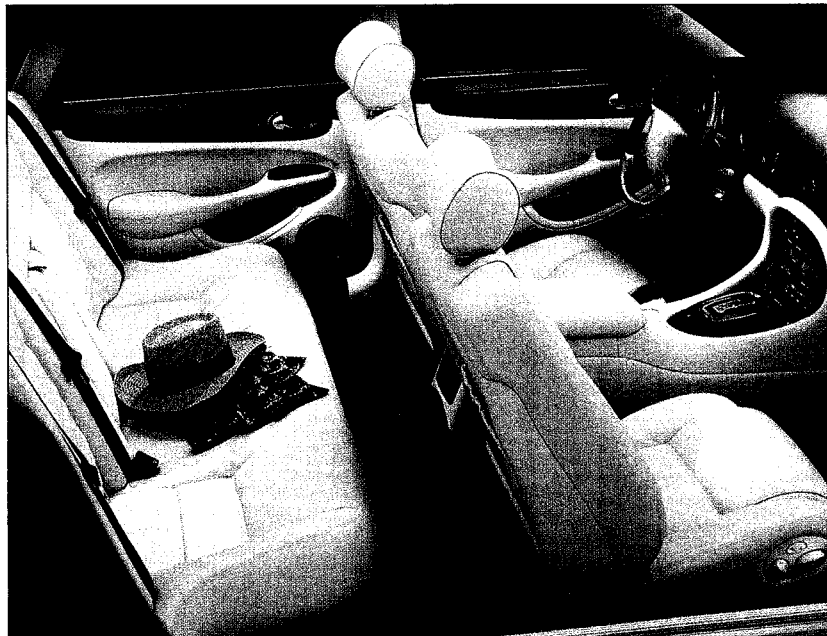




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## Technical Guide

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# V8 XJ Series Sedan 1998 Model Year Introduction

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BY APPOINTMENT TO  
HER MAJESTY QUEEN ELIZABETH II  
MANUFACTURERS OF DAIMLER AND JAGUAR CARS  
JAGUAR CARS LIMITED COVENTRY



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HER MAJESTY QUEEN ELIZABETH  
THE QUEEN MOTHER  
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BY APPOINTMENT TO  
HIS ROYAL HIGHNESS THE PRINCE OF WALES  
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## Technical Guide

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# V8 XJ Series Sedan 98 Model Year Introduction

## V8 XJ Series **Preface**

This Technical Guide gives the 1998 Model Year changes for the V8 XJ Series sedan range. It is intended to give Jaguar Dealer workshop personnel an overview of the changes and is for information purposes only.

The contents of this Technical Guide must not be used as a reference source for servicing procedures; all servicing procedures must be in accordance with the appropriate Service Manual.

This Technical Guide will not be updated. While every effort is made to ensure accuracy, changes may occur between going to press and the vehicle being introduced to the market. Once the vehicle is in service, details of changes can be obtained from Service Bulletins and revisions to the Service Manuals.

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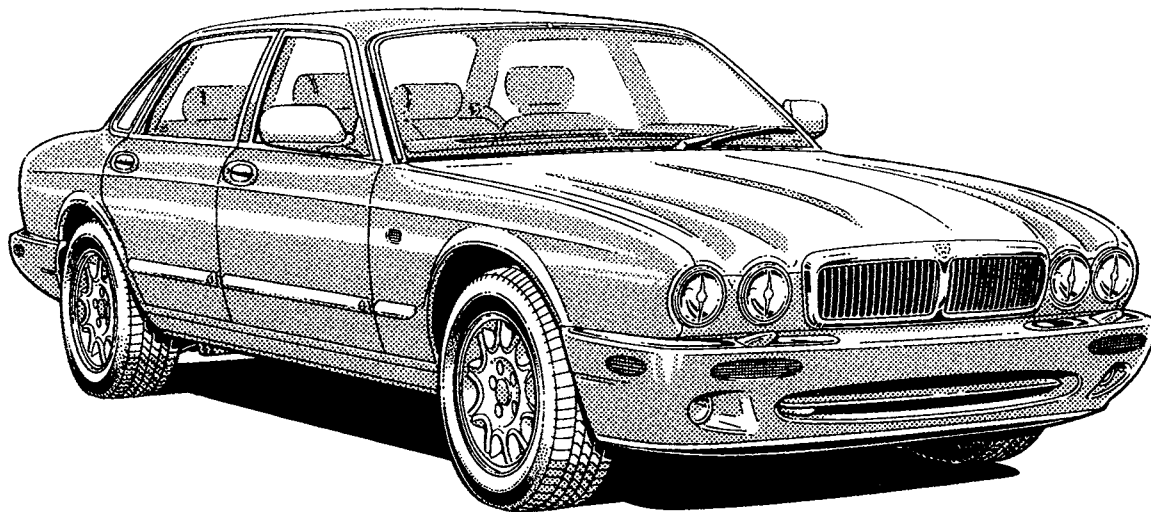
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The following abbreviations are used in this document

Abbreviation	Description	Abbreviation	Description
A/C	air conditioning	RH	right-hand
A/CCM	air conditioning control module	RPM	revolutions per minute
ABS	anti-lock braking system	SAE	society of automotive engineers (USA)
AIT	air intake temperature	SC	supercharged
BDC	bottom dead centre	SCP	(FORD)standard corporate protocol
BHP	brake horse power	SLCM	security and locking control module
BPM	body processor module	SPS	single point sensor
CAN	controller area network	SRS	supplemental restraint system
°C	degree Celsius	SWB	standard wheel base
CD	compact disk	TA	traffic announcement
DI	direction indicator	TCM	transmission control module
DIN	Deutsche Institut für Normung	TDC	top dead centre
DTC	diagnostic trouble code	UK	United Kingdom
ECM	engine control module	USA	United States of America
ECT	engine coolant temperature	VVT	variable valve timing
EGR	exhaust gas recirculation		
EMS	engine management system		
EVAP	evaporative emission		
EWB	extended wheel base		
°F	degree Fahrenheit		
HMSL	high-mounted stop lamp		
H02S	heated oxygen sensor		
IAT2	intercooler intake air temperature sensor		
ICE	in-car entertainment		
ISO	International Standards Organisation		
kg	kilogram		
km/h	kilometres per hour		
KTCM	key transponder control module		
kW	kilowatt		
lbf.ft	pound force feet		
LED	light emitting diode		
LH	left-hand		
MAFS	mass air flow sensor		
mph	miles per hour		
mm	millimetre		
MY	model year		
NAS	North American specification		
NA	normally aspirated		
ORVR	on-board refueling vapor recovery		
O2S	oxygen sensor		
PAS	power assisted steering		
PDU	portable diagnostic unit		



### General

This Model Year introduces a major update of the XJ Series sedan. Although externally little has changed, extensive changes are incorporated into the body structure to accommodate new power trains. Most systems have been overhauled, with emphasis placed on increasing commonality with the components and operation of the related systems in the XK8.

New engines providing improved performance, economy and refinement are combined with new transmissions providing improved shift quality and flexibility. These are complemented by the introduction of a new driveshaft and new final drive unit. Handling and ride refinement are enhanced by upgraded braking and stability/traction control systems, variable ratio steering and extensive changes to the suspension, including an all new front suspension. New electrical and multiplex communication systems are introduced to reduce the weight and complexity of vehicle harnesses.

The cabin interior maintains the Classic or Sport theme, depending on model, while incorporating an all new fascia and revised model differentiation. Interior freshening is further promoted by a new center console and cubby box lid, restyled one-piece door casings, a restyled steering wheel center pad and a revised gear shift lever and surround. Driver benefits include a new radio cassette with integrated telephone controls and additional fore/aft seat travel.

Exterior freshening includes styling changes to the lamps, bumpers and headlamp powerwash jets, and the introduction of new wheel designs. External dimensions are effectively unchanged by this Model Year update.

## Model Line Up

Model	Engine Size (Liters) and Wheel Base
XJ8	4.0 NA, SWB
XJ8 L	4.0 NA, EWB (only available in USA)
XJR	4.0 SC, SWB (not available in Mexico)
Vanden Plas	4.0 NA, EWB

## Vehicle Features

The features of the XJ Sedan range include those items detailed below.

**N = Not Available; O = Optional; X = Standard**

Feature	Applicability			Vanden Plas
	XJ8	XJ8 L	XJR	
Air conditioning	X	X	X	X
Automatic headlamps	X in Mexico and USA N in Canada	X	X in USA N in Canada	X in Mexico and USA N in Canada
Automatic transmission	X	X	X	X
Catalytic converters	X	X	X	X
Cruise control	X	X	X	X
Driver and passenger front airbags	X	X	X	X
Driver and passenger side airbags	X	X	X	X
Electric tilt/slide sunroof	X	X	X	X
Electrochromic interior mirror	X	X	X	X
Front fog lamps	X	X	X	X
Garage door opener	O in USA X in Canada and Mexico	X	X	X
Headlamp power wash	X in Canada and Mexico N in USA	N	X in Canada N in USA	X in Canada and Mexico N in USA
Heated windshield	X in Canada N in Mexico, and USA	N	X in Canada N in USA	X in Canada N in Mexico, and USA



# V8 XJ Series Introduction

Feature	Applicability			Vanden Plas
	XJ8	XJ8 L	XJR	
ICE:				
Audio system	X	X	X	X
CD autochanger	O in Canada, and USA X in Mexico	O	X	O in Canada, and USA X in Mexico
Premium system	O in Canada, and USA X in Mexico	O	X	O in Canada, and USA X in Mexico
Interior trim:				
Leather	X	X	N	N
Embossed leather	N	N	X	N
Autolux leather	N	N	N	X
Locking:				
Central locking	X	X	X	X
Drive-away door locking	X	X	X	X
Panic locking/unlocking	X	X	X	X
Remote locking/unlocking	X	X	X	X
Remote trunk unlocking	X	X	X	X
Trunk valet isolation	X	X	X	X
Two stage unlocking (key and remote)	X	X	X	X
Metallic paint	X	X	X	X
Road wheels:				
16 inch alloy	X	X	N	X
18 inch alloy	N	N	X	N
Full size spare wheel	X	X	X	X

Feature	Applicability			Vanden Plas
	XJ8	XJ8 L	XJR	
<b>Seating:</b>				
5 seat configuration	X	X	X	X
Driver's seat memory	X	X	X	X
Electrical front seat adjustment	X	X	X	X
Front passenger seat adjustment from the rear	N	N	N	X
Heated front seats	O in USA X in Canada N in Mexico	O	X	X
Heated rear seats	O in USA X in Canada N in Mexico	O	X in Canada N in USA	O in USA X in Canada N in Mexico
<b>Security:</b>				
Base system	X	X	X	X
System options:				
Engine immobiliser	X	X	X	X
Panic alarm	X	X	X	X
Stability control	X N in Canada and Mexico	X	N	X N in Canada and Mexico
<b>Steering:</b>				
Electrically operated tilt and reach adjustment with automatic tilt away	X	X	X	X
<b>Suspension:</b>				
Sports	N	N	X	N
Touring	X	X	N	X
Traction control	O in USA X in Canada and Mexico	O	X	O in USA X in Canada and Mexico
Trip computer	X	X	X	X

## Vehicle Weights

Model	Weight, kg					
	Kerb Weight (No Options Incorporated)			Gross Vehicle Weight (All Options Incorporated, Maximum Build Tolerance)		
	Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
XJ8	923 (2035)	866 (1910)	1789 (3945)	1016 (2240)	1202 (2650)	2218 (4890)
XJ8 L	924 (2038)	885 (1952)	1810 (3990)	1018 (2245)	1222 (2695)	2240 (4940)
XJR	960 (2117)	888 (1958)	1848 (4075)	1055 (2325)	1215 (2680)	2270 (5005)
Vanden Plas	941 (2075)	873 (1925)	1814 (4000)	1036 (2285)	1209 (2665)	2245 (4950)

**Note:** The above weights are for vehicles without a towbar. The addition of a towbar increases the total weight by 25 kg (55 lb), with the front axle load decreasing by approximately 8.5 kg (19 lb) and the rear axle load increasing by approximately 33.5 kg (74 lb). The gross vehicle weight can be increased by a maximum of 100 kg provided the tire pressures are at Normal pressure and vehicle speed does not exceed 100 km/h (62.5 mile/h).

## Body Structure

Although externally unchanged, 32% of the panels in the body shell are either new or modified to accommodate the new powertrains, the various chassis and system changes, and to improve torsional rigidity and side impact resistance. The more noticeable changes are detailed below.

8% of the body panels are now made from high strength steels (was 3.4%). The additional use of high strength steels provides further improvements to side impact resistance and to the strength of the reinforcing panels of the front damper turrets.

Already introduced as a running change are door skins and front fenders made from bake hardened 180 high strength steel. One of the properties of this steel is an increased resistance to denting. It was introduced to reduce the dents parked vehicles are prone to incur from the doors of adjacent vehicles, etc.

### Fuse Box Brackets

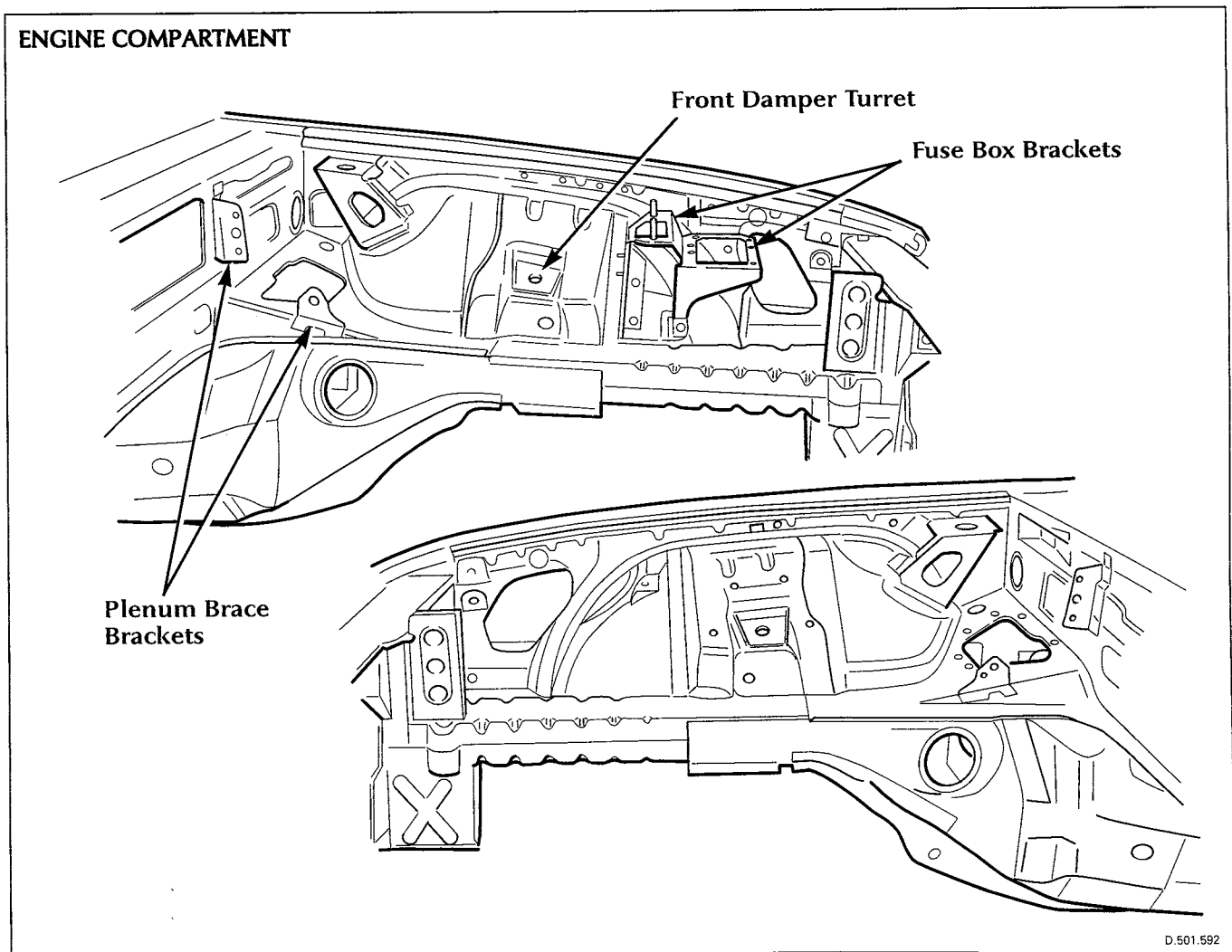
New fuse box brackets in the engine compartment are located on the left wheel arch.

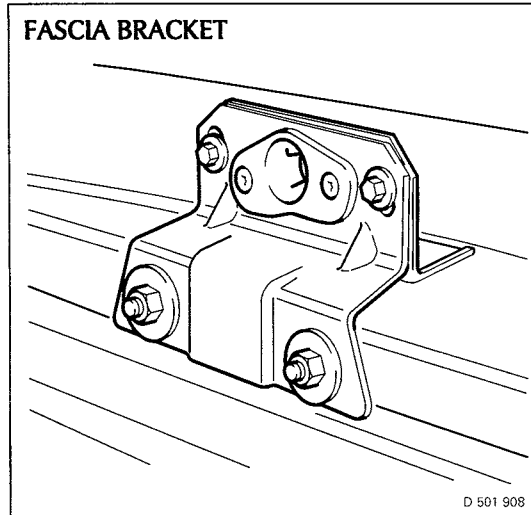
### Front Damper Turrets

The front damper turrets are revised to accommodate the dampers of the new front suspension.

### Plenum Braces

Plenum braces are bolted between brackets on the body. These produce a considerable increase in torsional rigidity, which improves refinement and front impact performance.





## **Fascia Bracket**

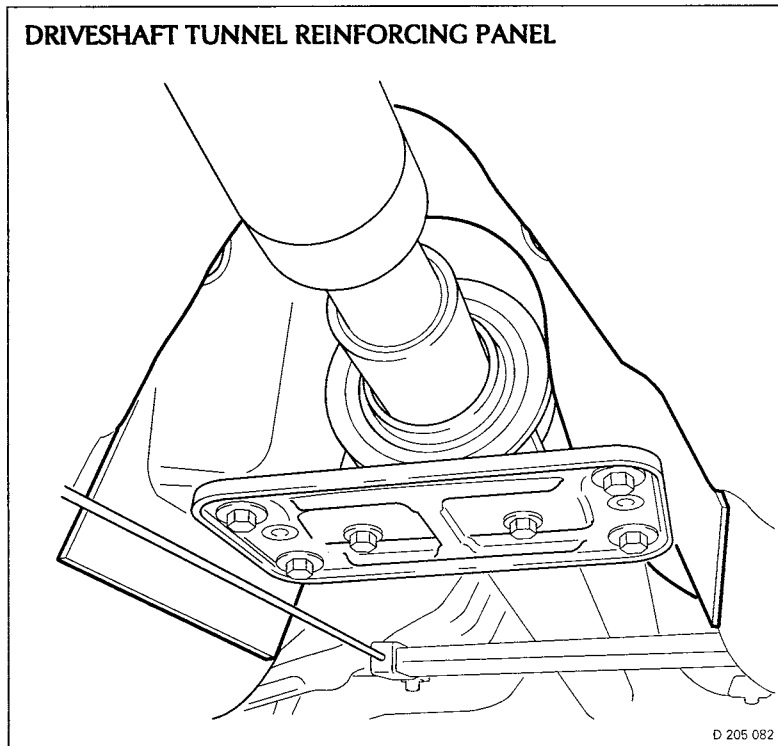
A new bracket is introduced to centralize the fascia. The bracket is centered between the A posts to provide a lateral datum point for a dowel on the fascia.

## **B/C Post**

The B/C post is revised to incorporate single, full height, closing and reinforcing panels in high strength steel for improved side impact resistance. The front seat belt anchorages are revised to accommodate the introduction of the seat belt pre-tensioners.

## **Doors**

The inner panel and inner waist reinforcements of the front and rear doors are revised to accommodate the new door speakers and door casings.



## **Transmission Mounting Bracket**

A new transmission mounting bracket is introduced to support the new transmissions and thereby improve refinement.

## **Driveshaft Tunnel**

A reinforcing panel for the driveshaft center bearing mount, similar to that already used on extended wheel base models, is incorporated on the standard wheel base models to improve refinement.

## Paints

The color basecoat paints used on the Sedan during manufacture are now water based instead of solvent based. To differentiate the two types of paint, water based paints have a four digit JBC number which always begins with the number 1. Colors retained from the previous Model Year have 1 added to the front of the existing JBC number and are allocated a new three letter sales code, eg: JBC 712, JFG (solvent based) Westminster Blue becomes JBC 1712, JHG (water based). For repairs, all colors are available in both water based and solvent based formats.

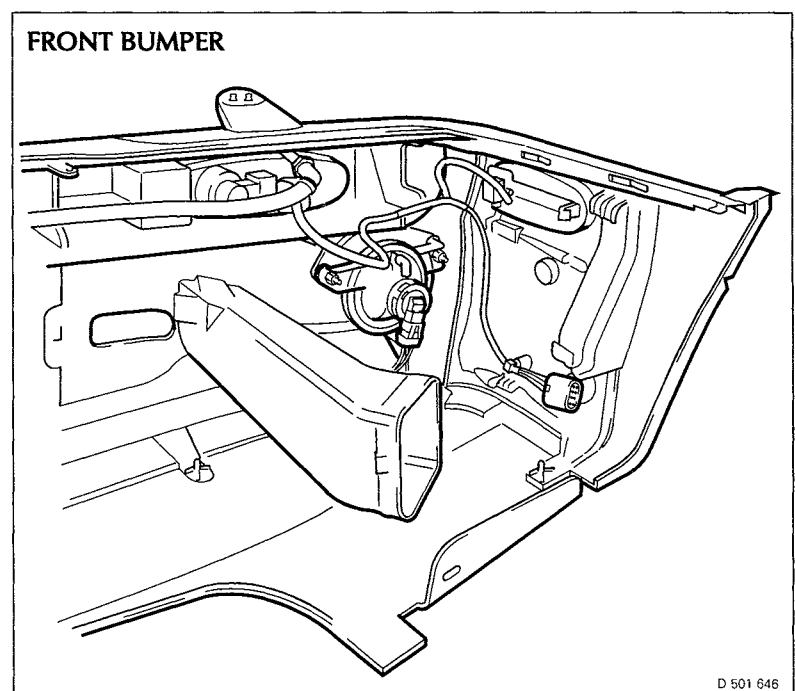
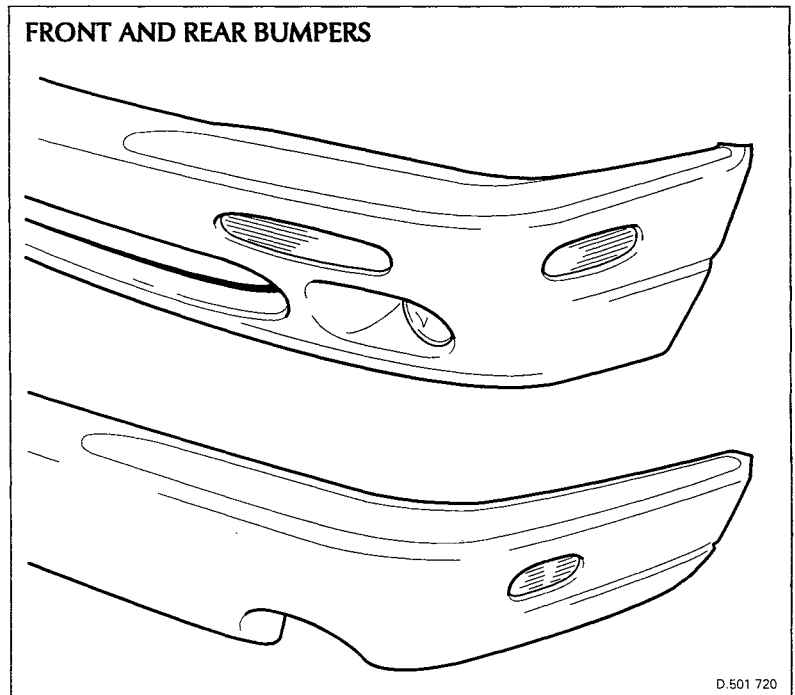
## Exterior Trim

Exterior trim changes consist of new bumpers, radiator grille, badges and front wheel arch liners.

### Bumpers

The front and rear bumpers are now manufactured in a thermoplastic material instead of polyurethane. They incorporate chromed plastic blades at each end of their upper surface instead of the full length chromed stainless steel ones of the previous design. The lamp apertures in the bumpers are revised to accommodate the new front fog lamps, front direction indicator lamps and side marker lamps/reflectors.

On the front bumper, the shape of the engine cooling intake is restyled. On Daimler and Vanden Plas models, the grille vane in the engine cooling intake is now chromed instead of body colored. In addition, the ambient temperature sensors are deleted from the brake cooling ducts (an ambient temperature sensor is now installed on the left side of the front cross member, see the Climate Control section for details).



## Radiator Grille

The radiator grille and the vane blocks are now made from high impact polypropylene. The grille has a color keyed surround on Sports models and a chromed surround on all other models. This is combined with Dorchester Grey vanes on XJ8 and XJ8L models, chromed vanes on Vanden Plas models and a steel mesh screen on the XJR.

## Badges

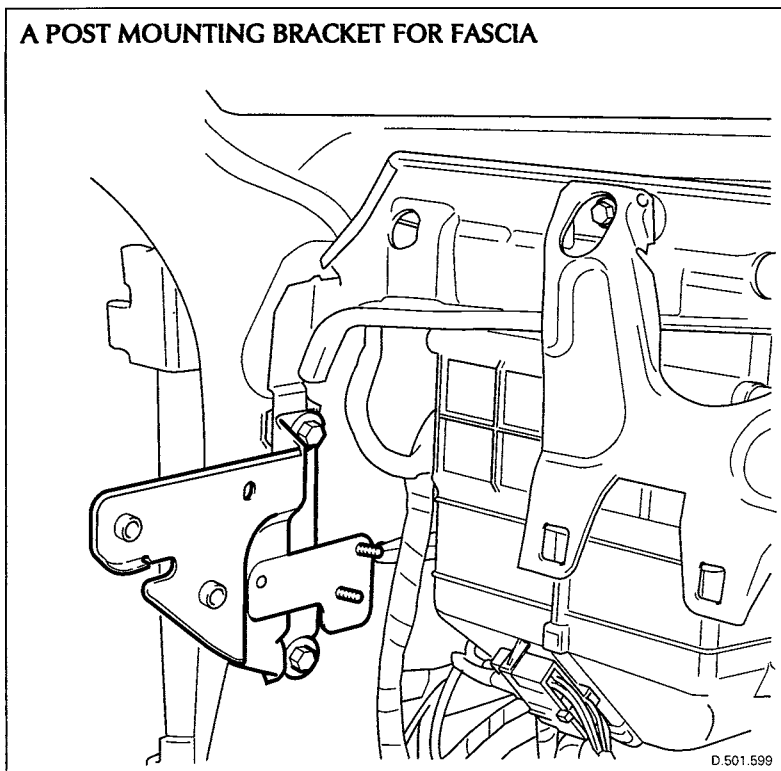
New radiator grille badges are introduced. The rear badges are similar to the previous Model Year but, where applicable, reflect the introduction of the eight cylinder engine.

## Front Wheel Arch Liners

The front wheel arch liners are modified to accommodate changes to the front stabilizer bar.

## Interior Trim

The most noticeable changes to the interior trim are the new fascia, new door trim, and a new center console. Other changes include those to the front and rear seats and the B/C post covers.

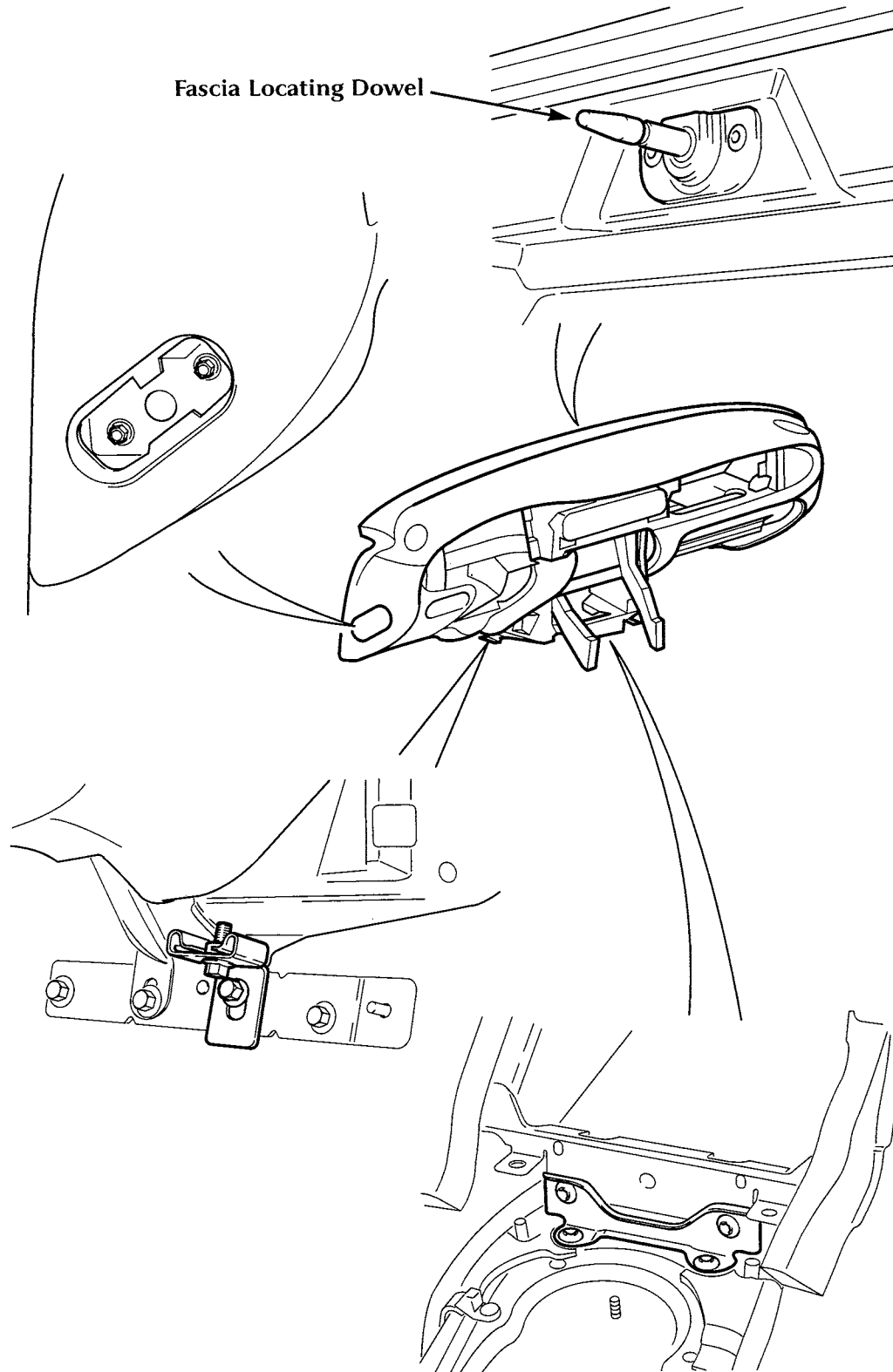


## Fascia

The fascia is a molded assembly which incorporates an injection molded frame and a lateral, steel reinforcing rail. A dowel on the front of the fascia locates in a bracket on the body to centralize the fascia between the two A posts. Bolts attach the fascia to the driveshaft tunnel and to brackets on the A posts. The bolts are accessed by removing the center console and the panel on each end of the fascia.

The dowel locating bracket and the A post brackets are non adjustable. The brackets are jig set during manufacture of the body to ensure correct positioning of the fascia without the need for adjustment.

FASCIA FIXING POINTS



J.501.942



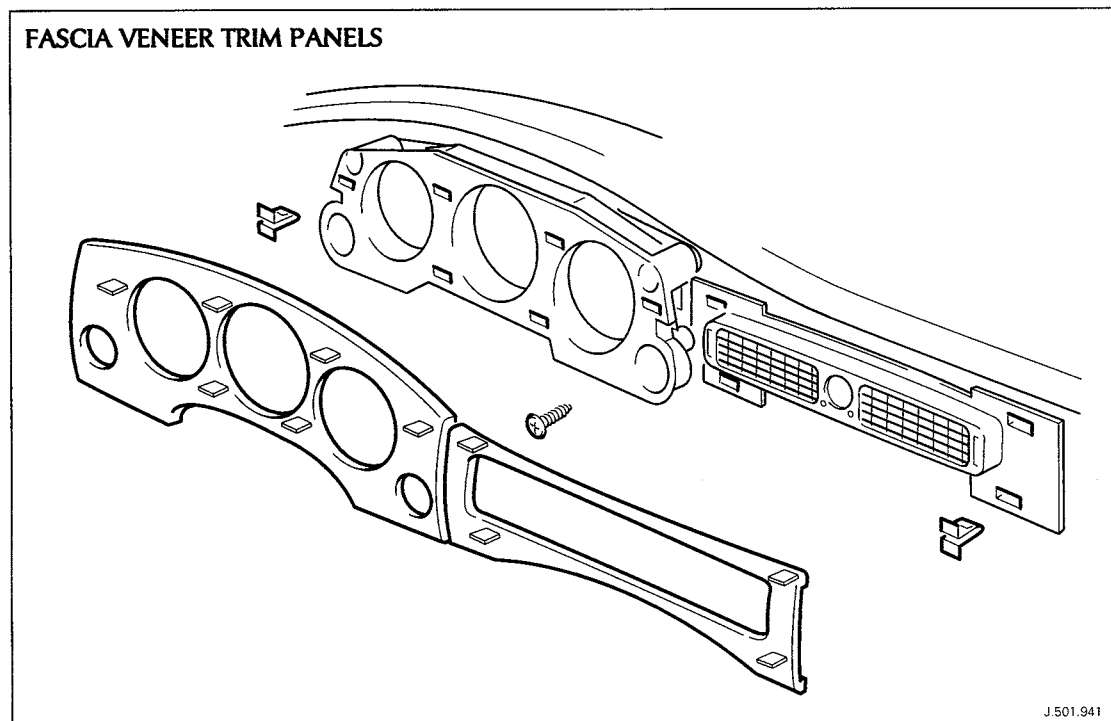
Veneered trim panels are attached to the fascia by pegs located in retaining clips. A glove box and a driver's stowage box are secured to the underside of the fascia. The glove box is the same as the one installed in the XK8 and is 40% larger than the one in the previous model year Sedan.

Ducts for the climate control system are integrated into the fascia. Outlet vents are installed on the ducts at the ends, center and top of the fascia. The end and center vents incorporate adjusters to control the flow and direction of the air. The top vents are fixed. An analog clock is installed in the center vent. The adjacent veneered trim panels must be removed to access the securing screws of the end and center vents.

The fascia harness is installed along the top rear edge of the fascia, to avoid the possibility of it being trapped in the fascia to body interface. Access to the connectors at the fascia harness to cabin harness interface is by removal of the driver's stowage box and the glove box.

The fascia also contains the following:

- the passenger airbag module, accessed by removing the deployment door
- the instrument cluster, accessed by removing the adjacent veneered trim panels
- the A/C solar sensor, accessed by removing the top center grille
- the key transponder module (where fitted), accessed by removing the steering column upper fixings and lowering the steering column
- the dimmer module, also accessed by removing the steering column upper fixings and lowering the steering column
- the driver's switch pack, accessed by removing the driver's stowage box
- the body processor module, accessed by removing the glove box.



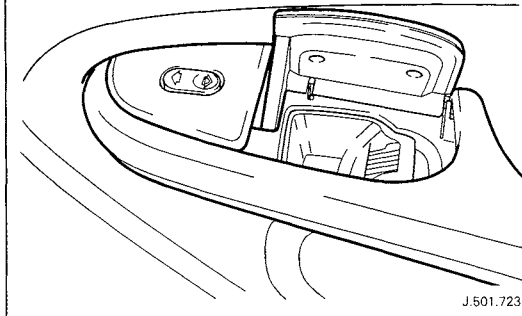
### Door Trim

The door casings are restyled single moldings attached to the doors by fir tree type fixings around their lower edges and by the armrest fixings. A veneered trim panel is attached to each door casing by the same peg and retaining clip method as used on the fascia.

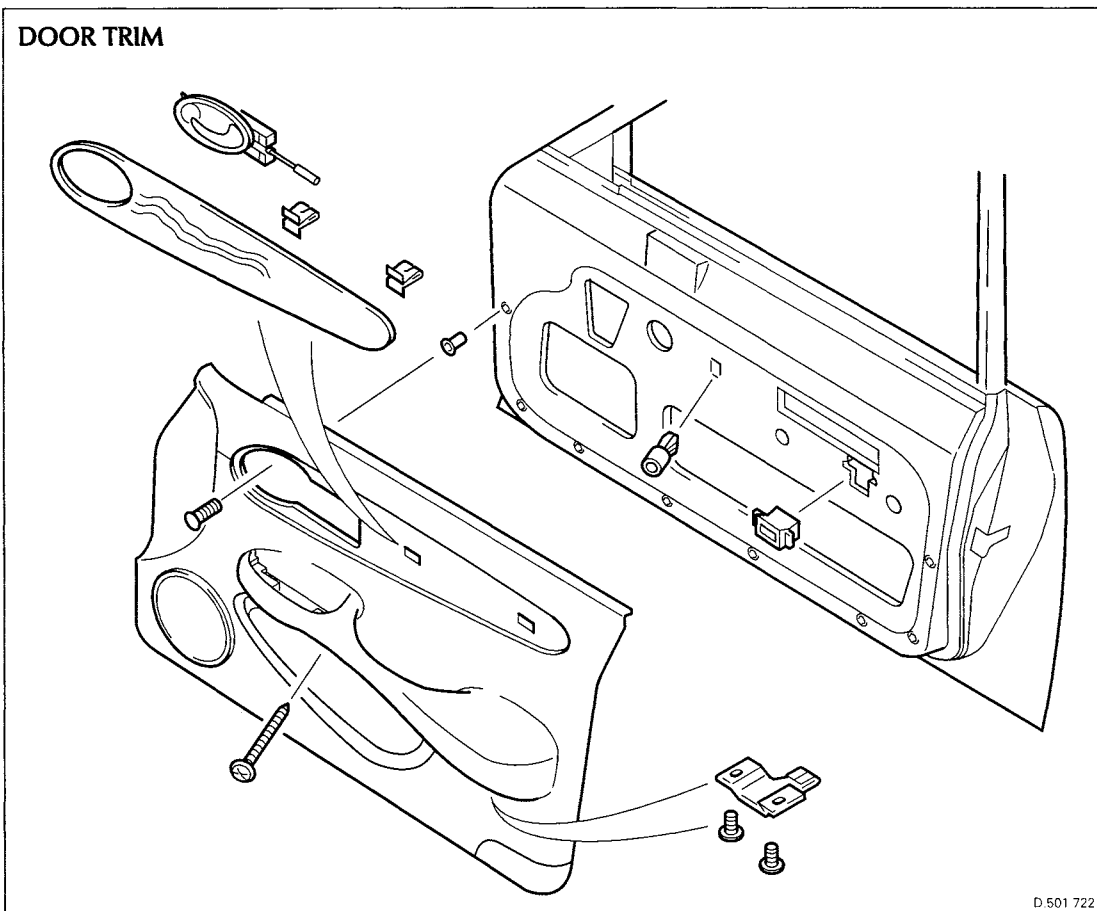
The door armrests are new and are common for front and rear doors. New switches and (in the rear) ashtrays are incorporated at the front of the armrests.

New door handles and housings are introduced. Tweeters are integrated into all four door handle housings on vehicles with the standard ICE system, and the two rear doors on those with the premium ICE system.

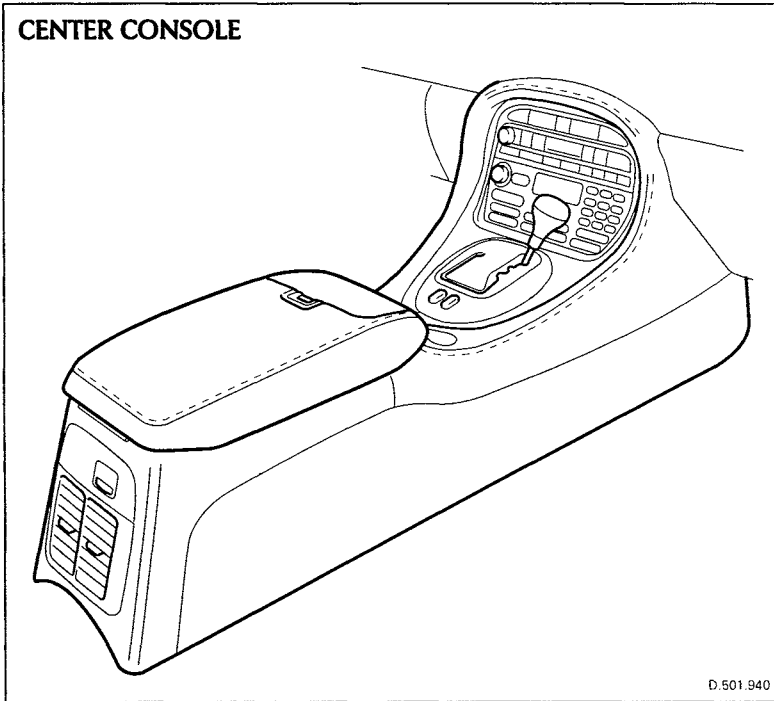
REAR DOOR ARMREST



DOOR TRIM



## CENTER CONSOLE



D.501.940

## Center Console

The center console is revised to accommodate the revised radio/cassette player and center console switch pack. The capacity of the cubby box is increased and the valet switch is relocated to the center console switch pack. A revised cubby box lid and shift lever surround compliment the new styling of the fascia and door casings.

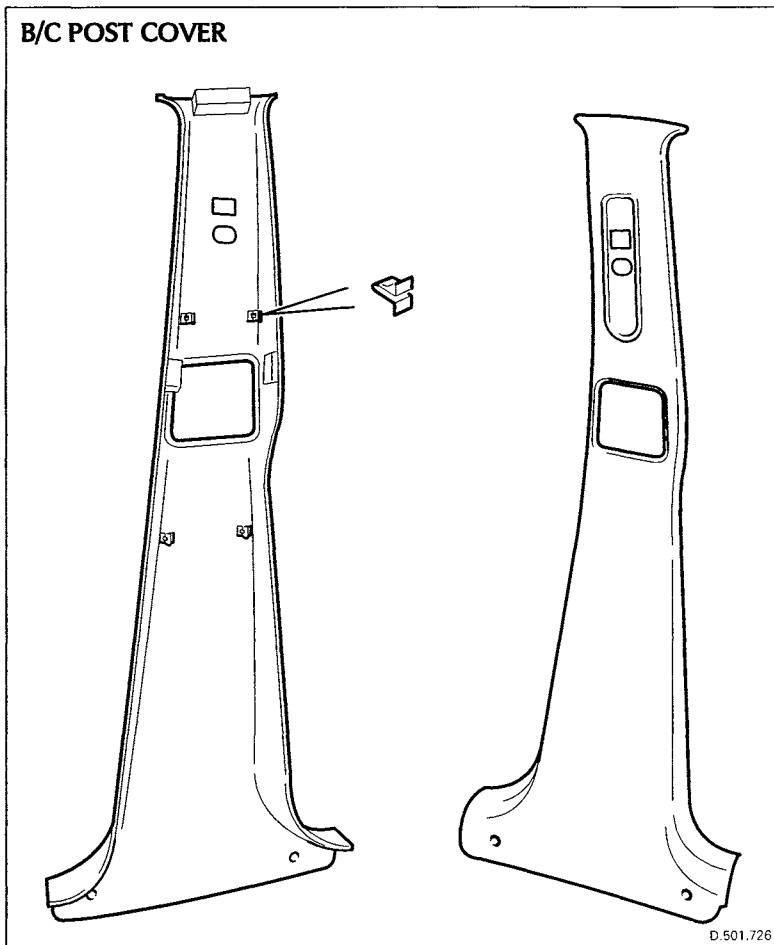
## Front Seats

Although externally unchanged, the front seats are revised to incorporate the side airbags, new seat control modules (where fitted) and new seat wiring harnesses, and to extend rearward travel by 20 mm (total fore and aft travel is now 220 mm). A label is attached to each seat cover to indicate that a side airbag is installed.

## B/C Post Covers

The B/C post covers are revised to accommodate the changes to the front seat belts (repositioned height adjusters and introduction of pretensioners). The covers are now one-piece items secured with clips instead of pegs.

## B/C POST COVER



D.501.726

## Hood Release System

A new hood release handle, latches and cables are introduced.

### Release Handle

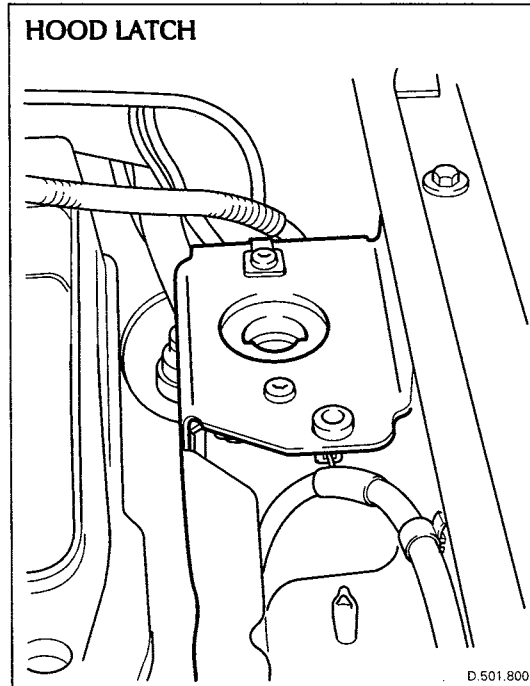
The hood release handle is the same as that used on the XK8. It is installed below the end of the fascia on the driver's side.

