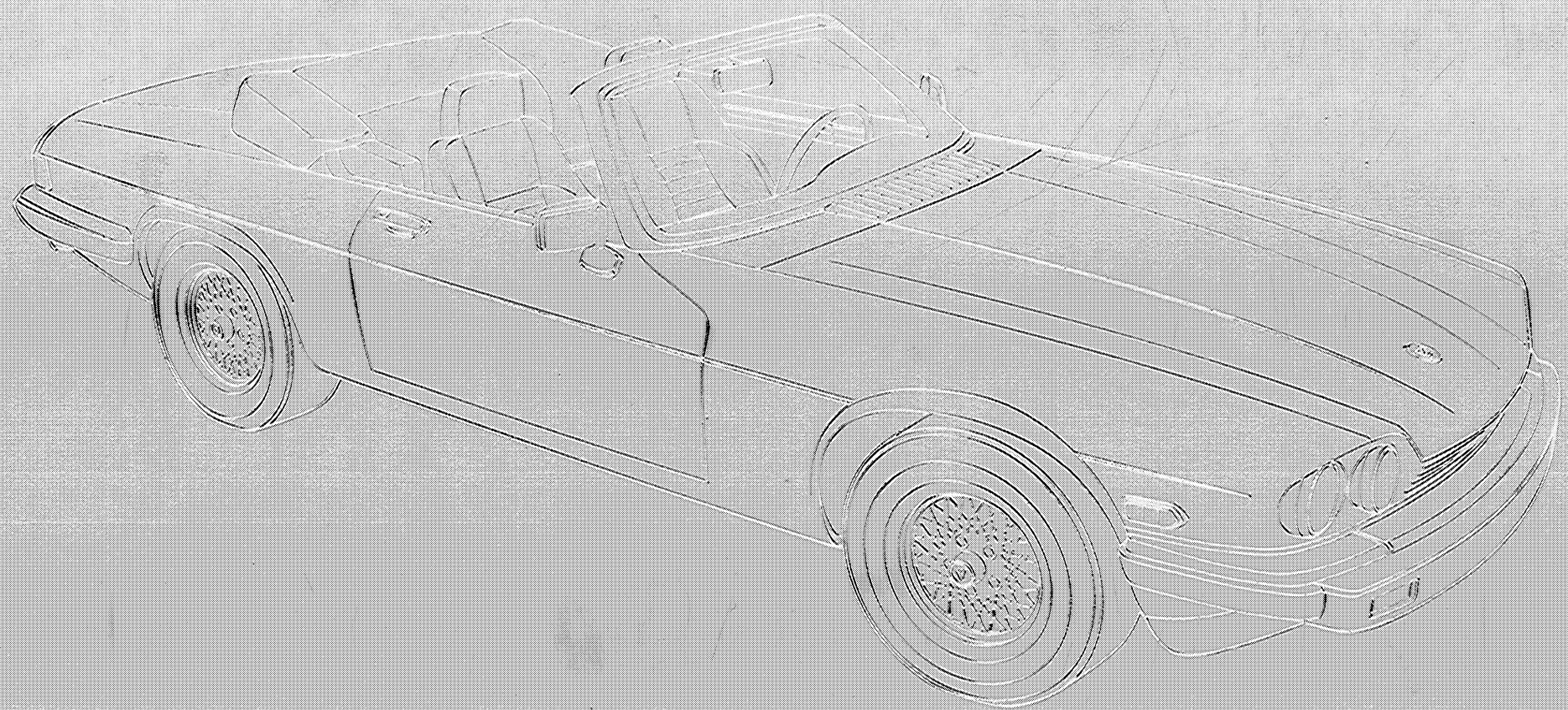
JAGUAR

XJ-S CONVERTIBLE



Technical Introduction

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Publication number S-61

