in the right intake replaces the previous coolant temperature sensor and air temperature switch. The intake air temperature input to the ECM is used to determine the ignition retard necessary to prevent detonation.

Idle switch

The idle switch remains in the system to signal the ECM to use the idle ignition strategy; however, a micro switch located on the throttle turntable replaces the previous linkage switch.

Ignition retard / transmission control

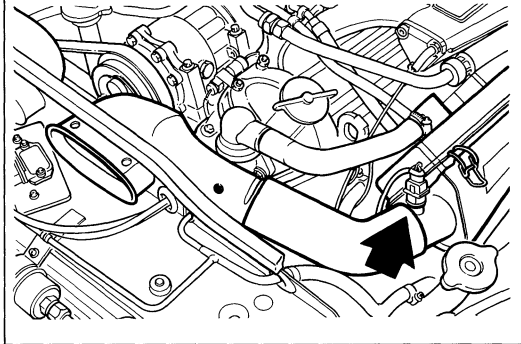
The ignition ECM receives an ignition retard request from the transmission control module during certain transmission apply and release functions. Before the transmission completes the function, an acknowledgment of the request is made by the ignition ECM.

Engine speed outputs

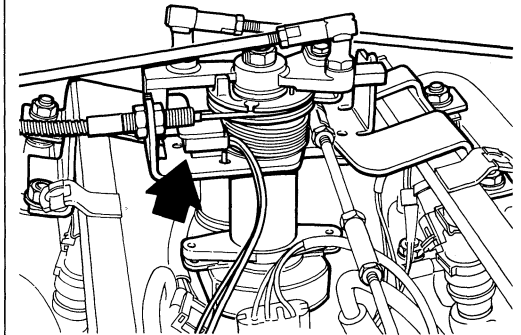
The ignition ECM provides engine speed outputs for the following:

- Tachometer
- Fuel injection control
- Fuel pump B control
- Transmission control

IGNITION INTAKE AIR TEMP. SENSOR

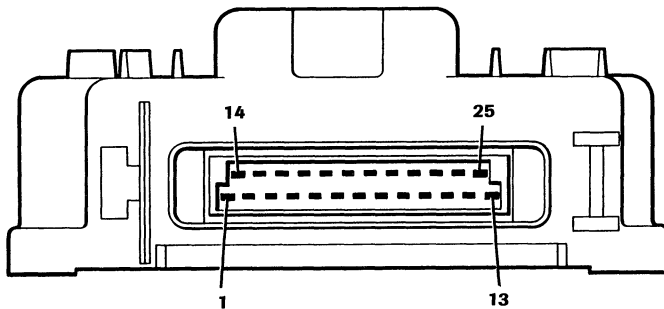


IDLE SWITCH

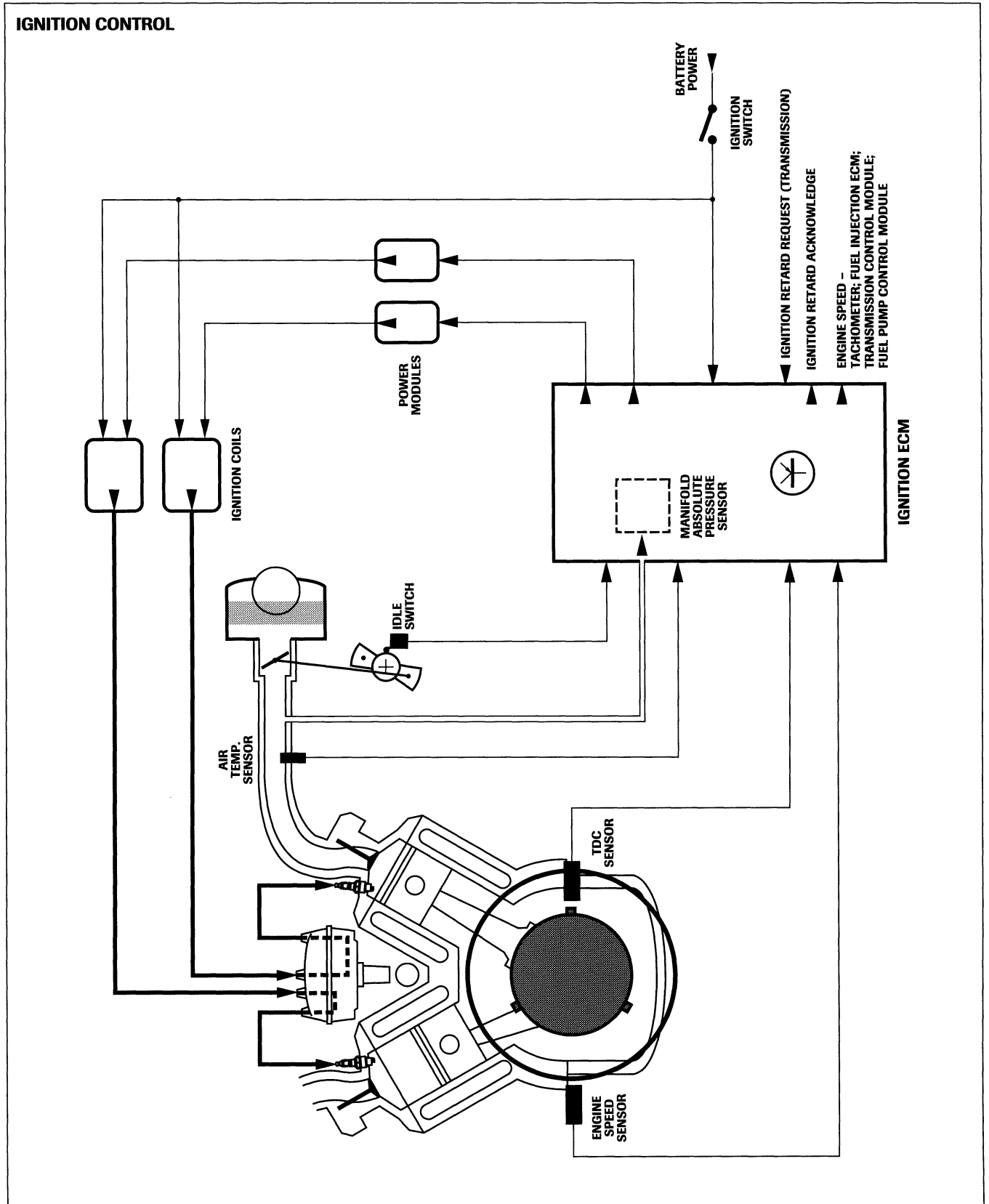


(RIGHT-HAND DRIVE SHOWN)

IGNITION ECM PIN OUT INFORMATION



- 1 TDC SENSOR
- 2 TDC SENSOR SHIELD
- 3 ENGINE SPEED SENSOR SHIELD
- 4 GROUND
- 5 IDLE SWITCH GROUND
- 6 AIR TEMPERATURE SENSOR GROUND
- 7 ENGINE SPEED OUTPUT SHIELD
- 8 POWER MODULE SHIELD
- 9 B BANK POWER MODULE OUTPUT
- 10 B BANK POWER MODULE OUTPUT
- 11 GROUND
- 12 GROUND
- 13 IGNITION SWITCHED POWER SUPPLY
- 14 A BANK POWER MODULE OUTPUT
- 15 A BANK POWER MODULE OUTPUT
- 16 ENGINE SPEED SENSOR
- 17 STRATEGY SELECT
- 18 IDLE SWITCH
- 19 AIR TEMPERATURE SENSOR
- 20 NOT USED
- 21 IGNITION RETARD ACKNOWLEDGED
- 22 NOT USED
- 23 STRATEGY SELECT
- 24 ENGINE SPEED OUTPUT
- 25 IGNITION RETARD REQUEST



**XJS 4.0 A4 Electronic
Four-speed Automatic Transmission**

Driver selected operating modes

An additional transmission mode, DELETE FIRST, has been added to the ZF 4HP 24E transmission control for the XJS. DELETE FIRST provides second gear start-off to help prevent wheel spin on roads with poor traction. If DELETE FIRST is selected when the transmission is in drive, the transmission will momentarily engage first gear before shifting to second. The instrument pack has indicators that illuminate if SPORT or DELETE FIRST are selected.

Gear Selector and Mode Switch

XJS 4.0

A three-way rocker switch for selecting NORMAL, SPORT or DELETE FIRST mode is mounted on the center console gear selector bezel.

XJS V12

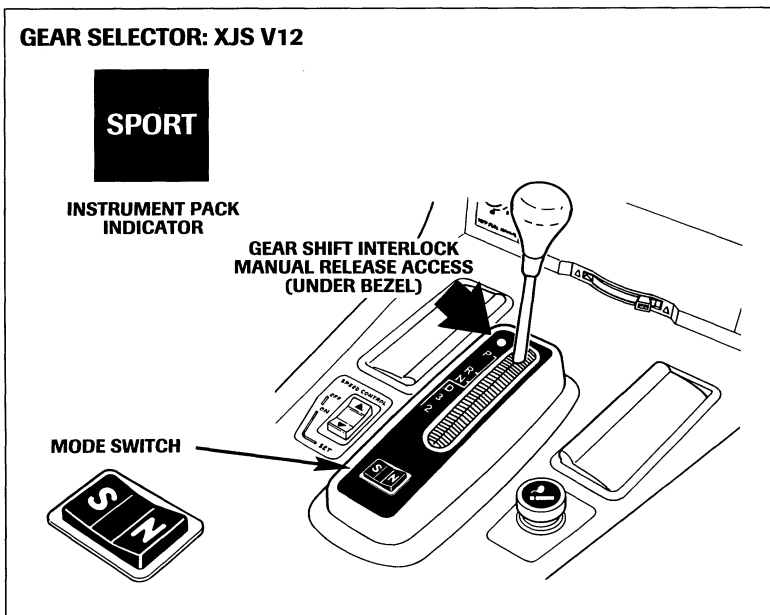
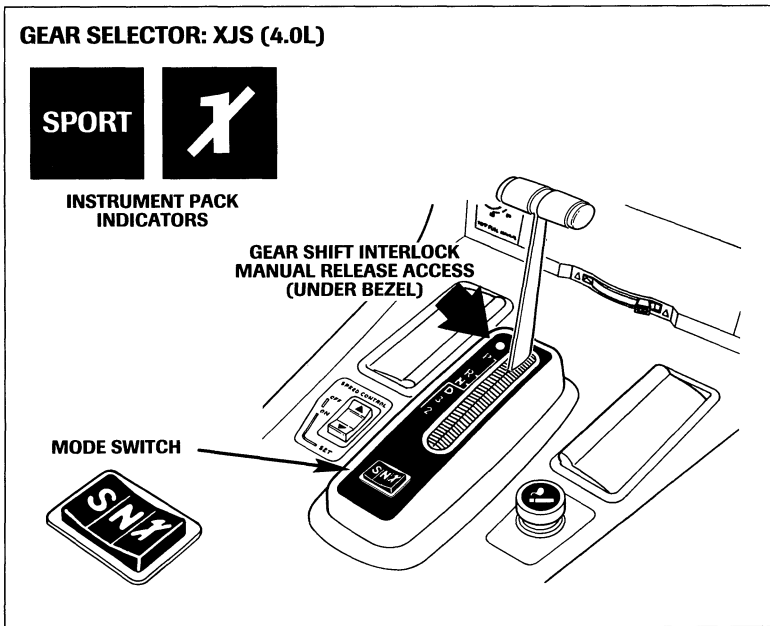
A two-way rocker switch for selecting NORMAL, or SPORT mode is mounted on the center console gear selector bezel.

Gear Shift Interlock

Manual override

The gear shift mechanism and electrical circuit remain unchanged from the 1993 model year XJS. A manual override access located under the gear selector bezel has been added. To override the interlock, remove the gear-shift lever bezel. Then, gently press down on the interlock release with a screwdriver through the access hole. Move the shift lever to neutral.

NOTE: The method suggested for vehicles without access holes — inserting a screwdriver through the shift lever slot — will not work.



XJS V12 Electronic Four-Speed Automatic Transmission

The Hydra-matic 4L80-E electronic four-speed automatic transmission incorporates electronic controls that utilize the transmission control module (TCM) to control shift points, torque converter clutch apply and release, and line pressure. Inputs from sensors and switches provide engine, transmission and vehicle operating information to the TCM. The TCM uses this information to determine the precise moment to upshift or downshift, apply or release the torque converter clutch, and what line pressure is required to apply the clutches or bands. This type of control, based on the operating conditions of the vehicle, results in consistent and precise shift points and shift quality.

NORMAL and SPORT modes

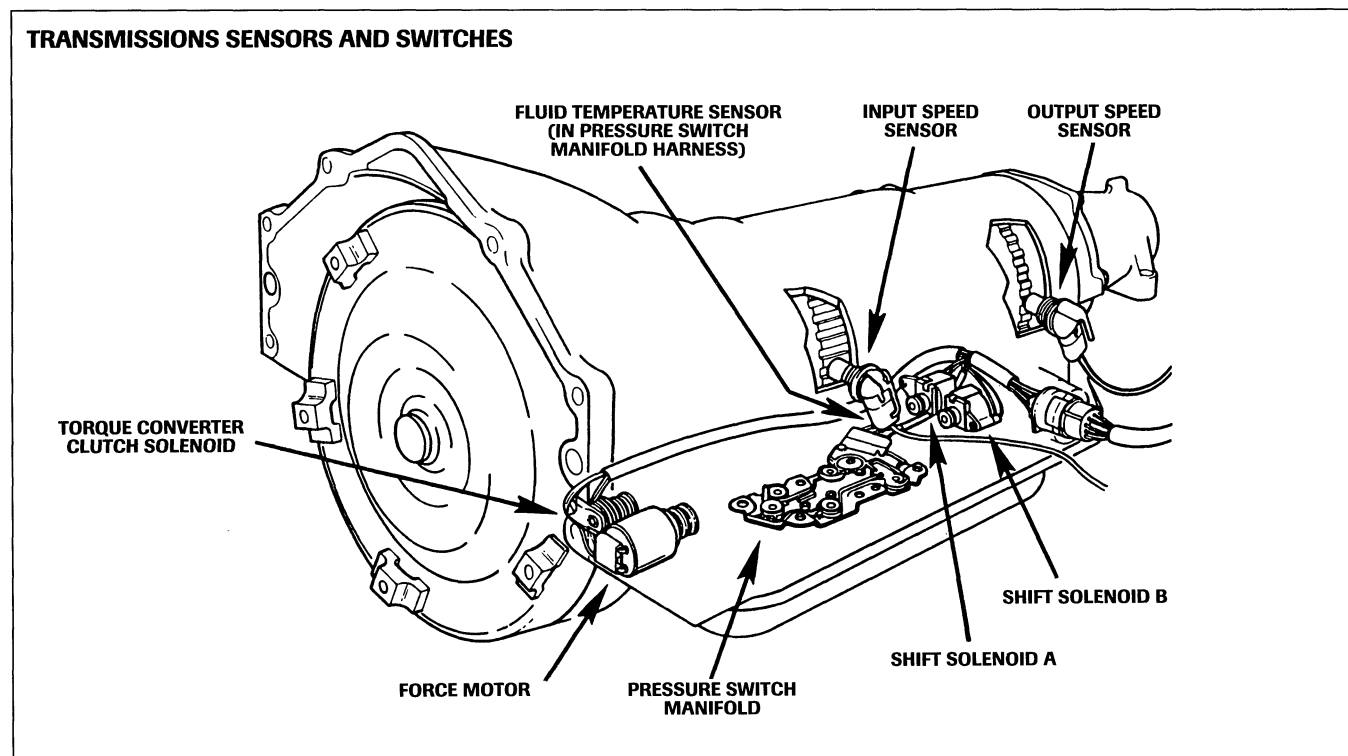
Two operating strategies are available to the driver:

NORMAL Normal mode provides economy operation by causing the transmission to upshift at lower engine speeds and throttle openings. Start-off occurs in second gear unless the accelerator is depressed to the kick down position. High-speed performance is available as required.

SPORT Sport mode allows the engine power to be used to its full potential at all times. Start-off occurs in first gear and upshifts and kick down are tailored to performance.

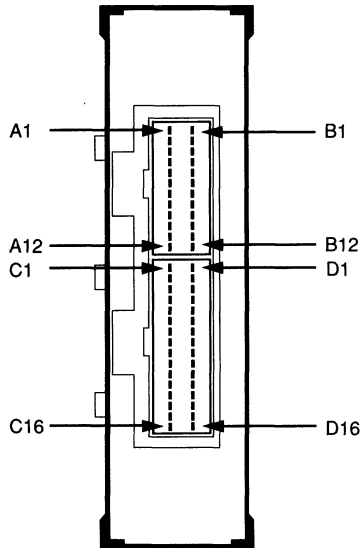
Torque converter lock-up clutch

The torque converter assembly employs a lock-up clutch to provide a direct drive coupling between the engine and transmission.