### Latches

The hood latches are installed below latching brackets on the body, inside the enclosures at the rear of the engine compartment. The securing screws cut their own thread into the plastic housing of the latch when they are initially installed. If a latch is removed and then reinstalled, ensure the securing screws engage the existing thread form.

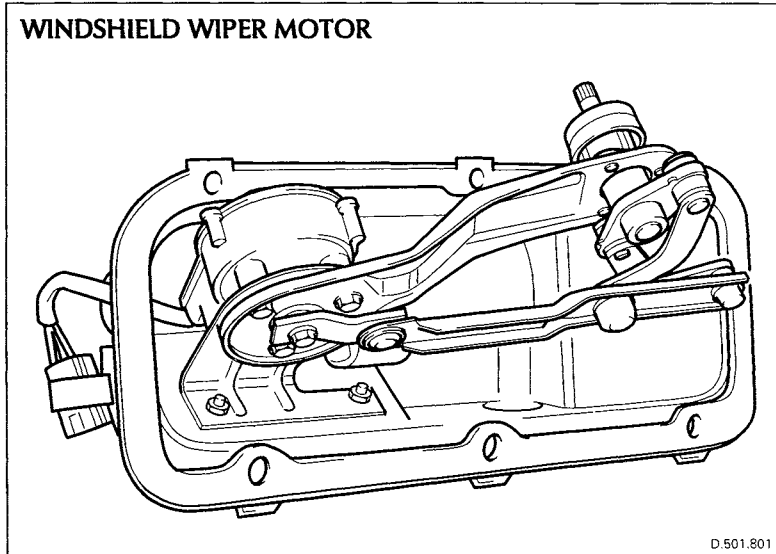
### Cables

The release cables are revised to match the new release handle and latches. The existing grommet and cable clips are used to seal the cables in the firewall and secure them to the body.



## Windshield Wipers and Washers

The windshield wipers and washers now use the same column switch, and operate in the same way, as on the XK8. Additional changes to the system are detailed below.



### Windshield Wiper Motor

For logistical reasons, a new motor is introduced in the windshield wiper system. The fixings are the same as for the previous motor, but are reduced from six to five. A new plastic cover isolates the motor from the plenum wet area.

### Windshield Wash Jets

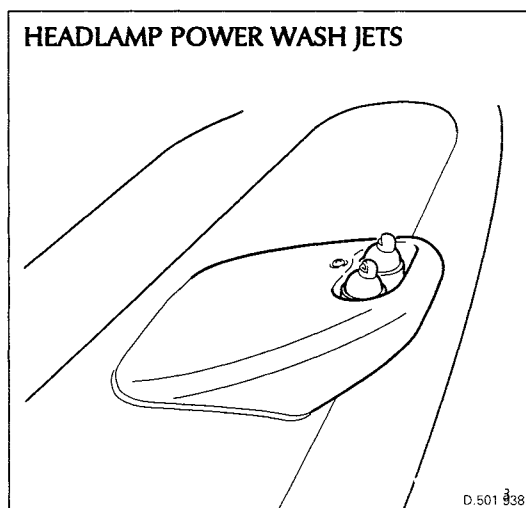
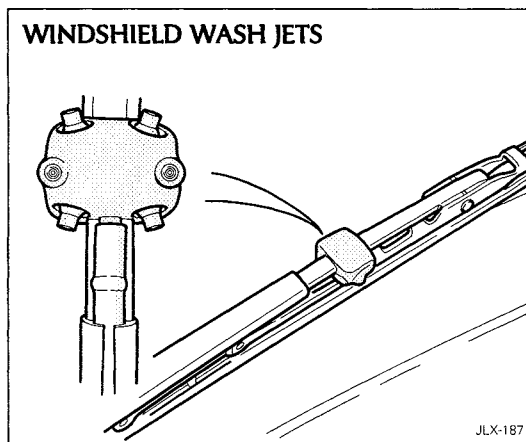
The windshield wash jets are now incorporated into a housing on the wiper arm, as on the XK8. Blanks are installed in the windshield lower finisher in place of the previous fixed jets, and a connector is added to the finisher for the new washer hose.

### Headlamp Power Wash

On vehicles with the headlamp power wash system, new power wash jets (shorter by approximately 25 mm) are introduced.

### Washer Fluid Reservoir

The capacity of the washer fluid reservoir is increased to 6.3 liters (6.67 quarts). A new screenwash pump and, where applicable, a new powerwash pump, are introduced to match the new wash jets.



## Engine Compartment

Plastic panels are installed to form enclosures at the rear corners of the engine compartment. A new trim panel is installed along the firewall between the enclosures. The trim panels at the sides and front of the engine compartment are deleted.

The enclosures provide protection from engine heat and also help to insulate the cabin from engine noise.

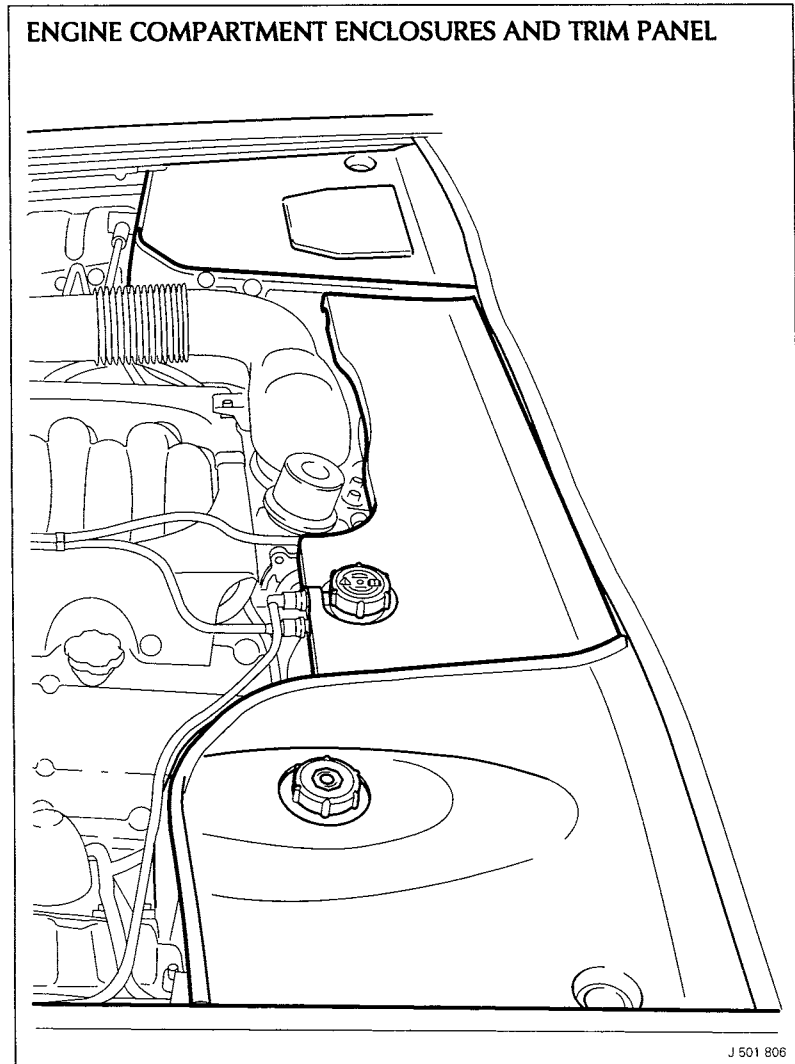
The enclosure on the driver's side contains:

- the brake booster
- the ignition amplifiers
- the vacuum solenoid valves of the cruise control system (where fitted).

The enclosure on the passenger's side contains:

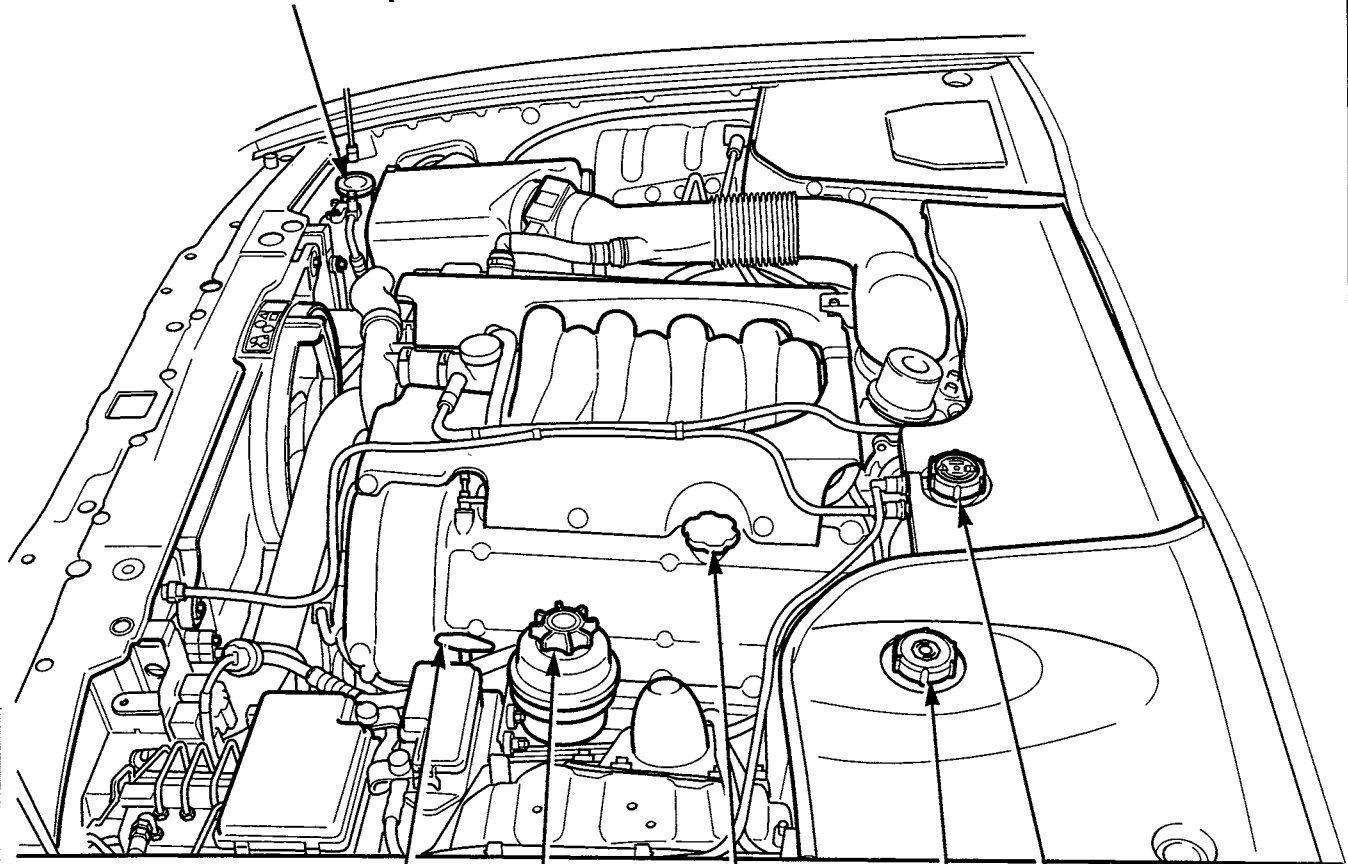
- the ECM
- the TCM
- assorted relays
- the horizontal movement sensor of the adaptive damping system (where fitted).

On SC vehicles an electric fan ventilates the passenger side enclosure with cabin air. Where specified, a tool kit is incorporated into the cover that retains the ECM.



**REPLENISHMENT POINTS**

Washer Fluid Reservoir Cap



Engine Oil Filler Cap

Coolant Reservoir Cap

PAS Reservoir Cap

Brake Fluid Reservoir Cap

Engine Oil Gauge (Dipstick)

J.501.730

## Basic Engine

The AJ-V8 engine replaces the AJ16 and V12 engines in all models. In addition to the 4.0 liter NA version of the AJ-V8 installed in the XK8, the Sedan range is also provided with 4.0 liter SC version.

The 4.0 liter NA engine is identical to that used in the 98 Model Year XK8. The 4.0 liter SC version is derived from the 4.0 liter NA engine, but does not have variable valve timing. Other differences from the 4.0 liter NA version are as follows:

### Pistons

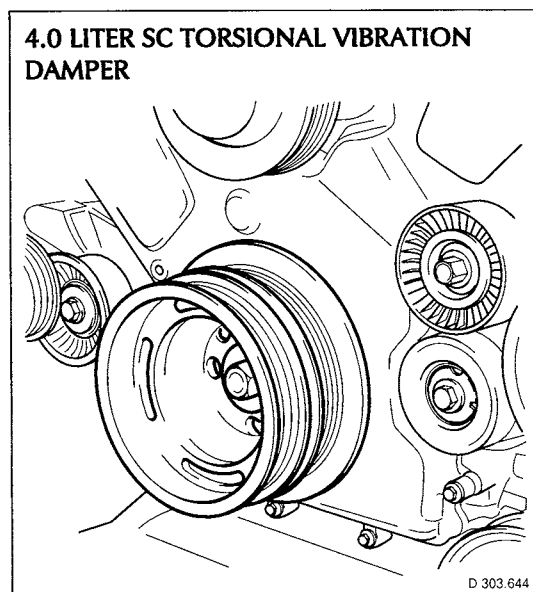
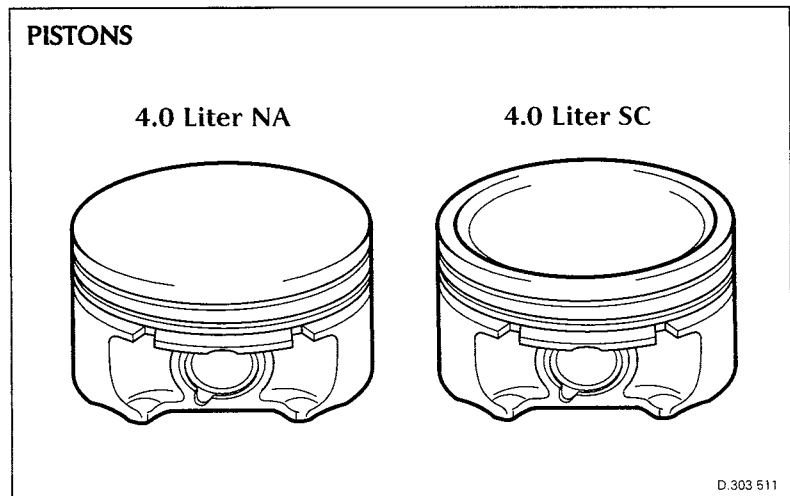
The pistons are dished instead of flat. They are also manufactured in a higher strength aluminum alloy and incorporate a thicker top land to resist the increased thermal and mechanical loads produced by supercharging.

### Cylinder Head Gasket

The cylinder head gaskets incorporate stainless steel eyelets for the cylinder bores in place of the mild steel ones used on the NA engines.

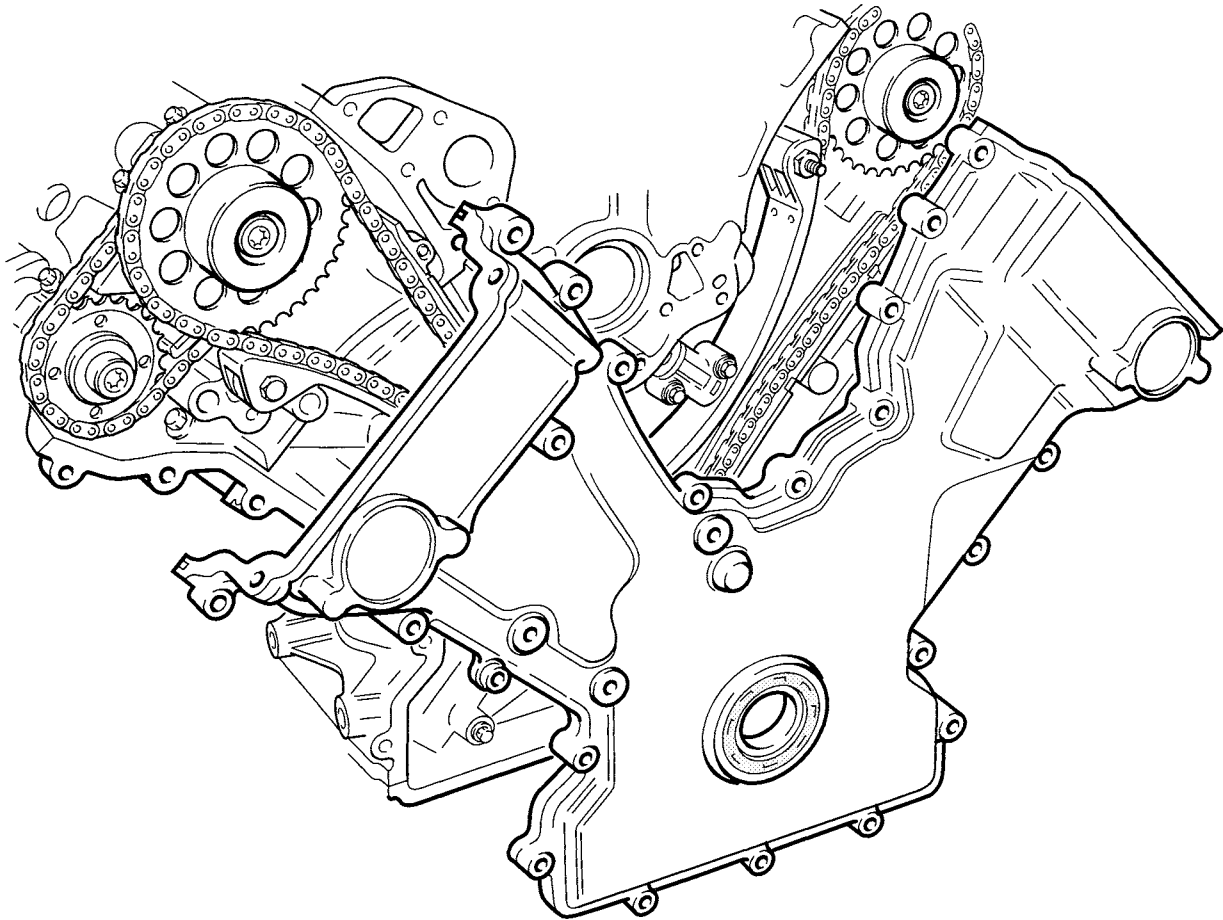
### Torsional Vibration Damper

The torsional vibration damper incorporates a second pulley to power the supercharger drive belt.





## INTAKE CAMSHAFT SPROCKET AND TIMING COVER - 4.0 LITER SC ENGINE



J 303 628

### **Intake Camshaft Sprocket**

A drive sprocket replaces the valve timing unit on the intake camshafts. An inertia ring is installed on each intake camshaft to minimize torsional vibration.

### **Timing Cover**

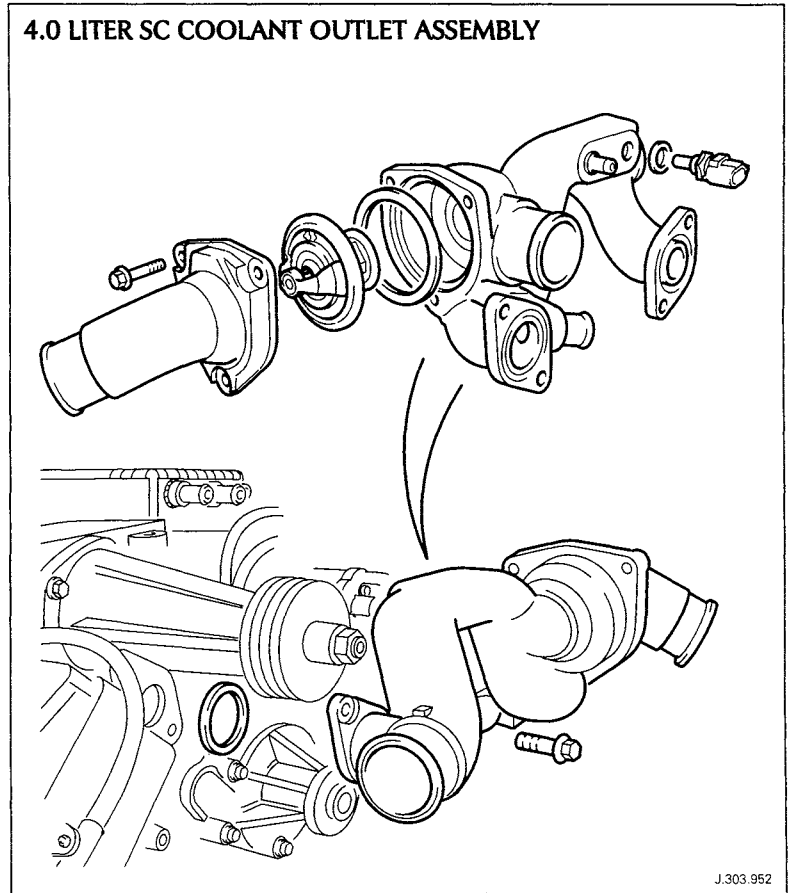
The timing cover does not have holes for the valve timing solenoids. The right side of the cover incorporates mounting holes for the idler pulley of the supercharger drive belt.

**Coolant Outlet Assembly**

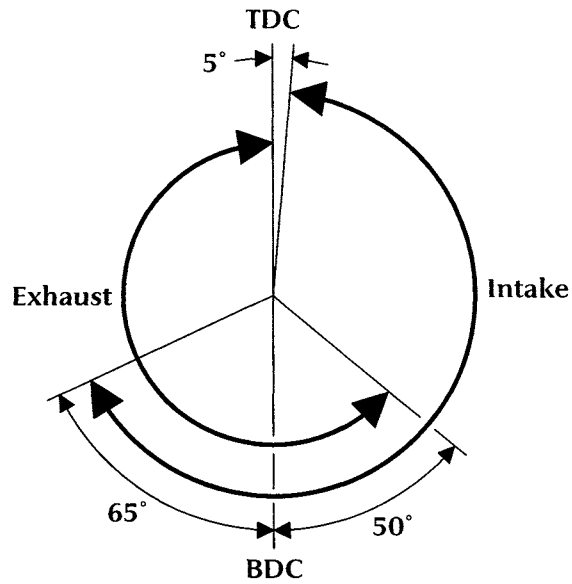
To accommodate the installation of the supercharger, the thermostat housing and the coolant outlet duct are combined into a new coolant outlet assembly made from aluminum alloy. A hose connects the coolant outlet assembly to a new coolant inlet housing attached to the coolant pump intake on the cylinder block.

**Coil Covers**

The coil covers incorporate the model identification which is incorporated on the engine covers of NA engines.

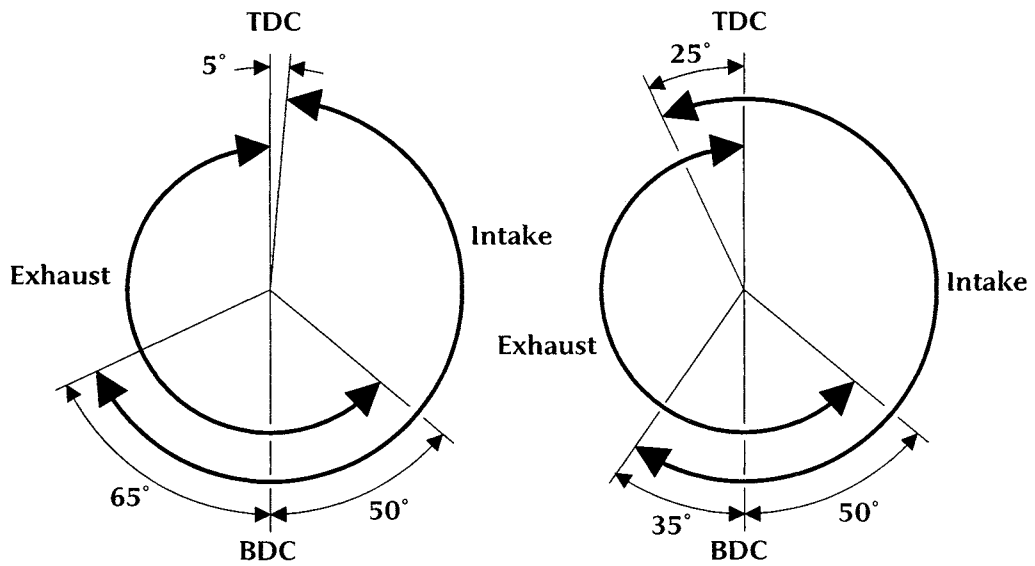


VALVE TIMING DIAGRAM - 4.0 LITER SC



J 303.889

VALVE TIMING DIAGRAMS - 4.0 LITER NA



J 303.887

## Engine Supercharger

On the 4.0 liter SC engine the intake manifold is replaced by:

- a supercharger
- a supercharger outlet duct
- two intercoolers
- a bypass valve
- a bypass valve actuator
- two intercooler adapters
- two fuel rails.

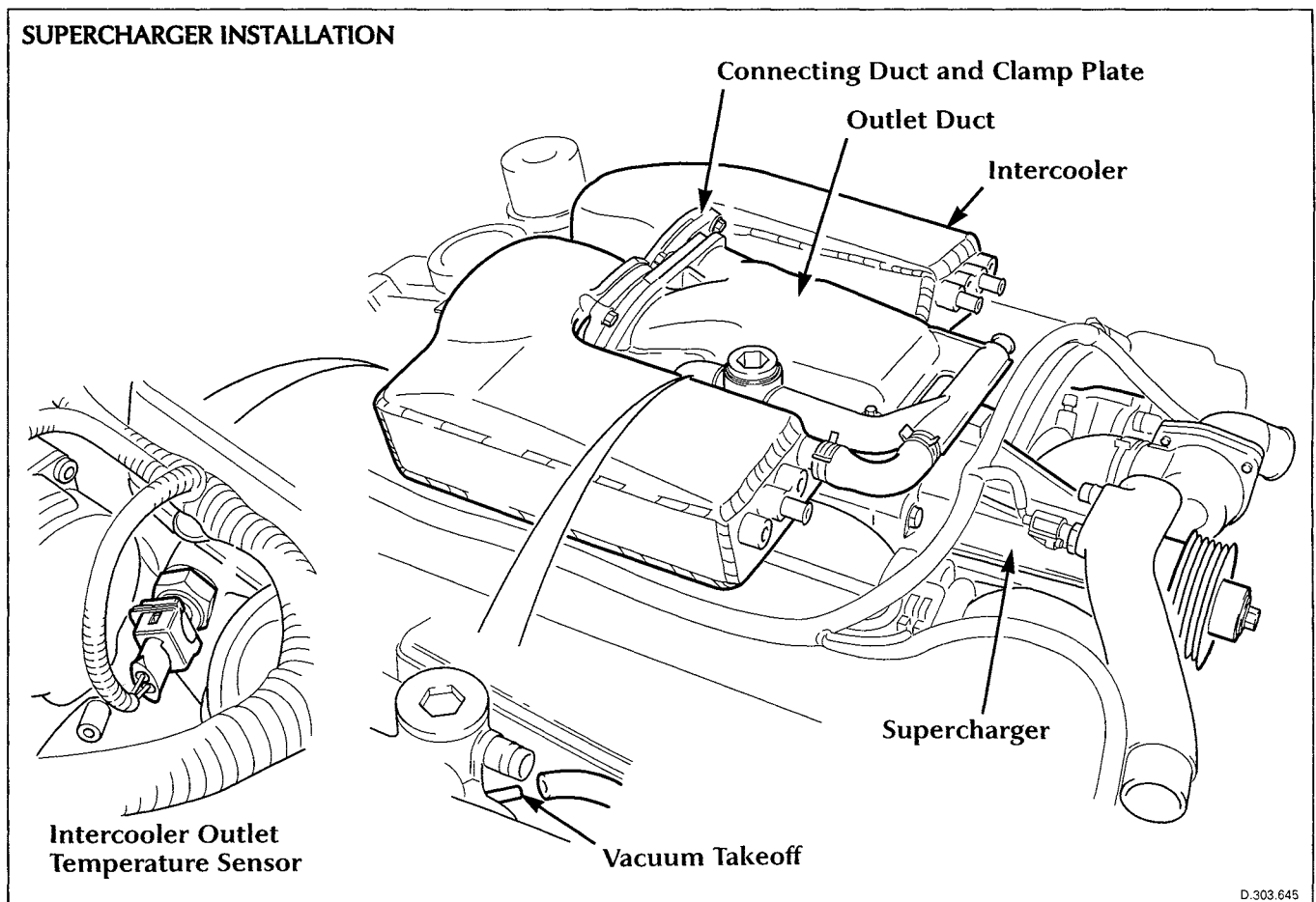
The induction elbow is revised to accommodate the installation of the bypass valve and delete the vacuum takeoff for the fuel pressure regulator/cruise control system.

Although visually very different, because of their individual installation requirements, the supercharger system on the AJ-V8 operates in the same way as the system on the AJ16 engine.

### Supercharger

The supercharger is an Eaton M112 unit attached to the three mounting bosses between the V of the cylinder block. Positive alignment with the drive belt is provided by a doweled mounting bracket. An eight ribbed belt drives the supercharger at twice engine speed. The maximum pressure increase is approximately 0.8 bar.

The supercharger has a filled for life internal lubrication system. Because of the confined installation, the oil level/filler plug is inaccessible and in the wrong orientation for checking the oil level. Should the oil level need to be checked, the supercharger must be removed from the engine.



## Intercooler

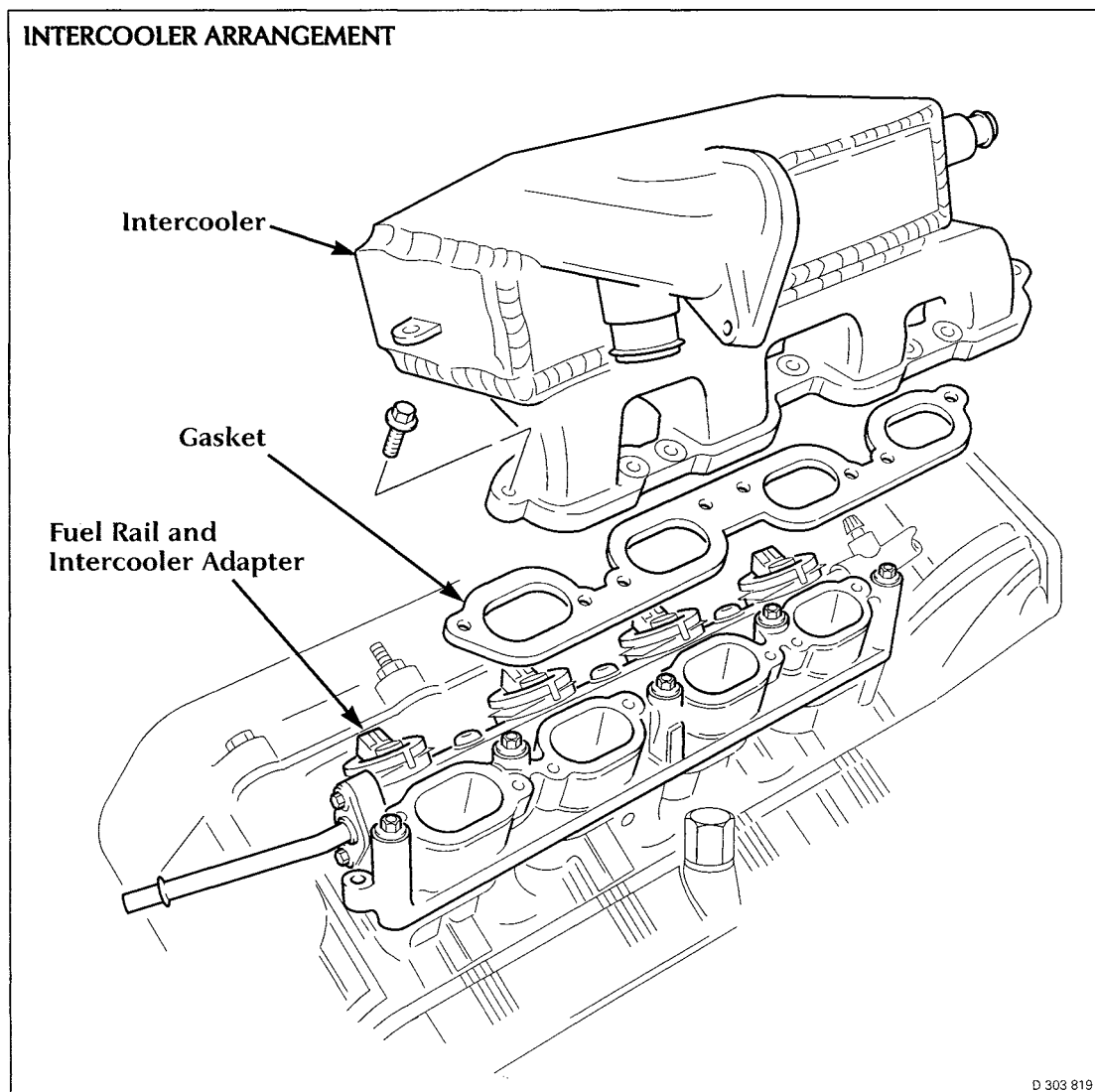
Each of the two intercoolers is a fin and tube air to liquid heat exchanger. Two rubber ducts, secured by clamp plates, provide the interfaces between the outlet duct and the intercoolers. After passing through the heat exchanger core, the air flows into individual outlets to the cylinders. At the rear of each intercooler there is a connection to the bypass valve. At the rear of A bank intercooler there is a mounting boss for an air intake temperature sensor.

## Outlet Duct

The outlet duct directs the air from the supercharger into the two intercoolers. A filler point and connections for the intercooler coolant system are integrated into the front and right side

of the outlet duct. A vacuum takeoff for the fuel pressure regulator/cruise control system is located on the right side of the outlet duct.

Isolating bolts, to reduce noise, secure the outlet duct to the supercharger and a rubber gasket seals the supercharger to outlet duct interface.



### **Bypass Valve**

The bypass valve attaches to an opening in the induction elbow and controls a bypass flow from the intercoolers back to the inlet side of the supercharger. At closed or partially open throttle settings (i.e. idle and most cruise conditions), the bypass valve is fully open to provide maximum bypass and optimum fuel economy. As the throttle opens, the bypass valve progressively closes to reduce the bypass flow and increase the pressure of the air supplied to the engine for optimum power output.

### **Bypass Valve Actuator**

The bypass valve actuator is a diaphragm operated actuator attached to the valve spindle of the bypass valve. A vacuum pipe connects the actuator to the induction elbow.

### **Intercooler Adapters**

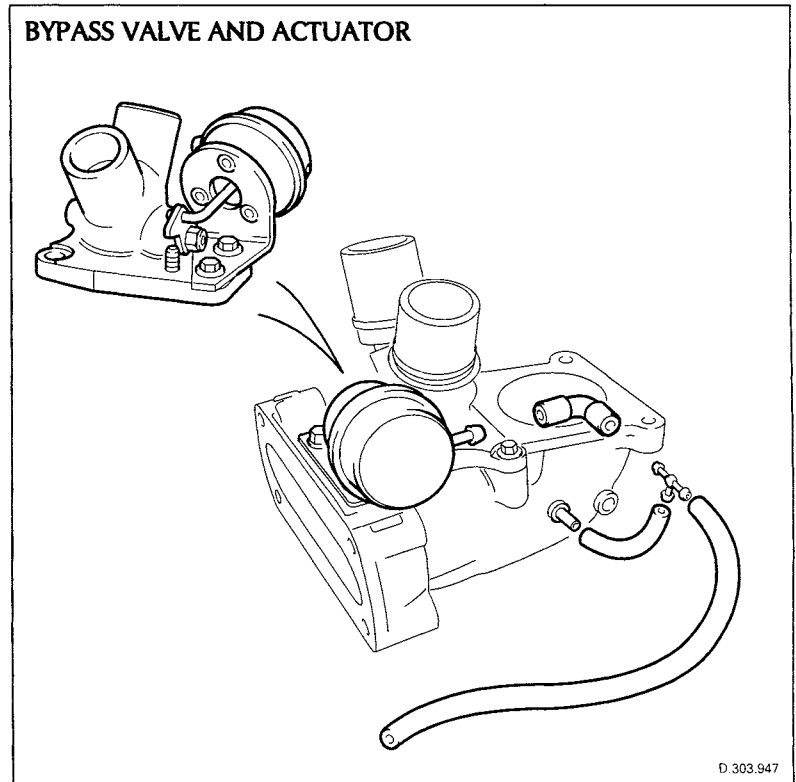
The intercooler adapters provide the interface between the intercoolers and the cylinder heads, and also locate the fuel rails and injectors. One-piece gaskets seal the joints between the intercoolers and the intercooler adapters, and between the intercooler adapters and the cylinder heads.

### **Fuel Rails**

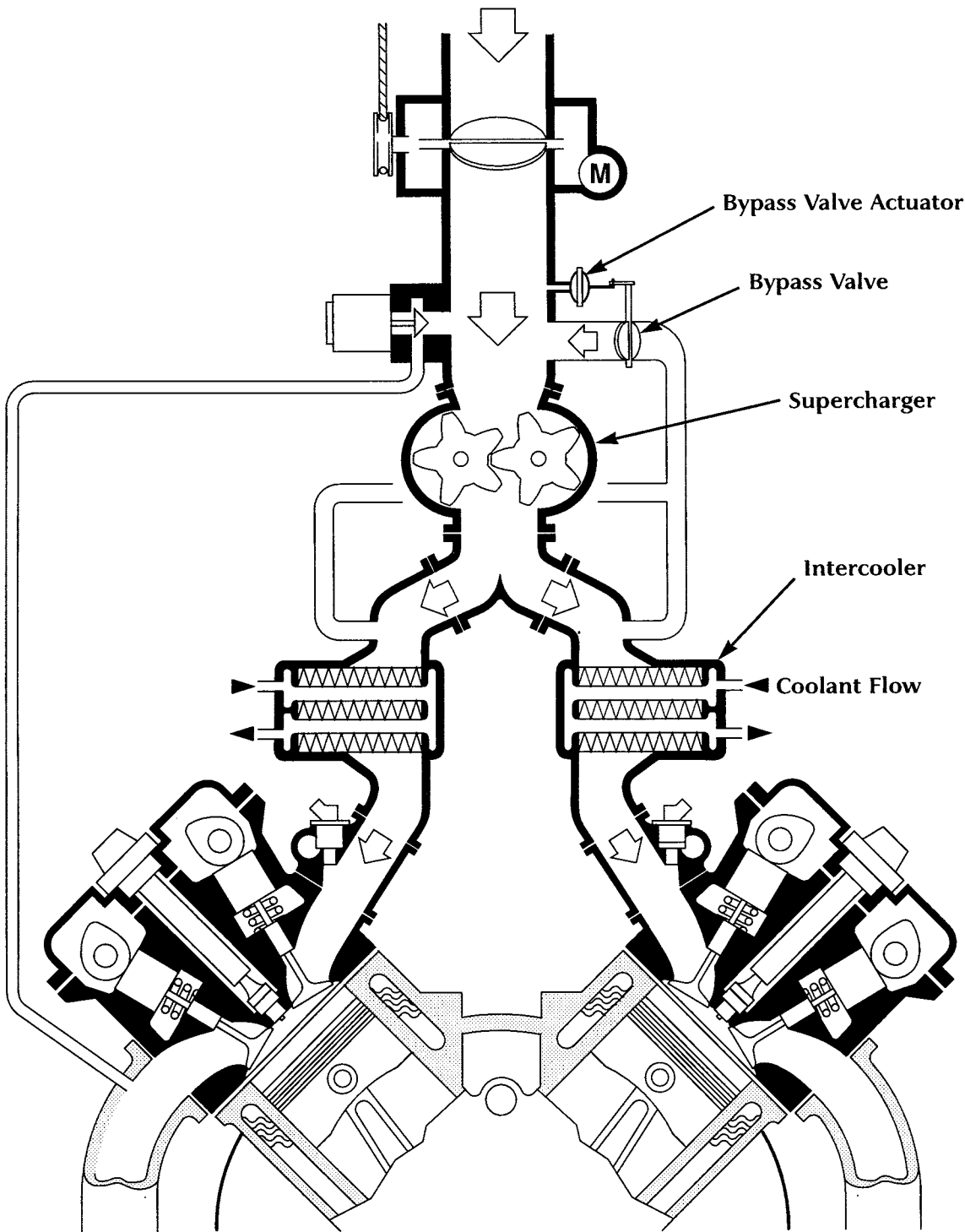
The two plastic fuel rails are installed on the intercooler adapters. A fuel crossover pipe, revised to accommodate the supercharger, connects the fuel rails together at the front of the engine. The fuel feed pipe and the fuel return pipe/pressure regulator on the rear of the fuel rails are the same as those used on NA engines.

### **Fuel Injectors**

Four fuel injectors, of a higher flow rating than those in the NA engines, are installed in each fuel rail. Spring clips secure the injectors in position. Circular seals are installed between the injector mounts of the fuel rails and the related recesses in the intercooler adapters.



SUPERCHARGER SYSTEM SCHEMATIC



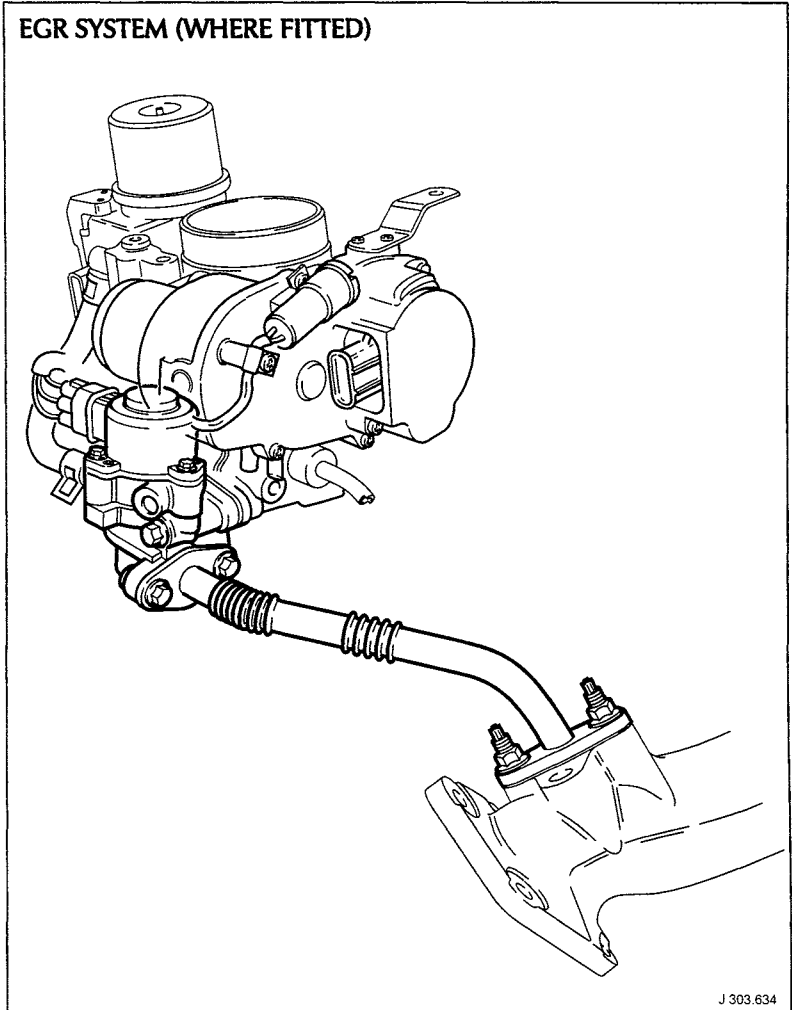
J.303.646

## Exhaust Gas Recirculation

The SC engine is fitted with EGR to improve emissions. The EGR system used is the same as the one installed on early XK8 engines, and consists of:

- an EGR valve installed on the rear of the induction elbow
- a transfer pipe connected between A bank exhaust manifold and the EGR valve.

The ECM controls a 4 pole stepper motor in the EGR valve to regulate the flow of exhaust gases back into the engine.