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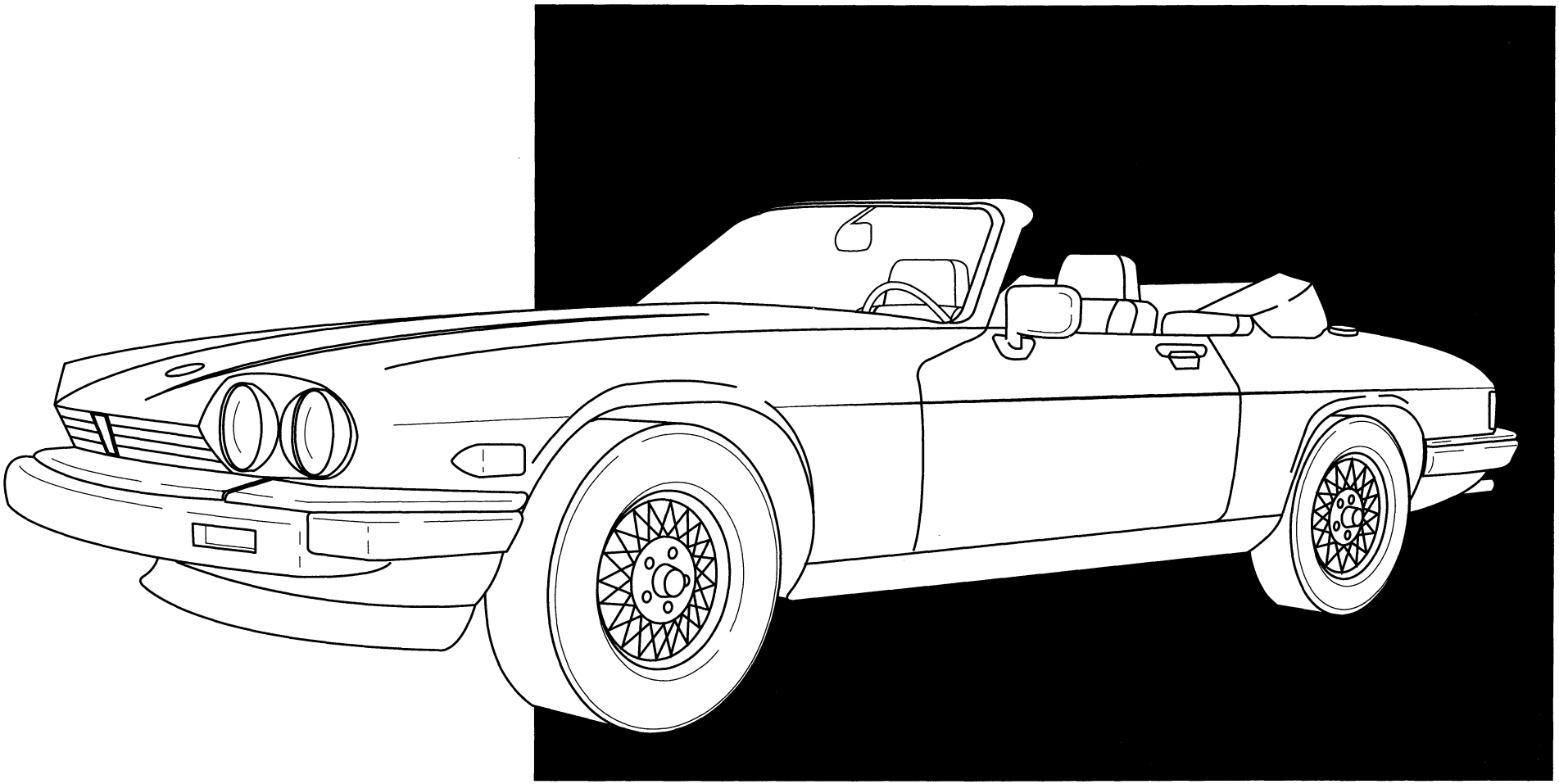
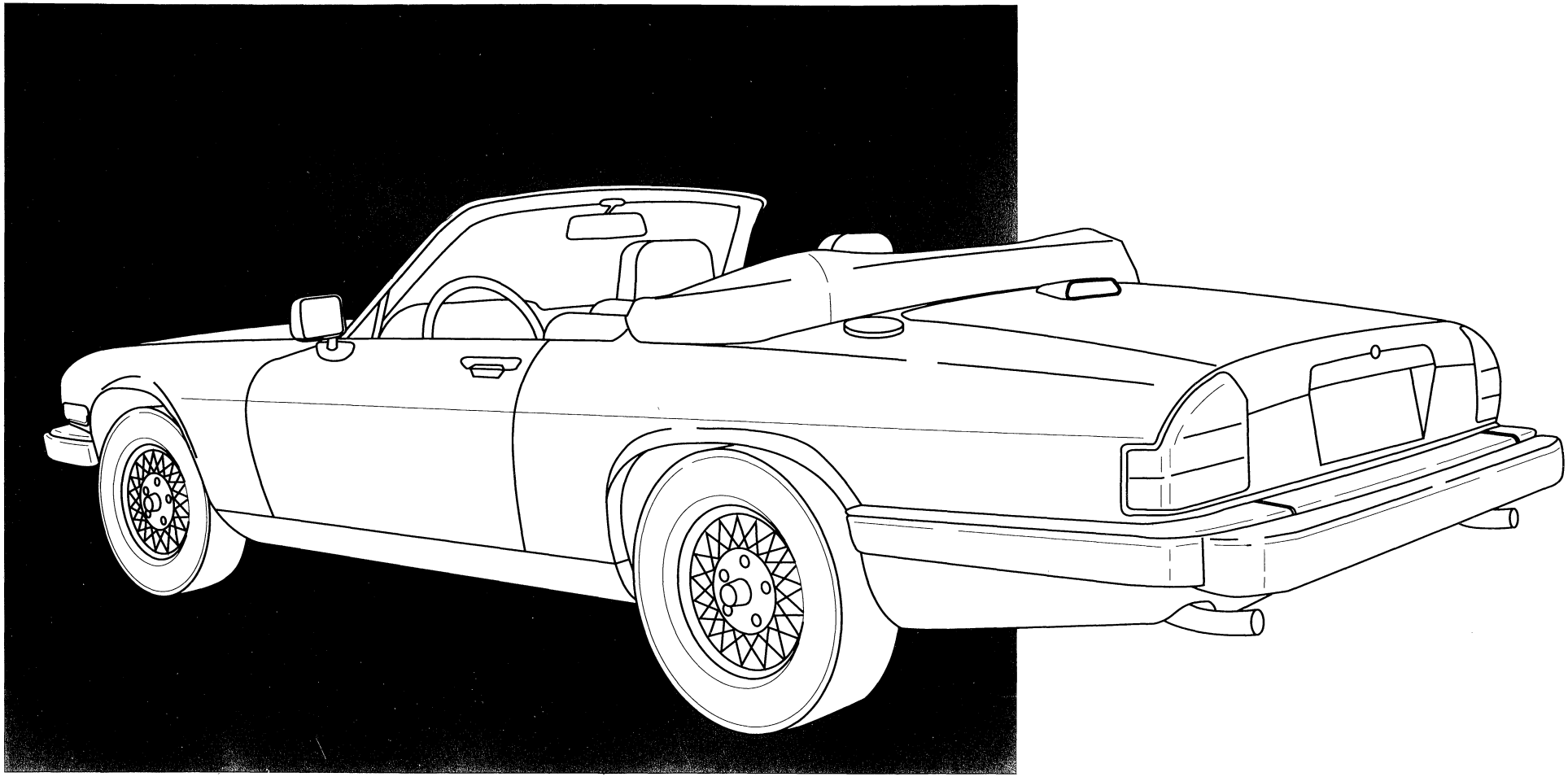
rebirth of a legend

