

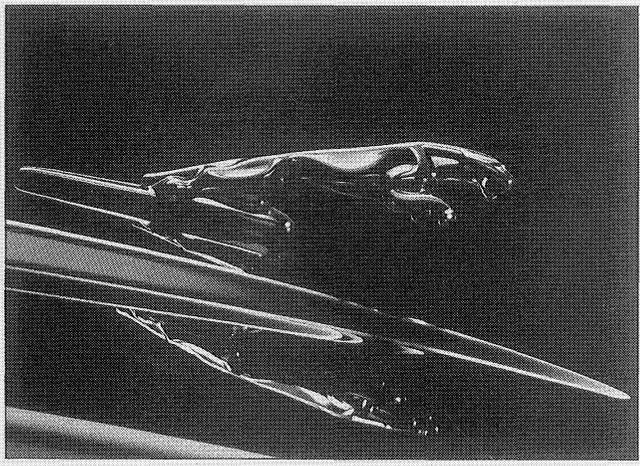


Technical Guide

AUGUST 1995

XJ SEDAN & XJS RANGES
1996 MY UPDATE
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BY APPOINTMENT TO
HER MAJESTY QUEEN ELIZABETH II
MANUFACTURERS OF DAIMLER AND JAGUAR CARS
JAGUAR CARS LIMITED COVENTRY



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



BY APPOINTMENT TO
HIS ROYAL HIGHNESS THE PRINCE OF WALES
MANUFACTURERS OF DAIMLER AND JAGUAR CARS
JAGUAR CARS LIMITED COVENTRY

Technical Guide

XJ SEDAN & XJS RANGES 1996 MY UPDATE AUGUST 1995

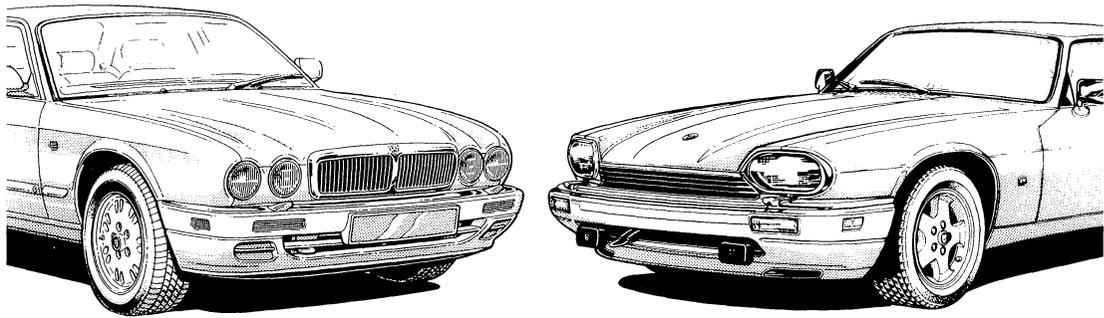
This Technical Guide is produced as an outline description of the model year program changes to the XJ Sedan and XJS ranges, for Dealer workshop personnel. As a cohesive package, it complements updates to the Service Manuals. However, in order to keep the contents concise, no attempt is made to cover technical details to the depth of the Service Manuals.

Most of the changes are programmed for vehicle volume production in August 1995. Some are running changes to be included as close as possible to this date. Subsequent vehicle launch will vary according to market destination.

The information contained in this publication should be considered as preliminary information. While every effort is made to ensure accuracy, changes may occur between going to press and vehicle launch.

Since the Technical Guide contents will not be updated, the reader is encouraged to study subsequent information sources, such as Service Bulletins and Service Manual Supplements.

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J76 - 1208

Contents Overview

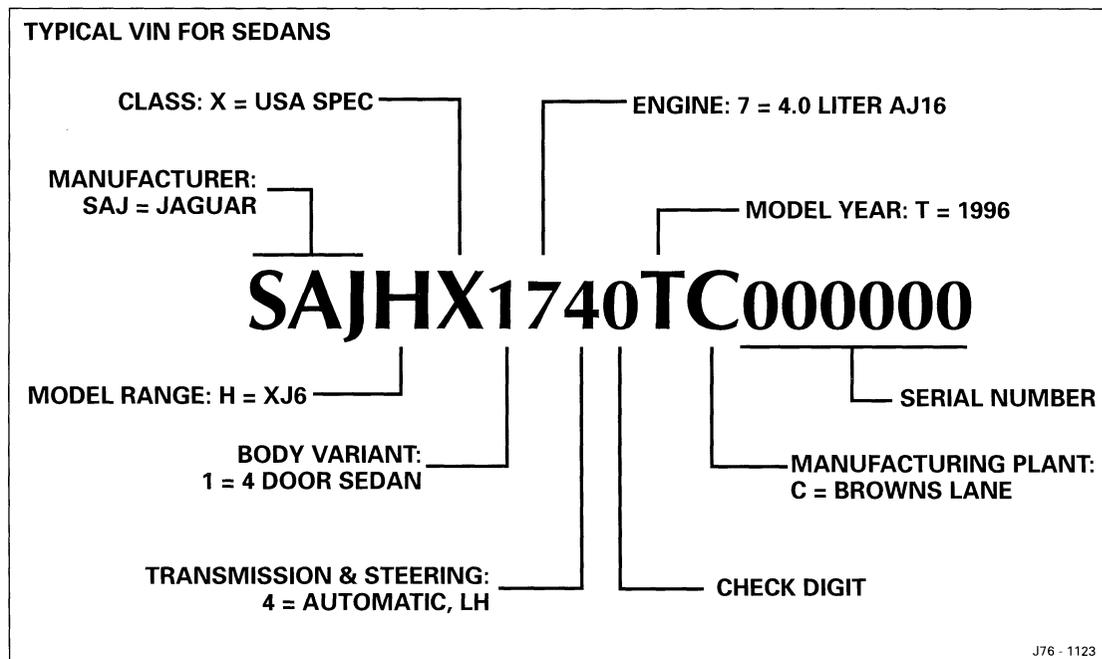
Most of the changes covered by this Technical Guide concern the XJ Sedan range, although a number of AJ16 engine related changes also apply to the 4.0 liter XJS. Of special significance at this Model Year is the withdrawal of the V12 version of the XJS.

Changes to the Sedan include the deletion of the front passenger door lock barrel and changes of material for some interior finishers. In addition, a percentage of vehicles have a revised evaporative loss control system and new fuel lines in the engine compartment.

Changes to the AJ16 engine include revised valve timing. A new transmission oil filler tube and exhaust manifold heat shield accommodate the introduction of an exhaust gas recirculation system on the supercharged engine. The down-pipe catalytic converters are standardised with those used in the Rest of the World.

Both the Sedan and XJS incorporate changes to the diagnostic software of the engine control module.