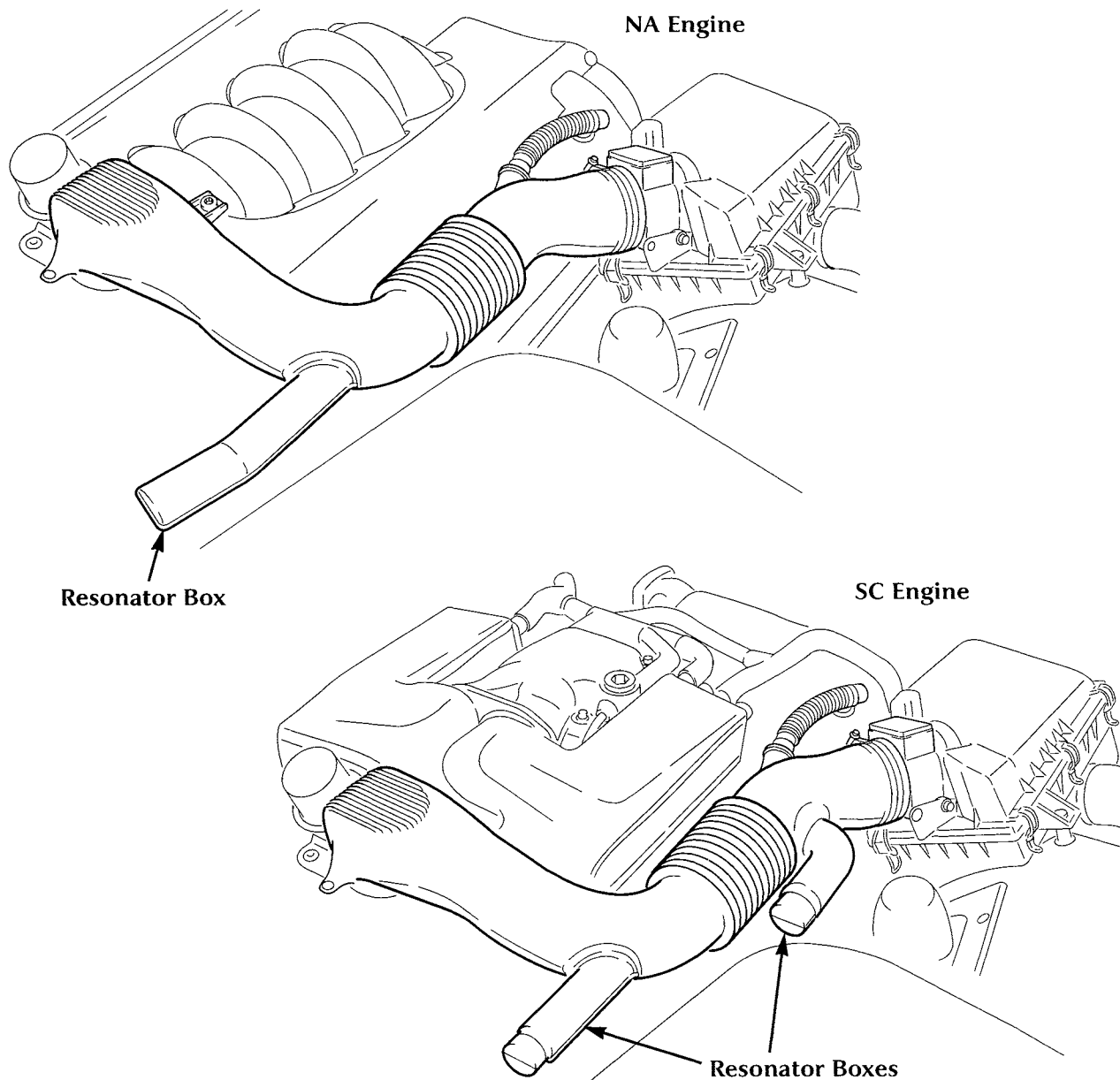


## Air Intake System

The air intake system is basically the same as that on the XK8 except for the incorporation of resonator boxes and, on the SC engine, a larger intake duct between the right inner fender and the air cleaner.

To reduce noise, quarter wave resonators are incorporated into the air intake pipe, one on NA engines and two on SC engines.

### AIR INTAKE SYSTEM



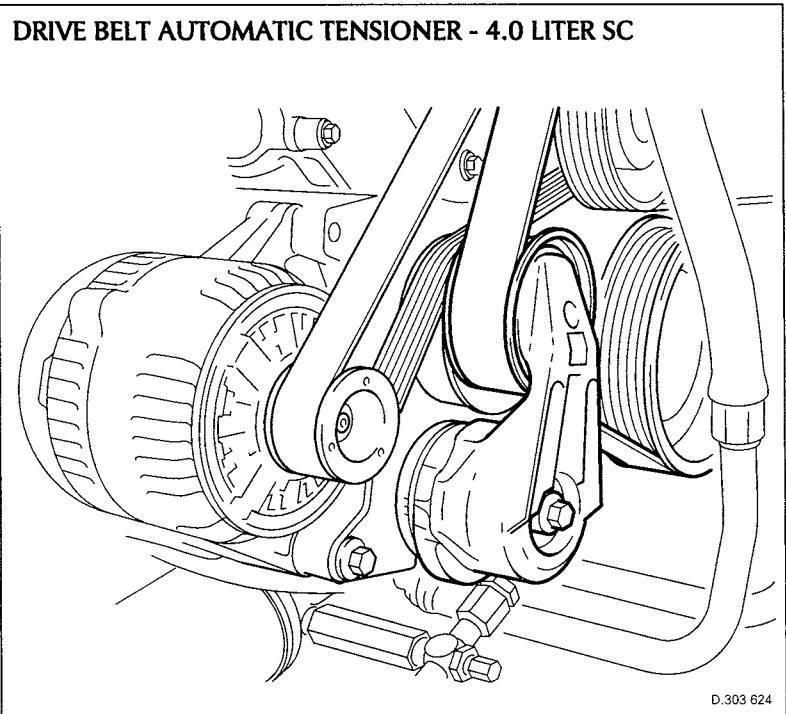
D 303, 853 & 854

## Accessory Drive

On 4.0 liter SC engines, an additional drive belt is installed to drive the supercharger. The eight ribbed belt is driven by the front pulley of the torsional vibration damper. An idler pulley on the timing cover and an automatic tensioner on the RH accessory bracket guide the belt around the pulley on the supercharger. The automatic tensioner is similar to the one used on the main accessory drive belt, and also incorporates a belt wear indicator on the rear of the pivot arm.

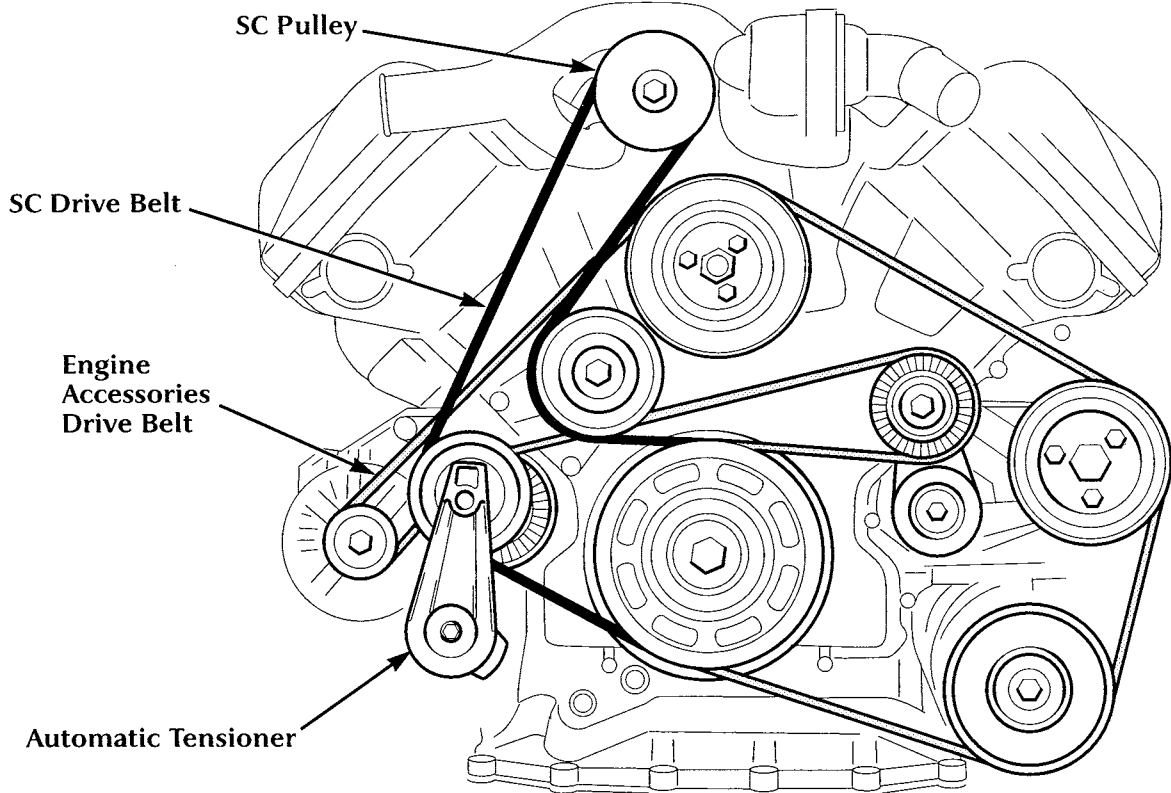
In service, the two belts have the same acceptance limits. A maximum of 15 cracks per rib over any 100 mm length is acceptable. If the number of cracks is over the limit, or if any rib material is missing, the belt must be replaced.

DRIVE BELT AUTOMATIC TENSIONER - 4.0 LITER SC



D.303 624

DRIVE BELT INSTALLATION - 4.0 LITER SC



D 303.512

## Engine Specifications

	4.0 Liter NA	4.0 Liter SC
Configuration	90° V8	90° V8
Cylinder Head	Dual overhead camshafts, 4 valves per cylinder	
Valve Clearances (Cold):		
Intake	0.18 to 0.22 mm	0.18 to 0.22 mm
Exhaust	0.23 to 0.27 mm	0.23 to 0.27 mm
Spark Plug Type	PFR6G-13E	PFR6G-13E
Spark Plug Gap	1.2 to 1.3 mm	1.2 to 1.3 mm
Firing Order	1A, 1B, 4A, 2A, 2B, 3A, 3B, 4B	
Bore	86 mm (3.386 in)	86 mm (3.386 in)
Stroke	86 mm (3.386 in)	86 mm (3.386 in)
Displacement	3.996 liters (244 in <sup>3</sup> )	3.996 liters (244 in <sup>3</sup> )
Compression Ratio	10.75 : 1	9.00 : 1
Maximum Power (DIN)	216 kW (290 BHP) at 6100 RPM	276 kW (370 BHP) at 6150 RPM
Maximum Torque (DIN)	393 Nm (290 lbf.ft) at 4250 RPM	525 Nm(387 lbf.ft) at 3600 RPM
Maximum Speed (Limited)	6950 RPM	6200 RPM
Coolant Type	Water and antifreeze D542 (see Service Manual for mixture ratio)	
Coolant Volume (Complete System)	10 liters (2.65 galls)	12 liters (3.17 galls)
Oil Specification*	SAE 5W30	SAE 5W30
Oil Volume (Approximate)	6.5 liters (6.88 quarts)	7.5 liters (7.95 quarts)
Weight (Approximate, With Accessories)	200 kg (441 lb)	227 kg (500 lb)

\*Initial fill: Other grades are acceptable, depending on prevailing ambient temperatures; see Service Manual for details.

## Engine Lubrication

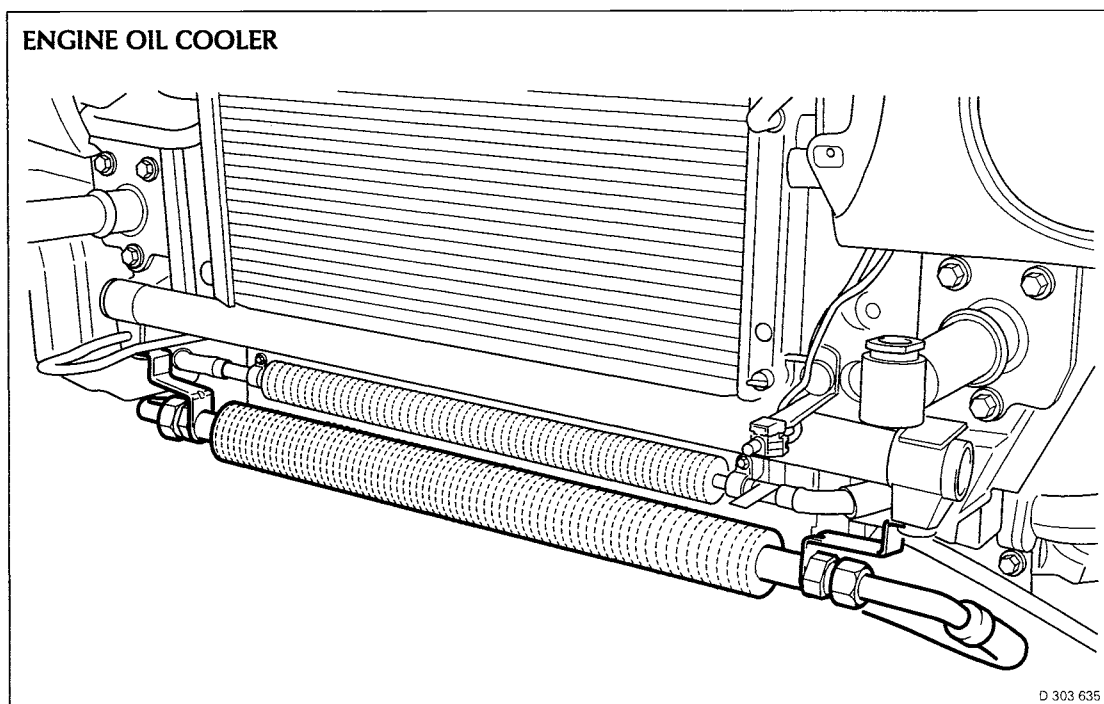
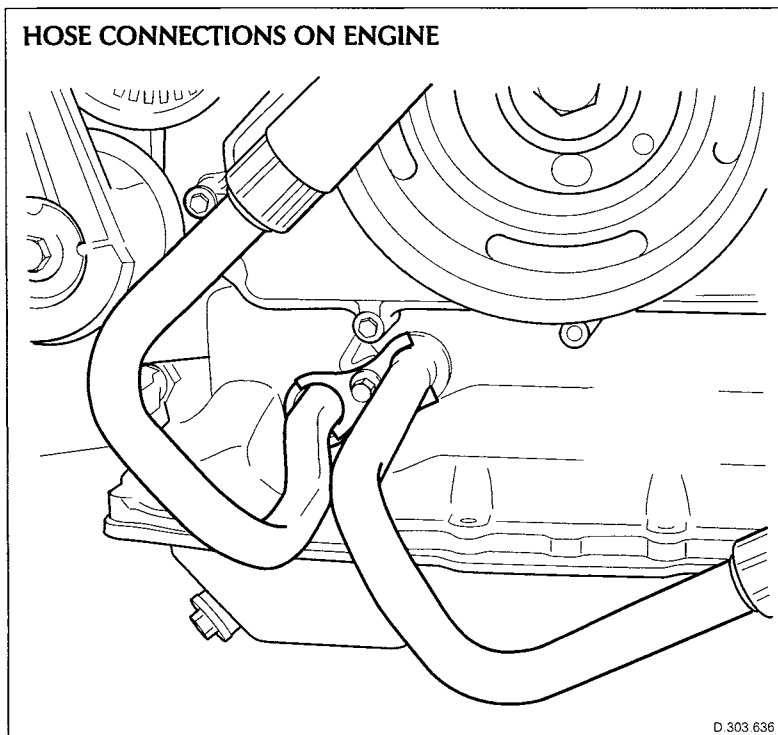
In all markets, the lubrication system of SC engines incorporates an oil cooler. An oil diverter valve controls the flow through the oil cooler.

### Oil Cooler

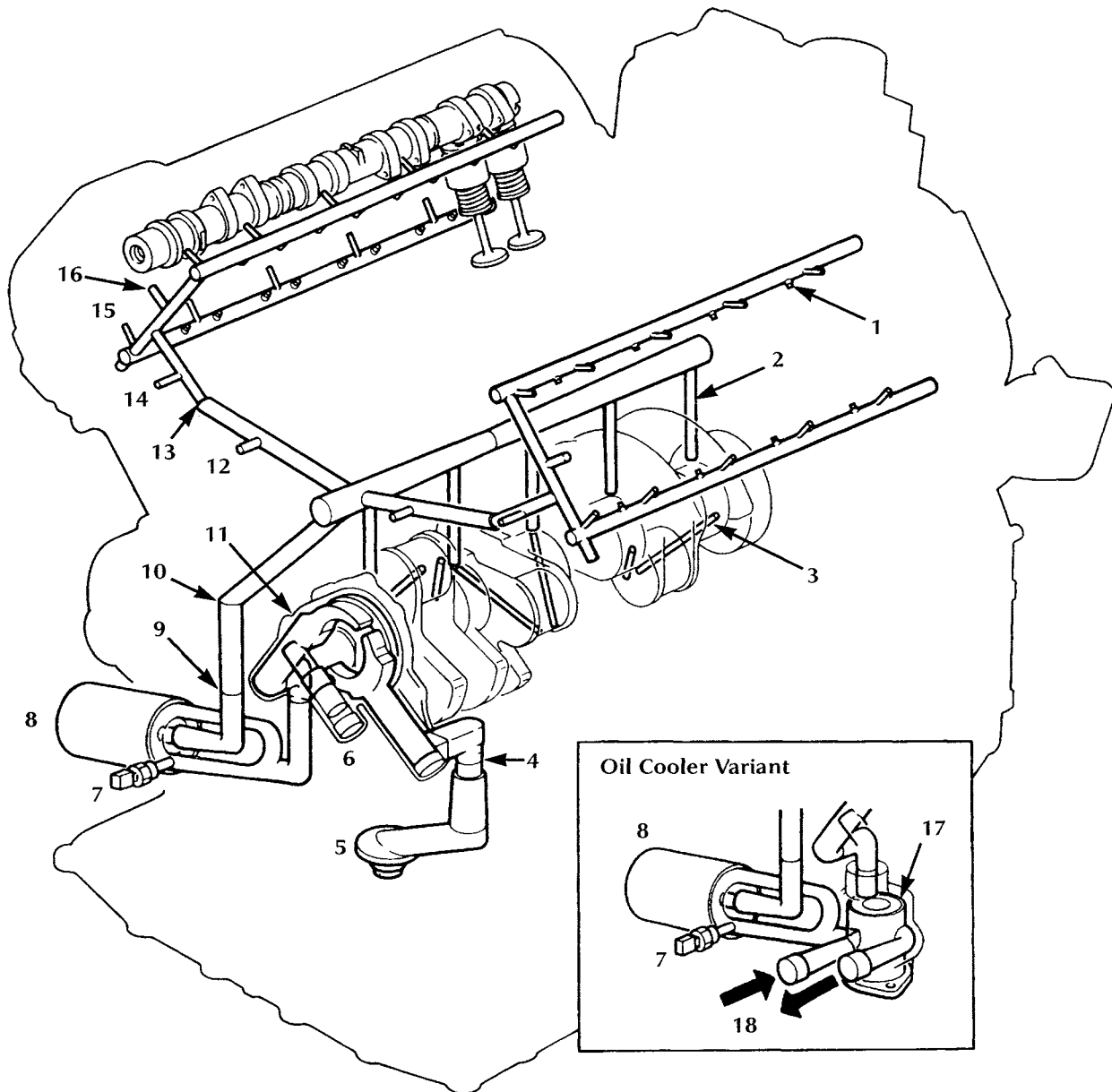
The oil cooler is a wire bound tube, liquid to air, heat exchanger installed immediately below the PAS cooler. A bolt, spacer and rubber isolating grommet, at each of two integral mounting brackets, attach the oil cooler to the body.

### Oil Cooler Hoses

Two oil cooler hose assemblies connect the oil cooler with the front of the structural sump on the engine.

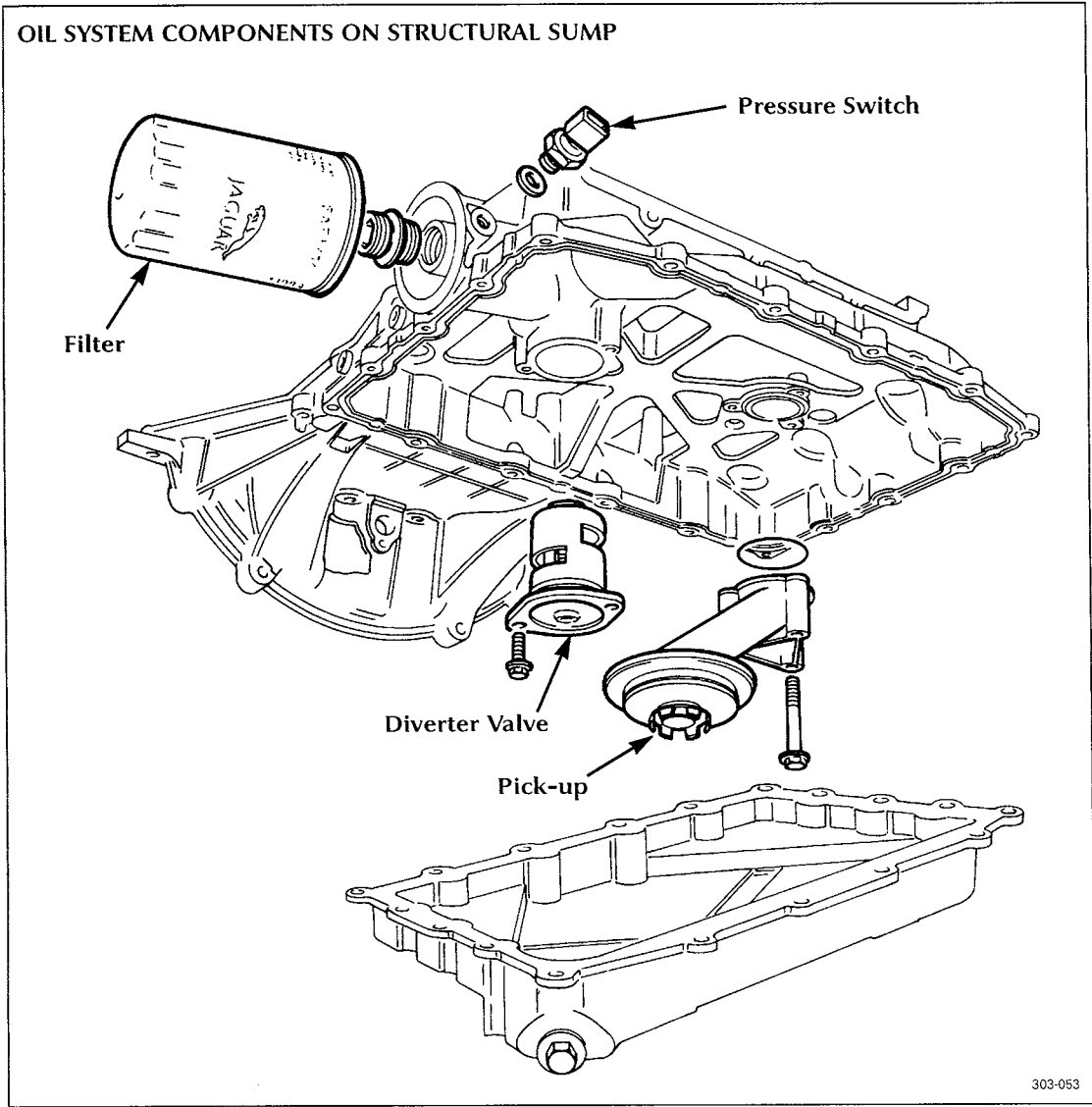


## LUBRICATION SYSTEM



- |                                       |                                                   |
|---------------------------------------|---------------------------------------------------|
| 1. Valve Lifter Supply                | 10. Bedplate/Cylinder Block Interface             |
| 2. Main Bearing Supply                | 11. Oil Pump                                      |
| 3. Connecting Rod Bearing Supply      | 12. Primary Chain Tensioner Supply                |
| 4. Bedplate/Cylinder Block Interface  | 13. Cylinder Block/Cylinder Head Interface        |
| 5. Oil Pick-up                        | 14. Variable Valve Timing Supply                  |
| 6. Pressure Relief Valve              | 15. Camshaft Bearing Supply                       |
| 7. Oil Pressure Switch                | 16. Secondary Chain Tensioner Supply              |
| 8. Oil Filter                         | 17. Oil Diverter Valve (Oil Cooler Vehicles Only) |
| 9. Structural Sump/Bedplate Interface | 18. Oil Cooler Supply and Return                  |

303-007



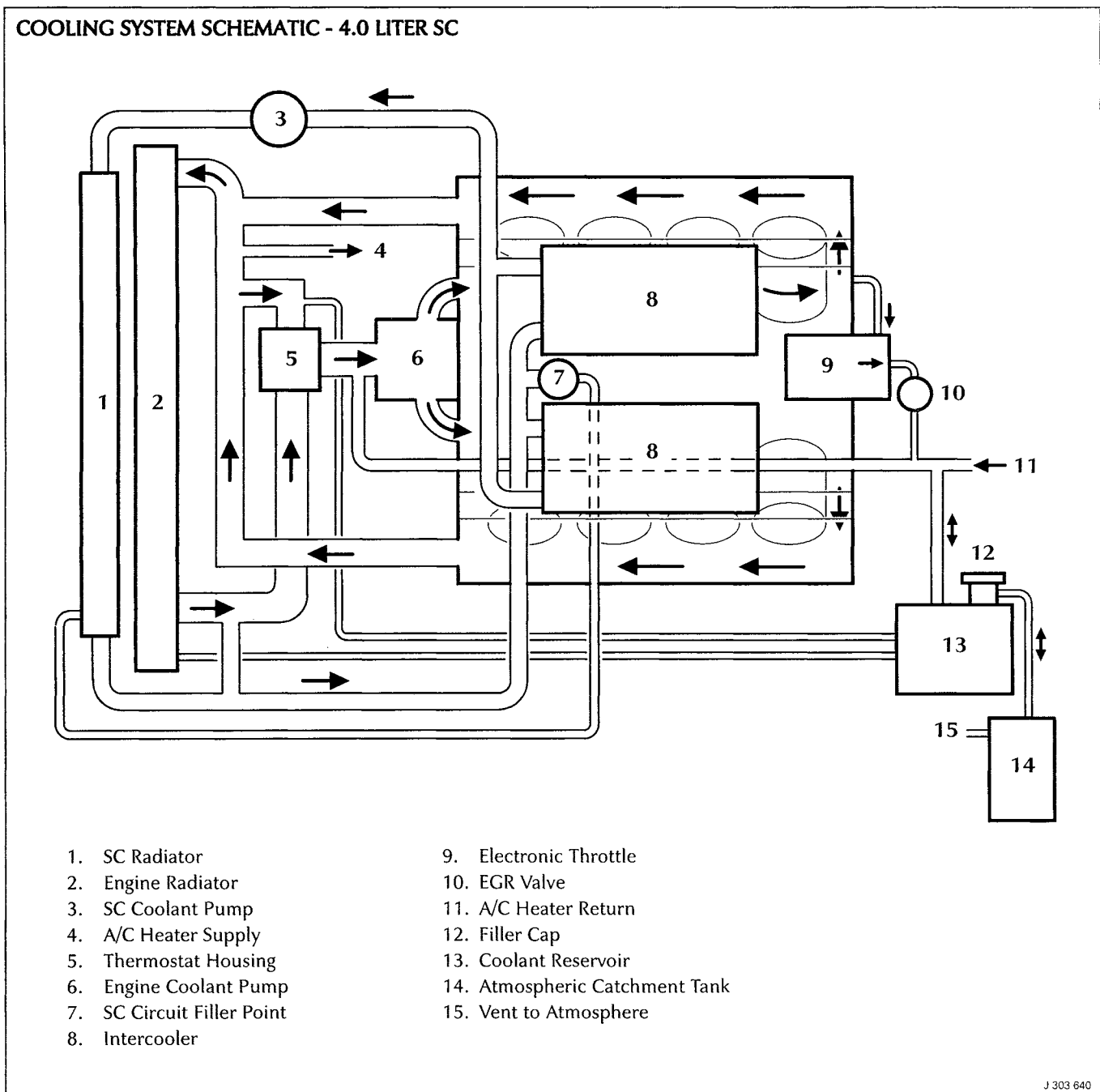
### Oil Diverter Valve

The oil diverter valve is installed in the structural sump of the engine, in the passage between the pump outlet and the filter inlet. At lower temperatures, the oil from the pump flows direct to the oil filter. At higher temperatures, a thermostat opens the valve to divert the oil through the oil cooler before it enters the oil filter. The valve begins to open at 103 to 107°C and is fully open at 119°C.

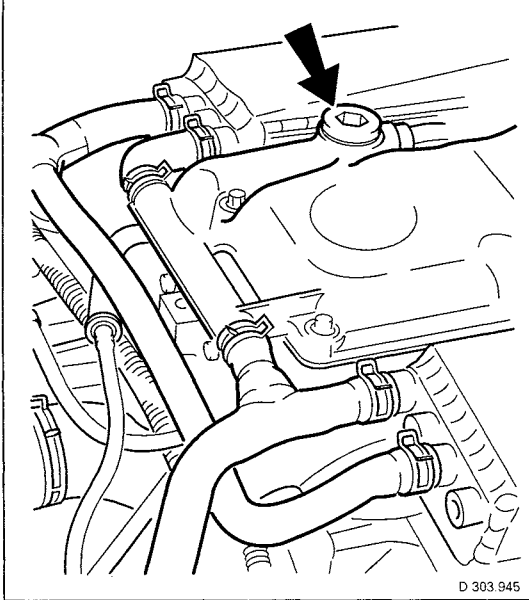
## Engine Cooling

The engine cooling system is changed to accommodate the AJ-V8 installation and now incorporates an atmospheric catchment tank similar to that on the XK8. On models fitted with the 4.0 liter SC engine, a new SC radiator and SC coolant pump are introduced for the intercooler circuit.

The intercooler circuit has an additional bleed point on the SC radiator and a filler point on the supercharger outlet duct. Both of these features are incorporated to prevent air being trapped when the system is filled. Topping up of the system is through the filler on the coolant reservoir. The correct level is when the coolant is level with the bottom of the filler neck.



**INTERCOOLER FILLER POINT AND HOSE CONNECTIONS**



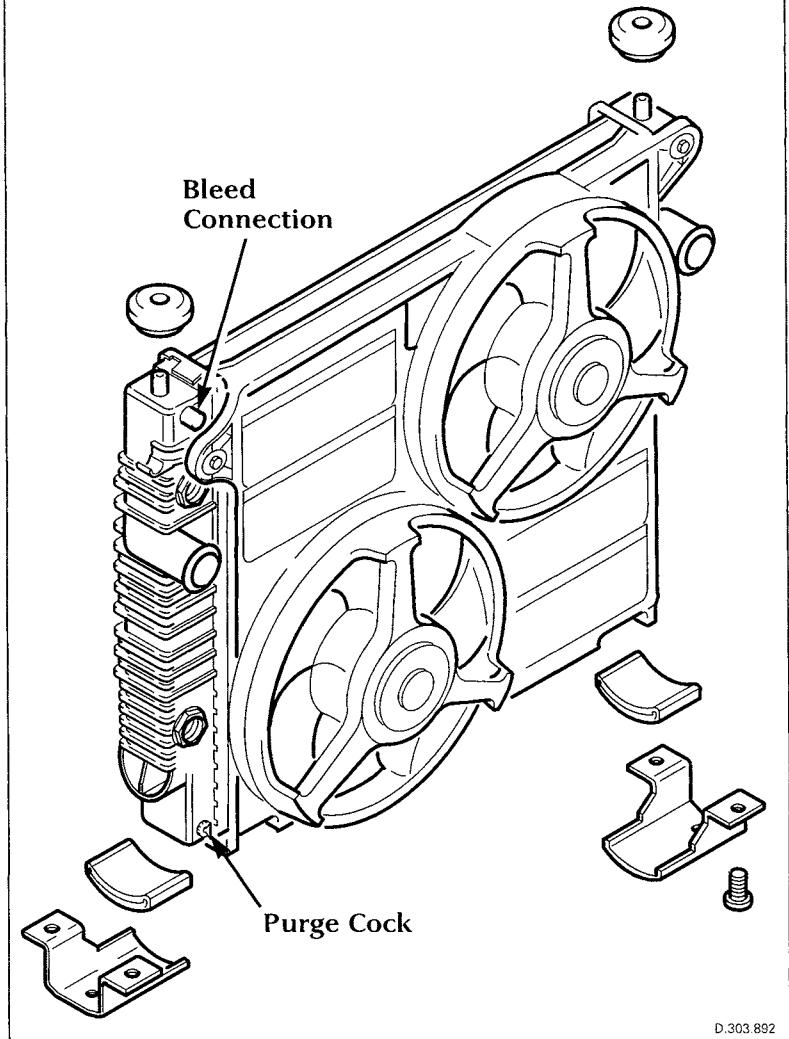
**Engine Radiator**

The engine radiator retains the same core, but now has plastic end tanks with revised positions for the top and bottom hose connections. The PAS oil cooler has been deleted from the right end tank (see Chassis section for details of the new PAS oil cooler). The left end tank contains a six plate transmission fluid cooler.

The radiator is supported on two brackets attached to the body, instead of the cradle assembly used previously. Two spigots, one on the top of each end tank, locate in rubber bushes in the radiator top mounting panel to locate the top of the radiator.

The closing panel on the top of the radiator is made from a polypropelene material, instead of steel, for weight and corrosion resistance benefits.

**ENGINE RADIATOR AND COOLING FANS**



**Cooling Fans**

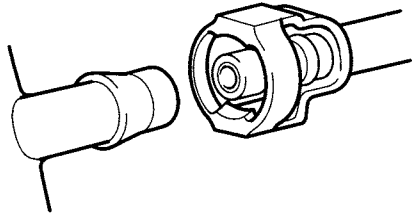
The cooling fans are the same as those used on the previous Model Year. The ECM controls the cooling fans to maintain the engine coolant and A/C refrigerant within their respective temperature and pressure limits.

**Cooling Fans Switching Points**

Mode	Coolant Temperature, °C (°F)		A/C System Pressure, Bar (lbf.in <sup>2</sup> )	
	On	Off	On	Off
<b>Slow</b>	95 (203)	90 (194)	12 (174)	8 (116)
<b>Fast</b>	105 (221)	100 (212)	22.5 (326)	17.5 (254)

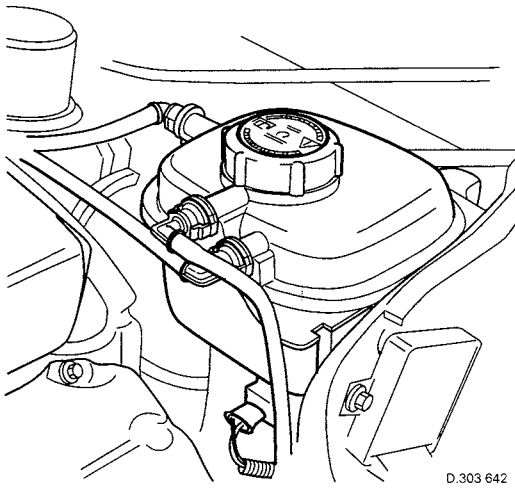


## QUICK RELEASE CONNECTOR



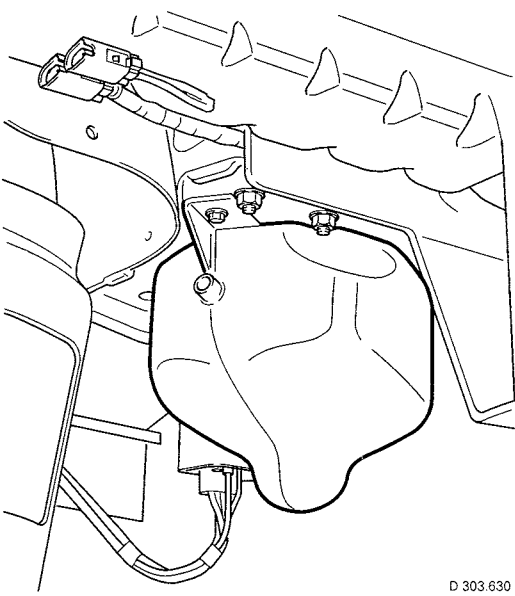
J.303.992

## COOLANT RESERVOIR



D.303.642

## ATMOSPHERIC CATCHMENT TANK



D.303.630

## Hoses

All of the coolant system hoses are new. The ends of the larger hoses have orientation marks to ensure correct installation. The orientation mark on the hose should be at the top of the mating spigot, unless the spigot also has an orientation mark, in which case the orientation marks should align. Spring clamps secure the ends of most of the hoses. Those not secured by spring clamps incorporate quick release connectors. Quick release connectors are incorporated at:

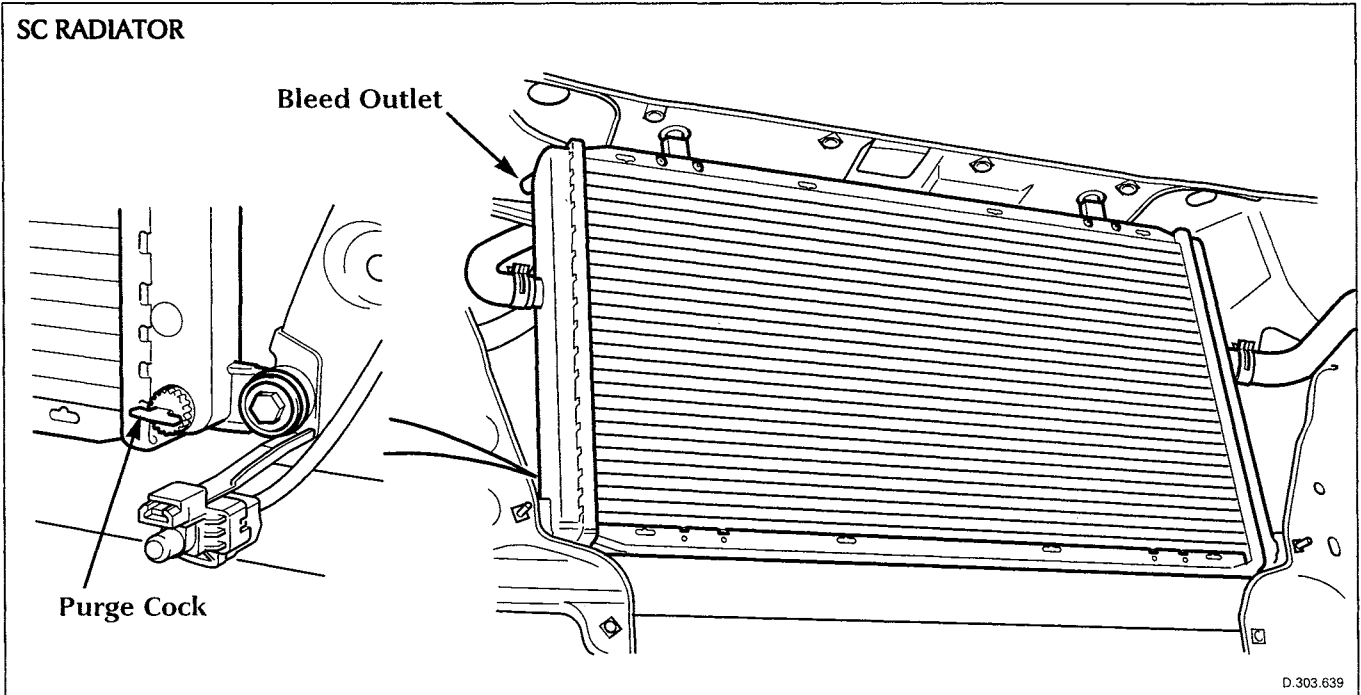
- the bleed connections with the engine radiator, SC radiator, thermostat housing and coolant reservoir
- the system connections with the supply and return of the A/C heater (these are the same as on the XK8).

## Coolant Reservoir

A new coolant reservoir, similar to the one on the XK8, is installed on the left firewall extension in the engine compartment. The filler cap incorporates a 1.0 bar pressure relief valve. The coolant volume is correct when the surface of the coolant is level with the bottom of the filler neck.

## Atmospheric Catchment Tank

The atmospheric catchment tank is installed behind the wheel arch liner forward of the left front wheel.

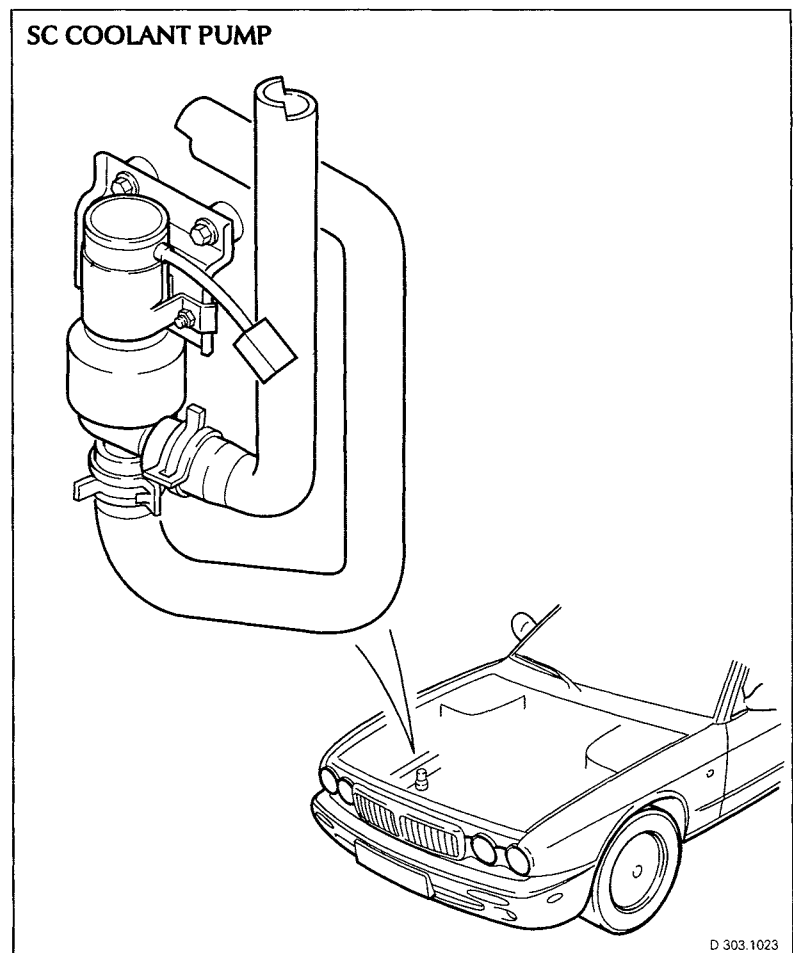


**SC Radiator**

The new SC radiator has a larger surface area and has plastic end tanks with revised positions for the inlet and outlet hose connections to suit the AJ-V8 installation. In addition, the radiator now has a bleed outlet, at the top left side, and a purge cock. The fixing arrangement is similar to that used before, with two locating lugs at the top and two securing brackets at the bottom.

**SC Coolant Pump**

The new SC coolant pump is installed on a new mounting bracket in approximately the same location as on previous Model Year vehicles. The new pump is larger and more powerful than the previous pump and is installed with the motor uppermost to prevent moisture ingress from the pumping element. The pumping element runs in roller bearings, instead of plain bearings, to reduce noise and improve durability.



The engine management system is similar to that of the 1998 Model Year XK8, with the software revised to suit each of the three engine types installed in the Sedan.

## ECM

The ECM is installed in a ventilated sealed box in the front passenger side enclosure of the engine compartment. An electric fan ventilates the box with air from the cabin. The lid of the box holds the ECM in position.

Different control features are incorporated into the ECM according to market and engine type. The main differences are:

## EGR

In NAS markets the ECM operates the EGR system on 4.0 liter SC engines.

## Fuel System Leak Check

On all USA vehicles, the ECM performs a leak check of the evaporative loss system.

## RPM Limit in Neutral

On all vehicles with a 4.0 liter SC engine, the ECM limits engine speed to 3000 RPM maximum while the transmission is in neutral.

## SC Coolant Pump

On all vehicles with a 4.0 liter SC engine, the ECM operates the SC coolant pump relay to control the

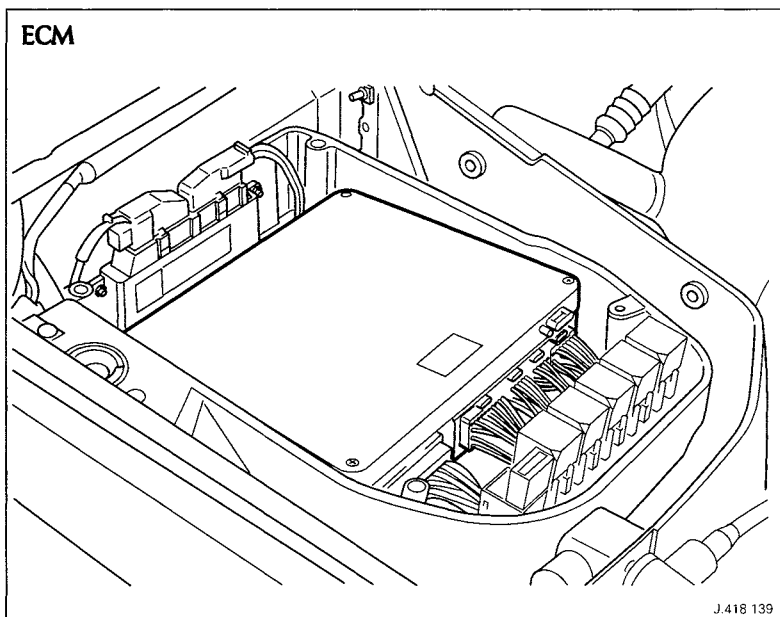
operation of the SC coolant pump. The pump is energized all the time the ignition is on.