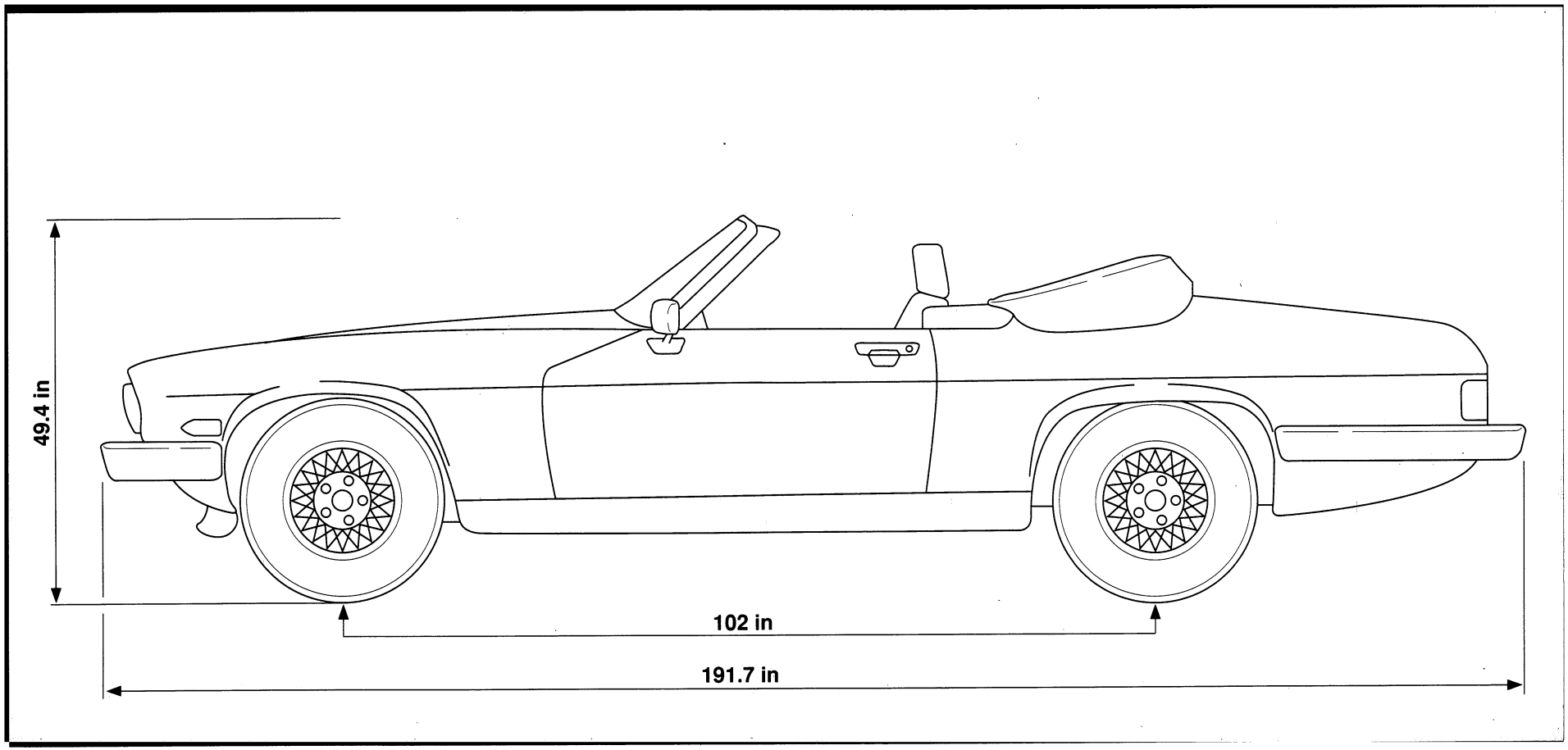


Jaguar enthusiasts have long considered the legendary E-type to be the ultimate in open top driving. With the arrival of the new XJ-S convertible, the legend has been reborn. Coming at a time when Jaguar is enjoying success on the race tracks of the world, this new model will certainly win favor with all automobile enthusiasts. The XJ-S Convertible retains the classic appeal of its coupe predecessors while incorporating many important technological changes. Powered by the ultra smooth V12 engine, the Convertible brings the excitement of open top driving into the 1980's.