Vehicle Identification Number (VIN)



Exterior Trim

Passenger Door Lock Barrel

As currently practised by competitor car manufacturers, the Sedan front passenger door is designed without a lock barrel. Since the common way to lock and unlock the doors is with the remote control key-ring transmitter, the frequent use of the key has diminished. The key's function now is as a recourse for the driver's door should the transmitter fail.

Deletion of the lock barrel has the side benefit of improving security to the front passenger door. Associated deleted components are the link, clip and lever, reset switch and cable.

Interior Trim

Door Switch Pack Finishers

The door window switch pack veneer finishers are replaced by satin finish injection moulded plastic versions on XJ6 and XJR Sedans.

The moulded finishers are color-keyed to the door trim casing in one of five colors. Fitment is by a spring steel strip latch moulded onto the forward edge of the switchpack and by a screw and spring steel retaining clip at the rearward edge.

Door Speaker Grilles

All door speaker grilles and finishers on non-premium ICE vehicles have undergone a material change from metal to plastic. There is no perceived difference in appearance between the new and previous parts but the plastic components possess a higher impact resistance.

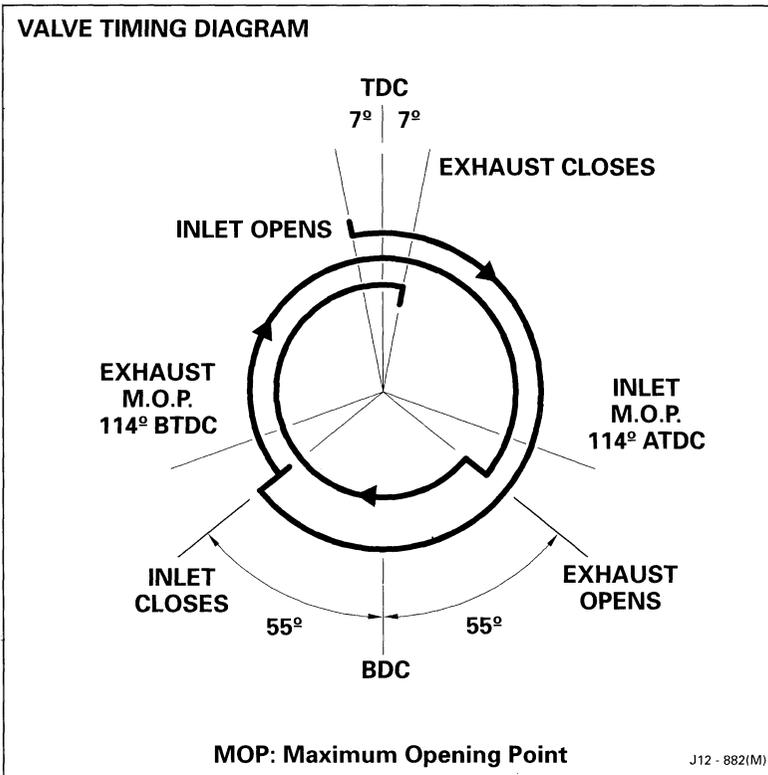
Engine - Mechanical

Valve Timing

On 4.0 liter normally aspirated engines, valve overlap is reduced from 22 to 14 degrees of crankshaft movement, to improve engine idle quality. The change in performance due to the revised timing is minimal and within the tolerances of existing power curves.

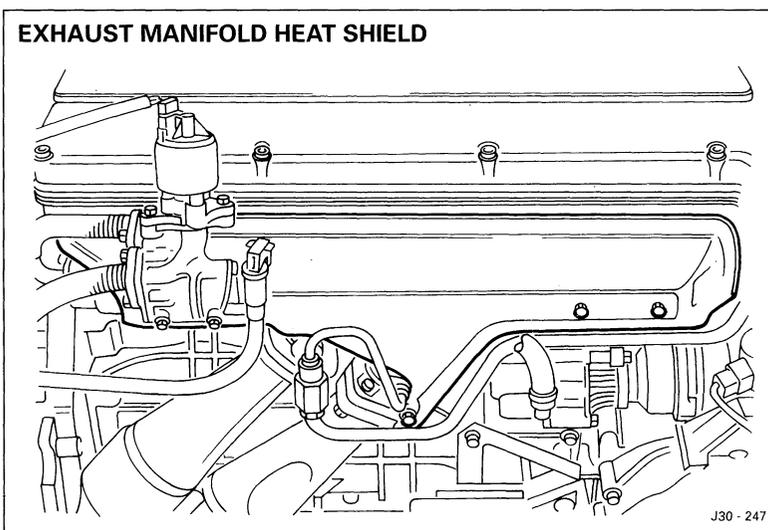
The reduced valve overlap is achieved by the introduction of camshafts with re-positioned timing gauge slots. The new camshafts retard inlet valve opening and advance exhaust valve opening by 4 degrees each. Introduction of the new camshafts began in May 1995 and they are now build standard for all Sedan and XJS normally aspirated AJ16 engines.

If required, the valve overlap of earlier 4.0 liter normally aspirated AJ16 engines can be reduced to 14 degrees using their existing camshafts (for details see Technical Bulletin 03.1-04 for Sedan, or JD 38-95 for XJS).



Exhaust Manifold Heat Shield

The heat shield now has an aluminum finish, instead of chromed, to match the other engine covers. A profile change at the rear of the heat shield accommodates the exhaust gas recirculation valve on XJR Sedans.