XJS V12 Electronic Four-Speed Automatic Transmission (continued)

TRANSMISSION CONTROL MODULE PIN OUT INFORMATION

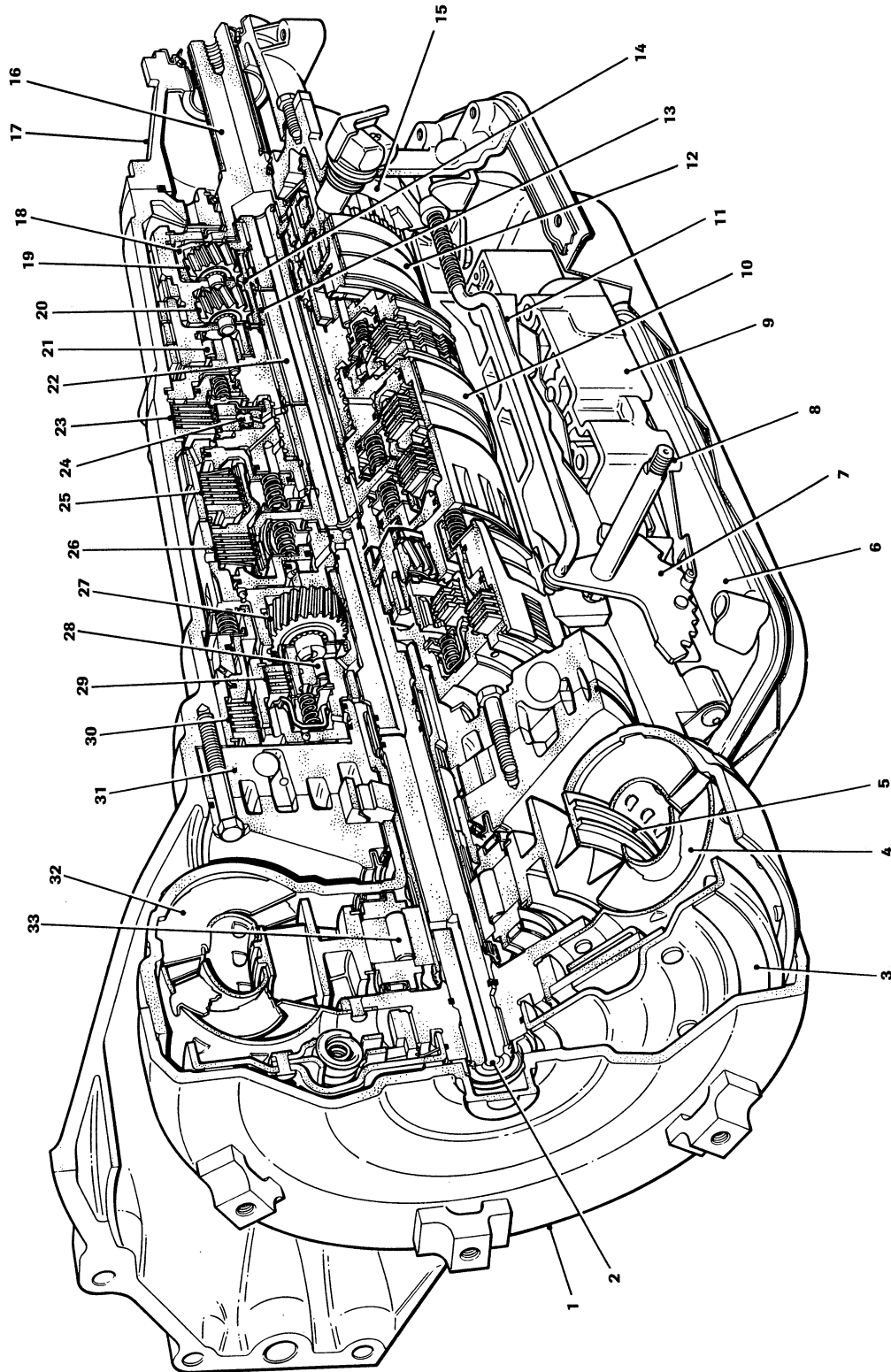


A1	NORMAL INPUT	B12	OUTPUT SPEED
A2	SPORT MODE INPUT	C1	GROUND
A3	GEAR CODE MODE A	C2	GROUND
A4	GEAR CODE MODE B	C3	SENSOR GROUND
A5	GEAR CODE MODE C	C4	SENSOR SUPPLY VOLTAGE
A6	SHIFT SOLENOID B	C6	FUEL OCTANE SELECT
A7	SHIFT SOLENOID A	C7	CATALYST SELECT
A10	IGNITION RETARD REQUEST	C8	KICKDOWN SWITCH
A11	TRANSMISSION FAIL OUTPUT	C9	ENGINE SPEED SHIELD
A12	BATTERY POWER	C15	FORCE MOTOR FEEDBACK
B2	ENGINE FUEL FAIL	C16	IGNITION SWITCHED POWER
B3	A/C COMPRESSOR CLUTCH OPERATION	D3	INPUT SPEED
B4	BRAKE LIGHT OPERATION	D4	INPUT SPEED
B5	TORQUE CONVERTER CLUTCH SOLENOID	D5	ENGINE SPEED INPUT
B6	SPORT MODE INDICATOR OUTPUT	D9	IGNITION RETARD ACKNOWLEDGED
B7	NOT USED	D10	THROTTLE POSITION SENSOR WIPER
B10	DATA LINK SERIAL OUTPUT	D12	DATA LINK SERIAL OUTPUT
B11	OUTPUT SPEED	D13	TRANSMISSION TEMPERATURE SENSOR

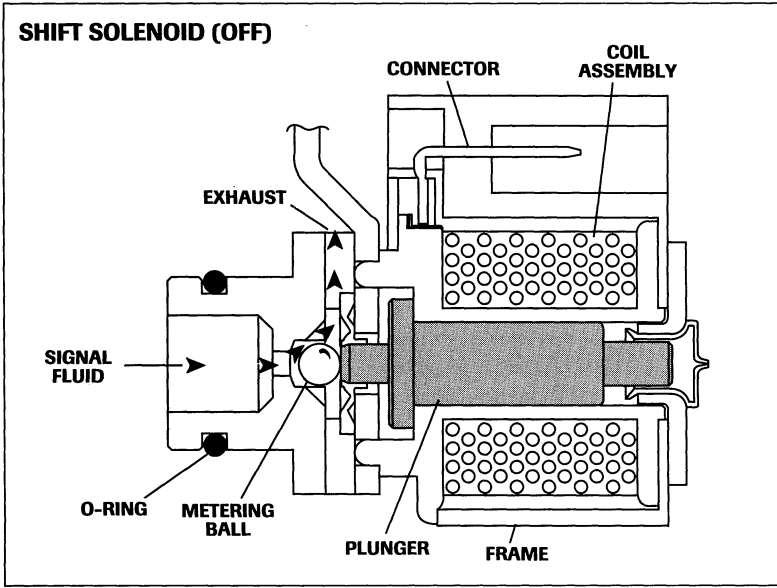
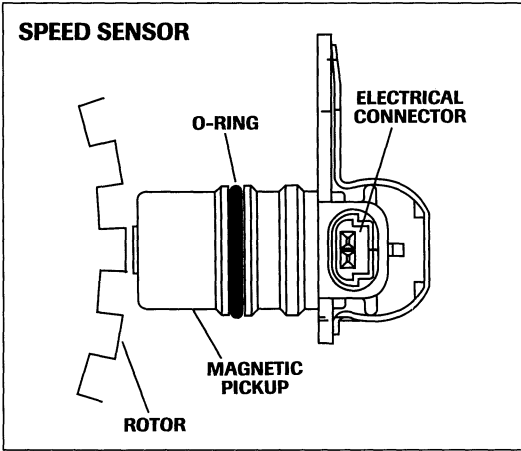
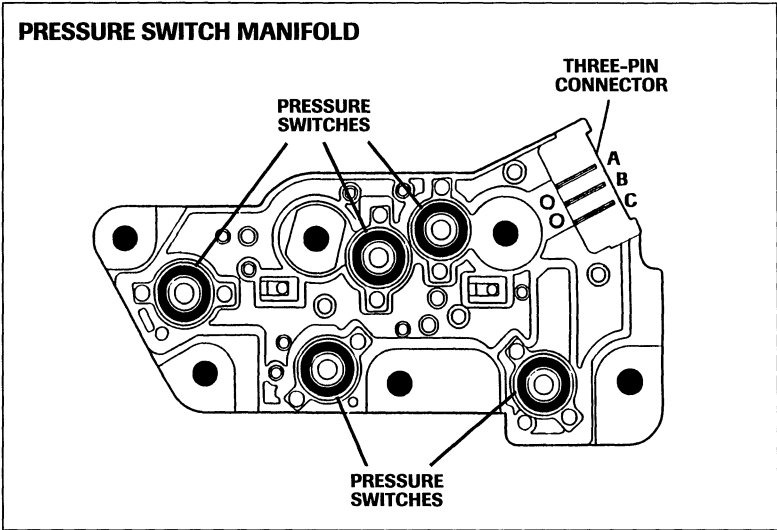
Transmission components (key to illustration on opposite page)

- | | | | |
|----|-------------------------------------|----|--------------------------------------|
| 1 | Torque converter assembly | 18 | Rear internal gear |
| 2 | Turbine shaft | 19 | Output planetary carrier assembly |
| 3 | Pressure plate | 20 | Reaction planetary carrier assembly |
| 4 | Converter turbine | 21 | Lo roller clutch assembly |
| 5 | Converter stator | 22 | Main shaft |
| 6 | Filter | 23 | Intermediate clutch assembly |
| 7 | Detent lever | 24 | Intermediate sprag clutch assembly |
| 8 | Manual shaft | 25 | Direct clutch assembly |
| 9 | Control valve assembly (valve body) | 26 | Forward clutch assembly |
| 10 | Front band assembly | 27 | Overdrive planetary carrier assembly |
| 11 | Park lock actuator | 28 | Overdrive roller clutch assembly |
| 12 | Rear band assembly | 29 | Overrun clutch assembly |
| 13 | Sun gear shaft | 30 | Fourth clutch assembly |
| 14 | Sun gear | 31 | Pump assembly |
| 15 | Park lock pawl | 32 | Converter pump assembly |
| 16 | Output shaft | 33 | Stator roller clutch assembly |
| 17 | Case extension | | |

TRANSMISSION CUTAWAY



XJS V12 Electronic Four-Speed Automatic Transmission (continued)



Transmission control components

The mechanical operation of the transmission follows conventional epicyclic gear transmission operation. The components unique to the electronic control of the transmission are explained here.

Transmission control module (TCM)

The TCM is a microprocessor based unit having control over all shift points and the transmission line pressure that determines shift quality. Control inputs are applied to the transmission operating strategy. From the strategy, the TCM controls the shift solenoids, force motor (line pressure), and the torque converter clutch solenoid. A diagnostic facility allows the TCM to diagnose transmission and related component problems. This information is accessed via serial communication.

NOTE: The TCM location varies with vehicle model type. Refer to page 54.

Pressure switch manifold

The pressure switch manifold is a multiple switch assembly made up of 5 normally-open pressure switches to provide a logic input to the TCM. Various fluid pressures are fed from the manual valve to the switches depending on gear selector and manual valve positioning. These pressures determine the digital logic at the connector pins A, B and C.

Transmission output speed sensor

The output speed sensor is a variable reluctance magnetic pick-up. The sensor is mounted in the case opposite the output speed sensor ring that is pressed on to the output carrier assembly. Whenever the vehicle is moving, the sensor produces an AC voltage input to the TCM proportional to vehicle speed.

Transmission input speed sensor

The input speed sensor is identical to the output speed sensor except that it uses the machined teeth on the forward clutch housing as the rotor. The sensor produces an AC voltage input to the TCM proportional to torque converter turbine speed.

Fluid temperature sensor

The transmission fluid temperature sensor, located in the pressure switch wiring harness, is a temperature sensitive resistor (thermistor) that provides a fluid temperature input to the TCM.

Shift solenoids

Two shift solenoids – A and B – are used to apply upshifts and downshifts in all forward gear ranges. The solenoids work together in a combination of ON and OFF sequences to apply hydraulic pressure to the various shift valves.

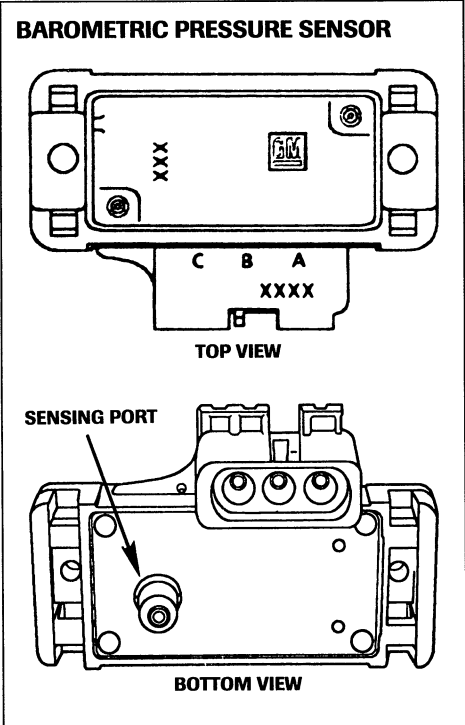
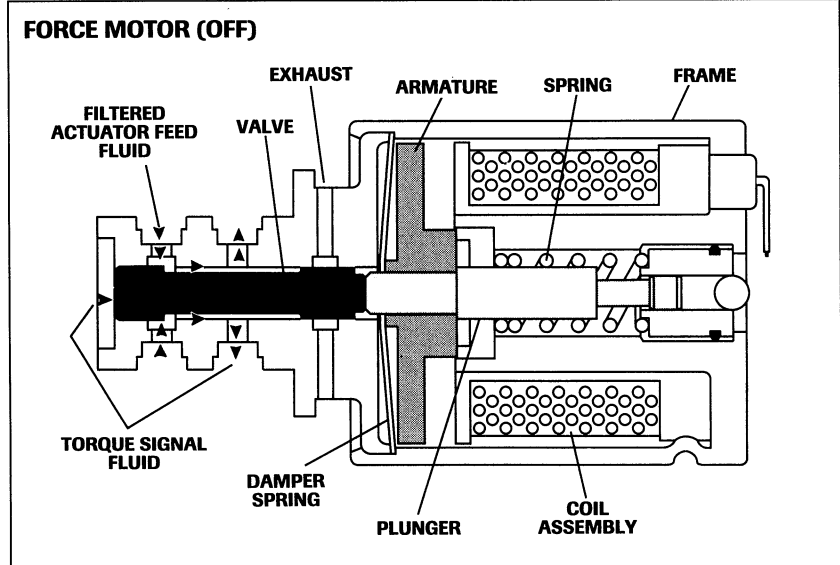
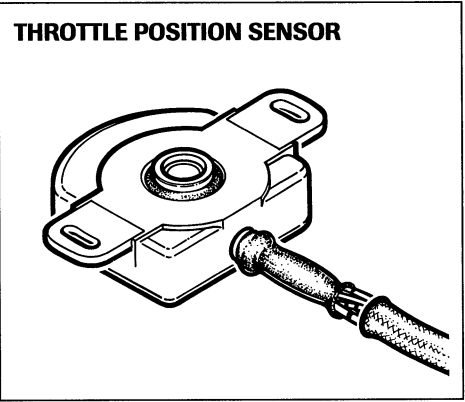
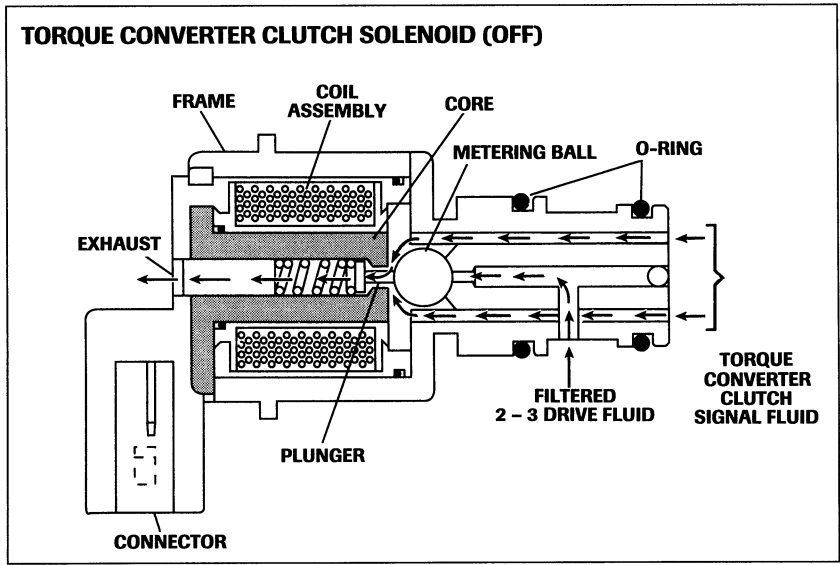
Torque converter clutch (TCC) solenoid The TCC solenoid is used to control the torque converter lock-up clutch apply and release. The solenoid duty cycle (percent time energized) is varied by TCM control of the ground circuit. The variable duty cycle of the solenoid allows the lock-up rate to be varied to ensure smooth operation.

Force motor The force motor is an electronic pressure regulator controlled by the TCM to produce a hydraulic "torque signal pressure" that is primarily an indication of throttle opening. The duty cycle (percent time energized) of the force motor is regulated by TCM control of supply current. No current flow applies maximum torque signal pressure; maximum current flow applies minimum torque

signal pressure. Torque signal pressure controls transmission main line pressure at the pressure regulator valve accordingly.

Throttle position sensor The twin track throttle position sensor is mounted under the throttle turntable. The throttle position input to the TCM is an approximation of engine torque.

Barometric pressure sensor A barometric pressure sensor, located under the right front component panel (right front inner fender), provides an air density signal to the TCM.



XJS V12 Electronic Four-Speed Automatic Transmission (continued)

Transmission Control Module Inputs and Outputs

The TCM receives inputs from the transmission, fuel injection and ignition ECMs, external components, and other vehicle systems and applies them to the operating strategy to determine the optimum transmission control outputs.

INPUTS

Mode switch The mode switch position inputs the driver's choice of operating strategy to the TCM.