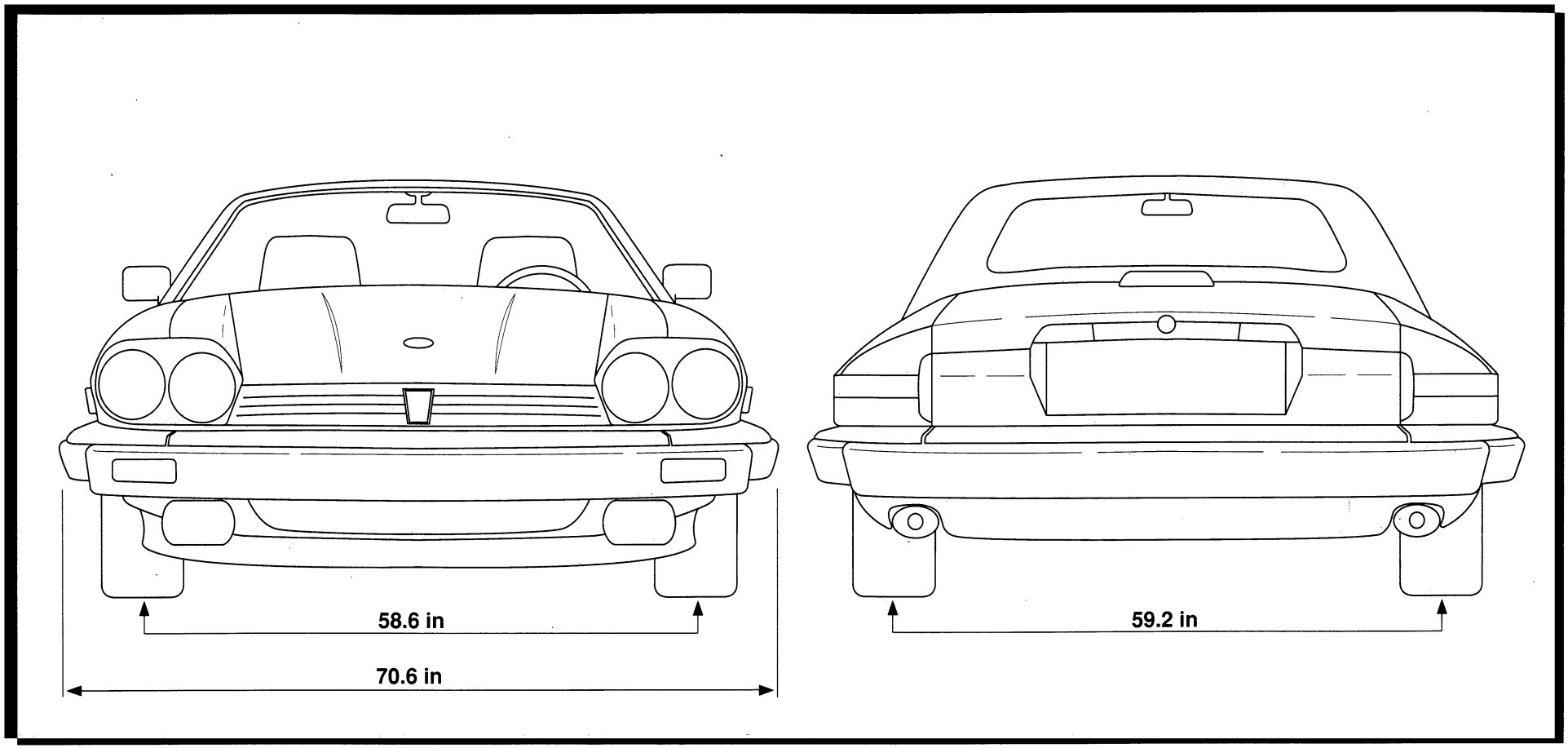


The design and development of the Convertible was a massive project which included a large investment in a new manufacturing facility at Jaguar's Castle Bromwich body assembly plant. The Convertible body is built from the ground up as a convertible in the new state-of-the-art plant. With the goal of producing a convertible that would offer the owner the ultimate open top driving experience, Jaguar turned to the renowned coachmaker Karmann for assistance. All engineering for the body structure and the manufacturing process was a joint project between Jaguar and Karmann.

SPECIFICATIONS



VEHICLE DATA:	Curb weight	4190 lb
	Gross vehicle weight	4710 lb
	Gross front axle weight rating	2420 lb
	Gross rear axle weight rating	2290 lb
	Turning circle (curb to curb)	42 ft 9 in
	Turning circle (wall to wall)	44 ft 9 in

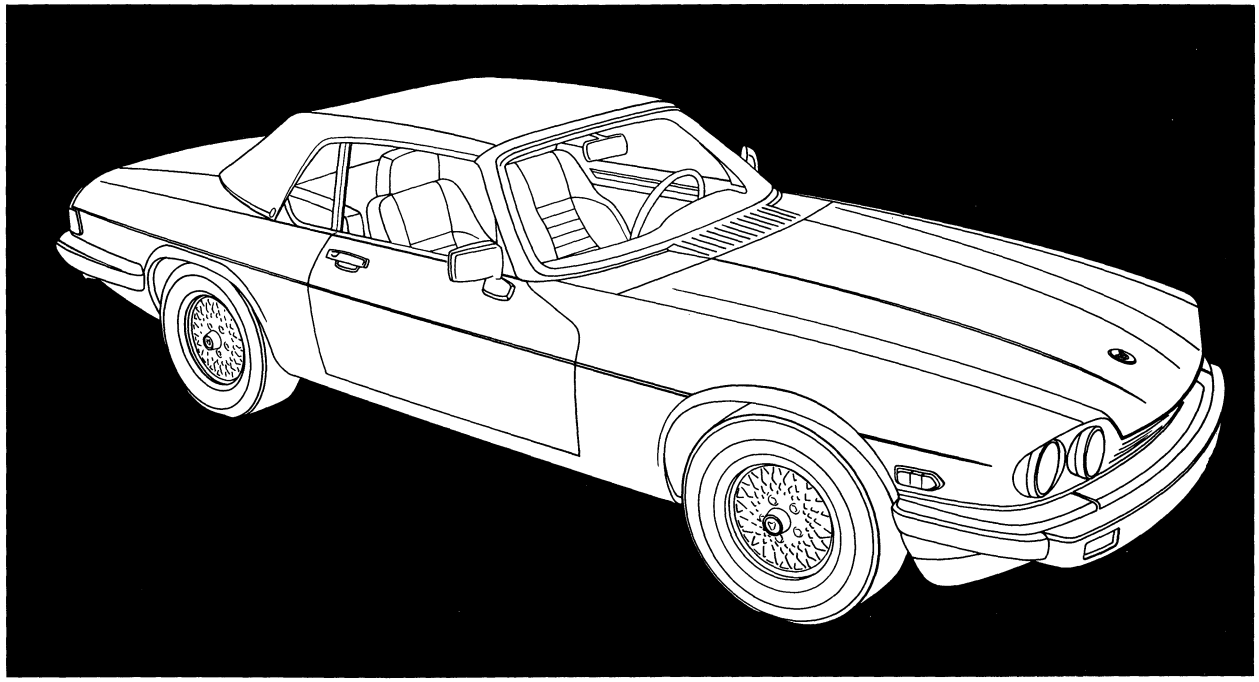


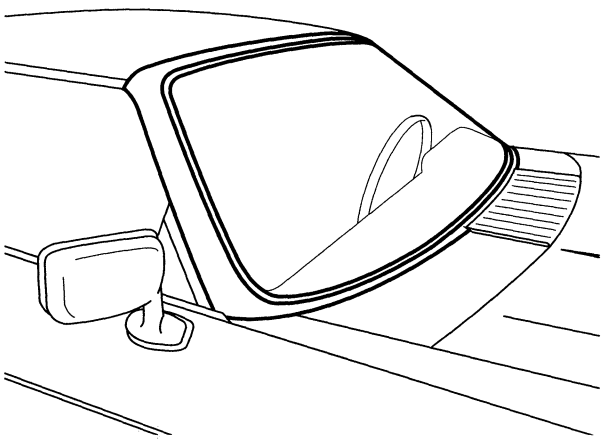
VEHICLE DATA:

Wheels and Tires	
Sports alloy rims	6 1/2 x 15 in
Pirelli P600	235/60 VR15
Tire inflation	
Maximum ride comfort	28 psi F and R
High speed driving	36 psi F and R
Fuel tank capacity	21.6 gal
Trunk capacity	9.24 cu ft

