

Introduction to Jaguar

This publication is intended for instructional purposes only. Always refer to the appropriate Jaguar Service publication for specific details and procedures.

 **WARNING: WHILE SERVICING AND TESTING VEHICLES AND VEHICLE SYSTEMS, TAKE ALL NECESSARY SAFETY PRECAUTIONS TO PREVENT THE POSSIBILITY OF BODILY INJURY OR DEATH.**

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Welcome to Jaguar

The Jaguar heritage has its roots in the development of sporting and luxury automobiles in the 1930's. Every exciting new model introduced throughout Jaguar's history has had its own identity and combined elements that made it uniquely Jaguar. These elements combined to enhance the owner's motoring experience and include: traditional craftsmanship, the richness of natural materials – wood and leather, exceptional road holding and ride comfort, spirited performance and the tasteful integration of luxury features.

Today's Jaguars continue these traditions in a line of classic automobiles integrated with a high degree of technical sophistication and advanced technology.

The service training course you are participating in will introduce you to the Jaguar organization and the technical aspects of Jaguar. It will prepare you for advanced systems-based courses.

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Jaguar Service Training

The Jaguar Service Training program is designed above all else to increase customer satisfaction by helping the technician to develop the specialized skills and knowledge required to keep the vehicle operating at its peak performance level.

Professional training is available at four strategically located training centers in North America. Each Jaguar training center is designed to represent an ideal service environment and is equipped to Jaguar dealer standards of appearance, tools and equipment. Members of the full-time instructional staff are "home based" at a particular training center. They also periodically teach at other training centers, allowing for uninterrupted class schedules and personalized attention to students.

Training Center Locations

Canada	8 Indell Lane, Bramalea, Ontario L6T 4H3
California	6 Morgan, Suite 150, Irvine, CA 92718
Georgia	6160 Peachtree Dunwoody Road, Atlanta, GA 30328
New Jersey	555 MacArthur Blvd., Mahwah, NJ 07430

Jaguar Training Courses

Jaguar Service Training Courses are designed to offer the optimum mix of hands-on work with live vehicles and actual components, and the related practical knowledge required to develop a thorough understanding of the vehicle systems. Each course is finely-tuned and concisely presented to provide information and develop new skills that technicians can put to work when they return to their dealerships.

Training courses are constantly being evaluated and updated to reflect the latest technology and answer the needs of the technician and the product. The current roster of courses includes:

INTR	Introduction to Jaguar
100	Engine Repair
200	Automatic Transmissions
450	Chassis, Steering, Brakes and Alignment
600	Electrical System I
650	Electrical Systems II
701	Climate Control Systems
801	AJ6 / AJ16 Engine Management (OBD I / OBD II)
851	V12 Engine Management (OBD I / OBD II)
NP	New Product and Model Year Introduction
PDU	Portable Diagnostic Unit
SP	Specialized Courses

NOTES

Registering for Training

Jaguar Service Training Schedules are published periodically. The schedule shows the classes scheduled at all four Jaguar Training Centers. There are no geographical restrictions for participating in the training program; dealers anywhere in North America may register their staff at any training center depending on space availability. Enrollment is on a first come, first served basis.

To register for training, submit a Request for Enrollment to the attention of the Training Administrator at Jaguar Cars, Mahwah, NJ, via Electronic Mail or U.S. Mail or FAX to 201-818-9781. State the dealer name and number, the name and social security number of the enrollee, and the dates, locations and class titles requested. Jaguar will immediately respond acknowledging receipt of the enrollment information. The dealer will be notified that the enrollment is confirmed or that the class is full. If the class is full, the dealer will be offered a choice of alternate dates, alternate locations, or the opportunity to be placed on a waiting list for the originally requested class.

Jaguar Owners

Jaguar cars appeal to a distinctive group of people: independent, highly successful individuals who have achieved a substantial measure of professional and personal accomplishment. They appreciate the refined elegance and performance of the product and expect competent professional service and courteous personal treatment. Jaguar owners expect perfection in their cars and in service from their Jaguar dealer.

Jaguar Owner Demographics

	Sedan Range	XJS Range
Male	59%	63%
Female	41%	37%
Married	89%	78%
Average Age	57	51
Average Income	\$220,000	\$221,000
College Graduate	66%	71%

NOTES

The Jaguar Organization

Jaguar Cars, headquartered in Mahwah, NJ, is responsible for sales, marketing, service, parts and providing feedback to the parent company, Jaguar Cars Ltd., located in Coventry, England.

Jaguar has established a highly successful and responsive network of service and technical support to assist its dealers and to gather information for the constant refinement of the product. The fourteen District Service Managers (DSMs) (US) are located where they can best serve their assigned dealers. They are the person-to-person link between the dealership Service Department and Jaguar. A group of Technical Service Representatives are on call to assist dealer Service Departments through the Jaguar Technical Hotline or in person if necessary. Product Analysts in Mahwah, each responsible for specific vehicle systems, are in daily personal contact with their counterparts in the engineering groups at Jaguar in England. A similar organization exists to support the Jaguar dealers in Canada.

Much of Jaguar's product improvement is the direct result of dealership Service Department feedback to Jaguar Cars. This vital "real world" information is evaluated and immediately communicated to England for action. The Jaguar technician plays an important role in the success of Jaguar.

Service Reports

Jaguar uses standardized technical information reporting to most effectively manage and evaluate dealer Service Department feedback. Three reports are key to this process: the Product Quality Report, the OBD II Report and the PDU Quality Report.

NOTES

Product Quality Report S-94

The Product Quality Report S-94 goes directly to the Product Analyst at Jaguar cars who is responsible for the vehicle system involved. This priority report is the fastest way to let Jaguar know about product or repair problems.

	PRODUCT QUALITY REPORT	S-94
---	------------------------	------

Date _____ Originator's name _____ Dealer No. _____

VIN # (last 6 digits only)	MODEL	MILEAGE	REPAIR DATE	REPEAT REPAIR?	
_ _ _ _ _ _				YES	NO
_ _ _ _ _ _				YES	NO
_ _ _ _ _ _				YES	NO

Customer Complaint / Symptoms (please be specific) _____

Recorded System Trouble Codes (*ECM, *TCM, ABS, Air Conditioning, Security System, Memory Seats, etc.):
 *Attach copy of Diagnostic Trouble Code Form S-93.

Technician Diagnosis (please be specific) _____

Technician Repair (please be specific) _____

Was the repair successful? (Check the appropriate box) Yes No Not sure

JAGUAR PRODUCT INVESTIGATION USE ONLY	
Title _____	Date _____
Comments _____	WF Code _____
_____	TS Code _____
_____	SAR # _____
_____	PQR # _____

FAX a copy of this completed form to: (201) 818-9763. Retain the YELLOW copy in the dealer file.

Mail the completed WHITE copy to:
 Jaguar Cars Product Investigation
 555 MacArthur Boulevard
 Mahwah, New Jersey 07430 - 2327

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NOTES

PDU Quality Report S-87

Jaguar PDU (Portable Diagnostic Unit) is a multipurpose software-driven service and diagnostic tool that is invaluable to the technician. In order to continuously improve the value of PDU to the technician, concerns or problems relating to PDU should be reported to Jaguar on the PDU Quality Report S-87.

	<h2 style="margin: 0;">PDU QUALITY REPORT</h2>	S-87
<p>IMPORTANT: PLEASE PRINT OR TYPE ALL INFORMATION DATE _____</p>		
<p>DEALER INFORMATION</p> <p>DEALER NAME _____</p> <p>DEALER NUMBER _____</p> <p>ORIGINATOR (NAME) _____</p>	<p>PDU INFORMATION</p> <p>PDU SERIAL NUMBER _____</p> <p>SOFTWARE RELEASE NUMBER _____</p> <p>AREA OF CONCERN: _____ HARDWARE _____ SOFTWARE</p> <p> <input type="checkbox"/> ENGINE MANAGEMENT <input type="checkbox"/> BODY SYSTEMS <input type="checkbox"/> TRANSMISSION <input type="checkbox"/> DATALOGGER <input type="checkbox"/> CLIMATE CONTROL <input type="checkbox"/> DIAGNOSTIC CODES <input type="checkbox"/> ANTI-LOCK BRAKING <input type="checkbox"/> DMM (DIGITAL MULTIMETER) <input type="checkbox"/> SEAT / MIRROR MEMORY <input type="checkbox"/> OTHER </p>	<p>VEHICLE INFORMATION</p> <p>MODEL CODE _____</p> <p>VIN _____</p>
<p>DESCRIBE VEHICLE SERVICE AND/OR TEST OPERATION</p> <p>_____</p> <p>_____</p> <p>_____</p>		
<p>DESCRIBE PDU CONCERN</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>		
<p>PLEASE FORWARD COMPLETED FORM TO: JAGUAR CARS INC. EQUIPMENT AND LITERATURE DEPARTMENT 555 MACARTHUR BLVD. MAHWAH, NEW JERSEY 07430-2327</p>		
<p>WHITE COPY: JCI YELLOW COPY: JCI PINK COPY: ORIGINATOR FILE</p>		
<p>INTR /1.03</p>		

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Jaguar Service Literature

Jaguar offers a comprehensive Service Literature System for dealer and technician reference.

Service Manuals

Jaguar Service Manuals covering specific vehicle Ranges and model years are indexed by vehicle system. The Service Manuals contain repair instructions with their corresponding Repair Operation Numbers (RONs), special tools, vehicle and tightening torque specifications, important safety considerations and general information. Jaguar manufactures vehicles for sale in more than 140 countries. Because of different legislative requirements and market conditions, there are differences in vehicle specifications for the various countries. Vehicles for the US and Canada are manufactured to North American Specification (NAS). NAS vehicles are sometimes referred to as Federal specification vehicles.

Service Manuals are published for the world market, therefore some systems, instructions and specifications may not apply to North American Specification (NAS) vehicles.

Special Service Publications

Special Service publications are developed to meet specific technician needs. Special publications are categorized as follows:

Focus Books

Focus books contain specialized information about the operation, diagnosis and repair of specific vehicle systems.

Technical Guides / Update Books

These publications provide new model information and descriptions of new systems. The books are published for each model year in which there are significant technical changes.

Electrical Guides

Electrical Guides are published for each vehicle and model year as necessary. The guides contain complete vehicle wiring schematics, control module pin-out data and detailed information for the location and identification of the various components.

NOTES

Service Bulletins

Service bulletins are published and distributed to update the Jaguar dealer organization with the latest service information. A quantity of bulletins, specified by the dealer, is mailed directly to the dealer service manager. Jaguar suggests that every technician be given copies of service bulletins.

Service Bulletins are categorized as Administration Bulletins and Technical Bulletins. Technical bulletins contain the latest service information, updates to specifications and repair procedures, special repair procedures and other information that is directly related to the technical job of diagnosing and repairing the vehicle. Administration Bulletins cover nontechnical service matters such as changes and updates to service programs, tool and literature information, training information and general workshop administrative issues.

Service Bulletins are organized in their respective binders by subject matter. Bulletins within each subject group are sequentially numbered so that they can be easily filed and any missing bulletins will be easily identified. In the example shown below, the bulletin number is 1-58. Administration Bulletin Group 1 is for TOOLS AND EQUIPMENT. The 58th Administration Bulletin issued in Group 1 was a list of Service Publications available from Jaguar.

TYPICAL ADMINISTRATION BULLETIN HEADING

 JAGUAR	All	Date 3/95	No. 1-58
SERVICE	ADMINISTRATION BULLETIN		
Service Publication Availability		Model:	
		VIN:	

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Administration Bulletins

Group	Subject
1	Tools and Equipment
2	Training
3	Warranty
4	Maintenance and PDI Schedules
5	Repair Operation Times
6	Workshop Administration
7	Recall Campaigns

Jaguar Service Literature (continued)

Service Bulletins (continued)

Technical Bulletins

Technical bulletins are organized in two separate binders for ease of access. One binder contains Technical Bulletins that apply to all XJS vehicles and to Sedan Range vehicles through the 1994 Model Year. The group numbering system is based on the Service Manual numerical index for those vehicles. The second binder contains Service Bulletins that refer to 1995 MY and later Sedan Range vehicles. The group numbering system follows the numerical index for 1995 MY ON Service Manuals.

In the first part of each year Jaguar publishes a book containing all Technical Bulletins issued for the previous year. This allows the technician to maintain only the current year's bulletins in the binder while still having the previous years' bulletins for easy reference.

TYPICAL TECHNICAL BULLETIN HEADING			
 JAGUAR	Sedan Range	Date 3/95	No. 14-01
SERVICE	TECHNICAL BULLETIN		
Heater Valve – Knocking Noise During Climate Control Operation – Repair Procedure			Model: Sedan (4.0L) Range VIN: 720001 -739750

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Technical Bulletins: XJS Range ALL; Sedan Range through 1994 MY

Group	Subject
04	General
12	Engine
18	Engine Management
19	Fuel System, EFI, Cruise Control
26	Cooling System
30	Manifolds, Exhaust System
44	Automatic Transmission
47	Propeller and Drive Shafts
51	Rear Axle, Final Drive
57	Steering
60	Front Suspension
64	Rear Suspension
66	Hydraulics
70	Brakes
76	Body
82	Air Conditioning (Climate Control)
84	Windshield Wipers/Washers
86	Electrical, Radio
88	Instruments
JDS	Jaguar Diagnostic System
PDU	Portable Diagnostic Unit

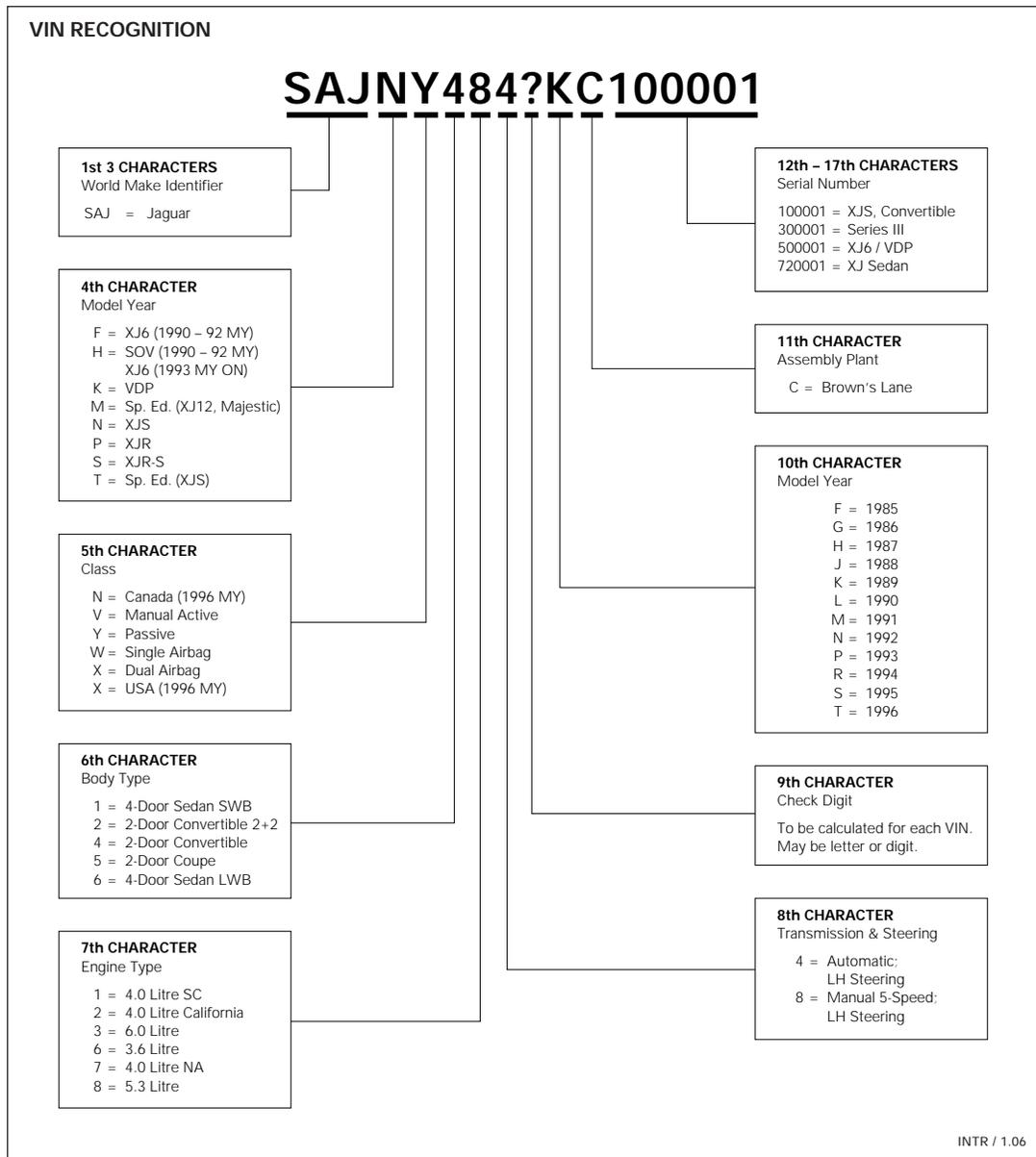
Technical Bulletins: Sedan Range 1995 MY ON

Group	Subject
1	General Information
2	Jacking, Lifting & Vehicle Recovery
3.1	Engine (AJ16)
3.2	Engine (V12)
4.1	Cooling System (AJ16)
4.2	Cooling System (V12)
5.1	Fuel, Emission Control & Engine Management (AJ16)
5.2	Fuel, Emission Control & Engine Management (V12)
6.1	Exhaust System (AJ16)
6.2	Exhaust System (V12)
7.1	Manual Transmission & Clutch (AJ16)
8.1	Automatic Transmission (AJ16)
8.2	Automatic Transmission (V12 & AJ16 Supercharged)
9	Drive Shafts & Final Drive
10	Steering
11	Suspension Systems
12	Brakes
13	Body Components & Trim
14	Climate Control Systems
15	Electrical

Vehicle and Component Identification

Vehicle Identification

All motor vehicles are identified with a 17-character Vehicle Identification Number (VIN). The VIN identifies the vehicle manufacturer, model, equipment, model year, and other important information about that vehicle. Each character in the VIN has a unique meaning. The last 6 digits of the VIN are the vehicle serial number. Jaguar uses these last 6 digits of the VIN (the serial number) in technical publications to identify vehicle application.

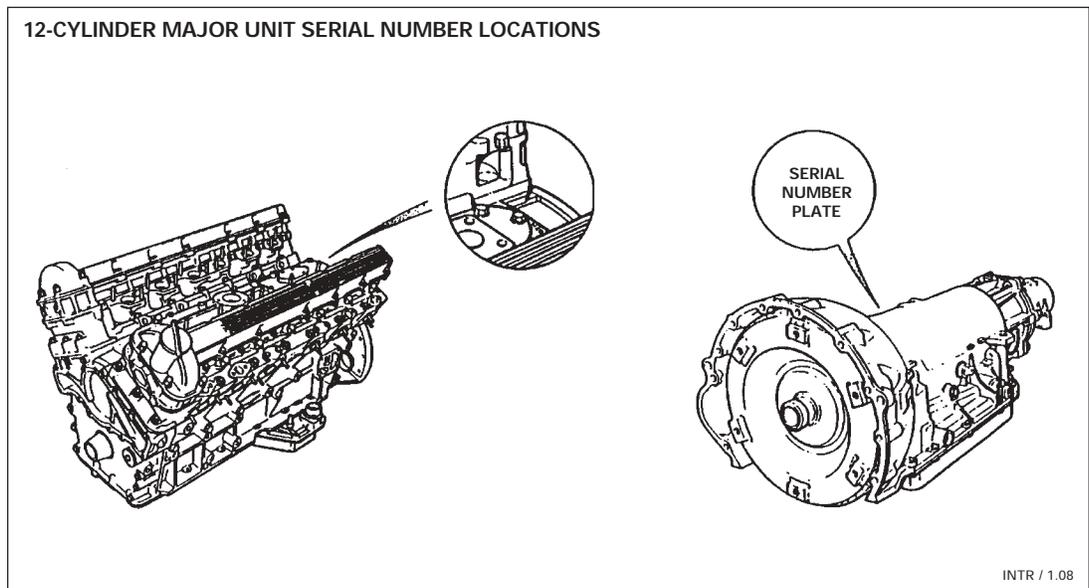
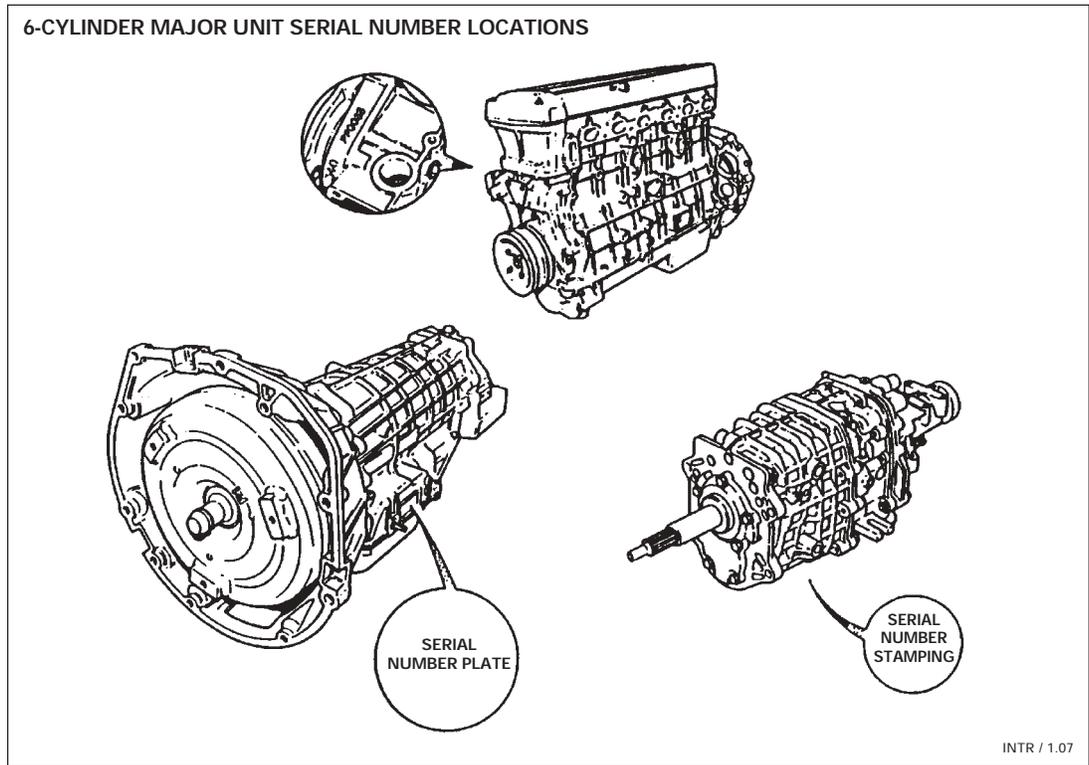


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Vehicle and Component Identification (continued)

Component Identification

All major components of the vehicle also have serial numbers. The locations of component serial numbers can be found in the microfiche parts information.



NOTES

Jaguar Warranties

Jaguar offers comprehensive warranties for the vehicles it sells in North America. Warranties for vehicles originally specified and built for the U.S. market are issued by Jaguar Cars, the sole authorized U.S. importer of Jaguar vehicles. Warranties for vehicles originally specified and built for the Canadian market are issued by Jaguar Canada Inc., the sole authorized Canadian importer of Jaguar vehicles.

Warranty Summary

For additional warranty information or questions on coverage, refer to the Importer's warranty documentation or contact your warranty department.

Warranty Type	Model Years	Coverage
New Vehicle Limited Warranty – U.S.		
New vehicles	1986 – 91	3 years / 36,000 miles
Demonstrator and company vehicles	1986 – 91	3 years / 36,000 miles (if vehicle is held 6 months or less before retail sale) For every month beyond 6 months, coverage is reduced by one month (mileage limitation remains 36,000 miles).
New vehicles	1992 – 94	4 years / 50,000 miles (1 year / 12,500 miles — wear parts and service adjustments)
Demonstrator and company vehicles	1992 – 94	4 years / 50,000 miles (if vehicle is held 6 months or less before retail sale) For every month beyond 6 months, coverage is reduced by one month (mileage limitation remains 50,000 miles [12,500 miles — wear parts and service adjustments]).
New vehicles	1995 ON	4 years / 50,000 miles (12 months / 12,500 miles — wear parts and service adjustments; battery — 2 years, prorated thereafter.)
Demonstrator and company vehicles	1995 ON	4 years / 50,000 miles (if vehicle is held 4 months or less before retail sale) For every month beyond 4 months, coverage is reduced by one month (mileage limitation remains 50,000 miles [12,500 miles — wear parts and service adjustments]).
New Vehicle Limited Warranty – CANADA		
New vehicles and demonstrators	1985	2 years / 60,000 km
	1986 – 91	3 years / 60,000 km
	1992 ON	4 years / 80,000 km
D.A.P. demonstrators and company vehicles	All	Full new vehicle limited warranty if held 6 months or less before retail sale. For every month beyond 6 months, coverage is reduced by one month. (mileage [km] limitation remains unchanged)
Emissions Design and Defect Warranty – U.S.		
Federal vehicles	1980 – 94	5 years / 50,000 miles
Federal vehicles	1995 ON	4 years / 50,000 miles (catalytic converters and electronic emission control unit: 8 years / 80,000 miles)
California vehicles	1980 – 89	5 years / 50,000 miles
California vehicles	1995 ON	Short-term: 3 years / 50,000 miles Long-term: 7 years / 70,000 miles

Jaguar Warranties (continued)

Warranty Summary (continued)

Warranty Type	Model Years	Coverage
Emissions Performance Warranty – U.S.		
Federal vehicles	1980 – 91	2 years / 24,000 miles
Federal vehicles	1992 – 94	5 years / 50,000 miles
Federal vehicles	1995 ON	2 years / 24,000 miles
California vehicles	1985 – 89	2 years / 24,000 miles
California vehicles	1990 ON	3 years / 50,000 miles
Emission System Warranty – CANADA		
All vehicles	1985 ON	5 years / 80,000 km
Corrosion Protection Limited Warranty – U.S.		
All vehicles	1983 ON	6 years / unlimited mileage
Corrosion and Perforation Warranty – CANADA		
Rust perforation protection	1985 – 88 1989 ON	5 years / unlimited mileage (km) 6 years / unlimited mileage (km)
Corrosion protection to painted surfaces	1986 – 91 1992 ON	3 years / 60,000 km 4 years / 80,000 km
Parts Limited Warranty – CANADA and U.S.		
	N / A	Material and labor: 1 year / unlimited mileage (km) (If installed by a Jaguar dealer)
Accessories Limited Warranties – CANADA and U.S.		
	N / A	Varies, refer to the Importer's warranty documentation (If installed by a Jaguar dealer)
Reacquired Vehicle Warranty – U.S.		
	N / A	1 year / 12,000 miles (1 year / unlimited mileage for vehicles resold in California)
Motorized Automatic Diagonal Seat Belts Limited Lifetime Warranty – U.S.		
Sedan Range vehicles	1989 – 92	For the life of the vehicle
XJS Range vehicles	1988 – 89	For the life of the vehicle
Select Edition Used Car Warranty – U.S.		
Qualified vehicles only	1992 ON	Refer to the Warranty Policies and Procedures Manual – U.S.
Select Series Used Car Warranty – CANADA		
Qualified vehicles only	1992 ON	Refer to the Warranty Policies and Procedures Manual – CANADA

NOTES

JDS / PDU

Jaguar Diagnostic System (JDS)

JDS is a computer-based, software-driven diagnostic tool for 1988 MY and later vehicles. JDS aids the technician in finding faults and verifying vehicle system operation. JDS allows the technician to "look into" the vehicle system and guides logical diagnosis of complex problems.

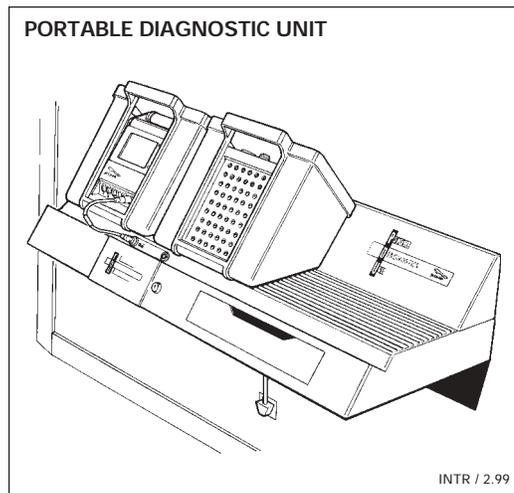
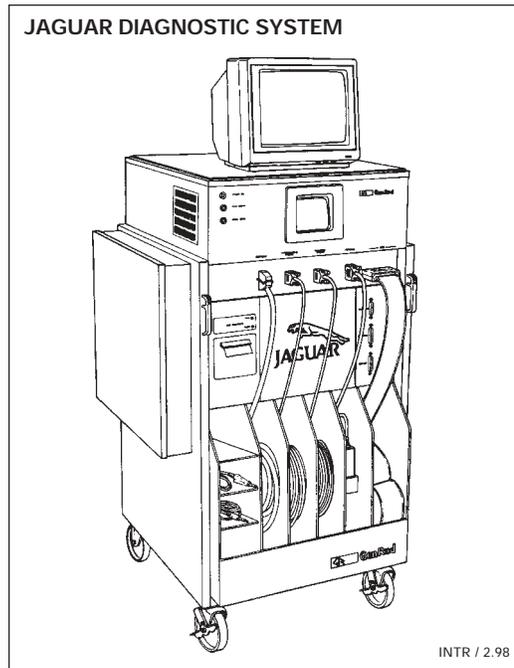
JDS can also print out a "trace", which documents the diagnosis procedure. A trace print-out is required for warranty claims that include JDS diagnostic time.

Portable Diagnostic Unit (PDU)

The Jaguar PDU, introduced in 1993, is the second generation computer-based, software-driven diagnostic tool. PDU communicates with vehicle systems through a single, serial communications diagnostic connector. The systems supported through serial communications on current vehicles include engine management, transmission, security, instrumentation, braking, climate control and air bag supplementary restraints. Systems not supported through serial communications are supported through directed diagnostics using PDU as a multimeter.

PDU's expanded capabilities, small size and portability have proven a valuable resource in the hands of trained technicians.

As with all diagnostic aids, both JDS and PDU require training, understanding and knowledge of the vehicle system being tested to maximize their effectiveness.



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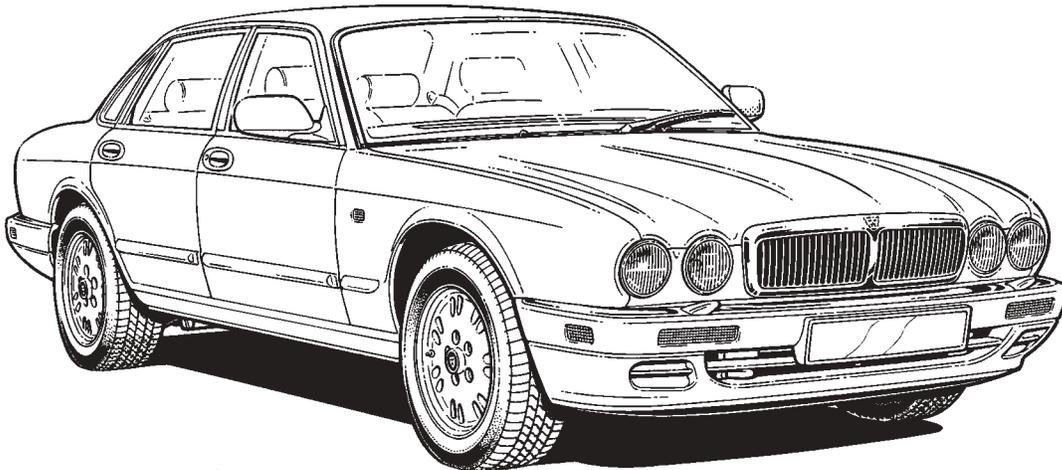
Body

Sedan Range vehicles were built on a common body through the 1995 MY. For the 1996 MY, the Vanden Plas and XJ12 will be offered on a long wheel base body. Trim levels, equipment and engine transmission packages define the individual models within the Range. Model offerings and specifications vary by model year. The Jaguar Sedan Range for the 1995 model year consists of four models: XJ6, Vanden Plas, XJR and XJ12. For the 1996 MY, XJS and XJR will be standard wheel base vehicles while Vanden Plas and XJ12 will be long wheel base vehicles.

The overriding priority in the design of the Jaguar Sedan Range body is quality. In addition to high quality, six major objectives govern body design:

- It should be aerodynamically efficient, but the styling should remain unmistakably Jaguar.
- It should provide more interior space while maintaining exterior dimensions similar to previous Jaguars.
- It should be light and easy to manufacture, with the highest quality of panel fit and accuracy.
- Its structural integrity and quietness should continue to develop the Jaguar tradition.
- Its quality of paint finish should be outstanding.
- It should offer the utmost in corrosion protection.

1995 JAGUAR XJ6 SEDAN



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Engine and Transmission Packages

Jaguar has chosen its engine and transmission designs carefully to provide the ultimate in refined performance, smoothness and effortless driving. The Sedan Range uses the following engine / transmission pairings:

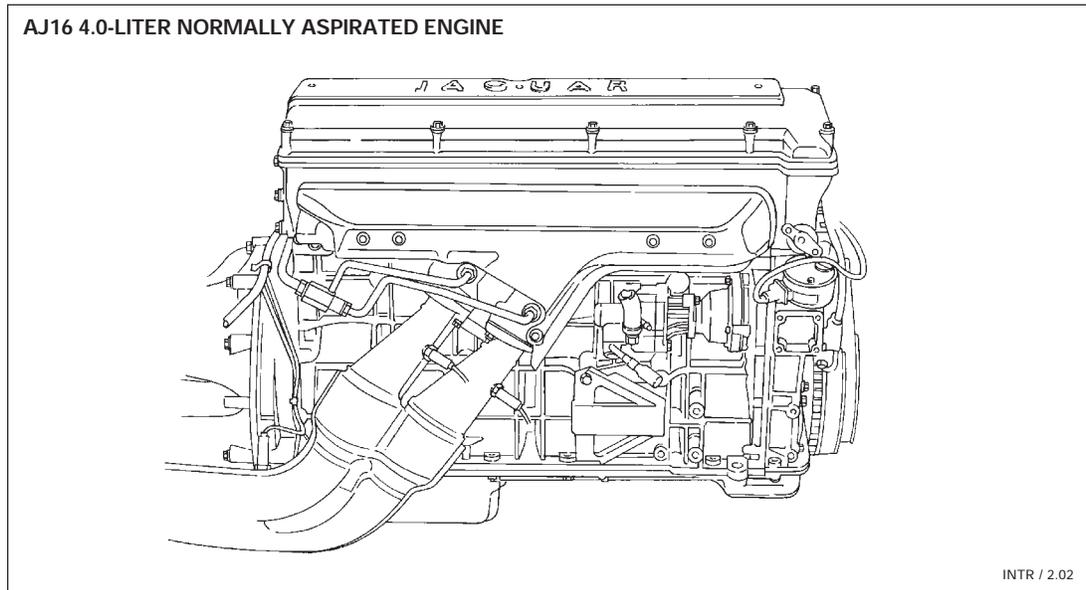
Engine	Transmission	Model
AJ16 (4.0L) NA	ZF 4HP 24 E9	XJ6, XJ6 Vanden Plas: 1995 MY ON
AJ16 (4.0L) SC	Powertrain (Hydra-Matic) 4L80-E	XJR Sedan
AJ6 (4.0L)	ZF 4HP 24 E9	XJ6, Sovereign, Vanden Plas, Majestic (1990 – 1994 MY)
V12 (6.0L)	Powertrain (Hydra-Matic) 4L80-E	XJ12

NOTES

AJ16 NA Engine / Transmission

AJ16 4.0-Liter Normally Aspirated (NA) Engine

The AJ16 4.0L NA engine combines high performance with exceptional flexibility and refinement. The classic 6-cylinder in-line layout delivers smooth high torque power due to the natural balancing of its inertial forces.



Configuration	Six cylinder, in-line
Valve gear	Two overhead camshafts, four valves per cylinder
Bore and stroke	91 x 102 mm (3.558 x 4.02 in)
Displacement	3980 cc (234 cu in)
Compression ratio	10 : 1
Maximum power (DIN)	245 hp @ 4700 rpm
Maximum torque (DIN)	289 lb ft @ 4000 rpm
Maximum engine speed	5500 rpm

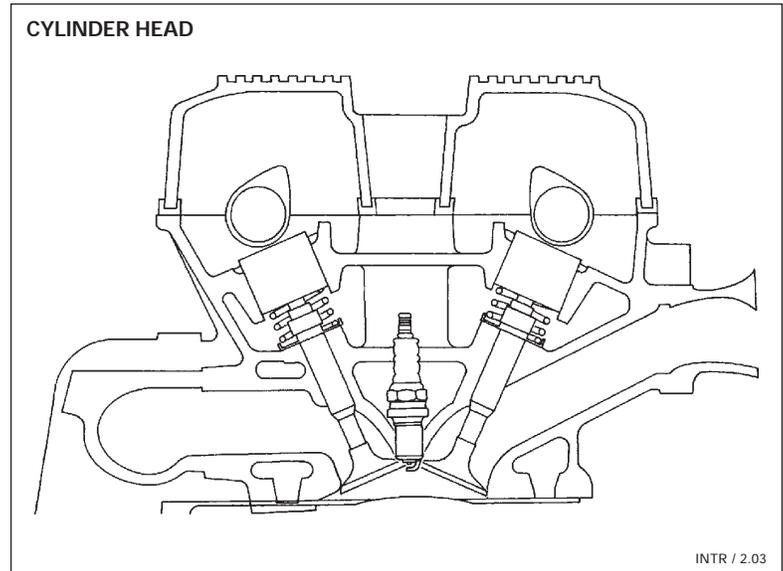
NOTES

Cylinder Head

The pent-roof combustion chamber is both efficient and practical. The cross-flow design allows for a very large valve opening area and free flowing intake tracts. The centrally located spark plug allows a short flame travel within the combustion chamber for good burning.

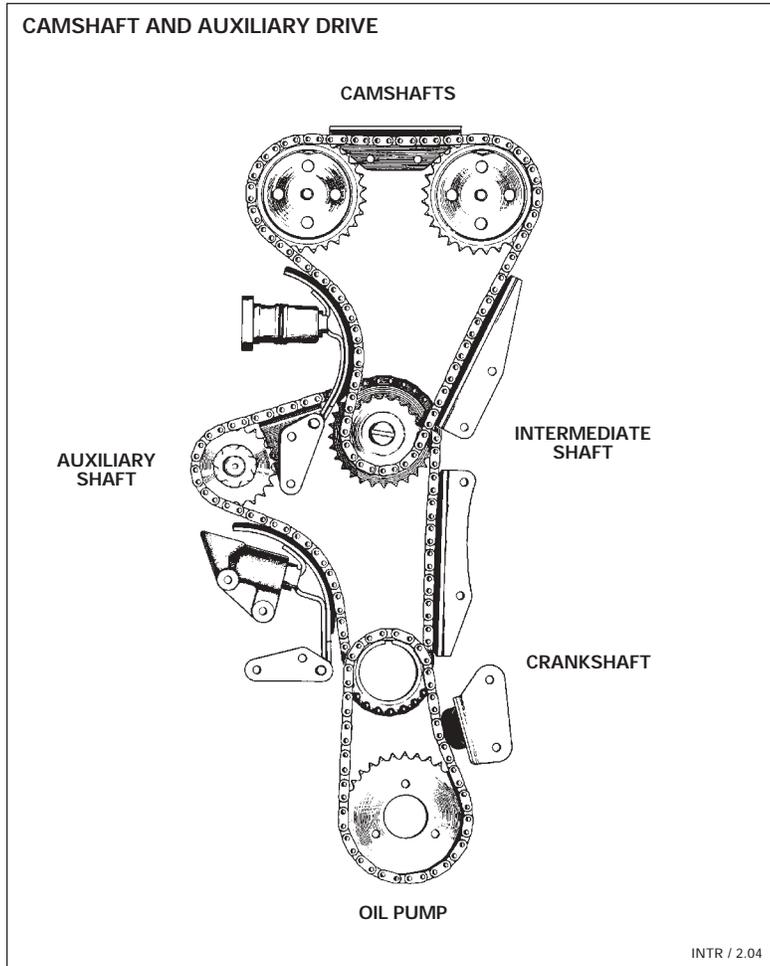
Four Valves per Cylinder

Four valves per cylinder produce a greater combined area than two per cylinder. In addition, the smaller diameter of the valves increases the velocity of the air flow. Power and efficiency are increased due to improved cylinder filling at all engine speeds.

**NOTES**

AJ16 NA Engine / Transmission (continued)

AJ16 4.0-Liter Normally Aspirated (NA) Engine (continued)

**Two Camshafts**

The two iron camshafts run directly in the cylinder head. Each camshaft drives two valves per cylinder via bucket shaped valve lifters (tappets) with shim valve adjustment. Single springs control the valves.

Camshaft and Accessory Drive

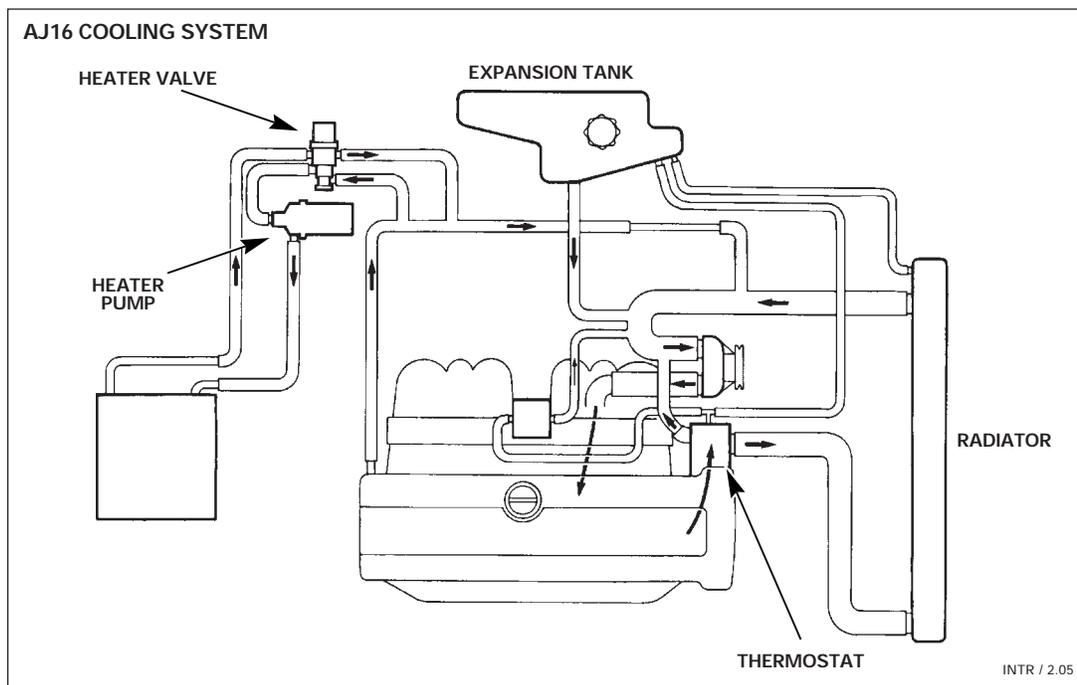
A two stage "duplex" (double row) chain drive from the crankshaft operates the camshafts, intermediate shaft and the auxiliary shaft. The auxiliary shaft provides the drive for the camshaft position sensor and the power steering pump. The second stage three-point drive operates between the intermediate shaft and the two camshafts. A "simplex" (single row) chain drives the oil pump.