Input and output speed sensors The TCM uses the transmission input and output speeds to help determine line pressure, shift patterns, and torque converter lock-up clutch apply pressure and timing. The speed inputs are also used to calculate turbine speed, deviation from gear ratio, and lock-up clutch slippage for diagnostic purposes and "adaptive learning" functions.

Transmission fluid temperature The TCM monitors the transmission fluid temperature to help determine torque converter lock-up clutch operation and line pressure. The TCM inhibits lock-up clutch operation until the fluid temperature reaches approximately 68°F (20°C).

If the fluid temperature becomes excessively high (approximately 250°F [122°C]), the TCM will apply the lock-up clutch whenever the transmission is in Second, Third or Fourth gears. Applying the lock-up clutch serves to reduce the fluid temperature, as the torque converter fluid coupling is bypassed.

Above approximately 310°F (154°C), the TCM will flag a fluid temperature diagnostic trouble code (DTC). Once the DTC is flagged, the TCM assumes a fixed temperature input of 266°F (130°C) and applies the lock-up clutch in Second, Third and Fourth gears.

Force motor feedback The TCM senses the force motor duty cycle (percent time energized) to determine the prevailing transmission line pressure.

Pressure switch manifold The pressure switch manifold output logic is used by the TCM to determine what gear range (PRN[D]D32) the transmission is operating in.

Kick down A kick down ground input is supplied to the TCM when the driver activates the switch by depressing the accelerator to the kick down position.

Engine throttle position A variable voltage input allows the TCM to sense throttle position. Throttle position, and other sensor inputs, are used to determine shift patterns and torque converter lock-up clutch apply and release. In general, the greater the throttle opening, the higher the upshift speeds and the greater the transmission line pressure. The TCM releases the lock-up clutch at minimum throttle opening and during open-throttle heavy acceleration.

Barometric pressure sensor The barometric pressure input allows the TCM to adjust the line pressure for changes in air density that affect engine power.

Engine speed An engine speed input is supplied to the TCM from the ignition ECM. Engine speed is one of the sensed inputs used to determine shift patterns and torque converter lock-up clutch apply and release.

Brake operation The TCM receives a brakes applied input via the stop light relay. When the brakes are applied, the TCM releases the torque converter lock-up clutch.

A/C compressor clutch operation The TCM receives a compressor clutch operating input from the climate control module compressor clutch relay activation circuit. When the compressor is operating, the TCM adjusts the line pressure and shift timing to compensate for the added engine load.

EMS fuel fail If a fuel fail input is received from the fuel injection ECM, the TCM defaults to a higher line pressure to compensate for the loss of engine power.

OUTPUTS

Force motor (line pressure) The TCM varies the current to the force motor to control "torque signal" pressure, which in turn, controls line pressure. The lower the "torque signal" pressure, the lower the line pressure; the higher the "torque signal" pressure, the higher the line pressure. At idle (throttle closed), current flow is close to maximum, positioning the force motor so that minimum "torque signal" pressure is applied to the line pressure regulator. At full throttle, current flow is close to minimum, positioning the force motor so that maximum "torque signal" pressure is applied to the line pressure regulator.

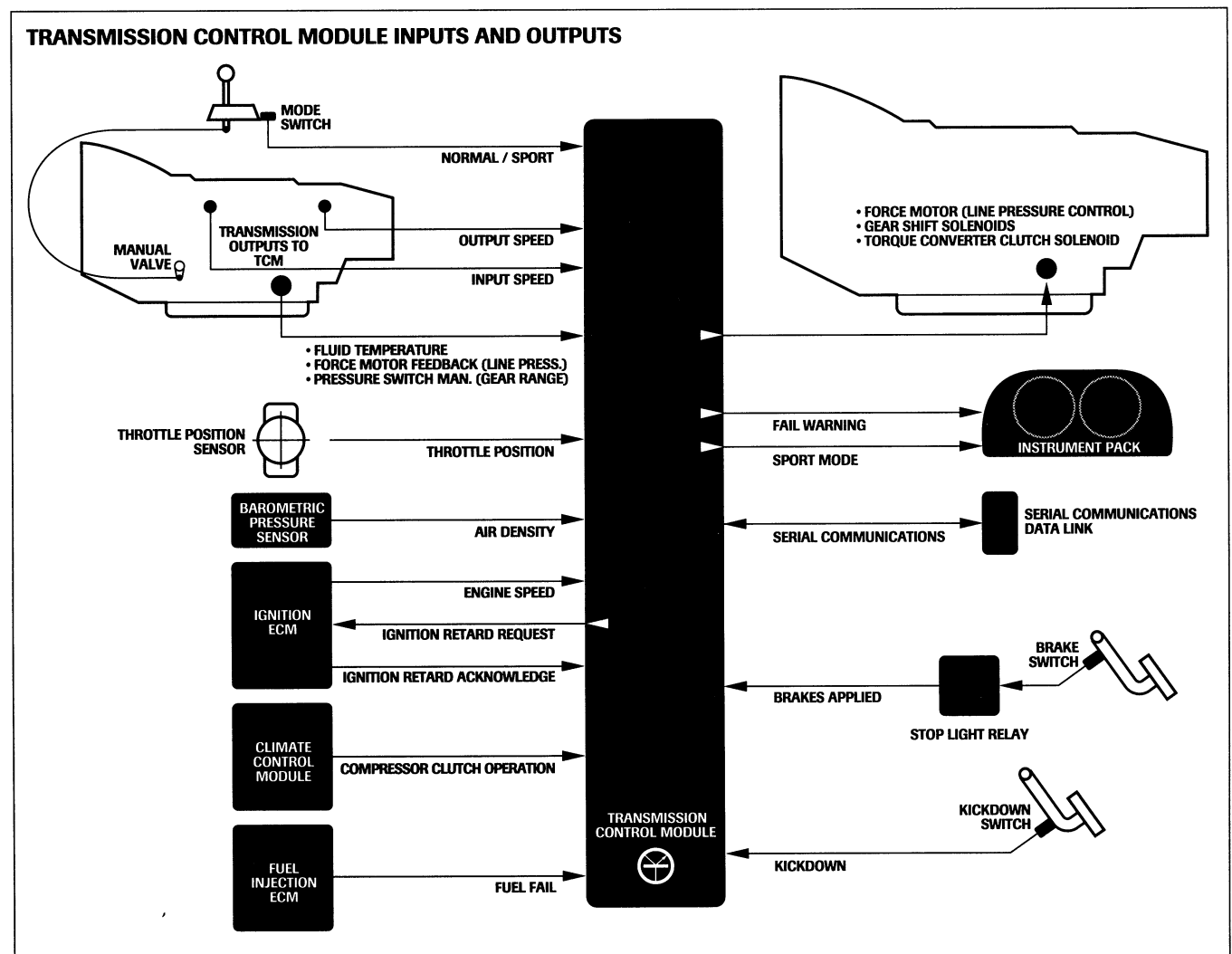
If the electrical system becomes disabled, current flow to the force motor will stop and maximum "torque signal" pressure will be applied creating maximum line pressure, thus preventing component slippage until the condition can be corrected.

Gear shift solenoids A and B The TCM controls the shift solenoids, based on parameters defined by the operating strategy, by switching the solenoid coil ground circuits. The following table shows the solenoid state combination required for each gear range:

Gear Range	Solenoid A	Solenoid B
P,R,N	ON	OFF
First	ON	OFF
Second	OFF	OFF
Third	OFF	ON
Fourth	ON	ON

Torque converter clutch (TCC) solenoid The rate at which the torque converter lock-up clutch is applied depends on the torque converter clutch signal pressure as controlled by the duty cycle of the TCC solenoid. The TCM varies the duty cycle of the TCC solenoid by controlling the ground circuit. The TCC solenoid, in turn, varies the torque converter clutch signal pressure acting on the lock-up clutch shift valve. By varying the duty cycle of the TCC solenoid, lock-up clutch apply and release occurs smoothly.

Ignition retard request and acknowledge When the TCM senses that a reduction in engine torque is required to allow a "quality shift", a request for ignition retard is output to the ignition ECM. After the ignition has been retarded, the ignition ECM signals the TCM to acknowledge timing retard. When the acknowledgment is received, the TCM initiates the apply or release function.



XJS V12 Electronic Four-Speed Automatic Transmission (continued)

Fail safe mode

If the entire electronic control system becomes disabled, the following occurs:

- both of the shift solenoids will be de-energized, forcing the transmission to operate in Second gear when the gear selector is in a forward drive range,
- the force motor is switched off, increasing line pressure to maximum,
- the pulse width modulated solenoid cannot apply the torque converter lock-up clutch.

Adaptive learning

The TCM programming allows for adjustments in line pressure based on the changing characteristics of the transmission components as sensed from the various TCM inputs. This process is called "Adaptive Learning" and is used to ensure consistent shift patterns and to increase transmission durability. As transmission "apply" components wear and the time required to apply a clutch or band increases, the TCM adjusts line pressure to maintain the originally calibrated shift timing. Line pressure adjustment is accomplished through control of the torque signal fluid pressure, which in turn is controlled by the force motor.

Diagnostics

The TCM continuously monitors the operation of the transmission to detect a fault. When detected, the TCM attempts to rectify a fault with "adaptive learning". If adaptive learning successfully rectifies the fault, the line pressure increase becomes the normal line pressure for that portion of the operating strategy. If the TCM cannot rectify the fault, a diagnostic trouble code (DTC) is flagged and the TCM selects a mode of operation that protects the transmission from damage. DTCs are accessed via serial communication. The following DTCs are available and are listed in the order of priority:

DTC	Input or Component checked	DTC	Input or Component checked
21 ✓	Throttle position high	84	Kick down switch stuck on
22 ✓	Throttle position low	78	Kick down switch stuck off
33	Barometric pressure high	73 ✓	Force motor current
34	Barometric pressure low	69	Torque converter lock-up clutch stuck on
58	Transmission temperature high	39	Torque converter lock-up clutch stuck off
59	Transmission temperature low	83	TCC solenoid circuit fault
79 ✓	Transmission hot	82 ✓	Shift solenoid A circuit fault
53 ✓	System voltage high	81 ✓	Shift solenoid B circuit fault
75 ✓	System voltage low	61	Torque reduction request signal fault
71	Engine speed low	62	Torque reduction acknowledge signal fault
74	Input speed low	89	1 - 2 maximum adapt and long shift
24 ✓	Output speed low	89	2 - 3 maximum adapt and long shift
72 ✓	Loss of output speed	89	3 - 4 maximum adapt and long shift
77	Mode select switch	68 ✓	Overdrive (Fourth) ratio
28 ✓	Pressure switch manifold	85 ✓	Undefined ratio / pressure switch manifold
37	Brake switch stuck on	87 ✓	Shift solenoid B stuck off
38	Brake switch stuck off	86 ✓	Shift solenoid B stuck on

NOTE: ✓ indicates that the DTC will illuminate a transmission warning on the instrument pack.

XJS V12 Propeller Shaft, Differential and Final Drive

The remainder of the drive train is unchanged with two exceptions: the propeller shaft has been shortened slightly due to the increased length of the new transmission, and the axle ratio is changed to 3.54:1 for improved mid-range passing performance.

Suspension tuning

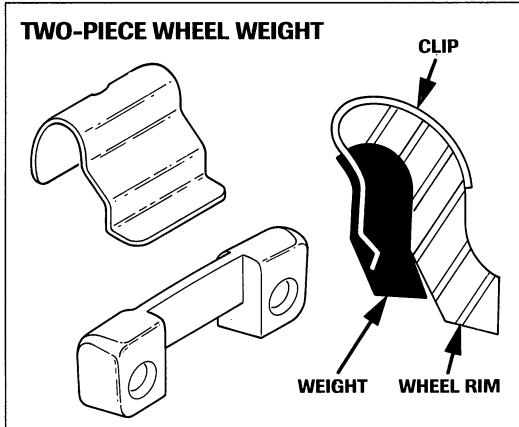
The XJS Range suspension has been re-tuned in conjunction with changes in body work, revised rear suspension and braking, new power train components, and engine power and torque changes. The changes improve comfort and ride refinement while maintaining competitive handling characteristics.

Vehicle ride height

Front and rear suspension revisions have increased ride height on U.S. Market vehicles by 5.0 mm (0.2 in). Canadian vehicles will retain their 1993 ride height.

Wheel balance weights

Two-piece coated wheel balance weights are used with the alloy wheels. The coating prevents galvanic action that can cause corrosion. The clip and balance weight assembly is designed to fit the profile of the road wheel rim. Installation of the clip requires that the tire sidewall be displaced. The use of a special tool, designed to displace the tire from the rim, will ensure that no damage to the alloy wheel or the tire sidewall occurs. The installed clip must be opened with an appropriate tool while the proper weight is slid under the clip.

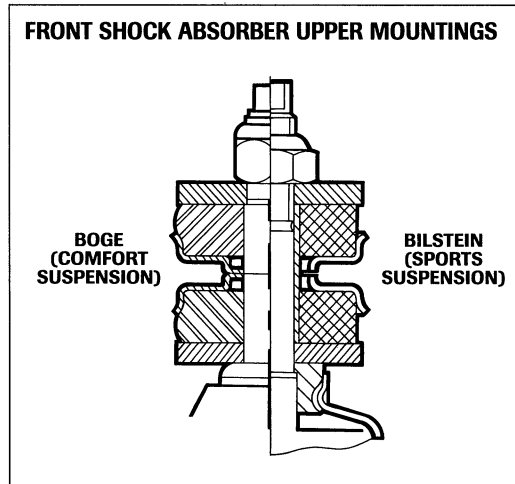


Springs and anti-roll bars

Spring rates and anti-roll bar stiffness have been revised throughout the XJS range. Anti-roll bar diameters have also been reduced.

Front shock absorbers

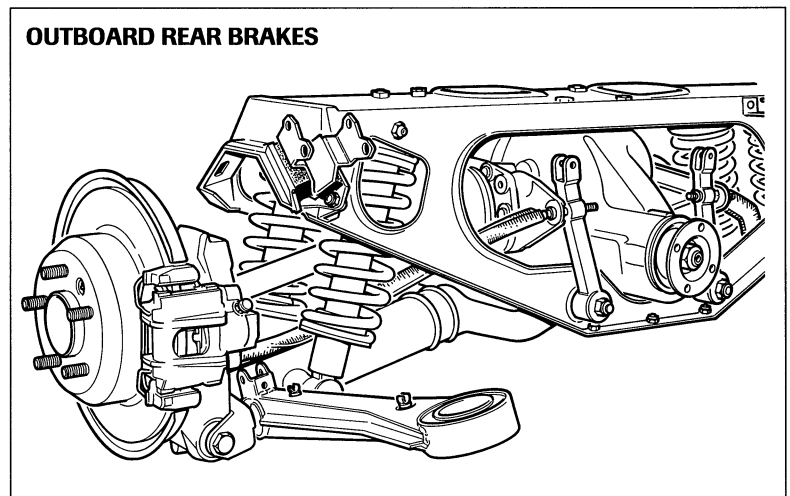
The sports suspension Bilstein (green) shock absorbers have different upper mountings. The upper washer is located by a sleeve on the shock piston rod.



Rear Suspension and Brakes

Outboard rear brakes

The rear suspension has been redesigned to accommodate outboard brakes with new calipers. This arrangement allows for easier servicing and increases the standardization of components with the Sedan Range. The brake assemblies are similar to the Sedan Range type with the discs housing internal shoe type parking brakes.



Parking brake adjustment

The parking brake shoes are adjusted as on the Sedan Range vehicles utilizing the star wheel adjusters in the parking brake drums. Parking brake cables and linkages are new and will require different setting and adjusting procedures. Refer to the Service Manual for a detailed explanation of the adjustment procedure.

HFC Air Conditioning System

XJS Range vehicles will be equipped with an HFC refrigerant air conditioning system replacing the current CFC refrigerant system. HFC (hydro-fluorocarbon) refrigerants are more friendly to the environment than CFC (chlorofluorocarbon) refrigerants. Although HFC systems function similarly to CFC systems they require unique service procedures and equipment. These new procedures must be strictly followed. New components specifically designed for HFC refrigerant operation cannot be interchanged with CFC components. These include:

- Aluminum refrigerant pipes
- Stainless steel liquid line
- Refrigerant pressure switch
- Clamp type expansion valve
- Receiver drier
- Compressor
- Parallel flow condenser
- R134a couplings
- R134a service ports

NOTE: Initial 1994 model year vehicles will be equipped with CFC air conditioning systems carried over from 1993. Only the HFC system and components are detailed in this publication.

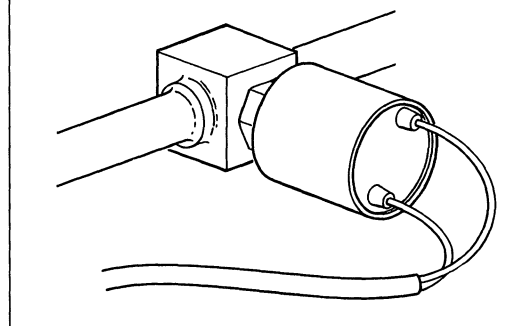
Compressor

Both the AJ6 and V12 engines will be equipped with Sanden R134a compatible compressors as used in the Sedan Range.

Refrigerant dual pressure switch

A refrigerant dual pressure switch located by the right front inner fender in the air conditioning high pressure (liquid) line closes to allow compressor operation at line pressures from 29 to 392 psi (2 to 27 bar).