BODY DESIGN AND STRUCTURE

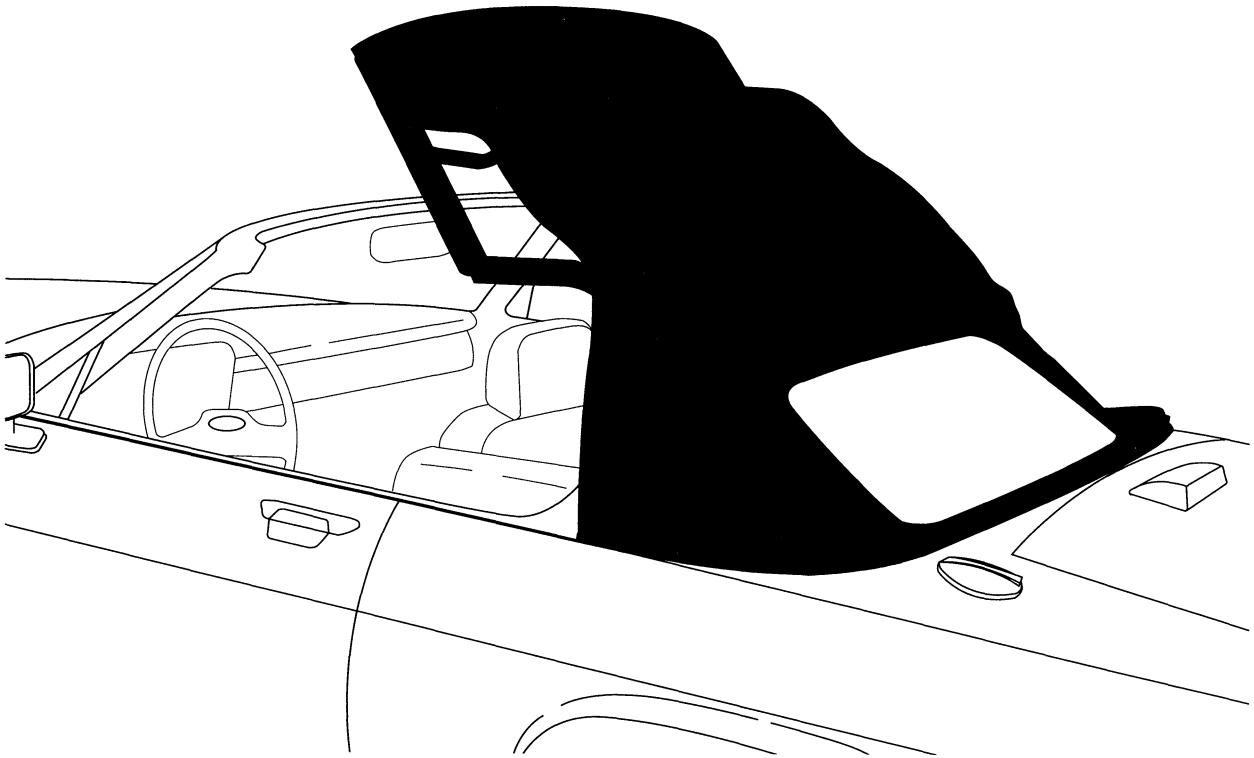
While retaining the classic body lines of the XJ-S coupe, the Jaguar stylists have created a vehicle with character and style all its own. The skillful integration of the convertible top and the rear quarter windows with the new rear deck has produced a truly stunning luxury open touring automobile. The body structure was conceived using advanced Computer Aided Design techniques for determining metal thickness and the need for reinforcement panels and members. This process yielded a convertible with optimal chassis torsional stiffness.





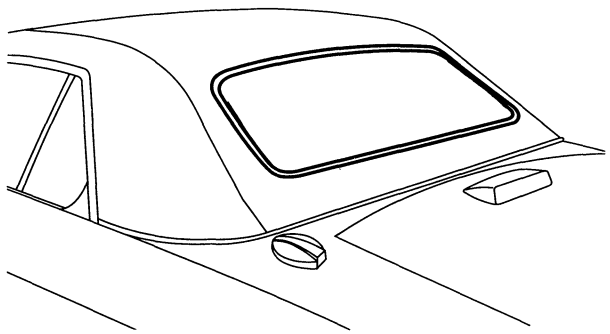
WINDSHIELD

The Convertible's windshield is direct-glazed so that it lies completely flush with the frame. This serves two purposes: it allows the glass thickness to be reduced, thereby saving weight, and it enhances aerodynamics while giving a smoother, more elegant line.