## Second Fuel Pump

On all vehicles with a 4.0 liter SC engine, the ECM operates the second fuel pump relay to control the operation of the second fuel pump. The ECM energizes the second fuel pump for two seconds at ignition on, then energizes the first fuel pump and de-energizes the second. The first pump remains energized for the remainder of the ignition cycle, with the second pump being energized as necessary at high engine speeds and high engine loads to supplement the supply from the first pump.

## VVT

Variable valve timing is only incorporated on 4.0 liter NA vehicles.

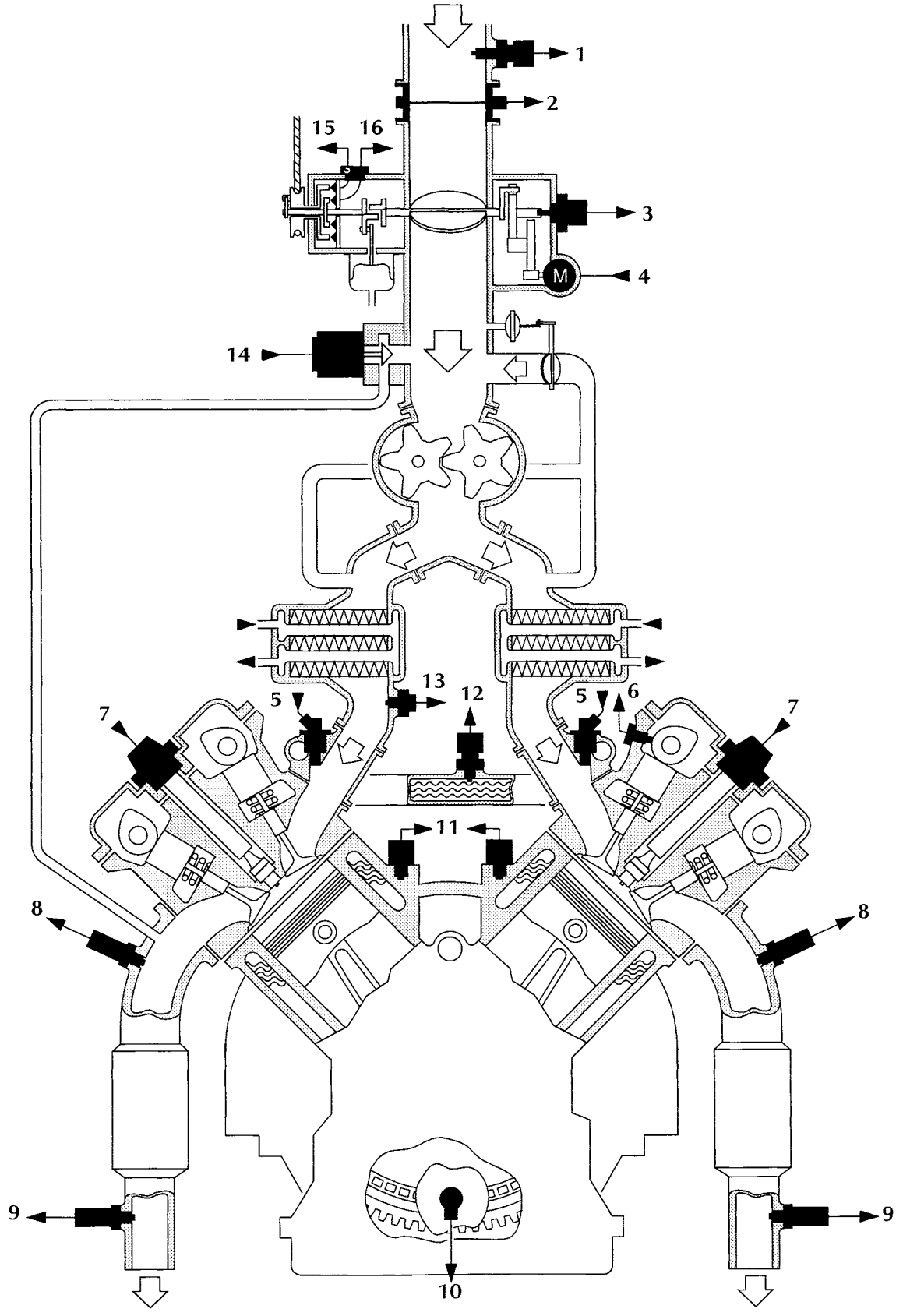


## Key for SC Engine Management Schematic:

### ECM Inputs and Outputs

1. Intake Air Temperature Sensor
2. MAFS
3. Throttle Position Sensor
4. (Throttle) dc Motor
5. Fuel Injector
6. Camshaft Sensor
7. On-plug Ignition Coil
8. HO2S
9. O2S
10. Engine Speed Sensor
11. Knock Sensor
12. ECT Sensor
13. Intercooler Intake Air Temperature Sensor (IAT2)
14. EGR Valve (Where Fitted)
15. Accelerator Pedal Position Sensor
16. Mechanical Guard Position Sensor

SC ENGINE MANAGEMENT SCHEMATIC



J.303.643

## Sensors

The engine management sensors are the same as those used on the XK8, except on the SC engine, which has a revised MAFS (to accommodate the higher mass air flows) and an additional air temperature sensor (IAT2) in the outlet side of A bank intercooler. The input from the intercooler temperature sensor is used for engine management functions, the input from the IAT that is integrated with the MAFS is used for diagnostics.

## Cruise Control

The cruise control system is the same as that used on the 1998 Model Year XK8. The vacuum switching valves and the check valve are installed on the front firewall, in the driver's side enclosure of the engine compartment. The vacuum reservoirs are installed in the engine compartment, behind the right headlamps. Also as on the XK8, the system is operated by a master switch located to the rear of the gear shift lever and four switches on the steering wheel.

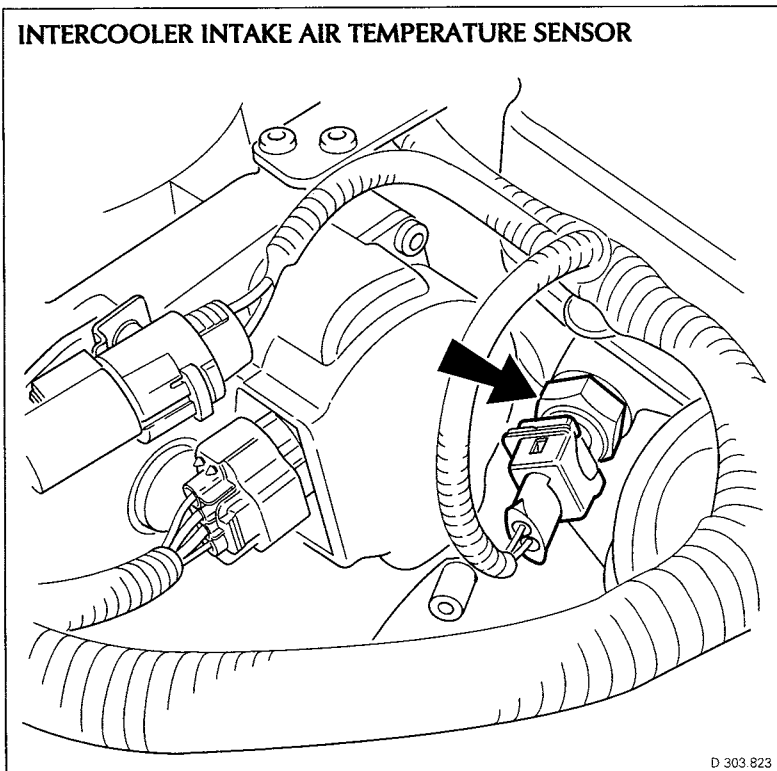
## Diagnostics

There are differences in the diagnostic functions incorporated into the ECM of the different engines. The functions of the 4.0 liter NA are the same as the 1998 Model Year XK8. The functions of the 4.0 liter SC differ from the 4.0 liter NA as follows:

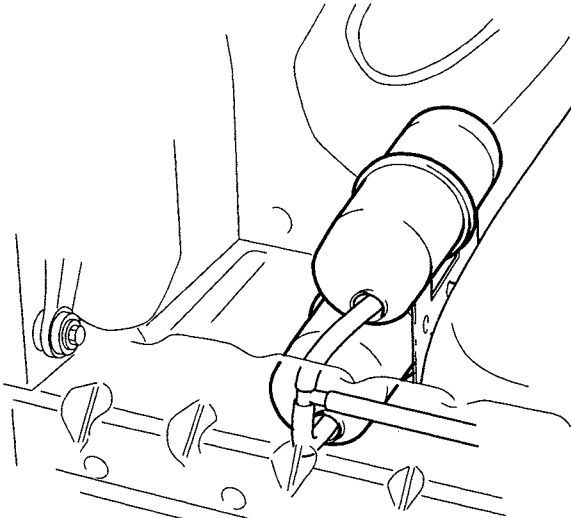
Misfire detection is performed only at the lower ends of the engine speed and load ranges (on the 4.0 liter NA the full speed and load ranges are monitored).

Monitoring of additional components is included. These are:

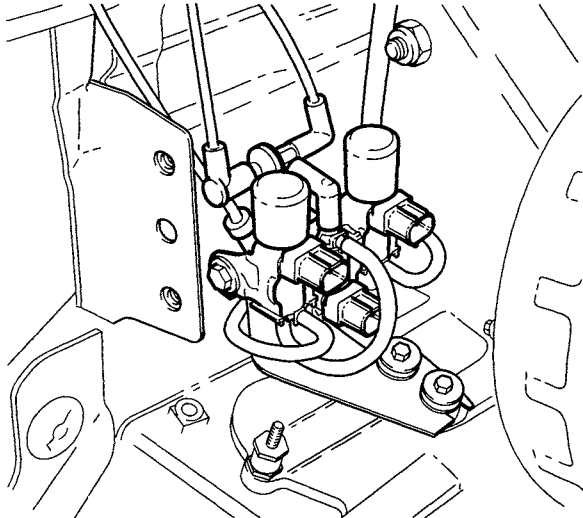
- the SC coolant pump relay. If a fault is detected, the ECM adopts the reverse gear throttle limit (18° maximum)
- the second fuel pump relay. If a fault is detected, the ECM adopts an engine speed limit of 3000 RPM maximum
- EGR control valve. If a fault is detected, EGR is disabled.



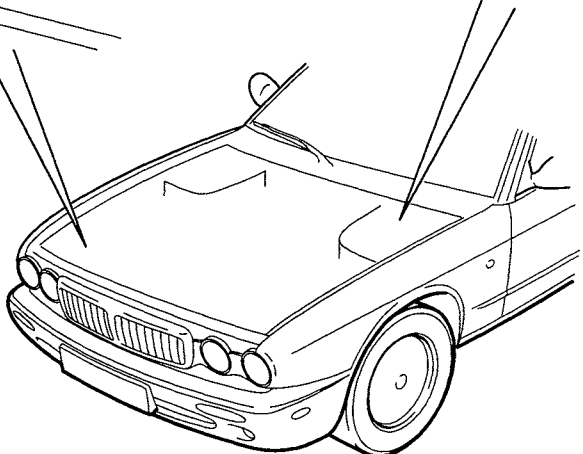
**VACUUM SWITCHING VALVES, CHECK VALVE AND RESERVOIRS**



**Vacuum Reservoirs**



**Vacuum Switching Valves and Check Valve**



D.310 007

On all vehicles, the fuel delivery system and the EVAP system lines are revised and a new fuel pump is introduced.

On the EVAP system:

- all models have the twin canister system
- the canister close valve and filter are repositioned.

All models have on-board refueling vapor recovery (ORVR).

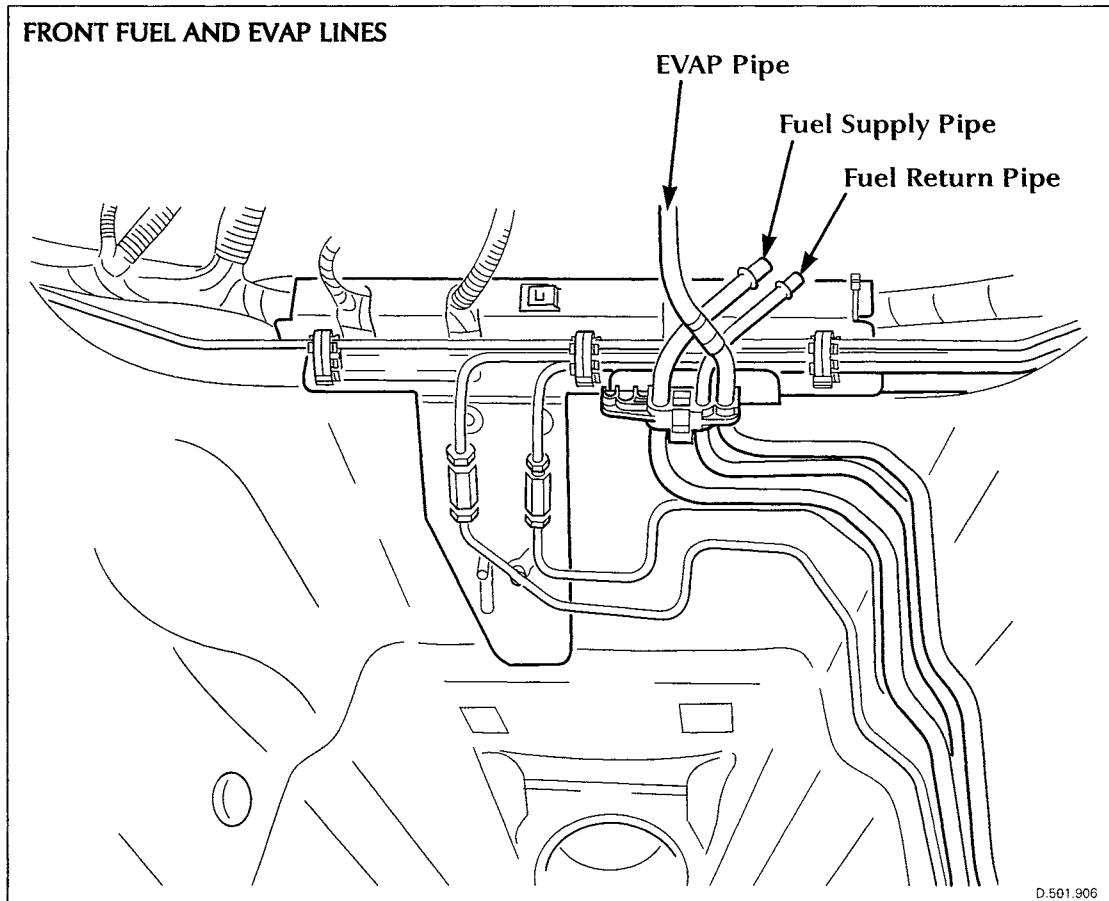
## Fuel Delivery System

### Fuel Lines

At the front of the vehicle the fuel lines are revised to match the new engine installation. A pulse damper is incorporated into the supply line.

### Fuel Pump

The new fuel pump is similar to the previous design, but is quieter and has a higher output. There is a single pump for 4.0 liter NA engined models and two pumps for 4.0 liter SC engined models. The fuel pumps are switched on and off by relays controlled by the ECM.



D.501.906

## EVAP System

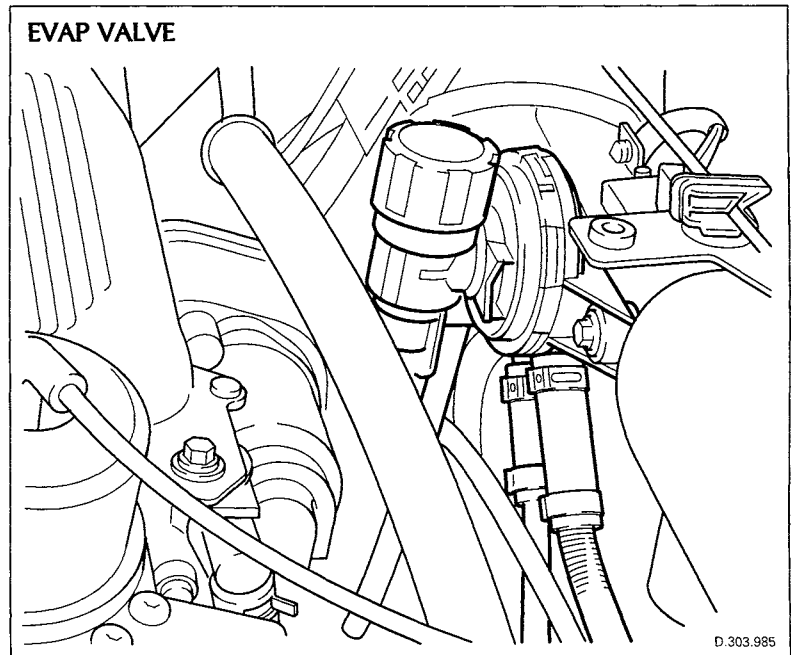
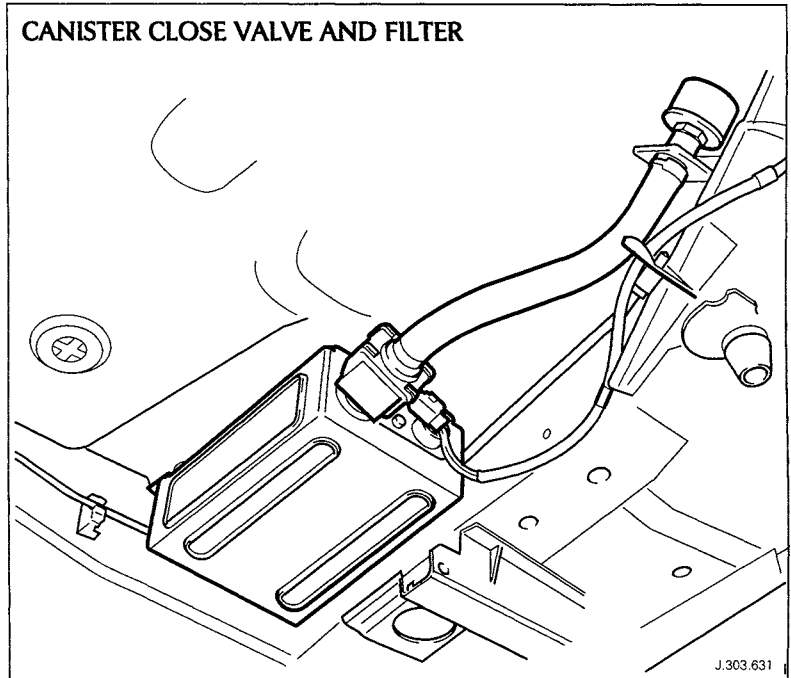
### EVAP Lines

At the front of the vehicle the EVAP lines are revised to match the AJ-V8 installation and the repositioned EVAP valve, which is now installed on the center of the firewall.

On vehicles with on-board refueling vapor recovery, the rear EVAP lines are revised to match the new vent lines on the fuel tank.

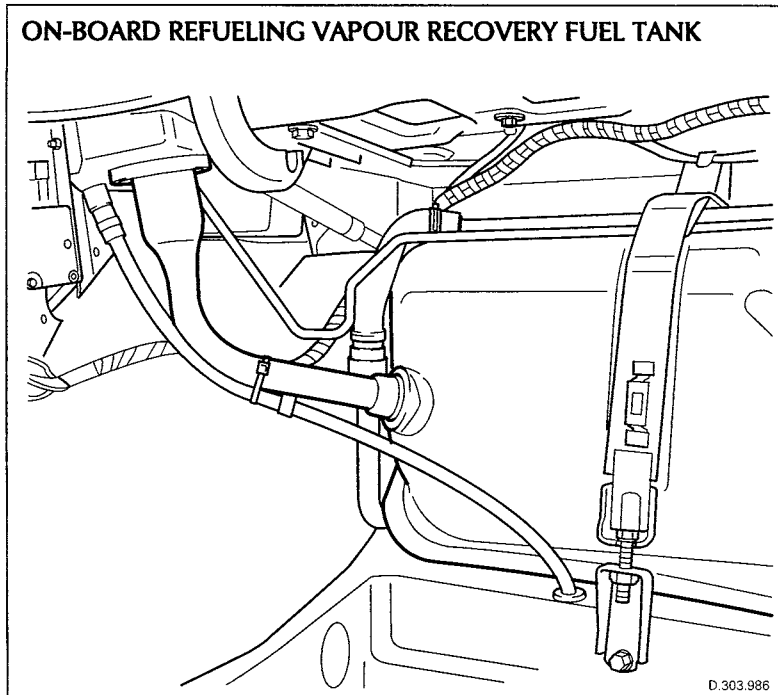
### Canister Close Valve and Filter

The canister close valve is now attached to the carbon canister. A hose connects the canister close valve to the filter positioned above the right axle shaft.





**ON-BOARD REFUELING VAPOUR RECOVERY FUEL TANK**



**On-Board Refueling Vapor Recovery (ORVR)**

On-board refueling vapor recovery prevents fuel vapor from the tank venting directly to atmosphere during refueling. Instead, the fuel vapor is vented into the EVAP system. On vehicles with on-board refueling vapor recovery, the fuel tank incorporates a new filler neck, new vent lines and a fill level vent valve.

**Filler Neck**

The diameter of the lower part of the filler neck is reduced. During refueling, the incoming fuel completely fills this reduced diameter and prevents vapor from the tank escaping up the filler neck to atmosphere. A check valve is incorporated at the outlet into the tank, to prevent fuel from surging back up the filler neck. A new nozzle guide is introduced to match the upper part of the new filler neck.

**Note:**

Because of the check valve, the tank cannot be fully drained with a siphoning tube installed in the filler neck. Draining by this method leaves the fuel level above the contents sender unit.

**Vent Lines**

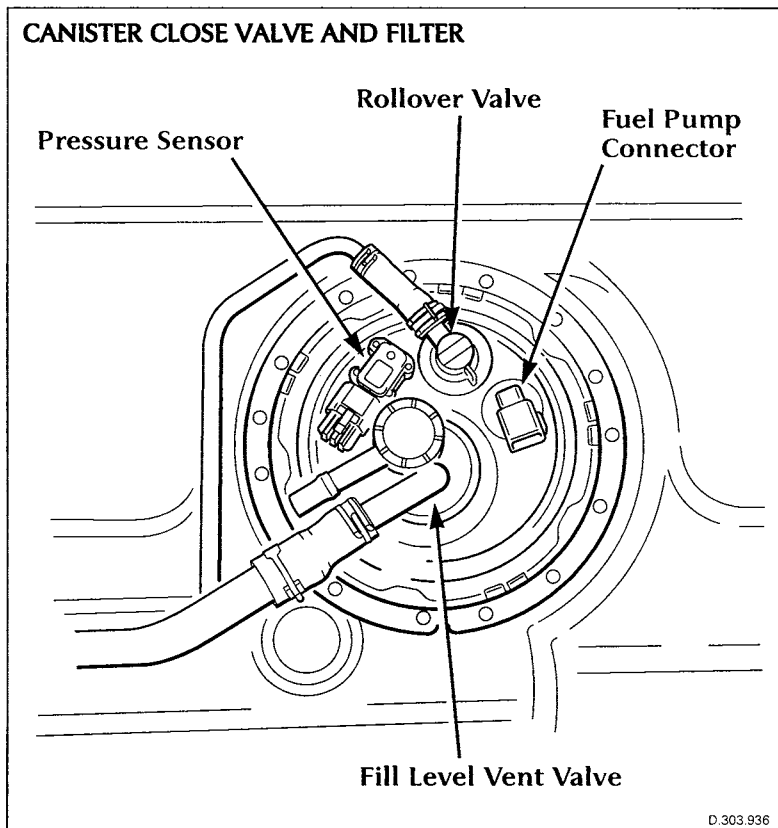
- The new vent lines on the fuel tank consist of:
- a pipe connecting the rollover valve and the fill level vent valve with the EVAP system
  - a pipe connecting the pressure relief outlet of the fill level vent valve with the filler neck.

**Fill Level Vent Valve**

The fill level vent valve sets the maximum level of fuel in the tank and provides ventilation outlets into the EVAP system and the filler neck. The valve is installed in the evaporative loss flange of the fuel tank.

A float valve and a pressure relief valve are incorporated into the fill level vent valve. When the fuel level in the tank reaches approximately half way up the fill level vent valve, the float valve closes the main vent into the EVAP system. The pressure relief valve is a safety feature. If a fault in the EVAP system causes pressure in the tank to increase (e.g. a blocked vent line or the canister close valve failing in the closed position), the pressure relief valve opens and vents the tank to atmosphere through the filler cap.

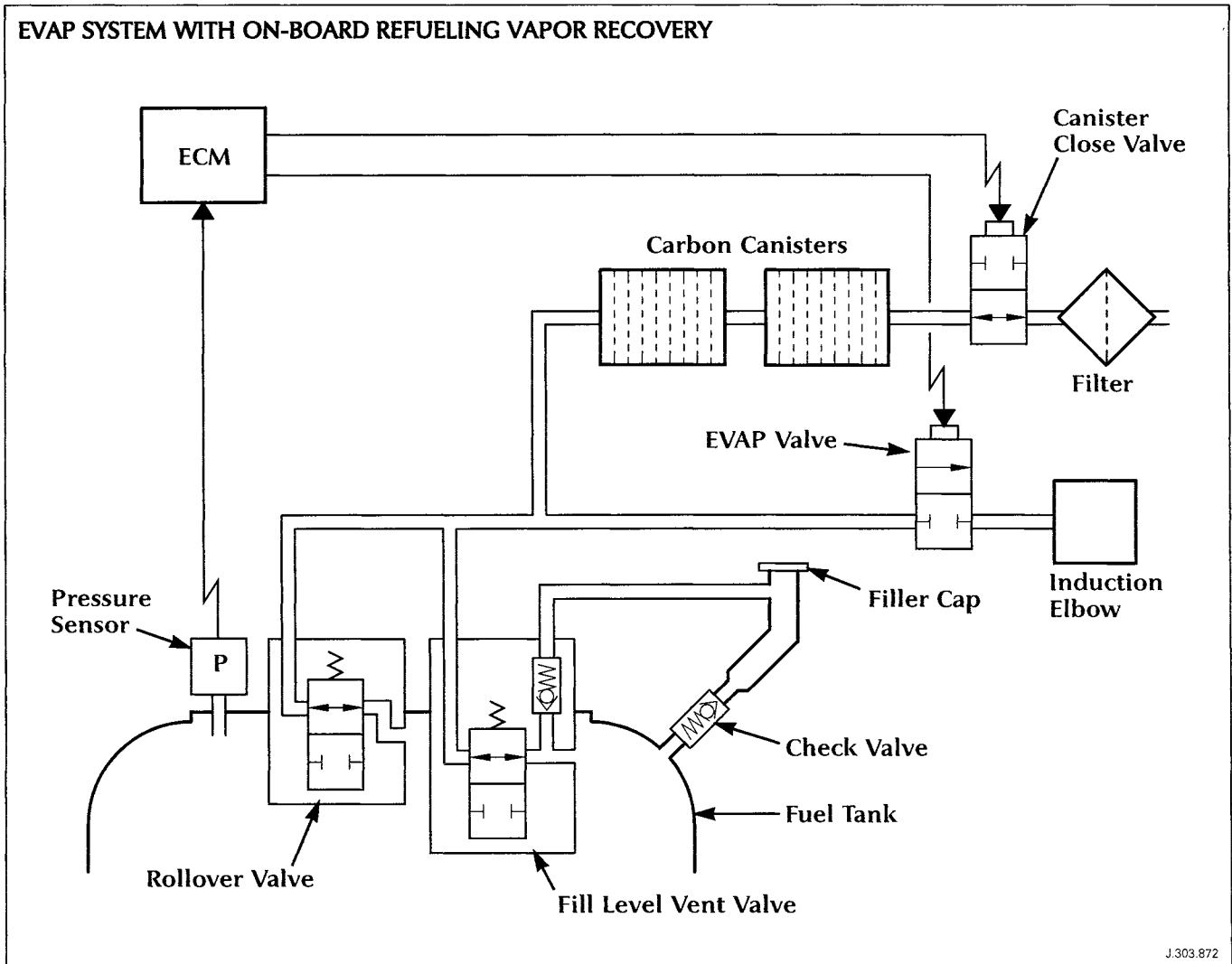
**CANISTER CLOSE VALVE AND FILTER**



**Vent Operation**

During refueling, the incoming fuel pushes fuel vapor out through the rollover valve and the float valve section of the fill level vent valve. When the float valve closes, ventilation is restricted, which causes a back pressure that is sufficient to operate the automatic shutoff valve in the refueling nozzle. The maximum fuel level is thus the level at which the float valve closes.

With the filler cap installed, the tank vents only through the rollover valve until the fuel level decreases and the float valve opens again.



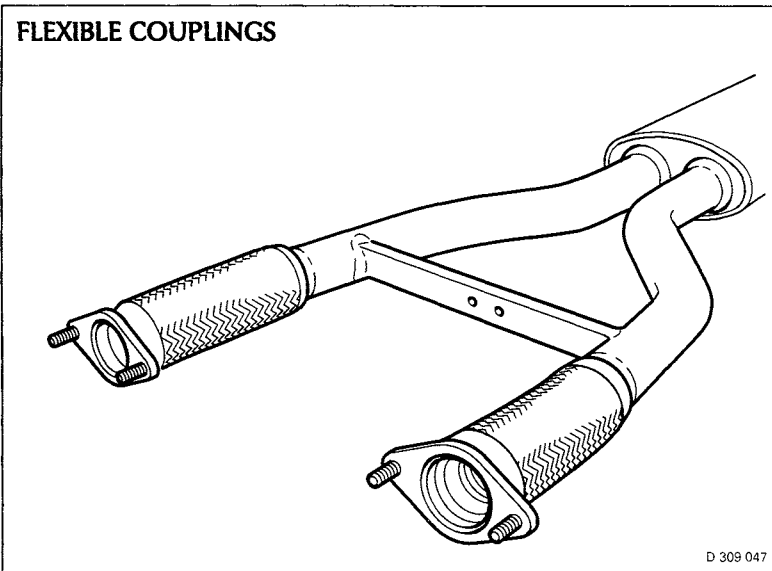
## System Layout

The layout of the exhaust system is now basically the same as on the XK8. The intermediate and rear mufflers are externally unchanged, but modified internally to tune them to the new engines. The downpipes, front muffler and tailpipes are new.

## Downpipe Assembly

On XJ8 and XJ8L models, the system has the same downpipe assemblies as the XK8. On the Vanden Plas and XJR models, the connection with the front muffler is a flanged joint instead of a slip joint. Also, on the XJR, the catalyst substrata in the catalytic converters are metallic instead of ceramic.

FLEXIBLE COUPLINGS



## Front Muffler

The front muffler replaces the underfloor catalytic converter of the previous system and is of a similar design to that of the XK8. Variants of the front muffler produce the different overall system lengths required for standard and extended wheel base models.

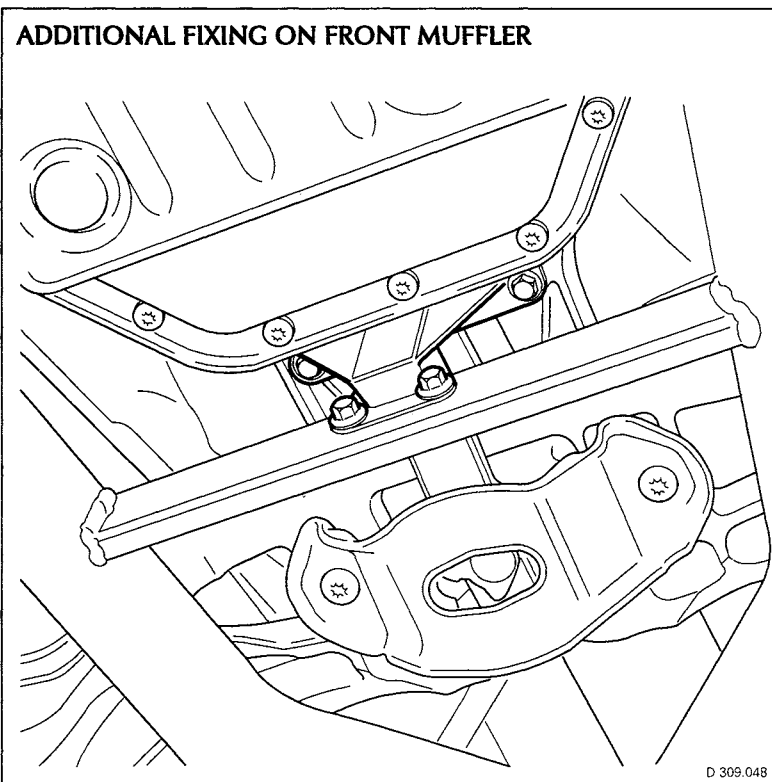
On Vanden Plas and XJR models:

- flexible couplings are incorporated into the front pipes for added refinement
- the muffler has an additional attachment point on the bracing strut between the two front pipes.

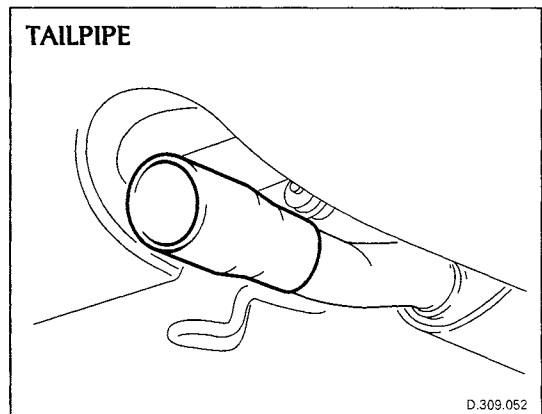
## Tailpipes

On the XJR, the tailpipes are restyled with a larger bore than the previous design. The fixing arrangement is unchanged.

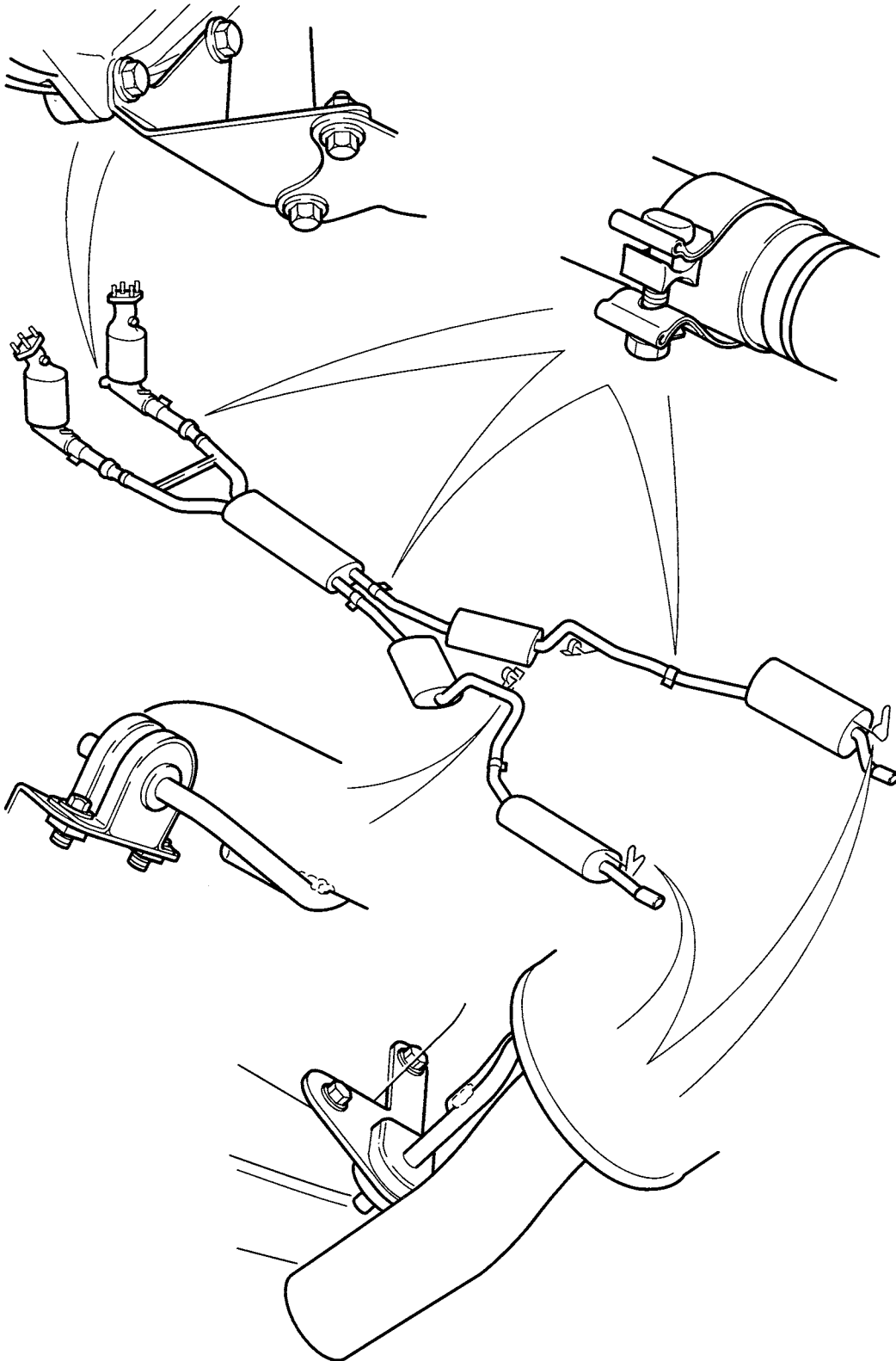
ADDITIONAL FIXING ON FRONT MUFFLER



TAILPIPE



TYPICAL EXHAUST SYSTEM LAYOUT



D.309 049

Two new automatic transmissions are introduced on the Sedan to match the new engines (there is no manual transmission). The 5HP24 is installed on 4.0 liter NA models and the W5A580 is installed on 4.0 liter SC models. The transmission mounting is revised to accommodate the new installations.

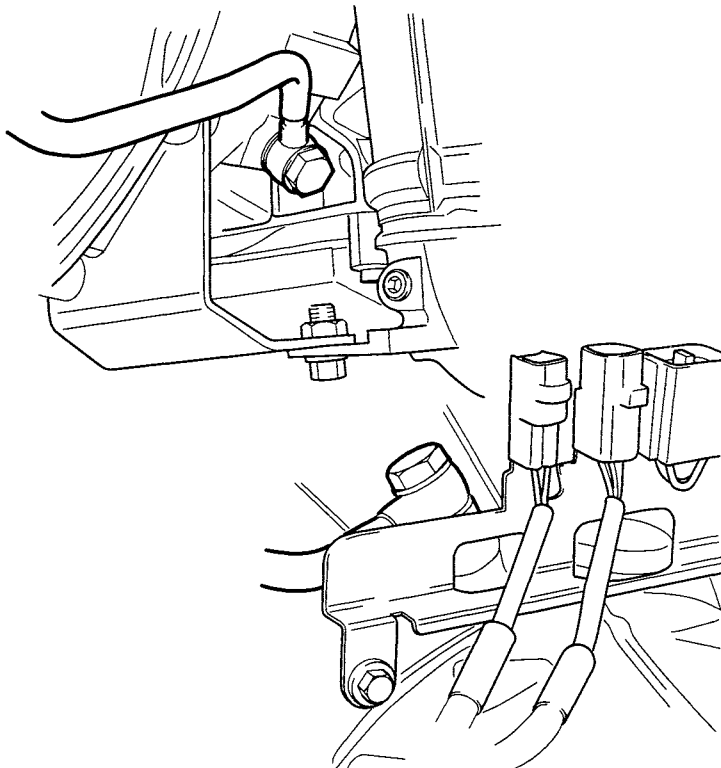
## 5HP24 Transmission

The 5HP24 transmission is the same as that installed in the XK8. It uses the same gearshift selector as the XK8, but the gearshift cable is revised to suit the Sedan installation. For further details of the transmission and gearshift selector, see the Technical Guides: AJ-V8 Engine and 5HP24 Transmission Introduction; XK8 Sports Coupe and Convertible Introduction.

## W5A580 Transmission

The W5A580 transmission is introduced to accommodate the higher outputs of the supercharged engine. Like the 5HP24 unit, this is an electronically controlled transmission with electro-hydraulic actuation of the gear shifts. There are five forward gears and two reverse gears, with torque converter lockup on 4th and 5th gears. Although outwardly the same, the gearshift selector and gearshift cable are unique to this transmission.

**W5A580 TRANSMISSION OIL COOLER PIPES**

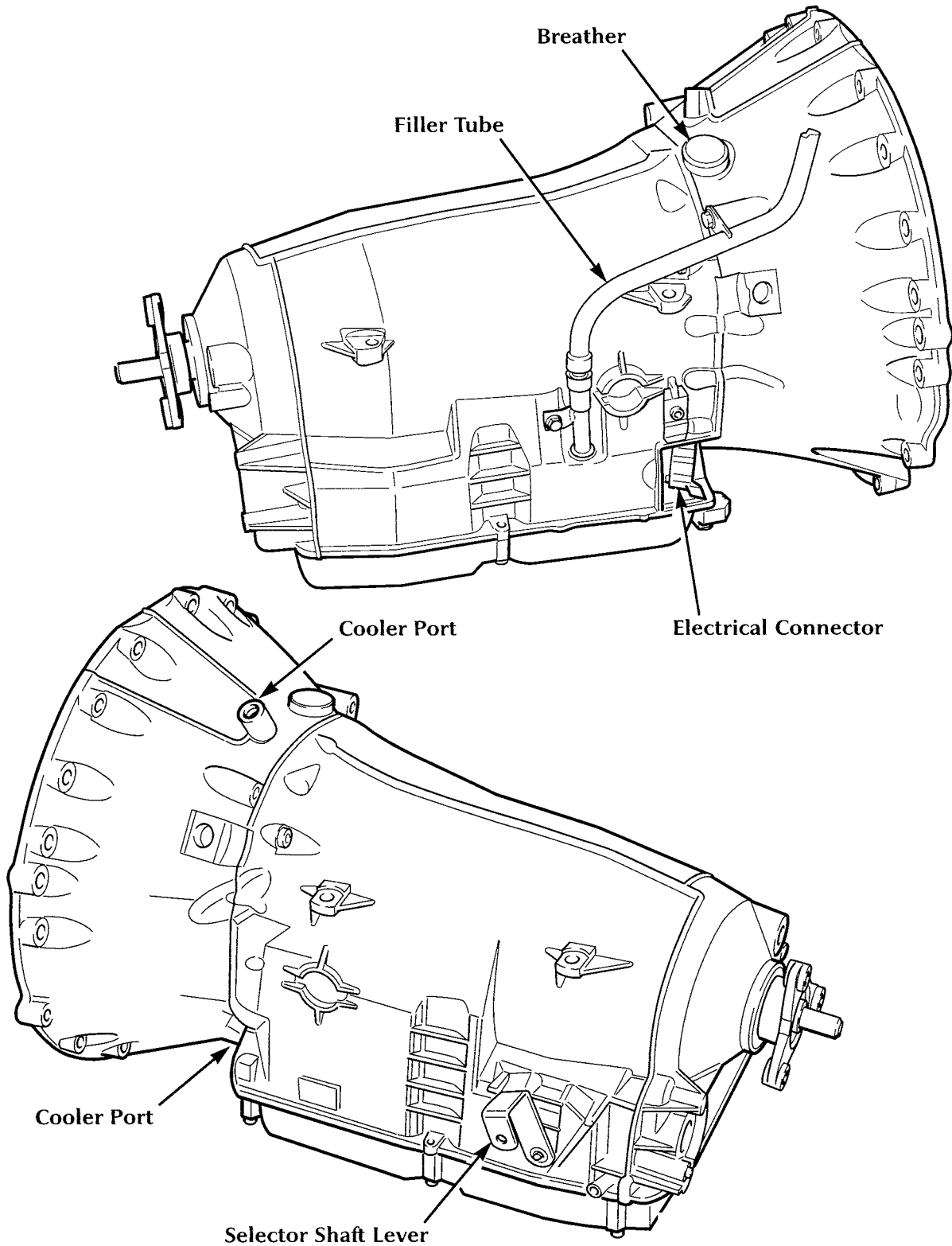


## Transmission Assembly

Two light alloy housings are bolted together to form the transmission assembly. The torque converter housing contains the torque converter and transmission oil pump. The transmission housing contains three planetary gear sets and associated shafts and gearshift operating mechanisms. A steel oil pan is installed on the bottom of the transmission housing.

The transmission uses a filled-for-life oil, and has a filler tube connected to the right side of the transmission housing. A service oil gauge is provided for checking the oil level, should it be necessary (there is no oil gauge attached to the filler tube cap). Inlet and outlet ports for the transmission oil cooler circuit are located towards the rear of the converter housing. A breather at the top rear of the converter housing ventilates the interior of the transmission housing.

**W5A580 TRANSMISSION ASSEMBLY**



D.307.177 & 178

## V8 XJ Series Transmission

An electrical connector at the front right side of the transmission housing provides the interface with the vehicle wiring. A heat shield protects the connector from heat from the downpipe of the exhaust system. In the transmission housing, the electrical connector is attached to the valve block. The valve block contains all the hydraulic and electrical components which, in response to inputs from the TCM, direct and modulate hydraulic pressure to the brakes and clutches that operate the gear shifts and torque converter lockup. Two speed sensors, an oil temperature sensor and a starter lockout switch are also installed in the valve block. These all output to the TCM.