NOTES

Cooling System

The cooling system consists of the following components:

- Cross-flow radiator
- Belt-driven water pump
- Thermostat and housing
- Coolant expansion tank
- Viscous coupled, belt-driven fan
- Electric fan
- Electrically driven heater circulation pump and heater control valve

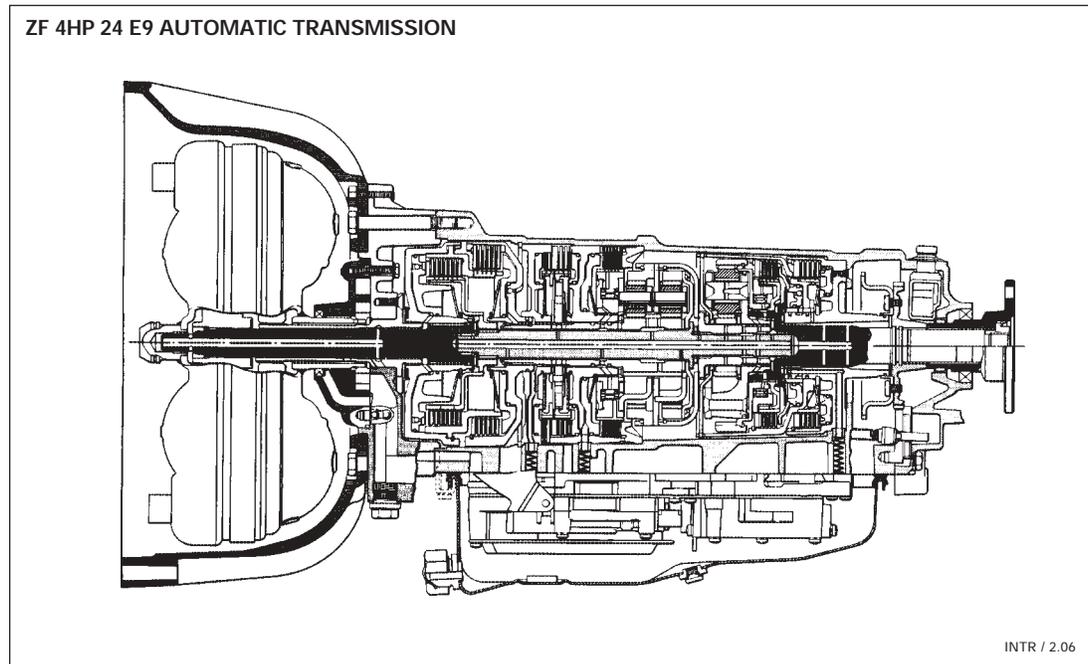


NOTES

AJ16 NA Engine / Transmission (continued)

ZF 4HP 24 E9 Automatic Transmission

The ZF electronically controlled four-speed overdrive automatic transmission utilizes a transmission control module (TCM) to control shift points. The TCM also controls the torque converter clutch (lockup clutch) and release and apply line pressure. Inputs from sensors and switches provide engine, transmission and vehicle operating information to the TCM. The TCM determines the exact moment to control transmission functions resulting in precise and consistent shift quality.



Lubricating fluid	Dexron II "D"
Approx. capacity from dry	10.75 qt. (10.2 liters)
Drain and refill	4.5 qt. (4.2 liters)

Normal and Sport Modes

The performance control switch on the "J" gate surround allows the driver to select one of two preprogrammed transmission control strategies, NORMAL or SPORT mode.

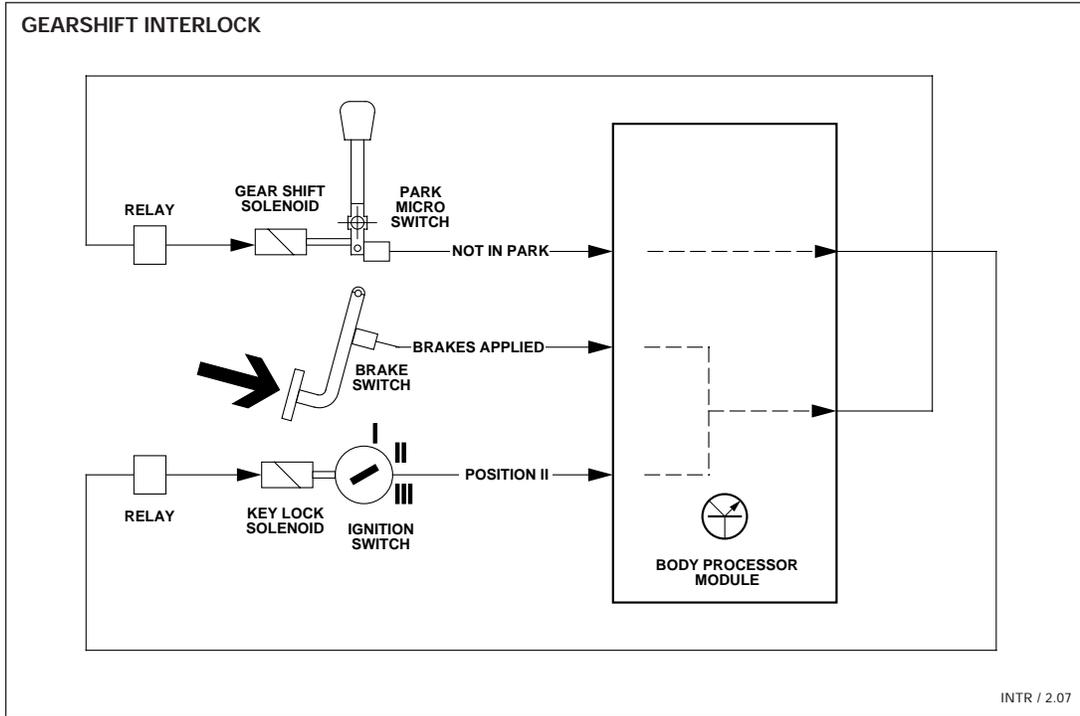
NORMAL mode The transmission shift points and kick down speeds are optimized for everyday driving.

SPORT mode This strategy makes the transmission more sensitive to changes in throttle position. Kickdown occurs more readily and at higher engine speeds. During acceleration, gears are held longer. Part throttle downshifts to first gear are possible.

NOTES

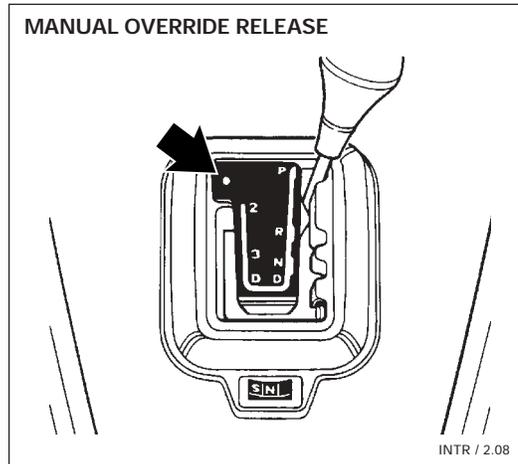
Gearshift Interlock

The gearshift interlock locks the gear selector in the PARK position unless the ignition switch is in position II (ignition) and the brake is applied. The interlock system also inhibits removal of the ignition key unless the gear selector is in PARK.



A gearshift interlock override is provided in the gear selector "J" gate. Remove the plastic screw at the left front side of the selector lever to access the release.

NOTES



AJ16 SC Engine / Transmission

AJ16 4.0-Liter Supercharged (SC) Engine

The AJ16 4.0L SC engine is fitted to the XJR Sedan. This high performance engine utilizes a belt driven positive displacement supercharger to increase manifold pressure to a maximum of 10.2 psi (0.7 bar) above atmospheric pressure at 2700 engine rpm. The AJ16 supercharged engine is similar in design to the normally aspirated version. Differences include the block, which has cast mounting bosses for the supercharger, the manifold, lower compression ratio pistons and the camshafts.

AJ16 4.0-LITER SUPERCHARGED ENGINE

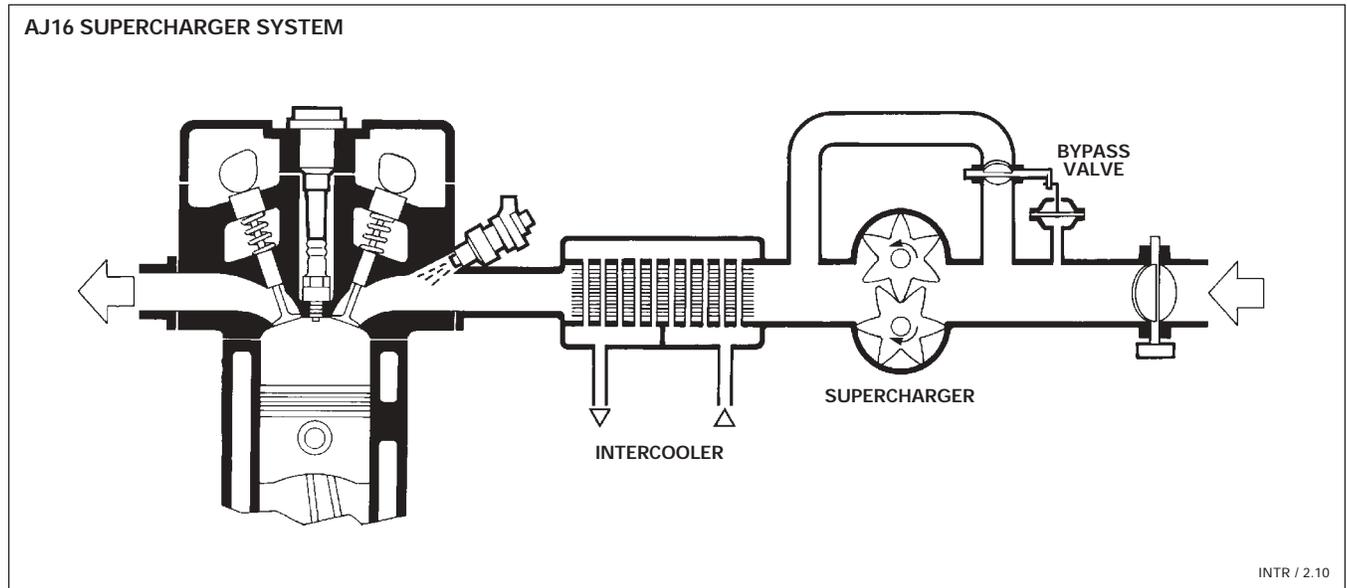
INTR / 2.09

Configuration	Six cylinder, in-line
Valve gear	Two overhead camshafts, four valves per cylinder
Bore and stroke	91 x 102 mm (3.558 x 4.02 in)
Displacement	3980 cc (234 cu in)
Supercharger boost	10.2 psi @ 2750 rpm
Compression ratio	8.5 : 1
Maximum power (DIN)	322 hp @ 5000 rpm
Maximum torque (DIN)	378 lb ft @ 3050 rpm
Maximum engine speed	5500 rpm

NOTES

Supercharger System

An air to liquid intercooler controls intake air temperature. The intercooler uses a separate cooling system with an electrically driven coolant pump, but shares engine coolant through a bleed.



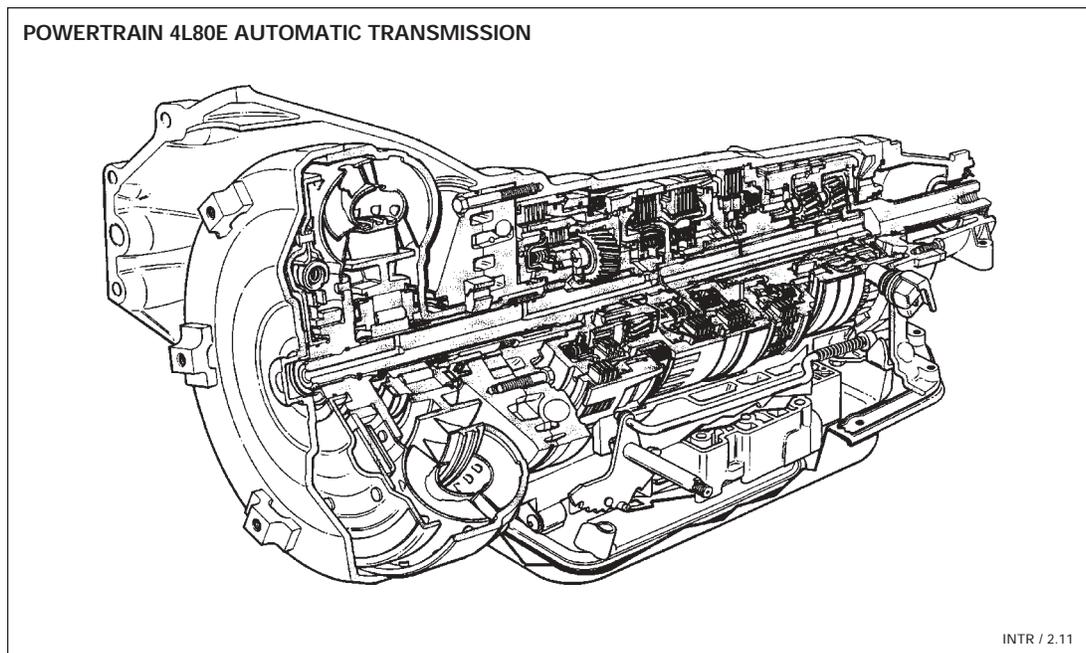
NOTES

AJ16 SC Engine / Transmission (continued)

Powertrain (Hydra-Matic) 4L80-E Automatic Transmission

The Powertrain transmission is packaged with the AJ16 4.0L SC engine to accommodate the increased torque characteristics of the supercharged engine.

The 4L80-E is an electronically controlled four-speed automatic transmission. It utilizes a transmission control module (TCM) to control shift points. Sensors and switches provide engine, transmission and vehicle operating information to the TCM. The TCM also controls the torque converter clutch (lockup clutch) and release and apply line pressure. Inputs from sensors and switches provide engine, transmission and vehicle operating information to the TCM. The TCM determines the exact moment to control transmission functions resulting in precise and consistent shift quality.



Lubricating fluid	Dexron II "E"
Approx. capacity from dry	13.5 qt. (12.8 liters)
Drain and refill	7.7 qt. (7.3 liters)

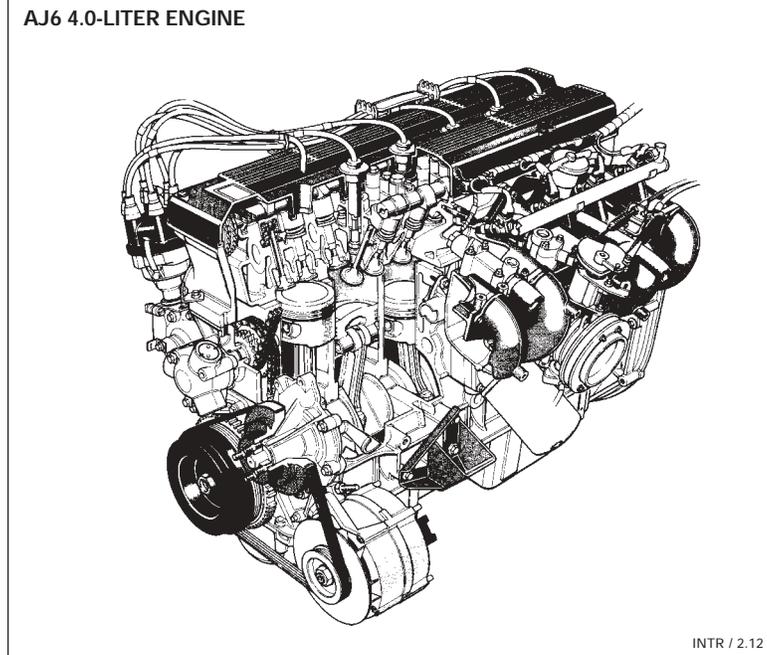
The 4L80-E transmission shares the gearshift interlock system and NORMAL and SPORT mode selection features of the ZF 4HP 24 E9 equipped vehicles. Refer to pages 8 – 9.

NOTES

AJ6 Engine / Transmission

AJ6 4.0-Liter Engine

The AJ6 4.0-liter engine was introduced in the 1990 model year. Earlier versions were of 3.6-liter displacement. The AJ6 series of engines is similar in design concept to the AJ16 engine. They are both light alloy double overhead camshaft engines with four valves per cylinder. Although most engine repair procedures are the same for AJ6 and AJ16 engines, components are not interchangeable.



Configuration	Six cylinder, in-line
Valve gear	Two overhead camshafts, four valves per cylinder
Bore and Stroke	91 x 102 mm (3.558 x 4.02 in)
Displacement	3980 cc (234 cu in)
Compression ratio	9.5 : 1
Maximum power (DIN)	219 hp @ 4750 rpm
Maximum torque (DIN)	273 lb ft @ 3650 rpm
Maximum engine speed	5500 rpm

ZF 4HP 24 E9 Automatic Transmission

Model year variations to this proven design include NORMAL, SPORT and DELETE FIRST modes.

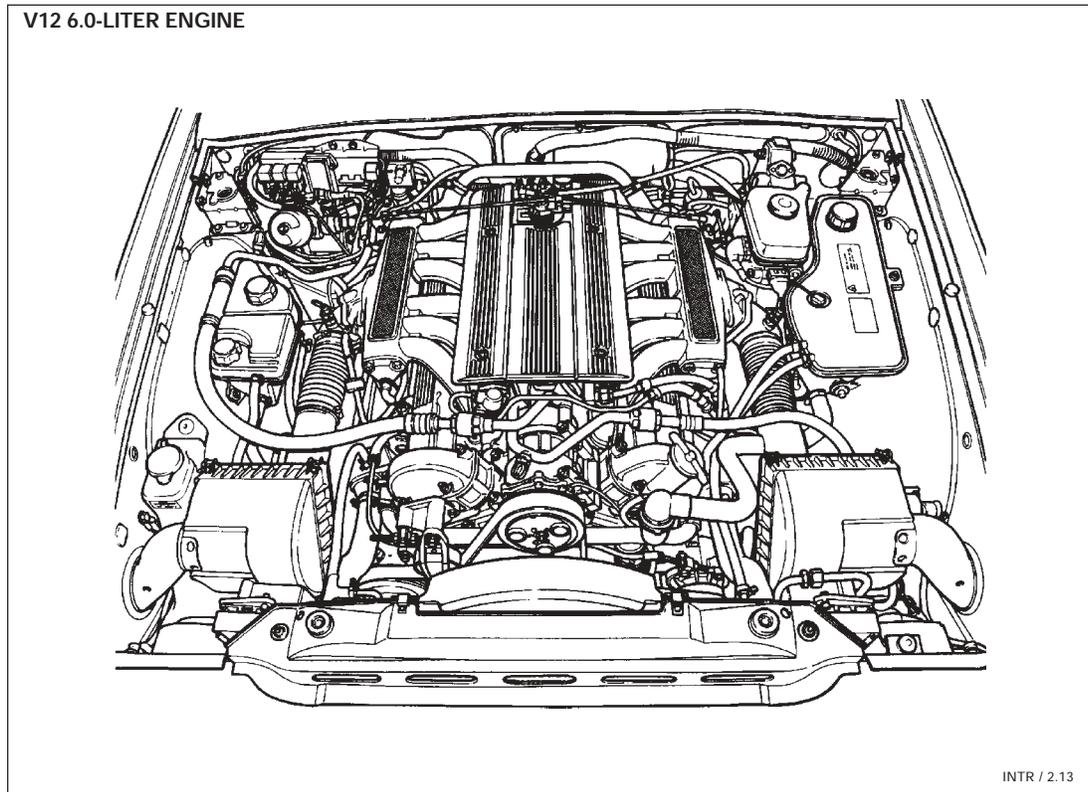
Depending on the model year, up to three transmission operating strategies are available to the driver. Transmission operating modes are selected with the performance control switch located on the "J" gate. NORMAL and SPORT modes operate as on the 1995 MY vehicles. The DELETE FIRST mode provides a second gear start-off to help prevent wheel spin in slippery traction conditions. If DELETE FIRST is selected when the transmission is in DRIVE, the transmission will momentarily engage first gear before engaging second gear.

NOTES

V12 Engine / Transmission

V12 6.0-Liter Engine

The V12 6.0L engine delivers an unmatched combination of power and smoothness. The engine is arranged in the classic 60° Vee configuration that produces balanced power impulses.

**XJ12 1995 (ND EMS)**

Configuration	12 Cylinder 60° Vee
Valve gear	One camshaft per cylinder head; Two valves per cylinder
Bore and stroke	90 mm x 78.5 mm
Displacement	5994 cc
Compression ratio	11 : 1
Maximum power (DIN)	313 hp @ 5350 rpm (310 hp, XJ12 1994 MY LM EMS)
Maximum torque (DIN)	353 lb ft @ 3750 rpm (336 lb ft, XJ12 1994 MY LM EMS)

NOTES

Engine Block

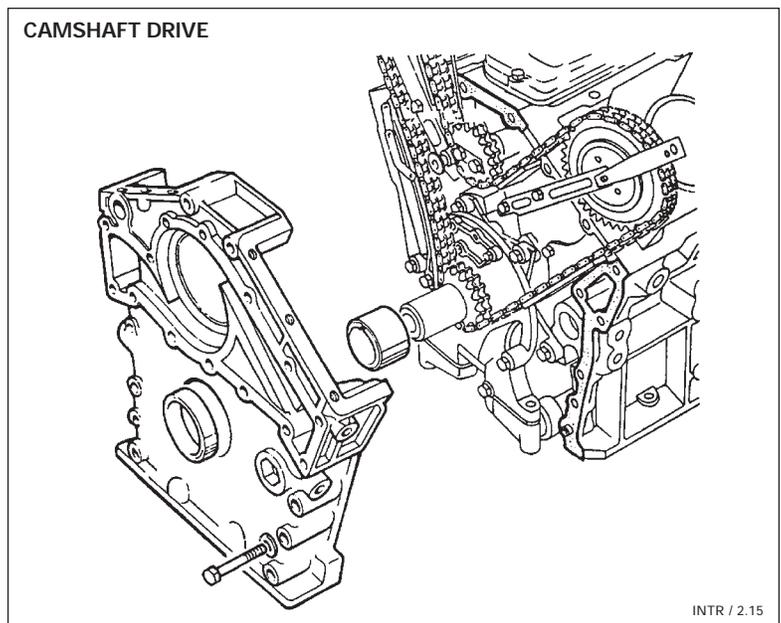
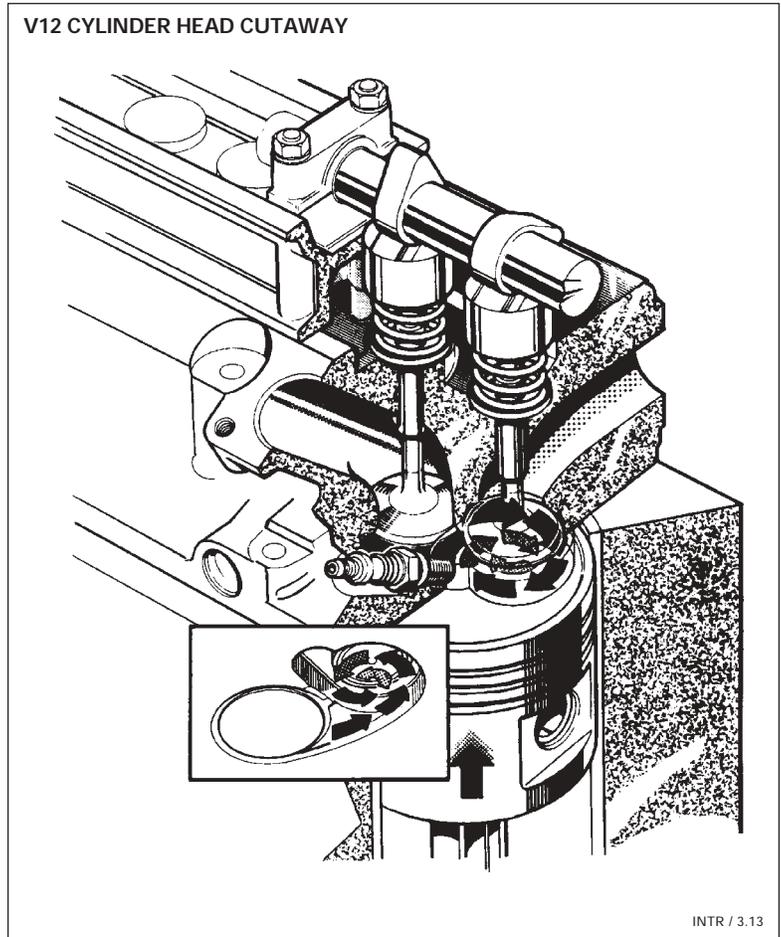
The lightweight aluminum alloy block is fitted with replaceable "wet" type cast iron cylinder liners, which form the inner wall of the cooling system.

Cylinder Head

The aluminum alloy cylinder head supports the tappet block and camshaft. A single camshaft for each cylinder head operates the parallel valves through bucket type valve lifters (tappets). The engine employs a high-efficiency combustion chamber that controls the movement of the air / fuel mixture and allows the use of a high compression ratio. This high-efficiency (HE) design consists of, in effect, two chambers. As the piston rises during the compression stroke, the mixture is compressed in the small chamber, below the intake valve, and swirled along a guide channel into the larger chamber, below the exhaust valve where it is ignited. The strong turbulence and "squish effect" produced by the two-chamber design results in excellent air / fuel mixing and even burning. The net effect of this design is excellent efficiency and fuel economy.

Camshaft Drive

A single stage "duplex" (double row) chain drive from the crankshaft operates the camshafts. The crescent type engine oil pump is driven directly by the crankshaft.



NOTES

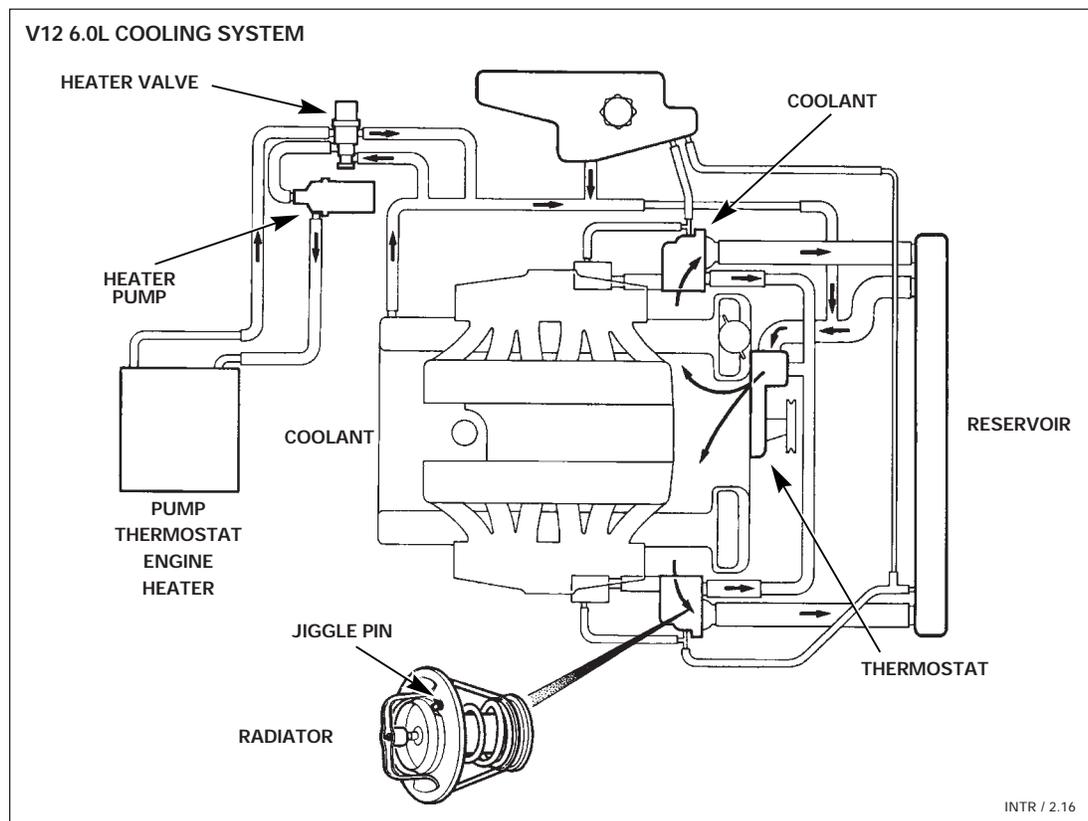
V12 Engine / Transmission (continued)

V12 6.0-Liter Engine (continued)**Cooling System**

The cooling system consists of the following components:

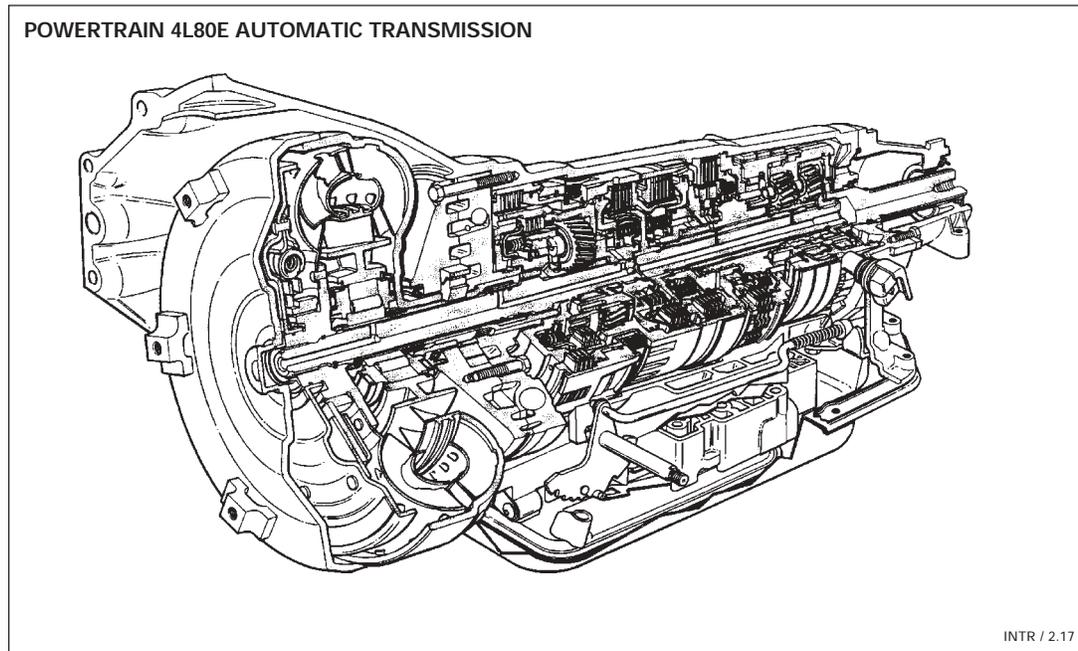
- Cross flow radiator
- Belt-driven water pump
- Two thermostats and housings (one per bank)
- Coolant expansion tank
- Viscous coupled, belt-driven fan
- Electric fans
- Electrically driven heater circulation pump and heater control valve

The thermostat housings are the high point of the cooling system. Air trapped in the engine cooling system will rise to the thermostat housings and pass through "jiggle pins" in each thermostat to the radiator. During cold start and warm-up, the thermostats are closed and the radiator is under suction from the water pump. Any air in the radiator is bled through the "jiggle pins" in each thermostat to the engine fill pipe.

**NOTES**

Powertrain (Hydra-Matic) 4L80-E Automatic Transmission

The 6.0L V12 engine is mated to the Powertrain (Hydra-Matic) 4L80-E automatic transmission for the XJ12 Sedan. The specifications and operation of this four-speed electronically controlled transmission are described on page 12.



The gearshift interlock system and preprogrammed driver selectable NORMAL and SPORT operating strategies are described on pages 8 – 9.

NOTES

Engine Management Systems

Jaguar Engine Management Systems (EMS) are controlled through a digital Engine Control Module (ECM) containing a microprocessor. The system maintains optimum performance over the engine operating range by precisely controlling all fuel injection, ignition and emission control functions. In addition, the ECM provides various interface outputs and incorporates an on-board diagnostic facility.

AJ16 Engine Management System

The AJ16 EMS complies with OBD II (on-board diagnostics II), the second generation environmental legislation that set the maximum acceptable levels of vehicle emissions and requires engine control systems self-diagnosis capabilities.

OBD II Legislative Requirements

- Low exhaust emission levels
- Industry standard Diagnostic Trouble Codes (DTCs)
- Generic (after market) scan tool capability for DTC retrieval
- Expanded self diagnostics to include monitoring and diagnosis of any power train fault likely to cause emissions to exceed 1.5 times the standard level
- Failure prediction of subsystems by performance observation over the life of the power train including: catalyst efficiency, engine misfire, exhaust gas recirculation and secondary air injection

GEMS 6 ECM

The GEMS 6 (Generic Engine Management System – 6 cylinder) ECM features on-board diagnostics and adaptive functions and has a nonvolatile memory. On-board diagnostic and adaptive information is retained if the battery is disconnected. Market specific differences in systems are programmed during manufacture through programmable electronic control units (PECUS). The VIN is recorded in the ECM memory.

NOTE: Fuel metering and idle air adaptations cannot be field reprogrammed with PDU. ECMs must not be switched from one vehicle to another.

On-Board Diagnostics – OBD II

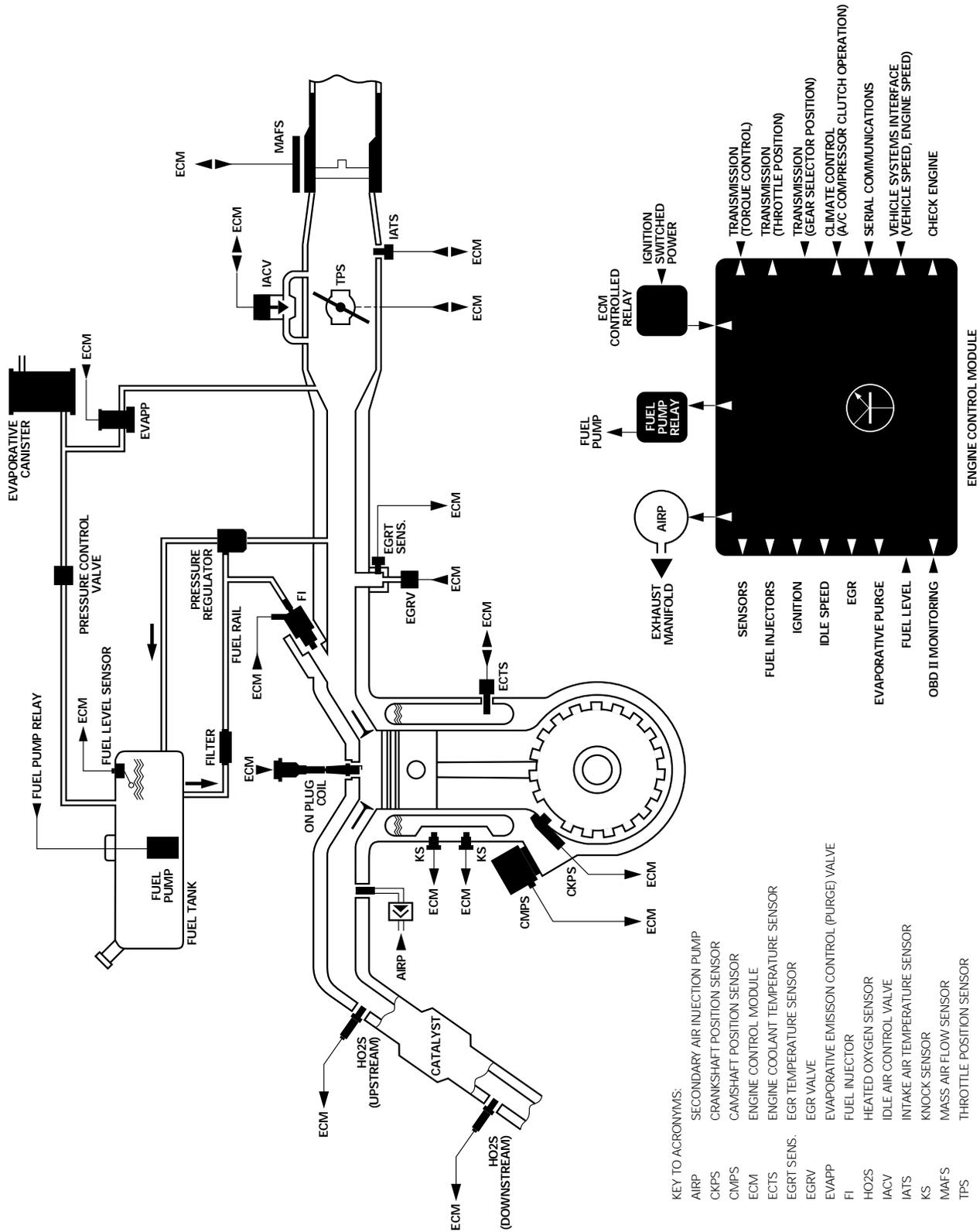
If an EMS related fault is detected by OBD monitoring or testing, a fault is registered and reported to the Diagnostic Status Manager (DSM) (ECM internal software). The DSM decides whether to flag a Diagnostic Trouble Code (DTC) and activate the CHECK ENGINE MIL. Except in cases where EMS system operation would be seriously impaired, a fault must be detected on two consecutive trips before the CHECK ENGINE MIL is activated. There are over 100 DTCs to identify specific system faults.

If, after the MIL is activated, three sequential trips were made with no recurrence of the fault(s) and no additional fault(s), the MIL will extinguish on the next trip. The fault(s) will remain stored in memory. The DSM will erase any DTC that has not recurred in 40 consecutive engine warm-up cycles.

Faults stored in the ECM memory can only be retrieved through serial communication via the data link. DTCs are held in nonvolatile memory (EEPROM) so that disconnecting the battery does not erase stored codes.

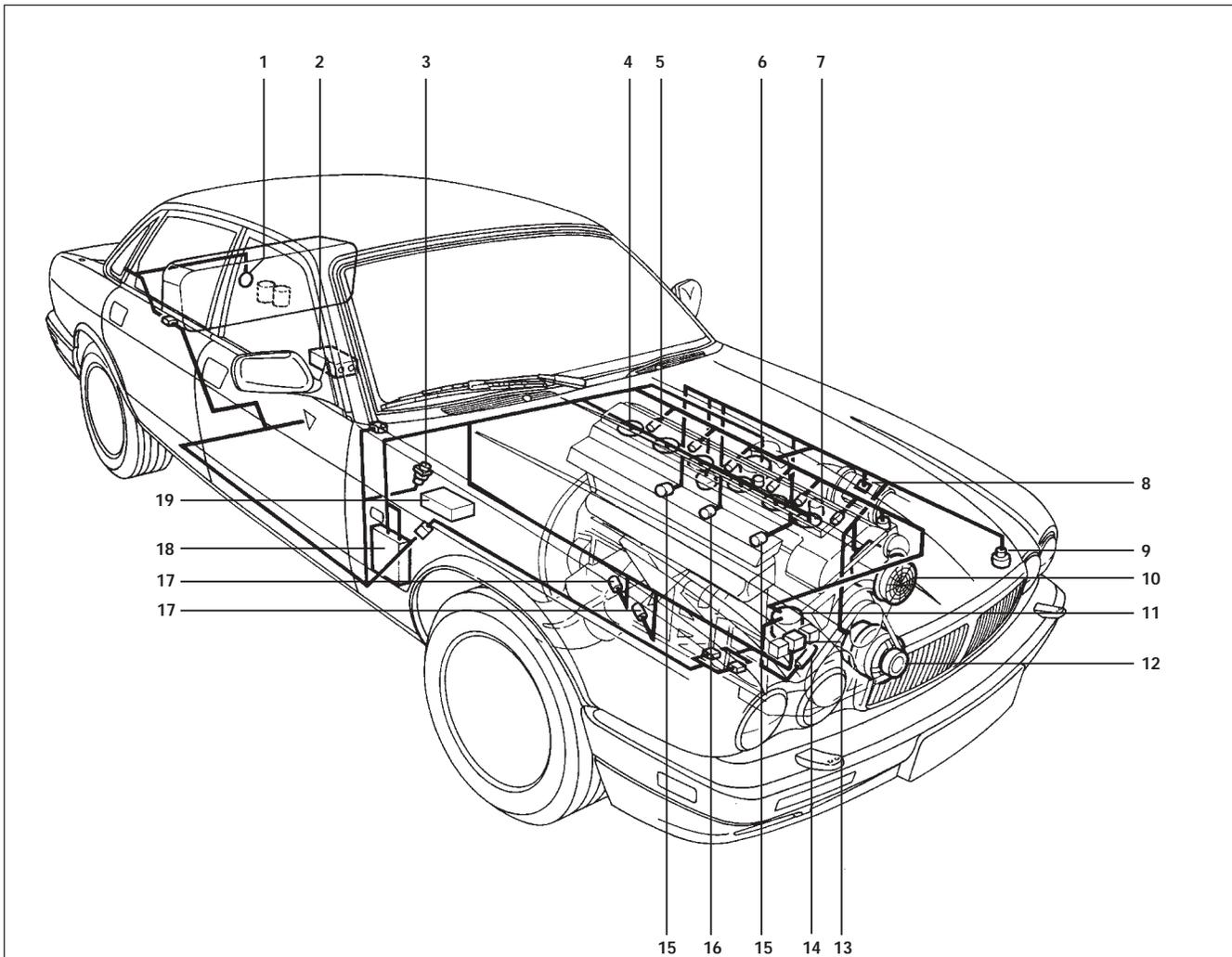
NOTE: Whenever the CHECK ENGINE or TRANSMISSION MIL is activated (AJ16 and XJ12, 1995 MY ON) it MUST be reported to Jaguar using the OBD II Report form S-93.

AJ16 NA ENGINE MANAGEMENT SYSTEM



AJ16 Engine Management System (continued)

Component Location



KEY TO ILLUSTRATION

- | | |
|--|---|
| 1 FUEL LEVEL SENSOR | 13 EMS MAIN RELAY |
| 2 EVAPORATIVE CANISTER | 14 CRANKSHAFT POSITION SENSOR (CKPS) |
| 3 INERTIA SWITCH | 15 KNOCK SENSOR (KS) |
| 4 SPARK PLUG WITH INTEGRAL COIL | 16 THROTTLE POSITION SENSOR (TPS) |
| 5 FUEL INJECTOR (FI) | 17 UPSTREAM HEATED OXYGEN SENSOR (HO2S) |
| 6 EGR VALVE (EGRV) | 18 ENGINE CONTROL MODULE (ECM) |
| 7 FUEL PRESSURE REGULATOR | 19 TRANSMISSION CONTROL MODULE |
| 8 MASS AIR FLOW SENSOR (MAFS) | 20 EGR TEMPERATURE SENSOR (EGRT SENSOR) |
| 9 EVAPORATIVE EMISSION CONTROL VALVE (EVAPP) | 21 ENGINE COOLANT TEMPERATURE SENSOR (ECTS) |
| 10 SECONDARY AIR INJECTION PUMP (AIRP) | 22 DOWNSTREAM HEATED OXYGEN SENSOR (HO2S) |
| 11 CAMSHAFT POSITION SENSOR (CMPS) | 23 CATALYST |
| 12 GENERATOR | 24 IDLE AIR CONTROL VALVE (IACV) |

Engine Management Control

The AJ16 EMS controls the following:

- Fuel metering
- Injector timing and semisequential fuel injection (sequential on AJ16 SC)
- Idle speed
- Primary and secondary direct spark ignition
- Knock control
- Emission control devices

Fuel Metering

Fuel metering is accomplished by ECM control of the period of time the fuel injectors are open (injector pulse duration or "on time") to supply fuel to the engine. Various sensors provide the ECM with engine and vehicle operating condition data. The ECM then calculates the amount of fuel the engine needs to provide the desired power while maintaining exhaust emissions within specified levels.

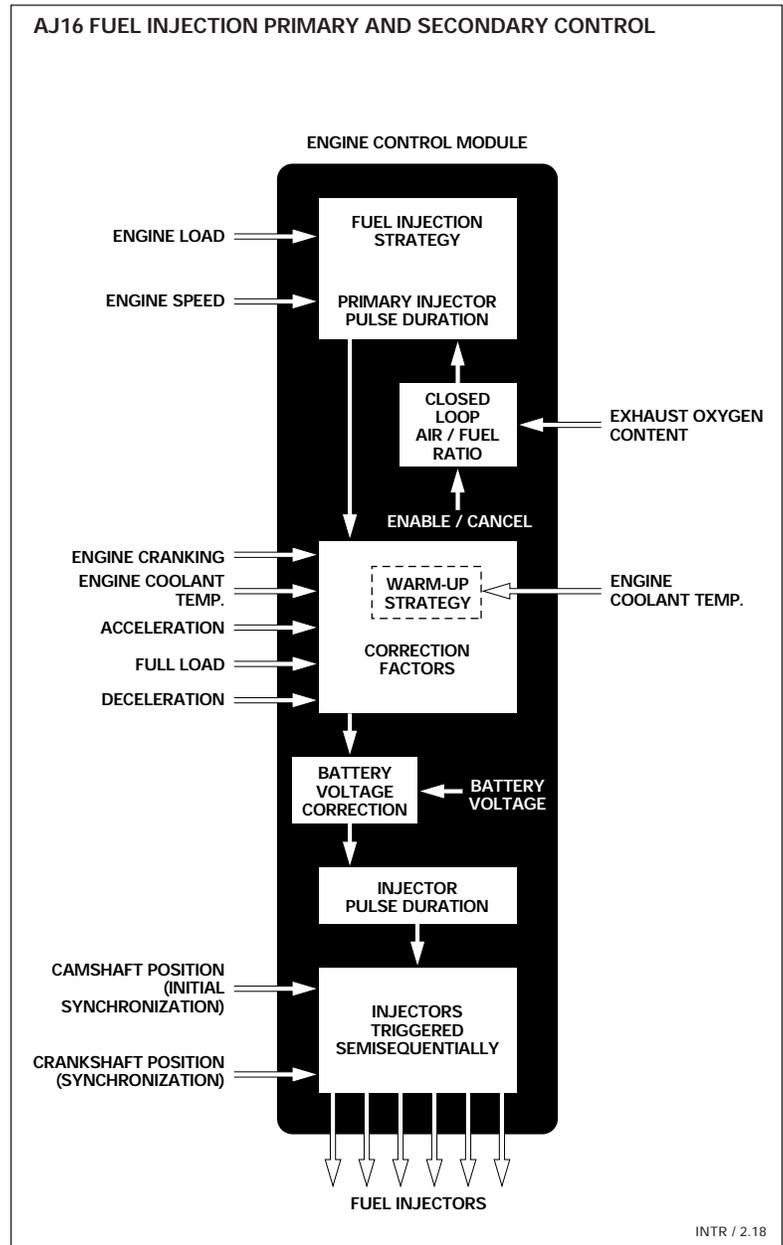
Fuel Injection Primary Control

Primary fuel metering is a function of engine load and speed. The ECM receives engine load input from the mass air flow sensor (MAFS) and engine speed input from the crankshaft position sensor (CKPS). These primary inputs are used by the ECM to select an injector pulse duration (injector "on time") from one of 256 sites in its memory.