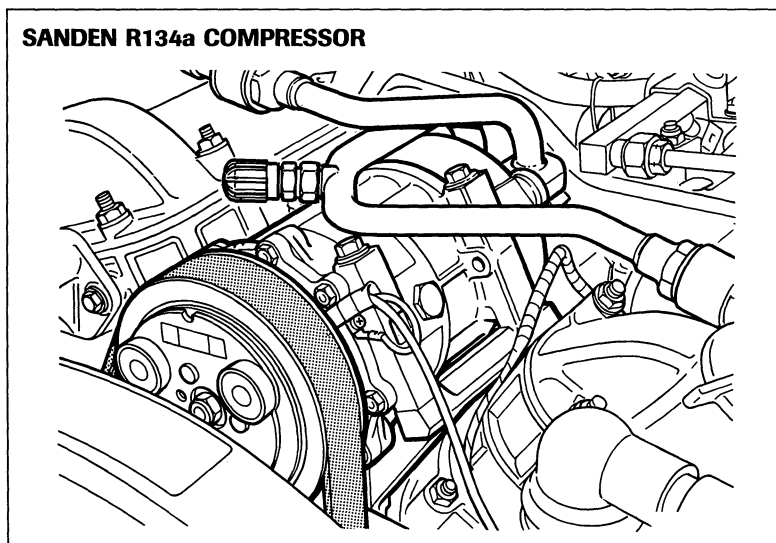
DUAL PRESSURE CUTOUT SWITCH



Condenser and receiver/drier

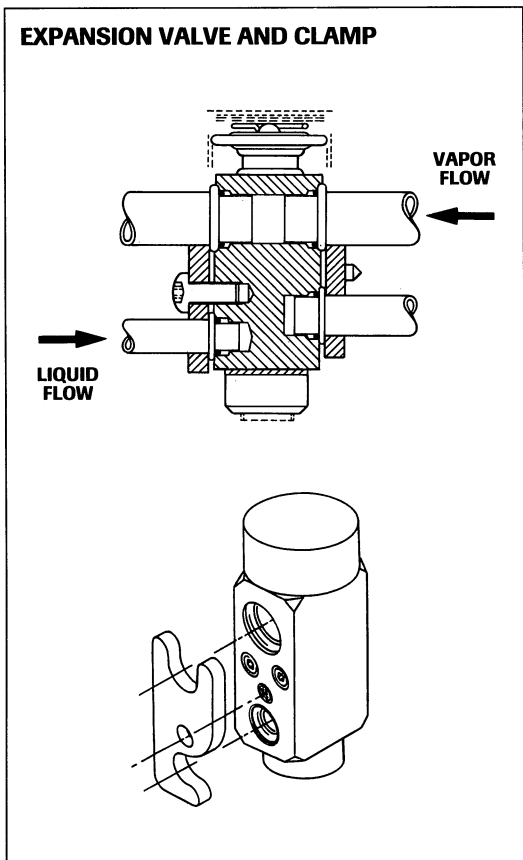
The condenser is constructed of extruded aluminum tubes with corrugated fins. The HFC-compatible receiver/drier is mounted horizontally on the top of the condenser. The receiver/drier sight glass has been eliminated because the combination of HFC refrigerant and PAG lubricating oil gives a milky appearance, making observation an unreliable method of determining state-of-charge.

SANDEN R134a COMPRESSOR



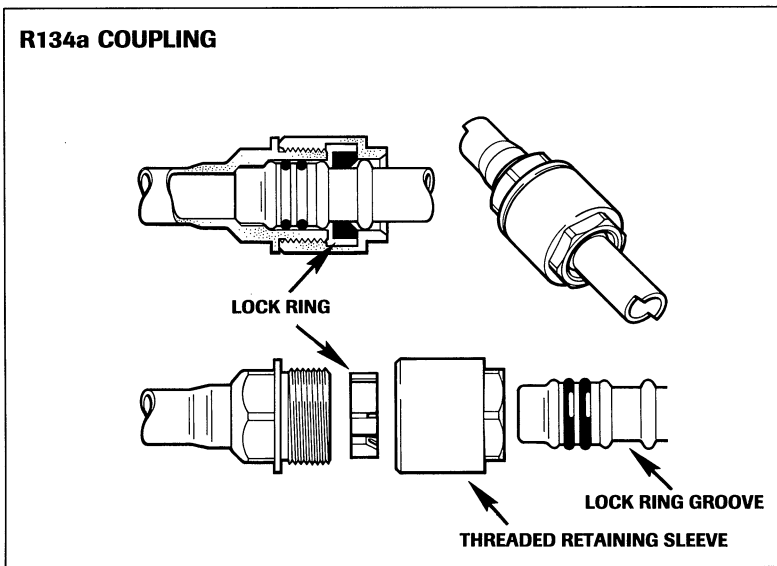
Evaporator and expansion valve

The evaporator is constructed entirely from aluminum. The expansion valve uses clamp plate connections on both sides of the valve. Some of the expansion valve internal parts are made from stainless steel to be compatible with PAG oil.



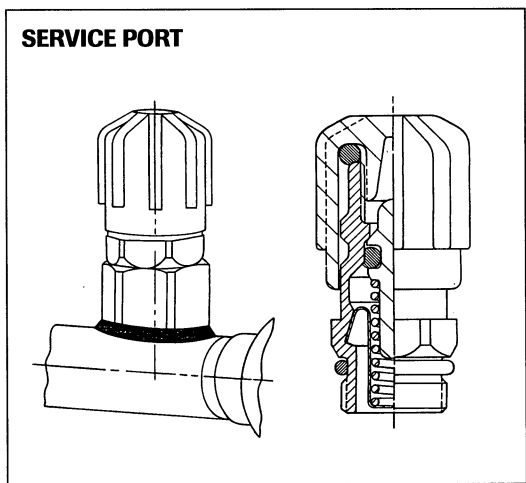
Refrigerant lines and couplings

The refrigerant lines are constructed from aluminum pipes and HFC-compatible flexible hose. Due to the increased operating pressures of R134a systems, couplings at the compressor and at the condenser inlet have been revised to improve sealing. The couplings are disconnected by fully unscrewing the connection (after the system has been de-pressurized). Connection is made by pushing the pipe into the connector after it has been assembled and fully tightened. The threaded retaining sleeve holds the lock ring that snaps around the pipe lock ring groove prior to assembly.



Service ports

The low and high side service ports are designed to accept the SAE standard service port connection, preventing incorrect system charging.

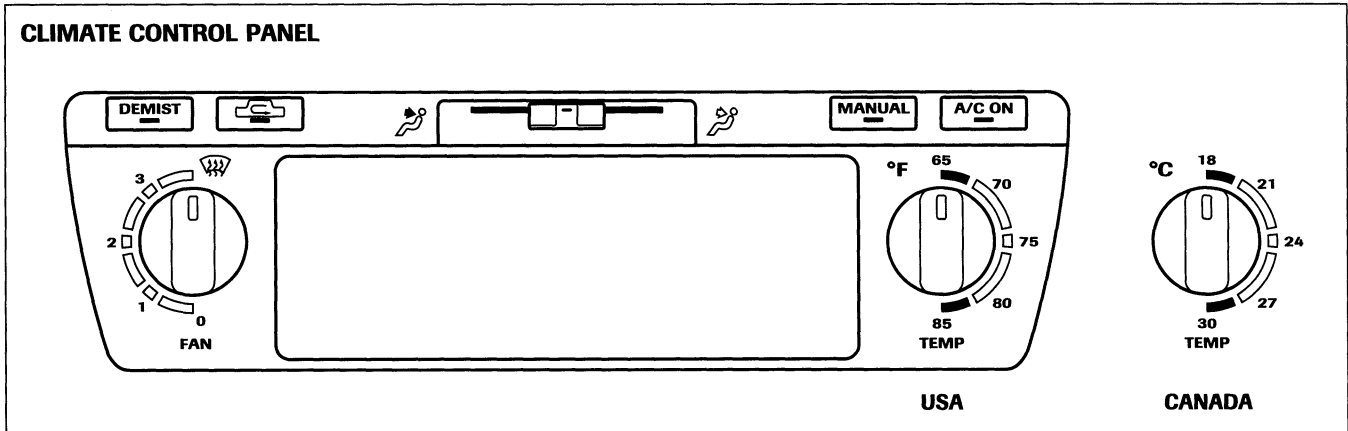


Climate Control System

The climate control system is refined to improve operation and include new functions.

Climate control panel

The climate control panel has revised functions with additional features. Individual buttons have been added to control manual recirculation, defrost (air bleed to windshield), air conditioning on/off, and automatic or manual function. A new temperature differential control is located at the top of the panel. New potentiometers are used for temperature differential and fan speed.



Climate control module

The climate control module has been revised to accommodate new functions and improve temperature stability and consistency of settings. A 45°C engine coolant temperature switch replaces the previous 30°C switch.

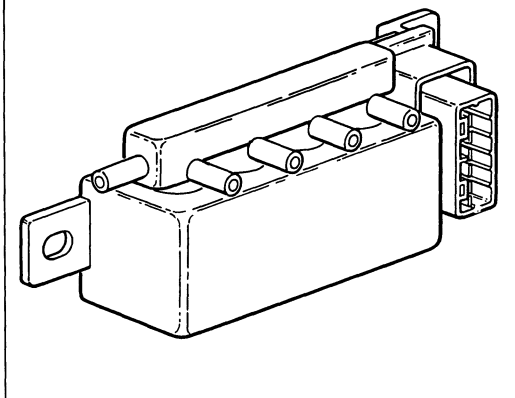
Servo motors

Quieter servo motors with reduced backlash react smoother and faster to further aid in stabilizing interior temperature and system reliability.

Vacuum harness and solenoid vacuum valve pack

The vacuum harness and vacuum valves have been revised to simplify assembly and improve reliability. The newly designed harness simplifies assembly and improves reliability. The solenoid vacuum valve pack contains the four vacuum valves for operation of recirculation, defrost, coolant valve and center vent.

SOLENOID VACUUM VALVE PACK



An additional separate main recirculation solenoid vacuum valve is used to bypass the climate control module and provide instantaneous recirculation. This separate main valve is identical to the previous individual valves used in the system.

Ambient temperature sensor

In order to improve response, the climate control ambient temperature sensor has been relocated to the air plenum chamber in front of the windshield.

Blower assemblies

Blower assembly mounting has been revised to accommodate the passenger side air bag and fascia refinements.

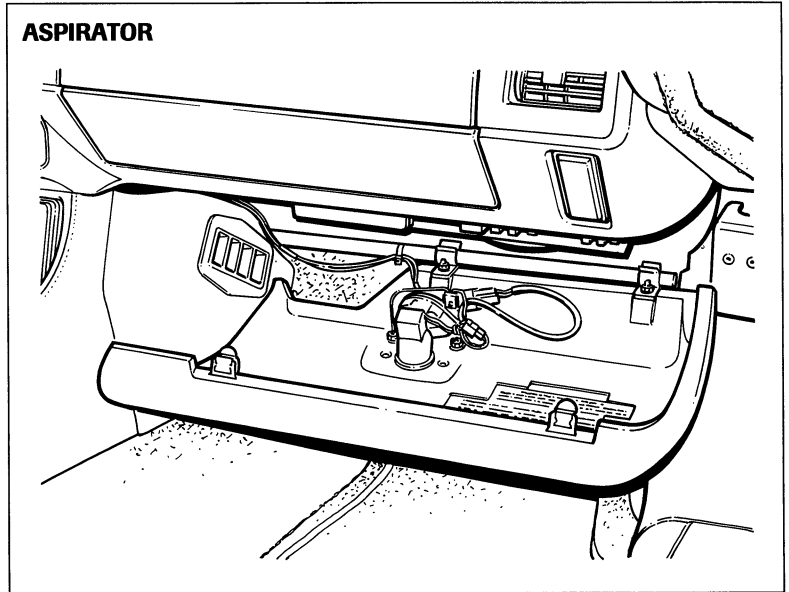
Aspirator

The motorized aspirator is mounted in the lower portion of the passenger knee bolster.

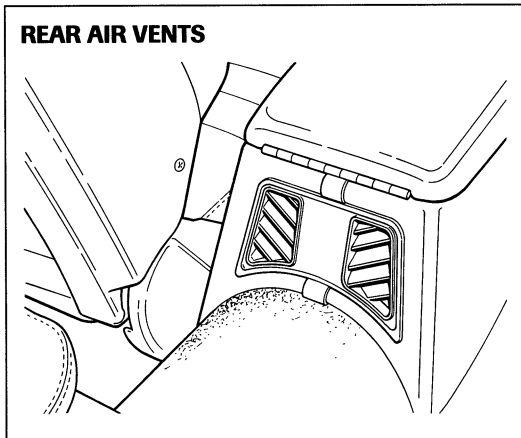
Console ducting and vents

Revisions to the console ducting and air vents, outlined in the interior section of this publication, improve air flow to the rear footwell areas and simplify construction.

ASPIRATOR

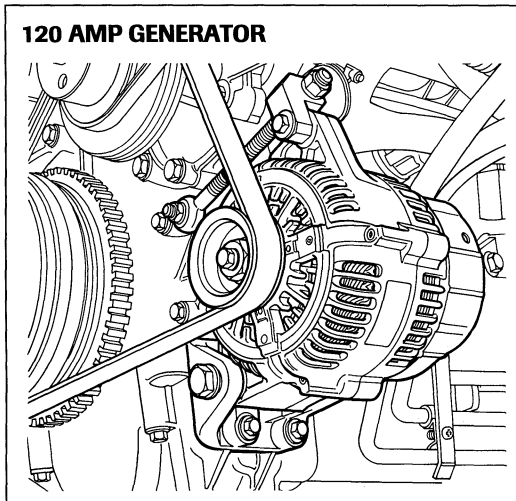


REAR AIR VENTS



Power Supply

The upgraded power supply system introduced in the 1993 model year is retained, with both engines using a 120 amp generator. The 120 amp generator has increased low speed output characteristics to provide an improved battery load balance. A separate load dump module is not required due to the generator's internal overload protection.



Battery tray

The tray for the DIN 66 low maintenance 72 amp hour battery now has a drain tube through the trunk floor.

Wiring Harness and Components

The evolution of the vehicle electrical system continues in an effort to improve reliability and to accommodate new and revised systems and components. The number of components has been reduced and many connectors have been made common with the Sedan Range, resulting in easier servicing.

Harness splices

All harness line splices are ultrasonically welded and covered with heat shrink insulation. Ultrasonic splices provide superior reliability; however, they are permanent and cannot be modified without destroying the splice.

⚠ CAUTION: Do not attempt to repair or modify an ultrasonic splice.

Harness retention

Harness installation along the drive shaft tunnel is greatly improved with the introduction of molded sound deadening material and new floor panels. Harnesses lay in three grooves that run on top of the tunnel and are secured by straps anchored to welded studs.

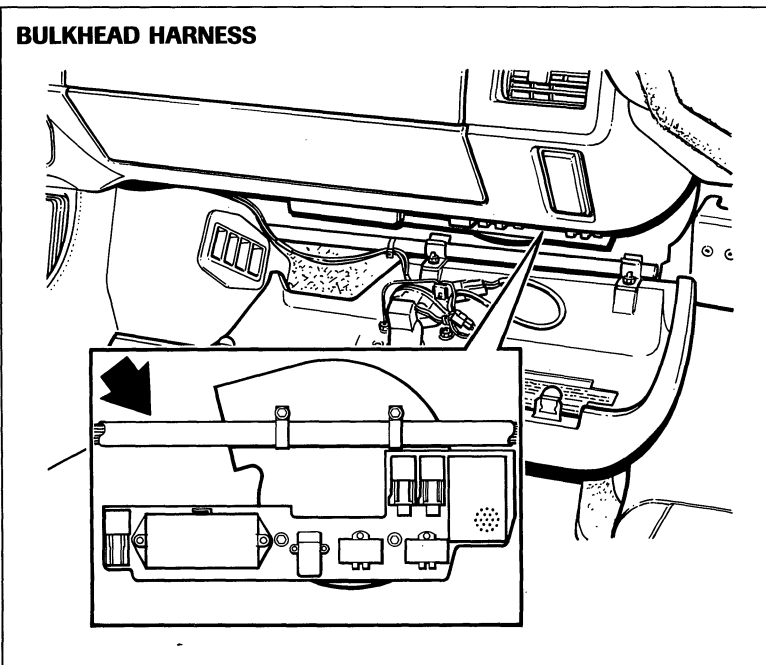
Left Groove: ABS and radio antenna wiring

Center Groove: Main harness

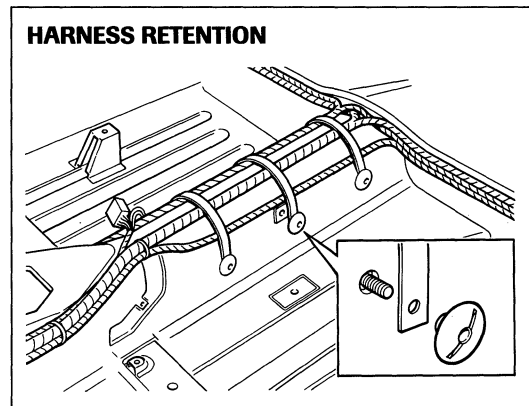
Right Groove: Fuel injection/transmission harness

This arrangement separates the fuel injection/transmission harnesses from the radio antenna cable to reduce the possibility of radio frequency interference.