A selector shaft at the rear left side of the transmission housing operates the selector valve and the parking lock mechanism. If there is a failure of the electronic control, the selector valve controls hydraulic actuation of reverse and forward (usually 2nd) gears. Detents in the transmission housing provide positive locations

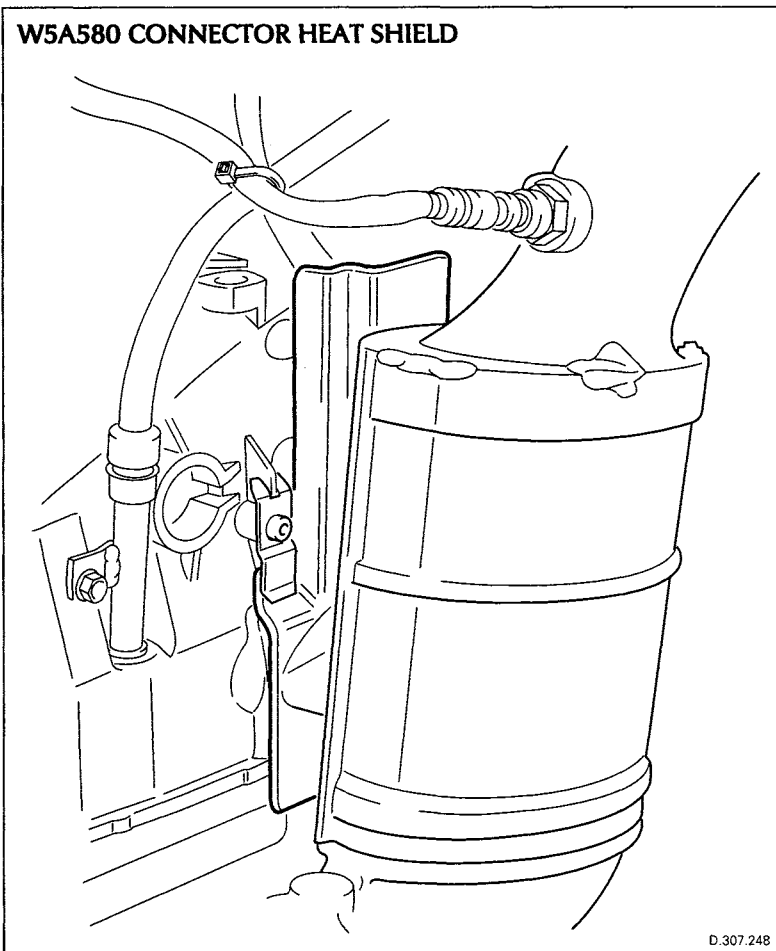
for the selector shaft (and thus the gear selector lever) at positions P, R, N and D.

The parking lock consists of a pawl that engages in a gear wheel on the output shaft. The pawl will only engage when the vehicle is stationary or moving very slowly.

### Technical Data

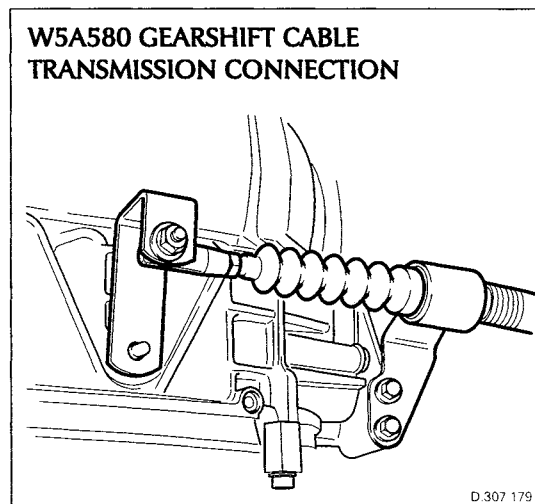
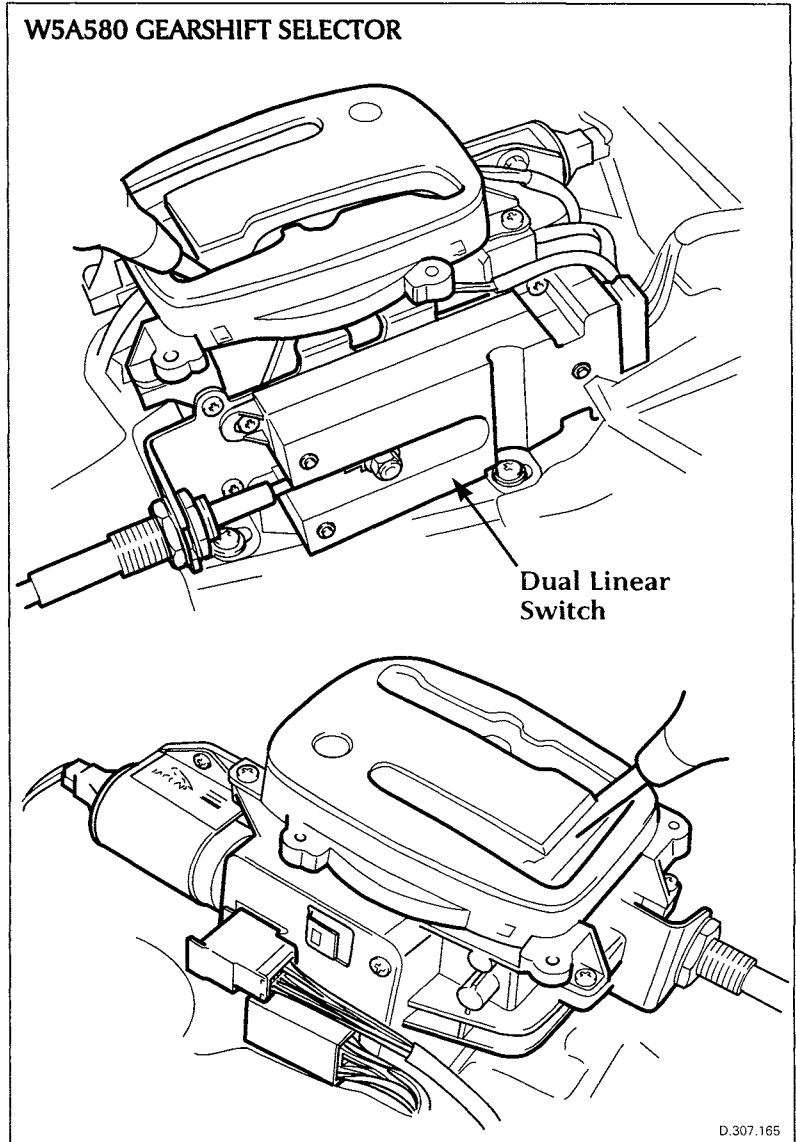
Oil Type	: Shell LA 3403-M115
Oil Volume (Approximate):	
Transmission Only	: 9.4 liters (9.95 quarts)
Including Oil Cooler	: 10.0 liters (10.58 quarts)
Gear Ratios:	
Reverse (Normal Mode)	: 1.93
Reverse (Sport Mode)	: 3.16
1	: 3.59
2	: 2.19
3	: 1.41
4	: 1.00
5	: 0.83
Weight, Wet (Approximate, Including Torque Converter)	: 81 kg (179 lb)

W5A580 CONNECTOR HEAT SHIELD



## Gearshift Selector

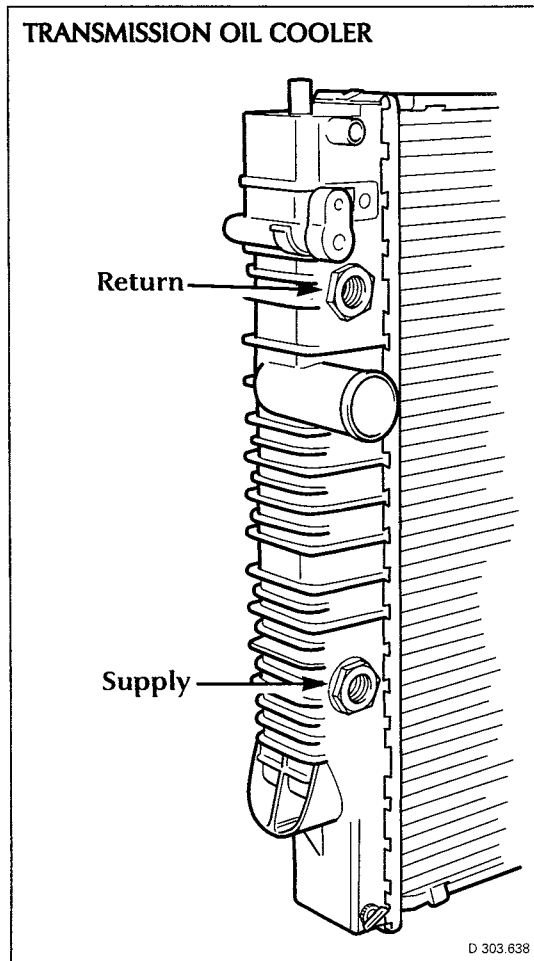
The gearshift selector transmits gear selector lever positions to the TCM and the transmission assembly: a dual linear switch transmits all positions, P through 2, to the TCM via hard wiring; positions P, R, N and D are transmitted to the transmission assembly via the gearshift cable. In positions 4, 3 and 2, the gear selector lever is disengaged from the the gearshift cable. Latches in the gearshift selector provide positive locations for the gear selector lever at these positions. Two solenoids in the gearshift selector operate the gearshift interlock and the reverse gear lockout mechanisms connected to the gear selector lever. A park switch provides an input to the BPM to control the operation of the gearshift interlock and the ignition key interlock.





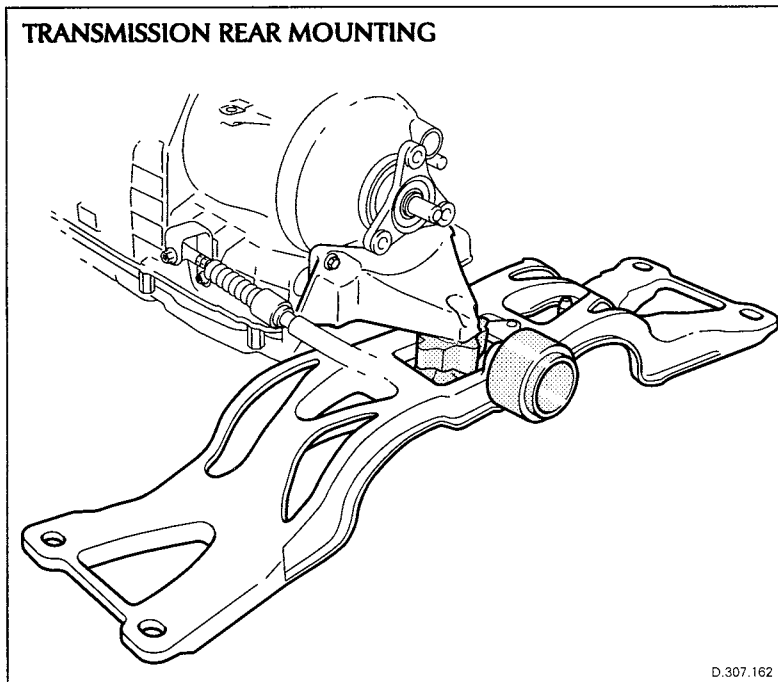
## Transmission Oil Cooling

For both types of transmission, an oil cooler is integrated into the left end tank of the engine radiator. It is a six plate cooler approximately 250 mm (10 in) high.



## Transmission Rear Mounting

The transmission rear mounting is revised to accommodate the new engine and transmissions. A new crossmember, made from a higher specification material, is introduced and the dynamic absorber is retuned and keyed to the crossmember.



## Driveshaft

The driveshaft is new, with improved refinement. It is of a lighter construction than the previous designs and therefore more finely balanced.

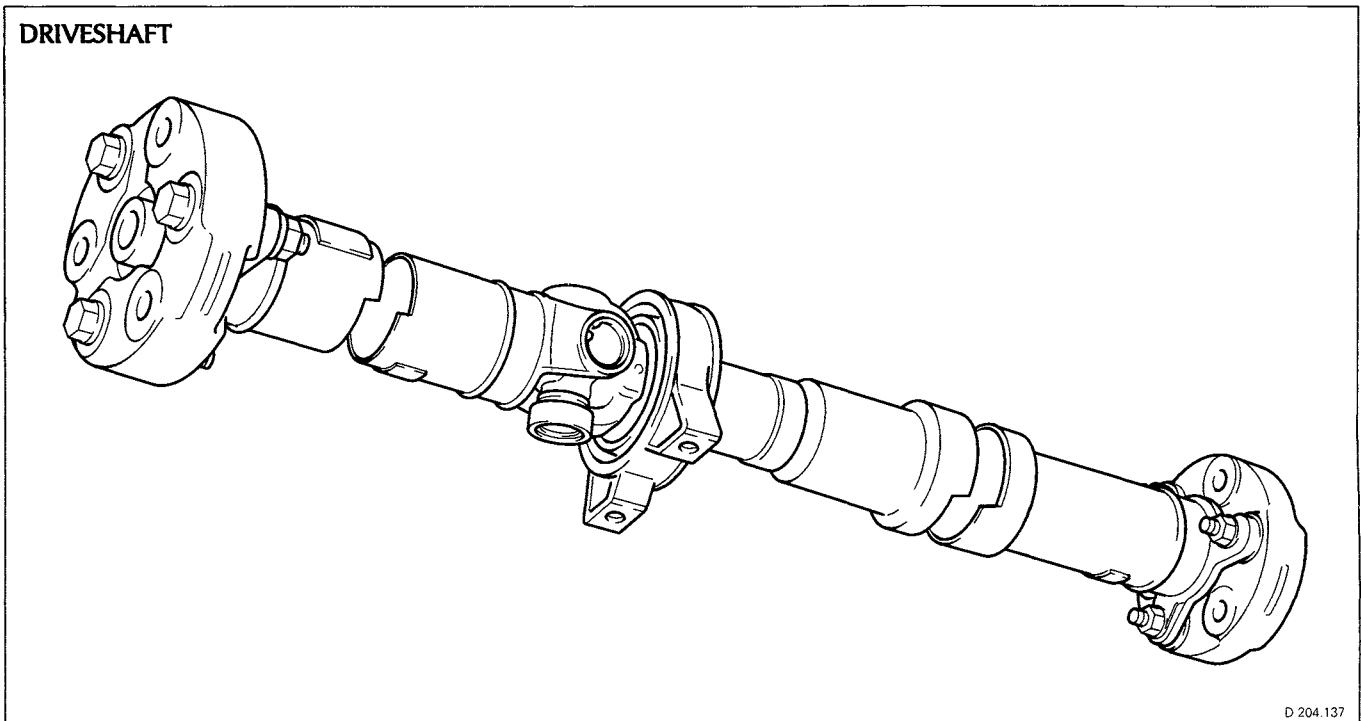
The basic design of the driveshaft is the same for all models, with the length adjusted to match the different transmission and wheel base combinations. The driveshaft consists of a front and a rear section connected by a sliding spline. Each section is made from thin walled tubing and has a flexible coupling at the outer end. A universal joint is incorporated at the forward end of the rear section. The front tube incorporates a crash feature in the form of a swaged area that collapses in a controlled manner if subjected to a high axial load.

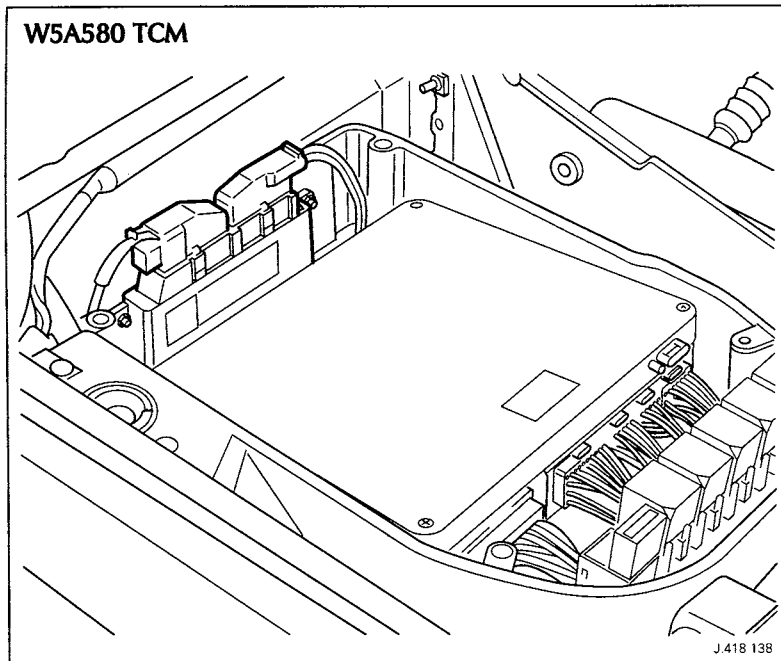
The center of the driveshaft is supported in a bearing attached to a bracket installed across the driveshaft tunnel.

The weight of the new driveshaft is between 9.90 and 10.50 kg (21.8 and 23.1 lb), depending on installation, compared to between 13.58 and 14.61 kg (29.9 and 32.2 lb) for the previous designs.

## Final Drive Unit

The 14HU final drive unit from the XK8 is now incorporated into the Sedan. With the input pinion on the centerline of the vehicle, driveshaft refinement is further improved. The drive ratio is 3.06.





## 5HP24 Transmission Management

The management system for the 5HP24 transmission is basically the same as that of the 1998 Model Year XK8 with the TCM software recalibrated to suit the Sedan's NA engine variants. The rotary switch and the mode switch are the same as those of the XK8.

The installation of the TCM on the Sedan differs slightly from that on the XK8. Although still installed in the passenger side enclosure of the engine compartment, it is installed in a bracket on the firewall, instead of in front of the ECM.

## W5A580 Transmission Management

The management system for the W5A580 transmission is a new system. It consists of a TCM, dual linear switch and a mode switch.

### TCM

The TCM is an integral part of the CAN system which facilitates the interchange of real-time data between control modules and sensors. Because it only activates solenoids during a gearshift (and thus does not require a high current capacity, heat sinks or a metal casing) the TCM has a plastic casing and is lighter and smaller than the TCM for the 5HP24 transmission. Two connectors provide the interface with the vehicle wiring.

The TCM is installed in the same position as the TCM for the 5HP24 transmission. However, in order to use a common firewall bracket for both types of TCM, the smaller W5A580 TCM is first attached to a mounting bracket; the mounting bracket is then installed in the bracket on the firewall.

### Dual Linear Switch

The dual linear switch is integrated into the right side of the gearshift selector. It contains two multi-track slider switches that transmit the position of the gear selector lever to the TCM: the upper slider switch for P, R, N and D; the lower slider switch for 4, 3 and 2.

## Mode Switch

Although externally the same as the switch of the 5HP24 transmission management system, the mode switch of the W5A580 transmission management system is unique. The switches of the two systems are not interchangeable.

## Operation

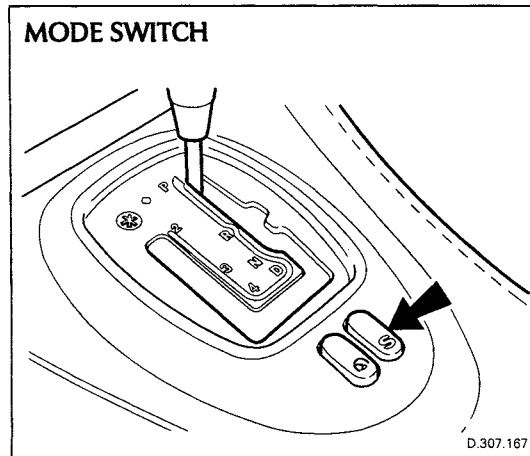
The TCM processes CAN and hardwired inputs and outputs to provide electronic shift control. Gear shifts are controlled by outputs to the valve block in the transmission housing. Shift energy management is controlled by interacting with the ECM.

Although the W5A580 transmission management system incorporates different hardware and software than the 5HP24 transmission management system, the functions performed by the two systems are virtually the same. Main differences of the W5A580 system include the way in which shift points are calculated, the limp-home (default) mode of operation and reverse gear selection.

## Shift Point Calculation

Except when the traction/stability control system is active, shift points are calculated in real-time as a function of transmission output speed, engine load and gear selector lever position (when the traction/stability system is active, the TCM adopts a specific shift map designed to maximize control of wheel slip). Real time calculations of shift points are influenced by the following:

- accelerator pedal movement, which is used to evaluate driving style; faster driving style cause later upshifts and earlier downshifts
- kickdown: if appropriate, the TCM will implement a downshift when it detects a kickdown request
- the mode switch: in the Sport mode, a higher base speed value is used for shift point calculations
- gradients: if engine load is low relative to vehicle speed, indicating a down gradient, downshifts are implemented earlier to provide engine braking; if engine load is high relative to vehicle speed, indicating an up gradient, upshifts are implemented later to prevent hunting between gears and to improve cooling.



## Limp-home Mode

In the limp-home mode the last gear shifted remains engaged until P or N is selected. On subsequent selection of D, second gear is engaged; if R is selected, Normal reverse is engaged.

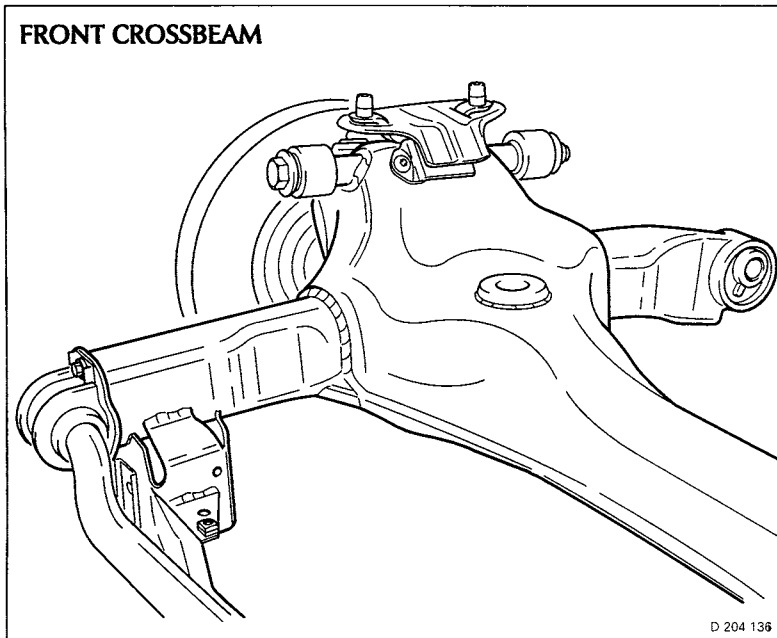
## Reverse Gear Selection

When R is selected:

- the high reverse gear is engaged if the mode switch is in Normal
- the low reverse gear is engaged if the mode switch is in Sport.

## Front Suspension

The front suspension is redesigned to accommodate the new engine, to improve refinement and to reduce the response to disturbing inputs such as braking and road bumps/holes.



### Front Crossbeam

The new front crossbeam is of a pressed steel and tube construction instead of the previous pressed steel with foam and wax injection. The side tubes are "swan necked" so that, in an accident, they deform and absorb some of the impact force. The tie bar is an integral part of the crossbeam instead of being installed between the fulcrum bolts of the lower wishbones as it was previously.

The method of attaching the crossbeam to the body is the same as on the previous Model Year V12 Sedan. However, the V mounting of the front mounting points is retuned and a new design of bush is introduced to the rear mounting points. On SC models, a heat shield is installed on the V mountings.

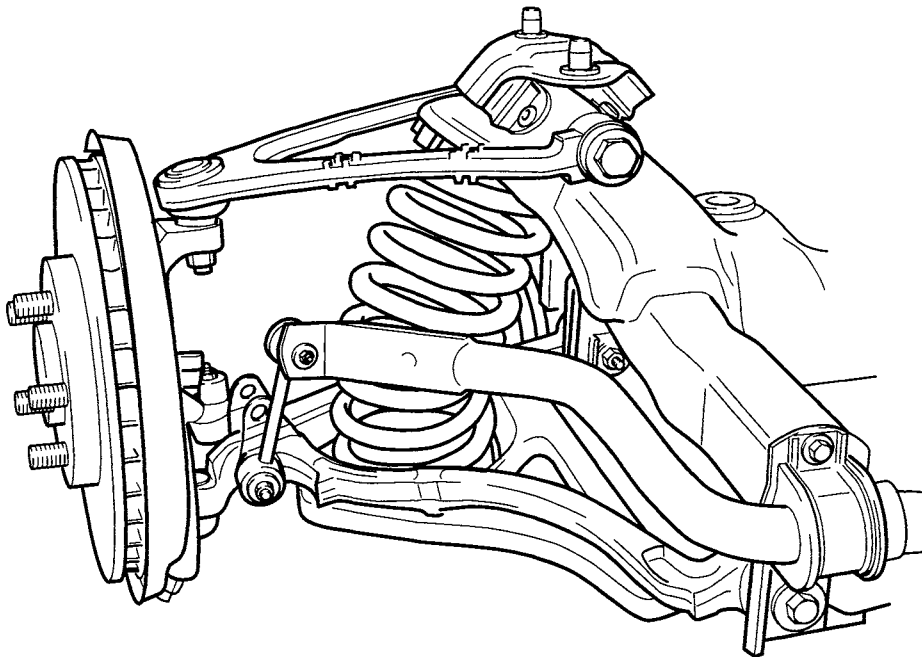
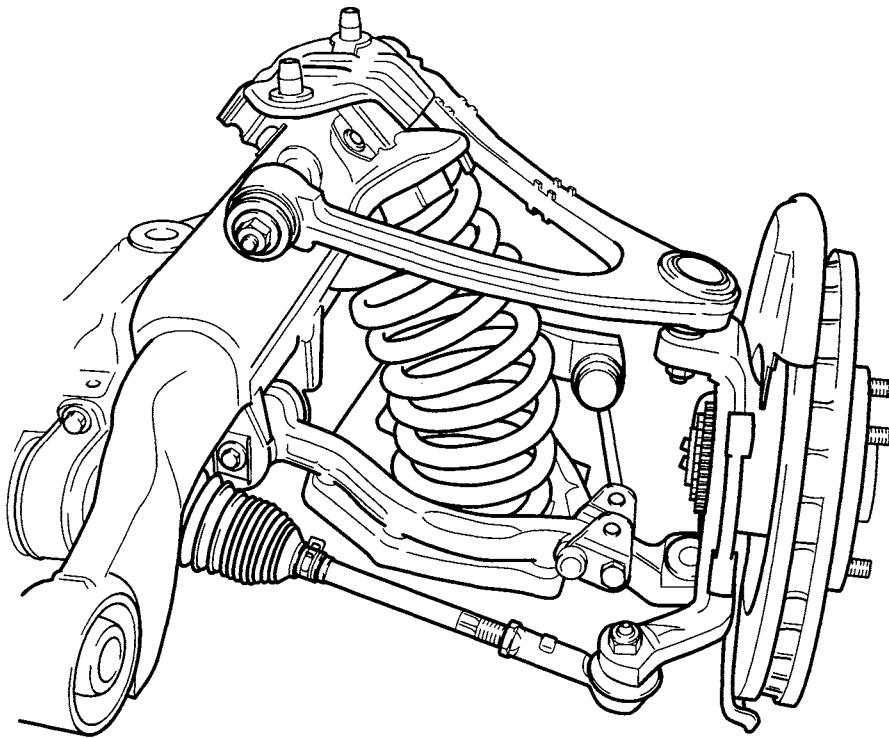
### Wishbone Assemblies

The new wishbone assemblies are similar to those on the XK8, and consist of one-piece upper wishbone assemblies and two-piece lower wishbone assemblies. Plates attached to the lower wishbone assemblies provide the lower mounting point for the front dampers. A spring pan attached to the underside of the lower wishbone assemblies locates the bottom of the front springs. The bushes in the upper wishbone assemblies are the same as those installed in the previous Model Year Sedan. The bushes in the lower wishbone assemblies are similar to those on the XK8, but with their stiffness modified to match the Sedan suspension settings.

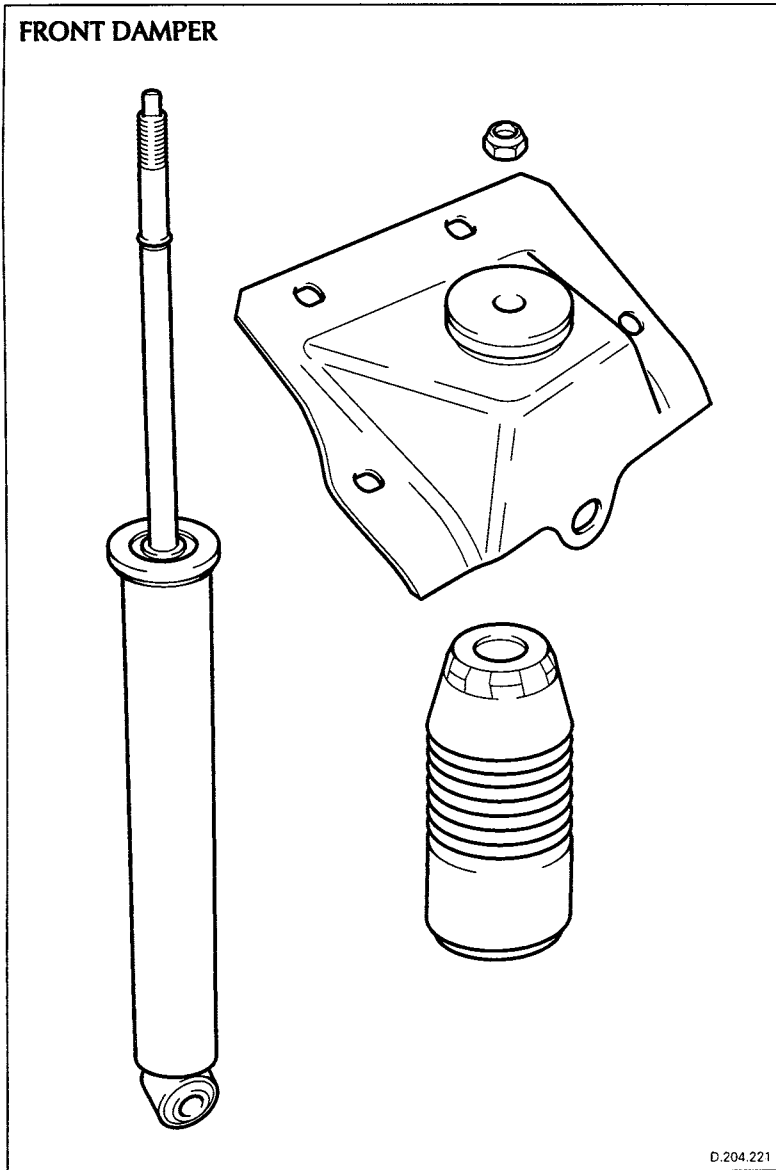
### Vertical Link Assemblies

The vertical link assemblies, comprising the vertical link, the wheel hub, the bearing and the ABS rotor nut, are the same as those installed on the XK8.

FRONT SUSPENSION



D.204.134 & 135



## Dampers and Springs

New dampers and springs are introduced. A bush in the end of the damper provides the lower attachment point in place of the previous forked end fitting. The upper damper mounting is new and now separates damper loads from spring aid. Spring aid and gaiter are now attached directly to the body whilst damper loads are reacted by the top mounting bracket which is bolted to the B/W structure via five bolts.

Spring and damping rates vary for the different models, to achieve the required suspension setting.

## Stabilizer Bar

The stabilizer bar is new and is tuned to the required suspension setting for each model.

## Rear Suspension

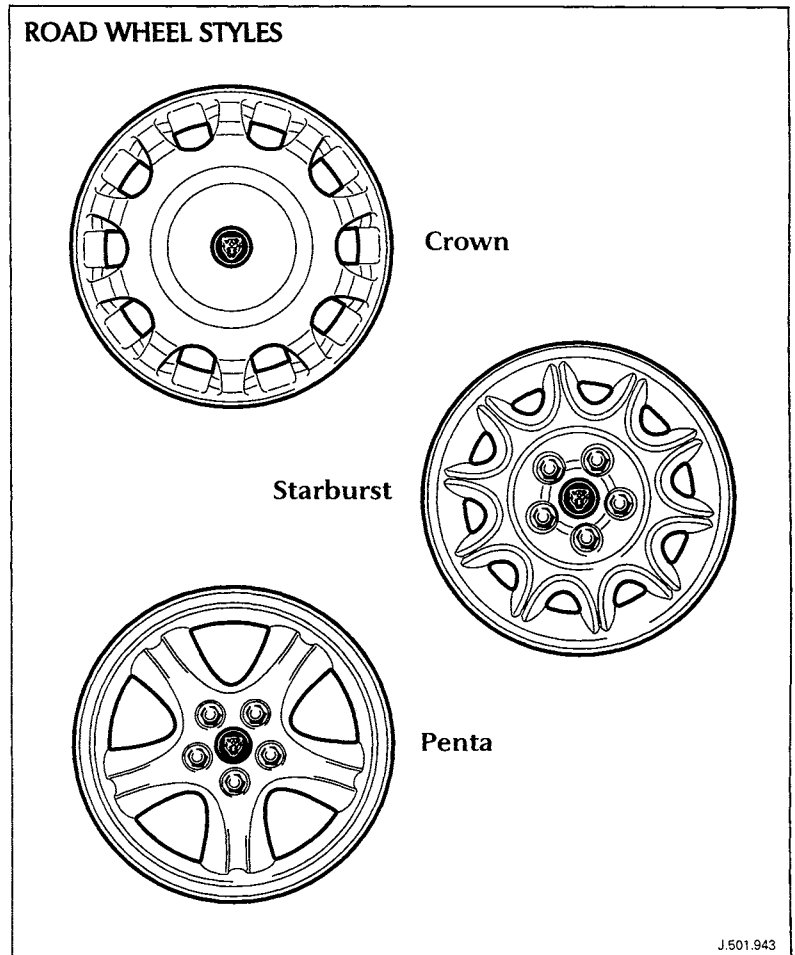
The monostrut is now installed on all models (previously installed only on the XJR). The dampers, springs and stabilizer bar (where fitted) are essentially the same as the previous design, but retuned to achieve the required suspension settings.

As on the front suspension, vehicles with adaptive damping incorporate dampers with two damping settings and an electrical connector in the top of the piston rod.

## Wheels and Tires

The range of road wheel styles and their related tires is extensively revised. The new range consists of three new alloy wheel styles.

Installed tire sizes and their respective cold inflation pressures are detailed below:

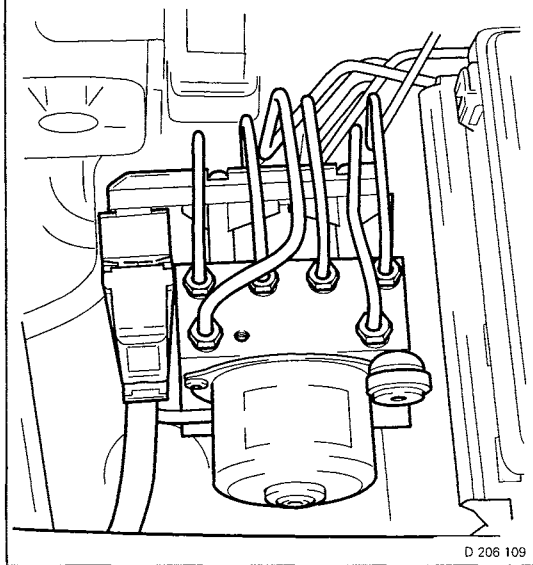


## Tire Sizes and Pressures

Size	Tire Type		Pressure, bar (lbf.in <sup>2</sup> )	
			Normal	Comfort (Max. Speed 160 km/h (100 mile/h))
225/55ZR16	P6000	Front	2.21 (32)	1.70 (26)
		Rear	2.30 (34)	1.90 (28)
225/60ZR16	P4000E	Front	2.21 (32)	1.70 (26)
		Rear	2.30 (34)	1.90 (28)
255/40ZR18	PZERO	Front	2.21 (32)	1.70 (26)
		Rear	2.30 (34)	1.90 (28)



**ABS CONTROL MODULE/HYDRAULIC MODULATOR**



## Brakes

The vacuum booster (with modified clevis fixing), front brake rotors and ABS control module/hydraulic modulator from the XK8 are now also installed on the Sedan, making the two systems virtually the same. The brake pipes in the engine compartment are revised to match the new installation. With the introduction of the electronic throttle on the new engines, the throttle cable actuator from the previous traction control system is deleted.

### Vacuum Booster

The vacuum booster is installed in the driver's side enclosure of the engine compartment. The vacuum source is taken from the right side of the engine's induction elbow.

### Front Brake Rotors

The front brake rotors are 28 mm x 305 mm diameter, ventilated rotors. The calipers are similar to XK8 but with revised port positions for the flexible hose connection. Rotor shields are also the same as on the XK8.

### ABS Control Module/Hydraulic Modulator

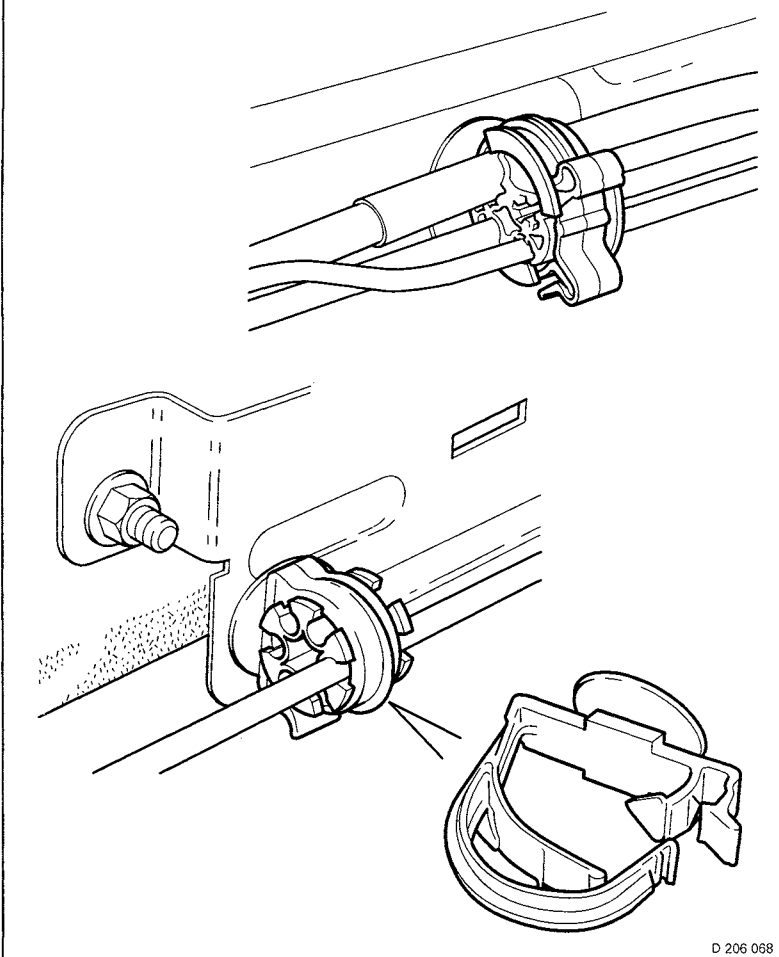
The ABS control module and hydraulic modulator are installed in the front left side of the engine compartment. The ABS control module is connected to the CAN and contains software based on that of the XK8, modified to suit the Sedan.

All models incorporate anti-lock braking and either stability control or traction control (for details see the Technical Guide, XK8 Sports Coupe and Convertible Introduction).

### Brake Pipes

The brake pipes in the engine compartment are revised to accommodate the new hydraulic modulator. Engine bay brake pipes are now supplied as clusters and are secured by two new designs of clamp.

**BRAKE PIPE CLAMPS**



## Steering System

The steering system has a new power assistance system, new steering rack and a revised steering column.

### Power Assistance

The power assistance system is a speed sensitive system based on that installed on the XK8. The fluid reservoir, pump and cooler are the same as those on the XK8. The interconnecting hoses are tailored to the Sedan installation. The steering control module is similar to that on the XK8, but has revised software to match the steering characteristics of the Sedan.

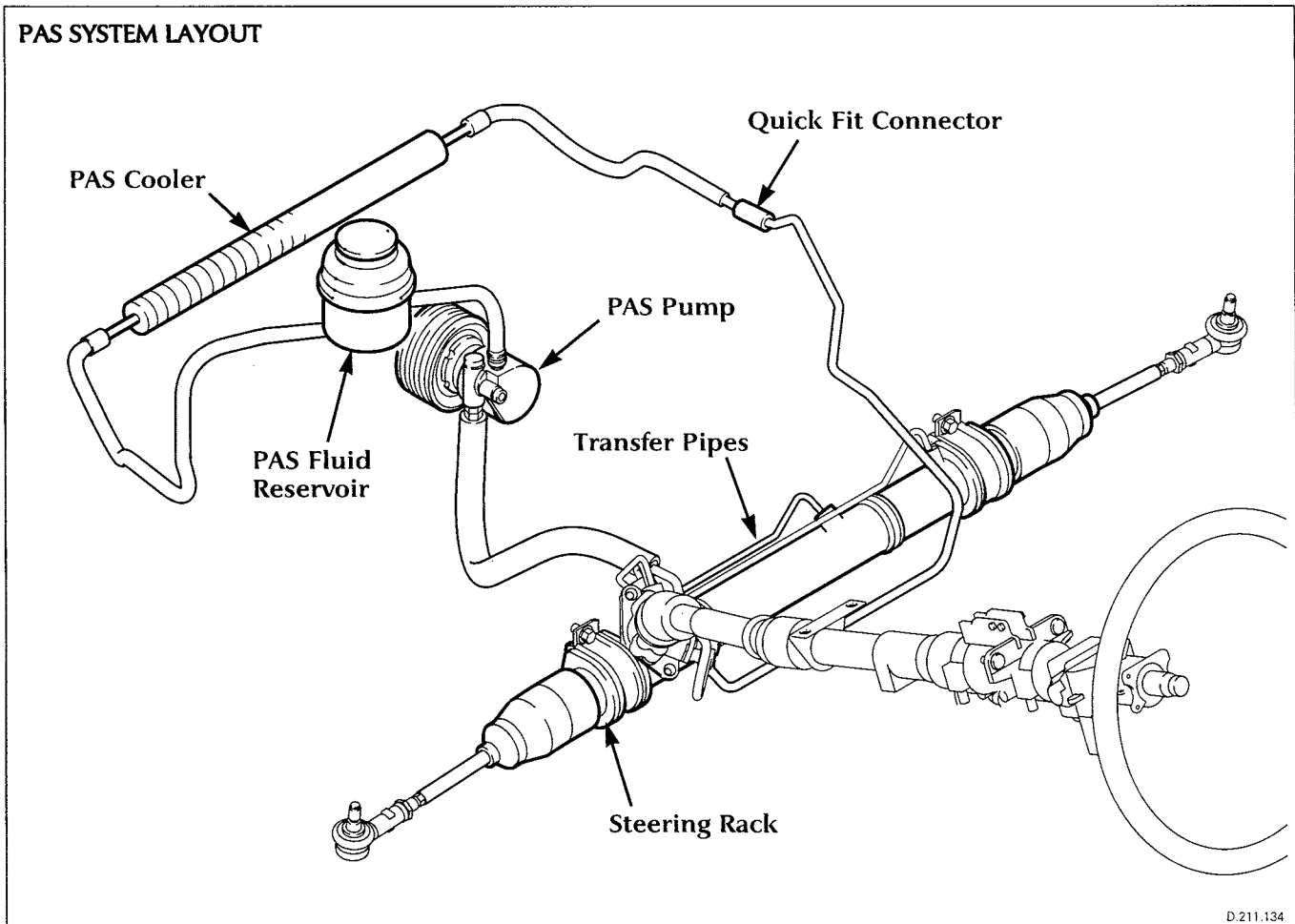
### Steering Rack

There are two variants of the variable ratio, rack and pinion type steering rack. The XJR and XJ Sport models have a Sport steering rack and all other models have a Comfort steering rack. The steering rack is externally the same as that installed on the XK8 with the exception of the

transfer pipes.

The Sports steering rack has the same torsion bar as XK8, where as the Comfort steering rack contains a smaller diameter torsion bar to give a lighter feel at the steering wheel. To assist with differentiation, the steering rack's identification plate is color coded. The identification plate is silver on Sport steering racks and green on Comfort steering racks.

The steering rack is installed across the rear of the front crossbeam, using the same bushings and brackets as on the XK8.