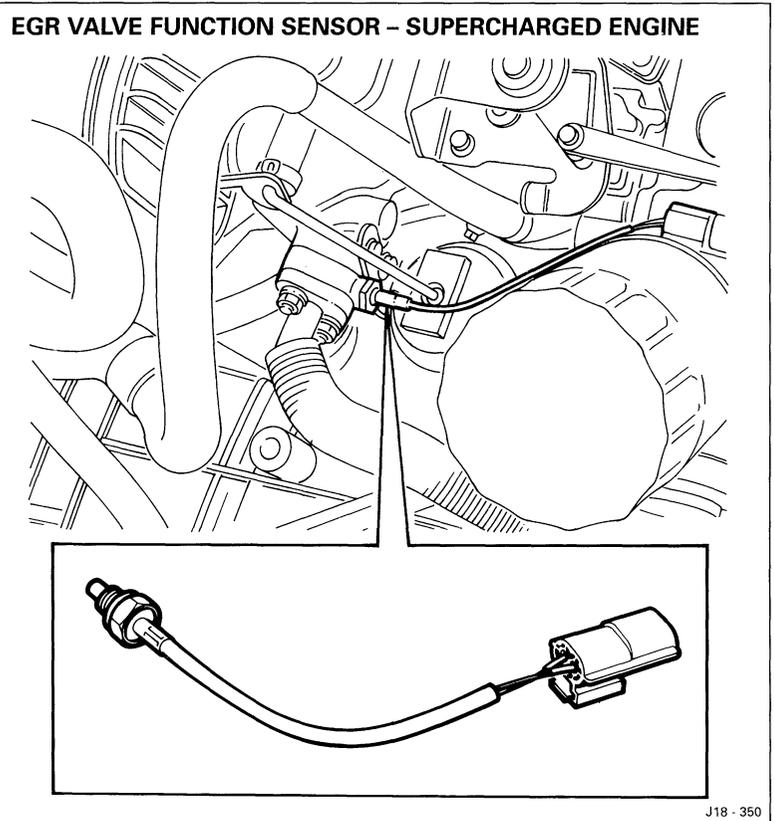
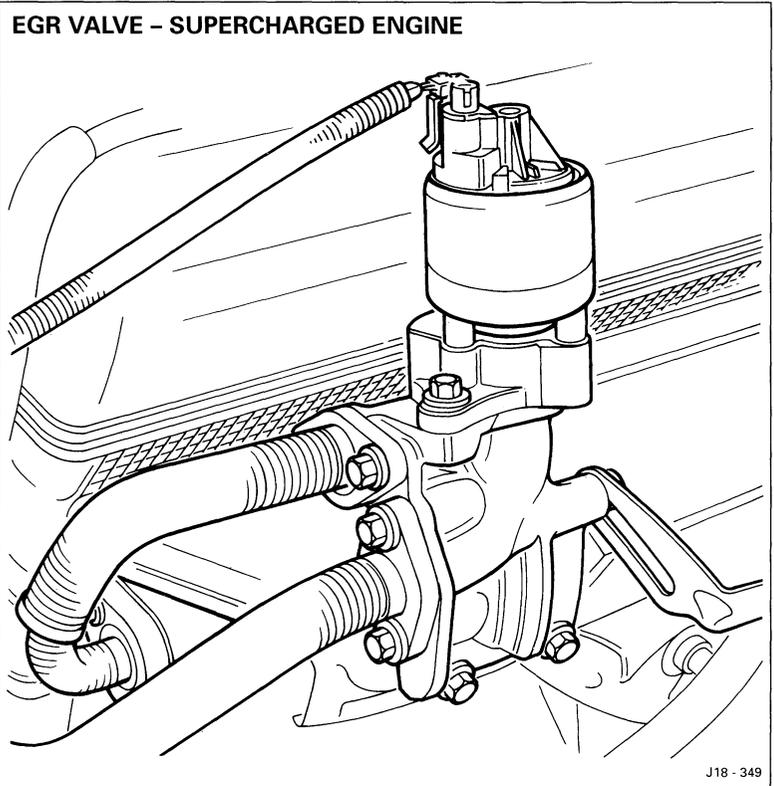


Exhaust Gas Recirculation (EGR) System

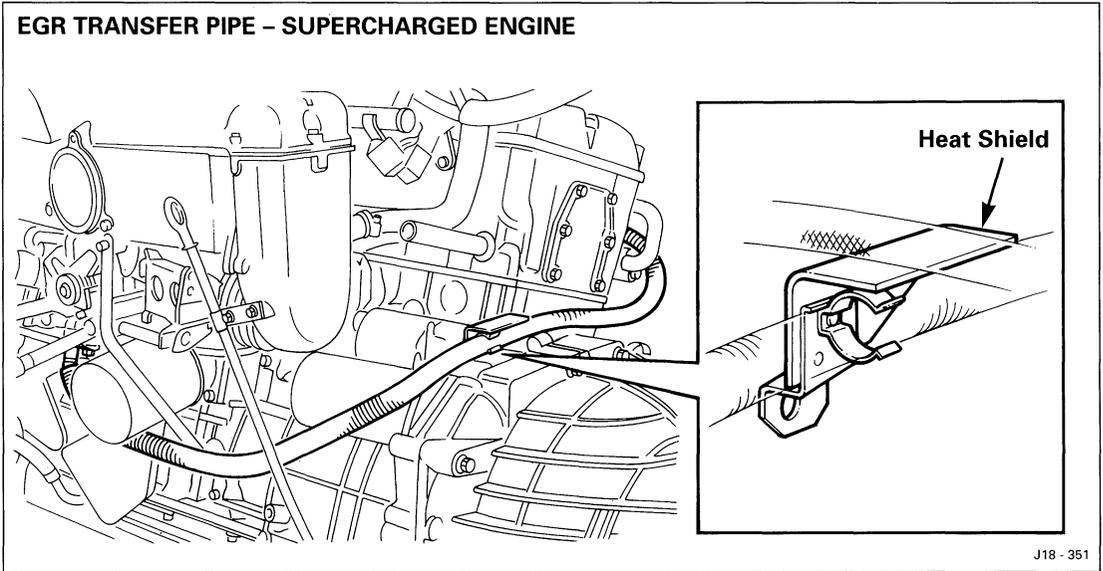
EGR is introduced on the supercharged engine of XJR Sedans. The system is essentially the same as on the normally aspirated AJ16, but with revised installation.

The EGR valve is located on a casting attached to the exhaust manifold. Also, the EGR valve function sensor and the transfer pipe outlet are connected to an adapter block on the throttle body adapter.

To protect the starter motor cable, a heat shield is installed on the upper mounting stud of the starter motor. In addition, a protective sleeve is installed on the starter motor cable between the starter motor and the first cable clip on the transmission housing. The transfer pipe is secured in a clip on the heat shield.