Fuel Injection Secondary Control

Secondary fuel injection control adjusts the injector pulses as necessary to compensate for the following engine operating conditions:

- Engine cranking
- Engine coolant temperature
- Acceleration, Full load, Deceleration
- Battery voltage correction
- Closed loop
- Overrun fuel cutoff
- Engine overspeed control
- Wide-open-throttle during cranking



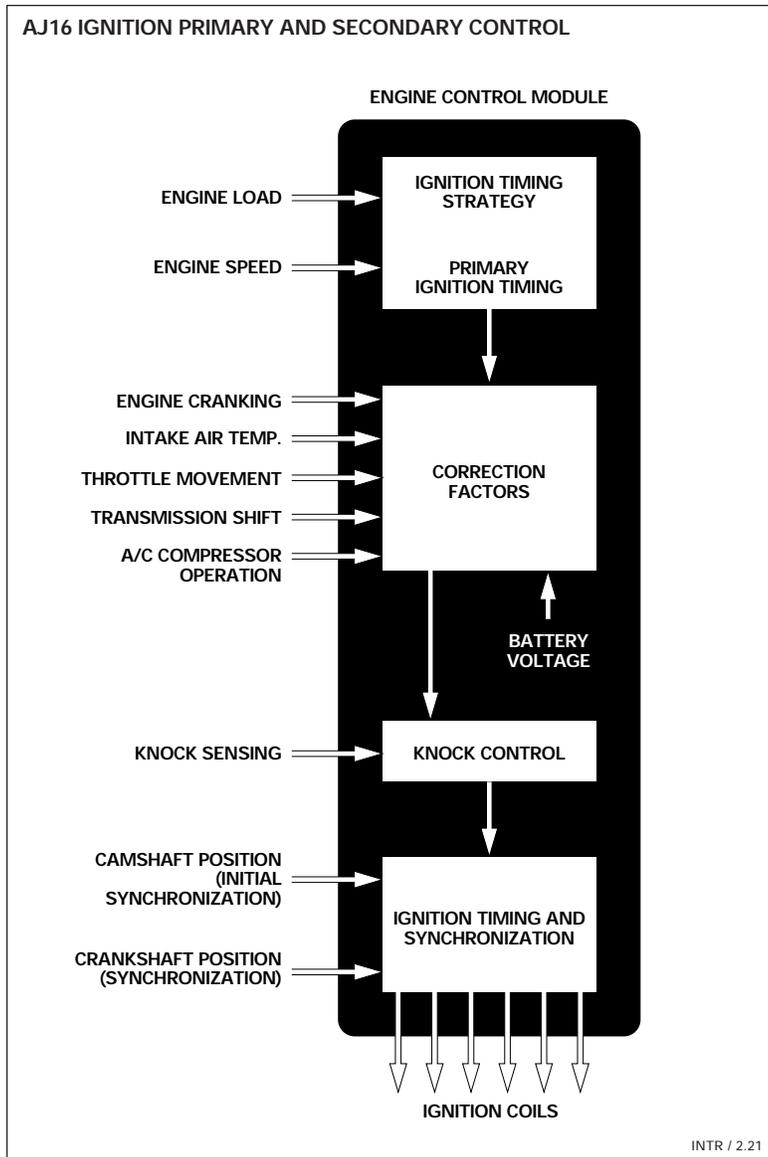
NOTE

AJ16 Engine Management System (continued)

Ignition Control

The ECM controls the ignition timing angle and spark distribution by directly operating the 6 individual on-plug ignition coils. Sensor inputs form primary and secondary control groups as with fuel injection.

The ignition sequence for spark distribution is set up by a signal from the camshaft position sensor (CMPS). The ECM "learns" the position of the number one cylinder ignition point at each engine start and applies the engine firing order to maintain the correct ignition sequence.



Ignition Primary Control

Primary ignition timing is a function of engine load and speed. The ECM selects an ignition timing angle from one of 256 sites in its memory based on engine load information from the mass air flow sensor (MAFS) and engine speed information from the crankshaft position sensor (CKPS).

Ignition Secondary Control

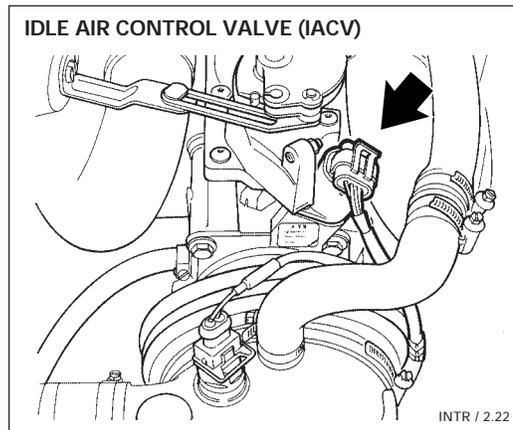
Secondary ignition control adjusts the ignition timing to compensate for the following engine and vehicle operating conditions:

- Intake air and engine coolant temperature
- Closed throttle / idle correction
- Transmission shift
- Full load correction
- Battery voltage correction
- Knock control

NOTES

Idle Control

Idle is regulated by air control and ignition timing. The throttle body incorporates the engine throttle, a fixed idle air bypass, an idle air control valve (IACV) and a fixed throttle position sensor (TPS). The ECM-driven IACV provides a variable idle air bypass enabling ECM idle air control. The ECM also anticipates engine load changes based on inputs signaling gear selector position, A/C clutch operation and increased electrical requirements and compensates for the load changes by adjusting the IACV.



Adaptive Idle Fuel Metering

The ECM makes baseline fuel metering corrections throughout the life of the vehicle to compensate for minor engine mechanical variability and engine aging. The adaption values are held in nonvolatile memory and will be retained even if the battery is disconnected.

Heated Oxygen Sensors (HO2S)

Sensors and connectors should be marked if removed. They must be reinstalled in their original positions. If they are not reinstalled in their original positions, or new sensors or wiring are installed, the ECM must be reprogrammed with PDU.

Limp Home Default

In order to allow vehicle operation if a malfunction occurs, "limp home" default values are incorporated as an ECM facility. If a sensor fault is detected, the ECM will substitute a nominal value for the missing input.

NOTES

AJ6 4.0L Engine Management System

The AJ6 4.0L EMS complies with OBD I, the first generation environmental legislation that set the maximum acceptable levels of vehicle emissions and required engine control systems with self-diagnostic capabilities.

OBD I Legislative Requirements

- Low exhaust emission levels
- Monitoring and diagnosis of electrical fuel system faults
- Monitoring of both open and closed circuit faults
- Visual warning to driver: CHECK ENGINE MIL
- Fault code provided to technician: Diagnostic Trouble Code – DTC (Fuel Fail Code – FF)

On Board Diagnostics Facility – OBD I

If an EMS related fault is detected by OBD monitoring or testing, the CHECK ENGINE MIL will illuminate and a DTC is stored in volatile memory in the ECM. If battery power is interrupted to the ECM, any stored data will be cleared from memory.

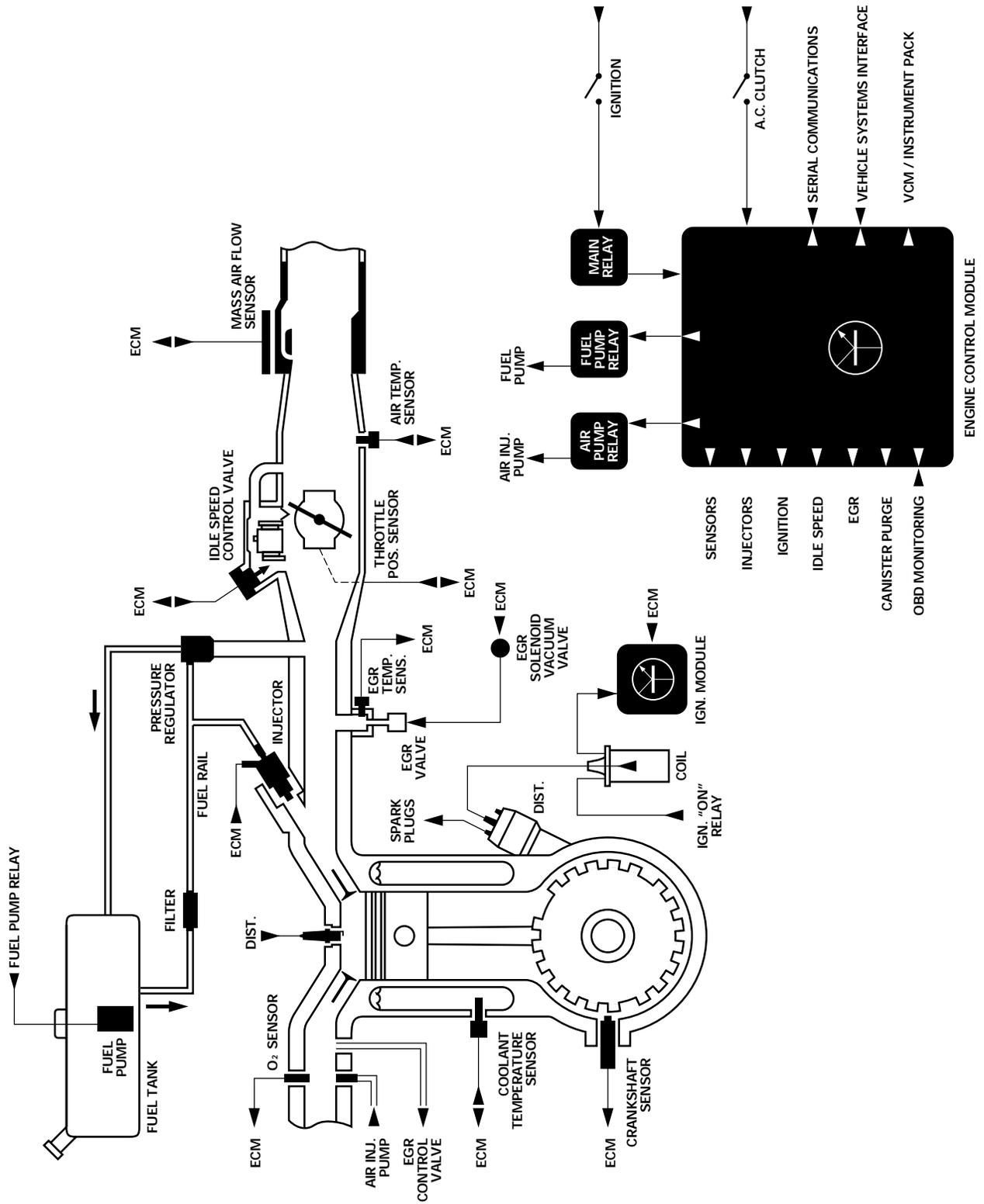
DTCs can be accessed via PDU or JDS serial communication with the ECM. They can also be displayed on the instrument pack LCD display.

To display stored DTCs perform the following procedure:

- Switch the ignition OFF – wait 5 seconds.
- Switch the ignition ON – do not crank the engine.
- Press the VCM button.

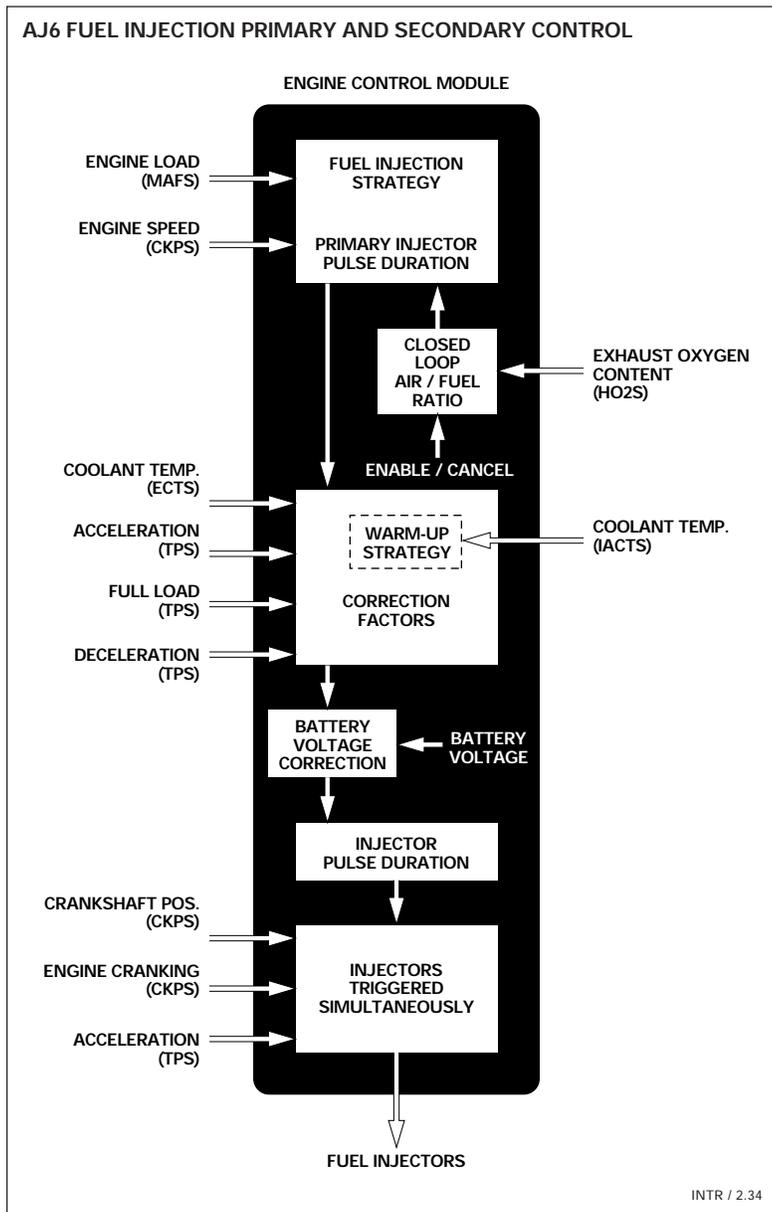
The CHECK ENGINE MIL will display and five seconds later the DTC will display. If two or more DTCs are stored in memory, only the highest priority code will be displayed.

AJ6 4.0L ENGINE MANAGEMENT SYSTEM



T800 / 1.01

AJ6 4.0L Engine Management System (continued)



Fuel Injection Control

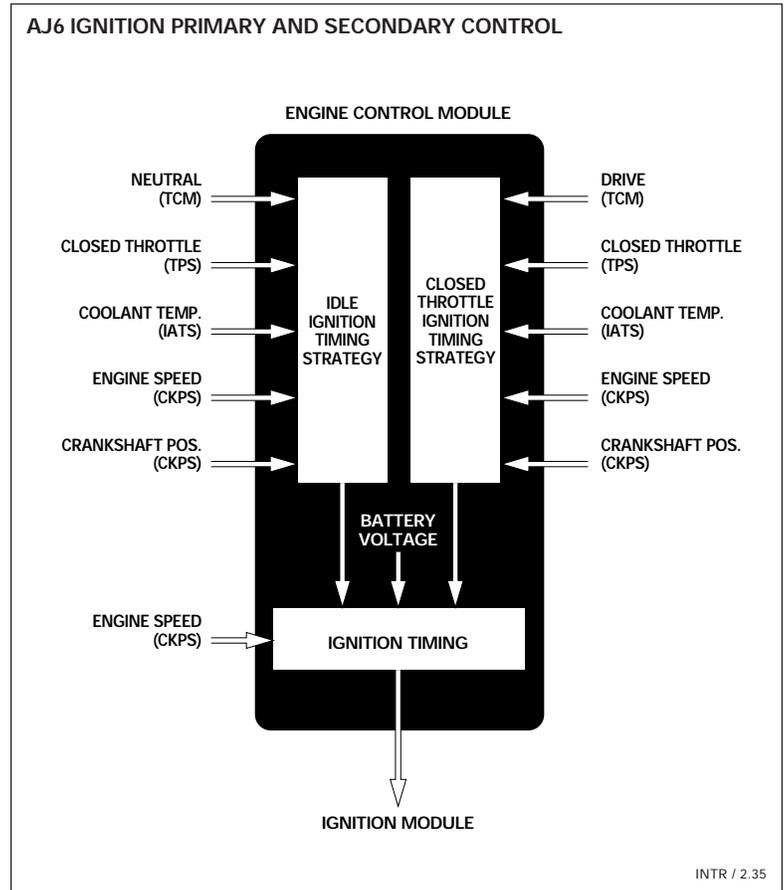
Fuel metering is a function of engine load and speed. The ECM utilizes the mass air flow sensor (MAFS) and crankshaft position sensor (CKPS) inputs to access the appropriate injector pulse duration (injector "on time") for the operating conditions.

NOTES

Ignition Control

Ignition timing, dwell and voltages are controlled by the ECM. Spark distribution is controlled by a conventional ignition distributor and rotor.

NOTES



6.0L V12 Nippon Denso Engine Management System

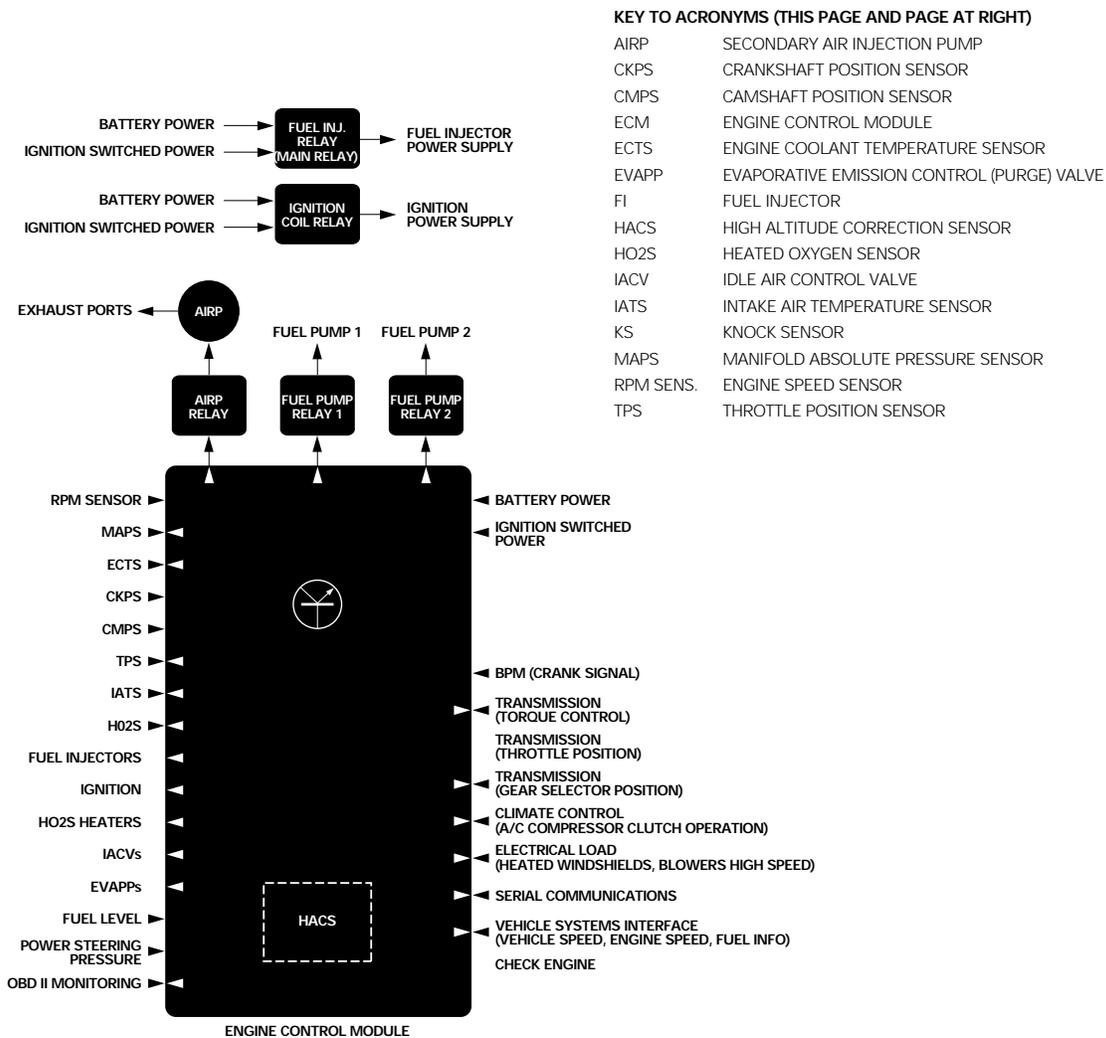
The Jaguar 6.0-liter V12 Nippon Denso Engine Management System (V12 / ND EMS), introduced in the 1995 MY Sedan Range, is controlled through a digital engine control module (ECM). The system controls all fuel injection, ignition and emission control functions. In addition, the ECM provides various interface outputs and incorporates an on-board diagnostic facility.

The V12 / ND EMS complies with OBD II (on-board diagnostics II), the second generation environmental legislation that set the maximum acceptable levels of vehicle emissions and required engine control systems with self-diagnostic capabilities.

Nippon Denso ECM

The Nippon Denso ECM controls the engine management system as two separate 6-cylinder systems – A bank (right side) and B bank (left side) – or as one 12-cylinder system, depending on engine operating conditions and diagnostic functions. The system provides serial communication for extracting DTCs, interface with the transmission and other vehicle systems and “limp home” capability. The vehicle identification number (VIN) is stored in ECM nonvolatile memory. Adaptive values and DTCs are maintained in memory by quiescent current. If the battery is disconnected, the ECM will “relearn” the adaptive values during the next driving cycle.

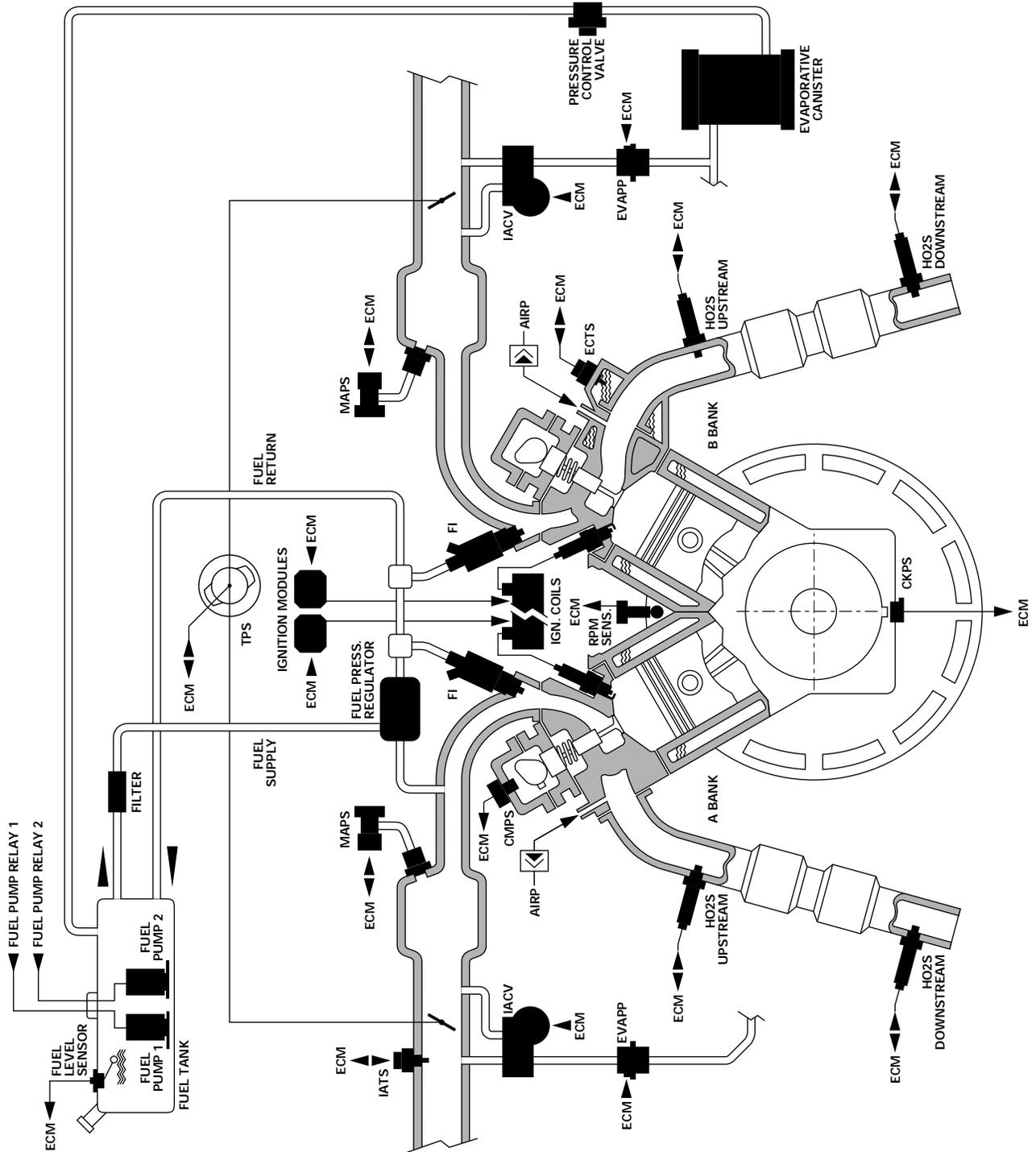
6.0L V12 / ND ENGINE MANAGEMENT LOGIC



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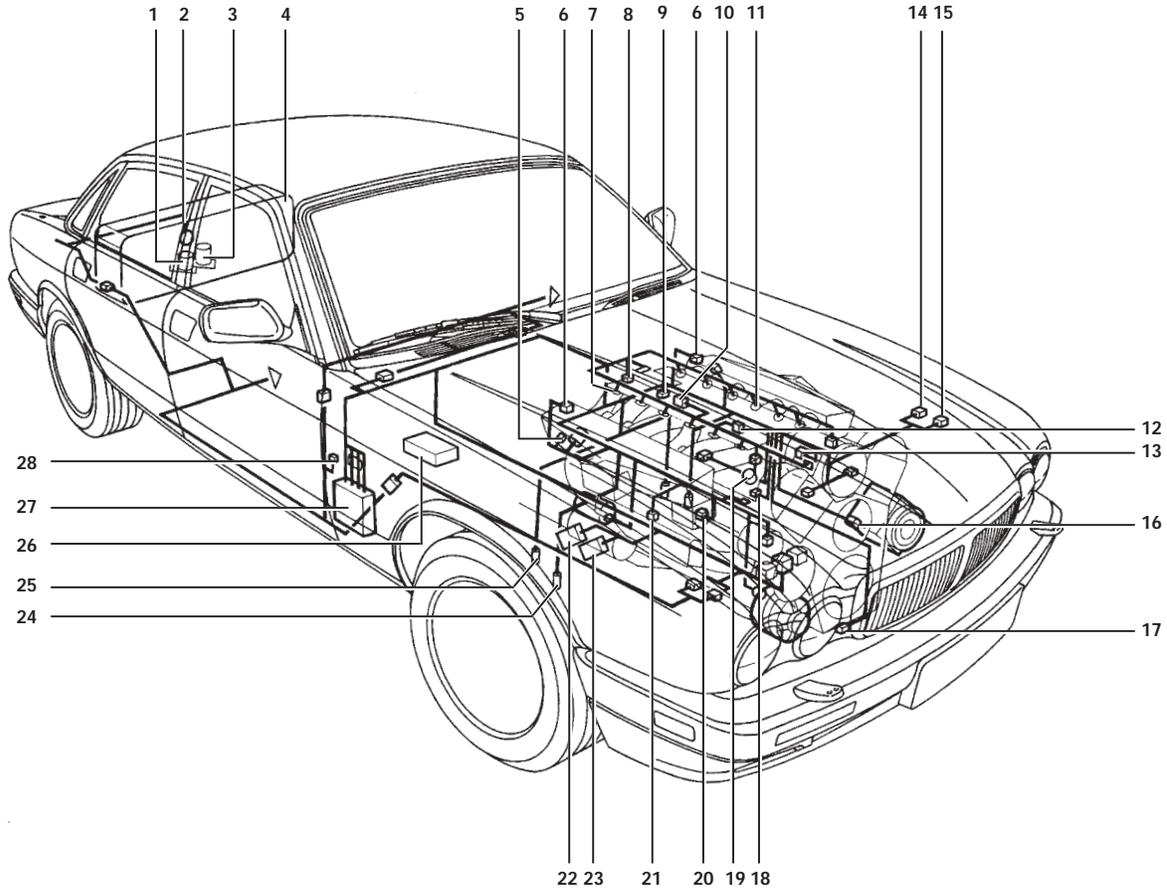
- AIRP SECONDARY AIR INJECTION PUMP
- CKPS CRANKSHAFT POSITION SENSOR
- CMPS CAMSHAFT POSITION SENSOR
- ECM ENGINE CONTROL MODULE
- ECTS ENGINE COOLANT TEMPERATURE SENSOR
- EVAPP EVAPORATIVE EMISSION CONTROL (PURGE) VALVE
- FI FUEL INJECTOR
- HACS HIGH ALTITUDE CORRECTION SENSOR
- HO2S HEATED OXYGEN SENSOR
- IACV IDLE AIR CONTROL VALVE
- IATS INTAKE AIR TEMPERATURE SENSOR
- KS KNOCK SENSOR
- MAPS MANIFOLD ABSOLUTE PRESSURE SENSOR
- RPM SENS. ENGINE SPEED SENSOR
- TPS THROTTLE POSITION SENSOR

6.0L V12 / ND ENGINE MANAGEMENT LOGIC



6.0L V12 Nippon Denso Engine Management System (continued)

EMS Component Locations



KEY TO ILLUSTRATION

- | | |
|--|--|
| 1 FUEL PUMP 1 | 19 FUEL PRESSURE REGULATOR |
| 2 FUEL LEVEL SENSOR | 20 A BANK IDLE AIR CONTROL VALVE (IACV) |
| 3 FUEL PUMP 2 | 21 INTAKE AIR TEMPERATURE SENSOR (IATS) |
| 4 FUEL TANK | 22 B BANK IGNITION MODULE |
| 5 VACUUM SOLENOID VALVE | 23 A BANK IGNITION MODULE |
| 6 ABSOLUTE PRESSURE SENSOR(S) | 24 A BANK DOWNSTREAM HEATED OXYGEN SENSOR (HO2S) |
| 7 A BANK FUEL INJECTORS (FI) | 25 A BANK UPSTREAM HEATED OXYGEN SENSOR (HO2S) |
| 8 ENGINE SPEED SENSOR | 26 TRANSMISSION CONTROL MODULE (TCM) |
| 9 THROTTLE POSITION SENSOR (TPS) | 27 ENGINE CONTROL MODULE (ECM) |
| 10 IGNITION COIL PACK | 28 INERTIA SWITCH |
| 11 B BANK FUEL INJECTORS (FI) | 29 CAMSHAFT POSITION SENSOR (CMPS) |
| 12 IGNITION COIL PACK | 30 IGNITION COIL PACKS |
| 13 B BANK IDLE AIR CONTROL VALVE (IACV) | 31 GAS FILTER(S) (FOR MAFS) |
| 14 A BANK EVAPORATIVE EMISSION CONTROL VALVE (EVAPP) | 32 B BANK MANIFOLD ABSOLUTE PRESSURE SENSOR |
| 15 B BANK EVAPORATIVE EMISSION CONTROL VALVE (EVAPP) | |
| 16 SECONDARY AIR INJECTION PUMP (AIR PUMP) | |
| 17 CRANKSHAFT POSITION SENSOR (CKPS) | |
| 18 ENGINE COOLANT TEMPERATURE SENSOR (ECTS) | |

Fuel Injection Primary Control

Fuel metering is controlled primarily as a function of engine load and speed.

Engine load

Each intake manifold (A bank and B bank) is connected to a separate manifold absolute pressure sensor (MAPS). Changes in manifold absolute pressure caused by throttle position and engine load will act on the MAPS. The ECM uses each MAPS signal to control the respective cylinder bank.

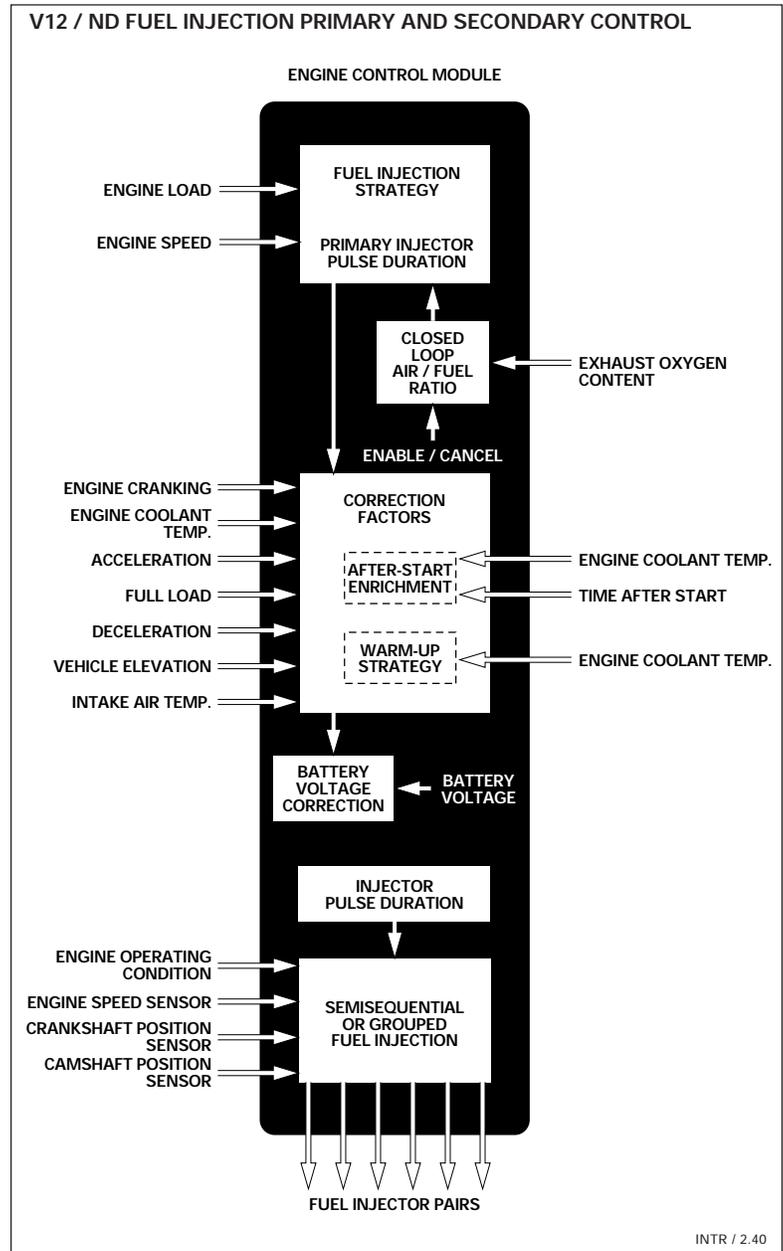
Engine speed and crankshaft position

The engine speed sensor (RPM Sensor) provides the ECM with engine speed information. The RPM Sensor is located behind the flywheel at the rear of the engine vee. The crankshaft position sensor (CKPS) provides the ECM with one pulse for each engine revolution. It is located at the bottom of the crankshaft pulley. A camshaft position sensor (CMPS) provides the ECM with a pulse for each engine cycle (two crankshaft revolutions). The camshaft position sensor is located on the A bank (right side) camshaft cover. All three inputs are required for cylinder synchronization of fuel injection and ignition.

Fuel Injection Secondary Control

Secondary fuel injection control adjusts the injector pulses as necessary to compensate for the following engine operating conditions:

- Engine cranking
- Engine coolant temperature
- Acceleration, full load, deceleration
- Battery voltage correction
- Closed loop
- Overrun fuel cutoff
- Engine overspeed control
- Wide-open-throttle during cranking



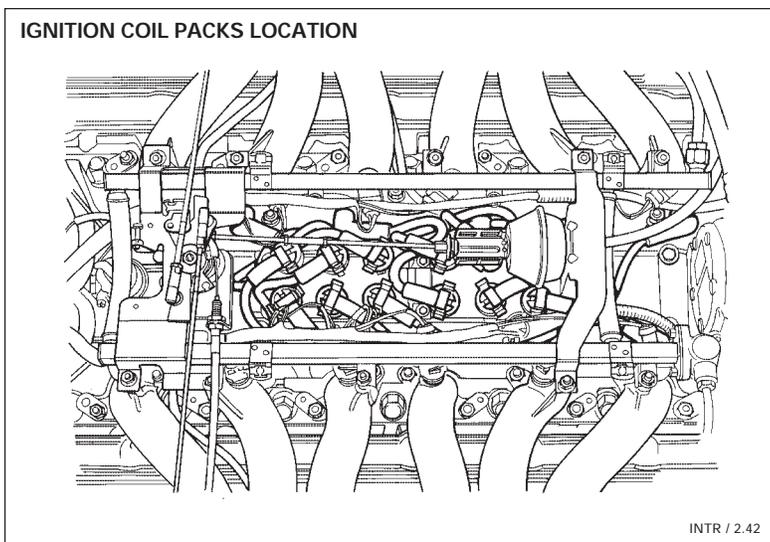
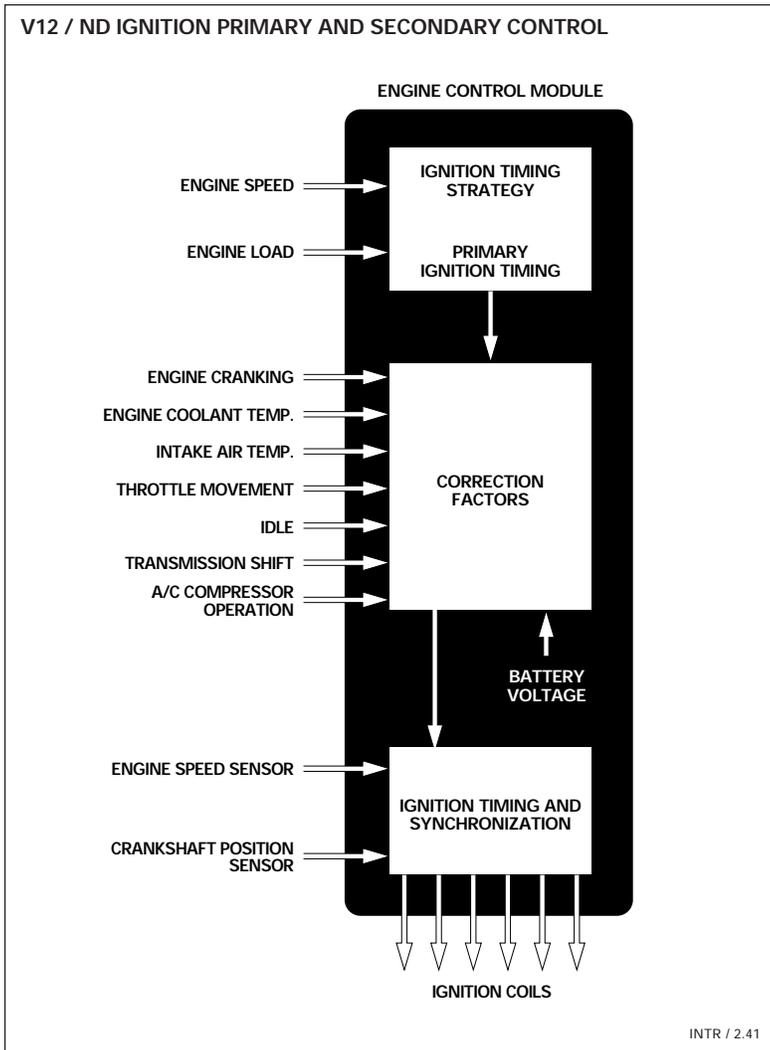
NOTES

6.0L V12 Nippon Denso Engine Management System (continued)

Ignition Control

Two ignition coil packs consisting of three coils each are installed. Each coil fires two spark plugs simultaneously so that one spark occurs on the compression stroke and the other spark on the exhaust stroke. The ECM drives two ignition modules, one for each coil pack, with timed ignition signals. Each ignition module controls the primary current switching for its coil pack resulting in precise ignition control for each cylinder.

NOTES



6.0L V12 Lucas / Marelli Engine Management System

The 1994 MY 6.0-liter V12 Lucas / Marelli Engine Management System (V12 / LM EMS) utilizes a combined Lucas / Marelli fuel injection / ignition system. Each system (fuel injection and ignition) has its own unique sensors, switches and control module. The engine control module (ECM) for fuel injection controls all fuel injection and emission control functions. The engine control module (ECM) for ignition controls ignition functions and provide the fuel injection ECM with engine speed information.

The 6.0L V12 Lucas / Marelli EMS complies with OBD I, the first generation environmental legislation that set the maximum acceptable levels of vehicle emissions and required engine control systems with self-diagnostic capabilities.

The system provides serial communication for extracting DTCs, interfacing with the transmission and other vehicle systems and "limp home" capability. Adaptive values and DTCs are maintained in memory by quiescent current. If the battery is disconnected, the ECM will "relearn" the adaptive values during the next driving cycle. DTCs can be accessed via PDU or JDS serial communication with the ECM or through the instrument pack LCD display. When multiple DTCs are stored, only the highest priority code is shown.

Fuel Injection Primary Control

Primary fuel metering is a function of engine load and speed. The fuel injection ECM receives engine load input from the single manifold absolute pressure sensor (MAPS) located within its housing. Engine speed information is provided from the ignition ECM.