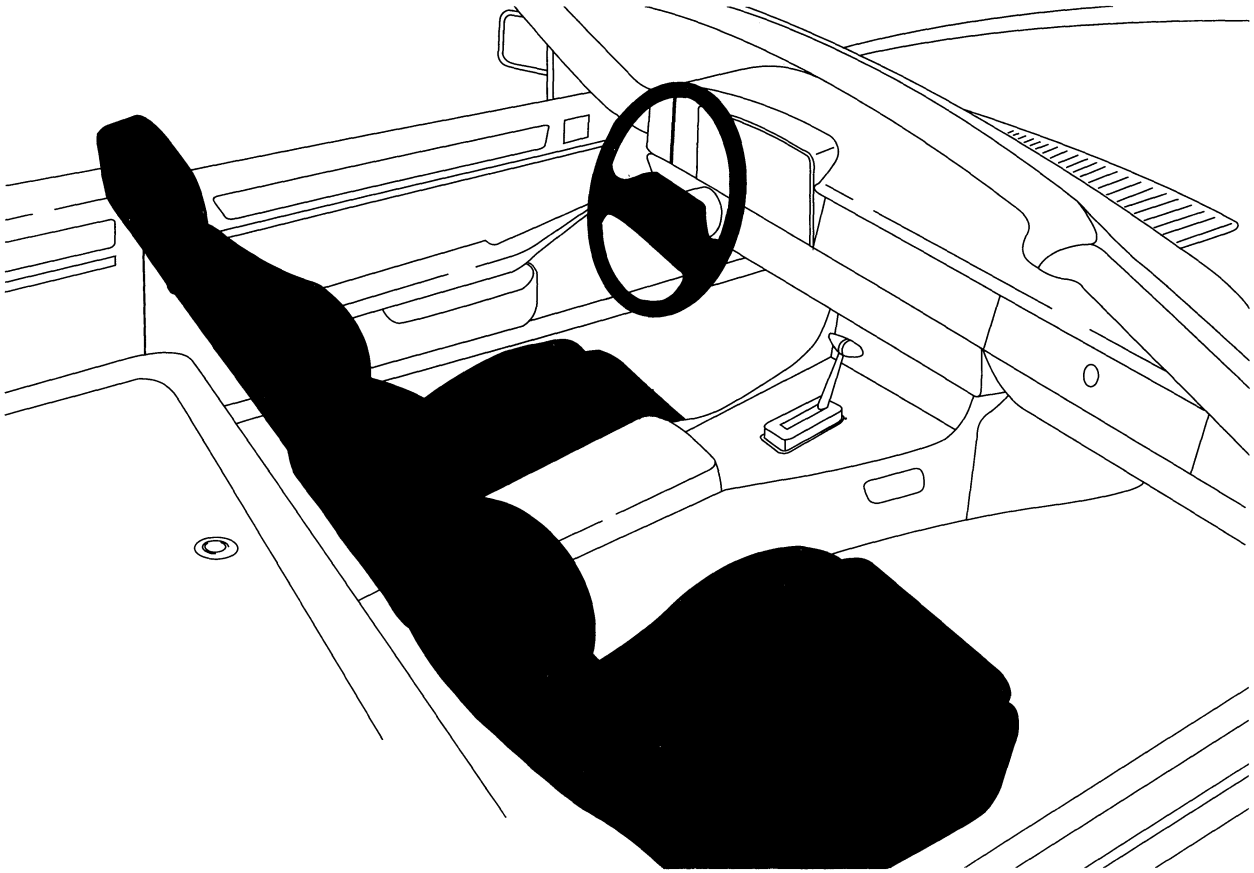
TOP CONSTRUCTION

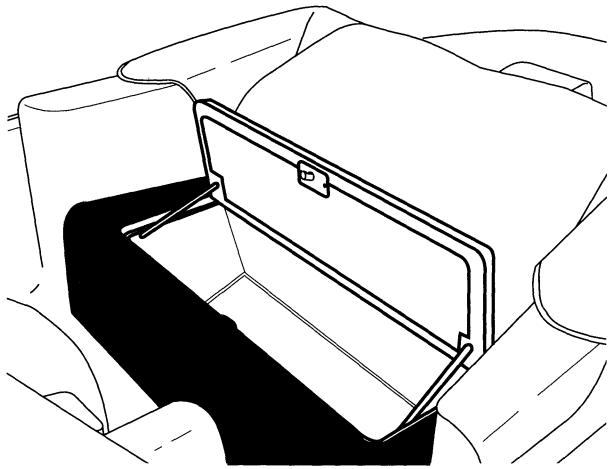
The convertible top is fully power operated, requiring that the driver simply move two release handles and press the roof switch. The electro-hydraulic operating mechanism moves the top to the full down position in approximately 12 seconds. The all metal framework is covered in luxurious heavy woven fabric. To enhance the interior appearance and provide additional soundproofing, the top is fully lined. A layer of insulating material forms a pad between the top and the headliner.



REAR WINDOW

The convertible top incorporates a heated glass rear window. The window glass is tinted and has a heating element to provide good rearward visibility in all weather conditions.





SPORTS SEATS

Leather trimmed sports seats incorporate power lumbar supports and seat heaters.

SPORTS STEERING WHEEL

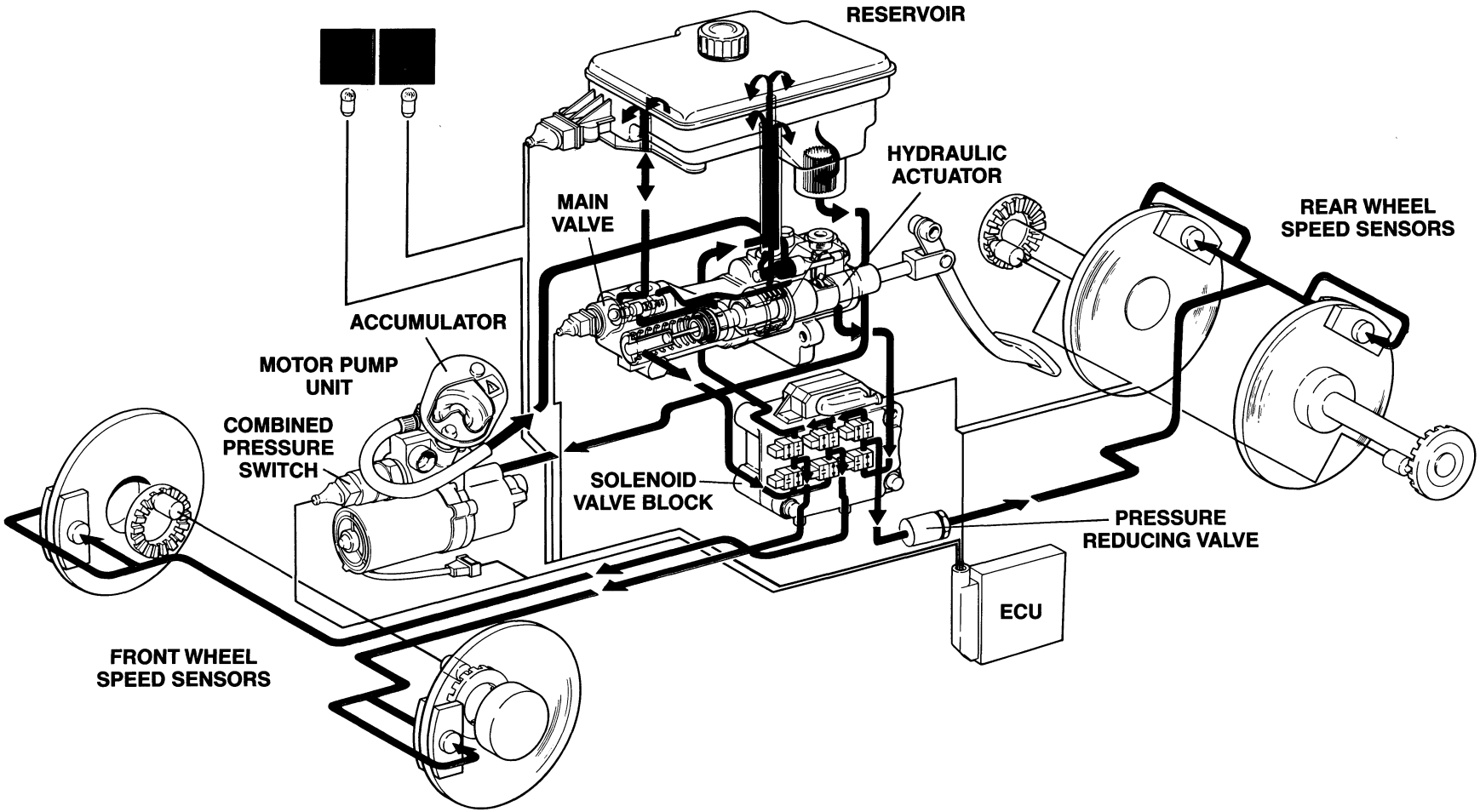
A new two-spoke sports steering wheel incorporates horn buttons.