## Steering Column

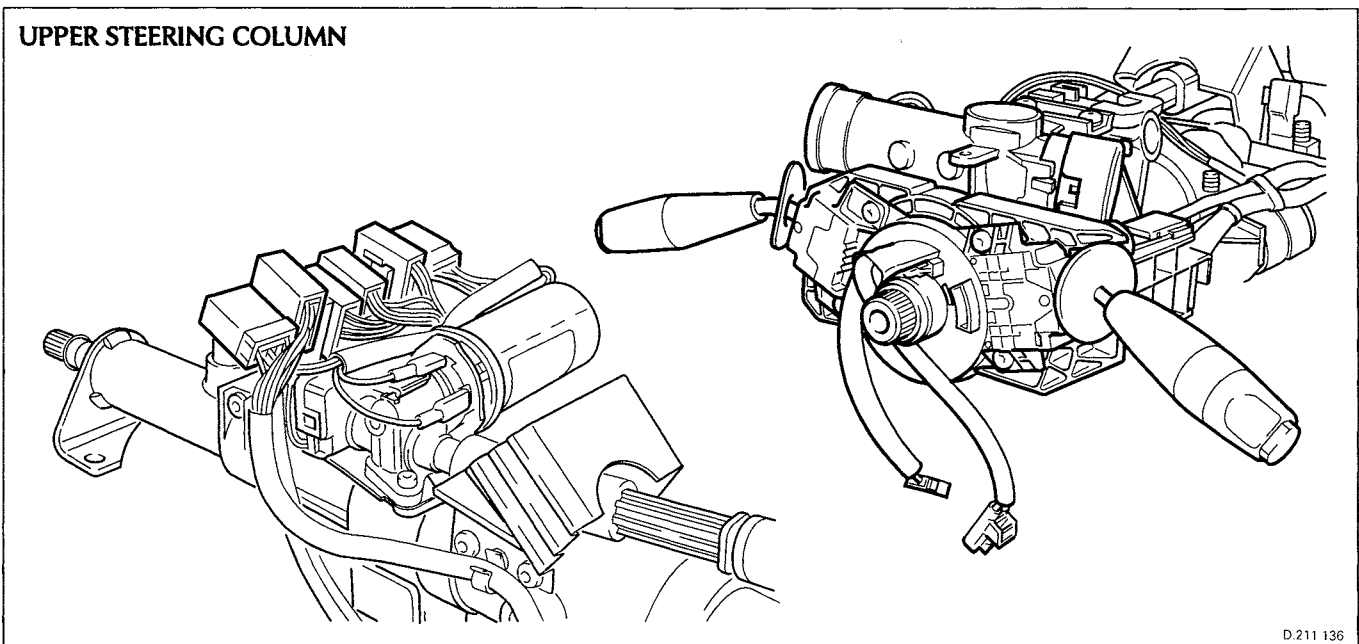
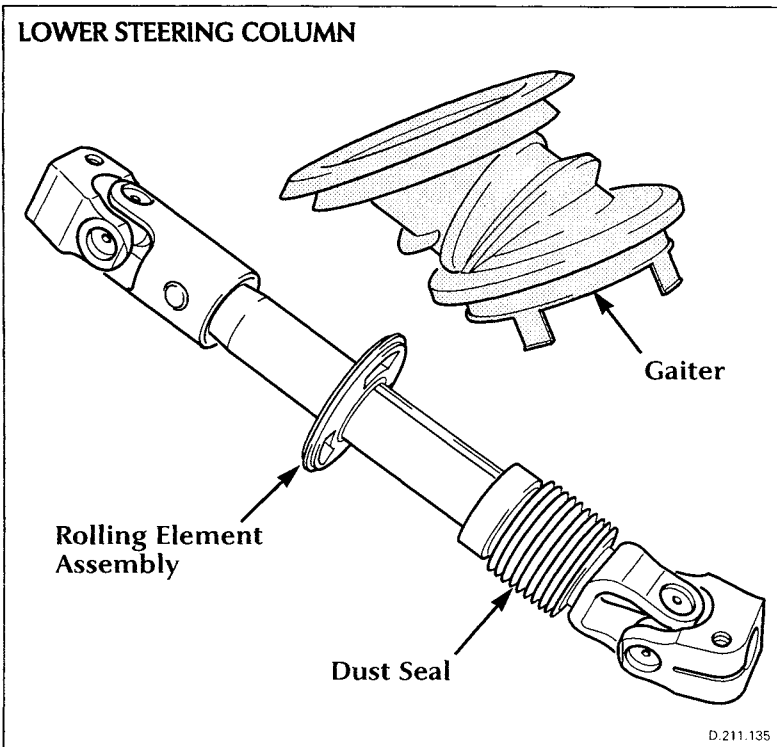
The lower steering column is a new design similar to that on the XK8. It is handed and incorporates a dust seal over the telescopic section. A rolling element assembly seals the gap between the lower steering column and the gaiter in the body. Unlike on the XK8, the gaiter is a separate, non-handed

item.

The upper steering column has revised upper fixings, for easier installation, and a repositioned connector for the interface with the fascia harness. With the introduction of the new fascia (deleting the switch assemblies from behind the steering wheel) the steering wheel reach adjustment range is increased to 40 mm (1.6 in). To prevent jamming, on vehicles with automatic tilt away, BPM software is revised so that the steering column stops moving before it hits the mechanical stop.

## Steering Wheel

Depending on model specification, the cruise control and/or remote ICE switches from the XK8 are added to the steering wheel. On Sport and XJ8 models, the badge on the driver's airbag is replaced with an embossed Jaguar.



Changes at this model year include new air distribution and refrigeration systems, revisions to the heating system and refinements to the control system.

## Air Supply and Distribution

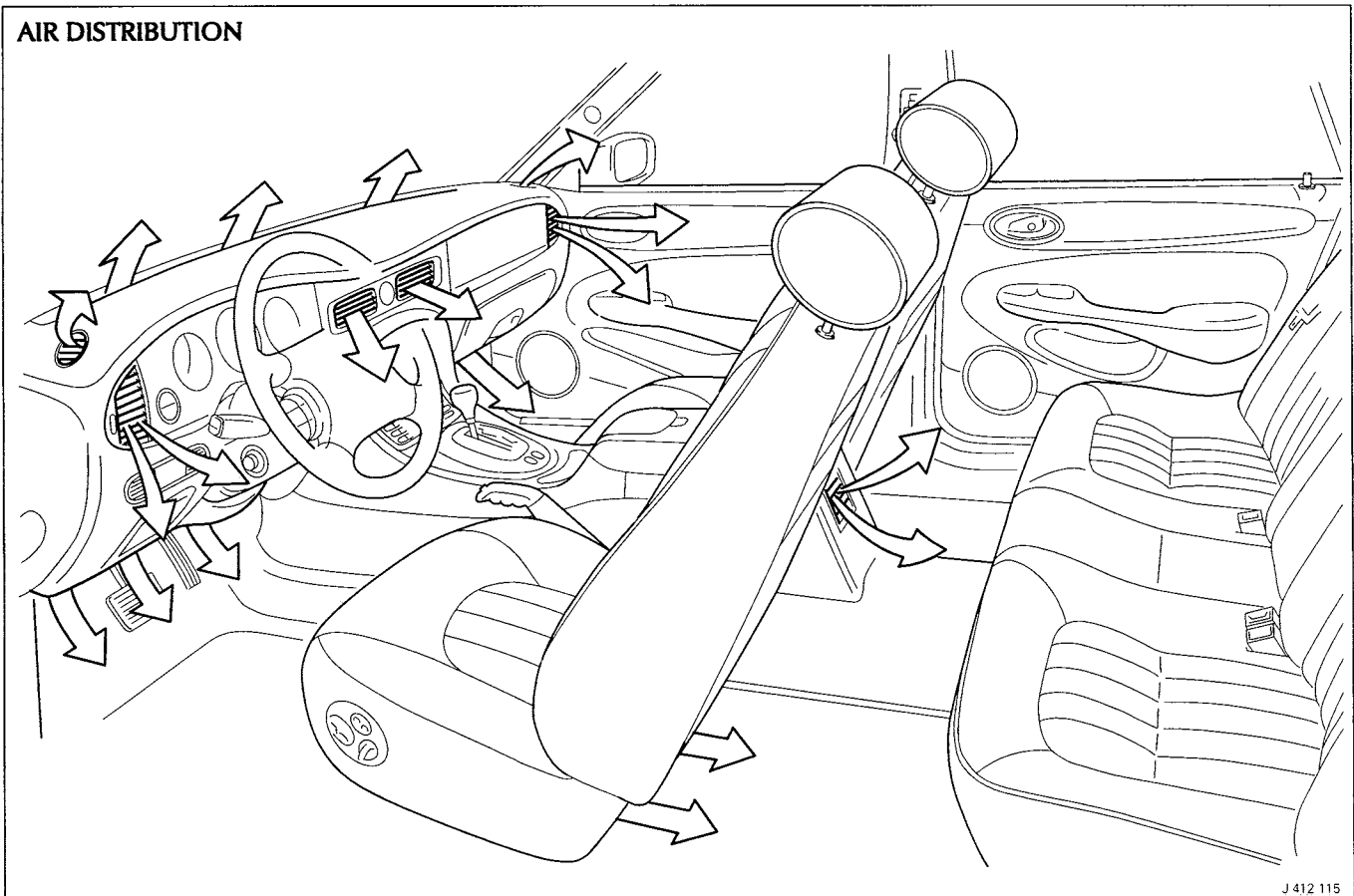
New blowers are introduced and new distribution ducts are incorporated into the fascia.

### Blowers

The blowers are the same as those installed in the XK8. The A/CCM operates individual relays on the right heelboard to select the blowers on and off. When the blowers are on, the A/CCM regulates their power supply to control their speed. The high speed relays of the previous blowers are deleted.

### Distribution Ducts

The distribution ducts direct air from the A/C unit to vents in the fascia, to the foot wells and to the ducts on the driveshaft tunnel. Vents with fixed vanes direct the air onto the windshield and the side windows (the vents in the front door top rolls are deleted). The face vents have movable vanes and thumbwheel controls to direct the air and regulate the flow. The differential temperature control is deleted from the center face vent.



## Refrigeration System

Except for the A/C unit itself, all of the refrigeration system is new. System volume is significantly reduced; consequently the system has a reduced refrigerant charge weight of 650 to 700 grammes (1.43 to 1.54 lb) (1050 to 1150 grammes (2.31 to 2.54 lb) on previous system).

### Compressor

The compressor is the same as that installed on the XK8, except that the lock sensor has been deleted.

### Receiver/Drier

The receiver/drier is similar to the one installed on the XK8, the difference being that the Sedan receiver/drier has an integral mounting bracket. The receiver/drier is installed immediately behind the right headlamps.

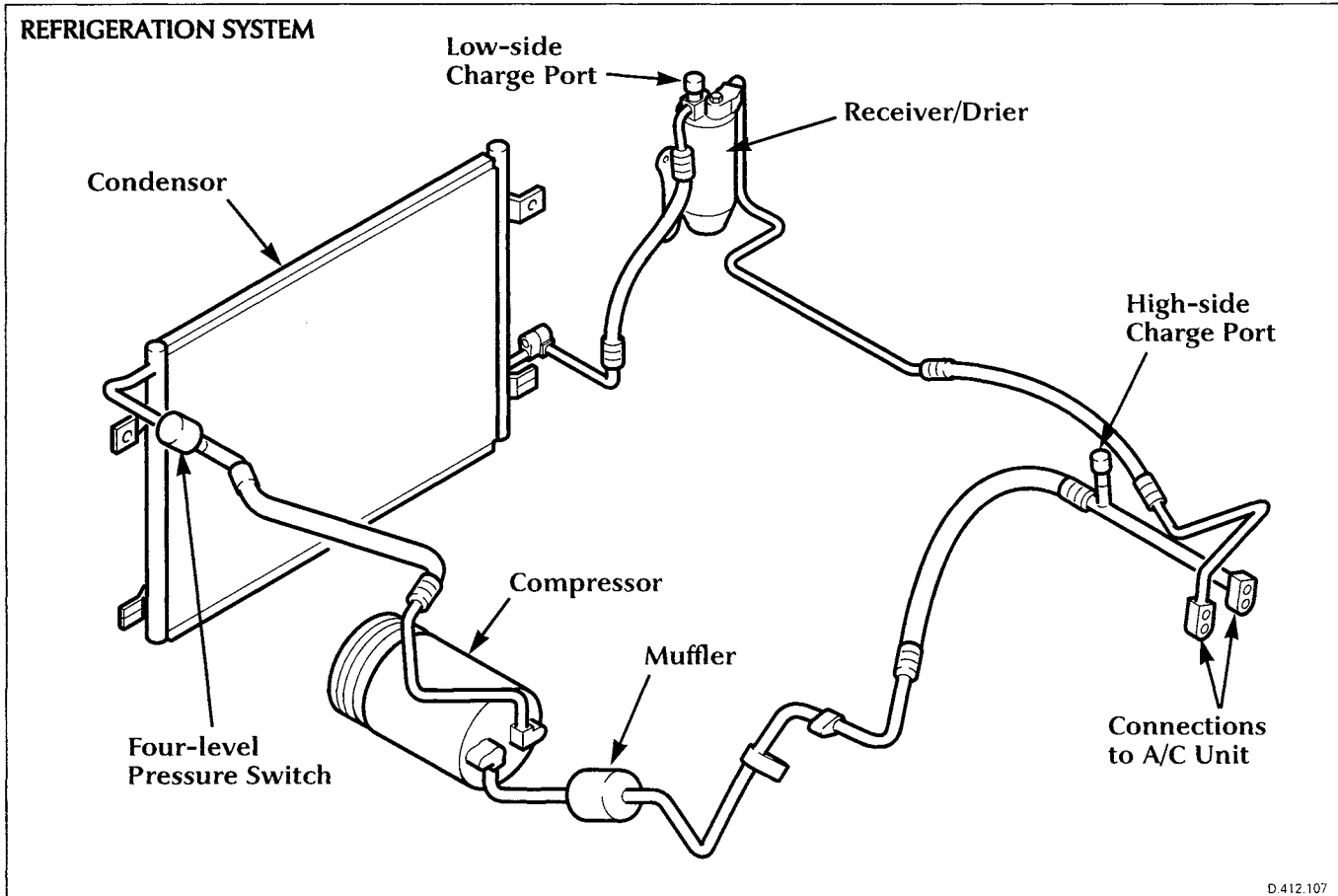
### Condenser

The condenser is a brazed aluminum, fin and tube heat exchanger with a three pass, single row circuit. The condenser is attached to the front of the engine radiator. The front of the condenser is

painted black to reduce it's visual impact through the radiator grille.

### Air Conditioning Lines

The air conditioning lines are a mixture of pipes and hoses tailored to match the Sedan installation. The pipe connected to the inlet side of the compressor is the same as the one installed on the XK8. A muffler is integrated into the pipe to reduce noise during operation. Standard SAE R134a charge ports and a four-level pressure switch are also integrated into the air conditioning lines.



D.412.107

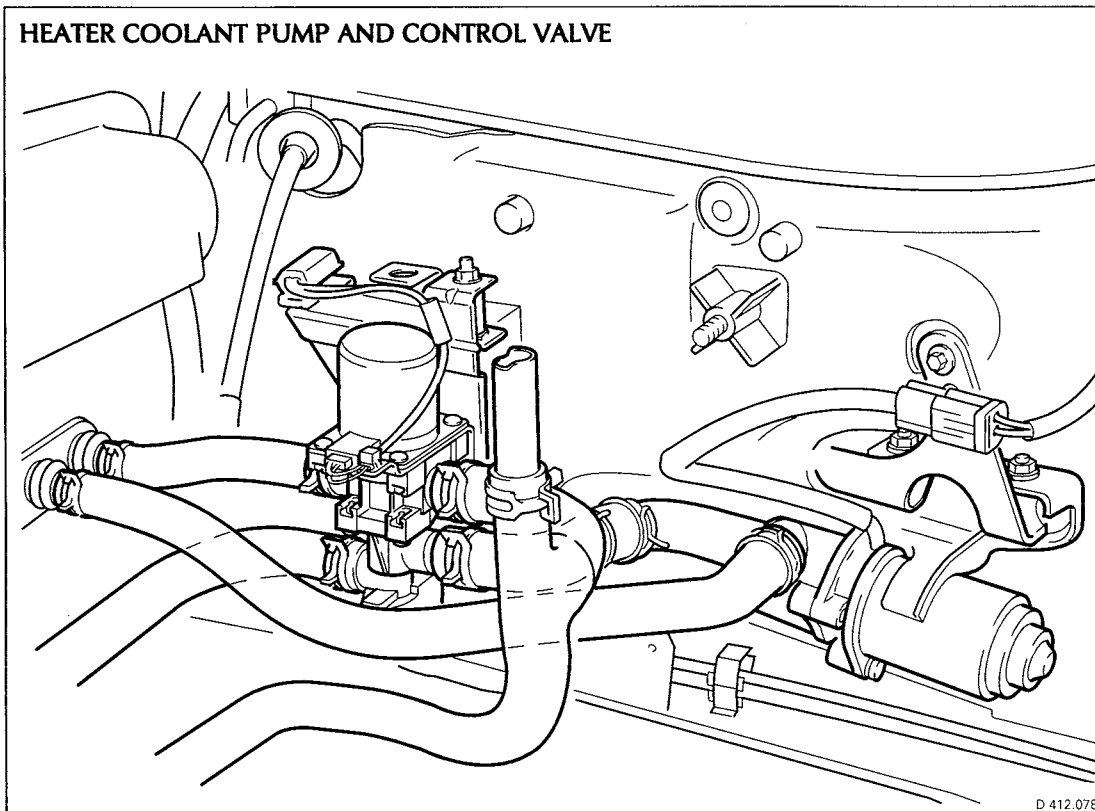
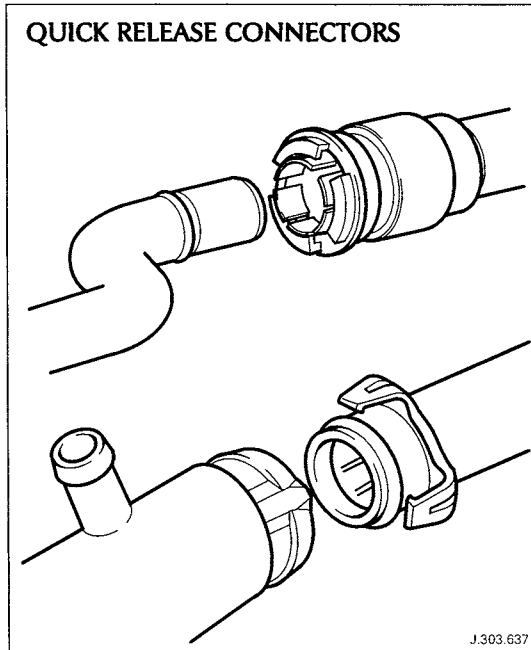
## Heating System

The heating system is revised to accommodate the installation of the new engine. Two non-return valves are added to the circuit, as on the XK8, to prevent:

- coolant recirculation at low engine speeds
- convection to the heater matrix after the engine stops.

The heater coolant pump and the heater coolant valve are re-located from the firewall to the inboard side of the left firewall extension.

Instead of the previous plate/seal, a grommet is installed in the firewall for the heater matrix supply and return pipes. The ends of the hoses are secured with spring band clamps instead of the previous worm drive clamps. The supply and return connections with the engine coolant circuit are provided by the same quick release connectors as installed on the XK8.



## Control System

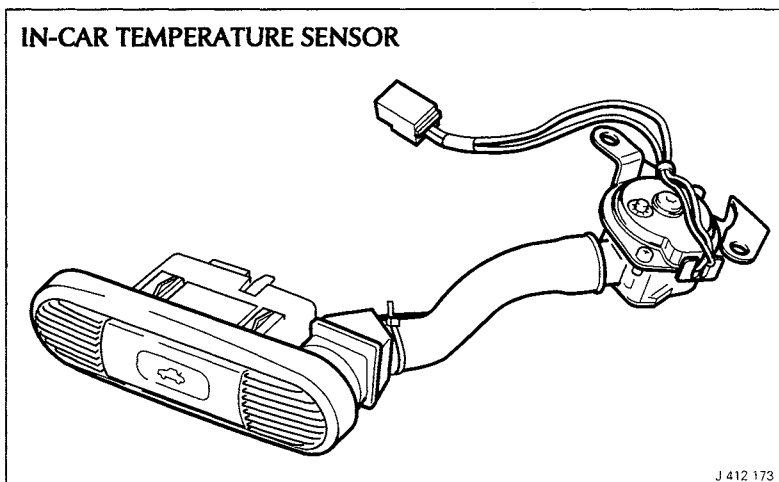
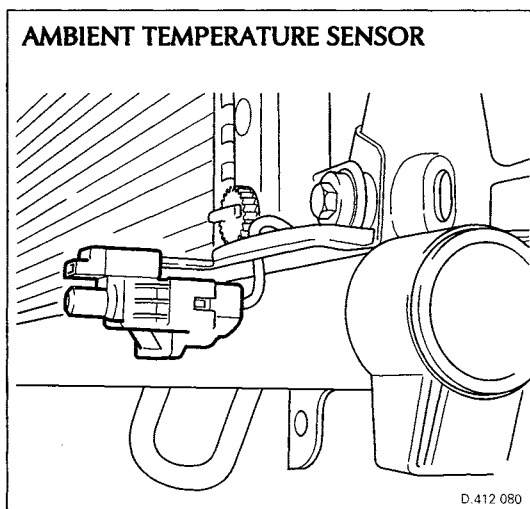
The control system incorporates a new ambient temperature sensor, a new in-car temperature sensor and a new A/CCM.

### Ambient Temperature Sensor

The ambient temperature sensor is the same as the one installed on the XK8. It is installed on the left lower mounting of the engine radiator, instead of the left brake cooling duct as on the previous system.

### In-car Temperature Sensor

The in-car temperature sensor is the same as the one installed on the XK8. The sensor is installed immediately behind the grille adjacent to the trunk release switch. A hose connects the sensor to the electric fan that draws air from the cabin over the sensor.



### A/CCM

The A/CCM incorporates revised software to tune operation of the climate control system to the new ducts and sensors. Blower control is revised to give a more refined speed progression. New features include:

- selection (using the PDU) of either filter or non-filter air flow
- automatic operation of the windshield heaters (where fitted)
- automatic operation of door mirror heaters.

### Windshield Heaters

If the windshield heaters are not already selected on, they come on automatically if these conditions coexist for 2 minutes:

- vehicle speed is 64 km/h (40 mile/h) or above
- ambient temperature is  $-10^{\circ}\text{C}$  ( $14^{\circ}\text{F}$ ) or below.

The windshield heaters go off immediately one of the conditions ceases to exist. Automatic operation may not be apparent because it does not operate the LED indicator in the windshield heater switch.

### Door Mirror Heaters

If the backlight heater is not already selected on, the door mirror heaters (only) come on automatically immediately these conditions coexist:

- vehicle speed is 48 km/h (30 mile/h) or above
- ambient temperature is  $0^{\circ}\text{C}$  ( $32^{\circ}\text{F}$ ) or below.

The door mirror heaters go off immediately if the ambient temperature goes above  $0^{\circ}\text{C}$  ( $32^{\circ}\text{F}$ ), and after a time delay of 2 minutes if vehicle speed goes below 48 km/h (30 mile/h). If vehicle speed increases to 48 km/h (30 mile/h) or above again, within the 2 minutes, the time delay clock is reset. As with the windshield heaters, automatic operation of the door mirror heaters may not be apparent because it does not operate the LED indicator in the backlight heater switch.

## Electrical Distribution

The electrical distribution system is extensively revised and incorporates a number of features from the XK8.

### High Power Protection Module

A high power protection module replaces the two separate power fuses used on the previous power distribution system. The high power protection module is the same as that used on the XK8. It is installed in the trunk, immediately below and to the rear of the fuel tank.

### Power Distribution Cables

The power distribution cables are revised to accommodate the introduction of the high power protection module, the new engines and the new fuse box layout. The power stud terminal at the front firewall is moved to the wall of the RH enclosure.

### Harnesses

The harness layout is revised to accommodate the new equipment and new communication networks. The through panel connectors are revised and, in unsealed applications, 070 multilock connectors replace the 040 multilock connectors of the previous system. Augat connectors replace the Econoseal connectors in sealed applications.

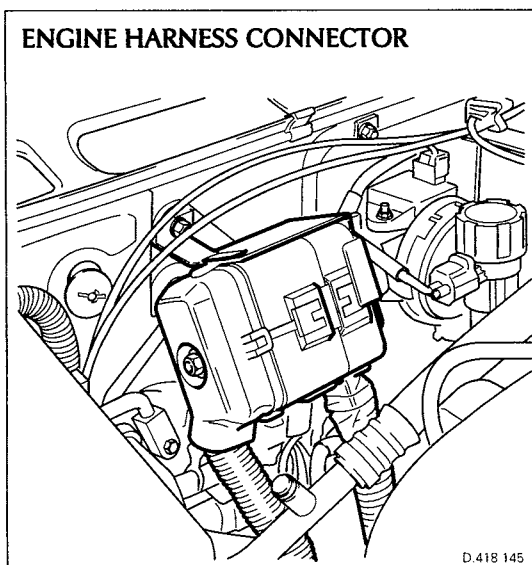
In the engine compartment, a new engine management harness is installed across the front firewall. Connectors attached to a bracket on top of the transmission provide the interfaces with the engine and transmission harnesses. The harness

on the right side of the engine compartment is deleted and the left side harness is extended across the radiator to the right headlamps.

In the cabin, although the harnesses retain a similar layout to the previous system, a number of changes are incorporated. These include:

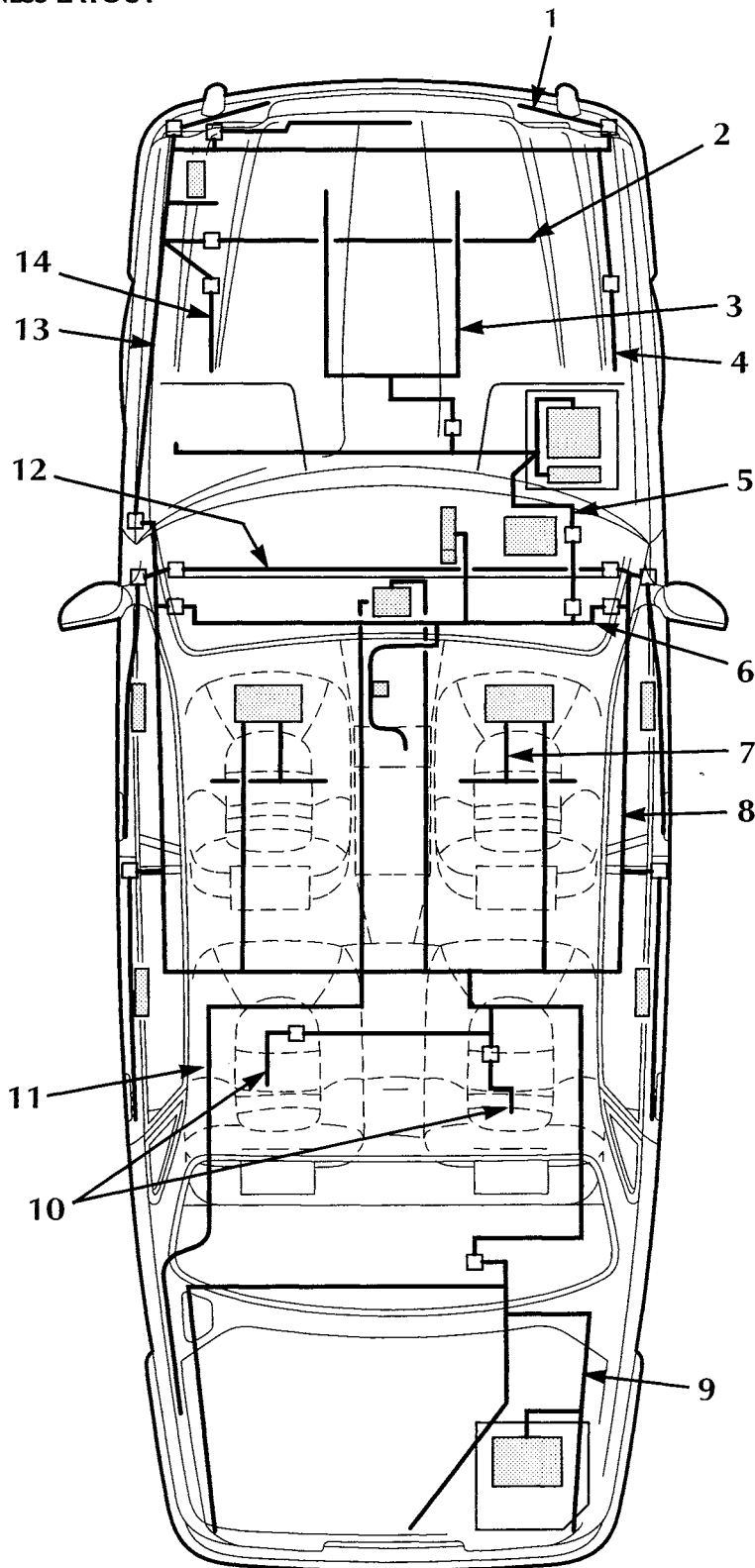
- deletion of the harness to harness connectors below the center console
- deletion of the harness extension at the left rear seat
- integration of the wiring for the airbag/SRS system (previously a separate harness with yellow sheathing)
- additional wiring for the door control modules, side airbags, side airbag sensors and front seatbelt pretensioners
- integration of the fascia harness into the top roll of the fascia
- routing the ICE harness along the left side of the driveshaft tunnel and rear seats
- common cabin/ICE harnesses for standard and extended wheel base models, with a loop at each B/C post and the heelboard for the excess length on standard wheel base models.

In the trunk, the harness is revised to accommodate the deletion of the link leads to the rear lamp clusters, which are now connected directly to the trunk harness.





HARNES LAYOUT



- 1 Bumper
- 2 Power Steering
- 3 Engine
- 4 Front Axle RH
- 5 Engine Management
- 6 Console
- 7 Seat
- 8 Cabin
- 9 Boot
- 10 Rear Axle
- 11 ICE
- 12 Fascia
- 13 Forward
- 14 Front Axle LH

- Inter Harness Connectors
- Control Modules

FUSE BOX AND RELAY LOCATIONS

Engine Compartment  
Front Relays

Engine Compartment  
Front Fuse Box Relays

Engine Management  
Fuse Box Relays

Engine Compartment  
Enclosure Relays

Front Firewall  
Relays

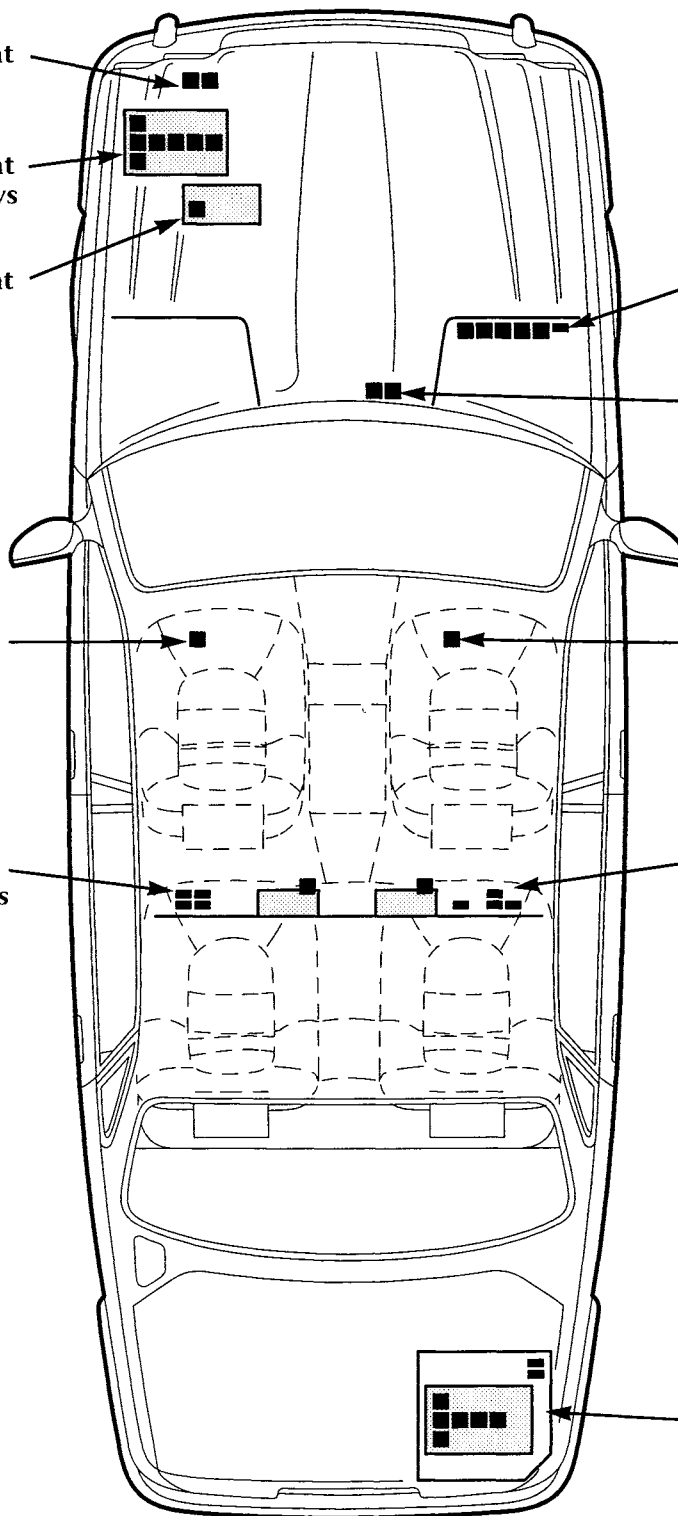
Front Seat  
Relay

Front Seat  
Relay

Left Heelboard  
and  
Fuse Box Relays

Right Heelboard  
and  
Fuse Box Relays

Trunk Fuse Box  
Relays



J.418.187

**Fuse Boxes**

The 18 way fuse boxes on the left and right heelboards and on the left side of the engine compartment are retained from the previous system. Two 22 way fuse boxes, the same type as installed in the XK8, are new to the system. One 22 way fuse box is installed on the left side of the engine compartment next to the 18 way fuse box. The second 22 way fuse box is installed in the electrical carrier in the trunk.

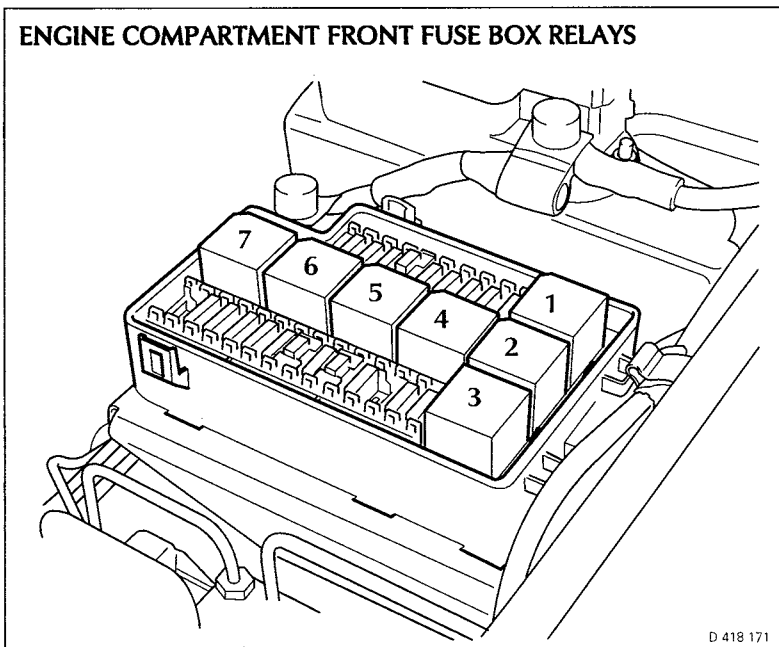
**Electrical Carrier**

The electrical carrier is now the same as the one installed in the XK8. In addition to the 22 way fuse box, it contains the SLCM. A fuse map is located on top of the lid. Spare fuses and a fuse extractor tool are located on the underside of the lid.

**Relay Identification Tables**

The number of relays installed on the vehicle is reduced as a result of the new distribution system and communication networks. The adoption of the 22 way fuse boxes from the XK8 reduces the number of free standing relays. All of the relays to be found on the vehicle are detailed below, although not all relays will be installed on any one model variant.

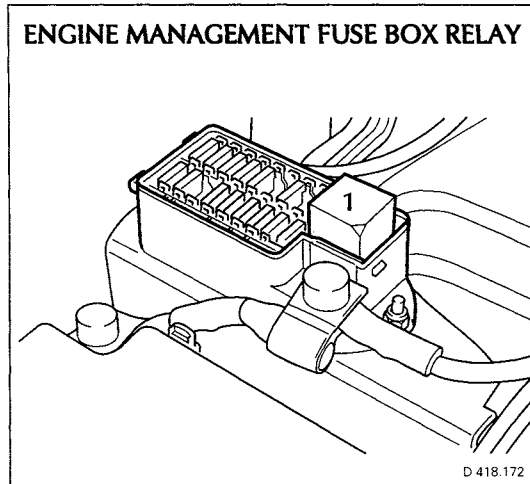
**ENGINE COMPARTMENT FRONT FUSE BOX RELAYS**



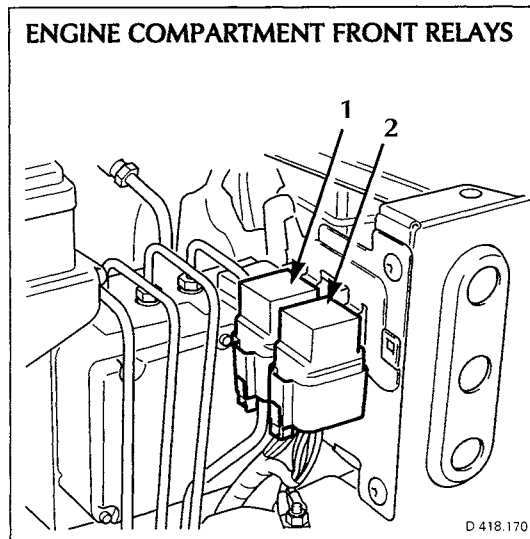
Location/ Number	Relay	Color
<b>Engine Compartment Front Fuse Box</b>		
1	A/C coolant pump	Brown
2	Front fog lamps	Brown
3	High beam headlamps	Brown
4	Headlamp power wash pump (where fitted)	Brown
5	Low beam headlamps	Brown
6	Horns	Brown
7	Ignition +	Brown

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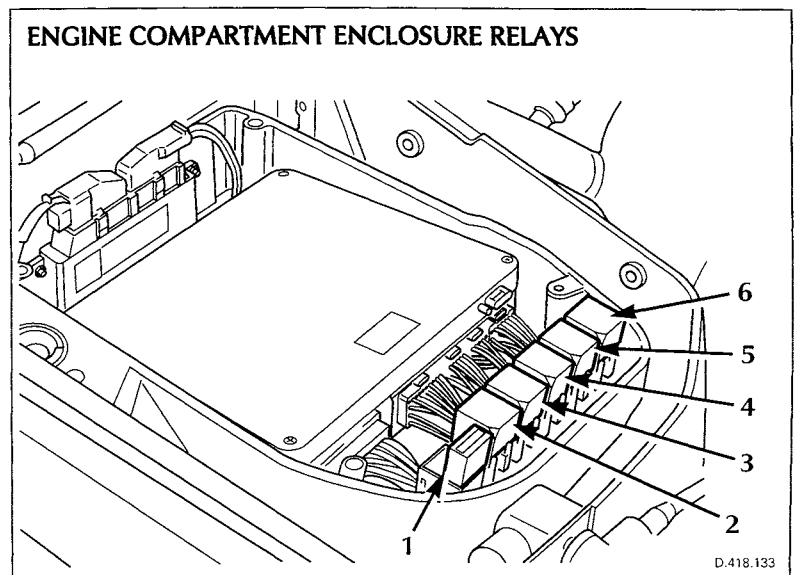
Location/ Number	Relay	Color
<b>Engine Management Fuse Box</b>		
1	EMS control	Brown

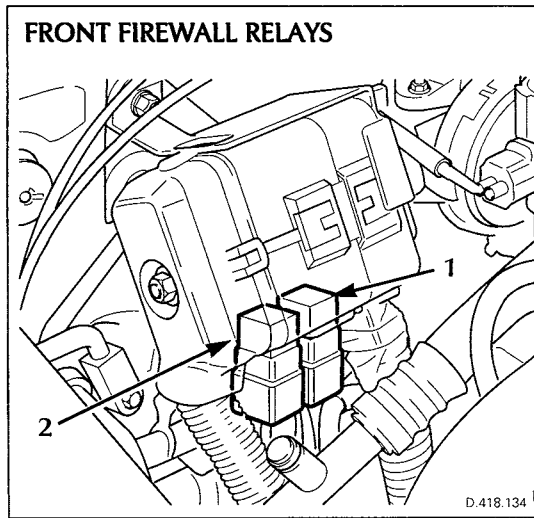


Location/ Number	Relay	Color
<b>Engine Compartment Front</b>		
1	Windshield wiper fast/slow	Black
2	Windshield wiper on/off	Black

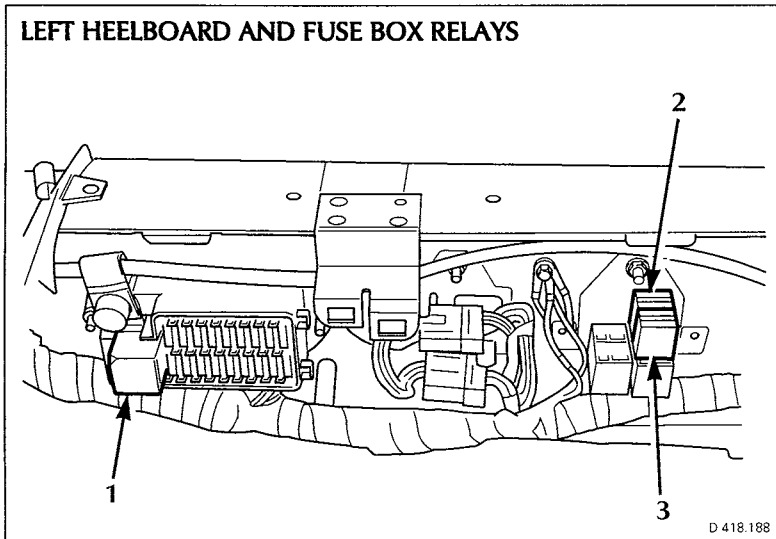


Location/ Number	Relay	Color
<b>Engine Compartment Enclosure</b>		
1	SC coolant pump (SC models only)	Blue
2	Fuel injection main	Brown
3	Ignition coils	Brown
4	Throttle motor	Brown
5	Starter solenoid	Brown
6	A/C compressor clutch	Brown

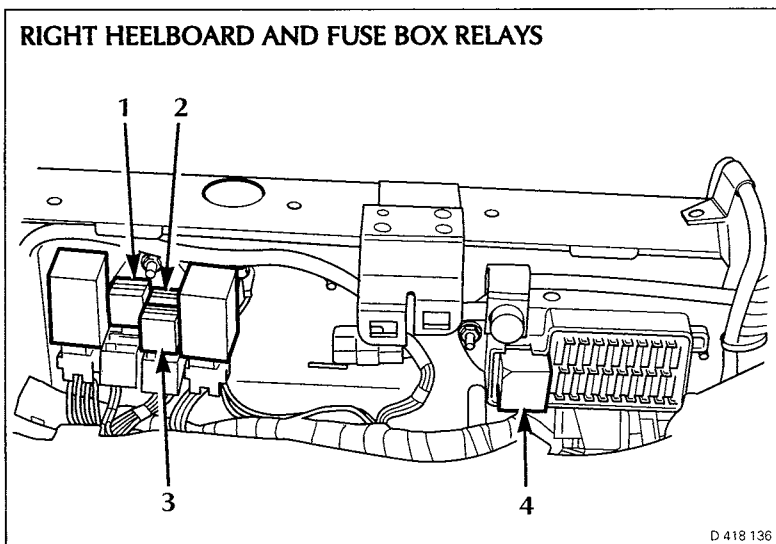




Location/ Number	Relay	Color
<b>Front Firewall</b>		
1	Windshield RH heater (where fitted)	Black
2	Windshield LH heater (where fitted)	Black

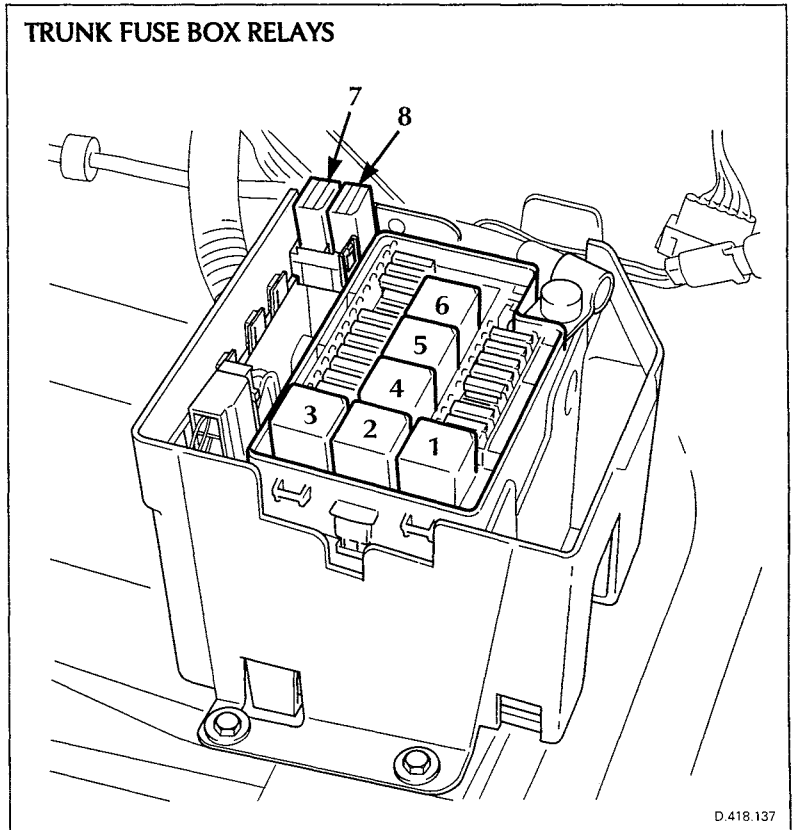


Location/ Number	Relay	Color
<b>Left Heelboard and Fuse Box</b>		
1	Ignition +	Brown
2	A/C isolate	Violet
3	Door locks	Violet