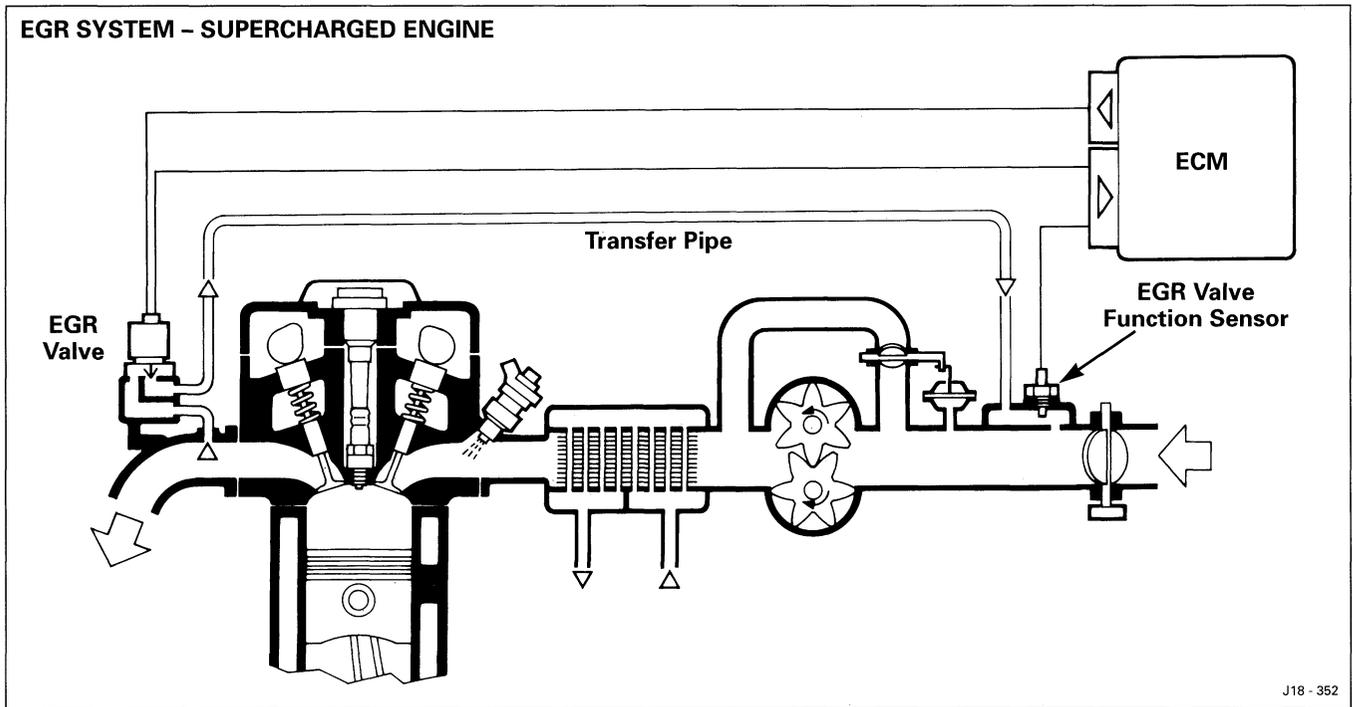


EGR TRANSFER PIPE - SUPERCHARGED ENGINE



J18 - 351

EGR SYSTEM - SUPERCHARGED ENGINE



J18 - 352

Transmission - Mechanical

Filler Tube

On XJR Sedans, a new transmission fluid filler tube is introduced to accommodate the installation of the EGR valve. A slotted bracket secures the top of the tube to the forward side of the EGR valve mounting, enabling the tube to be repositioned for checking and replenishing the transmission fluid.

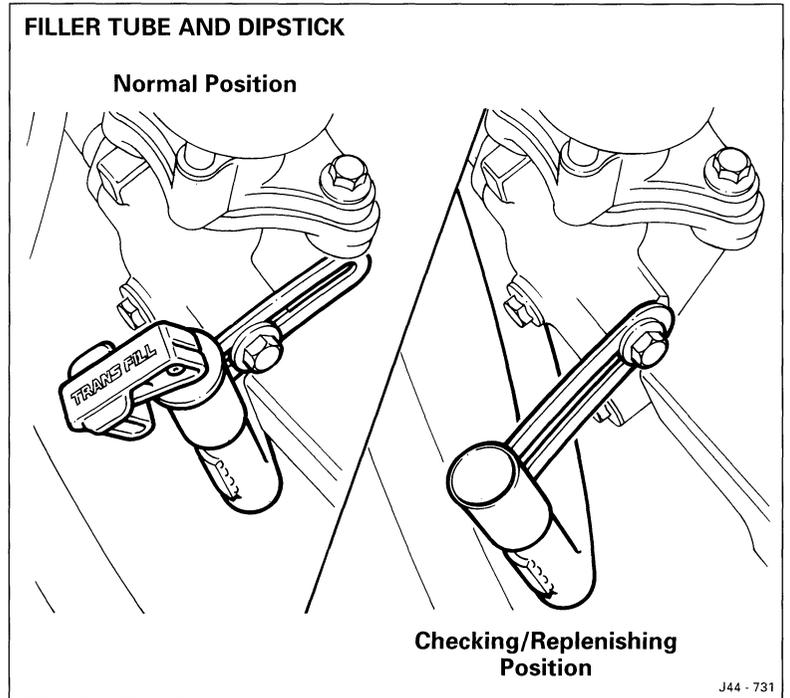
WARNING:

TAKE CARE TO PREVENT TRANSMISSION FLUID BEING SPILLED. WHEN CHECKING OR REPLENISHING THE TRANSMISSION FLUID, THE FILLER TUBE MUST BE REPOSITIONED AS SHOWN TO AVOID SPILLAGE OF TRANSMISSION FLUID ONTO THE EXHAUST AND HEAT SHIELDING.

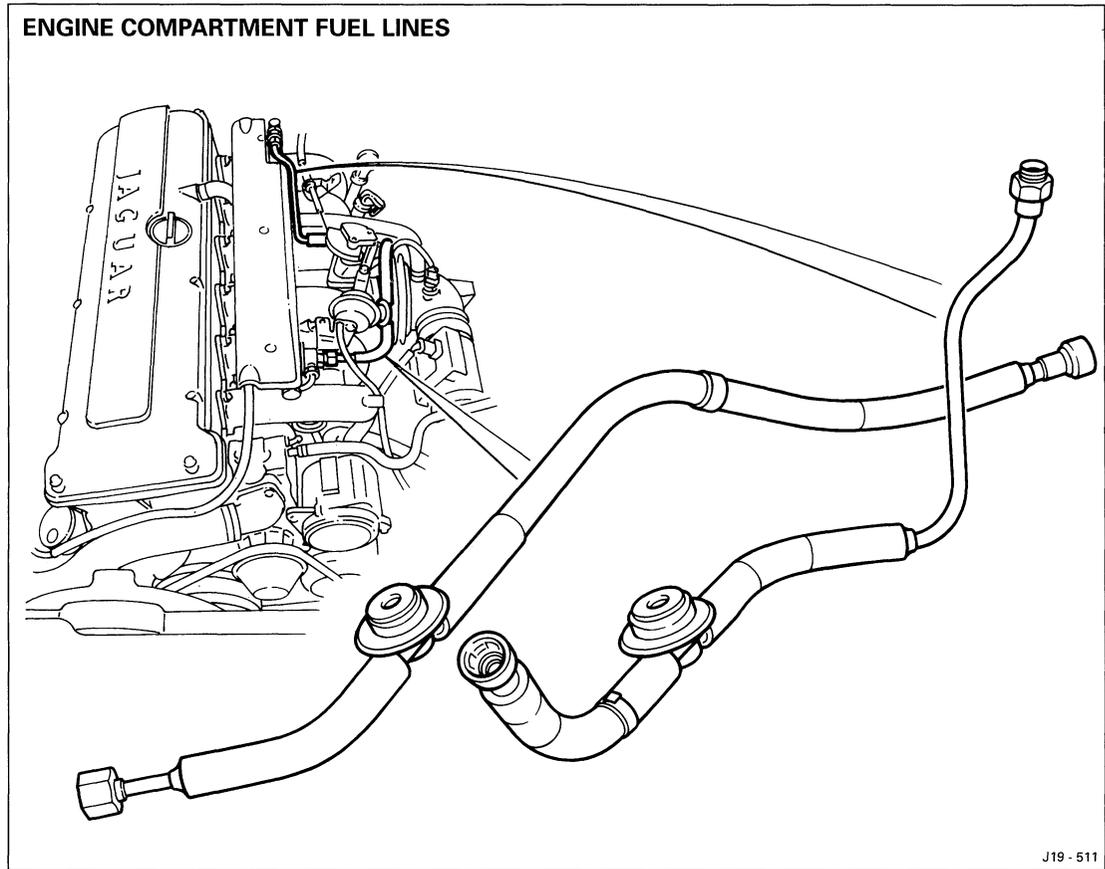
After checking/replenishing the transmission fluid, the tube must be returned to the normal position and the securing bolt tightened to 15.5 to 20.5 N.m (138 to 181 lbf.in).