INTERIOR TRIM

The door panels and the rear quarter panels are trimmed with leather and wood. The wood trim has boxwood inlays.

STORAGE COMPARTMENT

The lockable rear storage compartment provides a safe place for securing valuables when the top is down. The chrome rail on the lid will retain luggage or packages placed on top of the compartment.



BRAKING SYSTEM

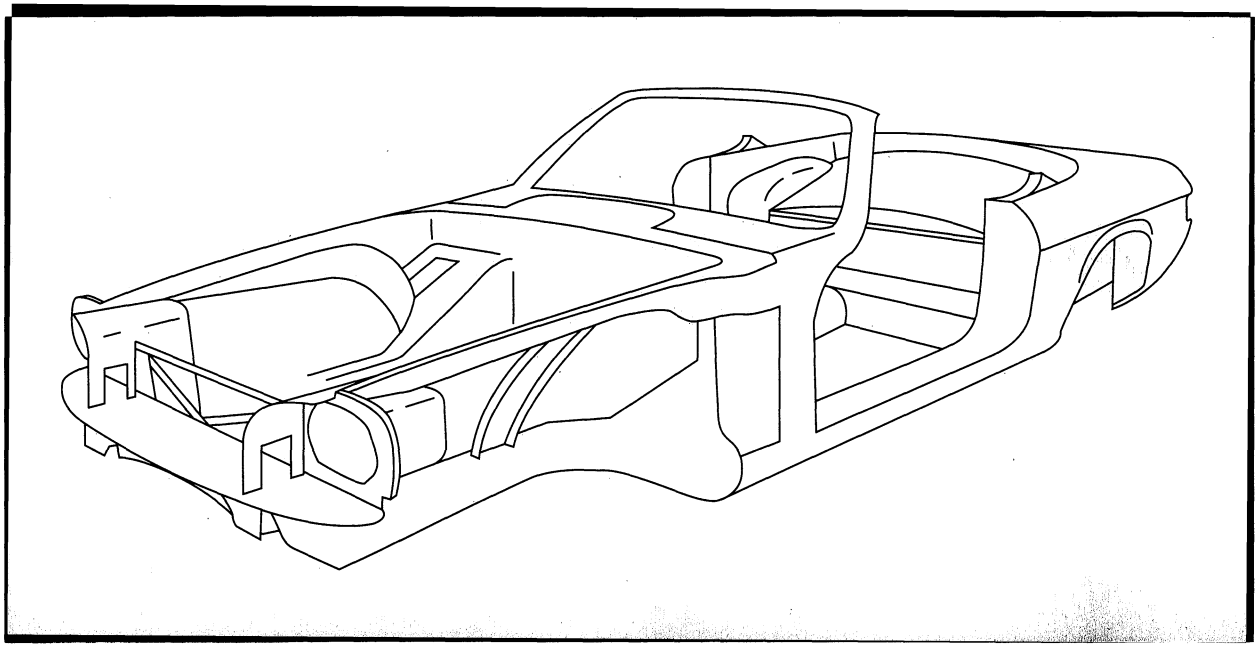
The new XJ-S brake system combines normal system operation, power boost, and anti-lock braking. Three hydraulic circuits are used—one to each front wheel and one to the rear wheels.

Normal Operation

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

Anti-lock Operation

When anti-lock control is required, the front hydraulic circuits are also operated directly by boost pressure. The four wheel speed sensors input to the ECU, which modulates the solenoid valves as necessary to prevent wheel lock.