Location/ Number	Relay	Color
<b>Right Heelboard and Fuse Box</b>		
1	Door mirror heater	Blue
2	A/C RH blower	Blue
3	A/C LH blower	Brown
4	Auxiliary +	Blue

Location/ Number	Relay	Color
<b>Trunk Fuse Box</b>		
1	Second fuel pump (SC models only)	Brown
2	Backlight heater	Brown
3	Tail and license plate lamps	Brown
4	Fuel pump	Brown
5	Stop lamps	Brown
6	Accessory socket (where fitted)	Brown
7	Fuel filler flap lock	Violet
8	Fuel filler flap unlock	Violet



Location/ Number	Relay	Color
<b>Front Seat (not illustrated)</b>		
1	Seat heater (where fitted)	Brown

**Fuse Identification Table**

Fuse Box/ Number	Color	Rating (Amperes)	Circuit
<b>Engine Compartment Front</b>			
1	Red	10	Transmission control
2	Tan	5	Generator regulator; windshield heaters (where fitted)
3	Red	10	Fog lamps switches; headlamp leveling (where fitted); ignition relay coils; security sounder
4	Tan	5	ABS control module
5	Red	10	Adaptive damping (where fitted); ECM; EMS relays; starter relay coil
6	Red	10	RH low beam headlamp
7	Green	30	Powerwash pump (where fitted)
8	Red	10	LH low beam headlamp
9	Red	10	Security sounder
10	-	-	Not used
11	Red	10	RH horn
12	Green	30	Radiator fans (LH and RH in slow/series, RH in fast/parallel)
13	Red	10	LH horn
14	Green	30	Radiator fans (LH in fast/parallel)
15	Red	10	A/C coolant pump
16	Green	30	ABS control valves
17	Blue	15	Front fog lamps
18	Green	30	ABS pump motor
19	Red	10	RH high beam headlamp
20	-	-	Not used
21	Red	10	LH high beam headlamp
22	Green	30	Windshield wiper motor

Fuse Box/ Number	Color	Rating (Amperes)	Circuit
<b>Engine Management</b>			
1	Yellow	20	Adaptive damping (where fitted))
2	Blue	15	S/C coolant pump (S/C models only)
3	Natural	25	Starter solenoid
4	Tan	5	ECM
5	Red	10	Fuel injectors
6	Tan	5	TCM
7	-	-	Not used
8	Red	10	A/C compressor clutch
9	Green	30	Throttle motor
10	Tan	5	Cruise control VSV (where fitted); ECM; EGR valve (where fitted); park/neutral switch
11	-	-	Not used
12	Red	10	MAFS; VVT solenoids A and B (4.0 liter NA models only)
13	-	-	Not used
14	Red	10	A/C compressor clutch relay coil; canister close valve (where fitted); EVAP valve; HO2S heaters; ignition coils relay coil; radiator fans control module coils; throttle motor relay coil
15	Green	30	Windshield LH heater
16	Tan	5	Engine compartment enclosure cooling fan
17	Green	30	Windshield RH heater
18	Red	10	Ignition coils; ignition amplifier

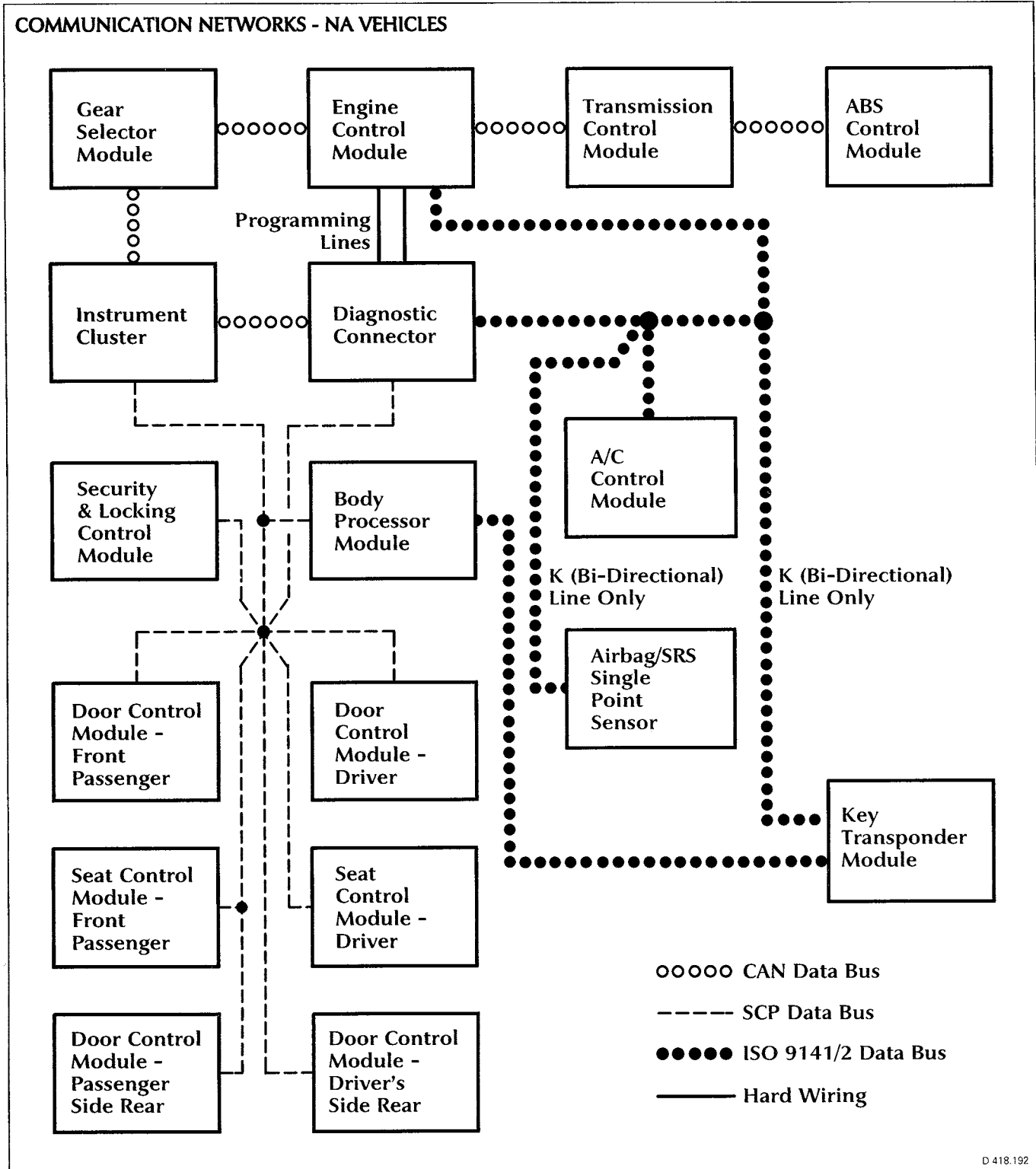


Fuse Box/ Number	Color	Rating (Amperes)	Circuit
<b>Left Heelboard</b>			
1	Yellow	20	RH seat control module
2	Tan	5	Driver's side rear window switchpack; driver's door lock barrel; driver's door switchpack and memory
3	Tan	5	Dimmer control module
4	Tan	5	Diagnostic connector
5	Blue	15	BPM
6	Tan	5	Center console switchpack; key transponder control module
7	Blue	15	BPM
8	Tan	5	Driver's seat switchpack; steering column adjustment switch
9	Red	10	Radio cassette head unit
10	Tan	5	Airbag/SRS
11	Yellow	20	A/C LH blower motor
12	Red	10	A/C; A/C blower relays coil; door mirror heaters relay coil; PAS control module
13	Natural	25	LH rear window motor
14	Red	10	Catalytic converter overheat warning control module (where fitted); cruise control on/off switch (where fitted); instrument cluster
15	Natural	25	LH door control module
16	Tan	5	Electrochromic interior mirror (where fitted); center console switchpack; gear selector; traction control on/off switch illumination (where fitted); transmission mode switch illumination; trunk fuse box pin A9 (coil's of fuel pump relay(s) and backlight heater relay); pin D8 (fuses 4 and 5) of trunk fuse box
17	Red	10	Accessory supply
18	Tan	5	Instrument cluster
<b>Right Heelboard</b>			
1	Yellow	20	LH seat control module
2	Blue	15	Door locks relay; door lock actuators
3	Blue	15	BPM
4	Red	10	Door mirror heaters; door mirror folding
5	Tan	5	Radio telephone
6	Red	10	A/C
7	Yellow	20	BPM
8	Tan	5	Passenger's side rear window switchpack; passenger's door switchpack and memory
9	Tan	5	Passenger's seat switchpack
10	Tan	5	Radio telephone; rear interior courtesy and map lamps
11	Yellow	20	A/C RH blower motor
12	Tan	5	ICE
13	Natural	25	RH rear door control module
14	Natural	25	Cigar lighters
15	Natural	25	RH front door control module
16	-	-	Not used
17	Blue	15	Sunroof
18	Natural	25	LH and RH front seat heaters (where fitted)

Fuse Box/ Number	Color	Rating (Amperes)	Circuit
<b>Trunk</b>			
1	Red	10	SLCM (back-up lamps, rear fog lamps, stop lamps, electrochromic interior mirror (where fitted))
2	Tan	5	Fuel filler flap
3	-	-	Not used
4	Tan	5	Diagnostic connector
5	Tan	5	LH and RH rear seat heater timers (where fitted)
6	-	-	Not used
7	Yellow	20	Fuel pump
8	Red	10	HMSL; caravan/trailer stop lamps
9	Red	10	Antenna motor
10	Red	10	SLCM (trunk release, fuel filler flap relay, inclination sensor, stop lamps)
11	Red	10	Accessory socket
12	Blue	15	Power amplifier (premium ICE systems only)
13	-	-	Not used
14	-	-	Not used
15	Yellow	20	Second fuel pump (S/C models only)
16	Yellow	20	Caravan/trailer backup lamp supply
17	Natural	25	Backlight heater
18	Yellow	20	Rear seat movement (where fitted)
19	Tan	5	LH and RH license plate lamps; caravan/trailer RH side/tail lamp
20	Yellow	20	Rear seat movement (where fitted)
21	Tan	5	LH and RH front and rear side marker lamps (where fitted); caravan/trailer LH side/tail lamp
22	Yellow	20	Rear seat heaters (where fitted)

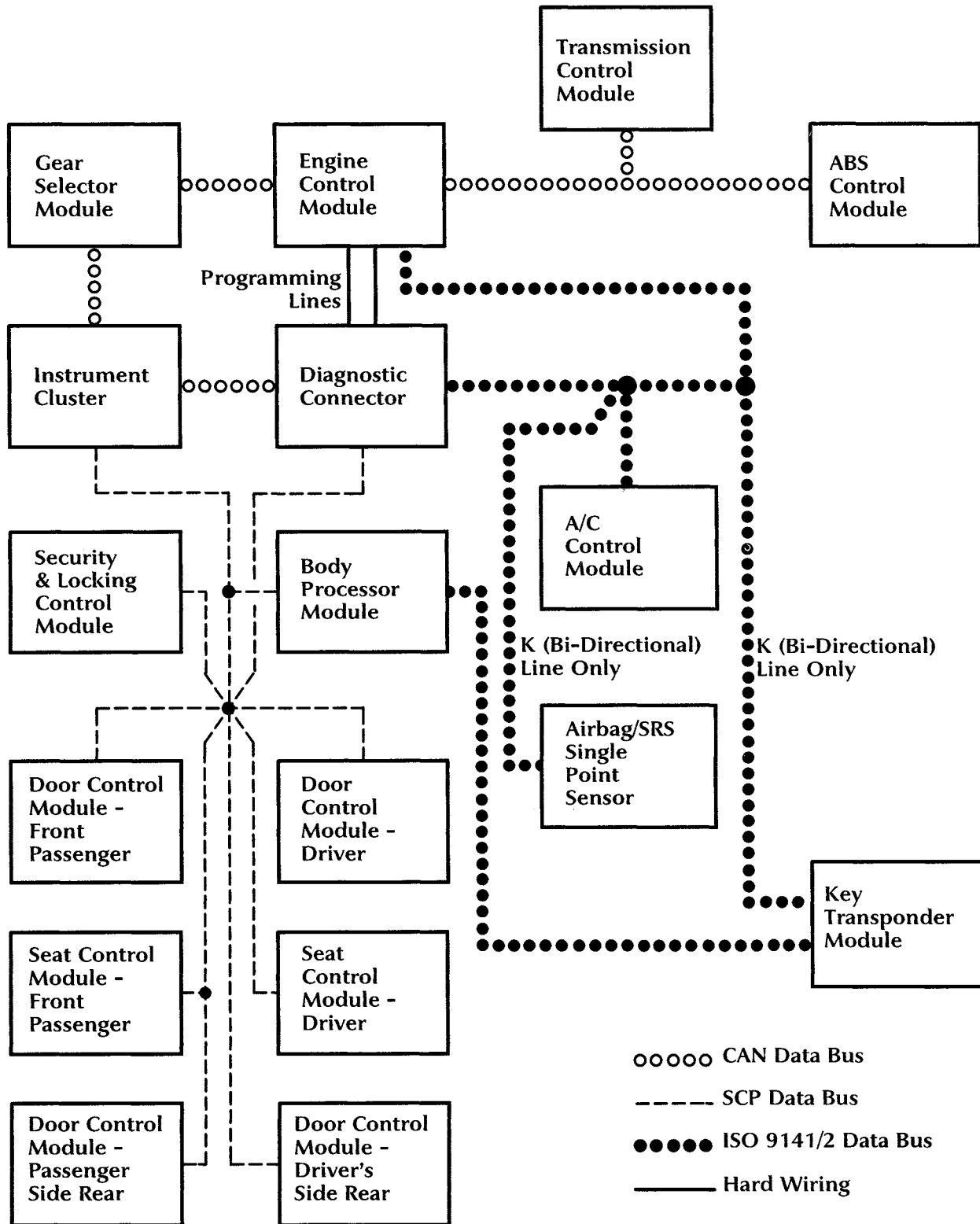
## Communication Networks

The Sedan now has CAN, SCP and ISO 9141/2 multiplex systems similar to those on the XK8. Although the networks operate in the same way as on the XK8, the inputs, outputs and functions of the individual control modules are unique to the Sedan.



D 418.192

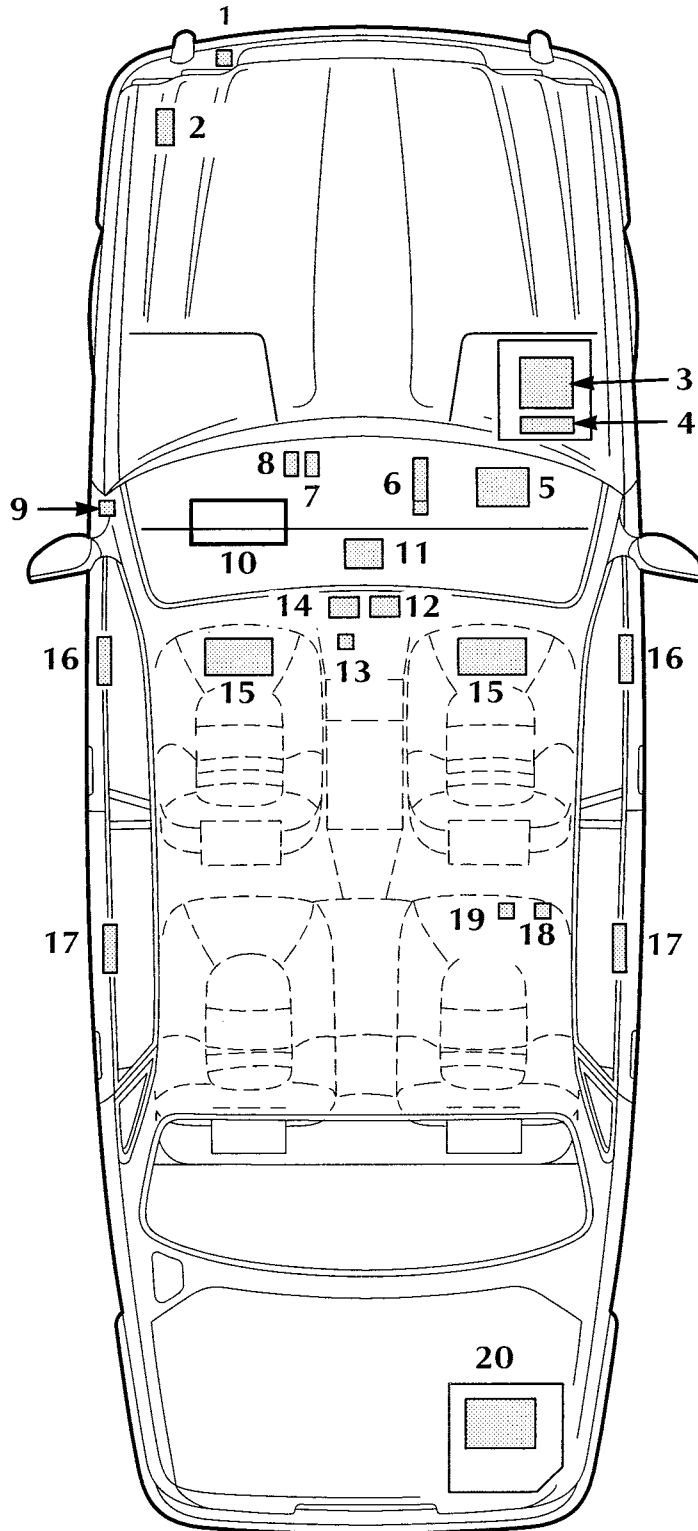
COMMUNICATION NETWORKS - SC VEHICLES



D.418.193

## Control Modules

### CONTROL MODULE LOCATIONS



- 1 Radiator Fans
- 2 Brake/ABS
- 3 Engine
- 4 Transmission
- 5 Body Processor
- 6 Air Conditioning
- 7 Dimmer
- 8 Key Transponder
- 9 Steering
- 10 Instrument Cluster
- 11 Single Point Sensor
- 12 Garage Door Opener (where fitted)
- 13 Gear Selector Illumination
- 14 Sun Roof (where fitted)
- 15 Driver/Passenger Seat (where fitted)
- 16 Driver/Passenger Door
- 17 Rear Door
- 18 Seat Heater Timer (where fitted)
- 19 Seat Heater Timer (where fitted)
- 20 Security and Locking

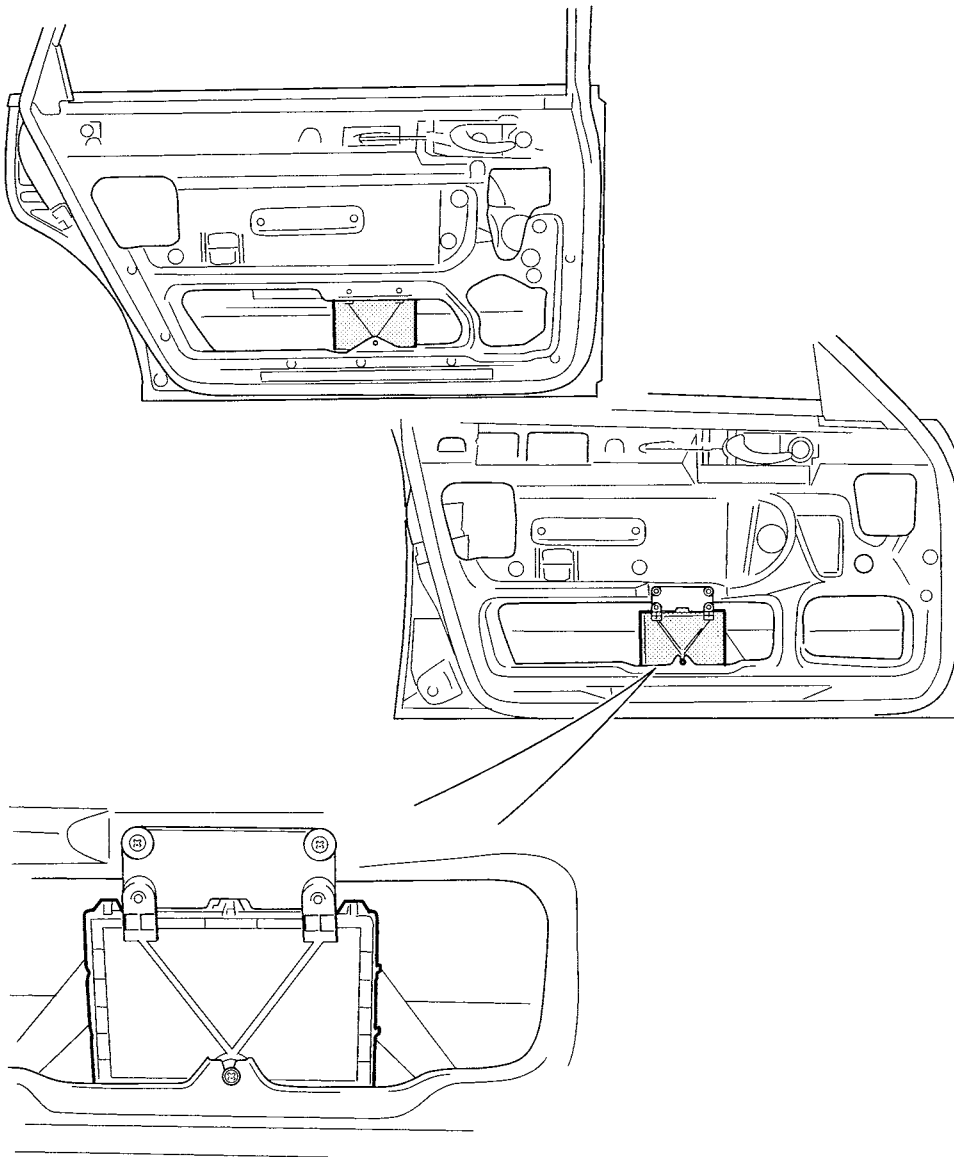
D 418 189

All of the control modules connected to the communication networks are new. A control module is added for each door. The exterior lamp control module in the trunk electrical carrier is deleted.

The door control modules operate the windows, the door unlock, the door guard lamps and, on the front doors, the door mirrors. They also produce SCP outputs for operation of the courtesy lights, the central locking system and the security system. One touch down operation is now incorporated on all four door windows.

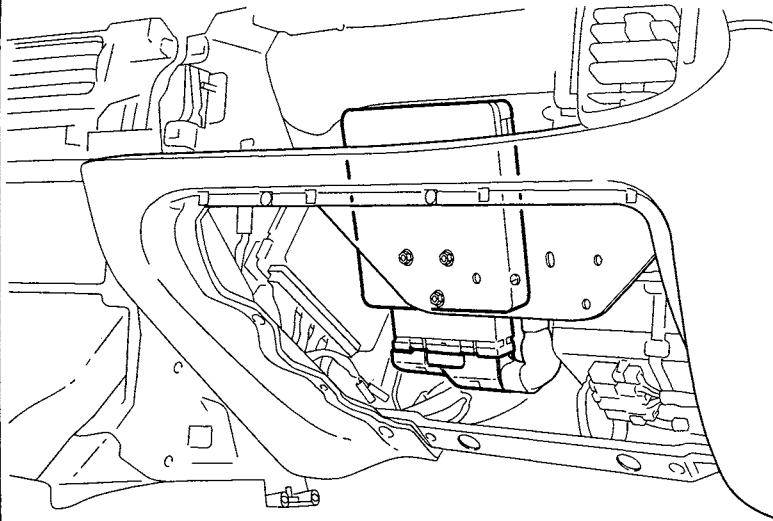
The BPM and the SLCM operate the lamps previously controlled by the exterior lamp control module. The SLCM monitors the rear stop lamps (not the HMSL) for bulb failure; the BPM monitors the tail lamps for bulb failure.

## DOOR CONTROL MODULES



D 418.140

## BODY PROCESSOR MODULE

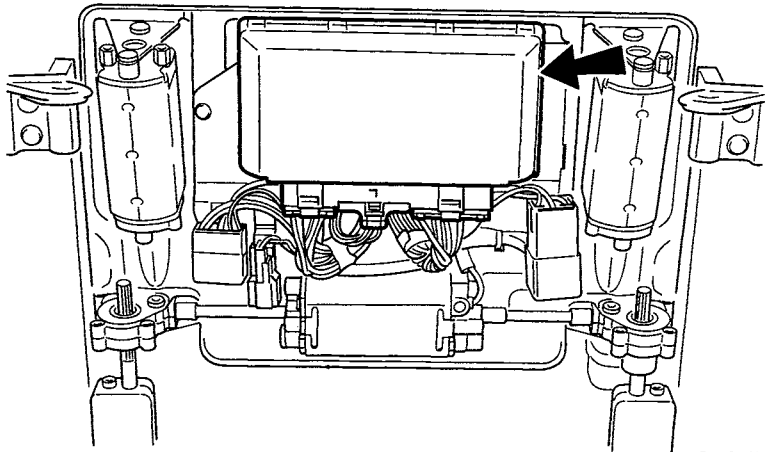


D.418.142.2

A number of control modules are relocated as follows:

- the brake control module is moved to the front left side of the engine compartment
- the ECM and TCM are moved to the passenger side enclosure in the engine compartment
- the airbag/SRS control module is integrated into a new single point sensor on the driveshaft tunnel below the fascia
- the BPM, dimmer control module and key transponder control module are relocated within the new fascia
- where fitted, the timer control module for the left rear seat heater is moved to the right heelboard
- the SLCM is moved to the electrical carrier.

## FRONT SEAT CONTROL MODULE



D.418.141

## Exterior Lighting

All of the exterior lamps are new except for the license plate lamps. Except for the HMSL, the lens and reflector of the new lamps are designed to give a bright appearance, for styling purposes.

New exterior lighting switches are introduced and operation is revised owing to the introduction of the new body system and deletion of the lamps control module.

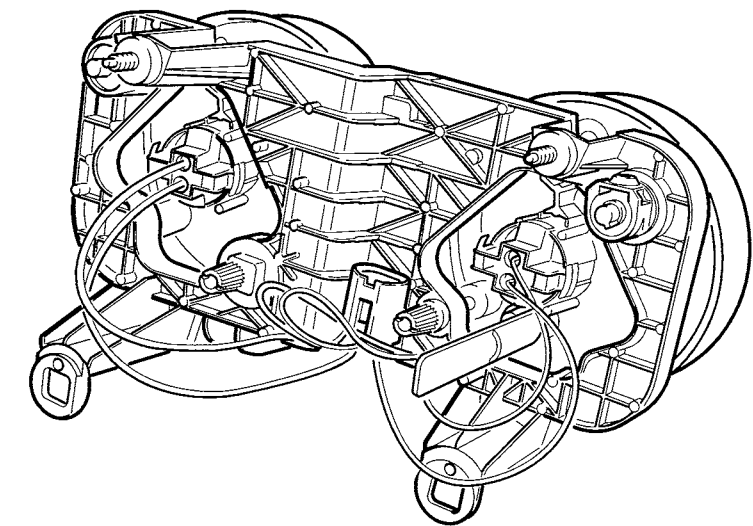
Automatic on/off control of the headlamps is introduced.

### Headlamps

Plain lenses are introduced on all four headlamps, and the facets that help to shape the light beams are now incorporated in the reflectors. The side lamp bulbs are moved from the outboard (low beam) lamps to the inboard (high beam) lamps. This maximises the reflector surface available for control of the low beams, which is more critical than that of the high beams.

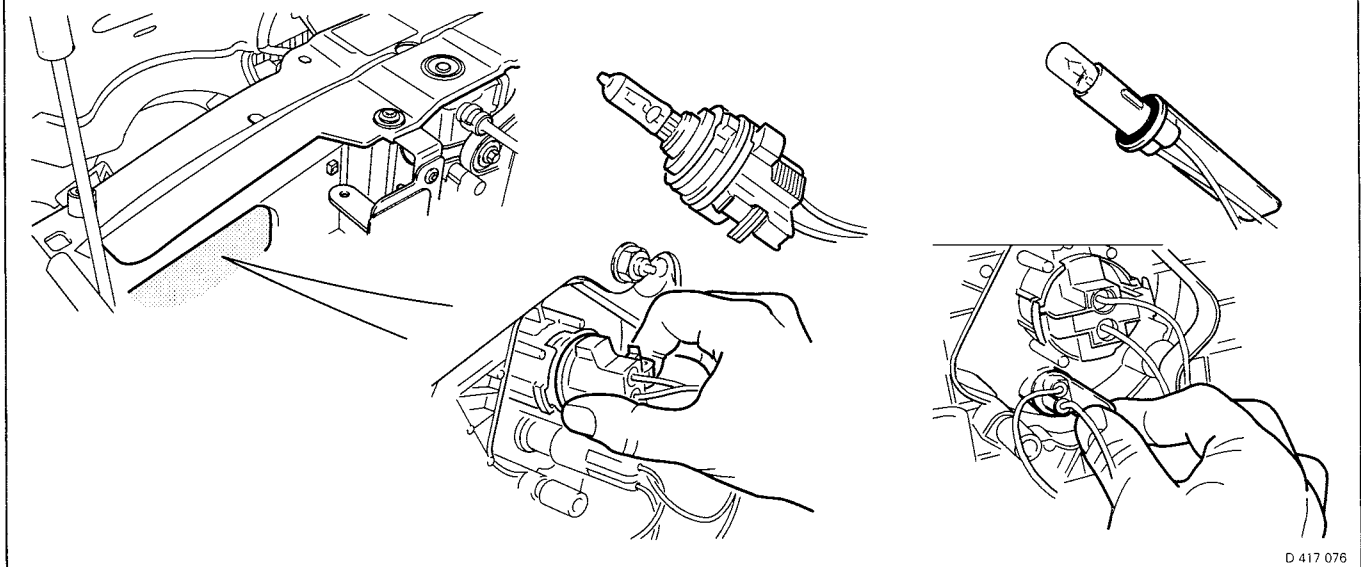
The headlamp and side lamp bulb are installed in bulb holders which are a push fit in the reflectors. The headlamps incorporate H7 bulbs. Light output from the new headlamps is 10 % greater than from the previous design.

HEADLAMPS



D 417.081

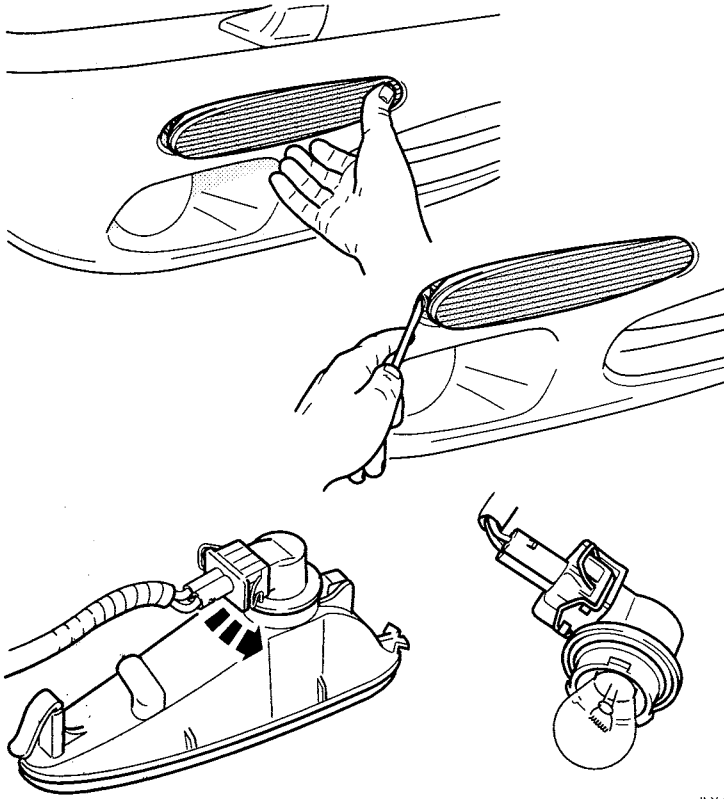
HEADLAMP AND SIDELAMP BULB REMOVAL



D 417.076



**FRONT DIRECTION INDICATOR LAMP**

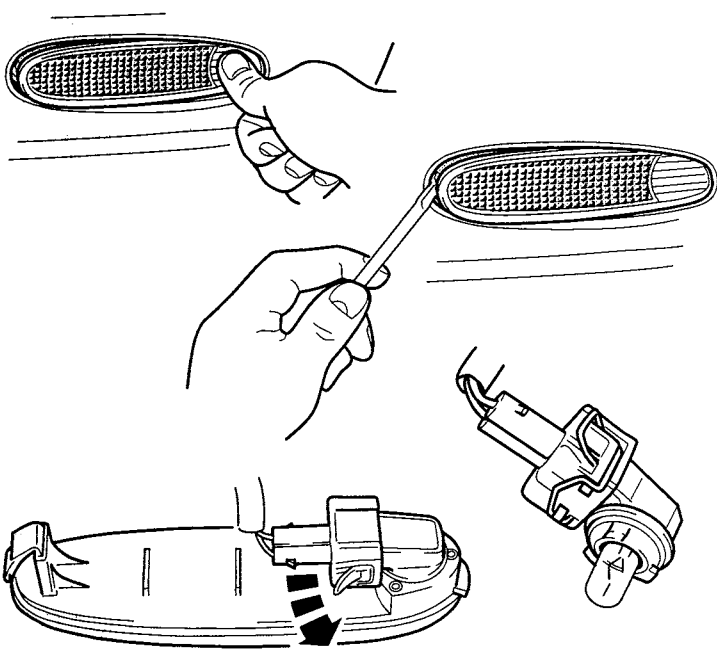


JLX-185

**Front Direction Indicator Lamps**

The front direction indicator lamps are retained in the bumper by spring clips. The lamps contain a P 21W bulb installed in a bulb holder which is retained in the reflector by a bayonet lock. Access to the bulb is by removal of the lamp. Pushing on one end of the lamp causes the opposite end to protrude from the bumper. The lamp is then removed by compressing the spring clip.

**SIDE MARKER LAMP/REFLECTOR**



JLX-181

**Side Marker Lamps/Reflectors**

The side marker lamps/reflectors are retained in the bumpers in the same way as the front direction indicator lamps. In applicable markets, a W 5W bulb is installed in a bulb holder which is retained in the reflector by a bayonet lock. Access to the bulb is by removal of the lamp.

### Front Fog Lamps

The two front fog lamps are identical. Three screws secure each lamp in a recess in the front bumper. The lamps incorporate plain lenses and free form reflectors (free form reflectors provide sufficient control of the light beam that it is unnecessary to have facets on the lense or reflector).

The fog lamps incorporate HB4 bulbs installed in bulb holders which are retained in the reflector by a bayonet lock. An adjuster for vertical alignment is incorporated in the lamp housing. Access to the lamps is from the rear of the bumper.

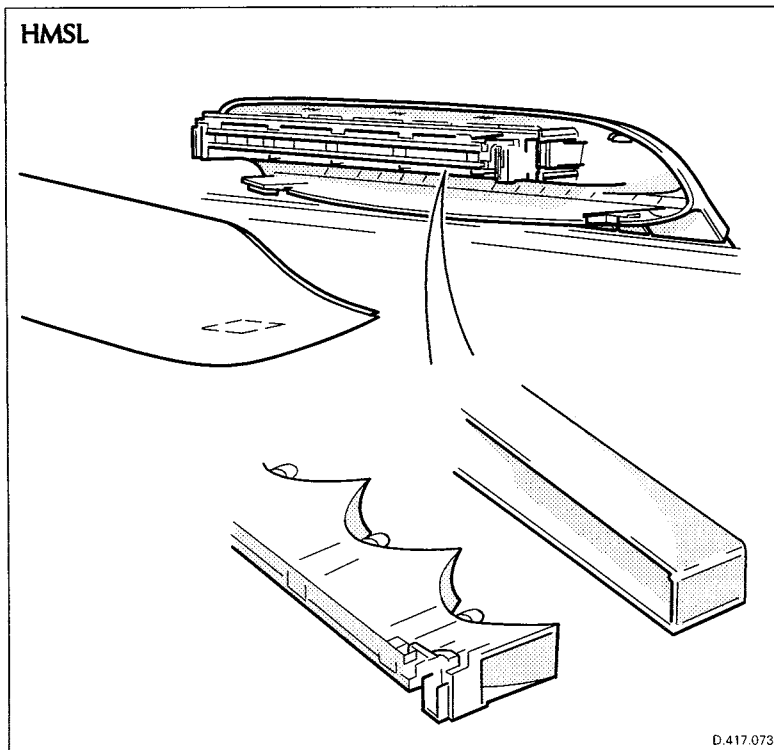
### HMSL

The HMSL attaches to studs on the center lower edge of the backlight. Inside the cover, five bulbs are installed in the reflector, which clips onto the base. The lens clips onto the reflector.

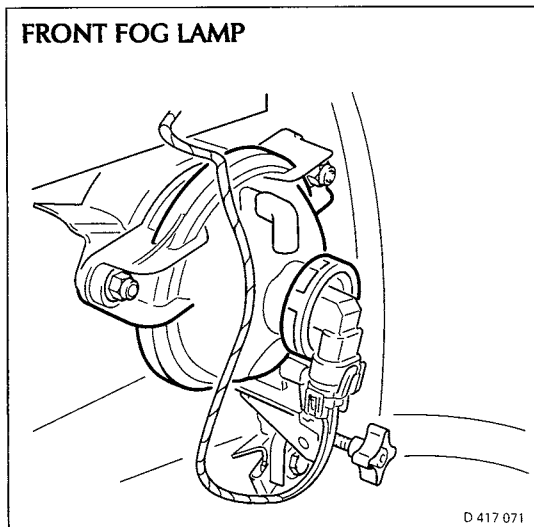
To remove the HMSL complete, access is required to the bottom edge, where the latching feature on each clip must first be released before lifting the unit up the back light.

### Rear Lamp Cluster

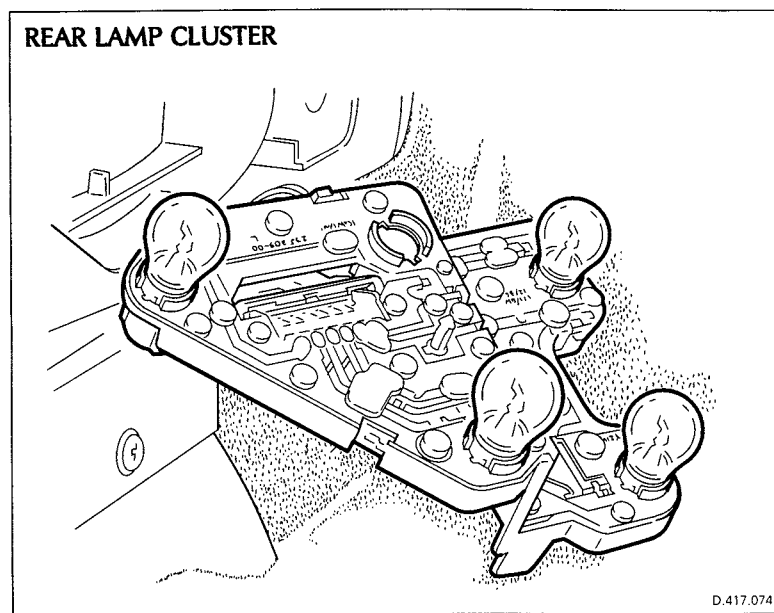
The vertical facets are deleted from the lens and incorporated into the reflector. The individual tail bulb is deleted, the tail lamp being provided by the combination stop/tail bulb.



D.417.073



D 417 071



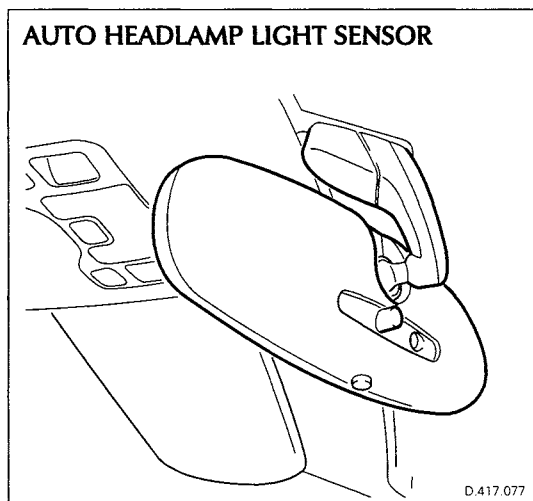
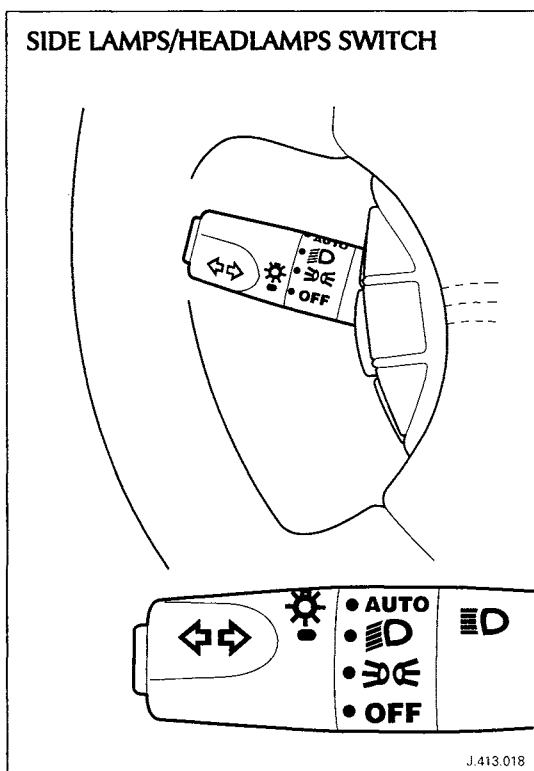
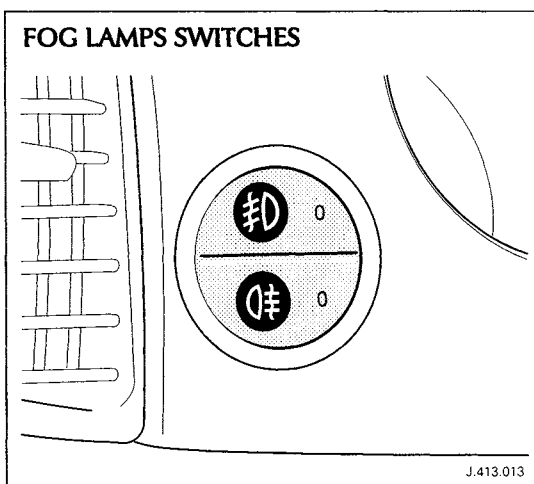
D.417.074

### Operation

Operation of the exterior lighting is similar to that of the XK8, except for the monitoring of the stop lamps (not the HMSL) and the tail lamps for bulb failure. On the Sedan this is done by the SLCM and BPM.

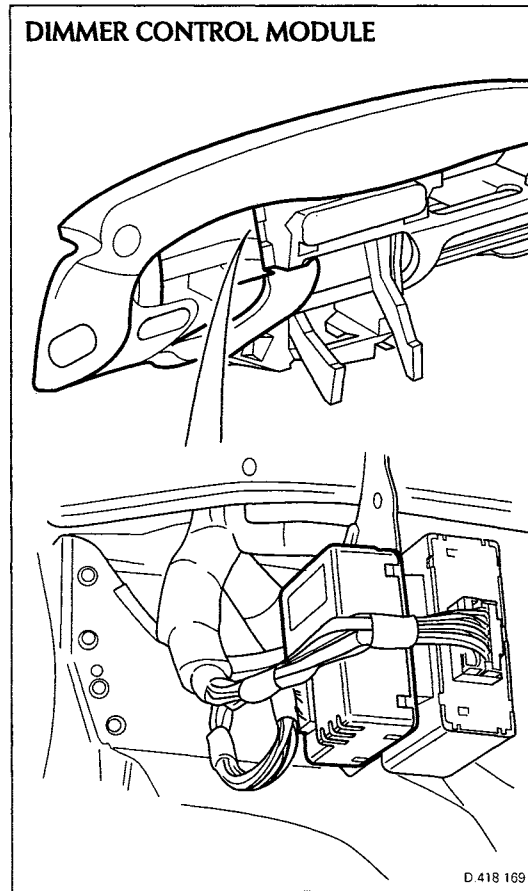
With the deletion of the fascia switch assemblies from each side of the steering column, new exterior lighting switches are introduced for the fog lamps, side lamps and headlamps. The front and rear fog lamps switches are on the fascia outboard of the steering column. The side lamps/headlamps switch is on the left stalk of the column switch assembly, as on the XK8.

For the auto headlamp function, a light sensor in the interior rear view mirror monitors ambient light and signals the BPM to switch the low beam headlamps on and off as appropriate for the prevailing light conditions. The automatic function is selected by setting the side lamps/headlamps switch to AUTO. An adjuster on the sensor allows the switching point to be adjusted to different light levels. A time delay in the BPM prevents "hunting" between the on and off states.



## Interior Lighting

Except for a new glove box lamp, which is the same as that in the XK8, the interior lamps are unchanged. However, with the introduction of the new body system, the operation of the interior lights is now similar to that of those in the XK8. The fade up and fade down feature introduced on the XK8 operates on the courtesy lights in the header console and the E post lamps. The instrument/switch lighting now incorporates the same dimmer control module as the XK8.