Dipstick

A longer dipstick is introduced to match the increased length of the new filler tube. The fluid level markings on the dipstick are unchanged.



Fuel Delivery System



On USA XJ6 Sedans with the twin canister evaporative loss control system (see Page 9), revised fuel lines are introduced in the engine compartment.

The fuel lines are changed to P-CAP tubing to reduce evaporative losses through the fuel line walls. A fire resistant rubber sleeve is installed over the P-CAP. Pulse dampers are introduced to both the supply and return fuel lines. The pulse dampers absorb the pressure pulses produced by fuel injector operation, to prevent knocking sounds in the semi-rigid fuel lines.

Evaporative Loss Control System

Evaporative Loss Flange

On all Sedan models, a steel evaporative loss flange replaces the previous plastic design. A new roll-over valve and fuel pump electrical connector are installed in grommets on the new flange. The flange locking ring is unchanged, but a revised flange to tank sealing arrangement means the two types of flange are not interchangeable.

Twin Canister System

In the USA, to comply with evaporative emissions and On-board Diagnostics legislation, a number of XJ6 Sedans (constituting 20% of annual Sedan sales) have a twin canister evaporative loss control system. The twin canister system provides further reductions in evaporative emissions and enables the Engine Control Module (ECM) to test for leaks equivalent to a hole of 1mm (0.040in) diameter minimum. Differences from the single canister system are detailed below:

Vapor Pipes

The flexible vapor pipes are changed to P-CAP to reduce losses through the pipe walls. Viton rubber hoses and hose clamps provide the in-line and component connections.

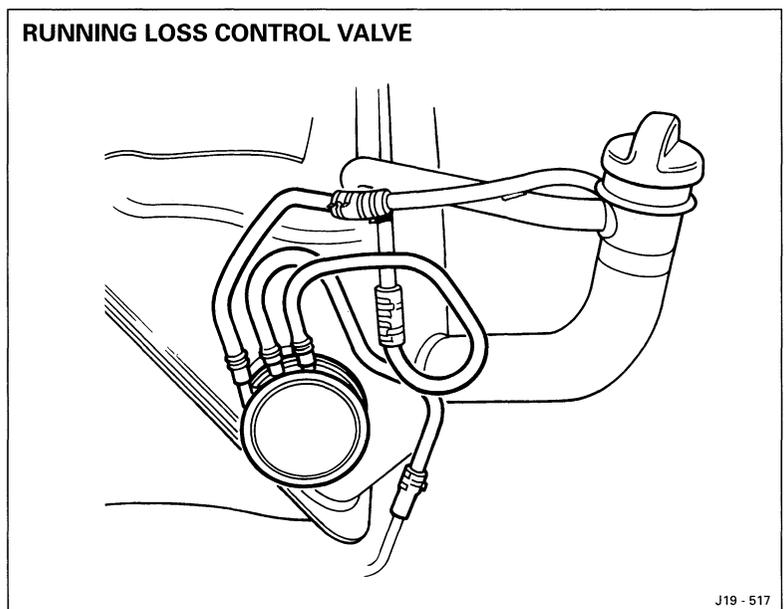
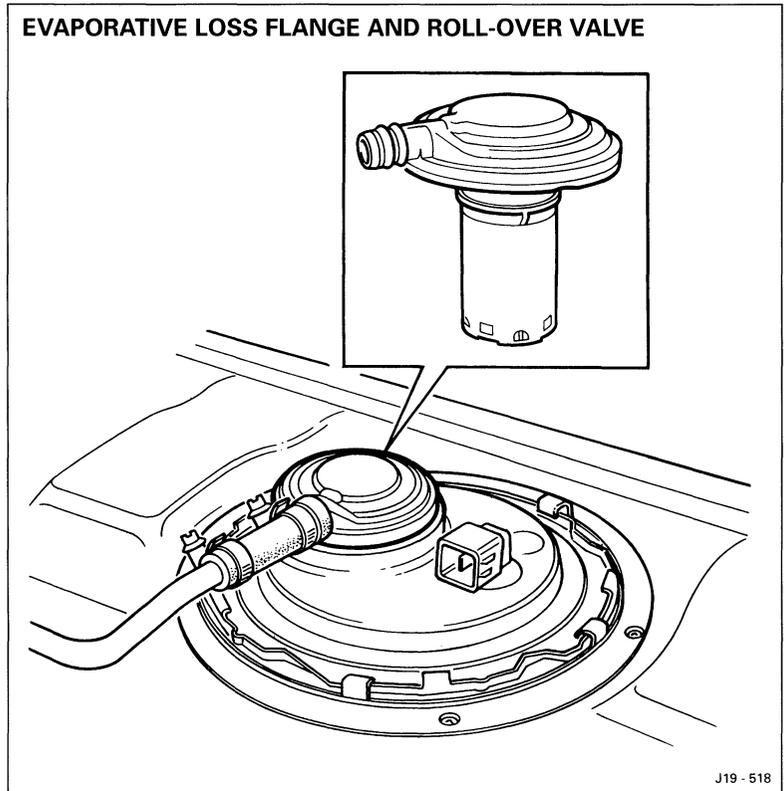
Carbon Canister