BULKHEAD HARNESS



HARNESS RETENTION



Bulkhead harness

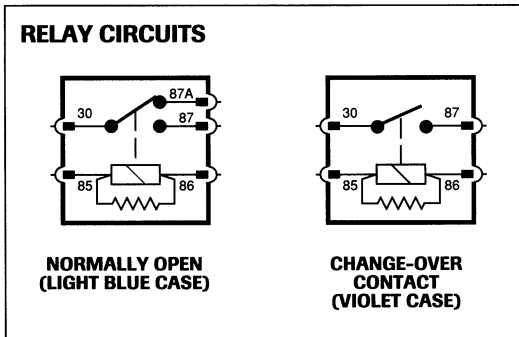
Beneath the fascia, the bulkhead harness is attached to the blower motor housings.

Engine harness

The upper radiator support harness has been deleted due to revisions in fuse placement and harness construction.

Relays

Individual relays incorporating internal transient protection are used wherever possible.



Switches

Steering column stalk switches Illumination of steering column stalk switch graphics has been deleted.

Seat switch packs The door mounted power seat switch packs have been revised to incorporate a sealed 14-way connector.

Facia switches Revised facia switches are identical in construction and operation as previous switches except they are of momentary touch operation to be compatible with the multi-function unit.

Locate lighting

Dimmer module The dimmer module is revised to incorporate an internally mounted anti-back feed diode.

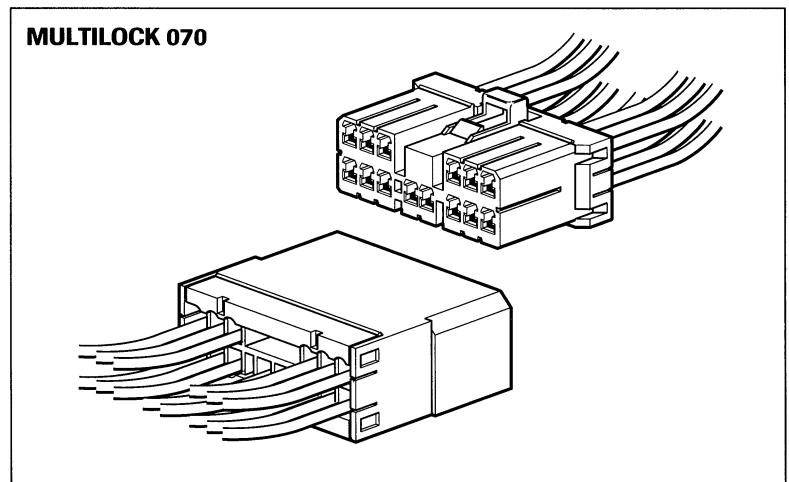
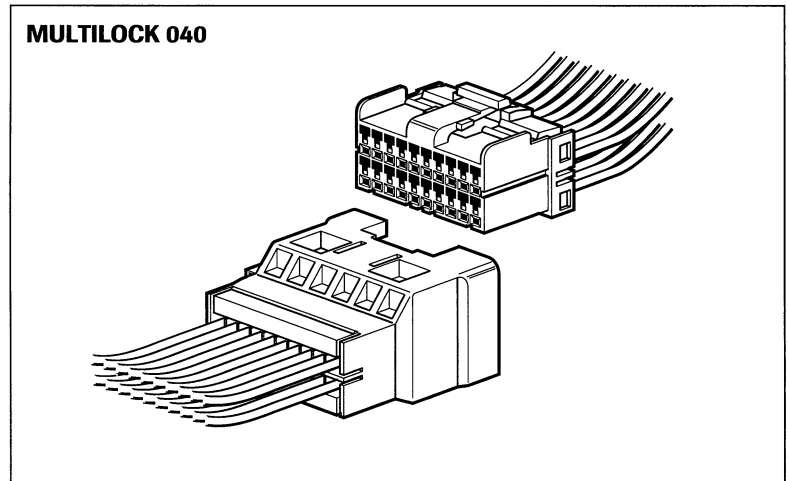
Gearshift illumination The gearshift illumination switch is upgraded with a Multilock connector replacing the previous bullet connector.

Cigar lighter The new cigar lighter features an SAE socket, an improved connector and a glow-ring surround. The cigar lighter has been standardized for all Jaguar ranges.

Connectors

Bullet connectors have been eliminated. The majority of components now use Multilock 040 or 070 connectors. Multilock 040 and 070 connectors are 2- to 20-pin connectors used for both wire-to-wire and wire-to-board connections. Multilock 040 connectors have a current-carrying capacity up to 4.5 amps per contact. Multilock 070 connectors have a current-carrying capacity up to 12 amps per contact. Changed connectors include:

- Speed Interface module
- Speed Sensor
- Door guard light
- Gear selector illumination
- Convertible rear courtesy light



Multi-Function Unit

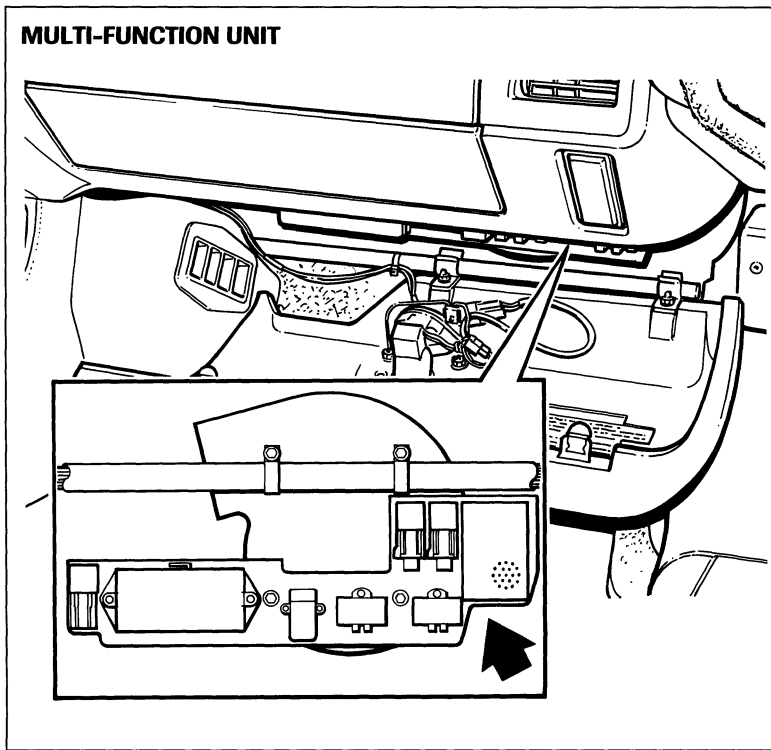
A multi-function unit (MFU) has been added to the electrical system to replace individual controls, simplify the system and increase reliability.

Control functions

The MFU simplifies the control of audible and visual warnings and provides outputs for other system interface. It replaces the following individual components:

- Seat belt warning module
- Interior light delay module
- Bulb check unit
- Lights-on audible warning module
- Heated rear window timer

The MFU is mounted on the right component panel under the passenger air bag.



Multi-Function Unit operation summary

Function	Condition	Warning / Output
Seat belt warning	Driver's seat belt unlatched, ignition ON Driver's seat belt latched, ignition ON	Single chime plus warning light for 6 seconds Warning light only for 6 seconds
Key in ignition	Ignition OFF, key in and driver's door open	Double chime
Lights on	Parking or headlights ON, ignition key out of switch and driver's door open.	Double chime
Bulb check	After ignition switched ON	Low wash, park brake, and brake fluid warning lights ON for 2.5 – 3 seconds
Security	Door open	Output to security system ECM
Heated rear window	Ignition ON, heated rear window switched ON	Indicator light on while window heating is activated (approximately 10 minutes)
Interior light delay	Ignition OFF; key out	Interior lights ON when door is opened. Interior lights OFF in approx. 10 sec after last door closed or ignition switched on
Interior light delay	Ignition ON	Interior lights ON when door is opened for approximately 2 minutes
Interior light delay	Key out	Interior lights OFF in approximately 2 minutes if doors are left open. After doors are closed, timer will reset in approximately 10 seconds.

Multi-function unit fault diagnosis

The MFU unit has a diagnostic facility for operator assisted diagnosis of inputs, outputs and MFU functions.

Input diagnostics The input diagnostics procedure determines if the system inputs are at fault, and verifies the input signals. The procedure is carried out as follows:

To determine if the system inputs are at fault, sit in the car with the doors closed and the seat belts unlatched. Be sure the parking and headlights are off. Press and hold the heated rear window switch. Switch on the ignition, then release the heated rear window switch. If the warning chime does not sound, all system inputs are OK and are not at fault.

To verify if the input signals are OK, latch and unlatch the driver's seat belt. The chime should sound while the belt is latched. Open and close the driver's and passenger's doors separately. The chime should sound while each door is open.

NOTE: The ignition key-in switch signal, ignition ON / OFF signals and heated rear window switch inputs are tested by default.

Output diagnostics The output diagnostic mode and procedure inhibits all inputs and tests output functions only. The heated rear window switch is used to cycle the MFU through its output diagnostic sequence. As each output function is selected, the MFU should operate its circuit loads. If the MFU fails to operate the circuit, a chime will sound. The procedure is carried out as follows:

- 1 Switch on the parking lights. Press and hold the heated rear window switch while switching on the ignition, then release the heated rear window switch. All outputs and warnings should be inactive.
- 2 Touch the heated rear window switch to activate the heated rear window circuit. The heated rear window should energize and the indicator should light. Touch the heated rear window switch to cancel the heated rear window circuit.
- 3 Touch the heated rear window switch to activate the interior lights. The interior lights should switch on. Touch the heated rear window switch to cancel the interior light circuit.
- 4 Touch the heated rear window switch to activate the seat belt warning light circuit. The seat belt warning should light. Touch the heated rear window switch to cancel the seat belt warning light circuit.
- 5 Touch the heated rear window switch to activate the low wash fluid, park brake and brake fluid circuits. The low wash, park brake and low brake fluid warnings should light. Touch the heated rear window switch to cancel the low wash, park brake and brake fluid circuits.

The output diagnostic mode is canceled by switching the parking or headlights lights off.

Exit diagnostics and MFU reset After completing the diagnostic procedure, switch off the ignition to exit diagnostics and reset the MFU.

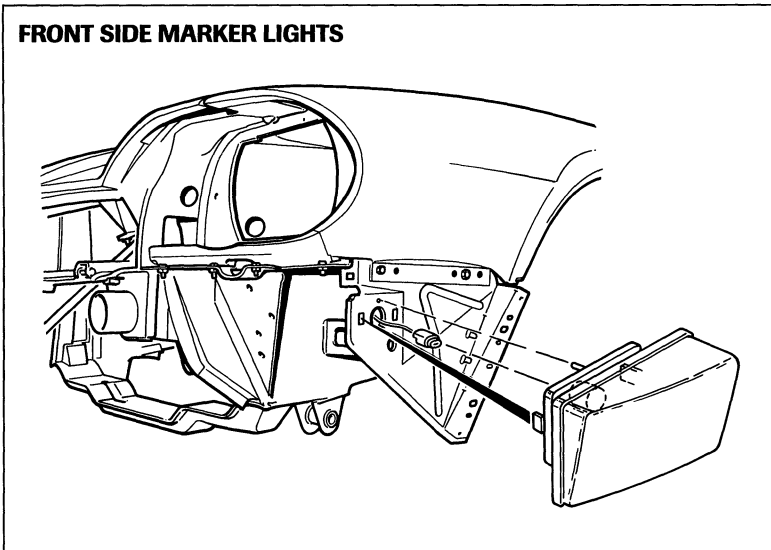
Lighting

Turn signals / side markers

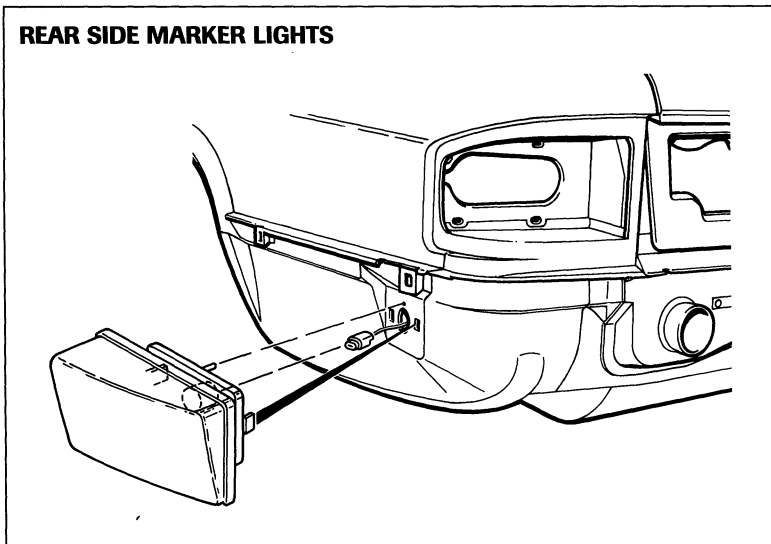
New front and rear turn signal and side marker lights are styled to match the design of the revised bumpers. Replacement of the side marker or rear reflector assemblies requires removal of the moulded polyurethane bumper cover. The lights themselves mount to the body with integral clips. Bulb access is through the wheel arch access doors at the front and behind the trunk panels at the rear. The bulb holders twist to remove.

Front turn signal lights are restyled but are serviced as in previous years by removing the two screws on the face of the light then twisting the bulb holder to remove the bulb.

FRONT SIDE MARKER LIGHTS



REAR SIDE MARKER LIGHTS



Bulbs

Long-life krypton-gas filled bulbs are smaller in size and provide greater illumination combined with extended service life. These bulbs are specified for the following locations:

- Turn signals
- Stop / tail lights
- Reverse lights
- High mount stop lights
- Side marker lights

Six new conventional bulbs are also specified:

- Door guard lights 12V 5W Festoon 239
- Interior light: upper 12V 5W Capless 286
- Map light 12V 5W Halogen 468
- Rear side int. light (Conv) 12V 10W Festoon 265
- Fog light: front 12V 55W Halogen 479 H2
- Sun visor vanity mirror 12V 1.2 Capless 286

Audio System

Speaker system: Convertible 2+0

The two-place convertible is equipped with six speakers. The two door speakers and rear bass speakers are located the same as in 1993. Two additional speakers are added to the rear, one in each rear quarter. The 2+2 convertible has a four-speaker system.

Antenna assembly

The previous automatic radio antenna is replaced with a new simplified unit. The new antenna features more positive electrical and coaxial connections with the time delay function built into the unit. Installation remains the same, with mounting brackets altered for the new unit.

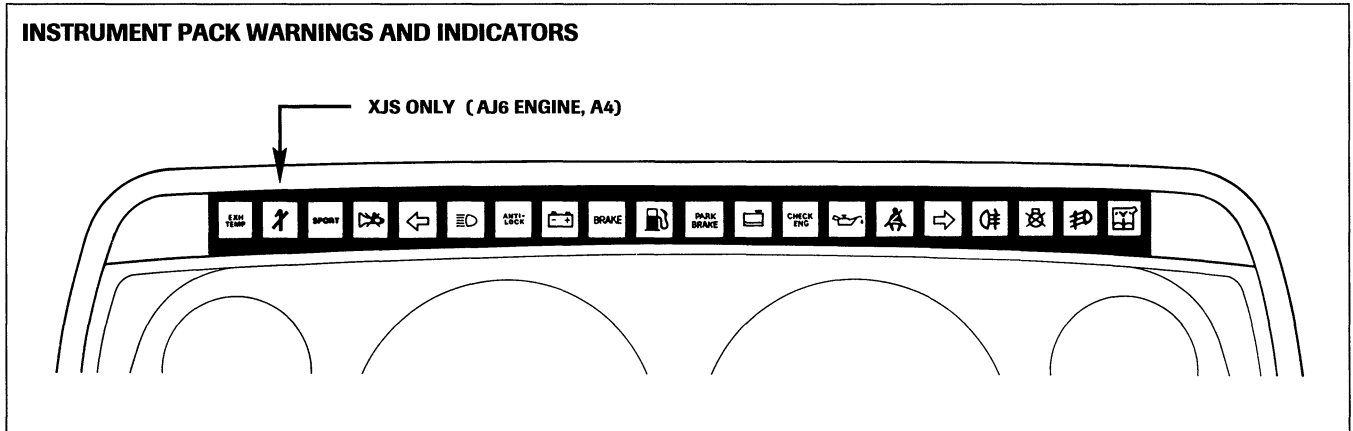
Instrument Pack

Warning and indicator lights

Instrument pack warning and indicator lights have changed to incorporate the DELETE FIRST function of the three mode ZF 4HP 24E automatic transmission. Other warning lights have been rearranged along with their respective connector pin allocations.

Non-interchangeable

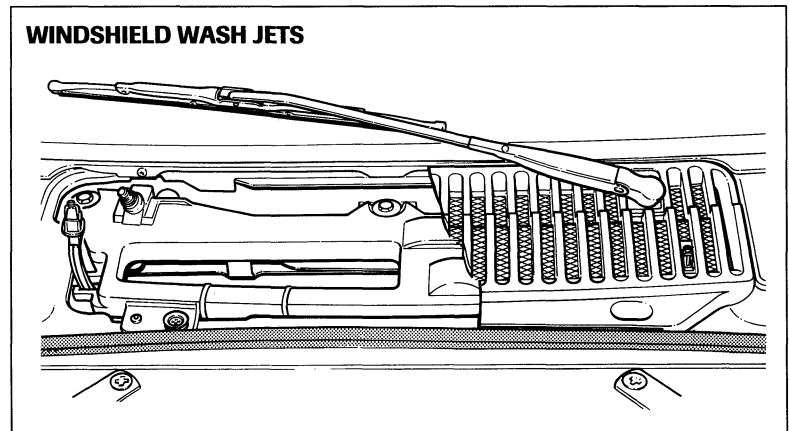
The new instrument pack is not electrically interchangeable with earlier versions. The flexi-circuit is colored green to identify it from the earlier blue units.