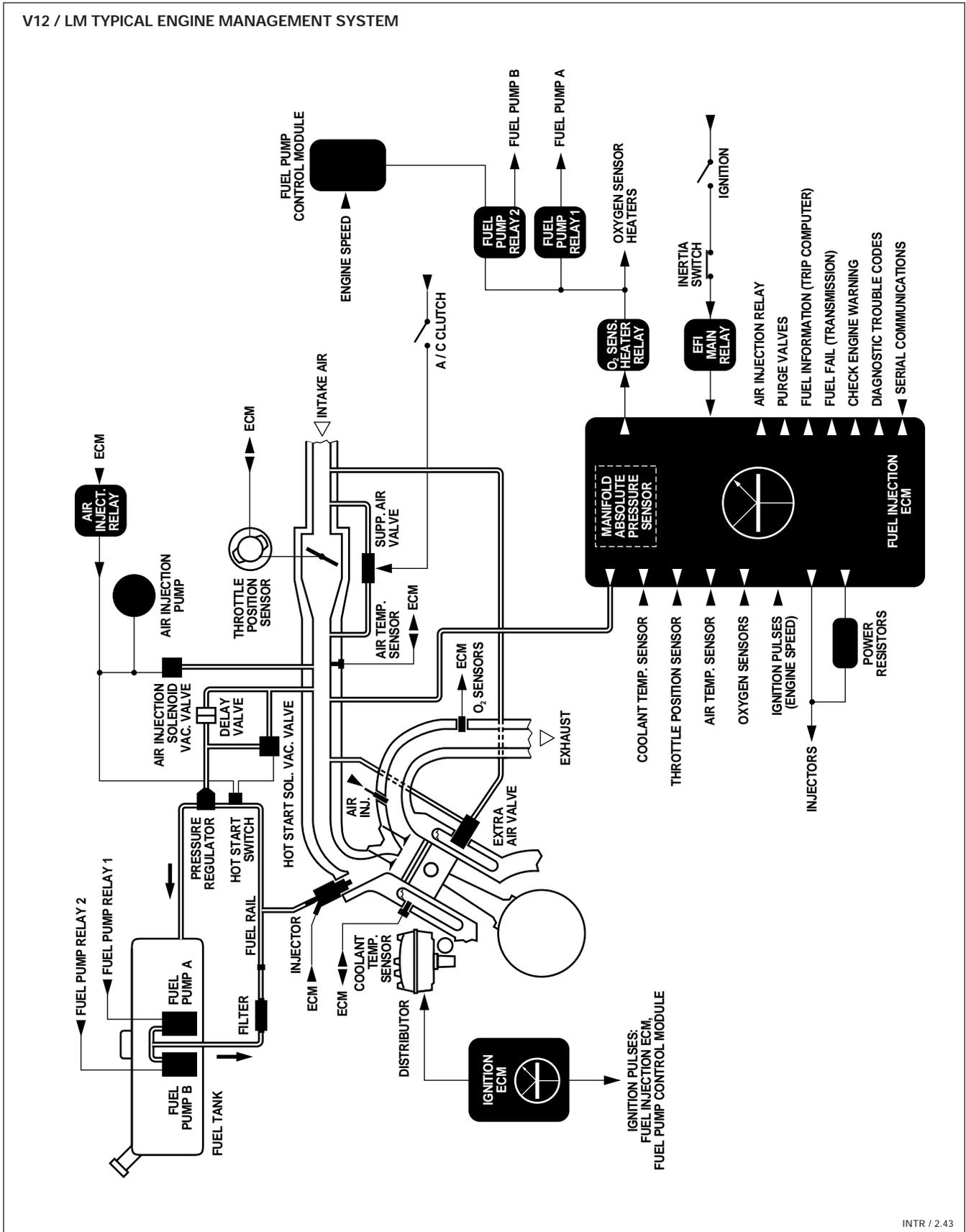
Fuel Injection Secondary Control

Secondary fuel injection control adjusts the injector pulses as necessary to compensate for the following engine operating conditions:

- Engine cranking
- Engine coolant temperature
- Acceleration, full load, deceleration
- Battery voltage correction
- Closed loop
- Overrun fuel cutoff
- Engine overspeed control
- Wide-open-throttle during cranking

NOTES

6.0L V12 Lucas / Marelli Engine Management System (continued)

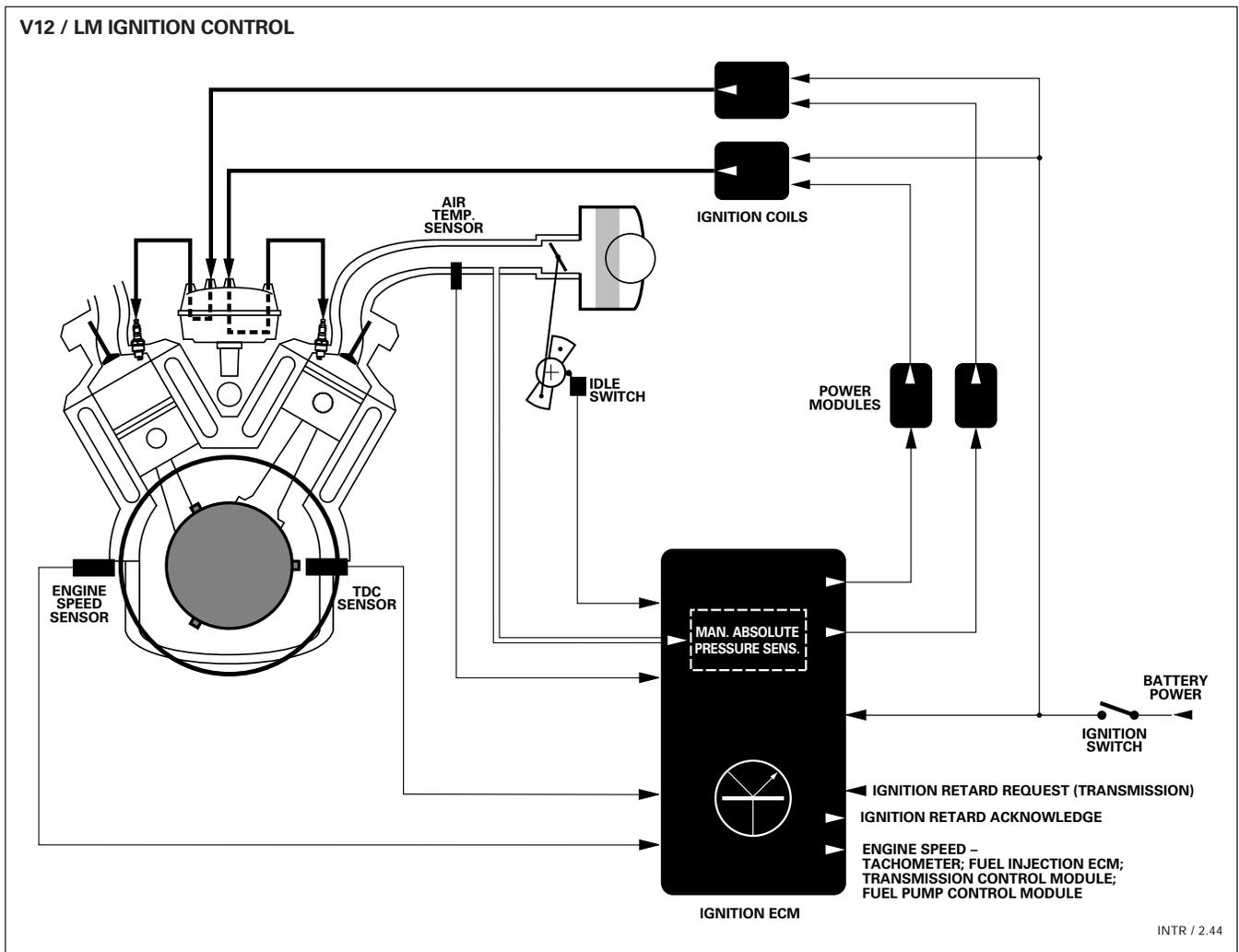


Ignition Control

Primary ignition control is established by the ignition ECM acting on information from the crankshaft position TDC sensor, the engine speed sensor and a manifold absolute pressure sensor (MAPS) located in the ignition ECM.

Secondary ignition control, to compensate for idle conditions, engine and intake air temperatures is accomplished by the ignition ECM based on inputs from sensors and switches.

The ECM establishes an ignition timing angle based on the engine operating requirements and controls two ignition coils via two power modules; one pair is utilized for each cylinder bank. A double-deck two-rotor distributor distributes the high tension voltage to bank A (right side) via the lower deck and bank B (left side) via the upper deck.



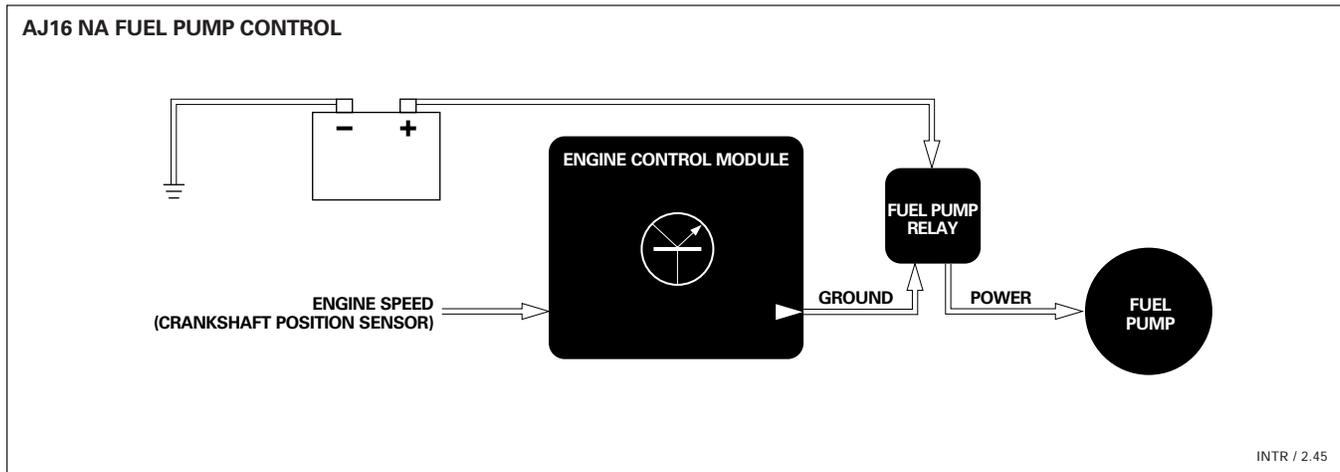
NOTES

Fuel Delivery Systems

AJ16 Normally Aspirated Fuel Delivery

The single in-tank fuel pump provides fuel pressure from the sealed fuel tank to the fuel rail. Fuel tank ventilation is controlled by the evaporative emission control system (EVAP). A fuel pressure regulator maintains fuel pressure for the injectors and allows excess fuel to return to the fuel tank.

The fuel pump module is switched by the ECM via a fuel pump relay. The ECM initiates fuel pump operation when the ignition is switched on and maintains pump operation based on an engine speed signal. In case of vehicle impact, the inertia switch will interrupt ignition power feeds, which will cause the ECM to remove the ground from the fuel pump relay, which in turn disconnects the fuel pump from battery power.

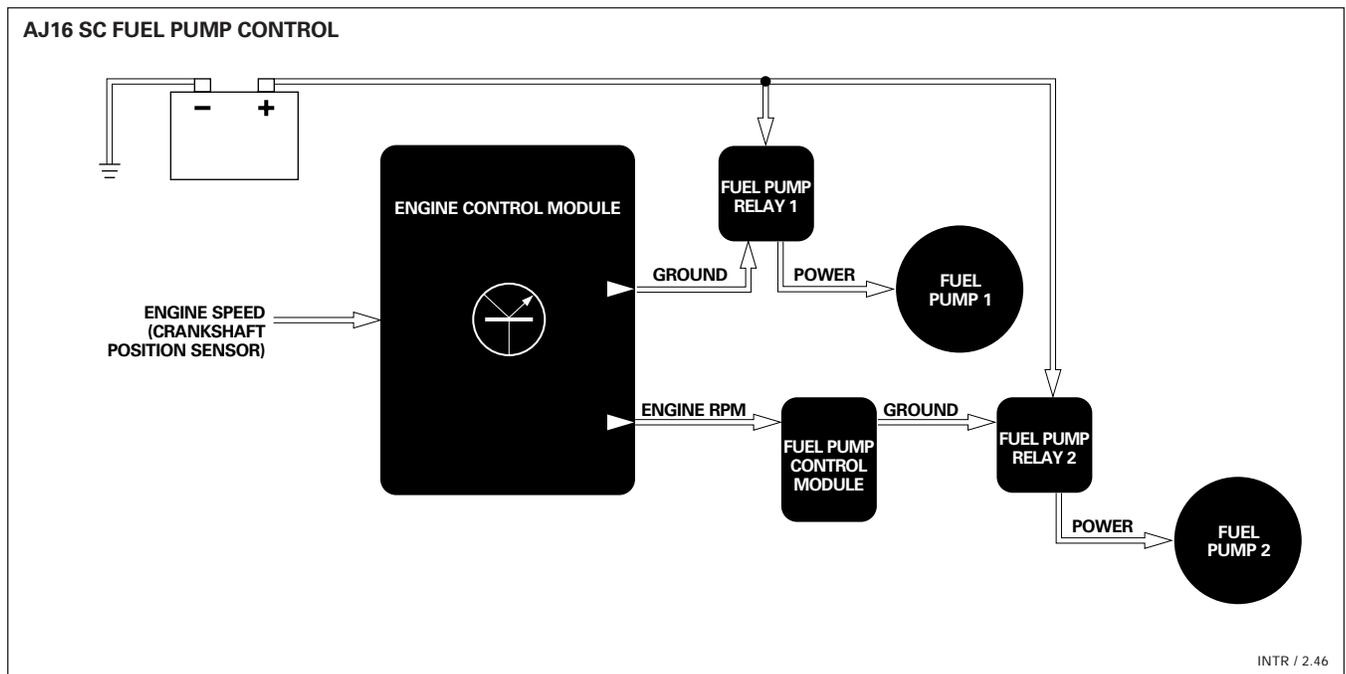


NOTES

AJ16 Supercharged Fuel Delivery

Twin in-tank fuel pumps provide fuel pressure from the sealed fuel tank to the fuel rail. Fuel tank ventilation is controlled by the evaporative emission control system (EVAP). A fuel pressure regulator maintains fuel pressure for the injectors and allows excess fuel to return to the fuel tank.

The two AJ16 SC fuel pumps are controlled separately. The ECM provides a ground for the fuel pump relay 1 when the ignition is switched on and maintains the ground based on an engine speed signal. The relay for fuel pump 2 receives its ground from the fuel pump control module. The pump control module switches the fuel pump relay 2 ground according to engine speed to provide the additional fuel required for high speed operation. The inertia switch will interrupt battery feed to the ECM in case of vehicle impact, which will disconnect the relay grounds.



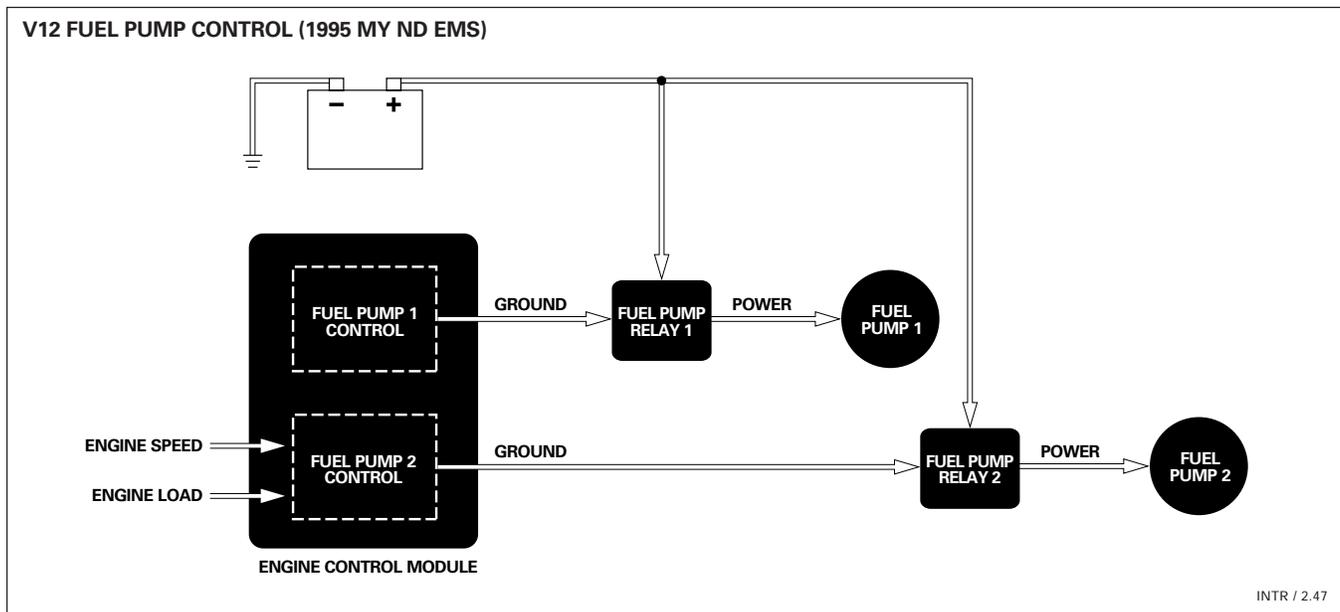
NOTES

V12 Sedan Fuel Delivery

The V12 Sedan utilizes twin fuel pumps and a fuel delivery system that is similar in function to the AJ16 SC system. The 1995 MY V12 Sedans use the same fuel tank and fuel pump modules as the AJ16 SC Sedans. Only the fuel pump control system is different. The 1994 MY V12 Sedans use a different control system and different fuel pump modules and fuel tank.

Fuel pump control (V12 Sedan: 1995 MY ND EMS)

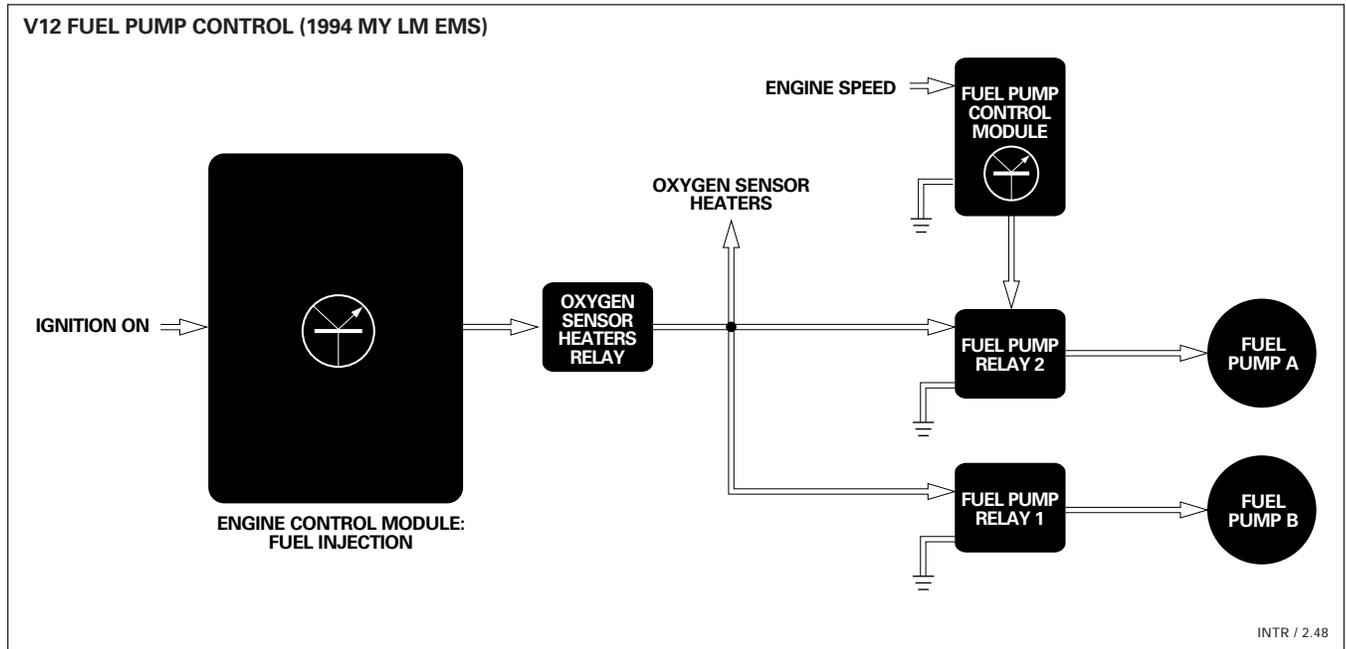
The ECM provides separate grounds for fuel pump relays 1 and 2. When the ignition is switched on, fuel pump 2 operates for a short period of time to assure fuel for starting. When the ignition is switched to the crank position, fuel pump 2 is switched off and fuel pump 1 is activated. Fuel pump 1 operates continuously when the engine is running. The ECM activates fuel pump 2 to provide the additional fuel required for high load engine operation. In case of vehicle impact, the inertia switch will interrupt battery feed to the ECM, which will disconnect the relay grounds.



NOTES

Fuel pump control (V12 Sedan: 1994 MY LM EMS)

Fuel pump 1 operates continuously when the engine is running. Fuel pump 2 is switched by the fuel pump control module. The fuel pump control module receives an engine speed input from the ignition ECM and switches fuel pump 2 on via pump relay 2 when the engine speed reaches 2840 rpm. As engine speed decreases, the pump control module interrupts pump relay 2 ground at 2000 rpm, switching off fuel pump 2. In case of vehicle impact, the inertia switch interrupts battery feed to the ECM, which will disconnect the relay grounds.



NOTES

Chassis

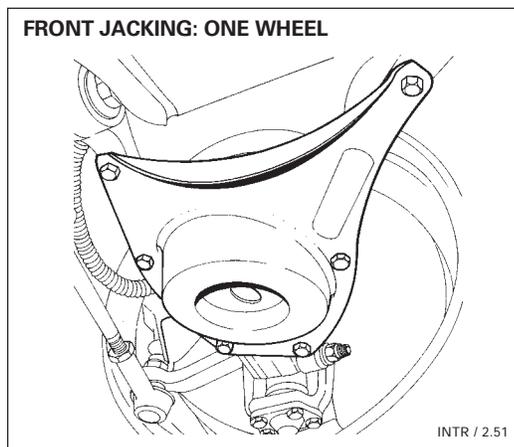
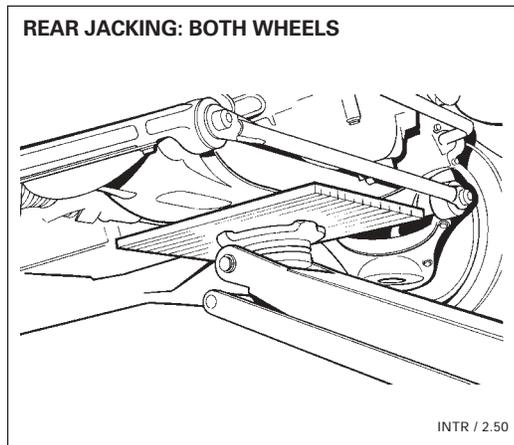
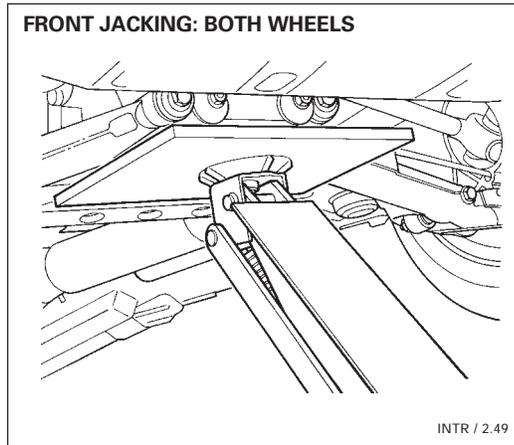
Lifting and Jacking

To prevent damage to the vehicle, Jaguar vehicles should be jacked or lifted only as described in the Service Manual. Position the pads of four-point lifts under the chassis jack pads.

Floor jack

To jack the front, place the jack pad at the center of the front suspension subframe. Use a wood block or pad to prevent damage to the subframe. At the rear, jack at the center of the final drive skid plate with a wood block or pad to prevent damage. To jack one wheel, jack under the center of the front spring pan with a wood block or pad on the jack.

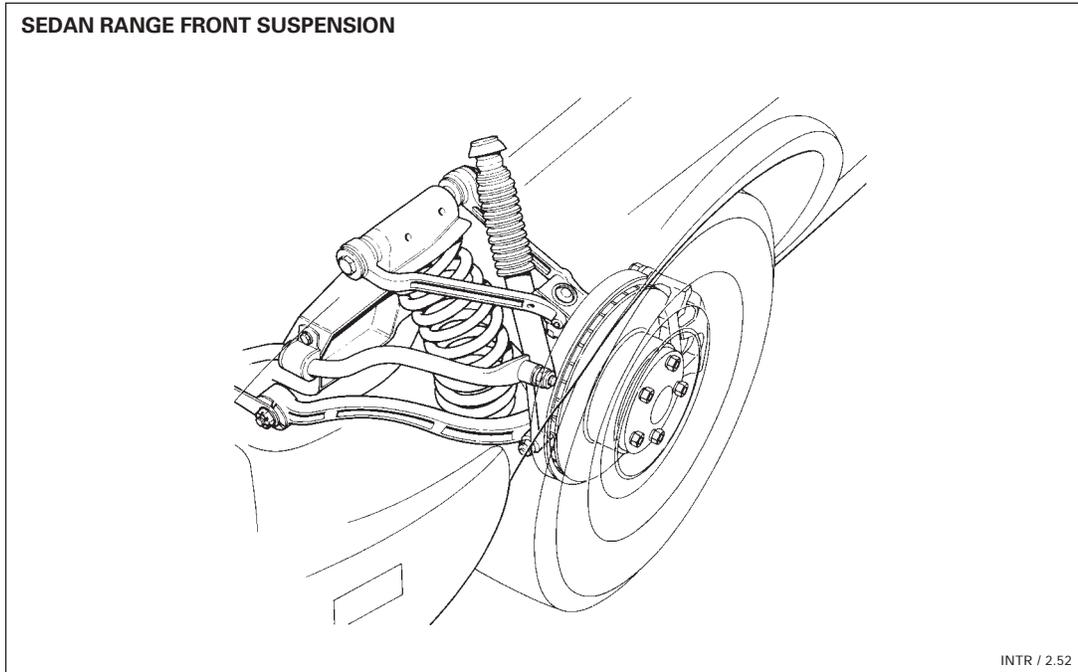
⚠ CAUTION: Do not jack on the front "A" arm or the rear wishbone.



NOTES

Suspension

Sedan Range vehicles employ unequal length "A" arms arranged to provide an anti-dive effect under braking and anti-squat during acceleration. All suspension loads (except the shock absorber) are fed into a subframe that is isolated from the body by rubber bushings.

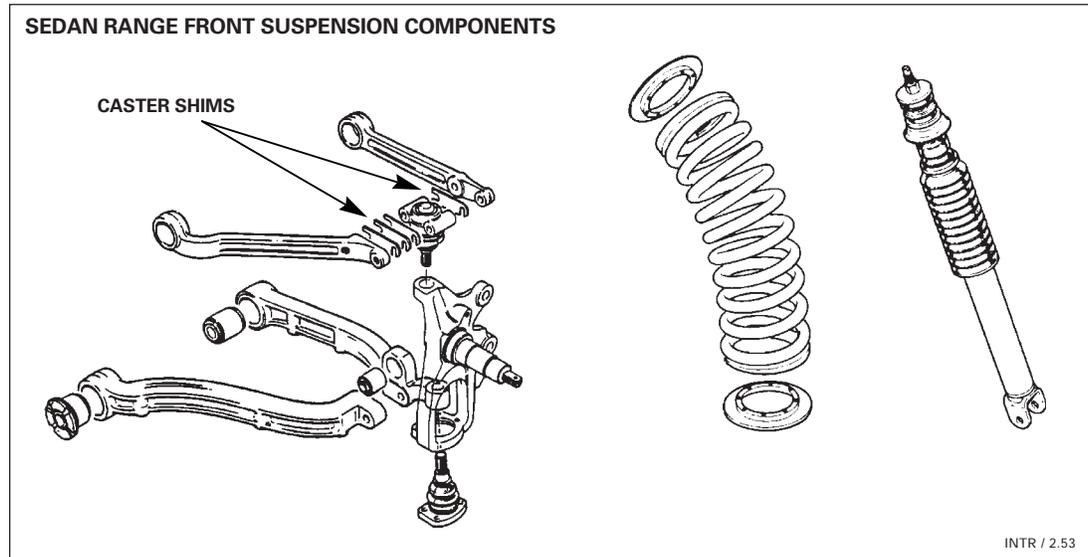


NOTES

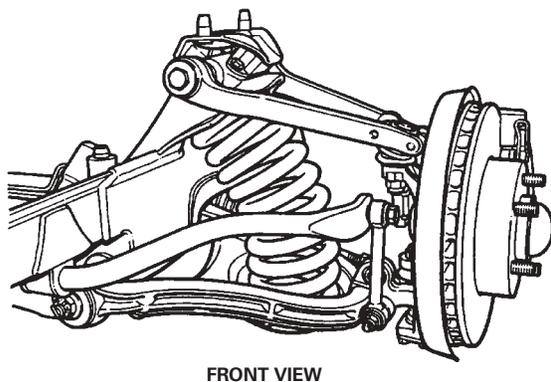
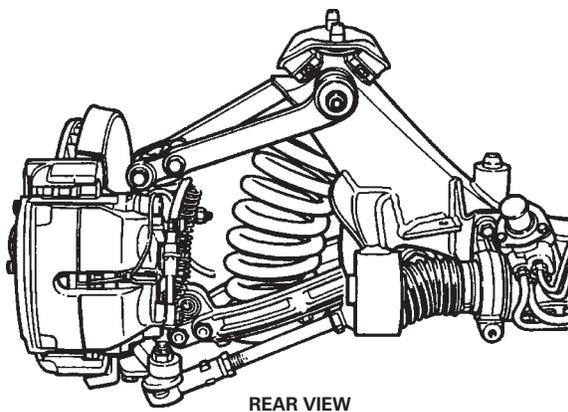
Suspension (continued)

Front Suspension

Both "A" arms are two-piece steel forgings. The upper arm incorporates shims at the ball joint for caster adjustment. There is no adjustment for camber.



XJ12 SEDAN FRONT SUSPENSION



INTR / 2.54A & B

The forged steel hub carrier has a pressed fit stub axle. The hub carrier pivots on nonadjustable sealed ball joints.

The color-coded road springs are installed with matching packings.

Front toe is adjusted by turning the steering tie rods. The steering rack must be centered and the vehicle suspension height must be set with mid-laden tools to check vehicle alignment.

XJ12 Sedan

The XJ12 suspension is of the same design with higher rate road springs and a larger anti-roll bar with revised geometry.

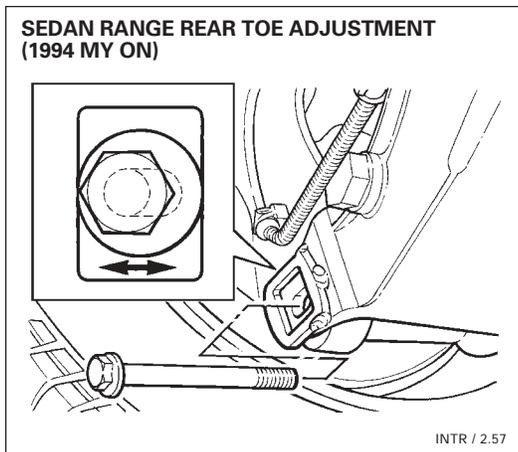
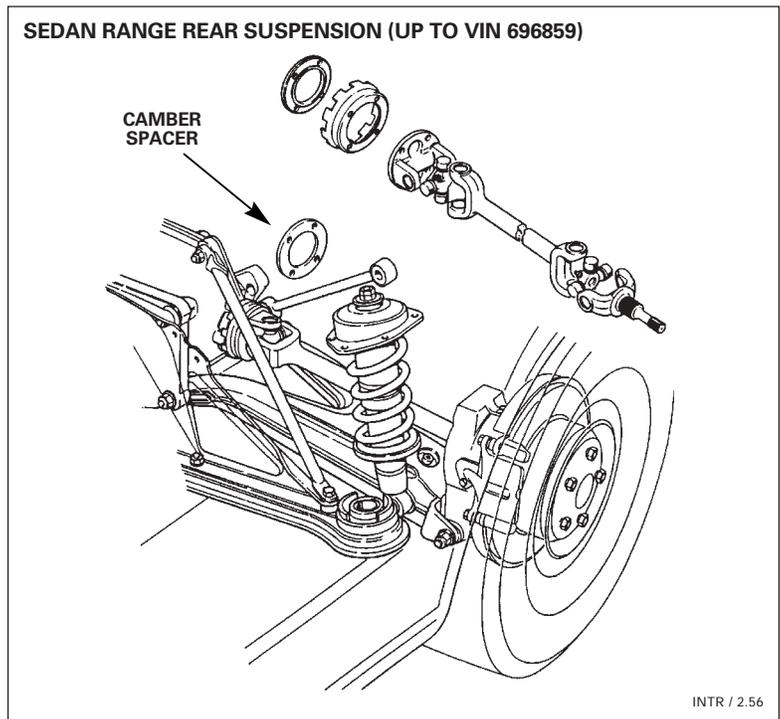
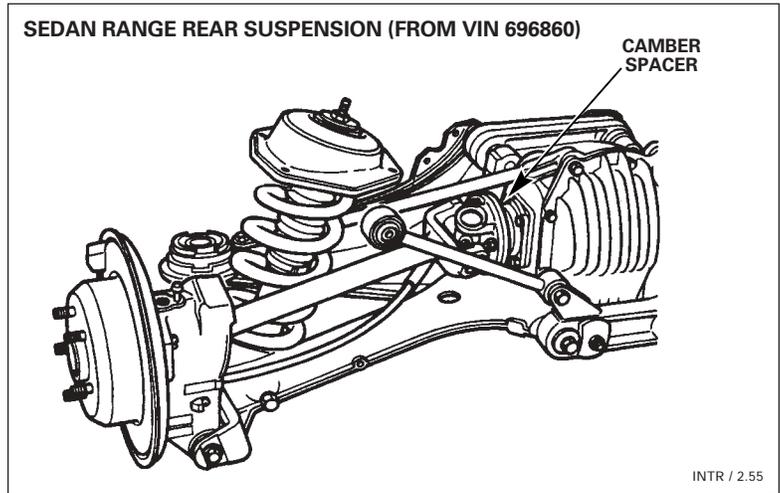
NOTES

Rear Suspension

The rear suspension is a two-link design with the axle shaft acting as the upper control arm. The final drive and rear suspension components are supported in a subframe, which is isolated from the body with rubber bushings. The road spring, which is mounted between the upper shock absorber / spring retainer and the lower wishbone is also isolated from the body.

A separate road spring / shock absorber assembly was fitted to the rear suspension of Sedan Range vehicles up to VIN 696859 (early 1994 MY).

Rear camber is adjusted with spacers between the final drive output flange and the axle shaft inner universal joint. Each axle shaft has two universal joints with grease fittings. Toe is adjusted with an eccentric adjuster at the lower wishbone outer pivot. Before VIN 687219 (start of 1994 MY production), the lower wishbone was fabricated and there was no rear toe adjustment.



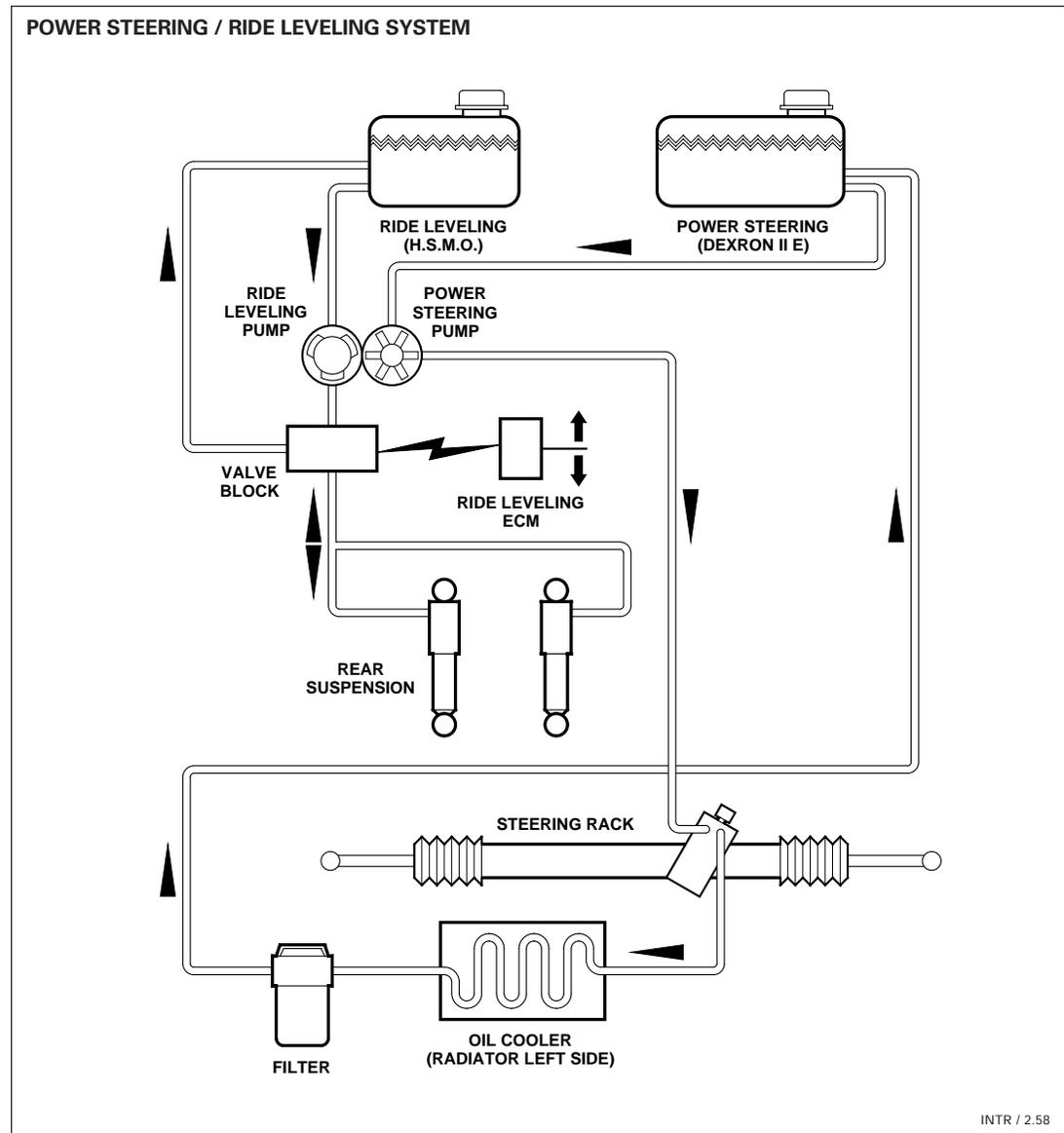
NOTES

Ride Leveling / Power Hydraulics

Depending on model and year, some Sedan Range vehicles were available with a power hydraulic system and ride leveling for the rear suspension. The system utilized an engine-driven pump to provide hydraulic pressure to power ride leveling units. A ride height sensor controlled the hydraulic valve block, which automatically adjusted rear suspension height.

XJ12 Sedan (up to VIN 682122)

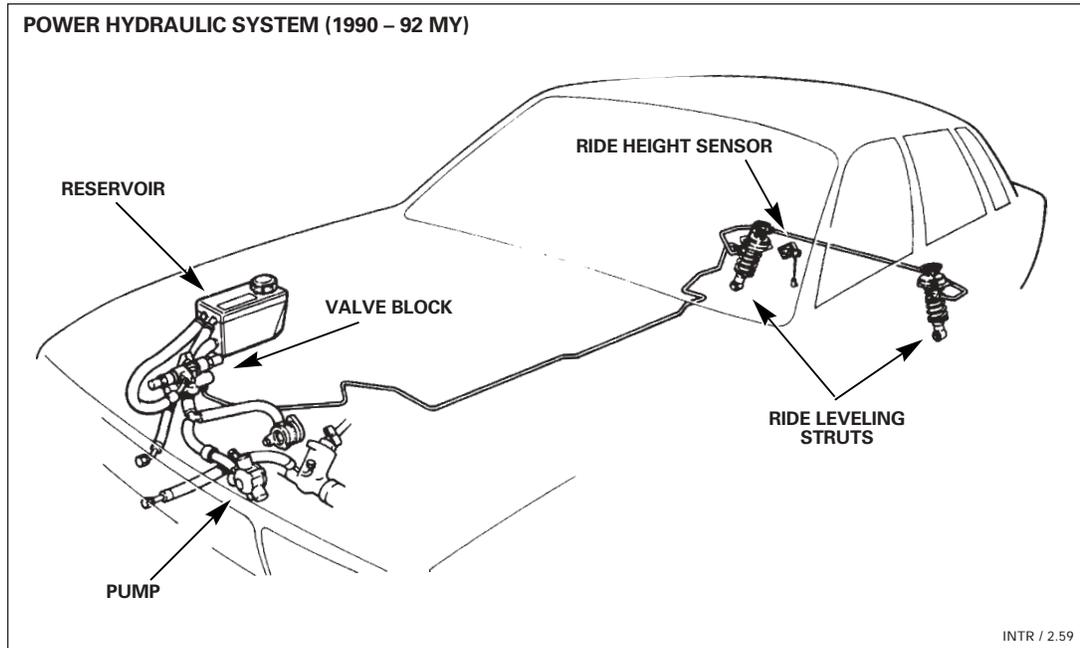
The power hydraulic system supplies pressure for the rear suspension ride leveling system only. A separate reservoir supplies Hydraulic System Mineral Oil (HSMO) to the engine driven ride leveling pump. A separate reservoir supplies Hydraulic System Mineral Oil (HSMO) to the engine driven ride leveling pump.



NOTES

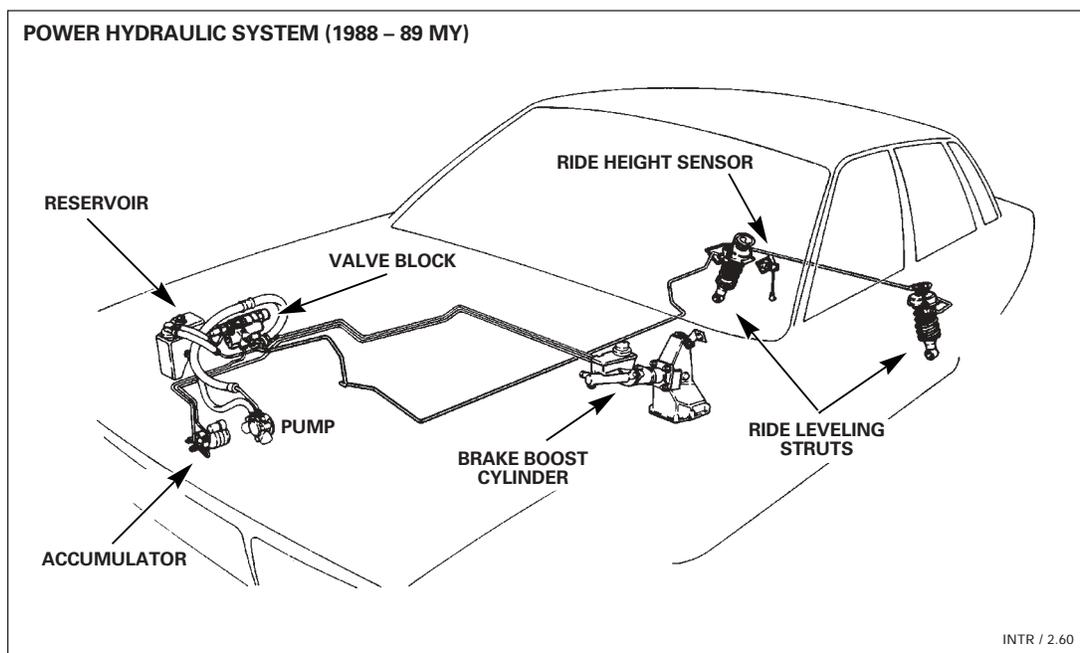
Sedan Range vehicles (1990 – 1992 MY, except XJ6)

The power hydraulic system supplies hydraulic pressure for the rear suspension ride leveling system only. A single reservoir supplies HSMO to both the ride leveling pump and the power steering pump.

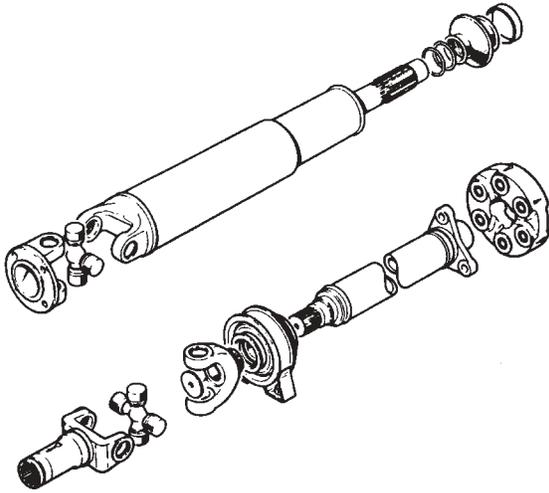


Sedan Range vehicles (1988 – 1989 MY)

A single pump and reservoir supplies hydraulic pressure for both rear suspension ride leveling and brake power boost. The system uses Hydraulic System Mineral Oil (HSMO).