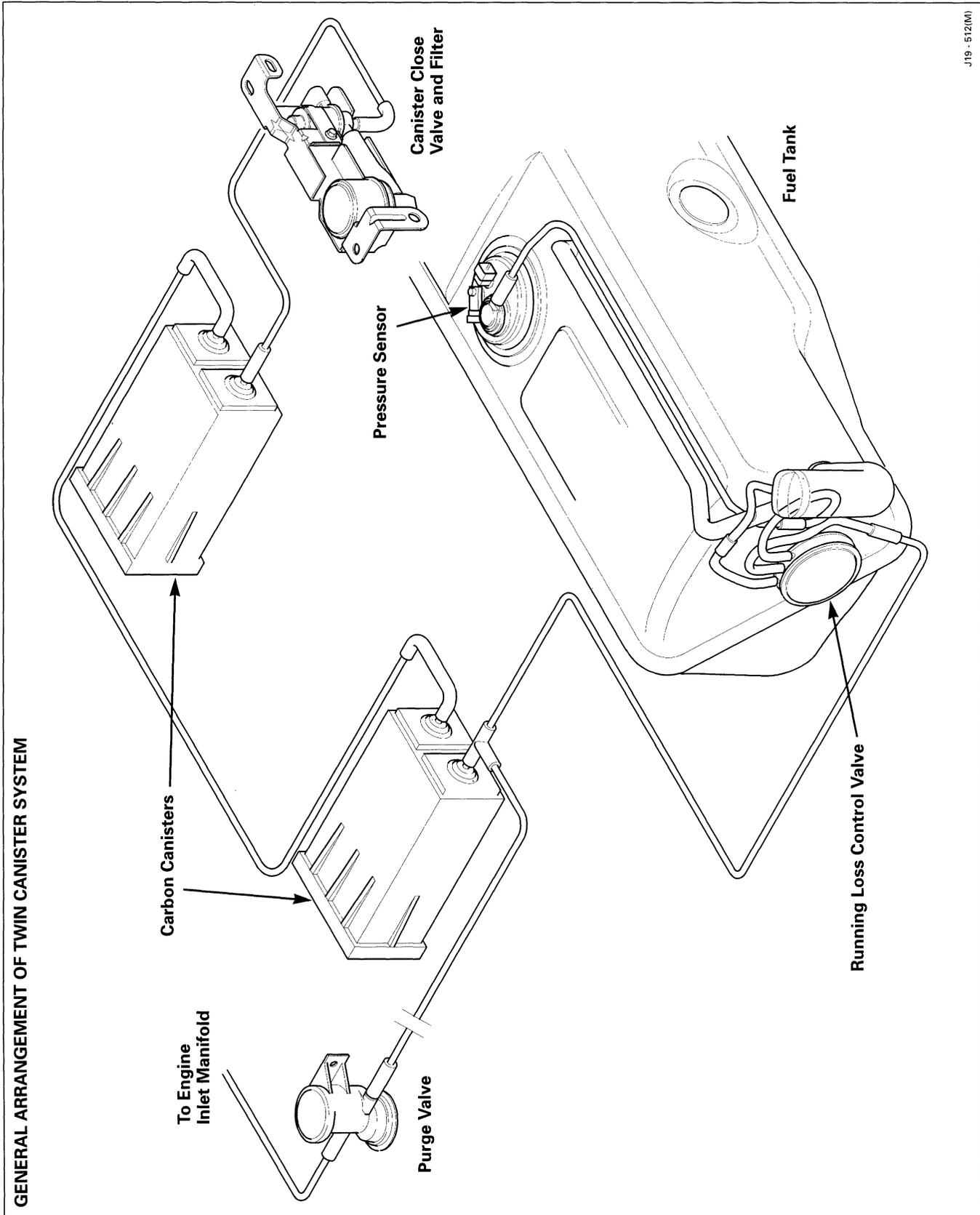
A second carbon canister is added to reduce the concentration of fuel in the vapor that vents to atmosphere. It is installed under the right rear seat pan and connected in series with the first canister.

Running Loss Control Valve

A normally open, running loss control valve replaces the vacuum/pressure relief valve (Rochester valve). The running loss control valve permits free venting of the tank, but prevents fuel entering the vent line during refueling.

During refueling, the incoming fuel creates a pressure differential between the tank interior and the filler neck. On sensing the pressure differential the valve closes, shutting-off the vent line.





J19 - 512(M)

Fuel Tank Pressure Sensor

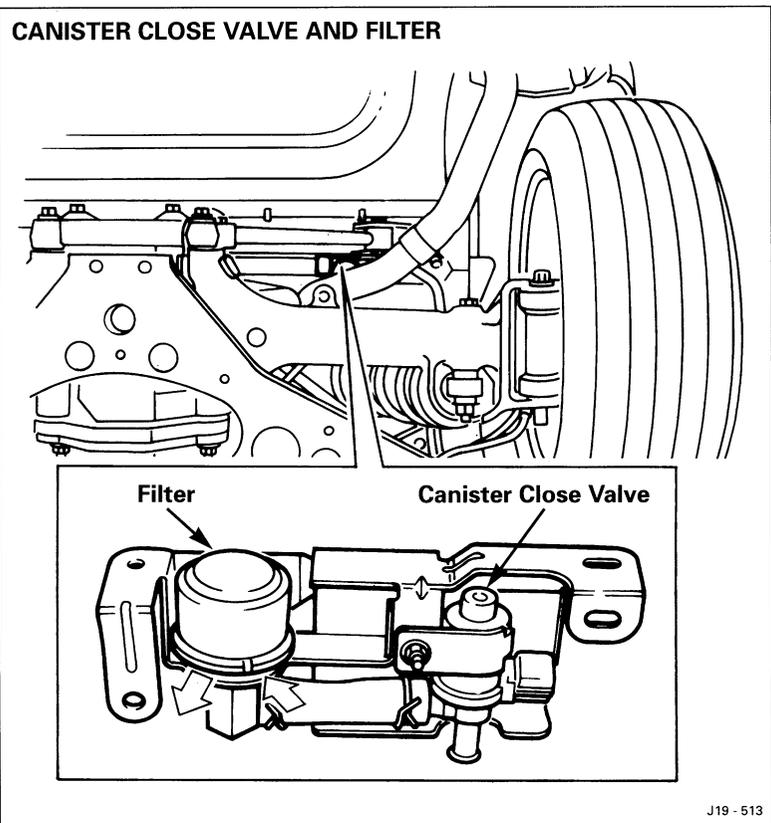
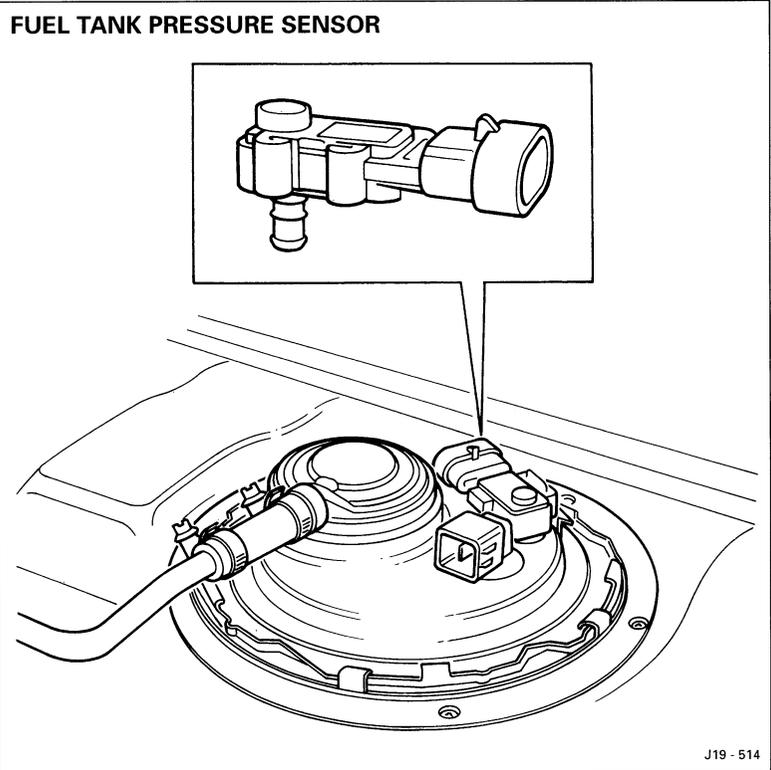
A fuel tank pressure sensor is installed in a rubber grommet in the evaporative loss flange. The sensor provides a vapor pressure signal to the ECM.