Power wash system

Power wash jets

The power wash system has self regulating, PTC (positive temperature coefficient) heated jets. This system eliminates the previous need for ambient air temperature sensor control of the heated jets. The new jets are fitted to the windshield wash and headlight power wash systems.

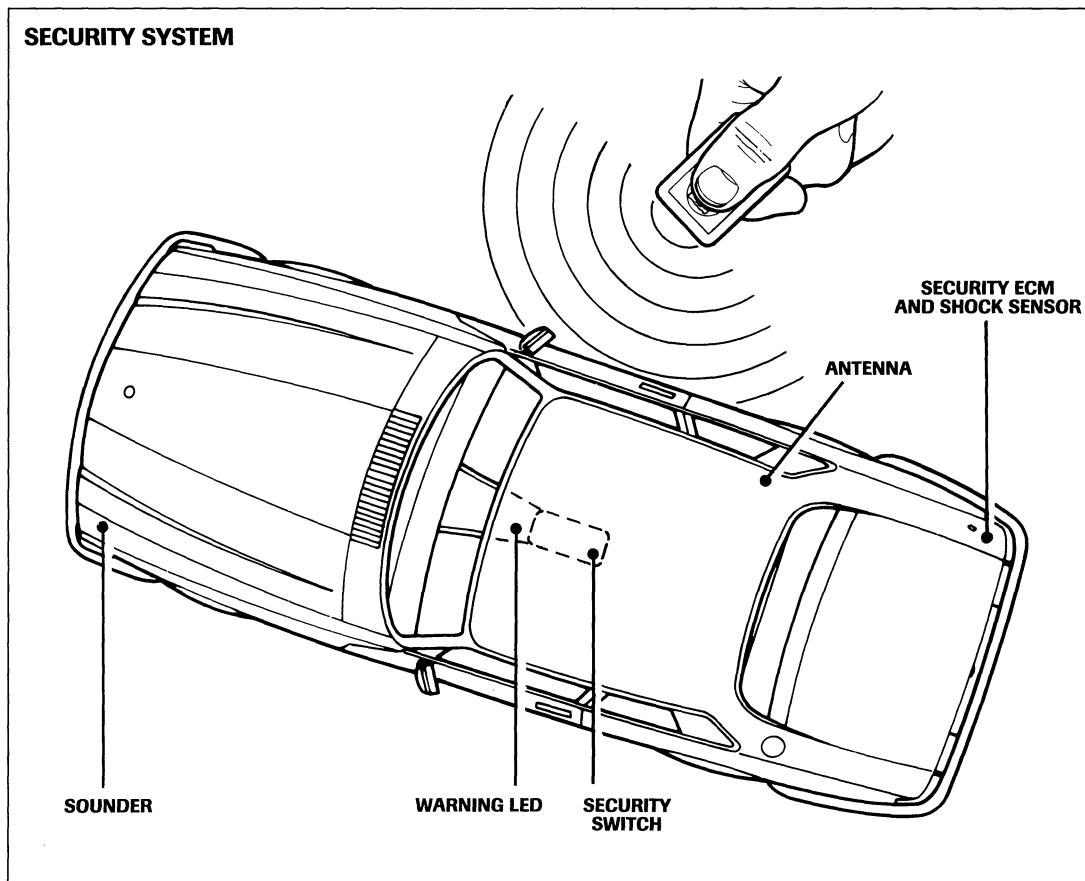


Security System

The factory integrated security system fitted in the 1994 XJS Range is derived from the system introduced in the 1993 Sedan Range.

System layout and features

The new XJS security system provides both audible and visual alarms. In addition to the standard security and convenience features, the system can be equipped with a shock sensor. The system is supplied with two radio frequency (RF) key fob transmitters.



Audible and visual alarms (FULL ALARM) The audible alarm is an intermittent siren and quiet zone lasting 90 seconds, then repeating twice. The visual alarm consists of flashing the headlights (low beams), the side lights and tail lights, the turn signals, and the interior lights. Other alarms and warning tones are explained on page 49.

Standard features Standard system features include: remote lock/unlock, engine starter disable, transmitter signal received indicator (chirp and side lights flash), security OFF reminder tone, quiescent current shutdown, alarm restart (battery removed) and emergency disarm procedure.

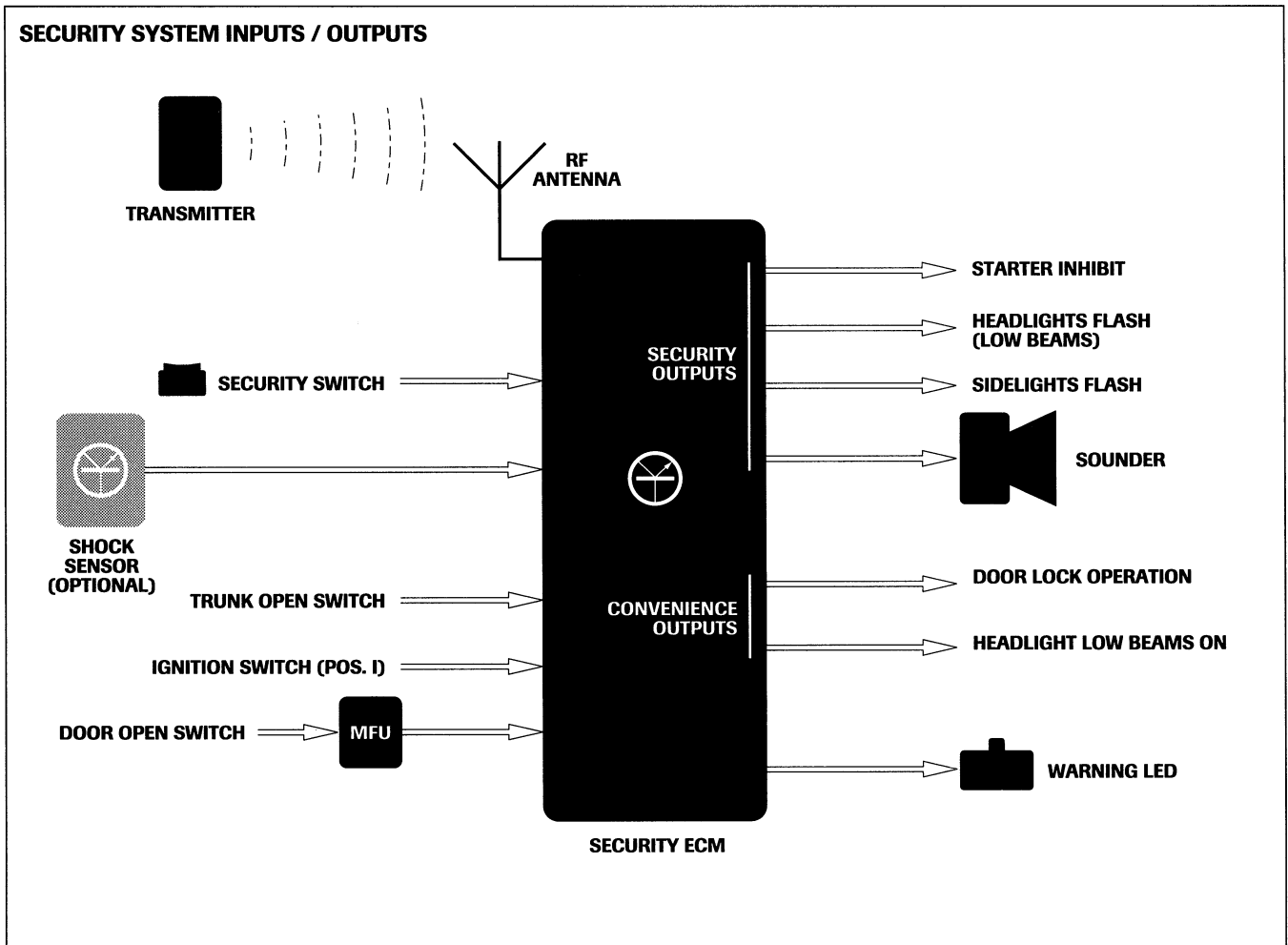
Dealer-programmable standard features The following programmable features are initially enabled:

- Active arming
- Audible confirmation of transmission
- Remote headlight convenience
- Remote panic alarm

At the customer's option, active arming can be changed to passive arming and the remaining features can be disabled, both by the dealer, using JDS.

Dealer-installed accessory security features

Shock sensing is a dealer-installed feature requiring additional parts.



Inputs to the security ECM The ECM receives inputs from the following sources:

- Door open switches (via Multi-Function Unit)
- Trunk open switch
- Ignition switch (position I)
- RF transmitter (via antenna)
- Security switch
- Shock sensor (optional)

Vehicle function control The ECM controls the following vehicle functions:

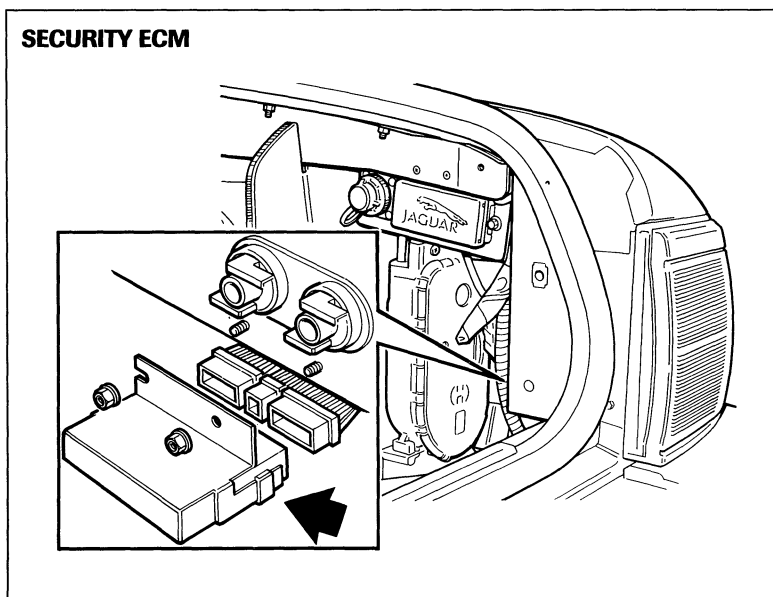
- Starter inhibit
- Central door locking
- Headlights ON (low beams)

Outputs from the security ECM The ECM outputs to the following systems and components:

- Headlights flash (low beams)
- Side lights flash
- Horn sounding
- Security system sounder tones
- Warning LED

Security System (continued)**Security system components**

Security system ECM The system is built around the microprocessor based security ECM, which interfaces with vehicle inputs and outputs, controls vehicle functions and interfaces with the remainder of the security system. All of the interfaces and functions are microprocessor controlled by the security ECM software. Located in the right rear corner of the trunk, the ECM is the RF receiver for the system. The ECM connects to the serial communications data link for diagnosis and programming.



Shock sensor The dealer-installed accessory shock sensor detects impacts or jarring motions and inputs directly to the security system ECM. The shock sensor is located beside the security system ECM.

Key fob RF transmitter The transmitter has a single button to operate all system functions. Since it is an RF transmitter, it does not have to be aimed at the vehicle. The nominal range of the transmitter is approximately 50 feet. This is made possible by an integral coaxial antenna located in the vehicle harness. Note that the transmitter range will vary with environmental conditions and transmitter battery voltage.

Security switch The security switch, located in the center console storage box, operates only when the system is disarmed. In the OFF position, the switch will inhibit the operation of the security system and allow remote lock/unlock and headlight convenience only.

IMPORTANT: Initial production 1994 vehicles will not be equipped with a security switch.

Warning LED The red LED is located on the cigar lighter bezel. The LED flashes once every four seconds when the security system is armed, or when the system locks the doors in the security OFF mode.

Sounder The sounder is a powerful speaker located to the rear of the left headlight.

Operating the security system

The basic operation of the security system requires a single press of the transmitter that will cause the system to lock and arm the vehicle, or to unlock and disarm the vehicle.

Prior to locking and arming, the system emits a short chirp, flashes the side lights once and inhibits the engine starter circuit. The system performs a self-test. When the vehicle is unlocked and disarmed, the system emits two chirps, flashes the side lights twice and clears starter inhibit. If the system detected a fault during the self-test, it will emit a third chirp and visual flash when disarmed.

Remote headlight convenience Pressing the transmitter for a second time within three seconds of locking and arming will activate the headlight low beams for 25 seconds. Remote headlights are a standard feature.

Remote panic alarm A maintained press of the transmitter for six or more seconds (other than within three seconds of locking and arming) will activate the system panic alarm. This alarm is the same as the full alarm and will continue for five times the duration of the full alarm or until the ignition is switched to position I. Panic alarm is a dealer-programmable function that can be disabled at the customer's option.

Security functions

In addition to monitoring the ignition, door and trunk switches, the security system supplies a number of other features.

Starter inhibit When the system is armed, the security ECM inhibits the engine starter by "opening" the circuit to the starter relay. The circuit is completed only when the security system is disarmed.

Passive arming (automatic arming) The security system will automatically arm if the vehicle is left with the ignition off and the doors and trunk closed for more than 30 seconds. The doors will not automatically lock when the system passively arms. To disarm a passively armed vehicle requires that the transmitter be pressed or the ignition switched on. Passive arming is a dealer-programmable function that can be disabled at the customer's option.

Alarms and warning tones The system provides several warnings and alarms:

ERROR TONE The error tone is a high pitched tone emitted when the transmitter is pressed to arm the system while one or more of the following conditions exist:

- a door or doors are open; the trunk is open
- the ignition is on
- a door has not been closed since the ignition was switched off.

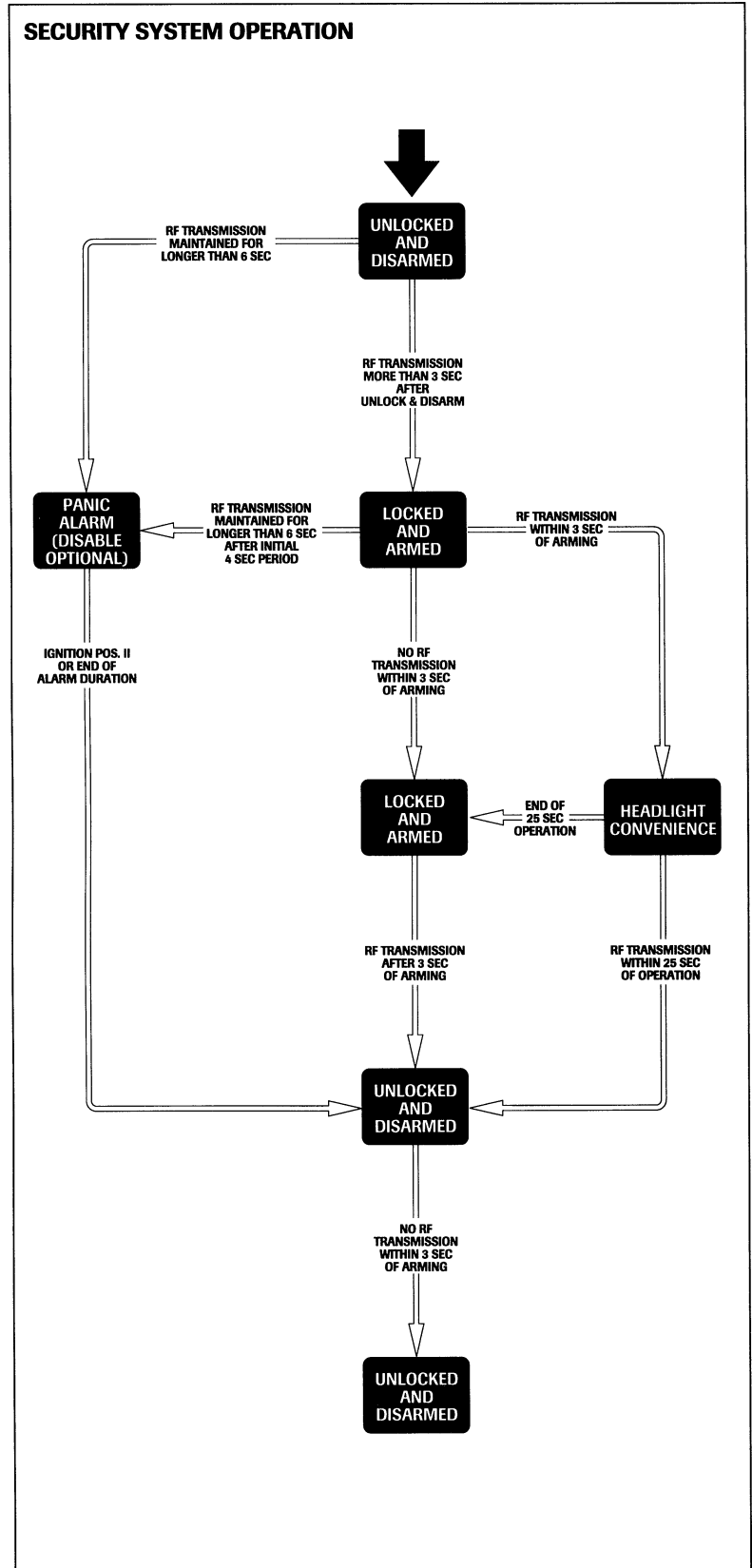
DOOR UNLOCK WARNING The door unlock warning is a repeated chirping tone emitted if a door is unlocked using the key after the system has been actively armed, or if the central locking fails.