SEDAN RANGE DRIVE SHAFT



INTR / 2.61

Drive Train

Drive Shaft

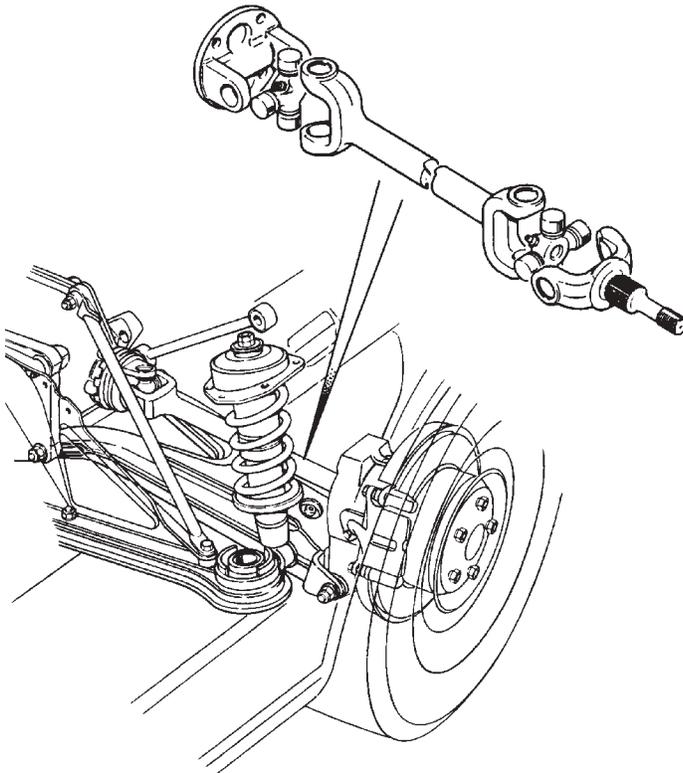
The two-piece drive shaft (propeller shaft) is supported on a center bearing. Sliding splines at the center universal joint allow for engine and transmission movement. Angular movement is compensated for with a front universal joint at the transmission and a flexible composite coupling at the final drive.

Axle Shafts (Drive Shafts)

The axle shafts form the upper link of the rear suspension system and are connected to the rear wheels through a hub and carrier assembly. Disc brakes are mounted outboard. Each axle shaft has two universal joints with grease fittings.

NOTES

SEDAN RANGE AXLE SHAFT



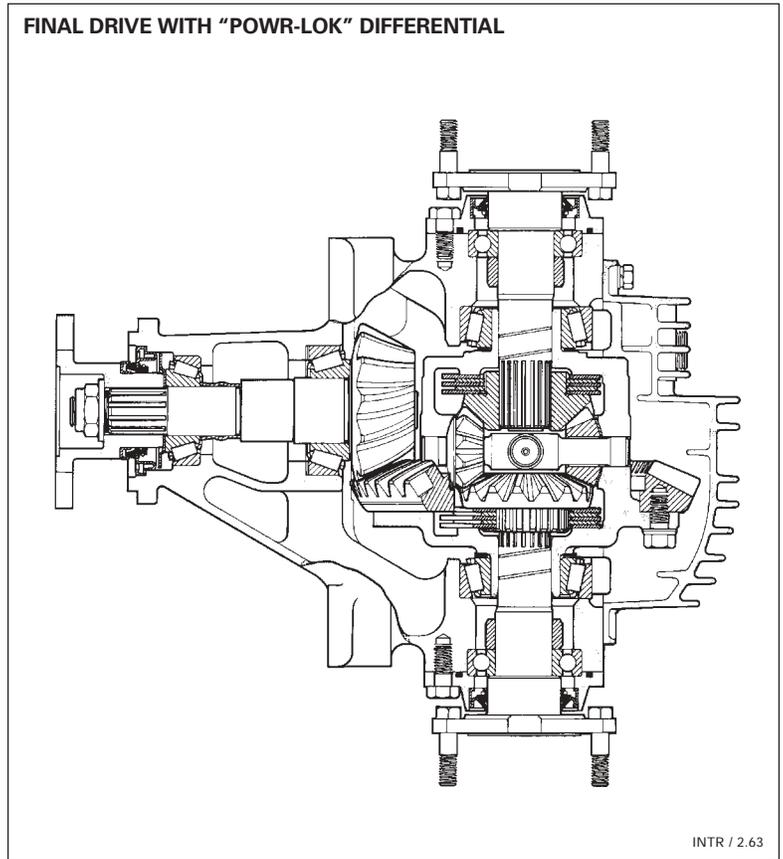
INTR / 2.62

Final Drive

The final drive unit is part of the rear suspension assembly. It is not field serviceable. Two versions of the unit are used: with and without limited slip differential. The limited slip differential ensures drive to both rear wheels in low traction conditions such as snow or ice. Limited slip differentials ("POWR-LOK") are identified with a metal tag stamped "PL" or a tag or sticker marked with an "X".

NOTES

FINAL DRIVE WITH "POWR-LOK" DIFFERENTIAL

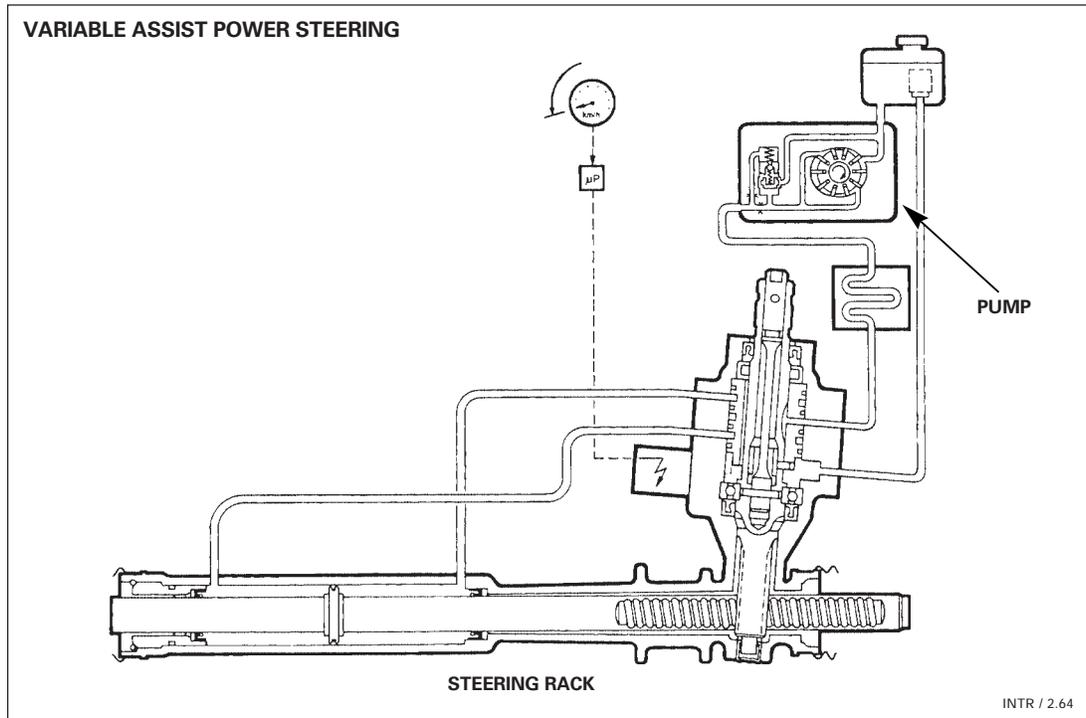


INTR / 2.63

Power Steering

Power assisted rack and pinion steering provides precise control and gives the driver positive feedback from the road. Hydraulic pressure is provided by an engine-driven pump. Oil cooling is provided by a cooler integral with the radiator.

Introduced with the 1995 model year, an electronically controlled variable assist unit provides full power assist during parking and low speed driving. As road speed increases, the amount of steering assist decreases to improve the driver's feel for road conditions.



Earlier vehicles utilized a similar system without electronically controlled variable assist and feedback.

NOTES

Steering Columns

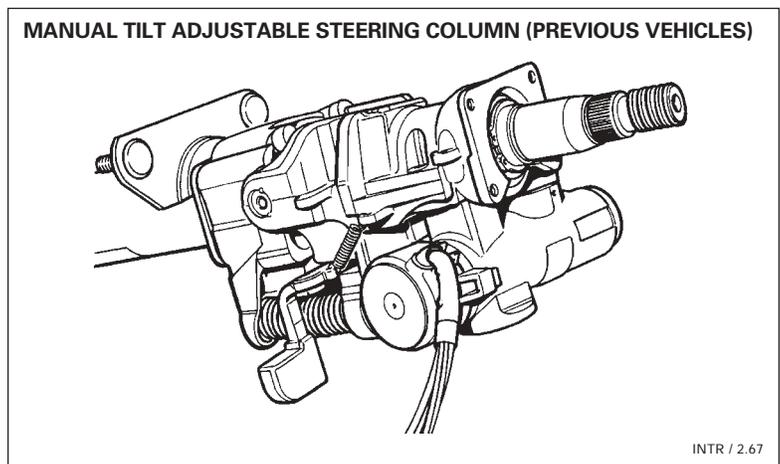
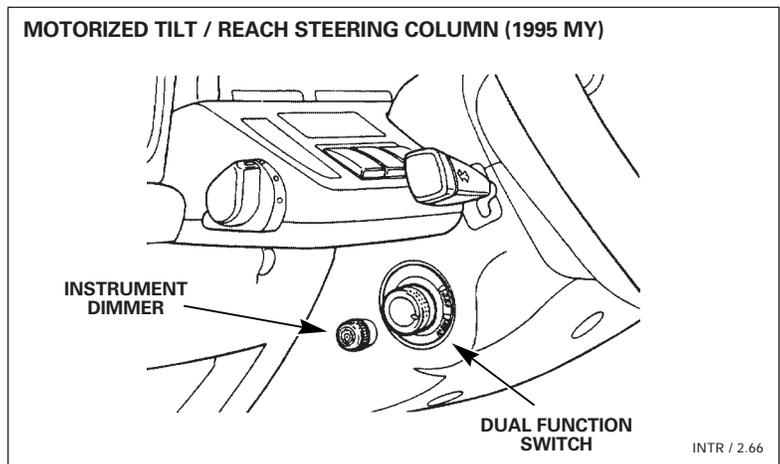
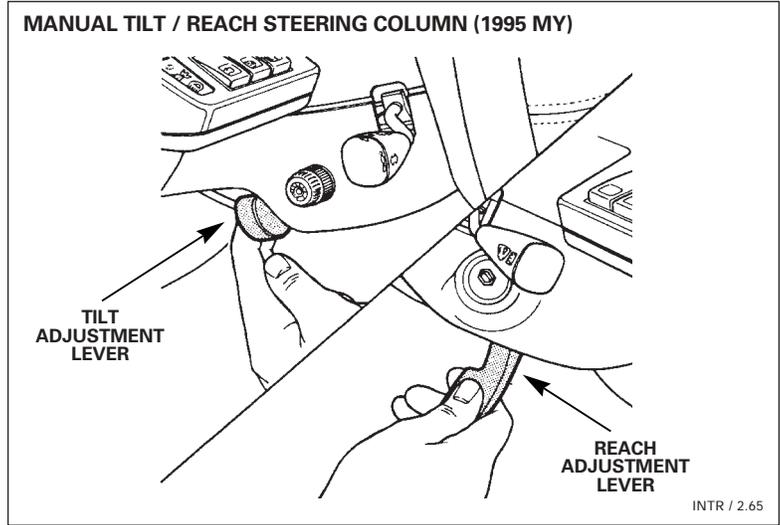
1995 MY ON Sedan Range vehicle steering columns are adjustable for tilt and reach. Manual adjustment models use separate levers for tilt and reach adjustment.

The motorized tilt / reach adjustable steering column is controlled with a dual function switch on the steering column. To adjust tilt, push the switch up to raise the column and down to lower it. To adjust reach, push the switch forward or back.

An entry / exit function moves the seat back and the steering wheel forward and up to ease entry and exit from the vehicle. This function operates when the key is removed from the ignition, or when the driver door is opened. When the key is inserted in the ignition, or when the driver door is closed with the key in the ignition, the steering column and seat will return to their last memorized positions. To stop steering column movement, move the steering column control switch. Automatic seat movement can immediately be stopped by touching the brake pedal or any seat control switch. If the steering column switch is in the OFF position, the entry / exit function will not operate.

Previous Sedans employed a manually operated tilt adjustable steering column.

NOTES



Brakes

Jaguar was a pioneer in the use of the disc brake for automobiles and is still a leader with four wheel anti-lock disc brakes throughout the Sedan and XJS Ranges. Traction control is available on some Sedan Range models.

The braking system on Sedan Range vehicles features ventilated discs front and rear with drum type parking brakes.

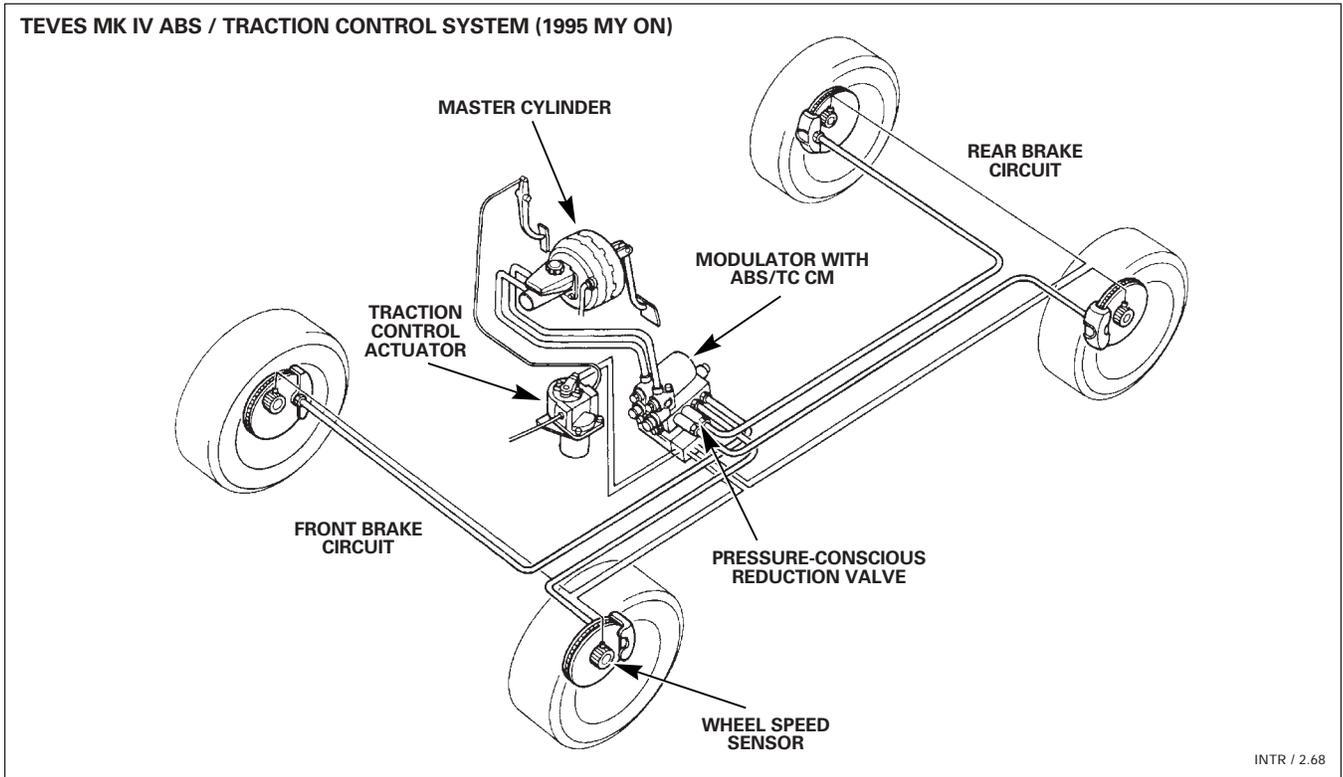
Anti-lock Braking (ABS) and Traction Control

Anti-lock braking helps the driver to retain steering control even during emergency braking on slippery road surfaces. Traction control improves tire adhesion and assists in maintaining straight line stability under acceleration.

Teves MK IV ABS (1995 MY ON)

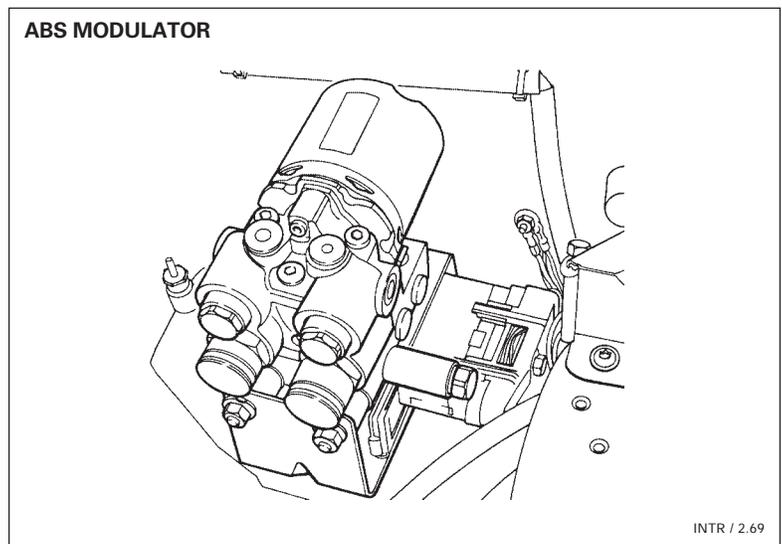
The Teves MK IV ABS system introduced on the 1995 MY Sedan Range combines normal system operation and anti-lock braking. The system uses a conventional brake master cylinder with vacuum assisted boost. An ABS modulator, incorporating an electrically-driven pump, valve body and control module (CM), modulates brake pressure based on input signals from wheel speed sensors. Each road wheel is equipped with a wheel speed sensor. Three hydraulic circuits are used – one to each front wheel and one to the rear wheels. The system is continuously monitored by the control module. If a fault occurs within the ABS system, the anti-lock warning light will illuminate and the brake system will still operate conventionally. ABS faults are diagnosed via serial communication with PDU.

NOTES



During normal braking the ABS modulator has no effect on the braking system. If during braking the CM senses a wheel approaching lock up, the system modulates the pressure to the hydraulic circuit of that wheel so that adhesion between the tire and the road surface is maintained under all driving conditions.

NOTES



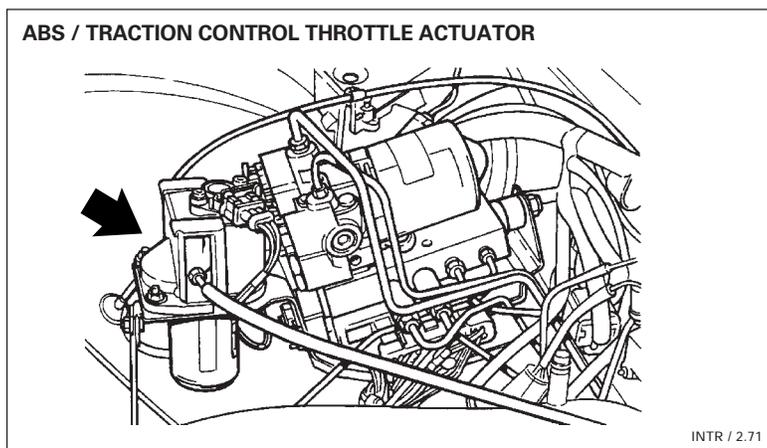
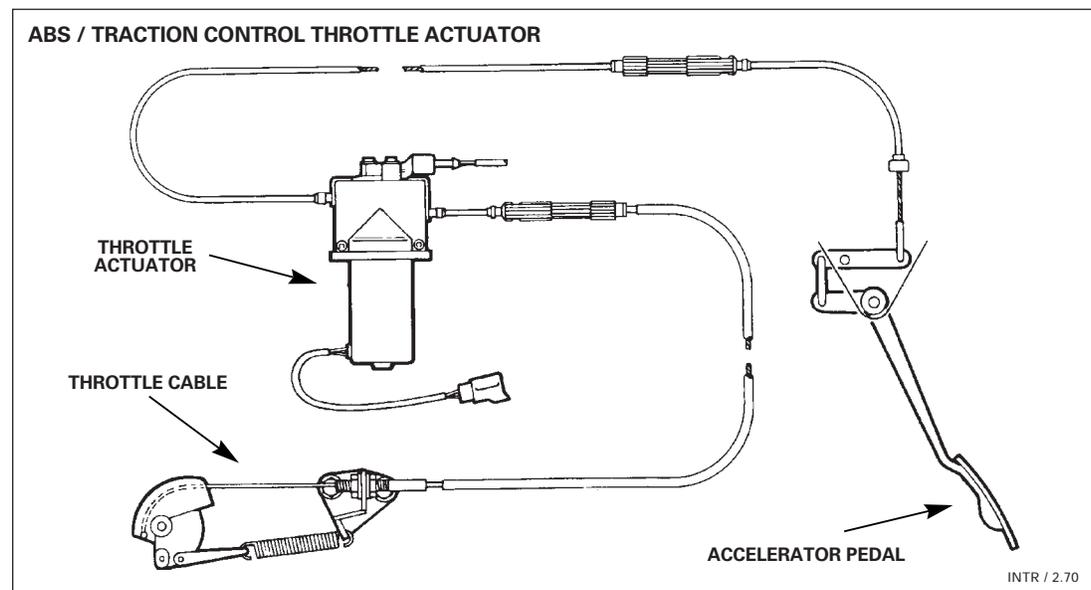
Anti-lock Braking (ABS) and Traction Control (continued)

Teves MK IV ABS / Traction Control

The Teves MK IV ABS / Traction control system integrates drive wheel traction control in the ABS / TC control module. When a wheel or wheels rotate slower than the comparative norm, the ABS / TC CM activates the ABS function. When one drive wheel rotates faster than the other, the ABS / TC CM activates the traction control function. If a fault occurs within the traction control system, the anti-lock warning light will illuminate. Traction control faults are diagnosed via serial communication with PDU.

The traction control system has an additional rear brake hydraulic circuit allowing independent control of the rear brakes and a throttle control actuator to modulate throttle opening thereby reducing torque to the rear wheels. Traction control is automatically switched on at each engine start. It can be switched off by pressing the TRAC switch on the right side of the fascia switch pack. A TRACTION OFF light remains illuminated when the system is off. Pressing the TRAC switch again or restarting the engine will turn traction control on again.

When a drive wheel starts to rotate faster than the other, the system applies brake pressure to the spinning wheel and reduces torque by regulating throttle opening via the throttle control actuator. If cruise control is engaged it will be disengaged if traction control activates.



NOTES

Teves MK II ABS (1990 – 94 MY)

The Teves MK II ABS system combines normal system operation, power boost and anti-lock braking. The system uses an independent electrically-driven motor pump unit to provide both boost pressure and brake application pressure. DOT 4 brake fluid is used for both power boost and brake application.

The MK II system uses three hydraulic circuits: one to each front wheel and one to the rear wheels.

During normal operation the two front wheels operate conventionally via the master cylinder assisted by the hydraulic booster. The rear circuit is operated continuously by the controlled pressure in the booster via the pressure reducing valve.

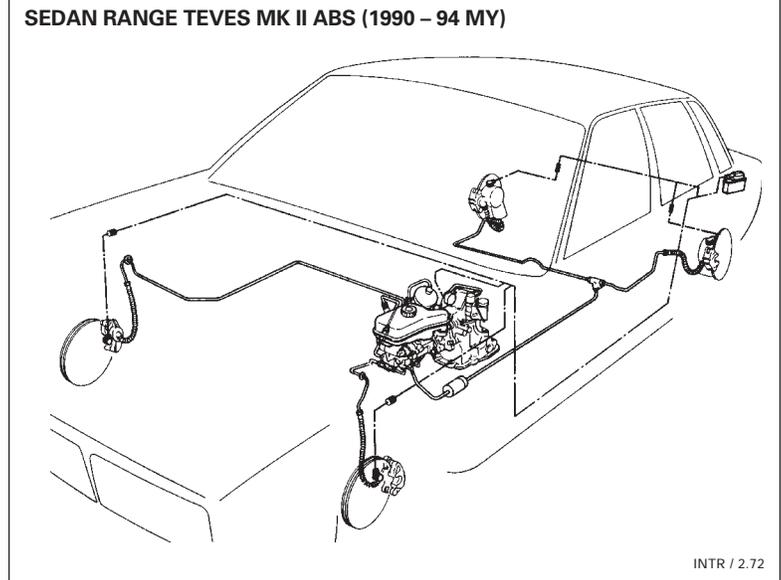
When anti-lock is required, the front circuits become "dynamic" as boost pressure replaces master cylinder pressure via the main valve in the valve block. The four road wheel speed sensors input to the ABS electronic control module, which processes the information and modulates the three sets of solenoid valves to control brake pressure in the three hydraulic brake circuits to prevent wheel lock. If a fault occurs within the ABS system, the anti-lock warning light will illuminate and the brake system will still operate conventionally. If a fault occurs with the hydraulic boost portion of the system, the brake system will function on the front wheels only, without boost pressure.

ABS faults can be interpreted from the flashes on the anti-lock warning light or accessed via serial communication with JDS / PDU.

Brake System Warnings

Additional brake system warning lights are provided as follows, depending on the model year of the vehicle.

- Low fluid level
- Low boost
- Pad wear

**NOTES**

Climate Control Systems

Jaguar climate control systems offer automatic control of temperature, blower speed and air distribution to provide optimum comfort to the vehicle occupants. The systems use the vehicle heating and air conditioning systems to provide the warm or cool air. Using advanced electronic components and microprocessor controls, the climate control system mixes the air to the desired temperature and distributes it as required to maintain a continuously comfortable environment. Manual controls are provided to override the automatic settings.

Since the 1993 MY, Jaguar has used HFC R134a refrigerant to reduce harm to the earth's ozone layer.

Nippon Denso Climate Control System (1995 MY ON)

System Operation

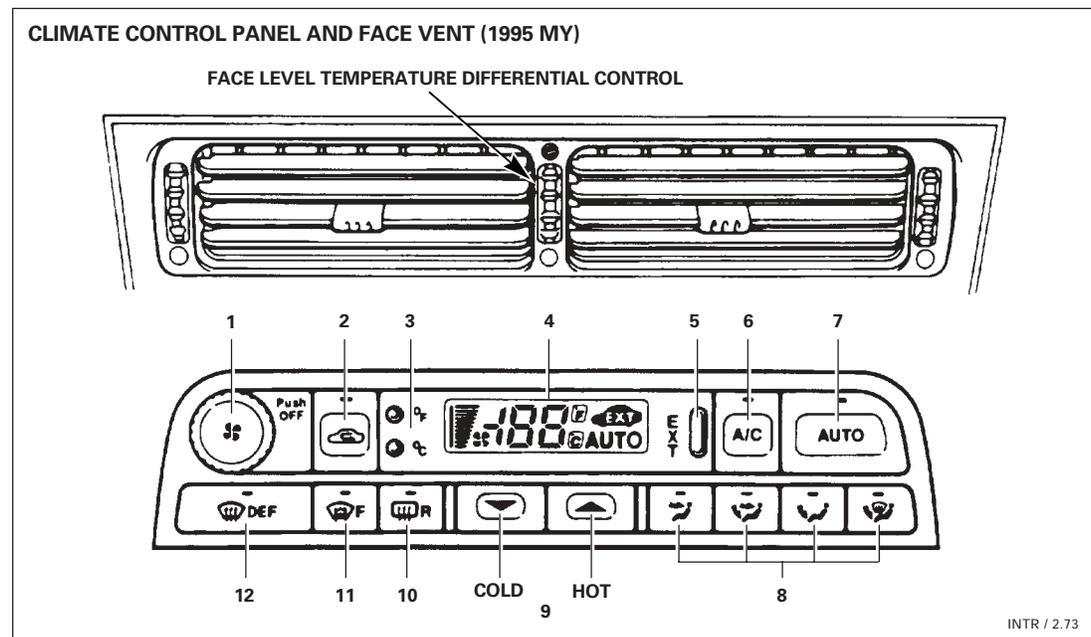
Switch ON the system by pressing one of the following:

AUTO Full automatic operation – the blowers will not operate in the heating mode if the engine coolant temperature is below 30° C (86° F).

DEF Defroster operation – maximum temperature, blower speed and air to the windshield.

A/C Switches the system on to the last programmed setting with the A/C on – Full operation of temperature, air volume and distribution.

PUSH ON Push to turn the system on (full automatic operation) or off – rotating the knob overrides automatic and selects a blower speed range.



NOTES

Controls

Numbers refer to the illustration at left.

- 1 OFF
 - push to operate
 - Manual blower speed, rotate
 - Blower speed varies with road speed to maintain constant air flow at any setting
- 2 Manual recirculation
 - press / release gives timed 5 minute recirculation
 - press / hold for 2 seconds gives continuous recirculation until the switch is again pressed / held for 2 seconds
- 3 Centigrade / Fahrenheit selection
- 4 Display
- 5 Outside temperature
- 6 A/C OFF; A/C ON to the last setting
- 7 Automatic operation
- 8 Manual air distribution controls
 - Face level
 - Bi-level
 - Foot level
 - Defrost and foot level
- 9 Temperature selection
 - increase (hotter)
 - decrease (cooler)
- 10 Heated rear window and side mirrors
 - 20 minutes timed, operates only with the engine running
- 11 Heated windshield and side mirrors (where fitted)
 - 6 minutes timed, operates only with the engine running
- 12 Defrost
 - System on in defrost
 - Maximum air flow to windshield
 - Windshield heater on (if fitted)
 - Press DEF or AUTO to return to last setting
 - Manual blower control overrides defrost blower speed

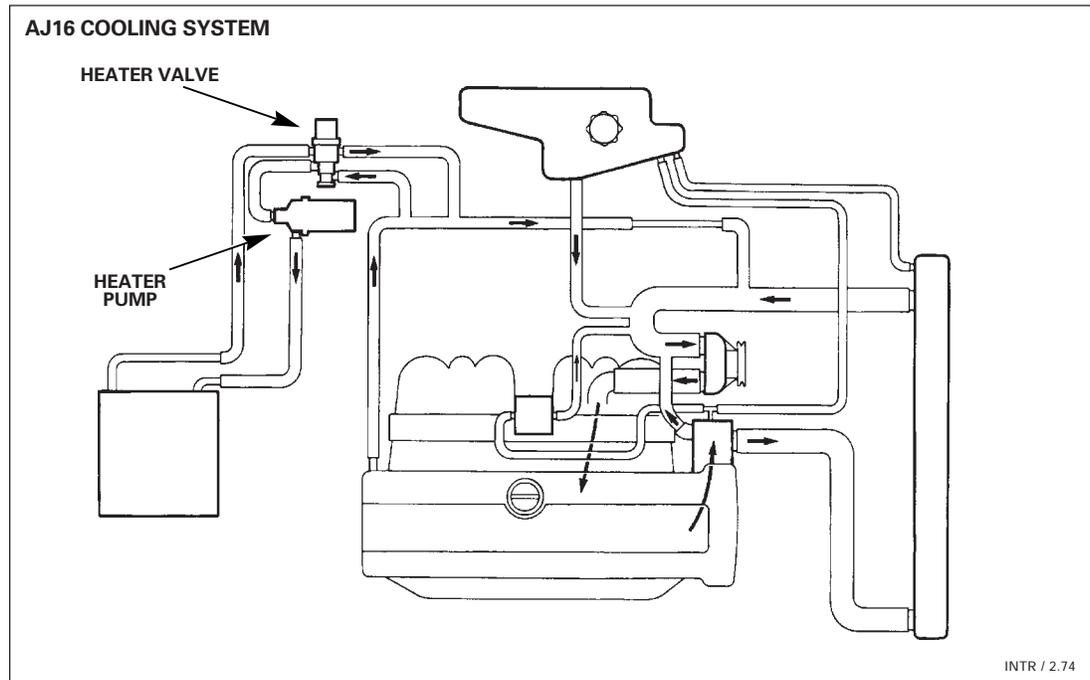
The climate control system has a self-diagnostic function that will display fault information on the system panel display. Refer to the Service Manual for further details. Faults can be diagnosed via serial communication with PDU.

NOTES

Nippon Denso Climate Control System (1995 MY ON) (continued)

Heating System

Engine coolant circulates through the heater core via a solenoid control valve and electric pump. The electric pump maintains a flow of coolant through the heater core that does not depend on engine speed. The solenoid valve opens and closes to maintain a constant heater core temperature.

**Refrigeration System**

The HFC R134a air conditioning system is of conventional design.

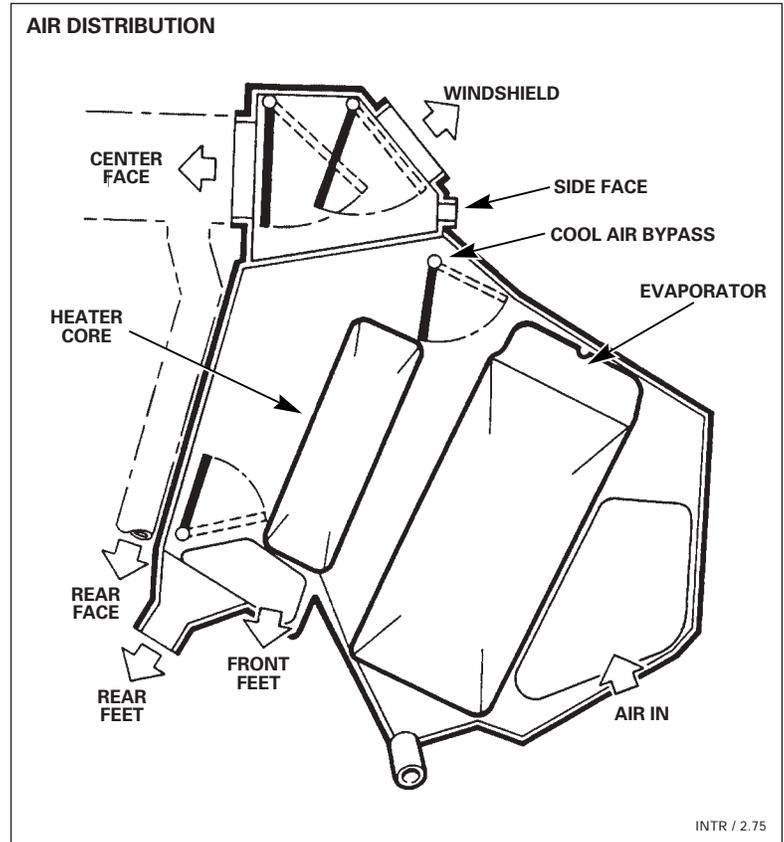
NOTES

Air Distribution and Control

Manual inputs from the climate control panel and automatic inputs from various sensors are received by the air conditioning control module (A/C CM). Using these inputs, the A/C CM provides the required power outputs to drive the servos, blowers, and other climate control components.

All air passes through the A/C evaporator, where it is cooled. The cool air bypass flap controls the temperature by routing the cold air through or around the heater core. Air distribution is controlled by a system of servo drive flaps that allow the blended air flow to the upper, lower and windshield ducts.

NOTES

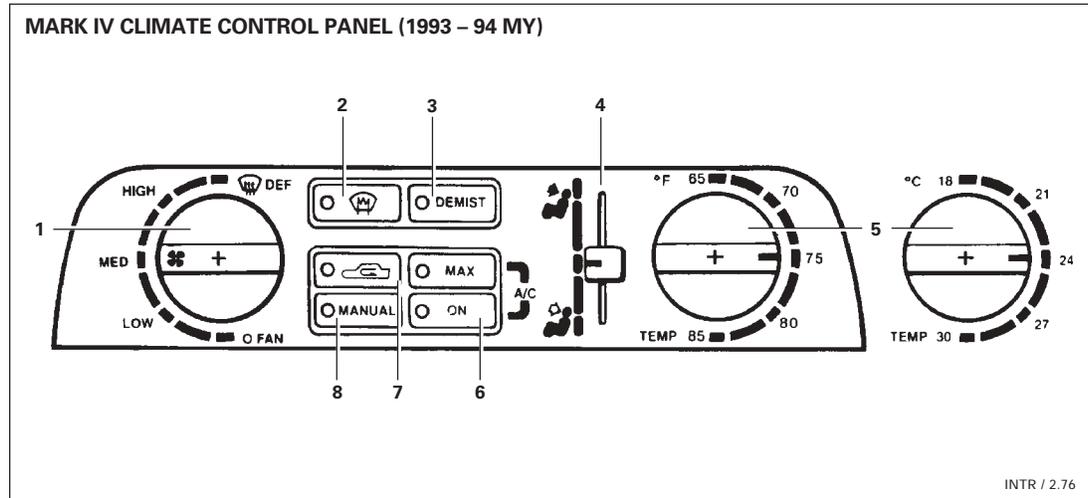


Mark IV Climate Control System

Mark IV Climate Control System (1993 – 1994 MY)

This system utilizes an HFC R134a refrigerant system that is more compatible with the environment than the former CFC R12 refrigerant system. HFC systems require components that are compatible with the refrigerant.

A vacuum-operated engine coolant valve allows coolant circulation through heater core. The refrigeration system cools the evaporator. All air passes through the evaporator and is then blended with heated air to control the vehicle environment.



NOTES

Controls

Numbers refer to the illustration at left.

1 LOW

The climate control module (CM) controls blower speeds within the low speed range depending on temperature requirements

MED

The climate control module (CM) controls blower speeds within the entire speed range depending on temperature requirements

HIGH

The blowers run at high speed only

DEF

The blowers run at high speed with full air flow and heat to the windshield

2 HEATED WINDSHIELD CONTROL (optional)

If DEFROST (1) is selected the heated windshield is automatically activated
If activated manually, the windshield will switch off after 6 1/2 minutes unless switched off manually

3 DEMIST CONTROL

Operates the defrost flap to provide air to the windshield with no change in air temperature

4 FACE LEVEL TEMPERATURE CONTROL

Moving the slide up reduces the temperature of the face level air as compared to the footwell air

5 TEMPERATURE CONTROL

Automatic Mode – In-car temperature is selected
Manual Mode – Vent outlet temperature is selected

6 A/C MAX

Maximum cooling and the highest blower speed

A/C ON

Automatic temperature and blower speed control

7 RECIRCULATION CONTROL

Shuts off outside air intake

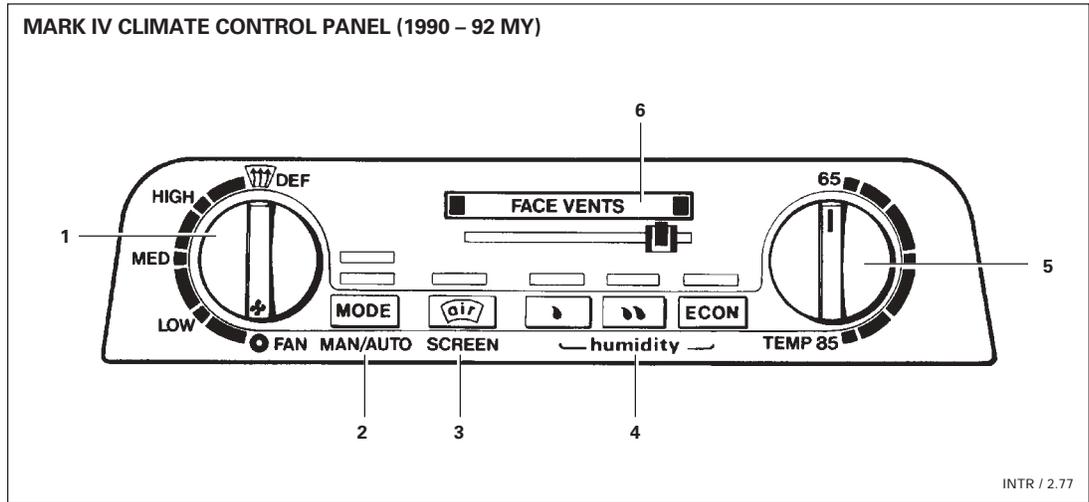
8 MANUAL

Overrides the automatic temperature control portion of the system

NOTES

Mark IV Climate Control System (continued)

Mark IV Climate Control System (1990 – 1992 MY)



NOTES

Controls

Numbers refer to the illustration at left.

1 OFF

The system is off. Recirculation flaps are closed to prevent outside air from entering the vehicle

LOW

The climate control module (CM) controls blower speeds within the low speed range depending on temperature requirements

MED

The climate control module (CM) controls blower speeds within the entire speed range depending on temperature requirements

HIGH

The blowers run at high speed only

DEF

The blowers run at high speed with full air flow and heat to the windshield.

2 TEMP

MODE switched to AUTO – In-car temperature is controlled to temperature selected

MODE switched to MAN – Vent outlet temperature is controlled to the temperature selected

3 SCREEN

Demist air to the windshield with no change to air temperature

4 HUMIDITY

ALL OFF – Evaporator temperature is controlled between 32° to 32.5° F (maximum dehumidification)

ONE DROP – Evaporator temperature is controlled between 39° to 39.5° F (less dehumidification)

TWO DROPS – Evaporator temperature is controlled between 44.8° to 45.2° F (less dehumidification)

ECON – The A/C compressor is switched off

5 TEMP

Temperature control

6 FACE VENTS

The temperature of the two outside fascia vents is controlled

– Full left decreases the side vent temperature

– Full right increases the side vent temperature

NOTES

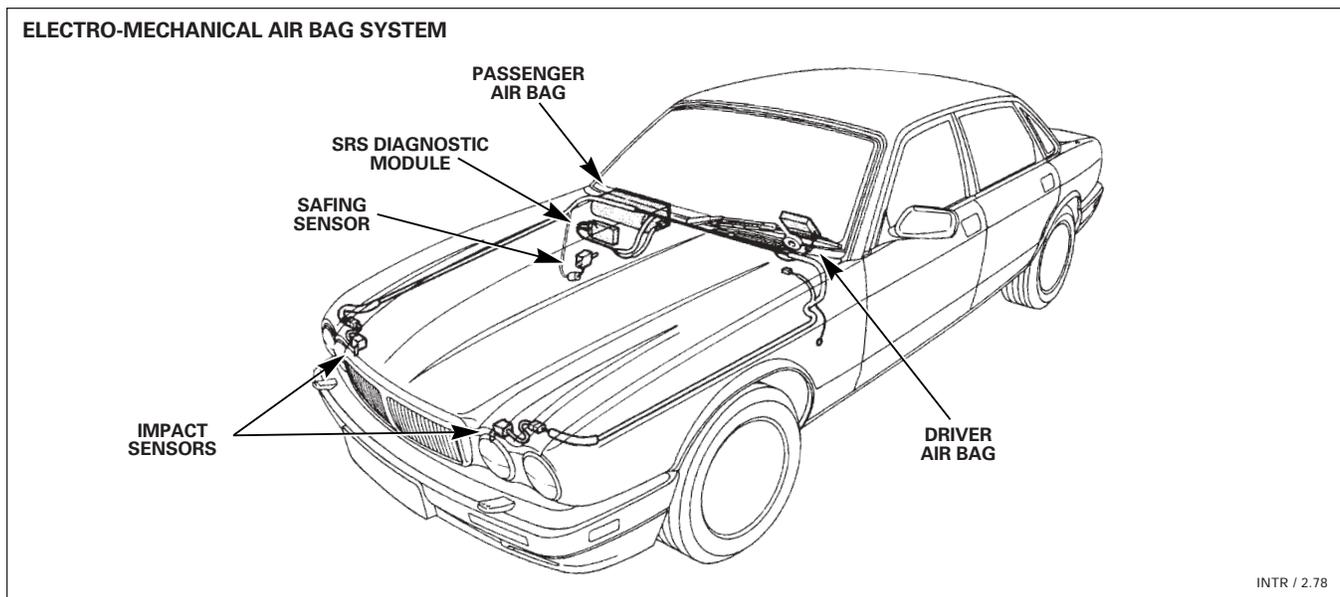
Occupant Protection

Occupant Protection Systems

Depending on the model year, all Sedan Range driver and front passenger positions are equipped with active three-point seat belts, passive two-point diagonal seat belts with separate lap belts, or three-point active seat belts combined with air bag supplementary restraints systems (SRS). The two outboard rear seat passenger positions are equipped with active three-point seat belts. The center position is equipped with a lap belt system.

Driver and Front Passenger Occupant Protection Systems Summary

Model year	Passive Restraints	Mechanical Air Bag	Electro-mechanical Air Bag
1989 – 92	Driver and passenger		
1993		Driver side	
1994		Driver and passenger	
1995			Driver and passenger



Electro-Mechanical Air Bag SRS

This occupant protection system consists of an electromechanically sensed air bag and a three-point tear-loop style seat belt for both the driver and the front seat passenger. Refer to page 64 for a description of the tear-loop seat belt.

A diagnostic module monitors the system and controls the SRS AIR BAG WARNING LIGHT MIL. The module contains a one minute power reserve to fire the air bags during impact even if main power is lost. The system utilizes a dedicated wiring harness, colored yellow for identification.

⚠ WARNING: Read the service instructions in the Service Manual and observe all safety precautions before attempting to service the steering wheel or any air bag SRS components.