Canister Close Valve and Filter

A canister close valve and filter assembly is installed on a bracket attached to the underside of the vehicle, above the right axle shaft.

The canister close valve is a normally open solenoid valve connected to the atmospheric side of the second carbon canister. Operation of the valve is controlled by the ECM.

A hose connects the atmospheric side of the canister close valve to the filter. The filter, a non-service item, prevents contamination of the valve during inward venting.



Twin Canister System Leak Test

The ECM runs a diagnostic leak test once every engine start/stop cycle, provided the following conditions occur:

- from "cold", the engine has warmed up to within the normal running temperature range
- a period of time (currently 15 minutes but subject to change) has elapsed since ignition ON
- the fuel vapor concentration in the evaporative loss system is not excessive
- the car is stationary with the engine at idle RPM after a driving cycle which included a minimum of approximately 5 minutes at a steady speed
- the fuel tank is between 10 and 90 % full.

During the test, the ECM checks that the required fuel tank pressure changes occur in response to the opening and closing of the purge valve and the canister close valve. It also monitors the canister close valve and the fuel tank pressure sensor for circuit continuity and correct signals.

Test Sequence

When the required conditions occur, the ECM begins the test by ensuring that the purge valve

is closed. A few seconds later the canister close valve is also closed, causing system vapor pressure to increase. This condition is maintained for approximately 5 seconds, after which the ECM begins to progressively open the purge valve. System vapor pressure then begins to decrease, due to the depression in the intake manifold. At approximately 2.5 kPa (0.36 lbf/in²) below ambient pressure, the ECM closes the purge valve. Approximately 5 seconds later, the ECM opens the canister close valve, system pressure returns to ambient and the test is complete.

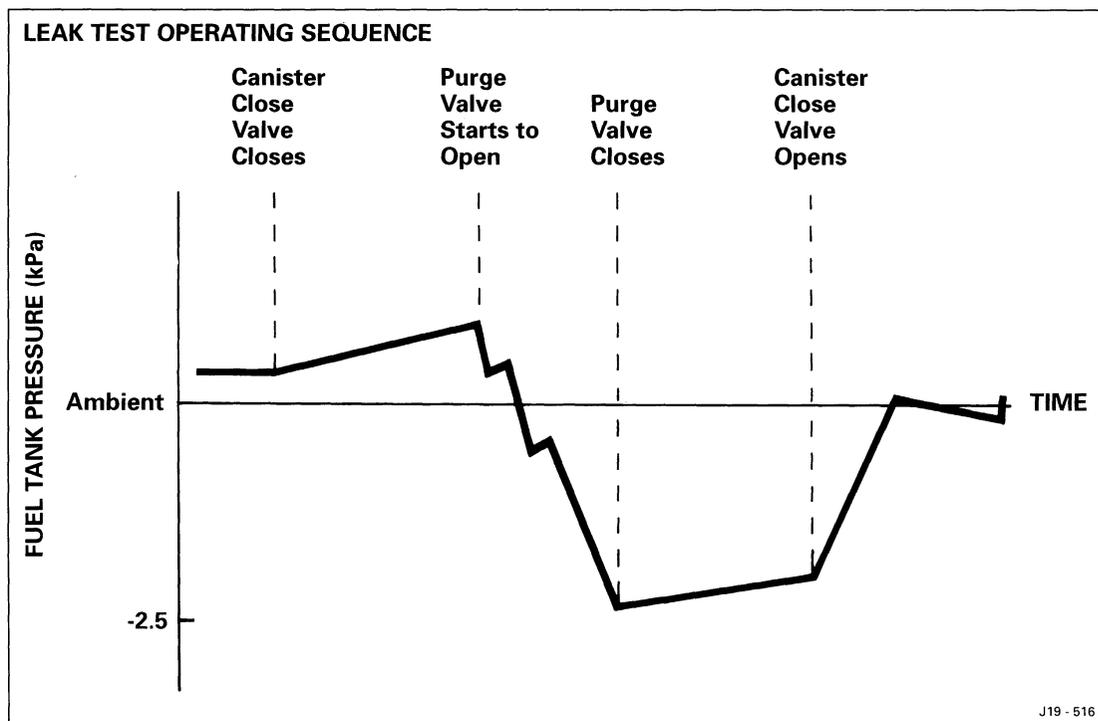
Total test duration is approximately 25 to 30 seconds.

The test is discontinued if any of the following occur:

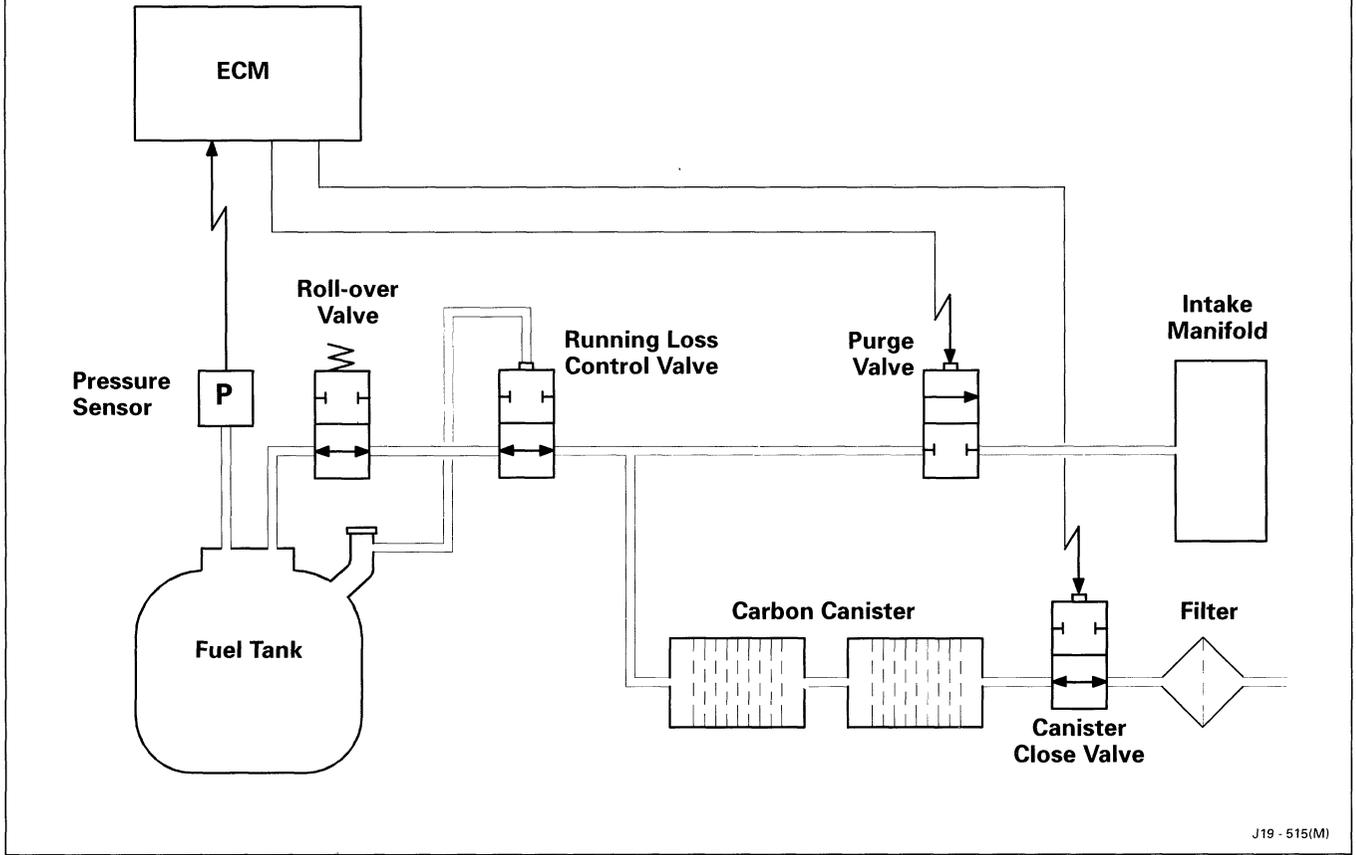
- no pressure decrease after the purge valve is opened
- excessive fuel vapor concentration in the system
- engine speed changes from idle.

Faults

Any faults detected during the test are logged as Diagnostic Trouble Codes (DTC) in the ECM memory (see Diagnostics section for details).



TWIN CANISTER SYSTEM SCHEMATIC



J19 - 515(M)

Catalytic Converters

4.0 liter normally aspirated Sedan and XJS models now have down-pipe catalytic converters which use palladium as the catalyst material (instead of platinum/rhodium) to give improved emissions performance.

Wiring Harnesses

XJS vehicles have revised harnesses to accommodate the installation of a dealer fit voice activated telephone.

Changes consist of:

- a new connector behind the left side of the fascia for connection to the voice activation switch
- a new two-way multi-lock connector in the center console for connection to the handset base
- two new RF connectors in the trunk, below the battery tray.

Color coded dust caps protect the two RF connectors. The RF connector with the gray dust cap is for the cable from the center console; the RF connector with the black dust cap is for the cable from the telephone antenna.

Seat Belts

XJS vehicles have new seat belts for the front and rear passenger seats.

On convertibles, all of the new belts have a reel that can be set to the emergency locking retractor (ELR) or automatic locking retractor (ALR) mode, as on Sedan models. Pulling the full length of the belt out of the reel engages the ALR mode, allowing the belt to retract fully into the reel returns the belt to the ELR mode.

On coupes the new belt for the front passenger seat also has an ELR/ALR reel. However, the new rear belts retain the standard reel, but have a new insertion tongue with an integral clamping device. Once the lap section of the belt is tightened, the clamping device grips the belt, preventing the lap section from being loosened until the buckle is released. The upper section of the belt can still extend and retract on the reel in the normal manner.

Engine Control Module

On both the Sedan and XJS models, new diagnostic software is incorporated in the engine control module.

AJ16 On-board Diagnostics

The following new Diagnostic Trouble Codes (DTC), already introduced on extended wheelbase Sedans, are introduced on standard wheelbase Sedans and the XJS:

DTC		Explanation
P0111	Intake air temperature rationality	Fixed sensor output when changing output is expected.
P0121	Throttle position rationality	Throttle position is not consistent with engine speed and airflow.
P0461	Fuel level rationality	Fuel level signal does not fluctuate.
P0560	System voltage malfunction	Battery supply voltage is outside limits.

USA XJ6 Sedans with the twin canister evaporative loss control system (see Fuel System section) also include the following new DTC's:

DTC		Explanation
P0442	System leak	Minor leak detected equivalent to hole of approximately 1 mm in diameter.
P0446	Vent control malfunction	Electrical fault with canister close valve or drive circuit.
P0451	Fuel tank pressure rationality	Pressure signal within limits but not consistent with purge valve/canister close valve configuration.
P0452	Fuel tank pressure sensor low input	Pressure signal below limits.
P0453	Fuel tank pressure sensor high input	Pressure signal above limits.
P1440	Purge valve stuck open	Unexpected decrease in pressure during leak check.
P1447	Closure valve flow fault	No pressure increase after canister close valve signalled open.
P1448	System 2 fault	Some pressure decrease when purge valve signalled open, no fueling feedback change detected.
P1496	System 1 fault	Pressure decrease after purge valve signalled open, no fueling feedback change detected.

V12 On-board Diagnostics

The following new and revised DTC's are introduced on all V12 Sedans:

DTC		Explanation/Change
P0106	Bank A manifold absolute pressure (MAP) rationality	Revised to include detection of disconnected sensor hose.
P0116	Coolant temperature rationality	Revised to enable faster detection of sensor faults and to include detection of failure to enter closed-loop fueling.
P0441	Bank A purge flow	Revised fuel level inhibit values.
P0461	Fuel level rationality	New. Fuel level signal is not consistent with fuel used.
P0462	Fuel level sensor low input	New. DTC number changed (was P1199).
P0463	Fuel level sensor high input	New. DTC number changed (was P1198).
P1106	Bank B MAP rationality	Revised to include detection of disconnected sensor hose.
P1441	Bank B purge flow	Revised fuel level inhibit values.