ESCALATING RESPONSE An alarm tone that gradually gets louder over its seven-second duration is the second warning that the system is actively armed and a door is opening. If the system is not disarmed during this seven second period, the system will activate the full alarm.

AUDIBLE TICKING A ticking tone that has a 15-second duration audible ticking is equivalent to the escalating response when the system has been passively armed. If the system is not disarmed during this 15 second period, the system will activate the full alarm.

FULL ALARM The full alarm is the combined audible and visual alarm.

SECURITY SYSTEM OPERATION



Security System (continued)

Security functions (continued)

Emergency disarm If the transmitter is inoperative or is lost, the system can be disarmed by cycling the ignition switch ON/OFF three or more times within 15 seconds of a door being opened.

Alarm restart If, while the system is armed, the battery is disconnected during or after a full alarm, the system will automatically rearm and reinstate the full alarm when the battery is reconnected. Starter inhibit will be maintained. The system then must be disarmed using either the transmitter or the emergency disarm procedure. This feature prevents defeat of the system by disconnection of the battery.

Anti-scan If the system receives more than 10 different RF transmissions within a short period of time (approximately one minute), the security system will not disarm for approximately one hour. This feature prevents defeat of the system by thieves employing frequency scan.

Quiescent current shutdown

If the security system remains armed for an extended period, the system will initiate a phased shutdown to reduce quiescent current (current drain) and extend the life of the battery. After 28 days, the ECM will switch off the RF receiver. The vehicle must then be unlocked manually. When the driver returns to the vehicle, the manual unlocking of the vehicle will cause the RF receiver to be reinstated and allow the system to be disarmed using the transmitter.

Programming the ECM

The ECM is programmed by the dealer using JDS software issue DBC 4065.

Coding for new transmitters

Two transmitters are supplied with each vehicle; however, the system may be coded for use with up to five transmitters. If new or additional transmitters are requested, the system must be recoded with all of the transmitters for the vehicle at hand (from one to five transmitters). Coding for new transmitters is accomplished using the JDS set-up procedure.

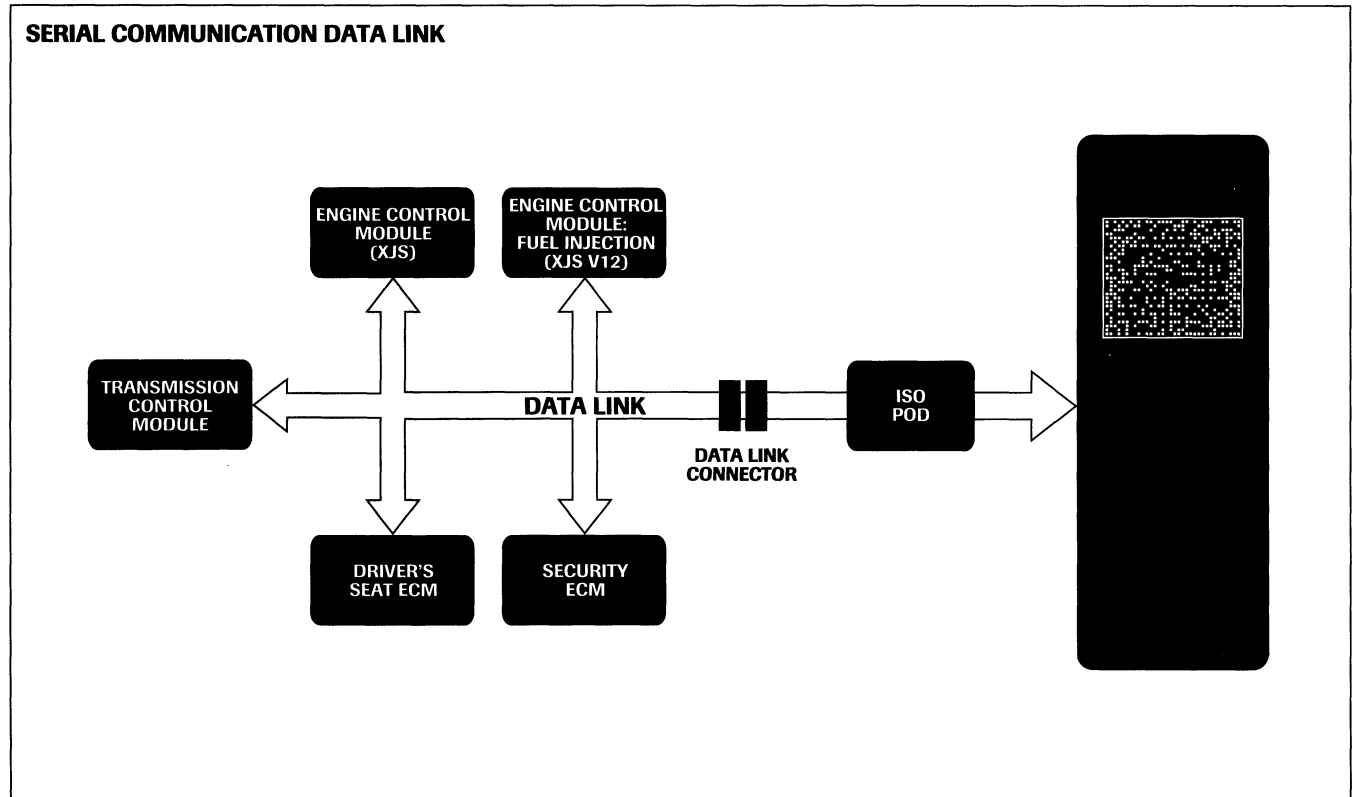
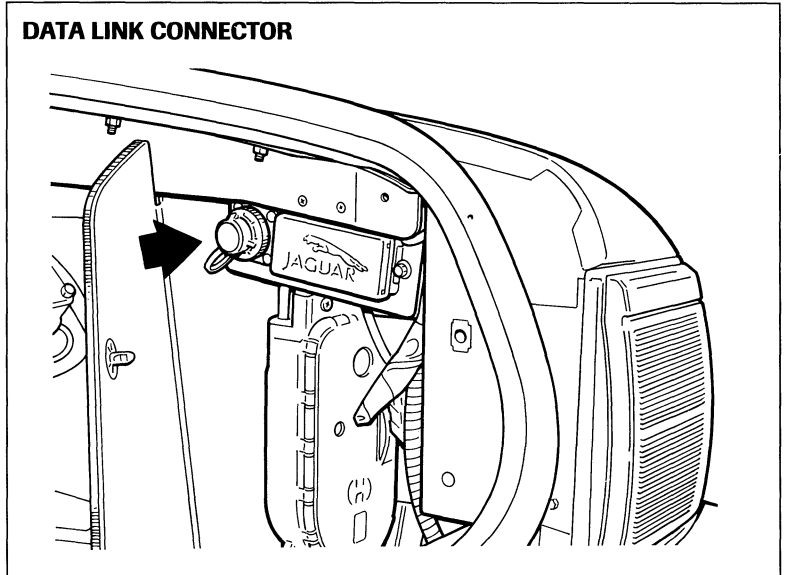
Serial Communication

The 1994 XJS Range incorporates a serial communication data link for communication with many of the vehicle control modules. The Data Link Connector (DLC) is located in the trunk behind the right rear side panel. Serial communication is used for Diagnostic Trouble Code (DTC) retrieval, fault diagnosis and programming optional features on the security system.

The vehicle control modules on the serial communication data link are as follows:

- Engine control module (XJS)
- Engine control module: Fuel Injection (XJS V12)
- Transmission control module
- Driver's seat ECM
- Security system ECM

The ABS and Climate Control systems have individual diagnostic connection.



Fuse Identification and Location**Left fuse panel**

Number	Color	Value	Circuit
1	Lt. Blue	15A	Driver's seat movement - fore, aft, lumbar
2	Tan	5A	Cruise control
3	Yellow	20A	Left blower
4	Tan	5A	Radio memory
5	Red	10A	Radio power
6	Tan	5A	Interior lights
7	—	—	Not used
8	Red	10A	Windshield washer pump
9	Red	10A	Driver's seat heater
10	—	—	Not used
11	Red	10A	Trunk lighting
12	Yellow	20A	Driver's seat movement - recline
13	Tan	5A	Trip computer memory; gear shift interlock
14	Tan	5A	Power mirrors; door switch packs; seat memory
15	Tan	5A	Heated washer jets
16	Tan	5A	Trip computer speed interface; gear shift interlock
17	Tan	5A	Rear fog lights
18	Orange	7.5A	Locate lighting; instrument pack lighting
19	Red	10A	Hazard warning; seat belt logic
20	—	—	Not used
21	—	—	Not used
22	Lt. Blue	15A	Heated Rear Window

Right fuse panel

Number	Color	Value	Circuit
1	Lt. Blue	15A	Passenger's seat movement - fore, aft, lumbar
2	Red	10A	Central locking
3	Yellow	20A	Right blower
4 *	Tan	5A	Air conditioning compressor relay
4 **	Tan	5A	Air conditioning compressor relay; supplementary air valve
5	Lt. Blue	15A	Horns
6	Brown	7.5A	Turn signals
7 *	Red	10A	Engine management system main relay
7 **	Lt. Blue	15A	Fuel injection main relay; ignition system power
8	Lt. Blue	15A	Windshield wash/wipers (logic module)
9	Red	10A	Passenger's seat heater
10	Tan	5A	Transmission memory
11	Lt. Green	30A	ABS ECM
12	Yellow	20A	Passengers seat movement - recline
13 *	Red	10A	Purge valve; air injection
13 **	Red	10A	Purge valves; air injection; hot start
14 *	Tan	5A	Engine management system memory
14 **	Tan	5A	Fuel injection memory
15	Tan	5A	Climate control (ECM and control circuit)
16	Red	10A	Cigar lighter
17	Lt. Green	30A	Headlight power wash

* XJS (AJ6 engine)

**XJS V12 (V12 engine)

Fuse Identification and Location

Right fuse panel (continued)

Number	Color	Value	Circuit
18	Lt. Blue	15A	Not used
19	Lt. Blue	15A	Stop lights
20 *	Yellow	20A	Engine management system power
20 **	Tan	5A	Transmission (shift solenoids) power
21 *	Red	10A	Transmission power
21 **	Tan	5A	Transmission control module power
22	Lt. Green	30A	ABS Pump

Left front fuse panel

Number	Color	Value	Circuit
1	Lt. Blue	15A	Not used – USA; daytime running lights – Canada
2	Lt. Blue	15A	Front Fog Lights
3	–	–	Not used
4 *	Red	10A	Auxiliary cooling fan
4 **	Lt. Green	30A	Auxiliary cooling fan
5	Red	10A	Left headlight high beam
6	Red	10A	Right headlight high beam
7	Tan	5A	Left front side lights
8	Tan	5A	Right front side lights
9	Brown	7.5A	Left headlight low beam
10	Brown	7.5A	Right headlight low beam
11	–	–	Not used
12	Tan	5A	Not used

Right rear fuse panel

Number	Color	Value	Circuit
1	Tan	5A	Cellular telephone power
2 *	–	–	Not used
2 **	Yellow	20A	Fuel pump B
3	–	–	Not used
4	Tan	5A	Right tail, right license plate lighting
5 *	–	–	Not used
5 **	Yellow	20A	Fuel injection power
6	Tan	5A	Cellular phone memory
7	Tan	5A	Reverse lights
8	Tan	5A	Serial communications data link
9	Red	10A	Oxygen sensor heater(s)
10	Red	10A	Radio antenna
11	Orange	7.5A	Security system
12 *	Yellow	20A	Fuel pump
12 **	Yellow	20A	Fuel pump A

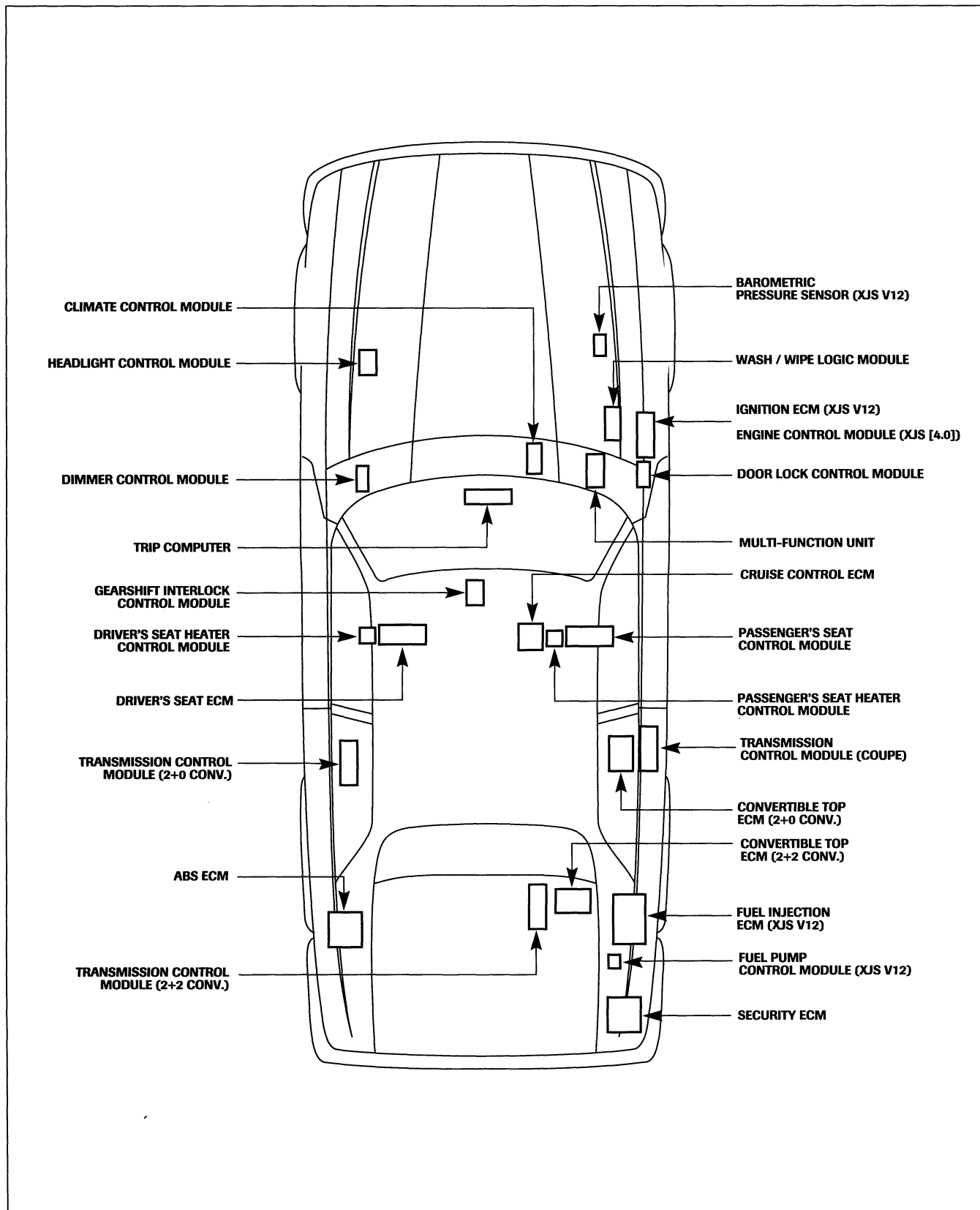
Left rear fuse panel

Number	Color	Value	Circuit
1	Tan	5A	Trailer left tail lighting
2	Tan	5A	Trailer right tail lighting
3	Tan	5A	Right tail, right license plate lighting

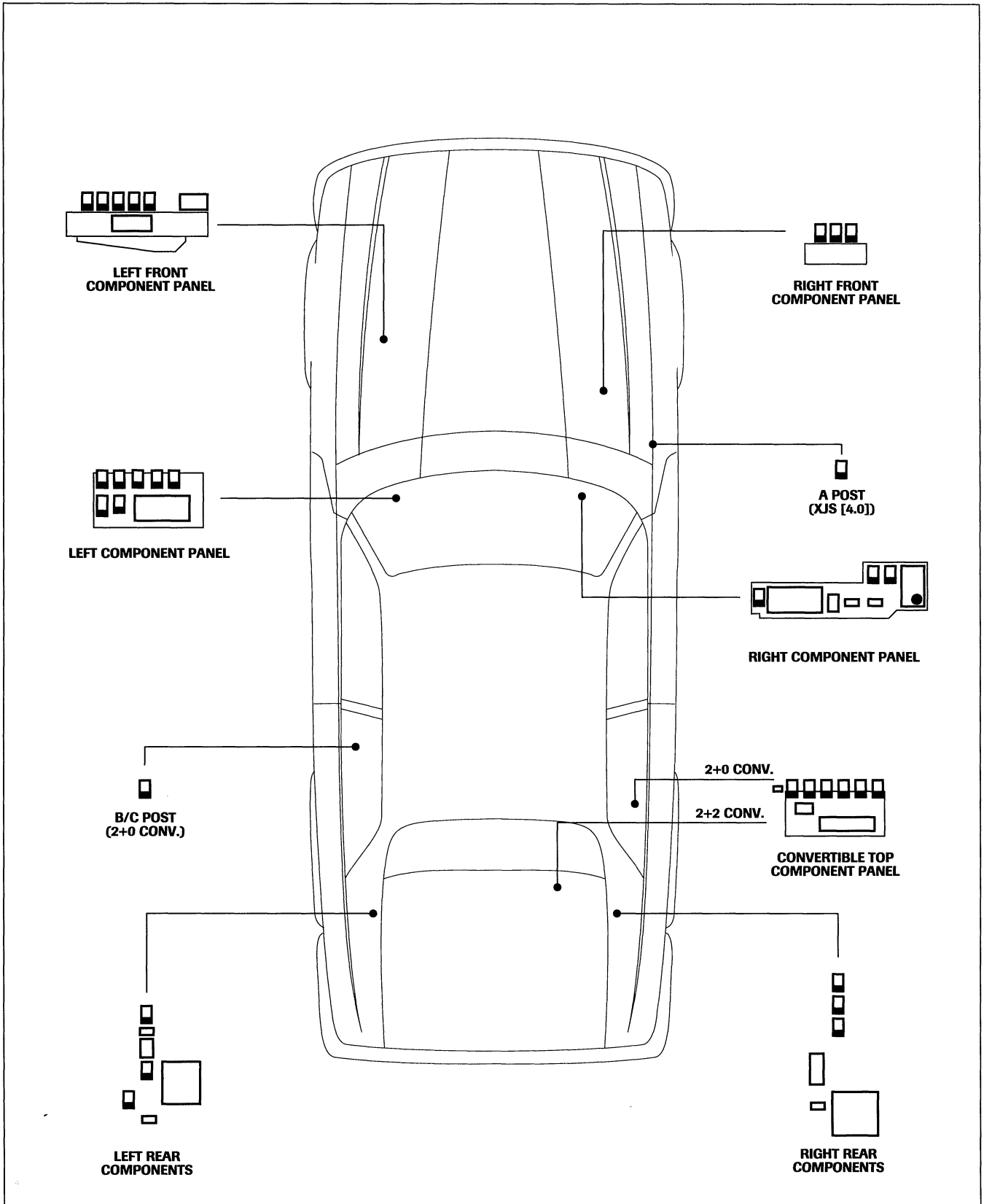
* XJS (AJ6 engine)