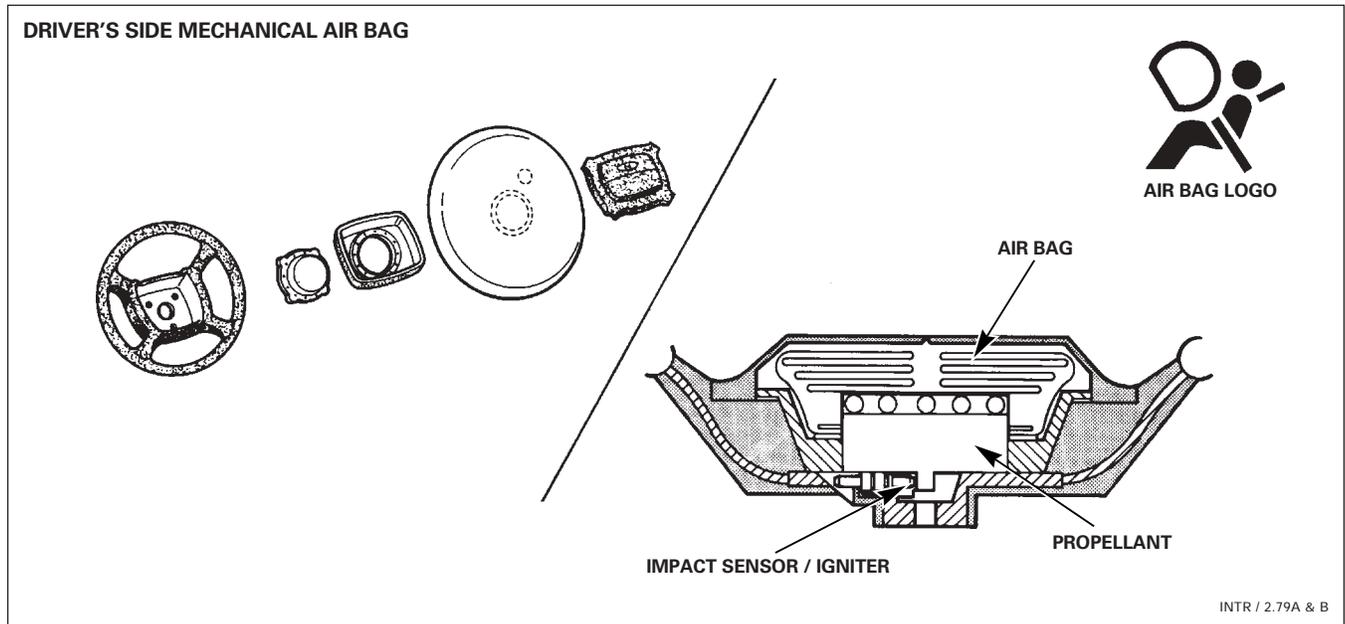
Two impact sensors and a safing sensor trigger air bag deployment. For the system to fire, the ignition must be in position II and at least one impact sensor and the safing sensor must be activated.

To disarm the system, disconnect the negative battery cable and wait one minute for the power reserve charge to dissipate.

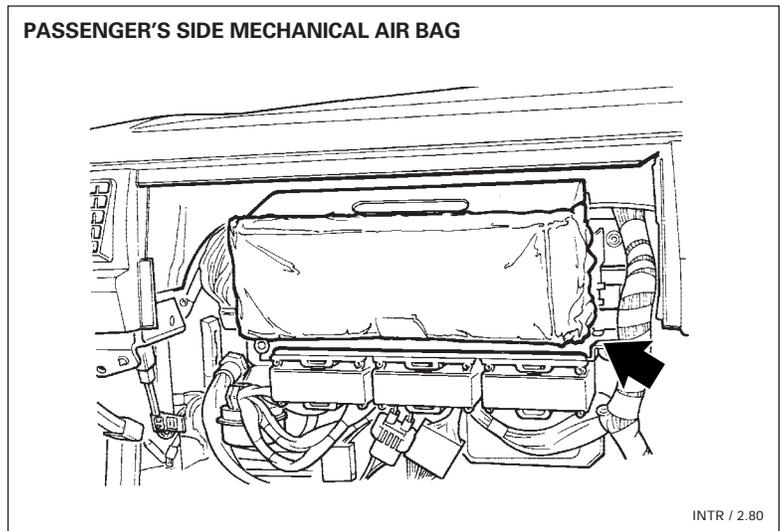
Mechanical Air Bag SRS (1993 MY Driver Side, 1994 Driver and Passenger Side)

A mechanically sensed air bag SRS utilizes a self-contained air bag module. A three-point tear loop style seat belt is an integral part of the system. The mechanically sensed air bag SRS and a tear loop style seat belt are fitted to the driver side or both front positions depending on model year.

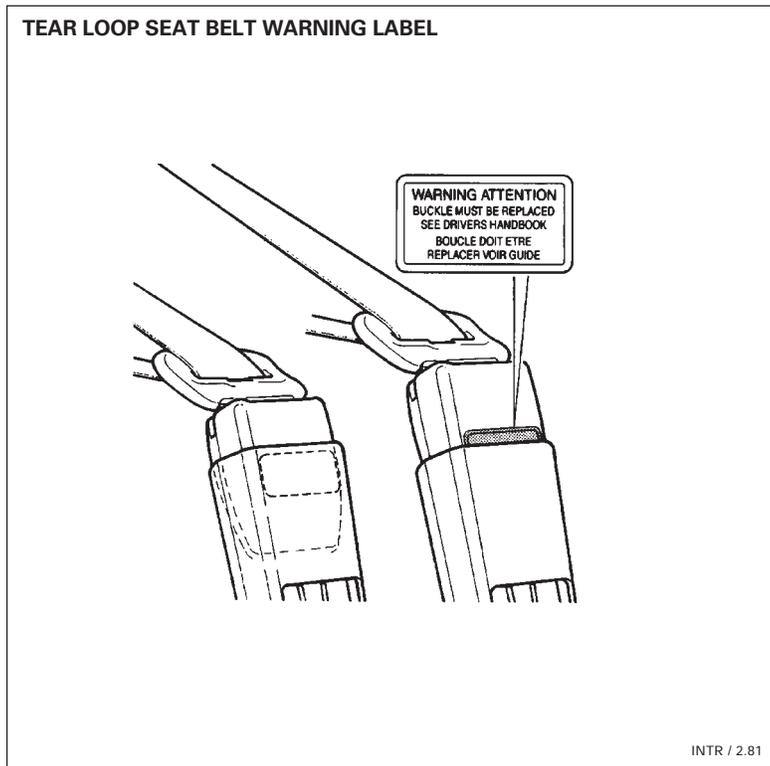
⚠ WARNING: Read the service instructions in the Service Manual and observe all safety precautions before attempting to service the steering wheel or any air bag SRS components.



NOTES



Occupant Protection Systems (continued)

**Front Seat Belts**

The three-point active seat belts utilize an adjustable shoulder anchor point.

Air bag SRS equipped vehicles utilize tear loop units on the air bag equipped position seat belts to reduce occupant chest loads in the event of a collision. The tear loop unit is designed to absorb energy as the occupant travels forward into the air bag. The tear loops are on the drivers outboard belt anchorage and the passengers seat belt buckle. Do not interchange seat belts. Use only the specified belt for the restraint system and position. If the tear loop warning label is visible, the belt assembly must be replaced.

The front passenger seat belt retractor in 1995 MY Sedans has 2 operating modes. The normal inertia mode allows the occupant freedom of torso movement while restrained. The static reel mode prevents belt outward movement. Static reel mode is used to secure child seats. To engage this mode, pull the belt all the way out. As the belt is fed back into the reel, the ratchet prevents the belt from reversing direction. To reset to the normal mode, allow the belt to fully retract, which disengages the ratchet.

Rear Seat Belts

The rear outboard seating positions are equipped with three-point seat belts.

The two outboard seat belt retractors in 1995 MY Sedans also have a static reel mode to secure child seats and a normal inertia mode. The retractors function as described above.

NOTES

Passive Restraint Seat Belt System

The passive restraint system is provided for the driver and front passenger. The system consists of a two-position adjustable diagonal seat belt fed from an inertia reel mounted on the inside seat slide. The diagonal belt is connected to a motorized runner on the upper door opening. An independent lap belt fed from an inertia reel, mounted on the outside seat slide, connects manually to the anchor on the inside seat slide.

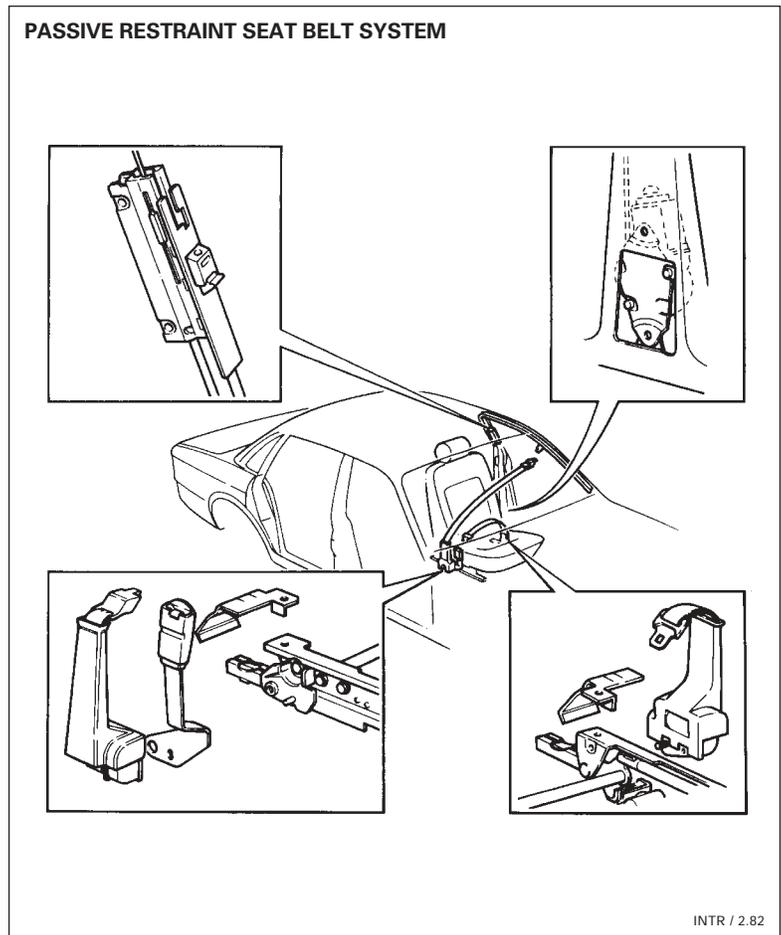
The motorized diagonal belts move to the restrained position when the respective front door is closed and the ignition is turned to position 2 or 3. The passenger belt operates with the seat empty. Both belts move to the unrestrained position when the ignition is turned to position 1 or off.

If a front door is opened with the ignition in position 2, that belt will move to the unrestrained position. In reverse with the drivers door open and the ignition in position 2 or 3, the belt remains in the restrained position. If the inertia switch trips with the ignition on, the belts will remain restrained and the doors will unlock.

An emergency release is provided on the shoulder end of the diagonal belt.

Inertia Switch

In the event of impact, the inertia switch shuts off all ignition switched circuits and the fuel pump(s).



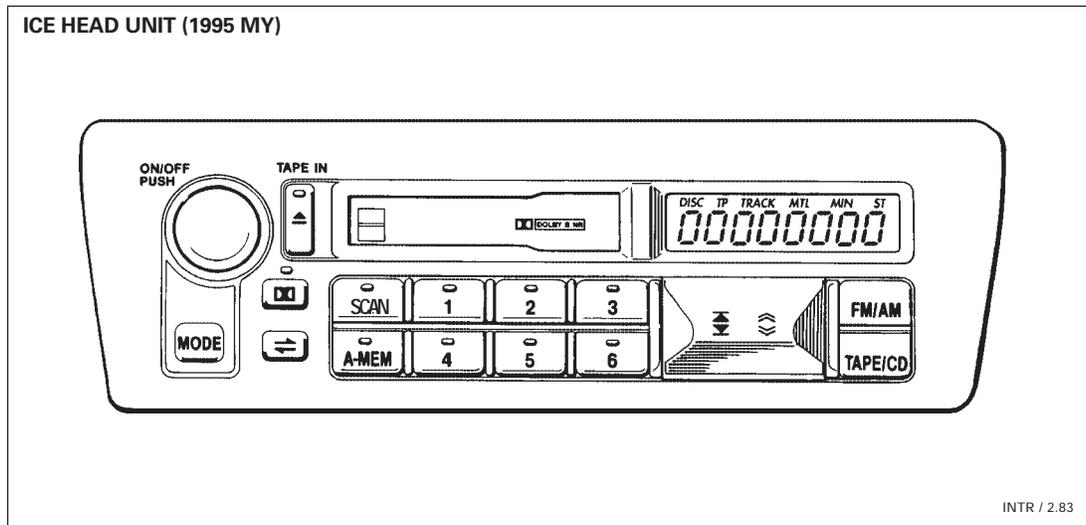
NOTES

Electrical / Electronic

In-Car Entertainment (ICE)

ICE Systems (1995 MY)

The 1995 MY ICE system does not require recoding if the radio is disconnected from battery power; in addition, preset radio station information is stored in nonvolatile memory. It is not necessary for the technician to note the preset radio stations before disconnecting the battery to perform service. Refer to the service literature or the vehicle owners literature package for complete ICE operating instructions.

**Standard ICE system features**

- AM / FM Stereo
- 80 Watt
- Dolby Tape
- 8 Speakers
- Optional CD Autochanger
- Automatic volume control raises the volume as road speed increases. When the system is turned on, the volume fades up to the preset volume level.

Memory 6 AM / 6 FM stations with Extra Memory (X-MEM) – 6 additional AM and FM stations

Premium ICE system features (standard on XJ12 and XJR Sedans)

- AM / FM Stereo
- 240 Watt
- Dolby Tape
- 9 Speakers
- CD Autochanger

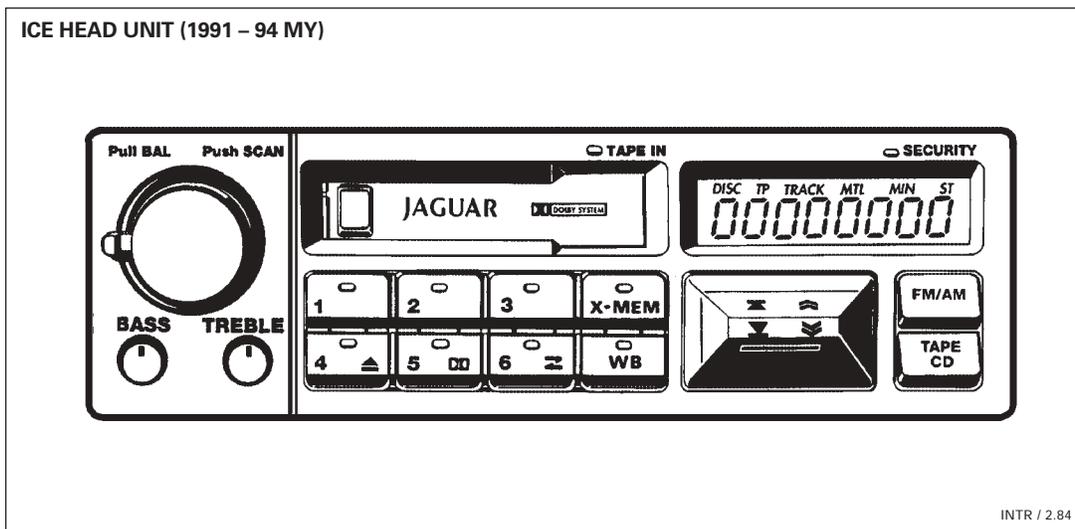
Memory 6 AM / 6 FM stations with Extra Memory (X-MEM) – 6 additional AM and FM stations

NOTES

ICE System (1991 – 1994 MY)

The ICE system fitted to vehicles from 1991 – 1994 MY is equipped with a radio security function that renders the radio inoperative if it is disconnected from battery power. To restore operation, the correct code for the radio must be entered when the radio is reconnected. In addition, the preset and X-MEM radio stations are stored in volatile memory.

When servicing these vehicles, always assure that the radio code is available if the battery is to be disconnected. Also, always note the positions of all preset radio stations and X-MEM stations before disconnecting the battery. When the radio is restored to operation, reset the radio preset and X-MEM stations.



ICE system features

- AM / FM Stereo
- 80 Watt
- Dolby Tape
- Weather Band
- Security Coded
- Optional CD Autochanger

Memory 6 AM / 6 FM stations with Extra Memory (X-MEM) – 6 additional AM and FM stations

Radio security function coding If power drops below 5V the radio will display "CODE" and require recoding. After power is restored, enter the four-digit radio security code with the preset buttons.

If three incorrect security code entries are input, the radio will display "WAIT" and will not accept another entry until one hour has passed with the power on.

Programming preset stations Manually select the station. Press/hold the button for 2 seconds until the radio "beeps".

Extra Memory (X-MEM) Press / hold the X-MEM button for more than 2 seconds. The radio will full scan and automatically program 6 strong stations into memory, then "beep." Pressing X-MEM again cycles the radio back to the original preprogrammed stations.

CD Autochanger with 6-CD magazine The radio displays the disc number and track. The scan button scans the disc. Disc selection is controlled in CD mode with the radio preset buttons.

Vehicle Security

Keys

Jaguar uses a "Tibbe" style key. "Tibbe" keys must be duplicated by Jaguar or a Jaguar dealer with special equipment.

Two master keys are provided. Master keys have black heads. The master keys operate the doors, trunk and ignition. One green-headed key is provided for valet parking use. The green-headed key operated the doors and ignition only; it will not open the trunk.

A valet switch in the center console inhibits the operation of the remote trunk release button.

NOTE: Any "Tibbe" key will lock any lock. Only the key for the vehicle will unlock the lock.

Security Systems

Factory-fitted security systems have various features depending on the model year of the vehicle. Some of the features are dealer programmable. Refer to the service literature or the security system information in the vehicle owners literature package for specific information.

Security System Coding

The security system control module is programmed (coded) for the owner's transmitters. If the transmitter batteries fail or are removed for a period of time, the system will require recoding. Refer to the service literature for specific system coding procedures.

NOTES

Security System Operation (1995 MY)**Locking**

Key	Turn to lock and release – locks doors, trunk, fuel filler, and arms the system. Hold key in lock position for 2 seconds – closes open windows and sliding roof.
Remote transmitter	Press large button once (red indicator light) – locks doors, trunk, fuel filler, and arms the system. Produces audible signal and 1 flash of sidelights. Press again within 3 seconds – headlights on for 25 seconds
Remote “Panic mode” (dealer programmable)	Hold any button for 3 seconds – unlocks, disarms and triggers full alarm. Cancel by turning ignition to position I or II.
Console locking “Panic button”	Press / release – locks / unlocks doors and trunk Press / hold – closes windows and sliding roof
Drive away lock (dealer programmable)	Ignition in position II, gear selector moved from PARK – locks doors and trunk
Error signal (high pitched warble)	Trunk, door or hood open, key in ignition or system error

Unlocking

Key	Turn to unlock and release – unlocks drivers door and fuel filler, disarms and turns on interior light for 15 seconds Hold in unlock position for 2 seconds or unlock twice – unlocks as above plus unlocks all doors and trunk
Remote transmitter	Press small button once (green indicator light) – unlocks drivers door and fuel filler, disarms and turns on interior light for 15 seconds. Cancels valet trunk lockout and recalls seat / mirror, steering wheel memory for that transmitter. Press small button second time – unlocks all other doors and trunk Press small button third time – releases trunk latch

Dealer Programmable Options (1995 MY)

- Remote “panic mode”
- Passive arming
- Headlight convenience
- Audible tones
- Drive away lock
- Trunk release
- Memory seat recall

NOTES

Vehicle Security (continued)

Security Systems (continued)

Security System Operation (1993 – 1994 MY)

Basic operation (Single button remote transmitter) The security system must be switched on. The switch is located in the center console.

Locking

Remote transmitter Press for 3 seconds – locks doors and trunk and arms the system. Produces audible signal and 1 flash of sidelights.
Press again within 3 seconds – headlights on for 25 seconds

Remote transmitter “Panic mode” Hold for more than 6 seconds – full alarm
To turn off “Panic”: ignition to position **II** or end of alarm cycle

Unlocking

Key Unlock normally – unlocks doors. If system is armed, ticking sound for 15 seconds until alarm sounds. To disarm, quickly switch the ignition to position **II** three times, or press the remote.

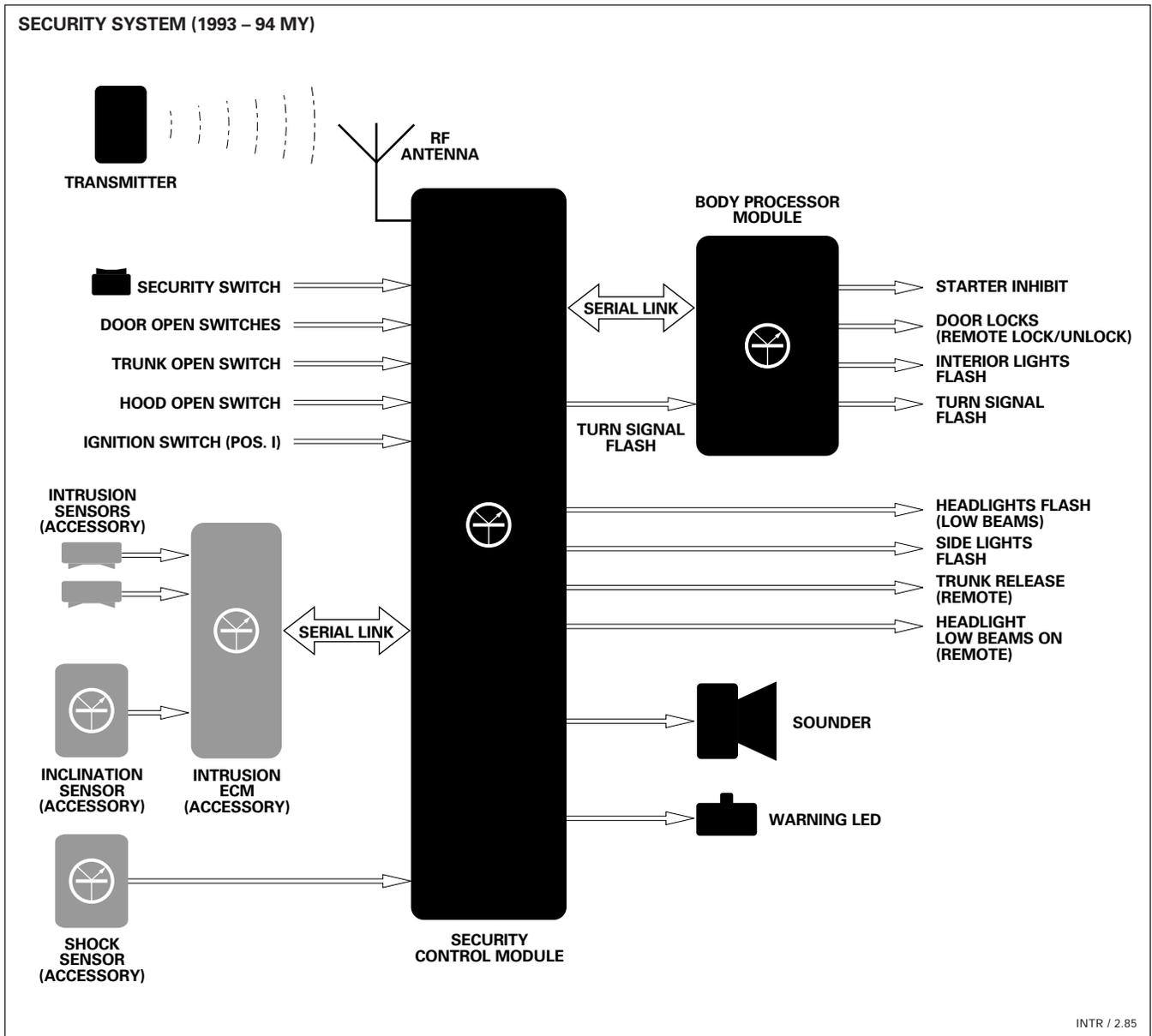
Remote transmitter Press once – unlocks doors and disarms. Produces two audible signals and 2 side light flashes; three audible signals indicates a system fault.

(dealer programmable) Second press – trunk unlock

Dealer Programmable Option

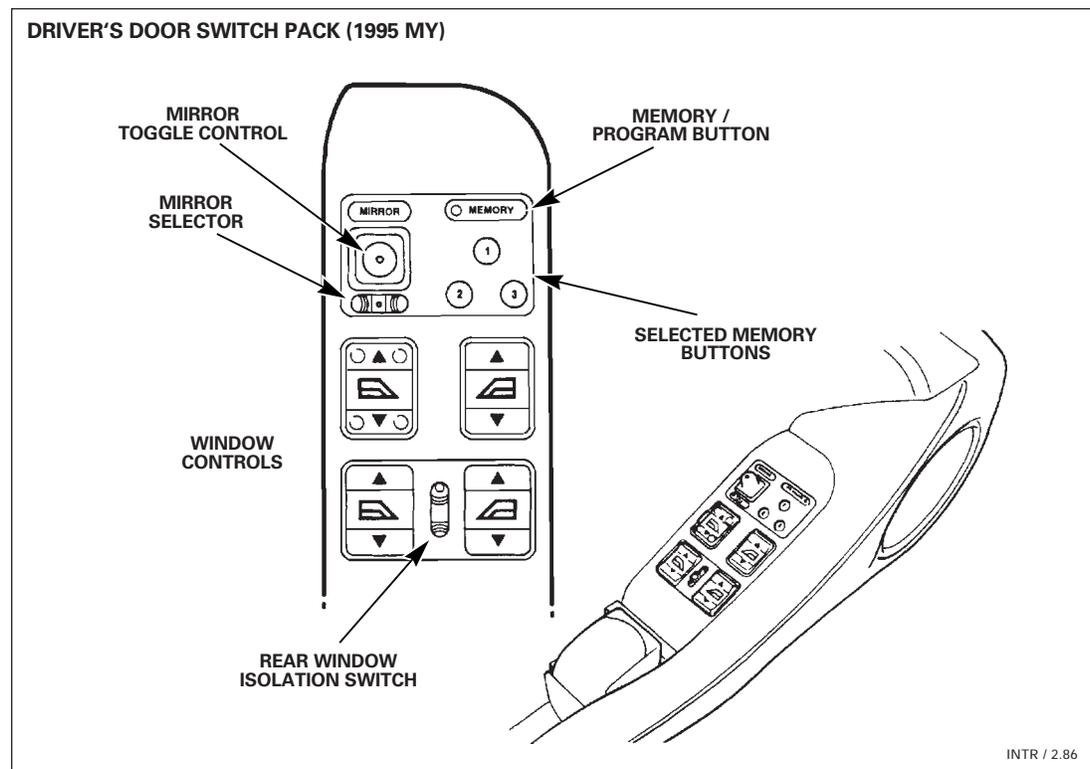
- Passive arming

NOTES



NOTES

Controls

Window Operation / Side Mirrors (1995 MY ON)

The driver door switch pack contains individual switches for the four power windows and a rear window isolation switch to immobilize the rear passenger door armrest switches. A four-position toggle switch and a three-position selector switch to control adjustment of the side mirrors are also in the switch pack.

The passenger side mirror will tilt down when the gear selector is in reverse to give the driver a view of the curb. To activate this feature, the mirror selector switch must be in the left or right position. Move the mirror toggle switch in any direction with the ignition ON and the gear selector in reverse and the right side mirror will tilt down. The mirror will return to its normal position when reverse is disengaged or if the mirror switch is moved again.

NOTES

Powered Seat and Mirror Memory (1995 MY ON)

Each front seat has three switches which control 12-way seat movement, head restraint adjustment and seat lumbar support adjustment.

The driver door switch pack can control three memory settings for seats, mirrors and powered steering column adjustment. To program the memory recall, the key must be in the ignition and the seat, mirrors and steering column adjusted. Push the memory button on the driver door switch pack. The memory button light will come on for four seconds. Press the selected memory button on the driver door switch pack to store the current positions in that memory location.

The memory recall will not work or will stop operation if:

- the vehicle is moving
- the brake pedal is pressed
- the seat, mirror or memory buttons are pushed

Two memory settings can be PDU programmed for recall by the two security system remote transmitters so that unlocking the vehicle or disarming with a transmitter will select the memory position assigned to that transmitter.

Entry / exit mode

An automatic feature for the driver position will move the seat and steering wheel to ease entry and exit from the vehicle (optional on XJ6). This feature is selected by turning the steering column adjustment switch to AUTO. When the key is inserted in the ignition, or the driver door is closed with the key in the ignition, the seat and steering column will return to their last memorized positions. Automatic seat movement can immediately be stopped by touching the brake pedal or a seat control switch. To stop steering column movement, move the steering column control switch.

Powered Seat and Mirror Memory (1993 – 1994 MY)

Vehicles from these model years are equipped with 12-way powered seats and powered mirrors. A two-position seat memory and the right side mirror dip function were optional on the XJ6. A driver seat entry / exit function switch is located on the driver door switch pack.

Memory set

With the ignition switched to position I or II, adjust the seat and mirrors. Press / hold the memory button and the numbered memory recall button for 30 seconds or until it “beeps” to signal acceptance.

Memory Recall

Press / hold the memory recall button until seat movement stops. Memory recall will function only with the driver door open and the ignition in position 1 or 2.

Previous Model Seats

Previous models were equipped with 8-way powered seats, a driver seat entry / exit switch, and no memory function.

NOTES

Controls (continued)

Windshield Wipers and Power Wash

The windshield wiper and power wash controls are located on the right steering column stalk. Operation is as follows:

Stalk position	Result
Stalk up 1	normal wipe
Stalk up 2	fast wipe
Stalk down 1	intermittent wipe (road speed dependent)
Pull stalk	single wiper sweep
Press end in	programmed wash / wipe – washers on for 2 seconds, wipers on for 2 seconds plus 3 sweeps

Headlight power wash (option)

Turn side lights on – powerwash operates on every 1st and 6th cycle of the programmed wash / wipe.

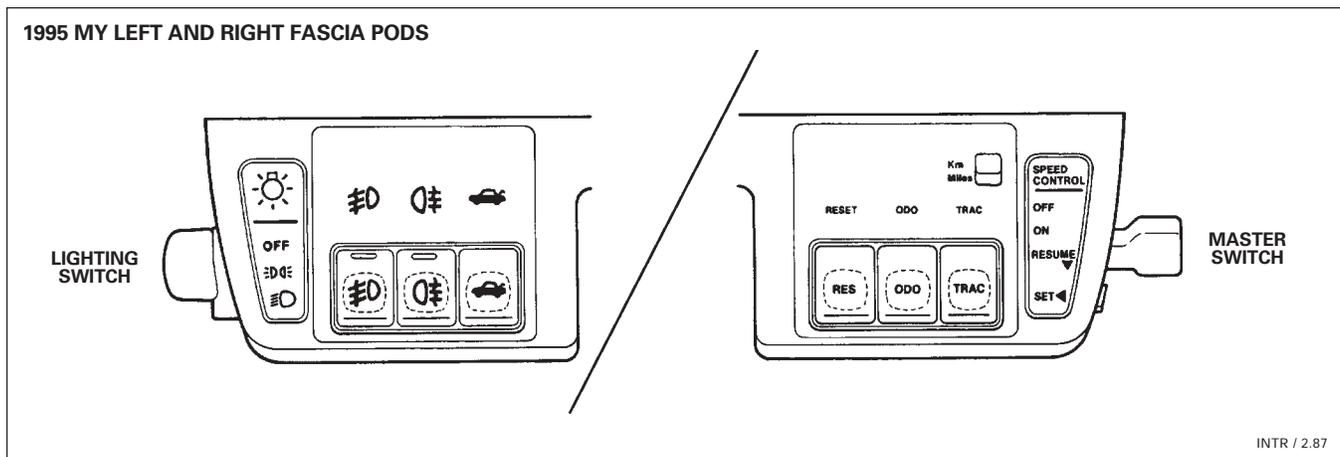
Speed Control

Speed control is actuated from the right side control pod. The system is electronically controlled employing an electrically-driven vacuum pump to provide actuation power. The speed control switches are located in the right side fascia pod. Operation is as follows:

ON, OFF, RESUME switch (Master switch) Switches the system on and off.

RESUME switch Recalls the last set speed since the system was turned on. Touching RESUME and releasing while under speed control returns the system to accelerator pedal control. Touching RESUME again returns the system to the last set speed.

SET switch Press once while driving – sets vehicle road speed. Hold in while driving – the vehicle accelerates until the SET switch is released. The vehicle speed at release is maintained.

**NOTES**

Exterior Lights

Exterior lighting controls are located in the left side fascia pod. Operation is as follows:

Switch position	Result
OFF	USA – All exterior lights are off. CANADA – With the ignition OFF, all exterior lights are off. With the ignition ON, the headlight low beams, the parking, side marker, tail and number plate lights are on.
Position 1	USA – The parking, side marker, tail and number plate lights are switched on. CANADA – With the ignition OFF, the parking, side marker, tail and number plate lights are switched on. With the ignition ON, the headlight low beams, the parking, side marker, tail and number plate lights are on.
Position 2	USA and CANADA – With the ignition OFF, the parking, side marker, tail and number plate lights are switched on. With the ignition ON, the headlights are added.

High and low beams may be selected with the multifunction switch in the left steering column stalk.

Universal Garage Door Opener (UGDO)

The roof console-mounted garage door opener allows remote operation of up to four radio frequency (RF) remote devices. Each device must be programmed into one of the four available garage door opener channels.

To Program

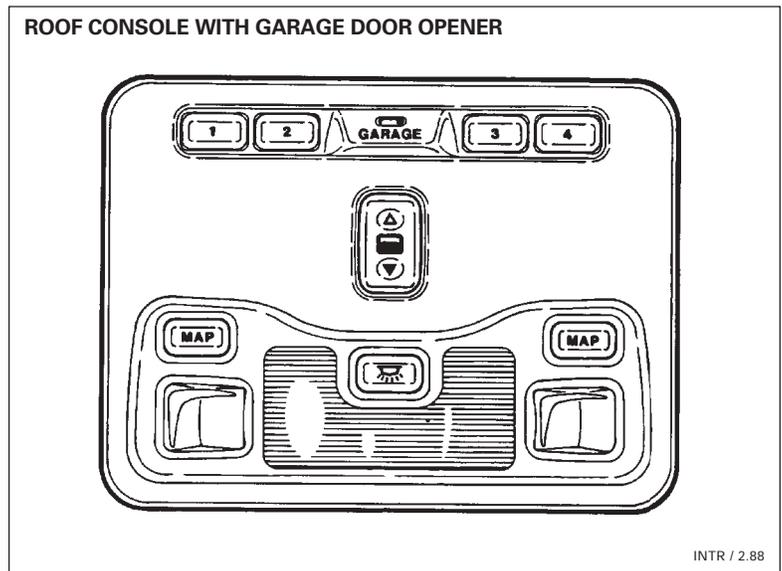
Hold the remote device transmitter to the roof console.

Press and hold the remote device transmitter and press and hold the selected garage door opener channel button.

Continue to hold both buttons. The red “Garage” light will flash slowly. When the “Garage” light begins to flash rapidly, release the buttons. It may take up to 1 minute for the light to flash rapidly.

To Erase

Press and hold garage door opener buttons 1 and 4 until the red light begins to flash. This erases all four channels. Channels cannot be erased individually, but they can be individually reprogrammed.



INTR / 2.88

NOTES

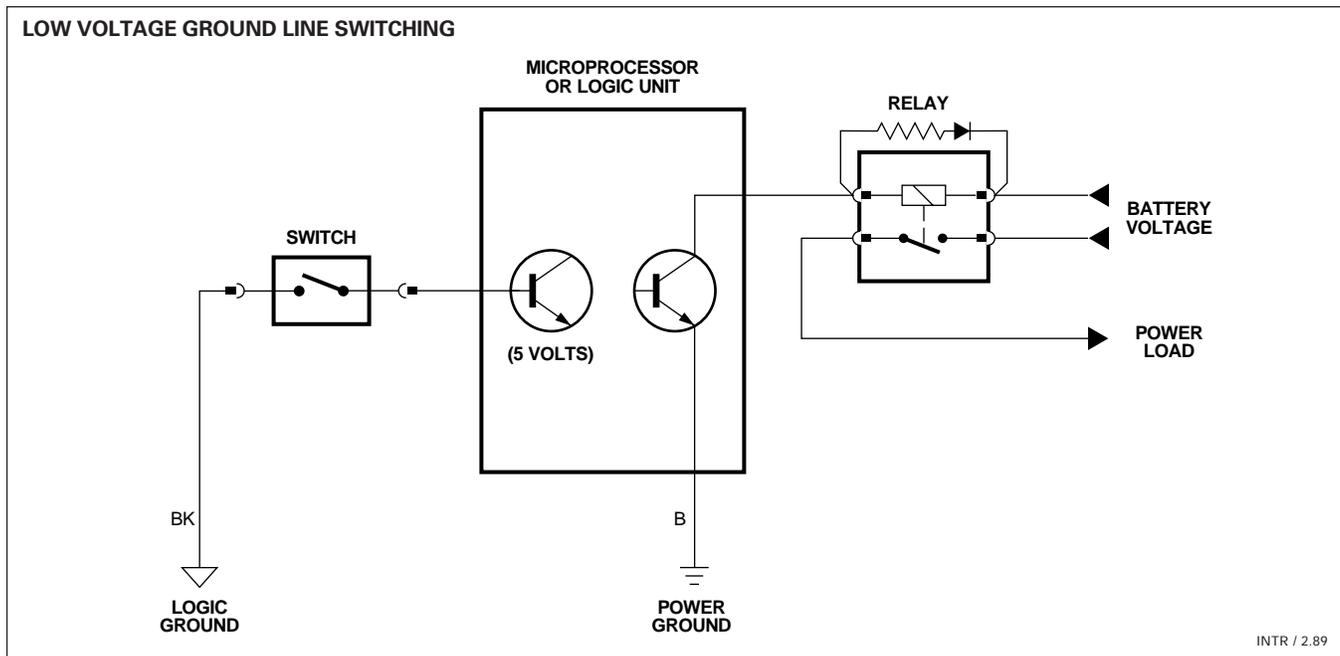
Electrical and Electronic Components

Jaguar pioneered an electrical design concept developed to provide reliability, performance and a level of vehicle function control that far exceeds anything possible with conventional electrical systems. The refinements to this concept that are the result of constant improvements over the past decade have resulted in a vehicle that offers the highest level of customer convenience, comfort and reliability.

Microprocessor Control

Microprocessors and logic control modules (CMs) control the operation of most of the vehicle electrical functions. Control modules can sequence the operation of electrical components based on system requirements. For example, one touch of a memory recall button can cause the driver seat, steering wheel and mirrors to move to preset positions provided that other vehicle systems are within the parameters required for the memory recall function to operate safely.

Serial communication data links between control modules allow various vehicle systems to “talk to each other,” and allow the technician to use JDS or PDU diagnostic equipment to diagnose and verify system operation and in some cases change the operating parameters of individual systems or components.



Low voltage ground line switching

Switches act as inputs to the vehicle control modules and as a result carry only very low current. Switches generally provide a ground signal to the microprocessor; this is referred to as a LOGIC GROUND.

Remote power switching

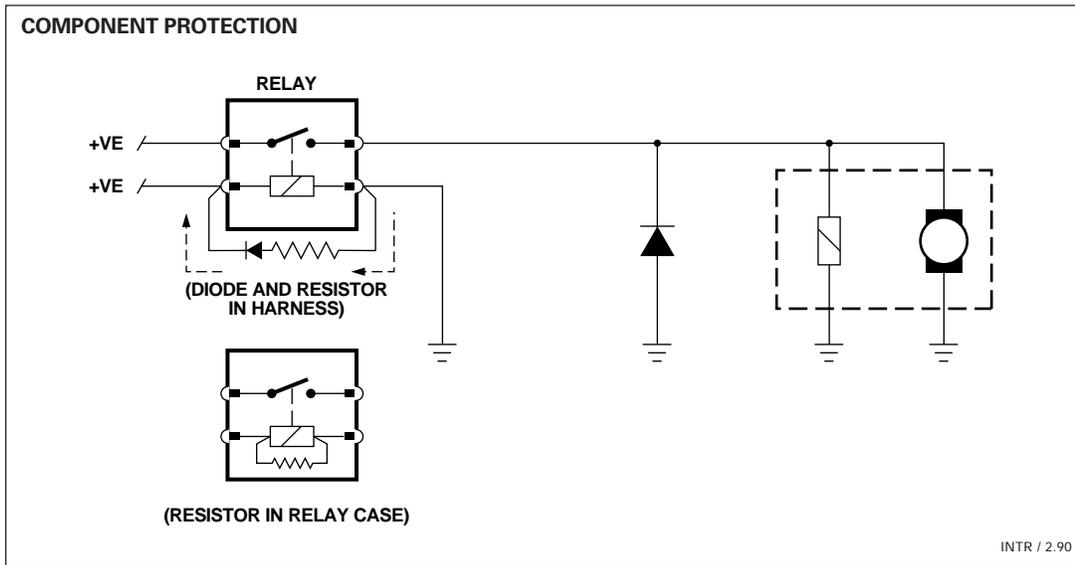
The control modules control a relay coil ground circuit to activate the relay; this is referred to as a POWER GROUND. This design concept optimizes the vehicle wiring and control system, reducing the amount of heavy current carrying wire required (reduced vehicle weight) and reducing the current load through switches (increased switch reliability).

NOTES

Relays

All cycling relays are located outside of the passenger compartment where any noise they might make will not be heard by the occupants. Relays are color coded with their sockets to aid in identification.

Relays and inductive power (coil type) consumers are protected against developing "high voltage spikes" that result when they are switched off and the magnetic field collapses. Momentary "high voltage spikes" which can also be developed by disconnecting components while they are operating or using improper circuit measuring techniques are potentially dangerous to the low voltage control units.



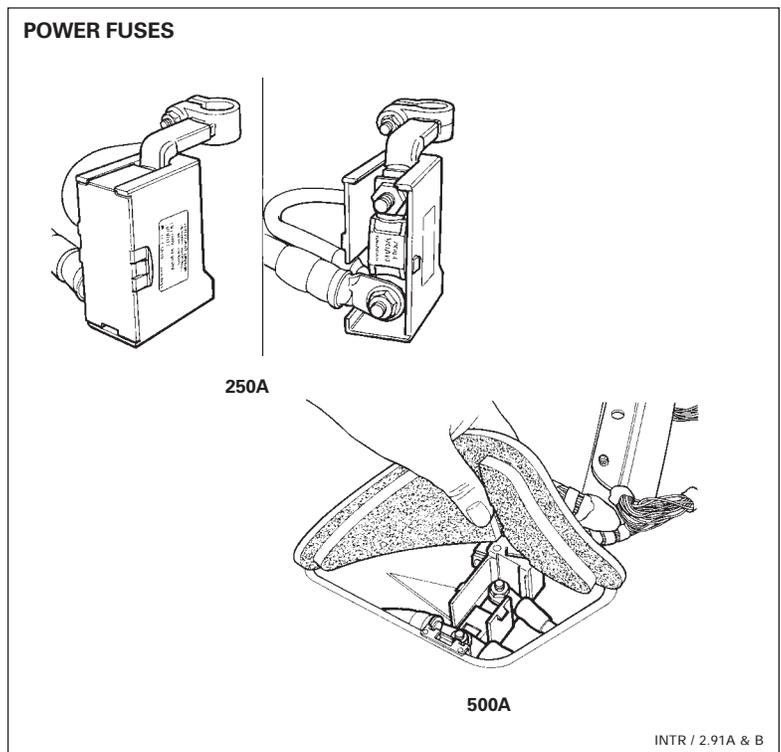
Power Distribution

Heavy duty cables distribute power to the five vehicle fuse boxes. For the 1995 MY, the power distribution cables themselves are protected by three 250A power fuses.

Wire Harnesses

The Electrical Guides have complete information regarding wire harnesses and wire identification. All wires are color coded following the Jaguar standard pattern. Power grounds are coded B (Black) and Logic grounds are coded BK (Black with Pink Tracer).