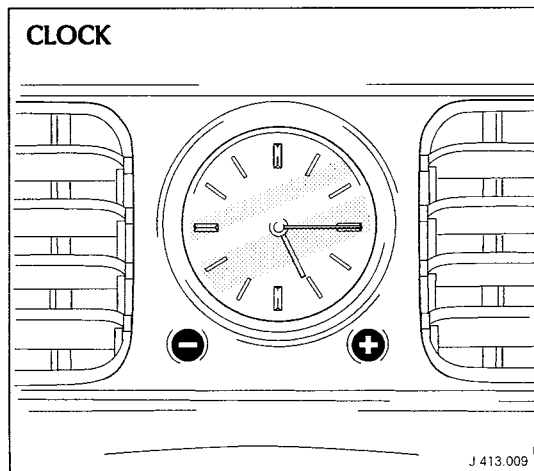
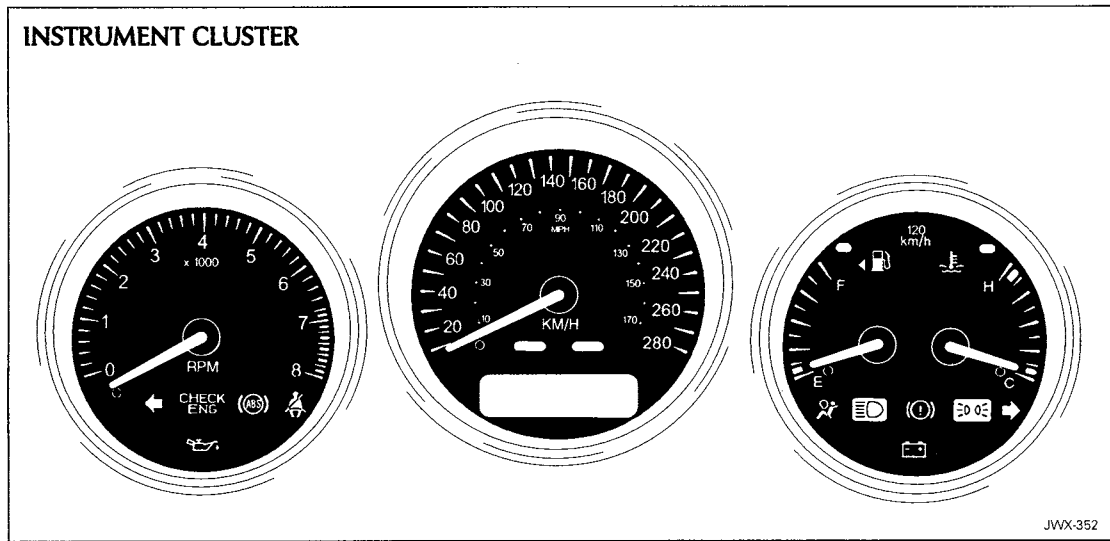


## Instrumentation

### Instrument Cluster

The instrument cluster is new. It is the same as the major instrument cluster installed in the XK8 at 1998 Model Year. However, there is a difference between installations: On the Sedan, warning lamps for engine oil pressure and battery condition are enabled; on the XK8 these are disabled because of the corresponding gauges and warning lamps in the minor instrument cluster.

If necessary, the odometer reading of the instrument cluster can be adjusted using the PDU (eg. to set the odometer reading of a replacement instrument cluster to match that of the instrument cluster it replaces). Note that the reading can only be increased and will not go past 99999.



### Clock

An analog electric clock is installed in the center vent of the fascia. Two push buttons below the dial enable + and - adjustment.

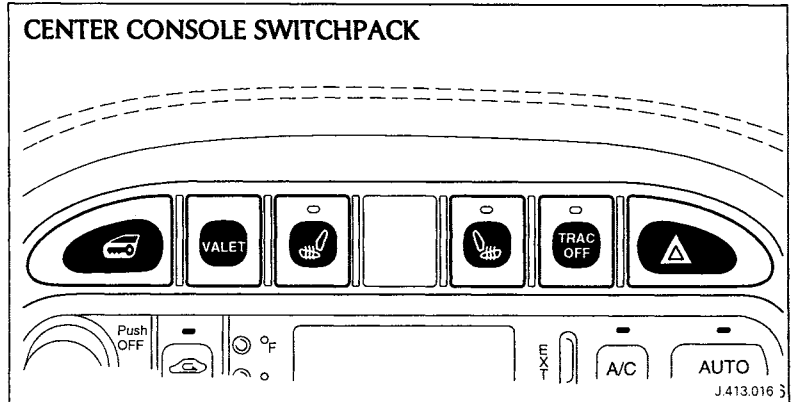
## Switchgear

Some of the switchgear is shown elsewhere in this Technical Guide, in the related individual Sections. Those that are not shown elsewhere are detailed below.

### Center Console Switchpack

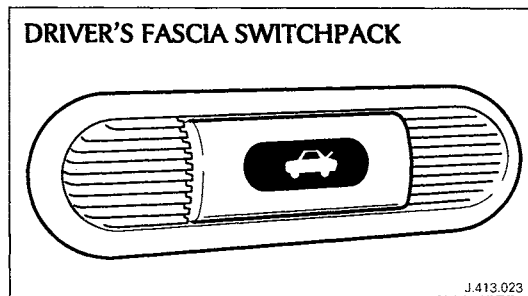
The center console switchpack is restyled and moved from below to above the A/C control panel. The contents of the switchpack are revised as part of the overall redesign of the switchgear:

- the clock and (where fitted) the headlamp levelling switch are deleted
- the valet switch and the stability/traction control switch are added.



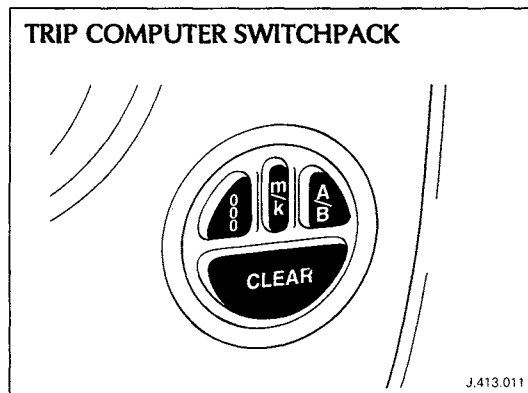
### Driver's Fascia Switchpack

The driver's fascia switchpack is a new switchpack installed in the fascia outboard of the steering column. It contains a push switch for the trunk release.



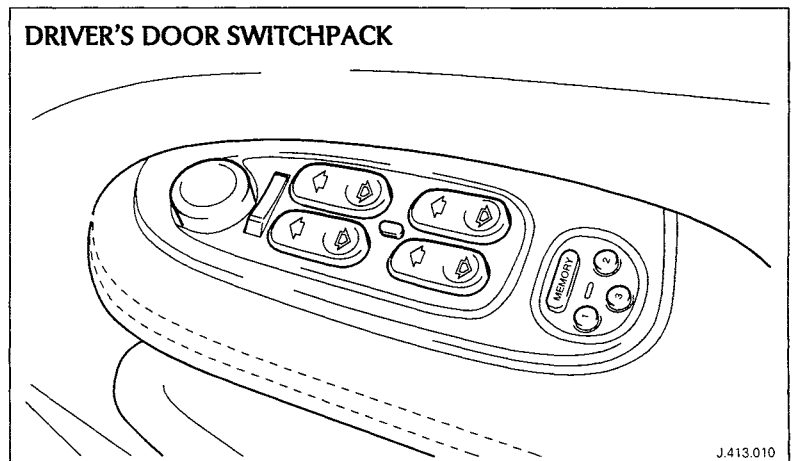
### Trip Computer Switchpack

A new trip computer switchpack is installed in the fascia inboard of the instrument cluster. The switchpack is similar to that installed in the XK8



### Door Switchpacks

The door switchpacks are restyled and, with the introduction of door control modules, are now more compact. Except for the addition of one-shot down operation of the passenger door windows, switch operation remains the same as on the previous design.

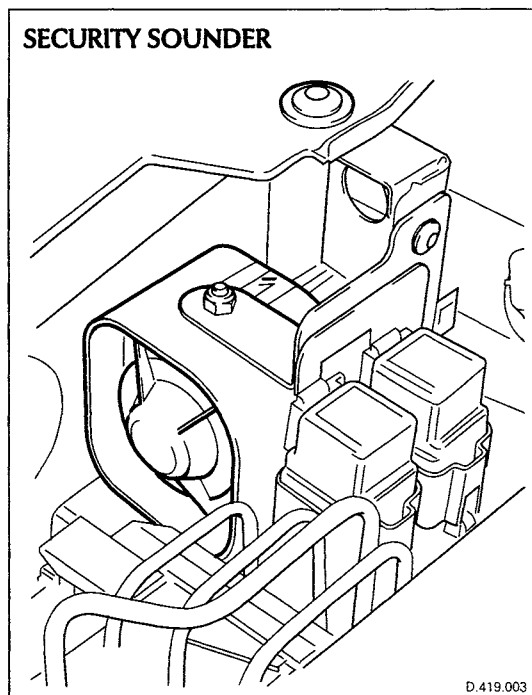
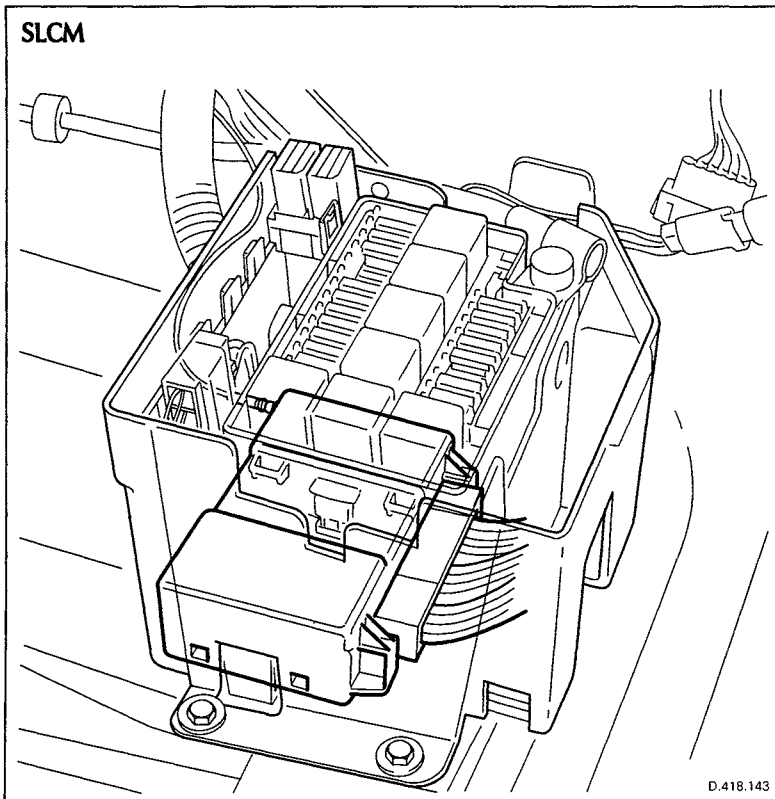


## Security System

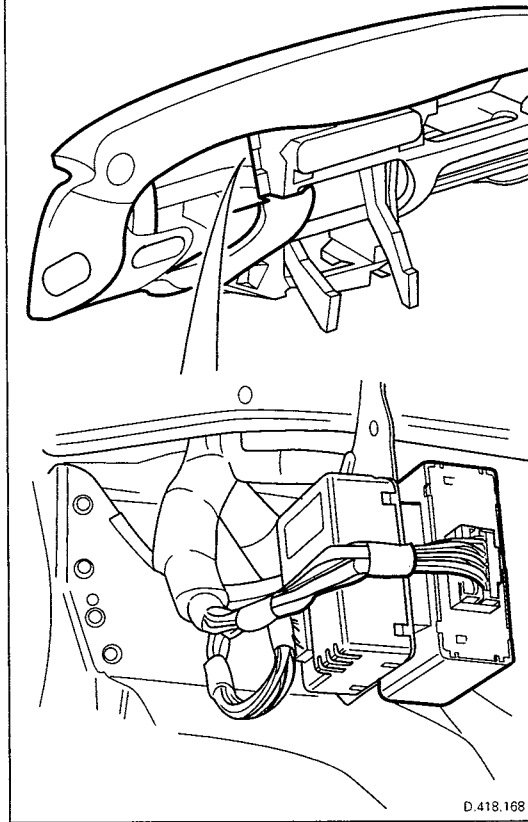
With the introduction of the SCP network and the door control modules, the architecture and operation of the security system are now similar to that of the security system on the XK8. The four button key-ring transmitter from the XK8 has also been adopted.

The SLCM is now installed in the electrical carrier in the trunk and, where fitted, the security sounder is now installed on the left side of the engine radiator.

The security features available remain as they were for the 97 Model Year Sedan.



Engine immobilisation is introduced. The engine immobiliser ensures the engine can only be started using a valid ignition key. A key transponder control module, installed in the fascia next to the control column, is linked to the BPM, the ECM and a reader/exciter coil around the ignition switch. The KTCM is programmed to recognise a uniquely coded transponder in the head of each key supplied with the vehicle. When a key is installed in the ignition switch and turned to position I (auxiliary), the KTCM uses the reader/exciter coil to read the transponder code. When the key is turned to position II (ignition), the KTCM exchanges signals with the BPM and ECM and, if the key is valid, fueling, ignition and cranking functions are enabled to allow the engine to start when the key is turned to position III (crank). If the key is invalid, the fueling, ignition and cranking functions are inhibited and the engine cannot be started. Programming of replacement keys is by use of the PDU.

**KEY TRANSPONDER CONTROL MODULE**



## In-car Entertainment

The ICE system incorporates a new harness, new radio cassette, new door speakers and, where fitted, a new power amplifier. The system also incorporates the same remote operating switches on the steering wheel as installed on the XK8.

### Harness

The ICE harness between the radio cassette and the CD autochanger/power amplifier is now routed along the left upper side of the driveshaft tunnel and the left side of the rear seats.

### Radio Cassette

The radio cassette incorporates improved button ergonomics and integrated telephone controls.

RDS is introduced to provide the following functions:

- station name display
- automatic retuning to follow network stations
- station/programme type display and search.

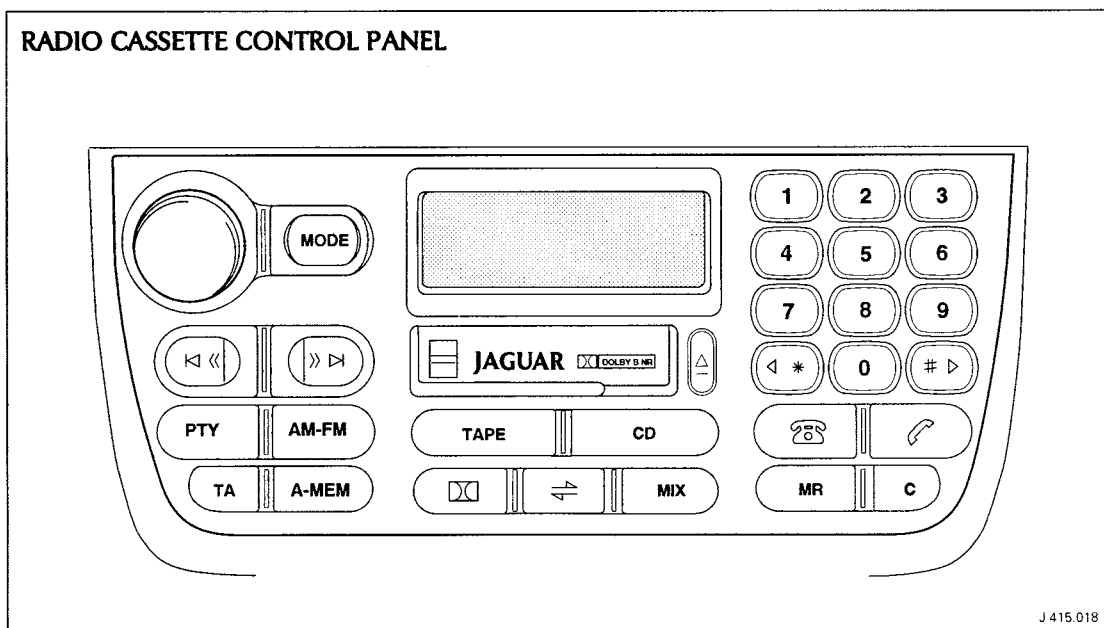
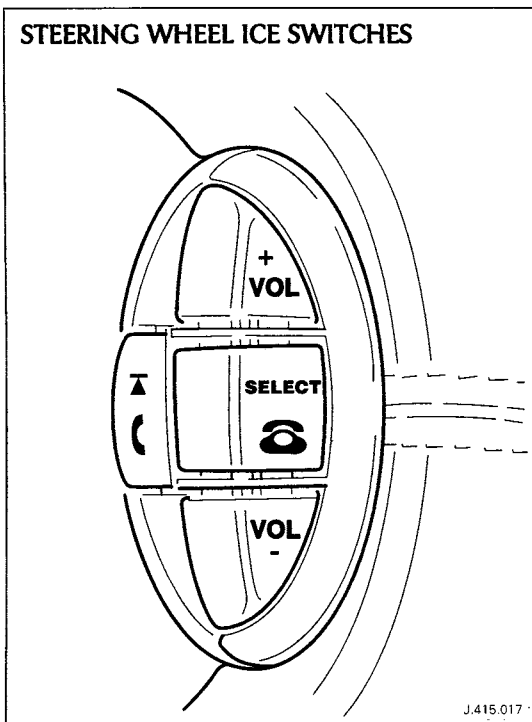
When the radio is on, RDS can be toggled on and off by pressing and holding the TA button for at least two seconds. RDS ON or RDS OFF will show on the display, as appropriate.

The telephone controls are incorporated in the radio cassette of all vehicles, although the telephone system itself is an accessory.

Note that the radio tuning control has two modes, seek tuning and manual tuning:

Momentarily pressing either button will activate the radio in the seek mode, making the tuner search up or down the frequency range for the next available station.

Push and hold either button to tune the radio manually, the display will show TUNE. Incremental adjustment can be made by momentarily pressing either button until the required frequency is reached, or by pressing and



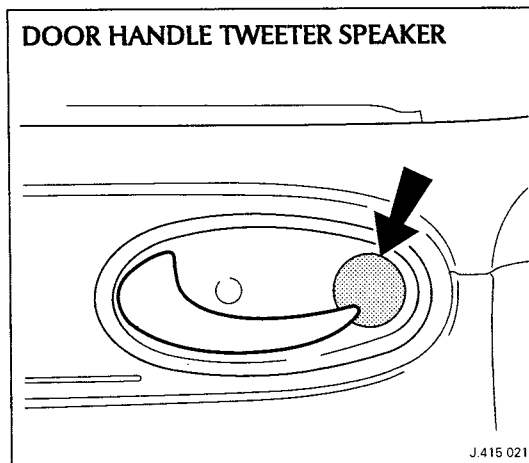
holding either button to continuously count up or down the frequency band. After a short period the radio returns to the seek tuning mode.

### Speakers

The diameter of the door speakers is increased to 166 mm. On base systems, the diameter of the front and rear tweeters is increased to 25 mm and they are now located in the housing of each interior door handle. On premium systems the tweeters are unchanged, but the rear ones are also relocated to the housing of the interior door handle (the front tweeters remain in the A post trim).

### Power Amplifier

The power amplifier incorporates a revised equalisation curve to match the new speakers and new vehicle interior.



## Seat Belts

The rear seat belts are unchanged. The front seat belts are new and incorporate changes to the buckles and height adjusters. In addition, they are now equipped with pre-tensioners.

### Buckles

The buckles are similar to the previous design, but the tear loop units have been deleted.

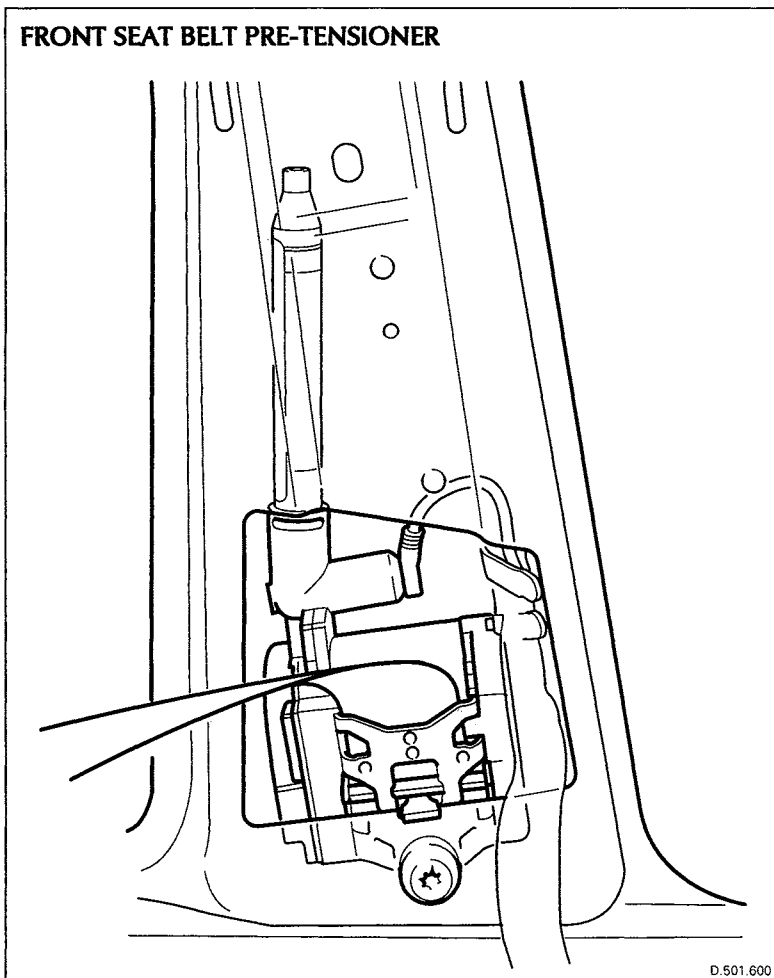
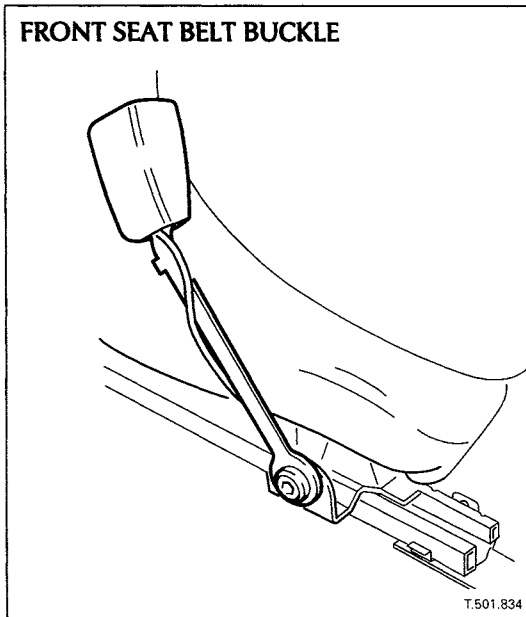
### Height Adjusters

The height adjusters are mounted approximately 30 mm (1.2 in) higher on the B/C posts.

### Seat Belt Pre-tensioners

The front seat belt pre-tensioners are of the pyrotechnic type, as on the XK8, but are activated electronically by the Airbag/SRS system instead of mechanically by integral sensors.

The pre-tensioners are installed in the B/C posts. The same safety and handling precautions apply as for the pre-tensioners on the XK8. In addition, before working on an installed pre-tensioner, the vehicle's battery must be disconnected for a minimum of one minute to ensure the airbag/SRS system is deactivated.



## Airbag/SRS System

The airbag/SRS system is extensively revised to introduce side airbags, single point sensing and electronic control of front seat belt pretensioners. The new system includes:

- driver and passenger airbags
- two side airbags
- two side impact sensing modules
- a single point sensor.

The wiring for the system is integrated into the vehicle harnesses, with yellow sleeving on the wires where they leave the harnesses to connect to the individual components.

### Driver's Airbag

The driver airbag has a new, repositioned connector and a new igniter. The new igniter has a resistance of 2 ohms (previous igniter was 1 ohm). Cut outs are incorporated into the airbag cover to accommodate the steering wheel switches and there are minor changes to the badge on some models.

### Passenger Airbag

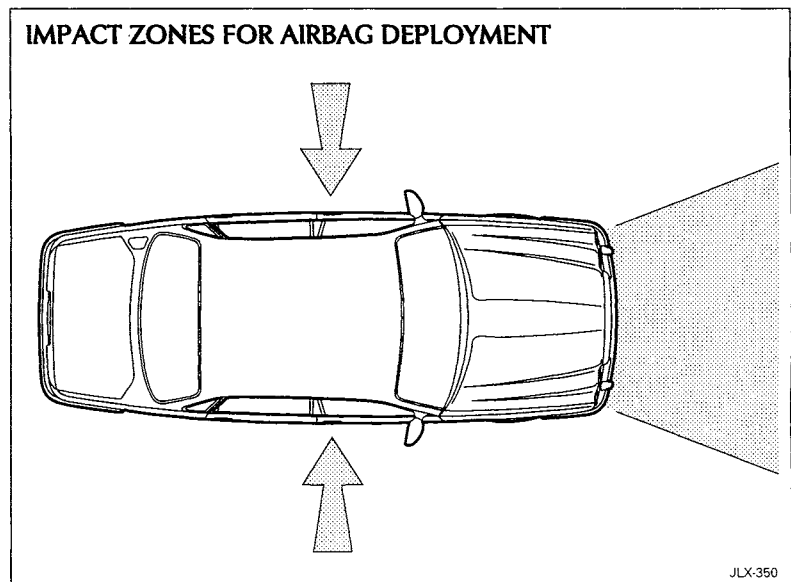
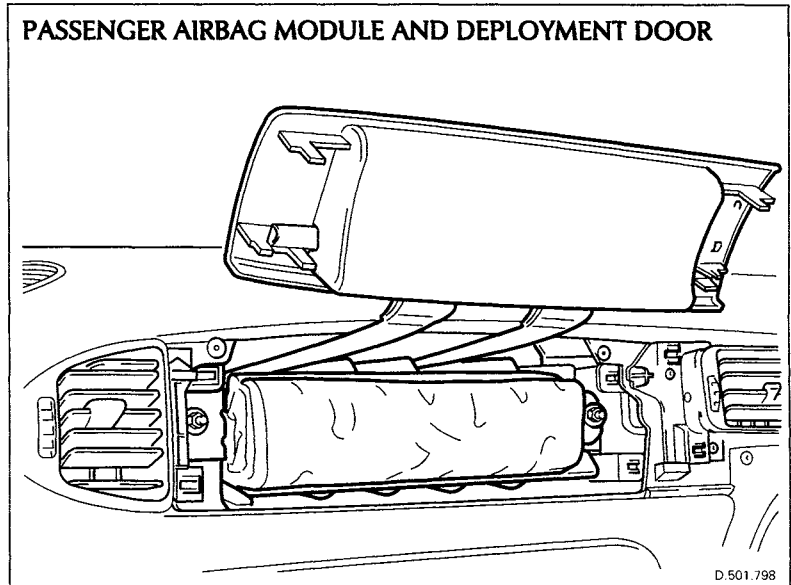
The passenger airbag is revised to incorporate a tethered deployment door, a new electrical connector and a new igniter.

The deployment door is similar to that on the XK8. Two webbing straps are attached between the door and the anchor bracket of the airbag module. Four integral pegs retain the door in clips in the fascia. Note that the clips should be replaced each time the door is removed.

The electrical connector is a gray 2 pin connector located on the left side of the airbag module, immediately behind the deployment door.

As on the driver's airbag, the new igniter has a resistance of 2 ohms instead of the 1 ohm of the previous igniter.

After deployment of the airbags the steering wheel and driver's airbag module, and/or the fascia and the passenger's airbag module must be replaced.



## Side Airbags

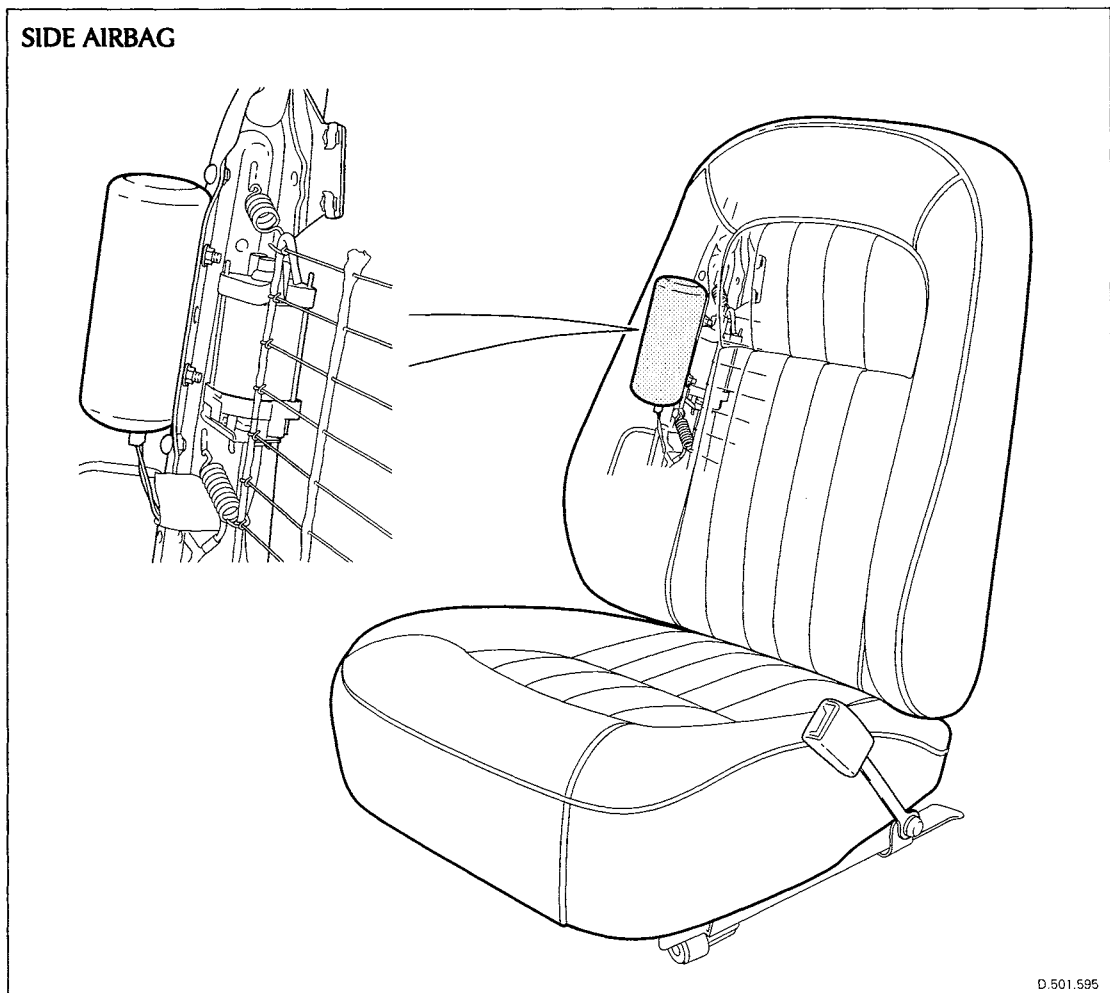
**WARNING:**  
**DO NOT PLACE OBJECTS IN THE INFLATION AREA OF A SIDE AIRBAG. INJURY COULD OCCUR IF A SIDE AIRBAG CONTACTS AN OBJECT DURING INFLATION.**

**Note:** The handling precautions and disposal procedures for the side airbags are the same as those for the driver and passenger airbags. For storage and transportation purposes, the side airbags are classified as pressure vessels.

The side airbags provide additional side impact protection for front seat occupants. In a side impact above a predetermined severity, the airbag on the impacted side inflates between the occupant and the door at approximately chest height.

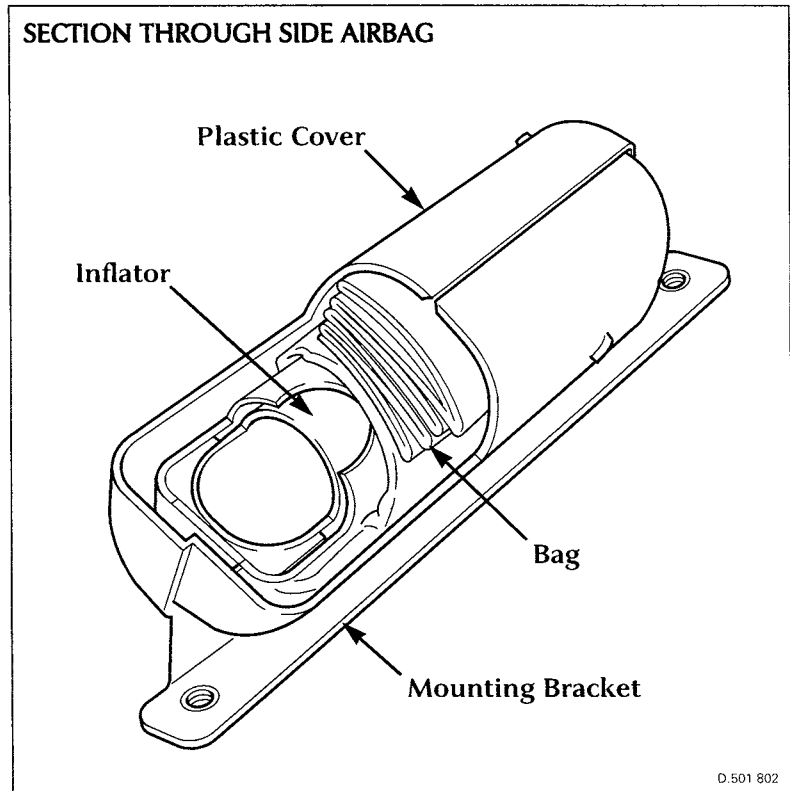
A side airbag is attached to the outboard side of the seat back frame of each front seat, in a cavity formed in the foam padding. A slit is incorporated in the foam, on the forward side of the cavity, to direct an expanding airbag to the required exit point in the seat trim. Externally, the front seats are unchanged.

The airbag consists of a 10 liter (approximately) non-coated, non-vented bag connected to an inflator. The bag and the inflator are contained within a plastic cover and attached to a bracket. The bracket is handed to ensure correct orientation of the airbag on the seat back. The inflator contains the airbag propellant, pressurized argon, in a chamber that is sealed by a burst disc. Located against the burst disc, inside a filter screen, is a small pyrotechnic charge connected to a two pin connector.

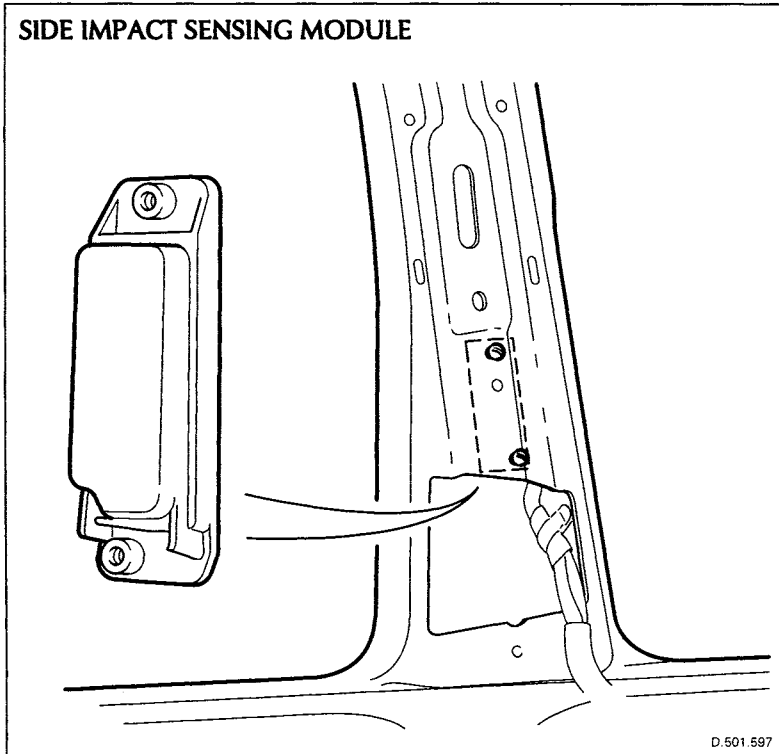


Operation of the side airbag is initiated by an electrical signal from the single point sensor igniting the pyrotechnic charge. The pressure produced by the burning pyrotechnic charge ruptures the burst disc and allows the argon to escape, pass through the filter screen and inflate the bag. The hot gases from the burning pyrotechnic charge mix with the argon to increase the flow energy. As the bag inflates it splits the plastic cover along a perforated seam, enters the slit in the foam padding and breaks through the stitched seam of the seat's side bolster to deploy along the inside of the door.

After the deployment of a side airbag, the front seat should be replaced.



## SIDE IMPACT SENSING MODULE



## Side Impact Sensing Modules

The side impact sensing modules detect any impact that may occur on the side to which they are installed.

A side impact sensing module is installed in each B/C post, just above the front seat belt pretensioner. If an impact above a preset threshold is detected, the module outputs a fire signal to the single point sensor.

## Single Point Sensor

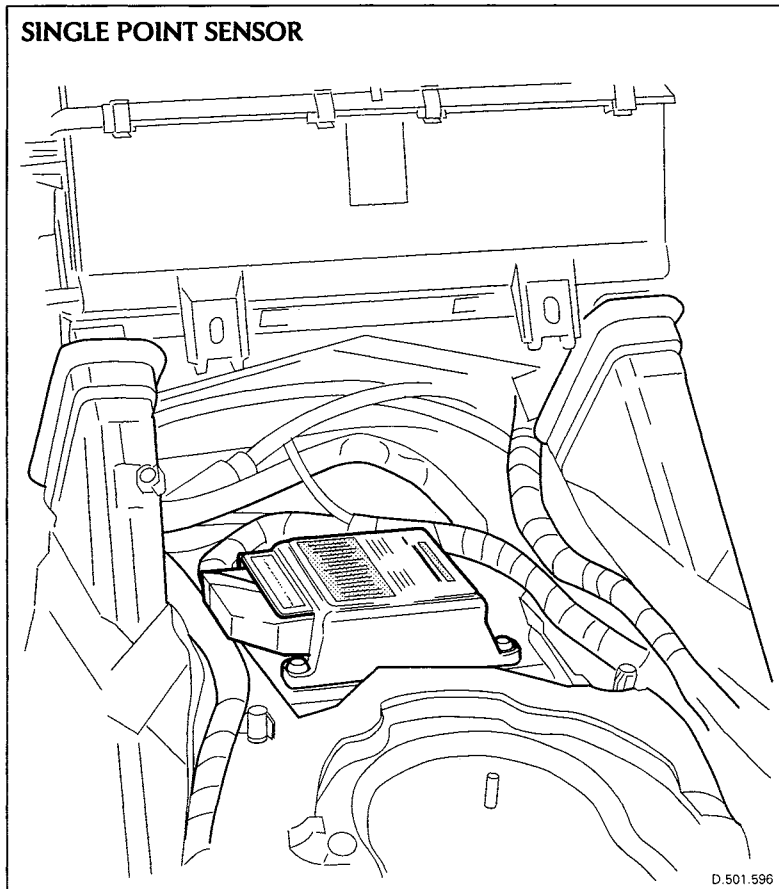
The SPS performs the functions that, in the previous system, were performed by the front impact sensors, the safing sensor and the airbag/SRS control module. In addition, it controls the operation of the front seat belt pretensioners and the side airbags. The SPS is installed on the driveshaft tunnel directly below the radio.

Contained in the SPS are:

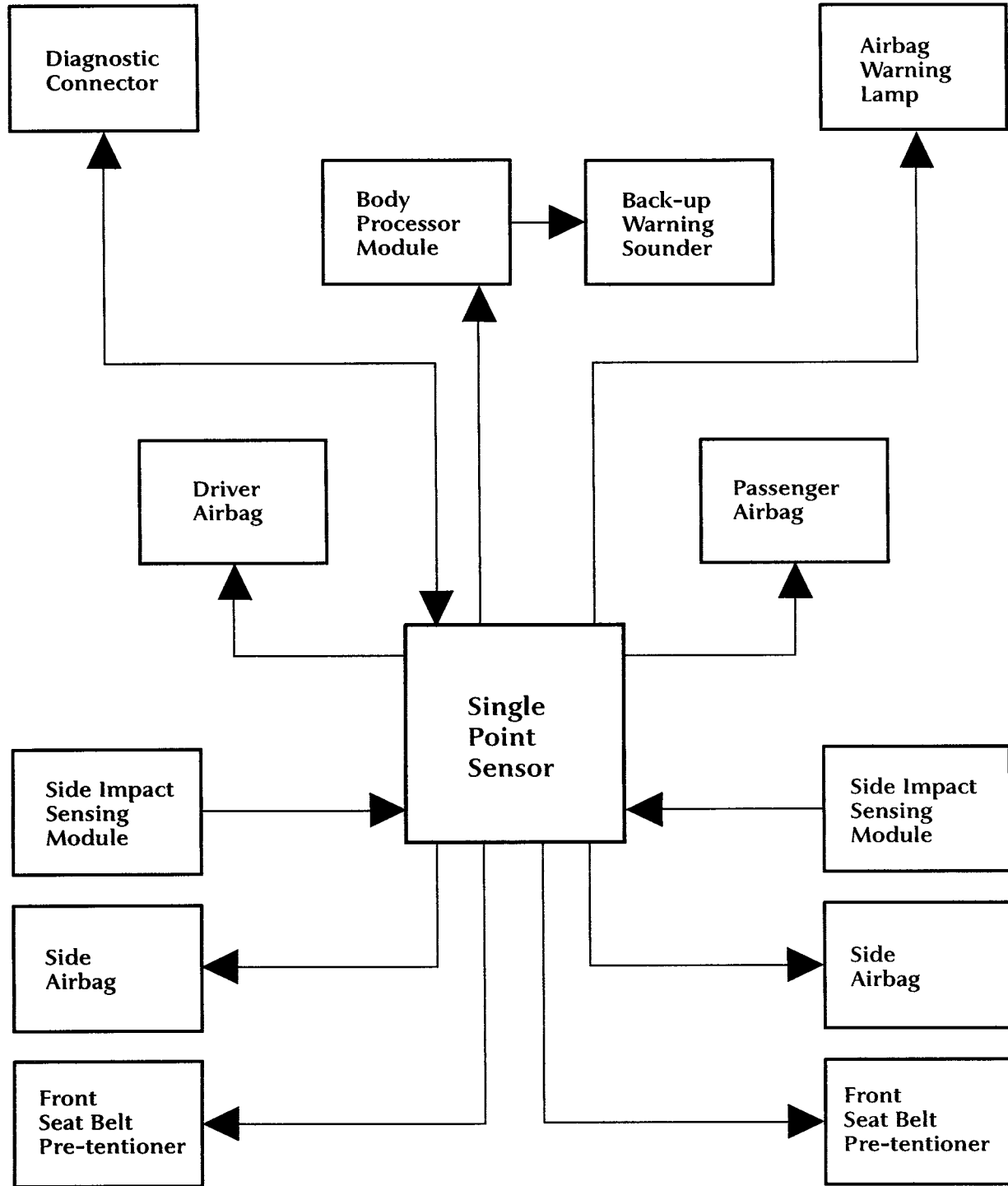
- an electronic front impact sensor
- a sleeve-on-shaft front impact safing sensor
- an electronic side impact safing sensor
- related operating and diagnostic circuitry.

An integral back-up power supply enables the SPS to operate the system if the external supply is disrupted during an impact.

## SINGLE POINT SENSOR



AIRBAG/SRS SYSTEM AND FRONT SEAT BELT PRE-TENSIONER BLOCK DIAGRAM



J.501.940



### **System Operation**

The system is only active when the ignition is on and for approximately one minute after the ignition is switched off.

The detection and response to side and frontal impacts are entirely separate. If the front impact sensor in the SPS detects a front impact above a preset threshold, and the impact has also been detected by the front impact safing sensor, the SPS fires the two front seat belt pre-tensioners, the driver airbag and the passenger airbag. If the SPS receives a fire signal from one of the side impact sensing modules, and the impact has also been detected by the side impact safing sensor in the SPS, the SPS fires the related side airbag.

### **Diagnostics**

The side impact sensing modules conduct their own diagnostic routines and output a status signal to the SPS. The SPS conducts diagnostic routines for the remainder of the system.

At ignition on, the SPS energizes the airbag indicator lamp on the instrument cluster to prove the lamp is serviceable. If the system is serviceable the lamp goes off after 6 seconds. While the ignition is on, if a fault is detected the SPS energizes the airbag warning lamp and logs the related DTC and time (in vehicle run hours) in memory. The airbag warning lamp then remains on whenever the ignition is on until the fault is cured. If the fault is intermittent, the time at which the fault disappears is also logged against the DTC and the airbag warning lamp remains on for the remainder of the ignition cycle. At the next ignition cycle, if the fault does not recur, the lamp goes off after the lamp test, but the DTC is retained in memory.

If the SPS detects a failed airbag warning lamp and then detects a system fault, it signals the BPM, which operates an audible warning of 5 groups of 5 tones, with a 5 seconds interval between each group. The audible warning is repeated at 30 minute intervals while the ignition remains on, and at the beginning and every 30 minutes of subsequent ignition cycles.

System fault diagnosis and DTC retrieval can only be done with the PDU through the diagnostic connector.