**XJS V12 (V12 engine)

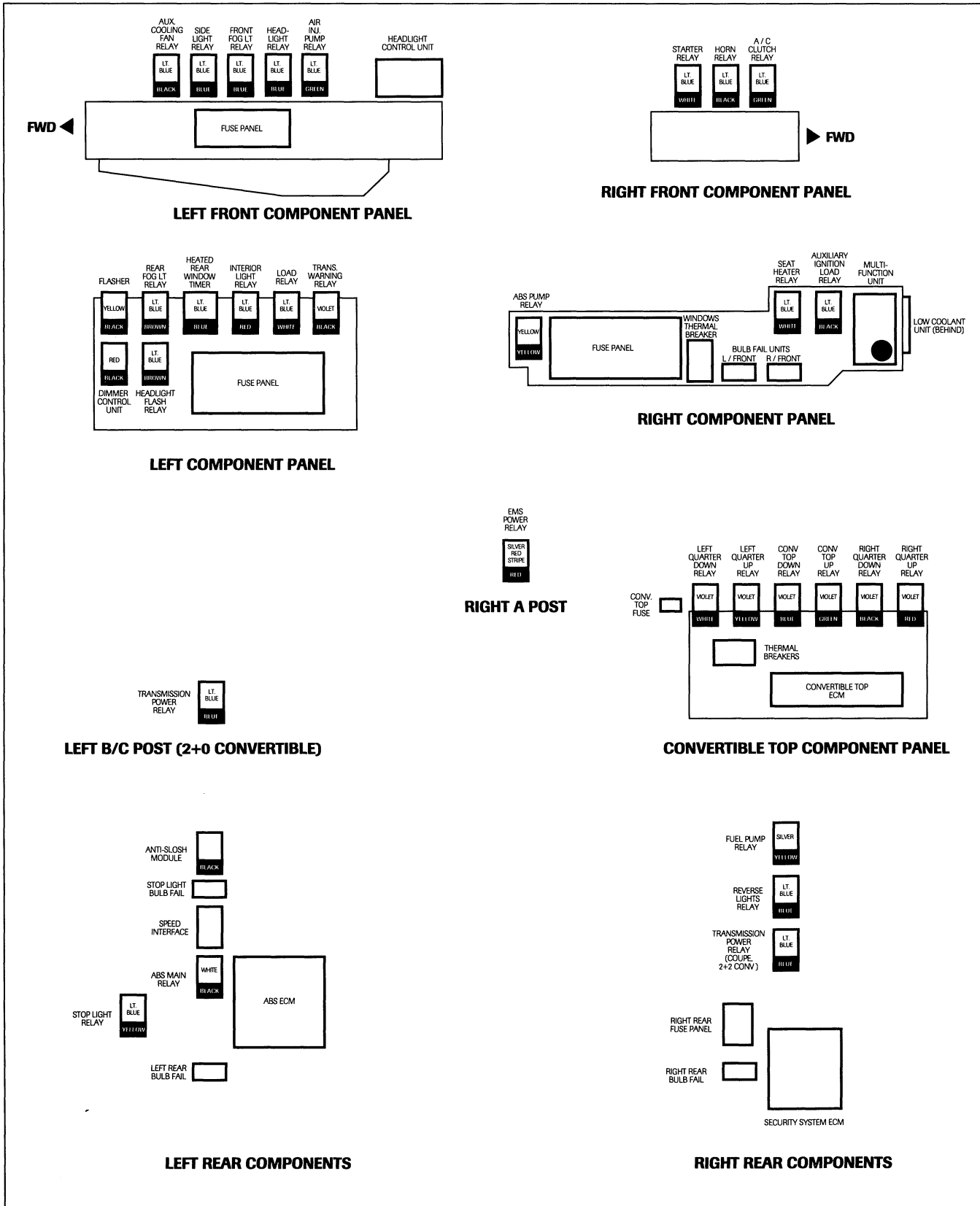
Vehicle Control Module Identification and Location



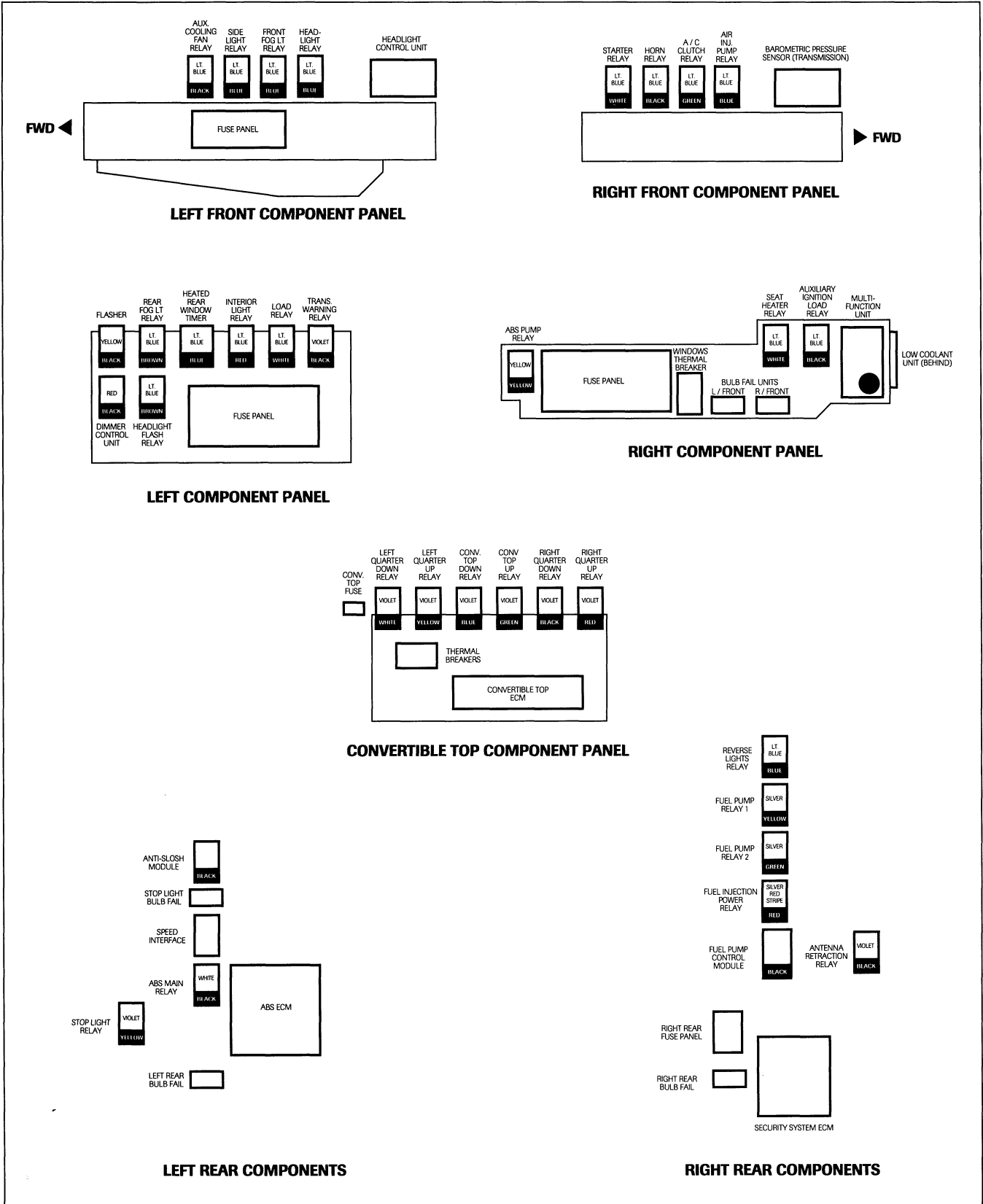
Component Panel Location — see pages 56 - 57 for detailed relay identification



Relay Identification and Location: XJS (4.0)

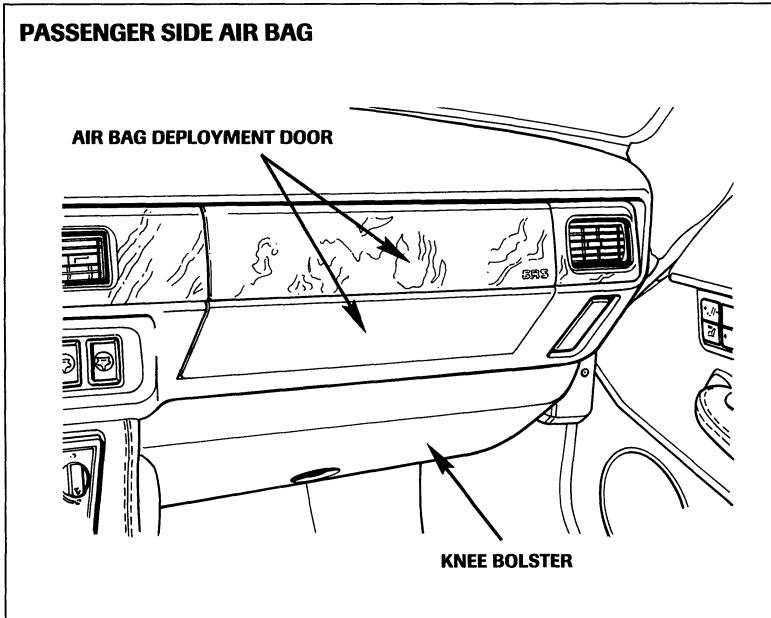


Relay Identification and Location: XJS V12



Passenger Supplementary Restraint System

The air bag supplementary restraint system (SRS) is now standard for both driver and front seat passenger. The driver's system is continued from the 1993 model year. The front seat passenger's supplementary system consists of an additional air bag module, a passenger side under-dash knee bolster and a revised seat belt with a tear loop buckle.



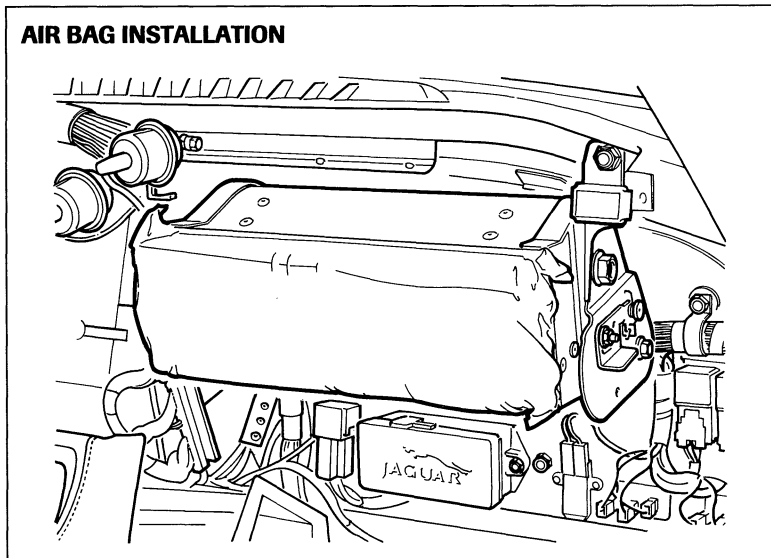
Passenger air bag

The new front passenger air bag is a separate unit with an integrated inflator/sensor assembly similar to the driver's side air bag module. The passenger's air bag module is larger than that required for the driver. It is installed behind a veneer-faced deployment door in the area previously used for the glove box. When the system is activated, the air bag emerges by opening the deployment door and splitting the perforated veneer as it deploys.

⚠ WARNING: Refer to technical bulletins and the XJS repair manual for safety precautions before handling or servicing any Jaguar air bag.

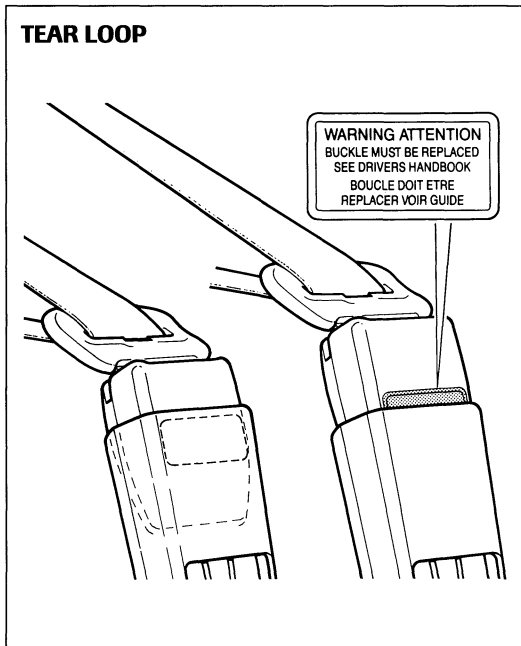
Passenger knee bolster

The passenger knee bolster is designed to function with the air bag and tear loop seat belt. The three components are necessary to complete the passenger supplementary restraint system (SRS). In order for the SRS to function properly, it is vital that the knee bolster be clipped in place correctly.



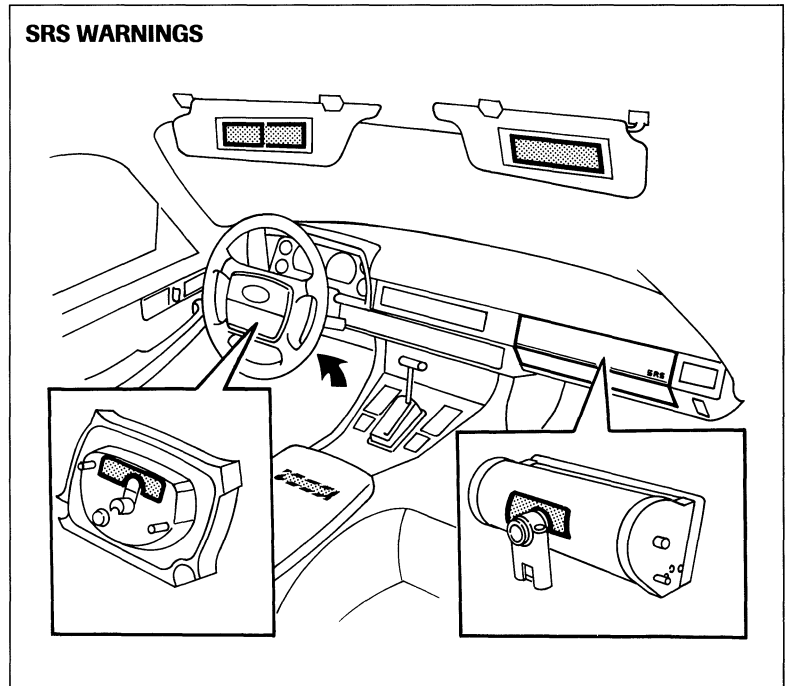
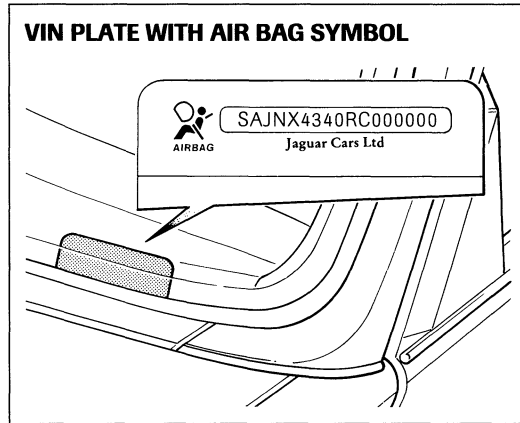
Front passenger seat belt tear loop buckle assembly

The front passenger seat belt incorporates a tear loop seat belt buckle to reduce chest loads in the event of a vehicle collision. Should any part of its warning label become visible, the buckle assembly must be replaced. The tear loop buckle rating for the XJS is unique to the range and is not interchangeable with the Sedan Range tear loop buckle. Therefore, if replacement is required, replace only with the correct XJS tear loop seat buckle assembly.



XJS SRS recognition

Warning and service labels have been placed on the vehicle and components so that vehicles with air bags can be readily identified.





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