NOTES



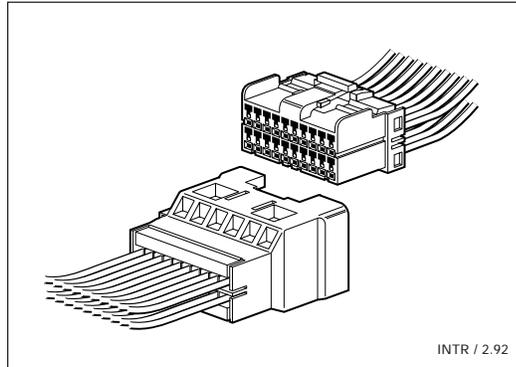
Electrical and Electronic Components (continued)

Connectors

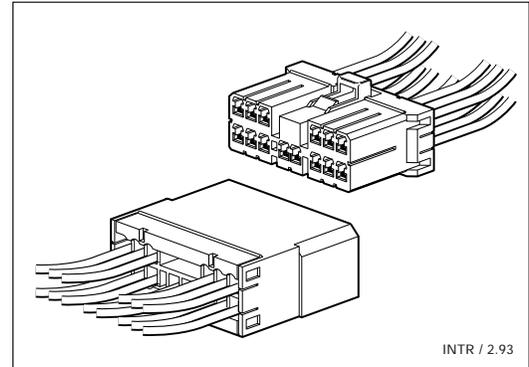
Positive connection locking connectors are standardized depending on their usage and model year. Sealed, waterproof connectors are used in areas of the vehicle where required.

Multilock 040

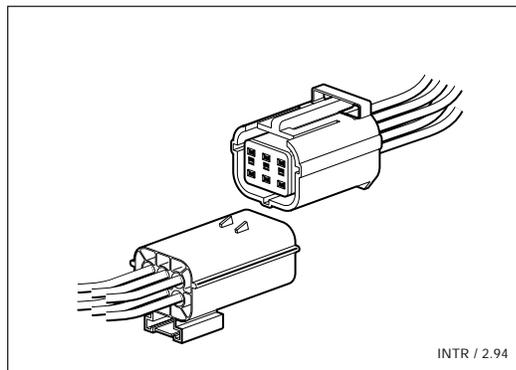
Low current (used as harness and 'direct' connection connector).

**Multilock 070**

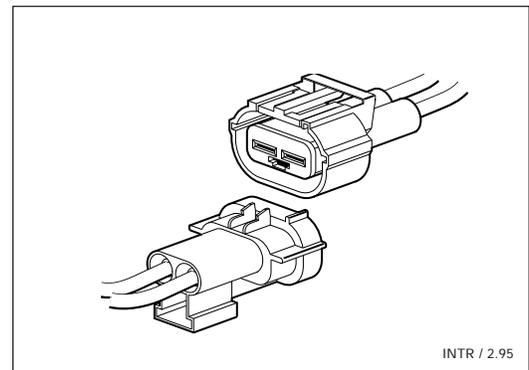
High current (used as harness and 'direct' connection connector).

**Econoseal III LC**

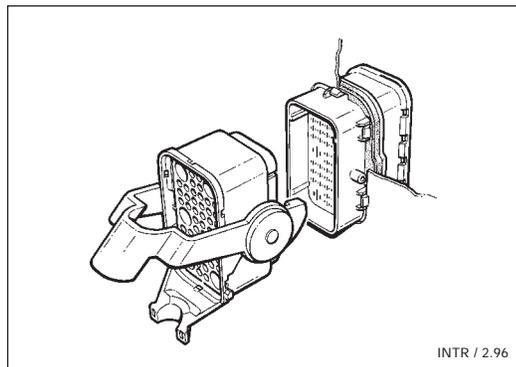
Low current sealed connector.

**Econoseal III HC**

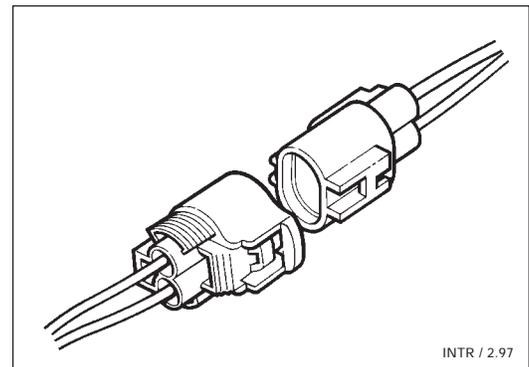
High current sealed connector.

**Through-Panel**

48 low-current pins / 6 high-current pins.

**Ford Card**

Used for SRS only.



Electrical Guides

Complete and comprehensive vehicle specific electrical and electronic information is available in the Jaguar Electrical Guides:

- An index to all components
- Connector identification information
- Description keys to symbols and codes used in the guide
- Control Module identification and location
- Fuse locations and identification
- Relay locations and identification
- Component panel locations and identification
- Individual circuit wiring schematics
- Detailed control module pin out information

NOTES

Vehicle Maintenance

The quality of the scheduled maintenance performed on a vehicle is a key factor contributing to the Jaguar owner's satisfaction with the vehicle.

Maintenance intervals are designed to allow inspection of the vehicle and the opportunity to spot potential problems before they occur. Report potential problems to the service manager. Early problem identification helps Jaguar to improve the product, provides a source of additional work for the dealership and keeps the customer's Jaguar running at peak performance.

It is important that the maintenance service be thorough. All required operations should be performed and the vehicle **MUST** be returned to the customer clean, with the clock, radio, climate control and all other convenience items set as the customer left them.

Vehicle Maintenance Schedule

Maintenance service intervals differ depending on the model year of the vehicle.

Refer to the vehicle Passport to Service or the Administration Bulletins in Section 4 of the Administration Bulletin Binder for maintenance schedules.

Jaguar also publishes Vehicle Maintenance Checklists for technician use in performing vehicle maintenance.

Service Intervals

1995 MY Every 7,500 miles. Certain operations are specified at 30,000, 52,500, and 60,000 mile intervals. Certain operations are specified at 2-year intervals regardless of mileage.

1994 MY Every 10,000 miles or 12 months. Certain operations are specified at 30,000 and 60,000 mile intervals. Certain operations are specified at 2-year intervals regardless of mileage.

Up to 1994 MY Every 7,500 miles or 12 months. Certain operations are specified at 30,000, 52,500, and 60,000 mile intervals. Certain operations are specified at 2-year intervals regardless of mileage.

Maintenance operations can be grouped into services performed in the vehicle interior, exterior, under body and under hood (engine compartment).

NOTES

Contents

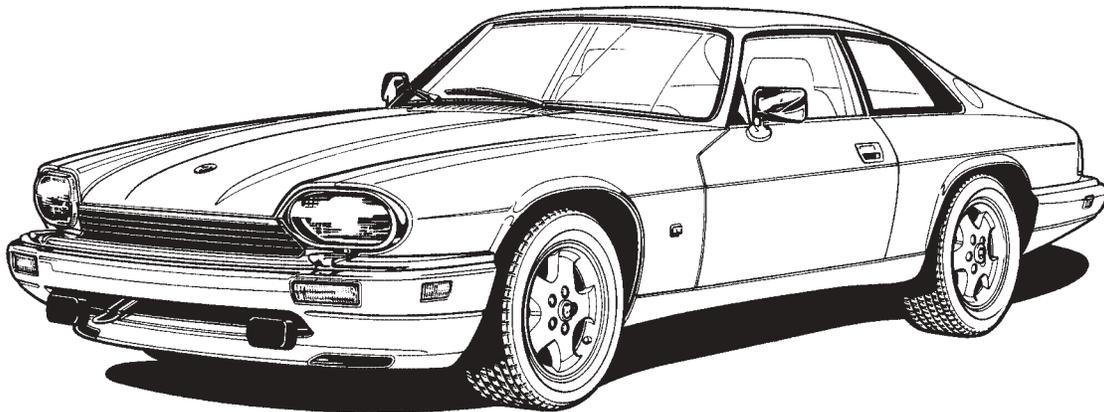
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XJS Range

First introduced in 1975, the Jaguar XJS Range vehicles with their smooth and powerful V12 engine have earned a unique standing in the world of high performance luxury automobiles. The styling of the XJS embodies the best of Jaguar's sporting and luxury heritage.

Throughout its production run, the XJS has undergone steady improvement and refinement. To carry the Jaguar sporting line into the future in a highly competitive market, a massive engineering and manufacturing effort was undertaken. The end result of this effort was a series of high performance luxury vehicles which retained the classic Jaguar XJS personality and styling characteristics with vast improvements to virtually every part of the vehicle.

1995 JAGUAR XJS COUPE



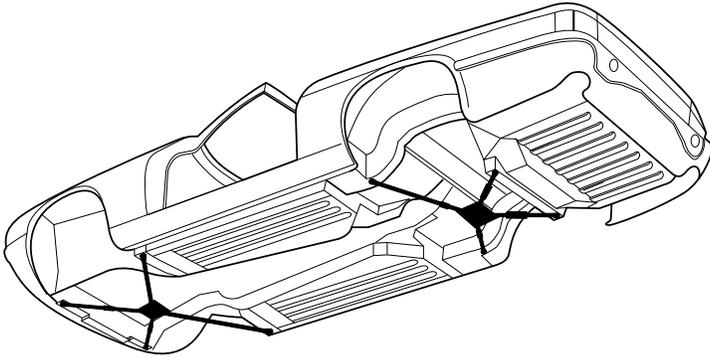
INTR / 3.01

NOTES

Body

The general construction of the XJS is similar to that of the Sedan Range, with the same attention to body stiffness, integrity, corrosion protection and finish.

CONVERTIBLE "X" BRACES



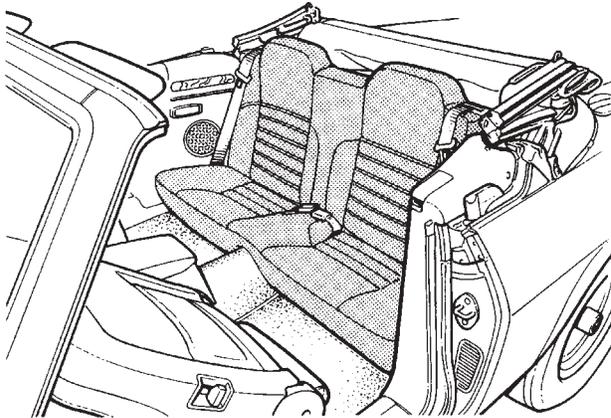
INTR / 3.02

Convertible

The XJS convertible is designed for strength and stiffness. Over 150 new or modified body panels reinforce the vehicle with additional reinforcement to critical areas. A system of stainless steel "X" braces increase torsional rigidity of the body. Each brace is secured to the body with four bolts and washers (tightening torque: 41 – 55 lb ft [55 – 75 Nm]).

⚠ CAUTION: Do not jack the vehicle on the center of the X braces. Jack only as described in the Service Manual or owners literature. A jacking pad is provided on the front suspension subframe at the rear of the X brace reinforcement plate. If the rear of the vehicle must be jacked from the center point, place a wooden block against the rear skid pan, behind the X brace reinforcement plate.

CONVERTIBLE 2 + 2 REAR SEATING



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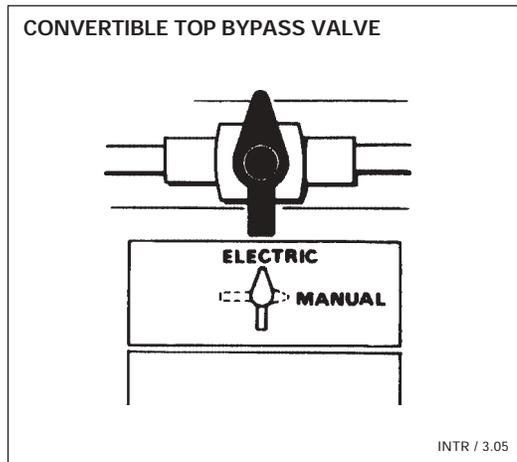
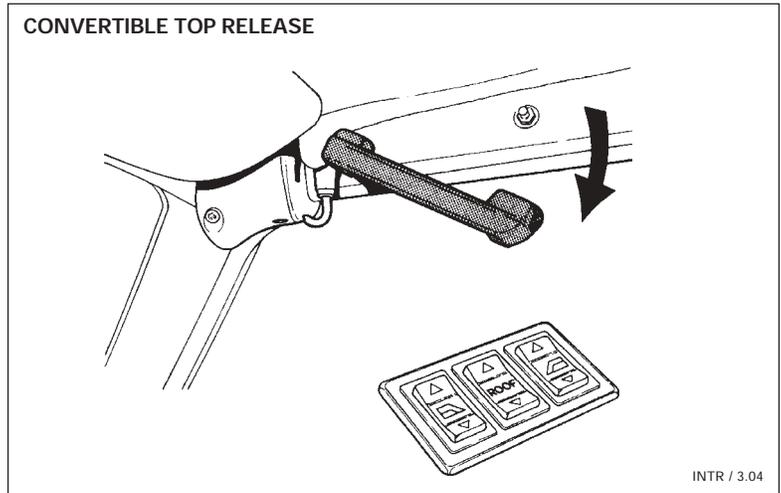
The Convertible 2+2 has provision for occasional seating of two passengers.

NOTES

Convertible Top

The fully powered convertible top require only that the driver move two release handles and press the roof switch. The electro-hydraulic operating mechanism moves the top to the full down position and the top controlling mechanism operates the rear quarter windows as necessary. The heated rear window stows with the top requiring no additional assistance from the driver.

The top can be operated manually if necessary. An electric-manual valve located on the hydraulic pump can be turned to bypass the hydraulic pump.

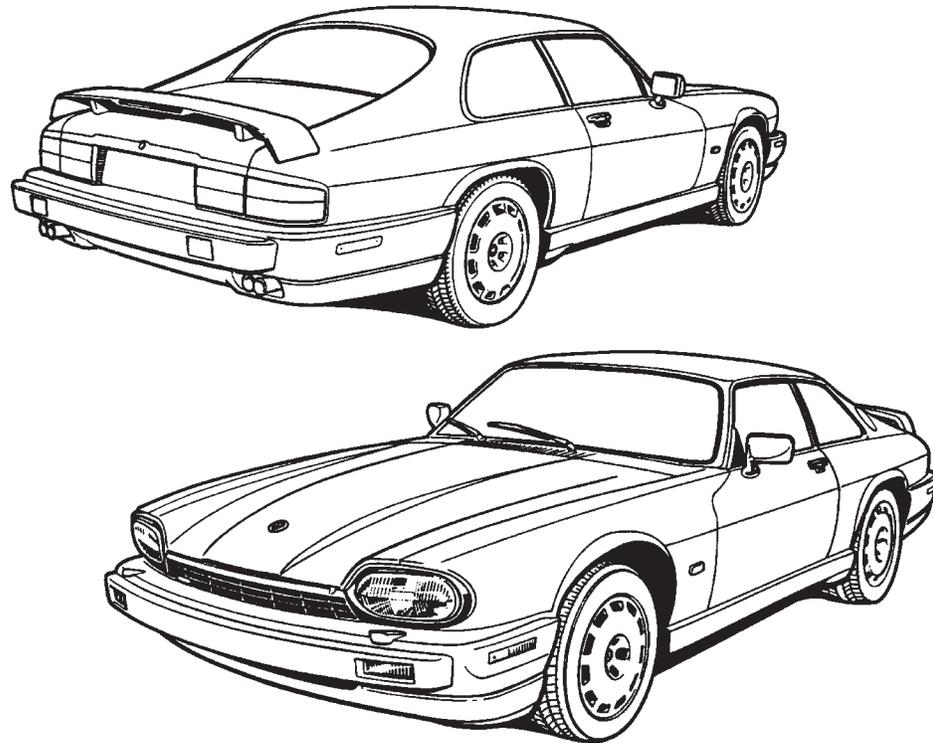


NOTES

XJR-S

The XJR-S was a limited production high-performance version of the XJS, available as a Coupe or Convertible in the 1993 model year. Aggressive styling and enhanced performance and road holding were unique features of this special vehicle.

XJR-S COUPE



INTR / 3.06

NOTES

Engine and Transmission Packages

The XJS Range uses the following engine / transmission pairings:

Engine	Transmission	Model Years
AJ16 (4.0L)	ZF 4HP 24 E9	1995
AJ6 (4.0L)	ZF 4HP 24 E9	1993 – 1994
AJ6 (4.0L)	Getrag 290 5-speed manual	1993 – 1994
V12 (6.0L)	Powertrain (Hydra-Matic) 4L80-E	1994 ON
V12 (6.0L)	Hydra-Matic 400	1993 XJR-S
V12 (5.3L)	Hydra-Matic 400	1975 – 1992

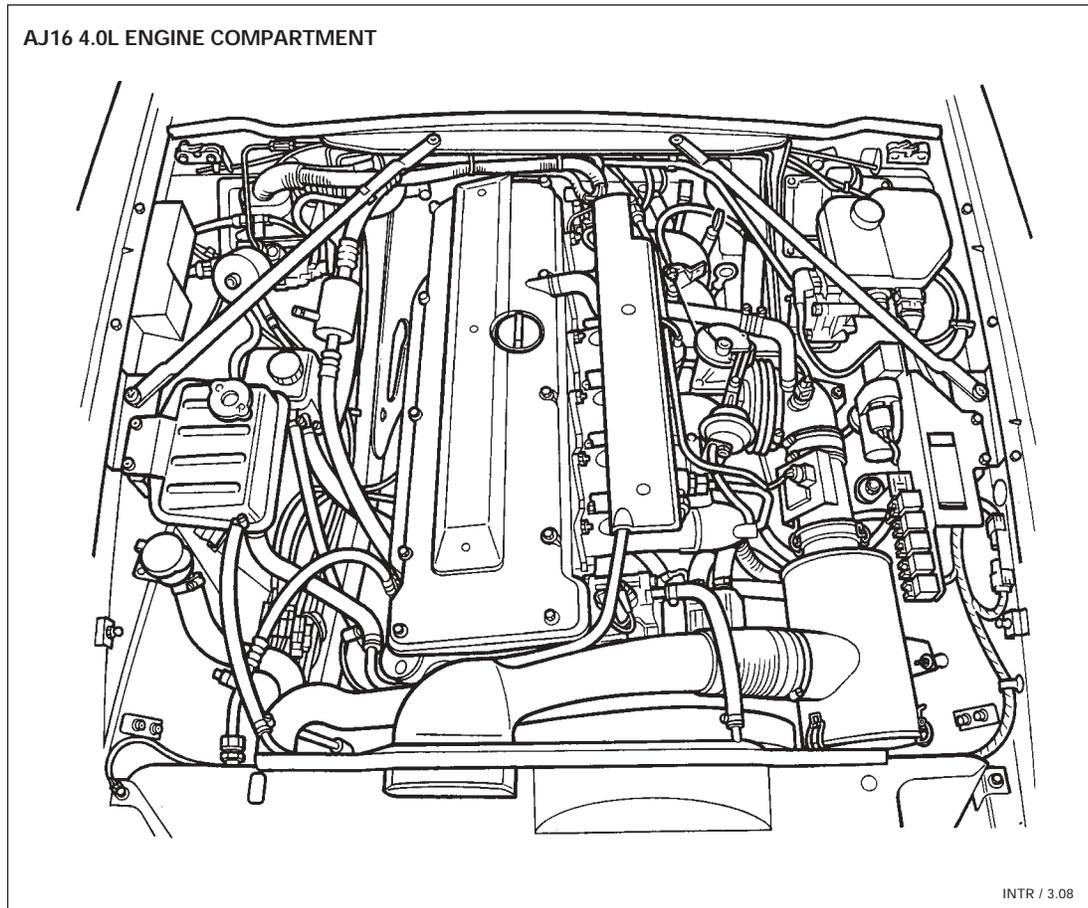
NOTES

AJ16 and AJ6 Engine / Transmission

AJ16 and AJ6 Engines

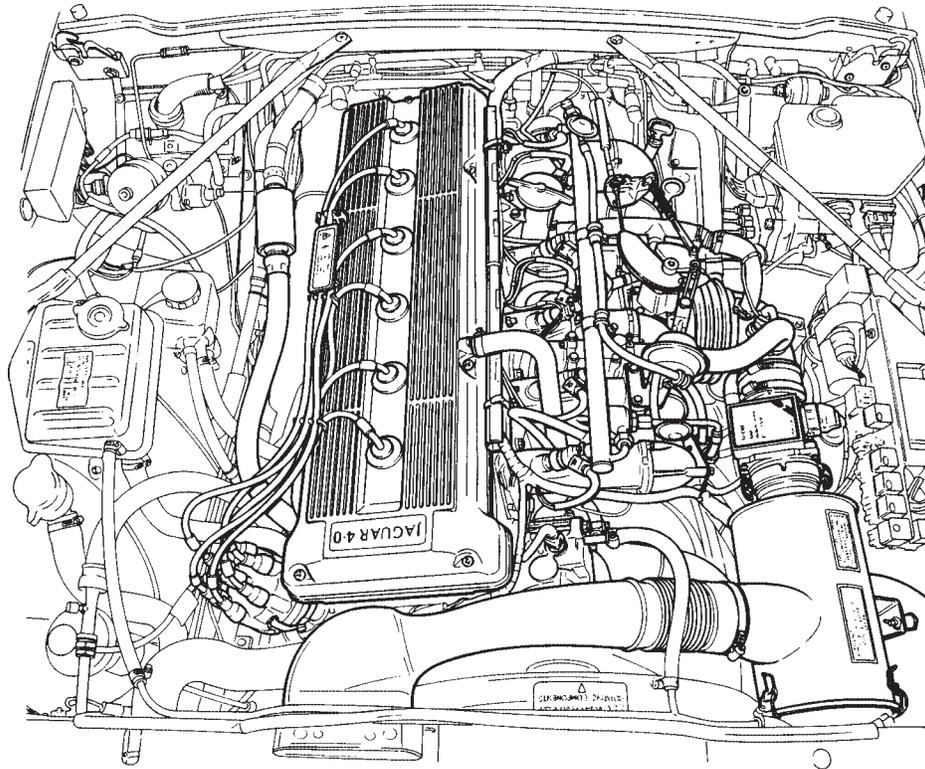
The AJ16 and AJ6 engines fitted to XJS vehicles are virtually identical to those used in the Sedan Range with the exception of revisions to accommodate the installation.

AJ6 engines are equipped with a separate engine oil cooler.



NOTES

AJ6 4.0L ENGINE COMPARTMENT



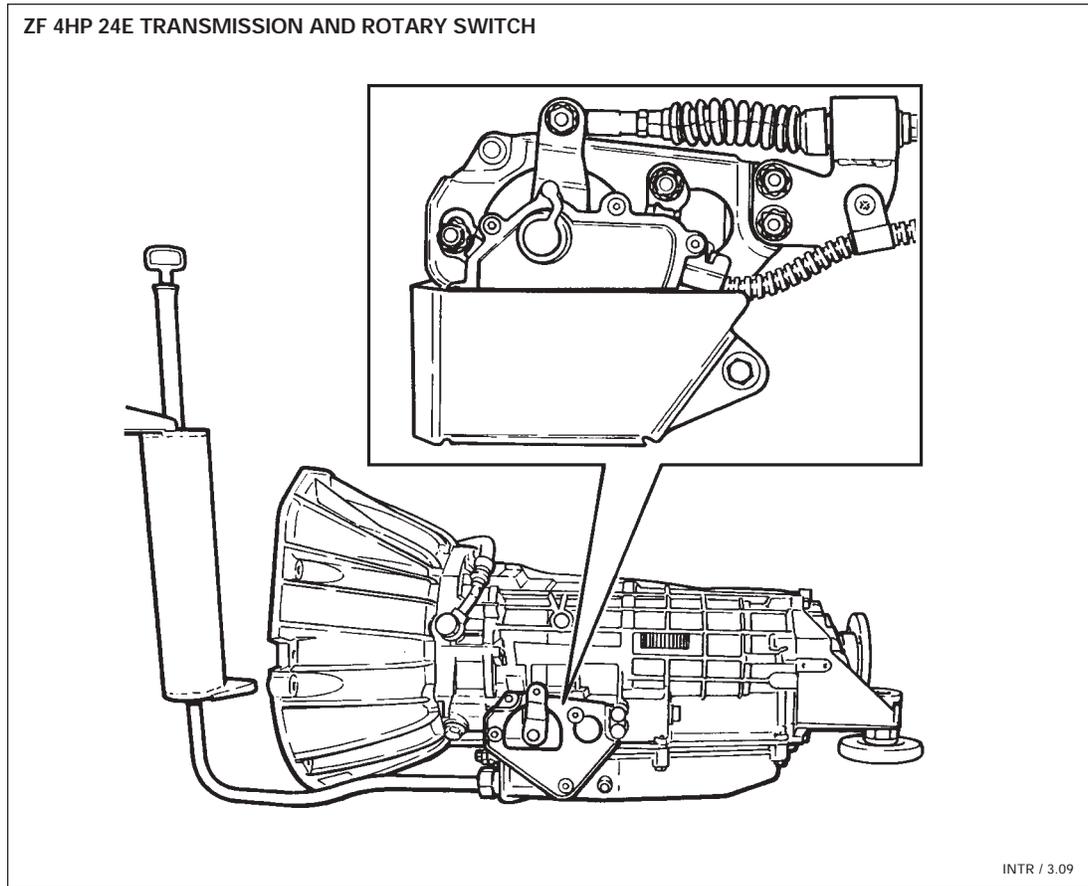
INTR / 3.07

NOTES

AJ16 and AJ6 Engine / Transmission (continued)

ZF 4HP 24E Automatic Transmission

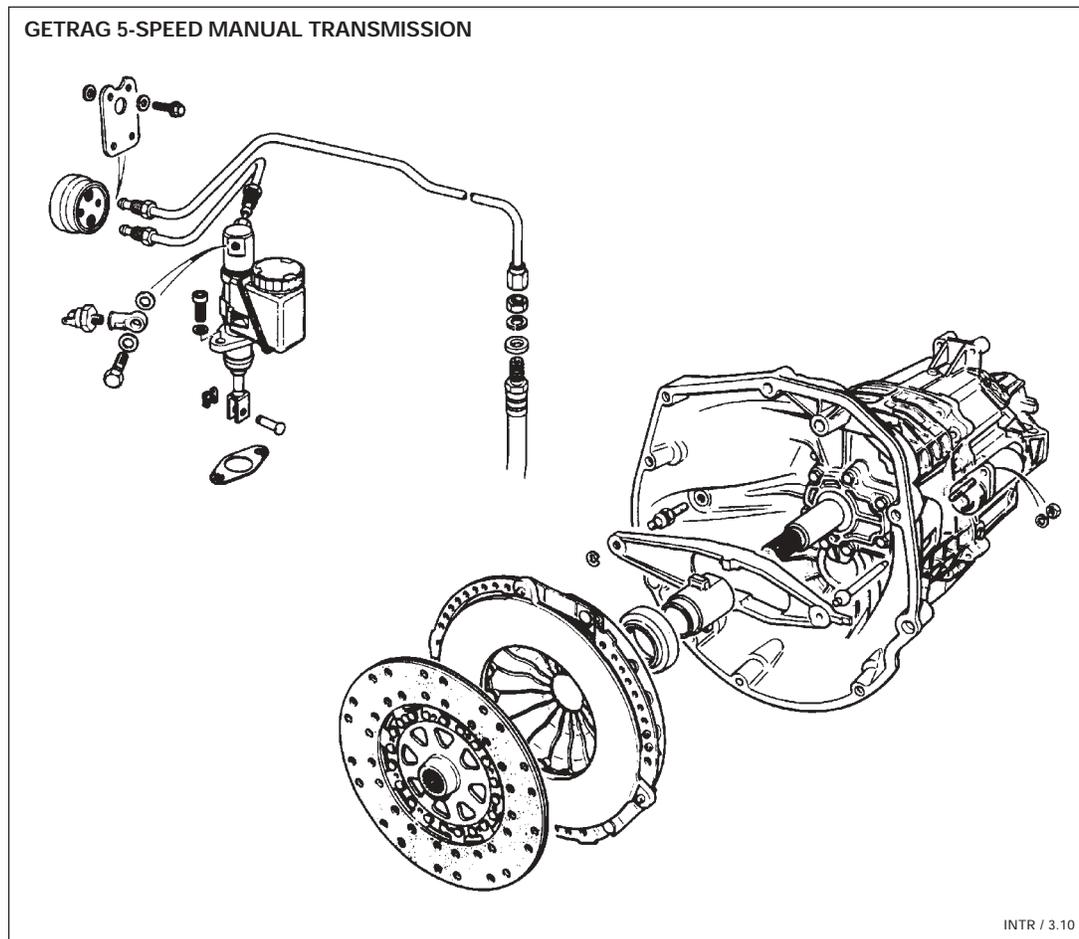
The ZF 4HP 24E four-speed automatic transmission on the XJS remains basically the same as the transmission used in the Sedan Range. The installation of the transmission differs in the gear selector mechanism and cable, the fill tube and the transmission fluid pan.



NOTES

Getrag 5-Speed Manual Transmission

The AJ6 was available in the 1993 and 1994 MY with a 5-speed fully synchronized manual gear-box coupled to the engine with a hydraulically operated single-plate diaphragm clutch.



Lubricating fluid	Dexron II E
Drain and refill	1.5 qt (1.65 liter)
Hydraulic fluid	DOT 4 brake fluid

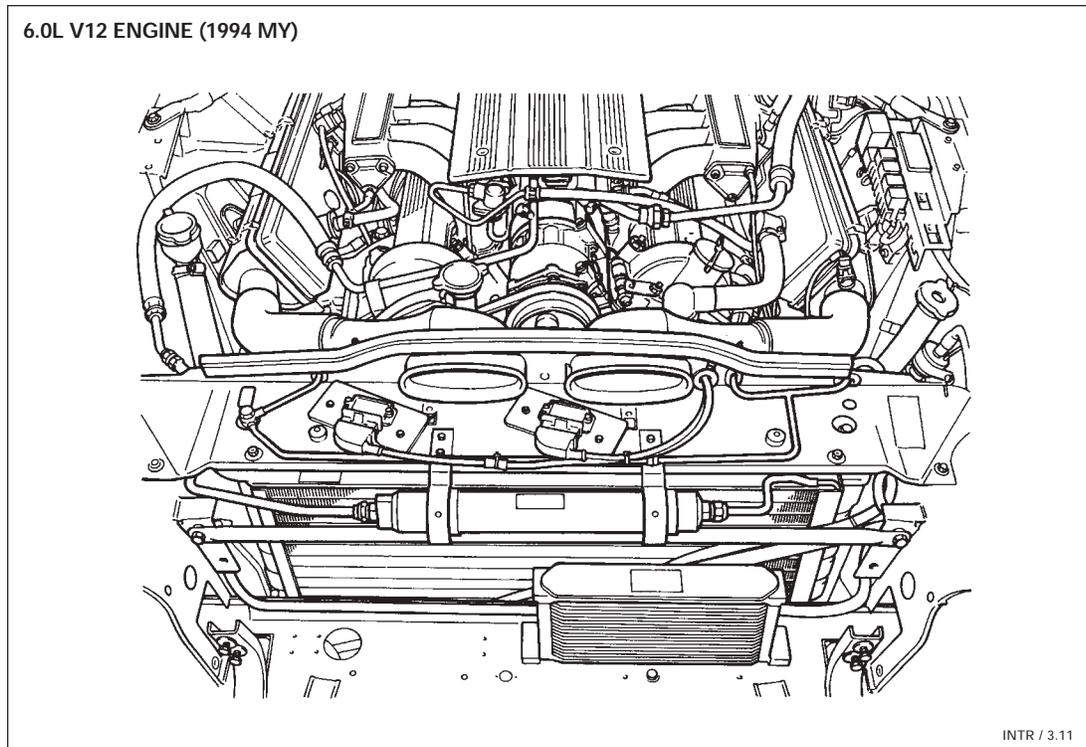
NOTES

V12 6.0L Engine / Transmission

V12 6.0-Liter Engine

The V12 6.0L engine fitted to XJS Range vehicles is virtually identical to the engine of the XJ12 Sedan. Some revisions have been made to accommodate the installation.

Configuration	12 Cylinder 60° Vee
Valve gear	One camshaft per cylinder head, two valves per cylinder
Bore and Stroke	90 mm x 78.5 mm
Displacement	5994 cc
Compression ratio	11 : 1
Maximum power (DIN)	301 hp @ 5350 rpm (278 hp @ 5400 rpm, 1994 MY)
Maximum torque (DIN)	351 lb ft @ 3750 rpm (334 lb ft @ 2800 rpm, 1994 MY)



Powertrain (Hydra-Matic) 4L80-E Automatic Transmission

This transmission is the same as the XJ12 and XJR Sedan transmission with minor revisions.

NOTES

XJR-S V12 6.0L Engine / Transmission

XJR-S V12 6.0-liter Engine

The XJR-S engine is based on the V12 5.3L engine with a longer piston stroke for increased displacement and a Zytex engine management system. Special intake and exhaust systems and other modifications contributed to the engine's increased performance.

Configuration	12 Cylinder 60° Vee
Valve gear	One camshaft per cylinder head, two valves per cylinder
Bore and Stroke	90 mm x 78.5 mm
Displacement	5994 cc
Compression ratio	11 : 1
Maximum power (DIN)	318 hp @ 5200 rpm
Maximum torque (DIN)	339 lb ft @ 3750 rpm

Hydra-Matic 400 Three-Speed Automatic Transmission

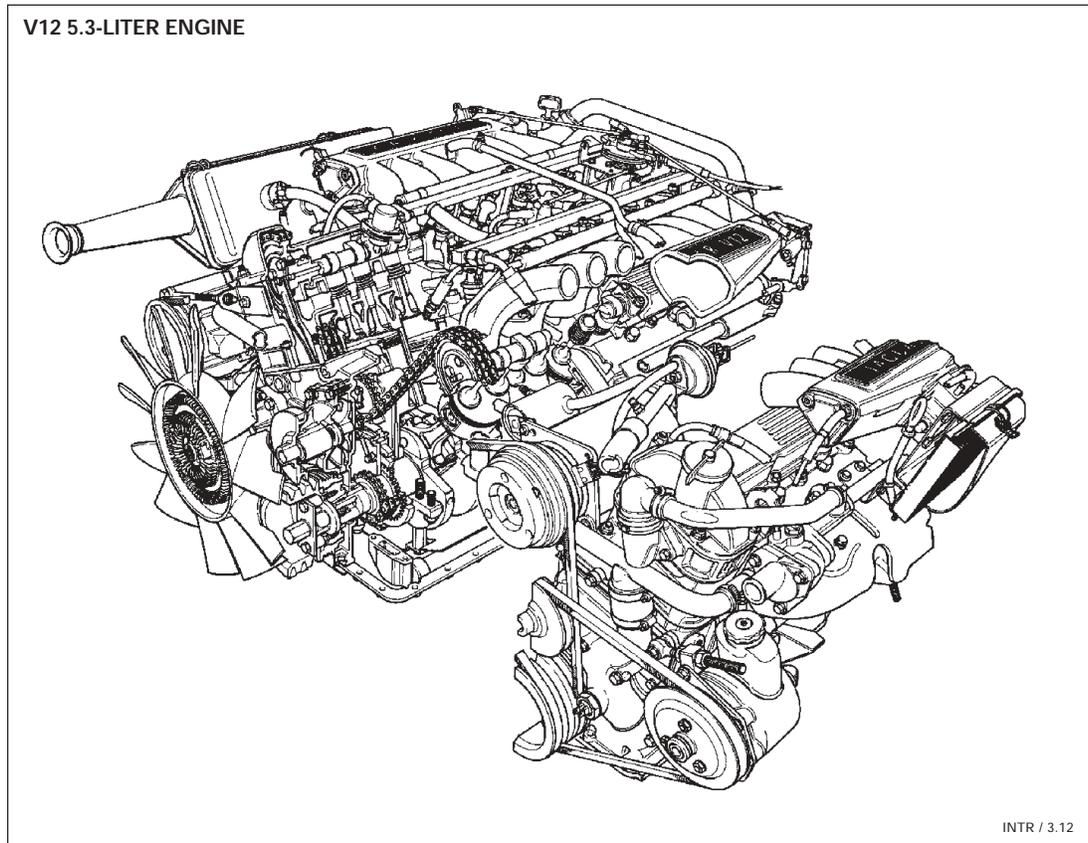
The transmission fitted to the XJR-S is an upgraded version of the tested Hydra-matic 400. The valve body of this three-speed hydraulically controlled automatic transmission is recalibrated and the rear accumulator spring is designed to take full advantage of the XJR-S power and torque increases.

NOTES

V12 5.3L Engine / Transmission

V12 5.3-Liter Engine

The V12 5.3L engine is constructed of light alloy and shares the design layout and features of the V12 6.0L found in the XJ12 Sedan and XJS Range.



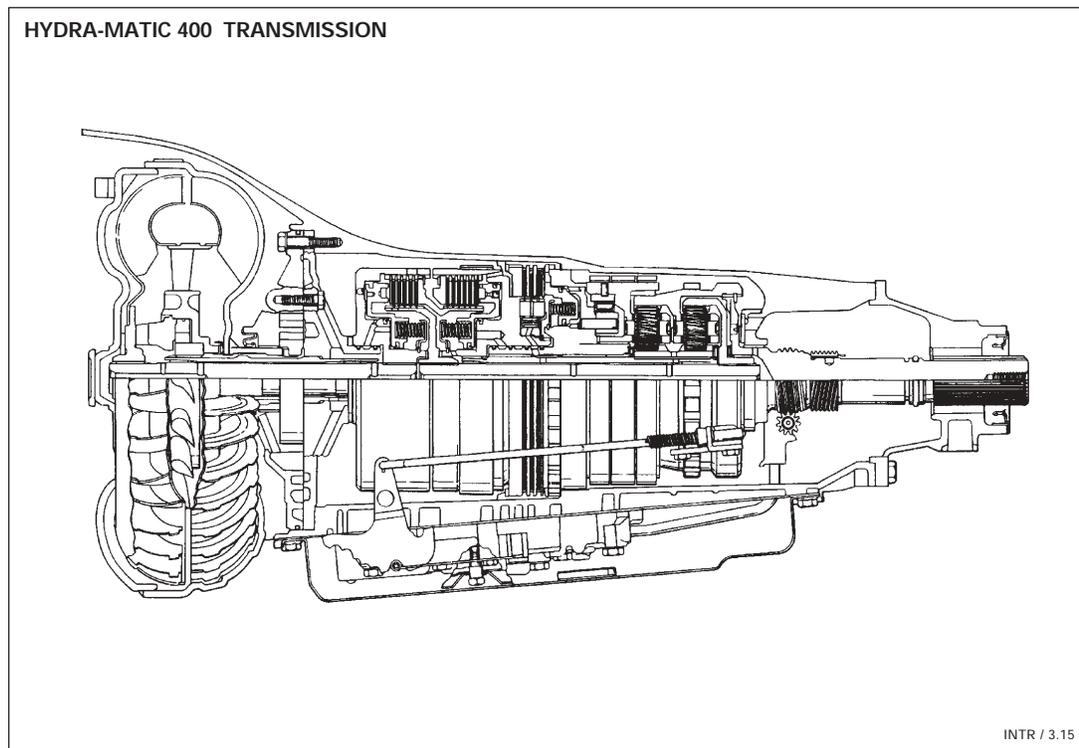
Configuration	12 Cylinder 60° Vee
Valve gear	One camshaft per cylinder, Two valves per cylinder
Bore and Stroke	90 mm x 70 mm
Displacement	5343 cc
Compression ratio	11.5 : 1
Maximum power (DIN)	261 hp @ 5000 rpm
Maximum torque (DIN)	290 lb ft @ 3000 rpm

NOTE: Horsepower and torque ratings vary slightly by model year. Ratings for 1991 MY are quoted above.

NOTES

Hydra-Matic 400 Three-Speed Automatic Transmission

The Hydra-Matic 400 is a fully automatic three-speed transmission with a three-element torque converter and a compound planetary gear set. Three clutch packs, a sprag (one-way clutch), one roller clutch and two bands control the planetary gear set to produce the desired gear selections.



Lubricating fluid	Dexron II "D"
Drain and refill	9.6 qt. (9.1 liters)

NOTES

Engine Management Systems

AJ16 Engine Management System

The engine management system utilized on XJS Range vehicles equipped with AJ16 engines is identical to the Sedan Range version. The AJ16 EMS complies with OBD II legislation. The ECM is programmed to comply with the different vehicle characteristics of the XJS Range.

AJ6 4.0L Engine Management System

The engine management system utilized on XJS 4.0L vehicles equipped with AJ6 engines is the same as the system used on the AJ6 Sedan Range. The OBD I EMS on-board diagnostic system is described on page 18.

V12 6.0L Engine Management System (1994 MY ON)

The V12 6.0L engine management system used in the XJS Range is the same as the EMS used on the 1994 MY XJ12 Sedan. The system employs a combination Lucas / Marelli fuel injection / ignition system. The XJS V12 6.0L EMS complies with OBD I legislation. The OBD I EMS on-board diagnostic system is described on page 18.

XJR-S V12 6.0L Engine Management System

The Zytec engine management system employed on the XJR-S is unique to this vehicle. A single ECM controls fuel delivery, evaporative emission purging, sequential fuel injection, exhaust emission, ignition timing and air injection. A manifold absolute pressure sensor (MAPS) located in the ECM drives the various functions by applying inputs received from sensors and strategies stored in memory.

Zytec On-Board Diagnostic System

The ECM contains on-board diagnostic capabilities which will activate the CHECK ENGINE MIL in the instrument pack and on the trip computer display. DTCs are stored in non volatile memory.

DTCs can be accessed using the following procedure:

Switch the ignition OFF, then ON. The CHECK ENGINE MIL will light and the DTC will appear five seconds later.

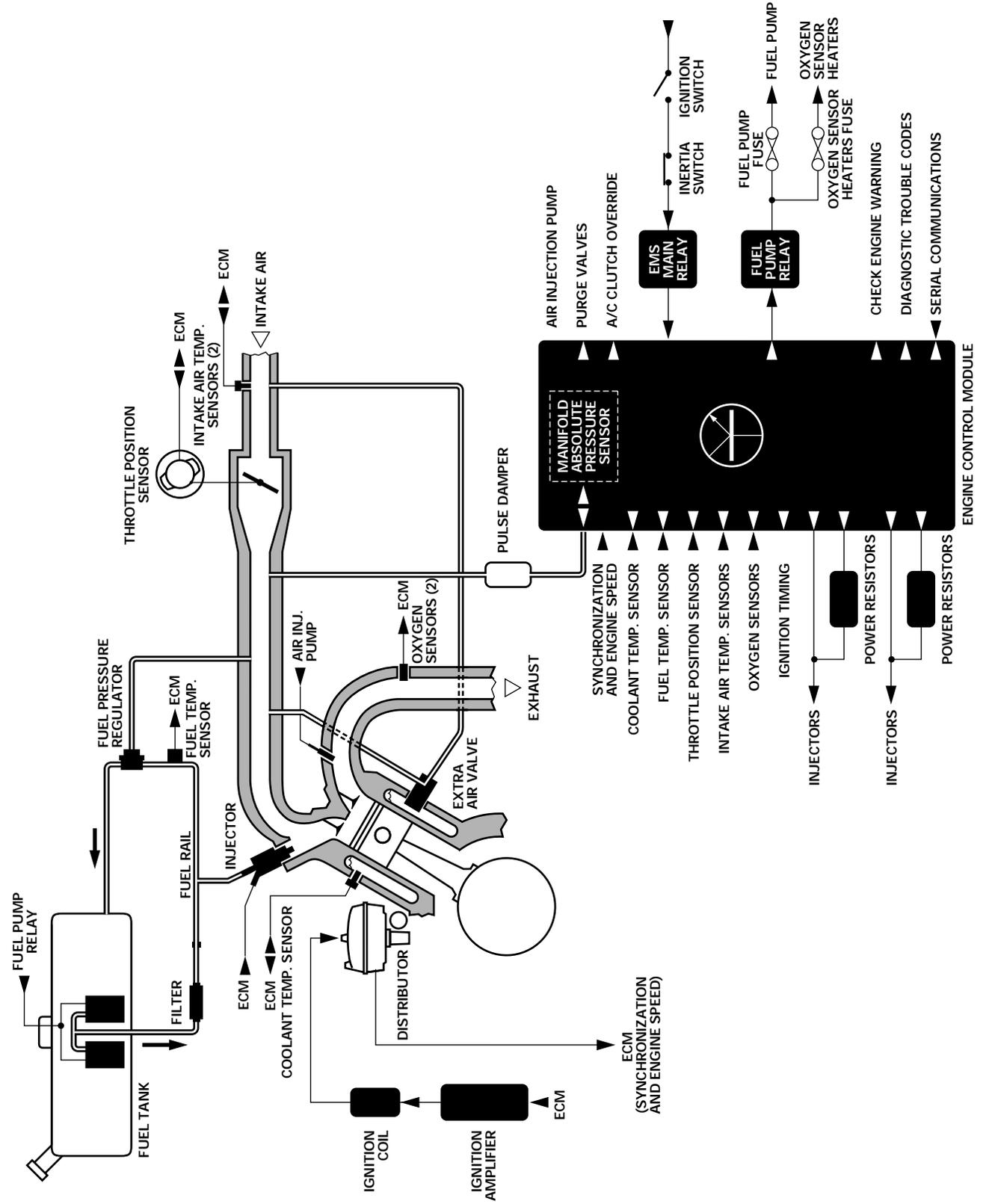
If two or more DTCs are in memory, only the highest priority code will be displayed. The remaining codes will be displayed, in turn, as the faults are corrected and erased from memory.

EMS diagnosis can be performed with a laptop computer and special Zytec software, which displays dynamic system parameters, oxygen sensor feedback, TPS data and DTC information. An engine set up routine is also included for setting the TPS, throttle linkage, checking ignition advance, idle speed and ECM idle fuel trim. The laptop computer and Zytec software are required in order to erase DTCs stored in memory.

Contact the Jaguar Technical Hotline for assistance with XJR-S EMS diagnostics.

NOTES

XJR-S V12 6.0L ENGINE MANAGEMENT SYSTEM



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XJS 5.3L V12 Engine Management System (1992 MY)

The XJS 5.3L Lucas / Marelli EMS consists of a electronic control module for the "P" system fuel injection and a separate control unit for the digitally controlled ignition system. The system performs many of the same functions as the later systems but uses combinations of electronic, electro-mechanical and vacuum sub systems for control fueling, ignition and emissions control tasks.

XJS On-Board Diagnostics – OBD I

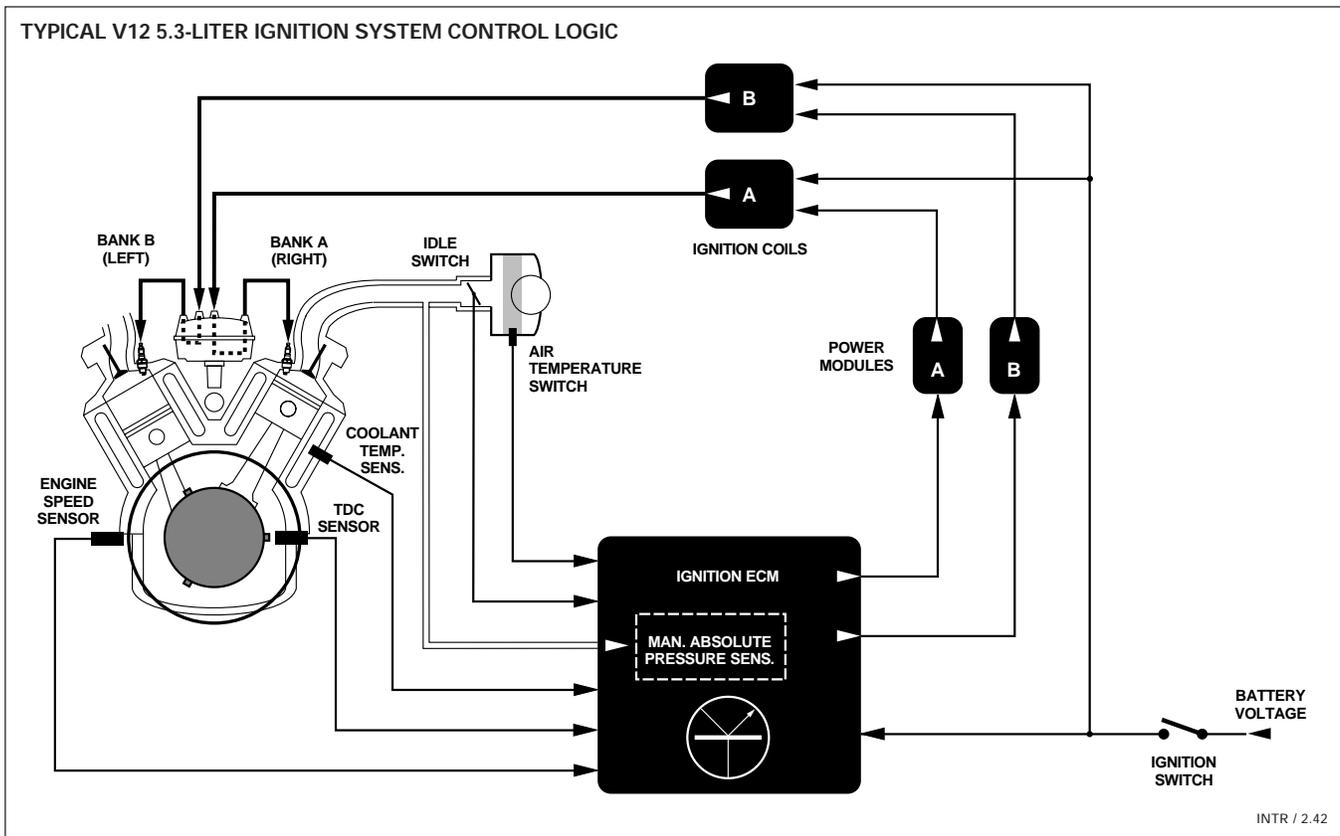
The ECM contains on-board diagnostic capabilities will activate the CHECK ENGINE MIL in the instrument pack and on the trip computer display.

DTCs can be accessed using the following procedure:

Switch the ignition OFF, then ON. The CHECK ENGINE MIL will light and the DTC will appear five seconds later.

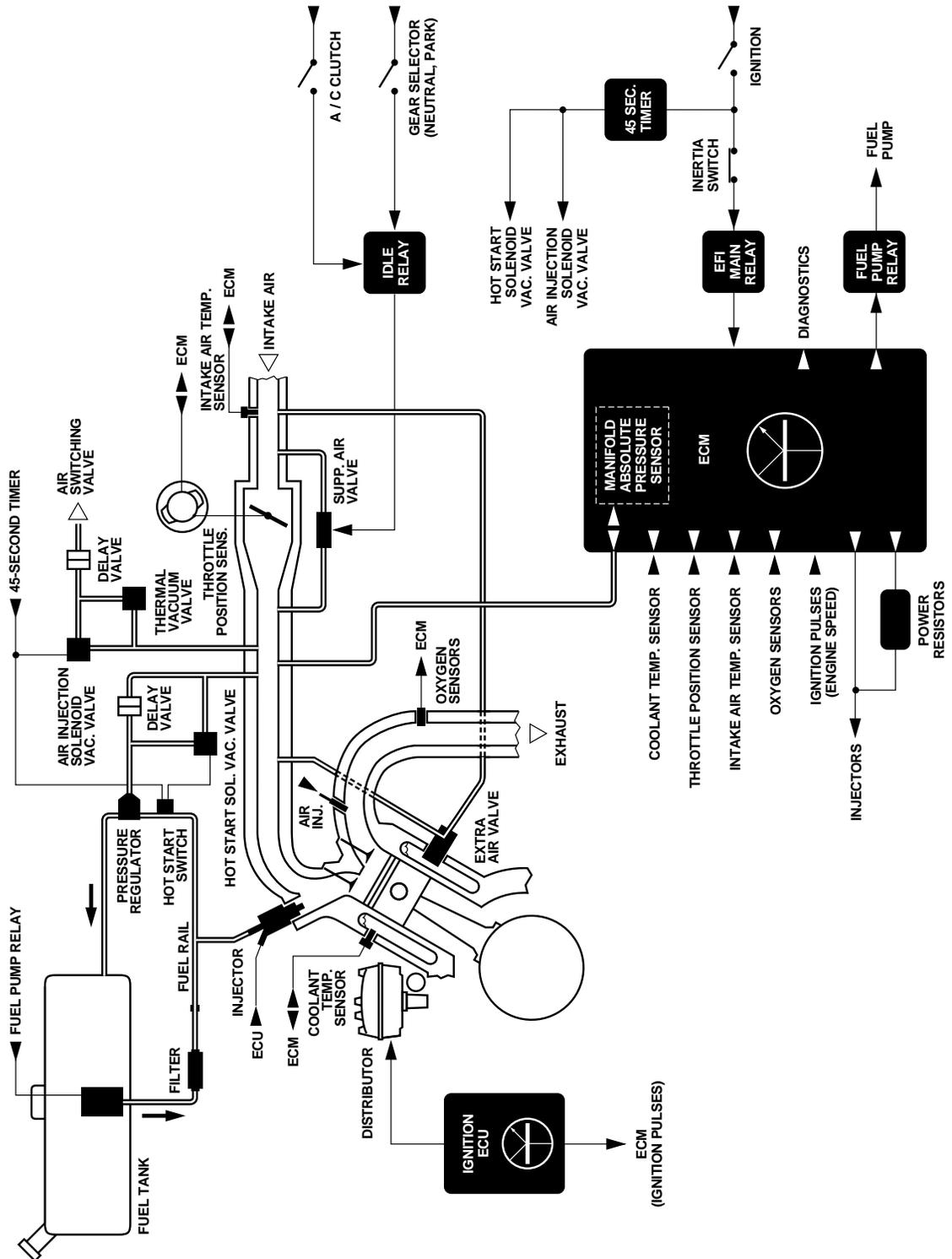
If two or more DTCs are in memory, only the highest priority code will be displayed. The remaining codes will be displayed, in turn, as the faults are corrected and erased from memory.

DTCs can also be accessed through PDU or JDS, which will access additional information associated with any DTC to assist in diagnosis.



NOTES

TYPICAL V12 5.3-LITER FUEL INJECTION AND EMISSION CONTROL LOGIC



INTR / 3.17

Fuel Delivery Systems

A recirculating fuel delivery system is used to provide a continuous supply of pressurized fuel to the fuel rail of the injection system.

XJS AJ6 and AJ16 Fuel Delivery System

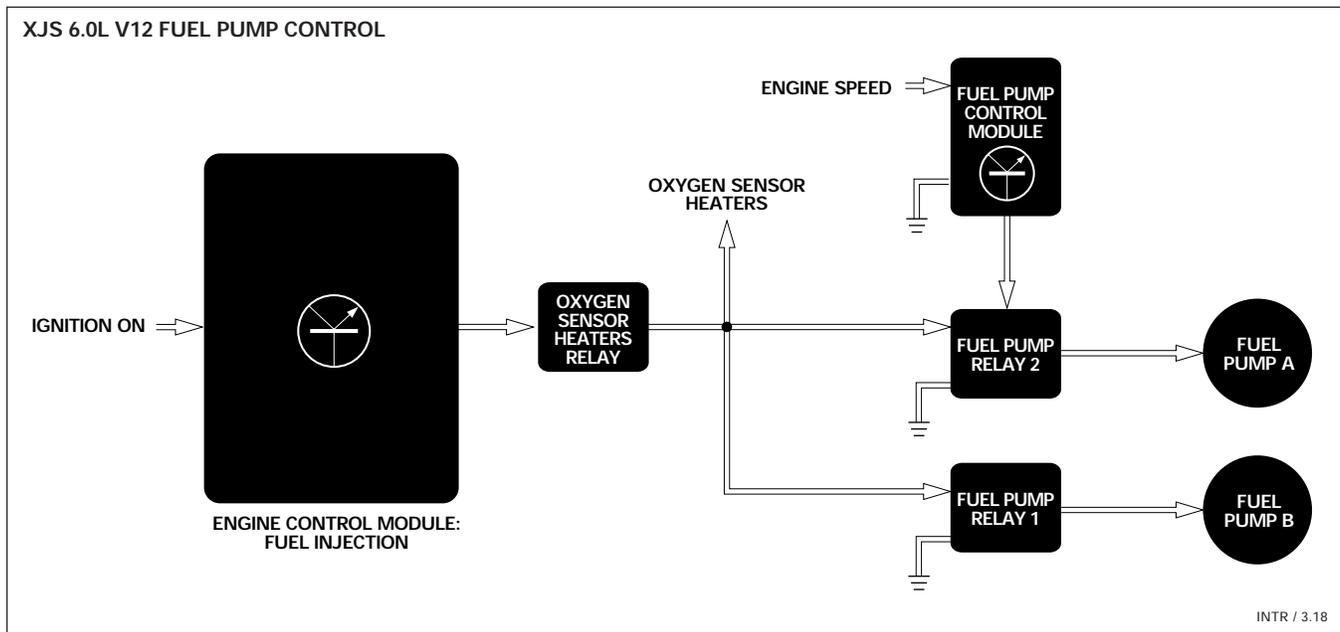
A single in-tank fuel pump module provides the fuel pressure and circulates fuel from the fuel tank to the fuel rail similar to Sedan Range systems. The fuel pump module is controlled by the ECM.

XJS 6.0L V12 Fuel Delivery System

The 6.0L XJS uses the same fuel delivery system as the 1994 MY XJ12 Sedan. Twin in-tank fuel pump modules provide the fuel required for the 6.0L engine. The modules are identical but operate independently with staged control. The control relay for fuel pump one is switched by the ECM. The control relay for fuel pump two is switched by the fuel pump control module. The fuel pump control module, located in the trunk right side, receives an engine speed input from the ignition ECM and switches the fuel pump relay on when engine speed reaches 2840 rpm.

XJS 5.3L V12 Fuel Delivery System

The 5.3L XJS uses a single fuel pump system that is similar in operation and layout to the 4.0L Sedan fuel delivery systems.



XJR-S 6.0L V12 Fuel Delivery System

The 6.0L XJR-S uses unique twin in-tank fuel pumps. The pumps operate simultaneously, controlled by an ECM switched relay.

NOTES

Chassis

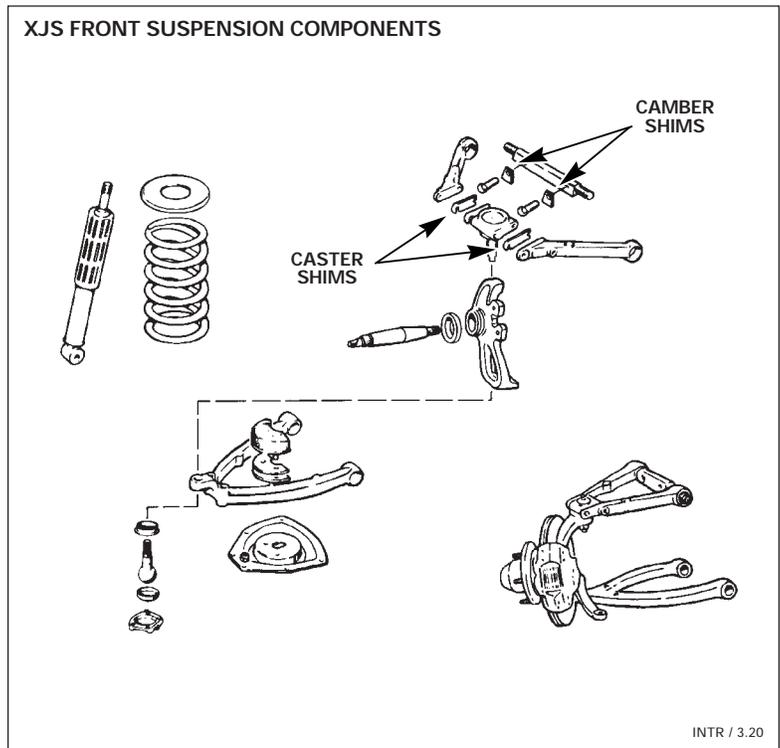
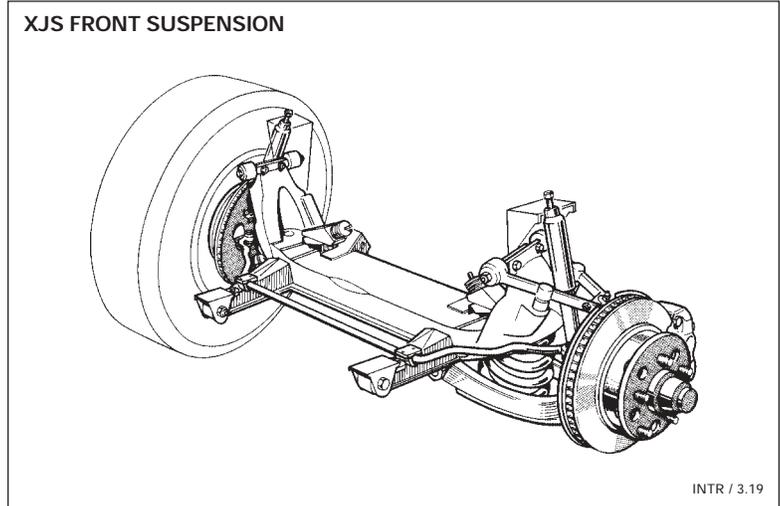
Suspension

XJS suspension is similar in design to the Sedan Range with unequal length "A" arm front suspension providing anti-dive under braking and a two link independent rear suspension utilizing the axle shafts as the upper link. Both the front and rear suspension assemblies are mounted on rubber isolated sub frames to isolate suspension loads from the body.

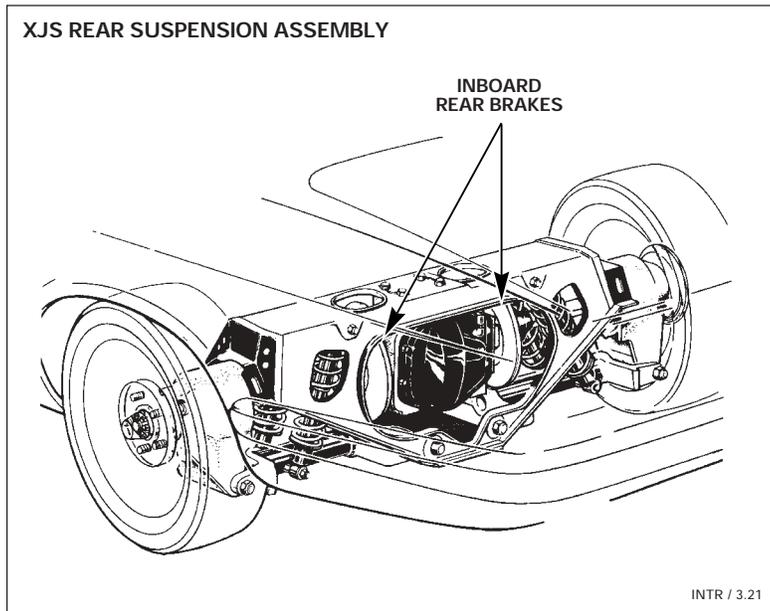
Front Suspension

The XJS front suspension has provisions for adjusting both caster and camber through the use of shims. When performing alignment measurements or adjustments, the steering rack must be fixed in the center position and the front and rear suspension height must be set with mid-laden tools.

NOTES



Suspension (continued)

**Rear Suspension**

Axle shafts (drive shafts) form the upper link of the rear suspension system as on Sedan Range vehicles and utilize shims on the inboard side for camber adjustment. Twin shock absorber / road spring units are used for each rear wheel.

Steering

A power assisted rack and pinion steering system receives its assist from an engine driven pump. The Dexron II D fluid is cooled with an external cooler.

Drive Train

A single drive shaft (propeller shaft) has universal joints front and rear and a sliding spline to allow for engine and transmission movement.

Final Drive

All XJS vehicles are fitted with a Powr-Lok limited slip differential.

NOTES

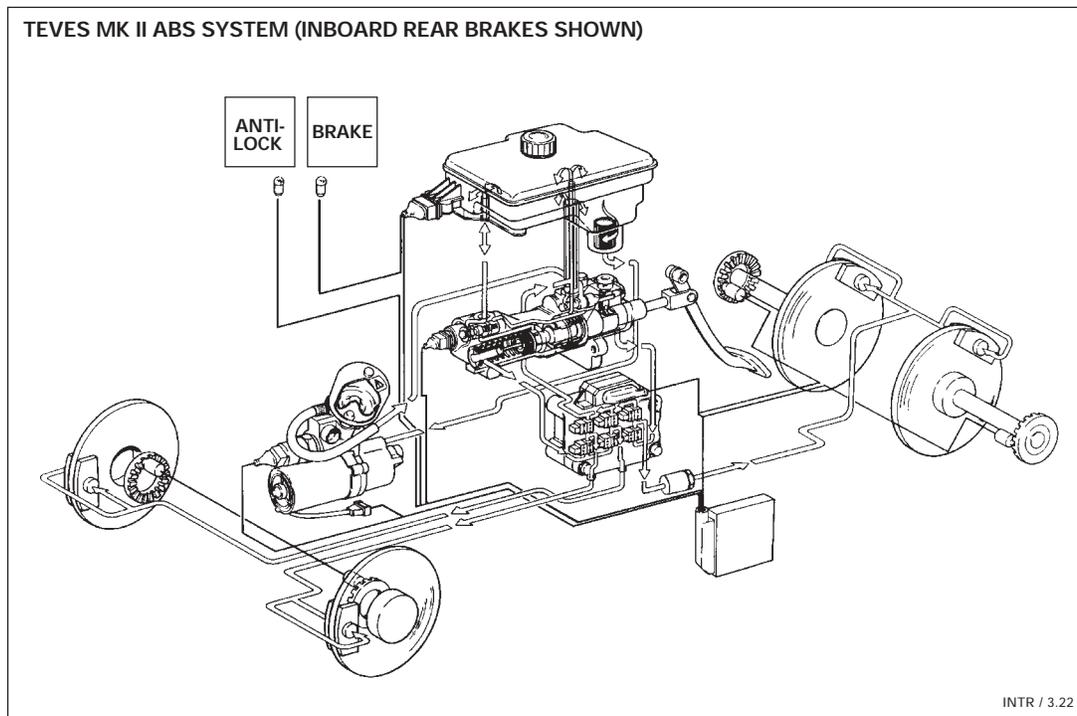
Brakes

The Rear brake arrangement on 1994 MY ON XJS Range vehicles is identical to that of the Sedan Range. XJS rear brakes were mounted inboard on the axles through the 1993 MY.

Anti-Lock Braking

A Teves MK IV ABS system is fitted to XJS Range vehicles beginning with VIN 198335. The MK IV ABS system is also used on 1995 MY Sedans as described on pages 50 and 51 of the Sedan Range section of this book.

A Teves MK II ABS system was fitted through the 1994 MY, combining normal system operation, power boost and anti-lock braking. The system uses an independent electrically-driven motor pump unit to provide both boost pressure and brake application pressure. DOT 4 brake fluid is used for both power boost and brake application. System operation is described in the Sedan section of this book on page 51.



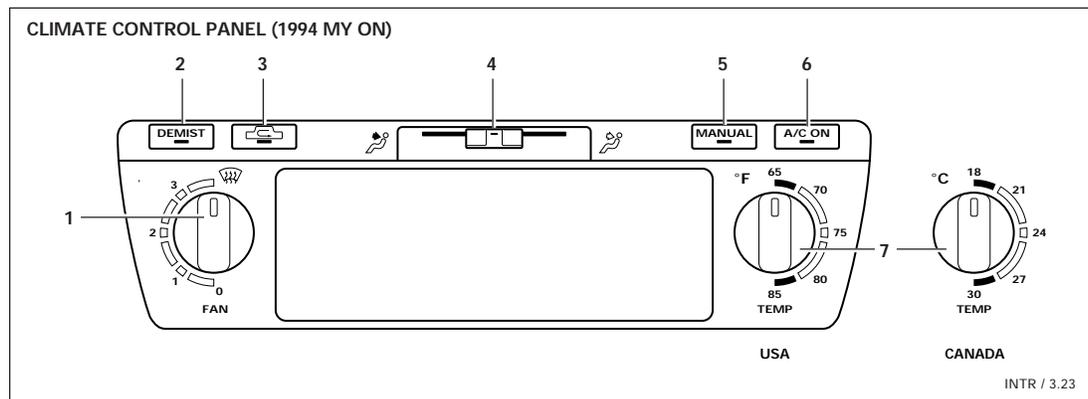
NOTES

Climate Control Systems

The XJS Mk III climate control system is very similar to the Mk IV system found in the Sedan. The main difference is the function control panel. The XJS climate control system has separate controls for temperature selection, mode control and face vent temperature. No provision is made for humidity control or solar compensation.

XJS Mk III Climate Control System (1994 MY ON)

The climate control panel uses individual buttons to control manual circulation, defrost (air bleed to the windshield), air conditioning on / off, and automatic or manual functions. A separate control panel module interfaces with the climate control module.



Controls

1 BLOWER CONTROL

Sets the range of automatic blower speeds with the system in automatic mode. With the blower control set to defrost, the system provides full heat and air to the windshield.

- 0 Switches the system off and seals the vents
- 1 Low blower speed range, variable depending on temperature differential between in-car and requested
- 2 Automatically varies blower speed through a wide range; blower speed reduces as the set temperature is approached
- 3 Constant maximum blower speed

DEFROST Maximum airflow at maximum temperature to the windshield; all other controls are overridden

2 DEMIST

Bleeds air to the windshield vents

3 RECIRCULATION

Closes outside vents and recirculates air within the car

4 TEMPERATURE DIFFERENTIAL

Adjusts the temperature difference between the face and footwell vents

5 MANUAL

Vent outlet temperature is controlled to the temperature selected

6 A/C ON

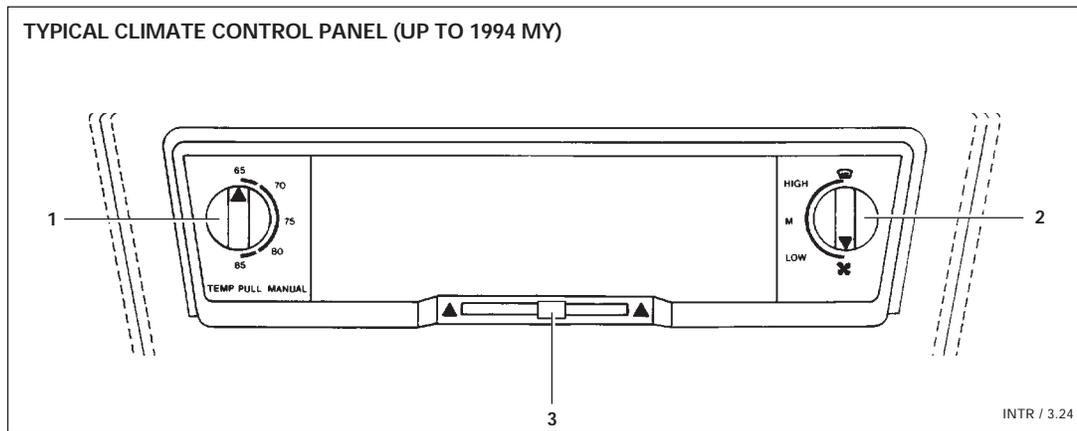
Switches on the air conditioning compressor

7 TEMPERATURE CONTROL

Rotate to select the temperature desired

XJS Mk III Climate Control System (up to 1994 MY)

The control panel uses potentiometers and switches to control temperature selection, and mode control. A cable from temperature differential slider controls face vent temperature.



Controls

1 TEMPERATURE CONTROL

Rotate to select the temperature desired

With the knob pushed in – Automatically achieves and maintains the in-car temperature desired

With the knob pulled out – Maintains the vent-out air at the desired setting regardless of the in-car temperature

2 BLOWER CONTROL

OFF – Switches the system off and seals the vents

LOW – Low blower speed range, variable depending on temperature differential between in-car and requested

M – Automatically varies blower speed through a wide range; blower speed reduces as the set temperature is approached

HIGH – Constant maximum blower speed.

DEFROST – Maximum airflow at maximum temperature to the windshield; all other controls are overridden

3 TEMPERATURE DIFFERENTIAL

Adjusts the temperature difference between the face and footwell vents

NOTES

Occupant Protection

Occupant Protection System Summary

Model year	Active Restraints	Passive Restraints	Mechanical Air Bag
1988 – 89 Coupe		Driver and passenger	
1990 – 93	Passenger side		Driver side
1994 ON			Driver and passenger

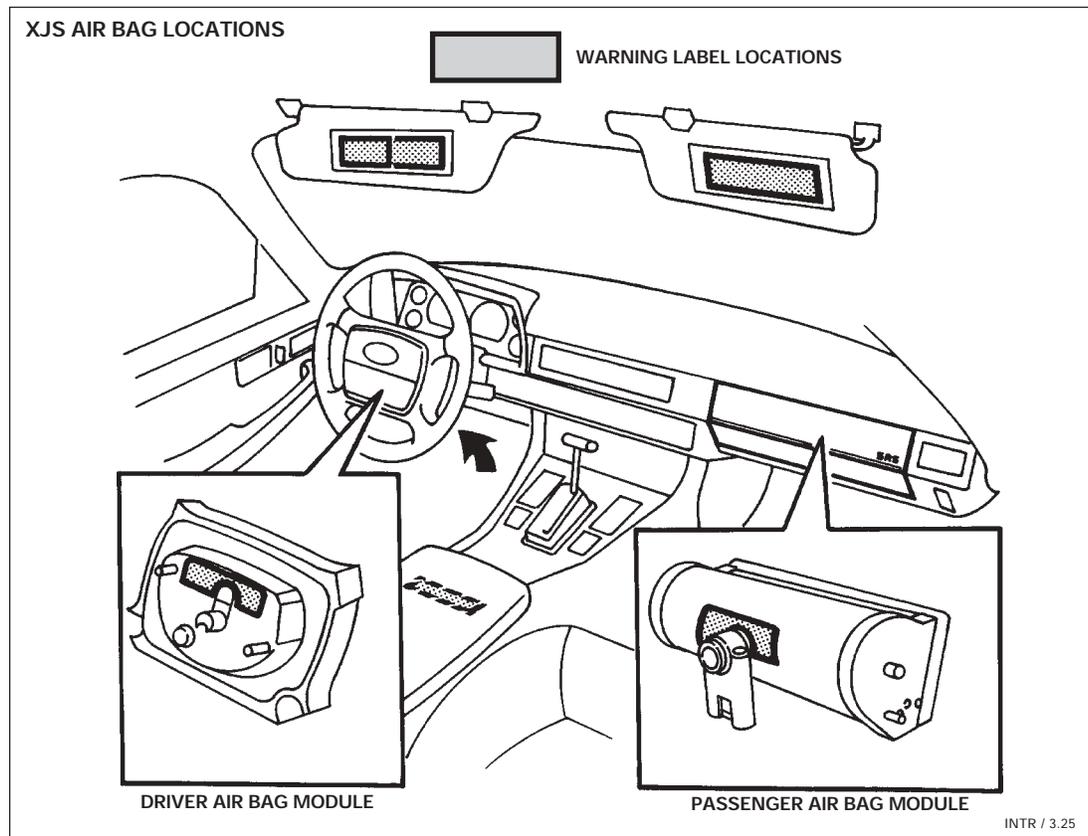
Air Bag Supplementary Restraint System (SRS)

XJS vehicles are fitted with a mechanically sensed air bag SRS which utilizes a self-contained air bag module. A three-point tear loop style seat belt is an integral part of the system. The mechanically sensed air bag SRS system and tear loop seat belt is fitted to the driver side or both front positions depending on model year.

The driver side air bag is mounted in the steering wheel. The passenger side air bag is fitted in the area previously used for the glove box.

Warning and service labels are placed in the vehicle and on the components so they can be readily identified.

▲ WARNING: Do not attempt service or maintenance work on the air bag SRS system without Jaguar specific tools, equipment and service procedures. Do not remove the steering column or steering wheel from the vehicle without first disarming the air bag. Do not remove an air bag without first disarming. Observe all safety precautions when working with air bags.



INTR / 3.25

Passive Restraints

The passive restraint system is provided for the driver and front passenger. The system consists of a two position adjustable diagonal seat belt fed from an inertia reel mounted on the inside seat slide. The diagonal belt is connected to a motorized runner on the upper door opening. An independent lap belt fed from an inertia reel mounted on the outside seat slide connects manually to the anchor on the inside seat slide.

The motorized diagonal belts move to restrained position when the respective front door is closed and the ignition is turned to position 2 or 3. The passenger belt operates with the seat empty. Both belts move to the unrestrained position when the ignition is turned to position 1 or off. If a front door is opened with the ignition in position 2, that belt will move to the unrestrained position. In reverse with the drivers door open and the ignition in position 2 or 3, the belt remains in the restrained position.

If the inertia switch trips with the ignition on, the belts will remain restrained and the doors will unlock.

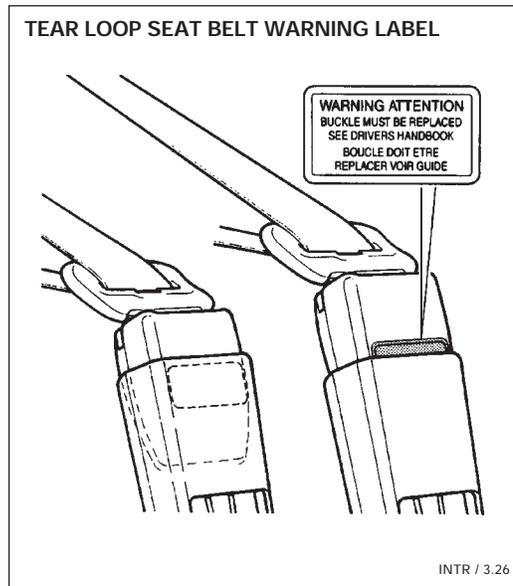
An emergency release is provided on the shoulder end of the diagonal belt.

Front Seat Belts

Front seats are equipped with three-point seat belts with adjustable shoulder anchor points.

To reduce driver and front seat passenger chest loads in air bag SRS equipped vehicles in the event of a collision, tear loop units on the air bag equipped positions absorb energy as the occupant travels forward into the air bag. The tear loops are on the driver out-board belt anchorage and the passenger seat belt buckle. Do not interchange seat belts. Use only the correct belt for the restraint system and position.

If the tear loop warning label is visible, the belt assembly must be replaced.



NOTES

Electrical / Electronic

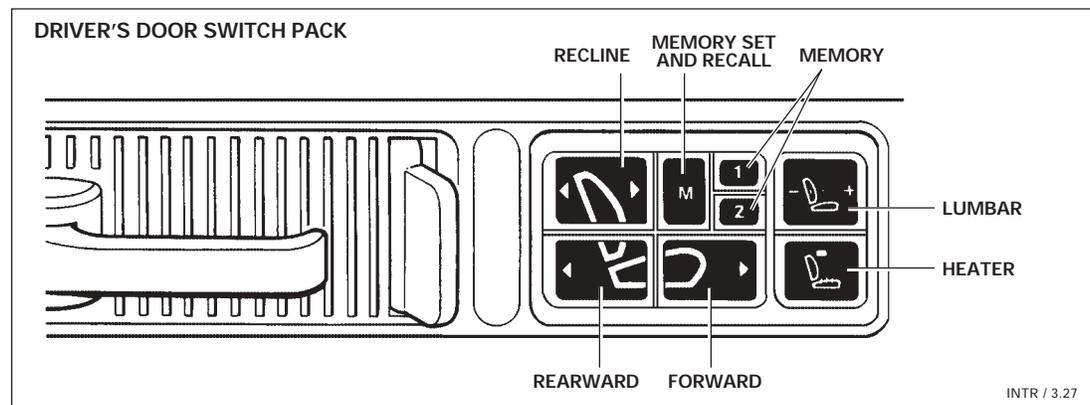
Controls

Powered Seat and Mirror Memory

The power adjustable front seats include lumbar support and heaters. The seat controls are located on the respective door trim panels.

Two sets of driver seat and door mirror positions may be programmed into memory with the ignition in positions I or II.

To program the seat and mirrors, first adjust to the desired position. Simultaneously press the M (memory set) and 1 (memory position 1) switches on the door trim panel and hold for three seconds. A second set of positions can be programmed by repeating the process and pressing switch 2.



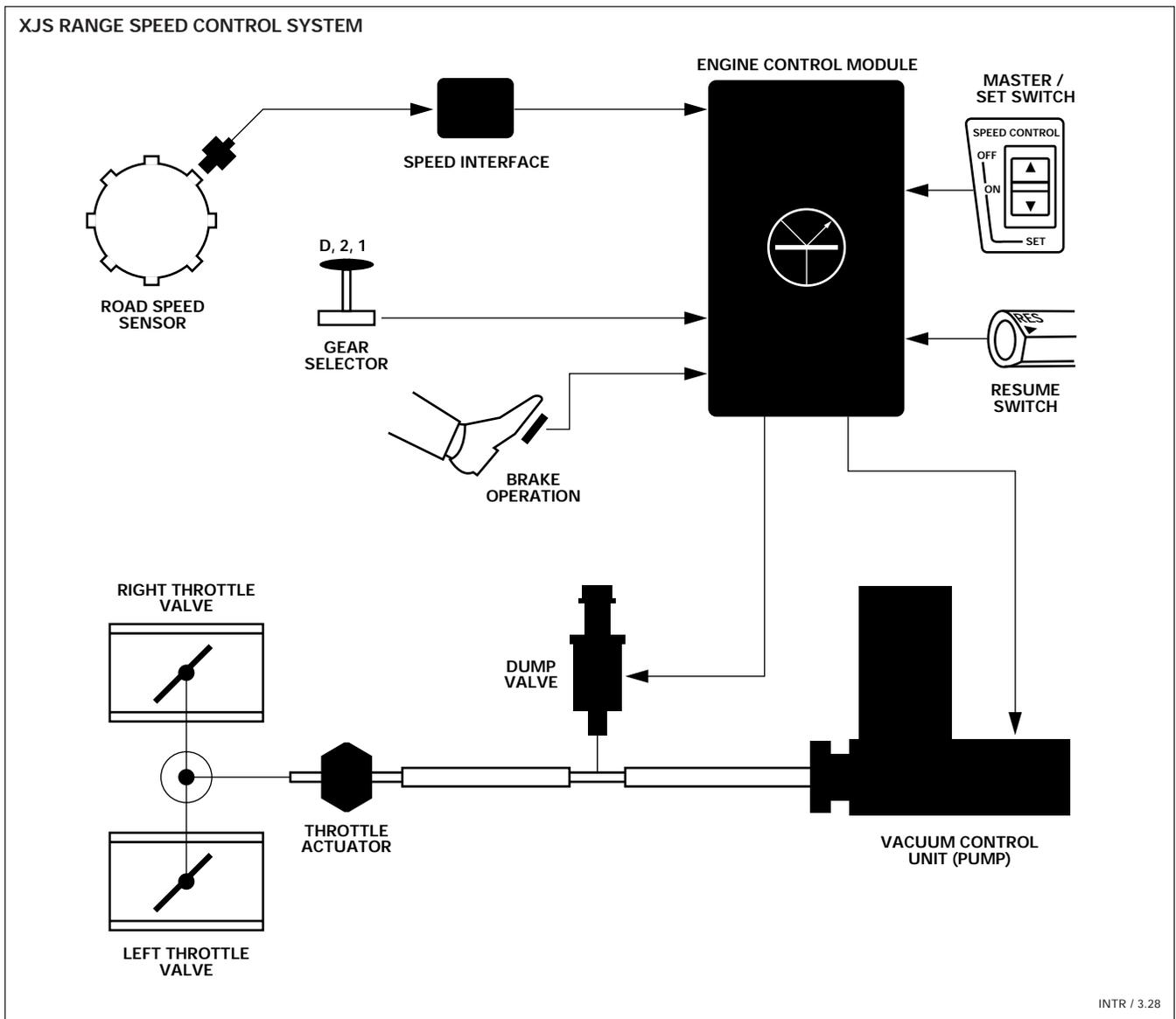
NOTES

Speed Control

The speed control (speed control) system is similar to the Sedan Range system in design and operation. It is controlled with two switches. The master (ON / OFF / SET) switch is located adjacent to the gear selector. The RESUME switch is on the end of the left combination switch stalk.

To operate the system, touch SET to set the current speed. Holding the SET switch will gradually increase vehicle speed. When the switch is released, the new speed is set. Touching the brake disengages the system. Pressing RESUME will recall the last set speed and reengage the system.

Set memory is canceled when the ignition or the speed control system is switched off.



INTR / 3.28

NOTES

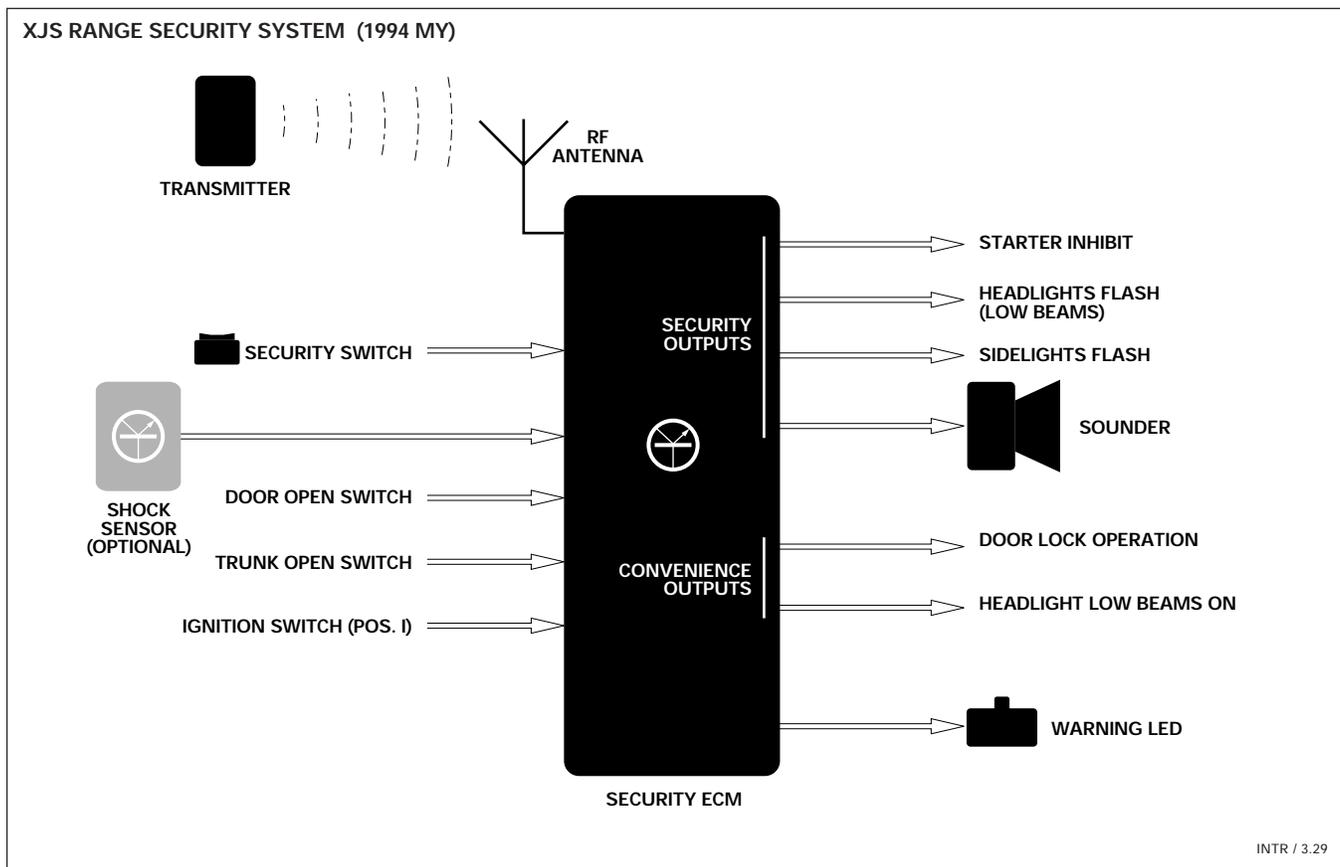
Electrical and Electronic Components

The XJS Range utilizes an electrical design concept that is more conventional than that of the Sedan Range vehicles. Control Modules operate a number of the vehicle systems and share the convenience features of the Sedan electrical system.

Complete details of the XJS electrical / electronic systems can be found in the Electrical Guide for the specific vehicle.

Vehicle Security

A full feature microprocessor-controlled security system was available as an option in the 1993 model year. The Jaguar 19K security system provided audible and visual alarms and starter disablement. The factory integrated security system was standard equipment from 1994 MY on.



NOTES

Vehicle Maintenance

Service intervals are different depending on the Model Year of the vehicle.

Refer to the vehicle Passport to Service or the Administration Bulletins in Section 4 of the Administration Bulletin Binder for maintenance schedules.

Jaguar also publishes Vehicle Maintenance Checklists for technician use in performing vehicle maintenance.

Service Intervals

1995 MY Every 7,500 miles. Certain operations are specified at 30,000, 52,500, and 60,000 mile intervals. Certain operations are specified at 2-year intervals regardless of mileage.

1994 MY Every 10,000 miles or 12 months. Certain operations are specified at 30,000 and 60,000 mile intervals. Certain operations are specified at 2-year intervals regardless of mileage.

UP TO 1994 MY Every 7,500 miles or 12 months. Certain operations are specified at 30,000, 52,500, and 60,000 mile intervals. Certain operations are specified at 2-year intervals regardless of mileage.

NOTES