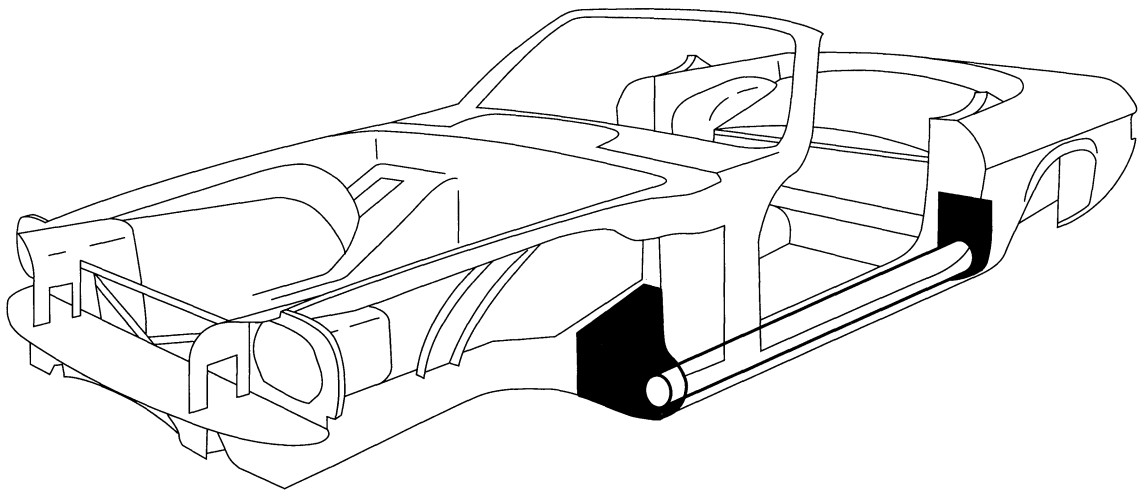


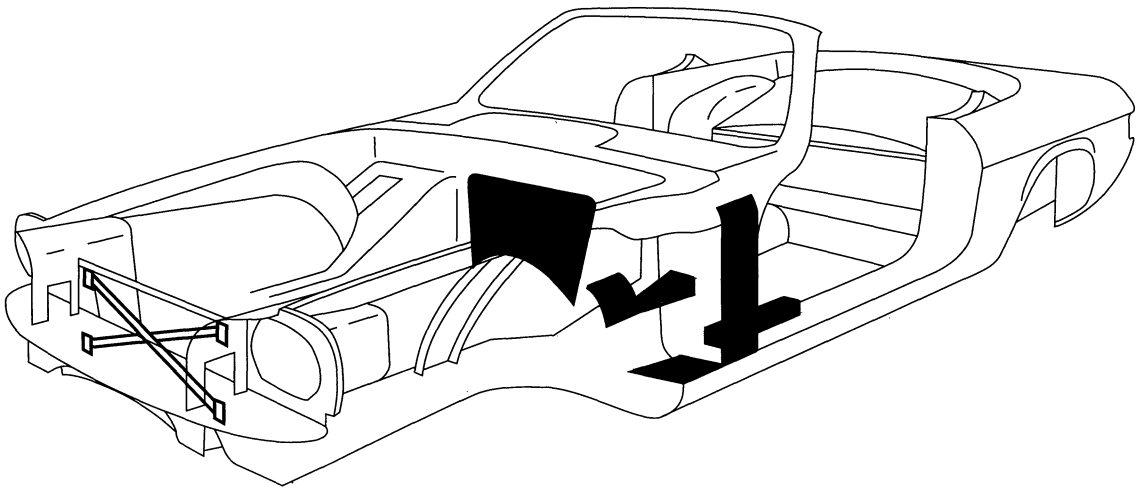
DESIGNED FOR STRENGTH

In designing the body structure, the Jaguar and Karmann engineering team faced a formidable task. Without any metal roof structure, optimal chassis torsional rigidity would be difficult to achieve and would require extensive reinforcement and increases in metal thickness. Vehicle weight gain was kept to a minimum by the design of light weight but strong panels. The end result of the research and development phase was almost a car within a car. A total of 156 new or modified panels were incorporated—approximately 33% of the total panel count in the car.

SILL REINFORCING TUBES

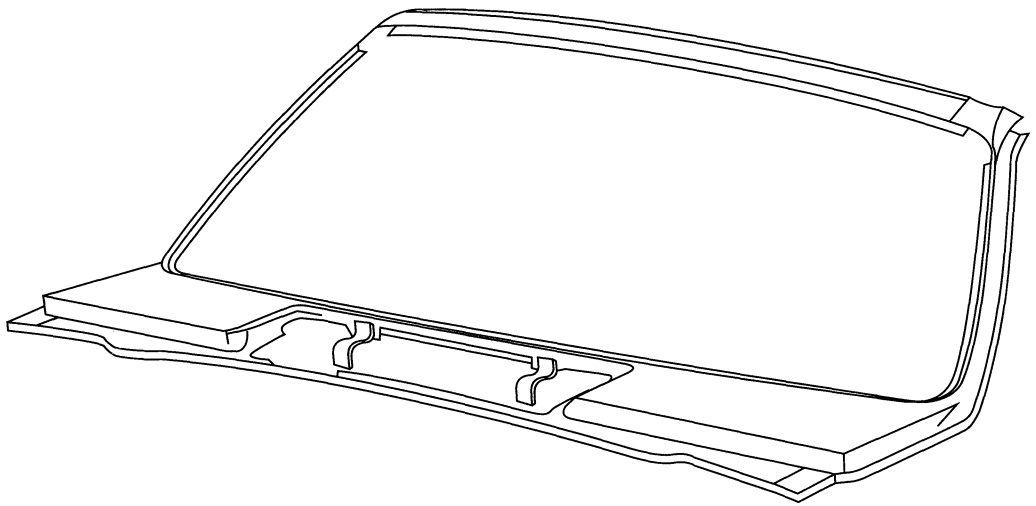
Massive 4 1/2 in. built-up steel tubes, placed in the door sills and welded at the front and rear to new reinforcement brackets, strengthen the backbone of the Convertible.





FORWARD REINFORCEMENTS

The forward portion of the body required the least amount of reinforcement. An "X" brace was added to the radiator support area. Reinforcing panels were added to the "A" post, the front bulkhead, the transmission tunnel, and the front floors.

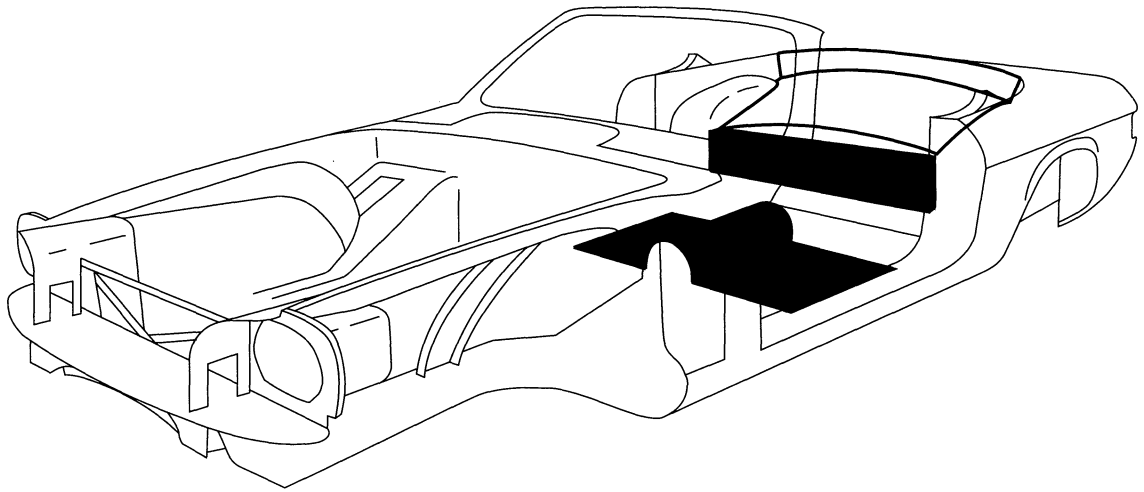


WINDSHIELD FRAME

The windshield frame was redesigned to accommodate the new glazing and additional reinforcement. The side members contain strengthening tubes and the entire assembly plays an important role in enhancing torsional rigidity.

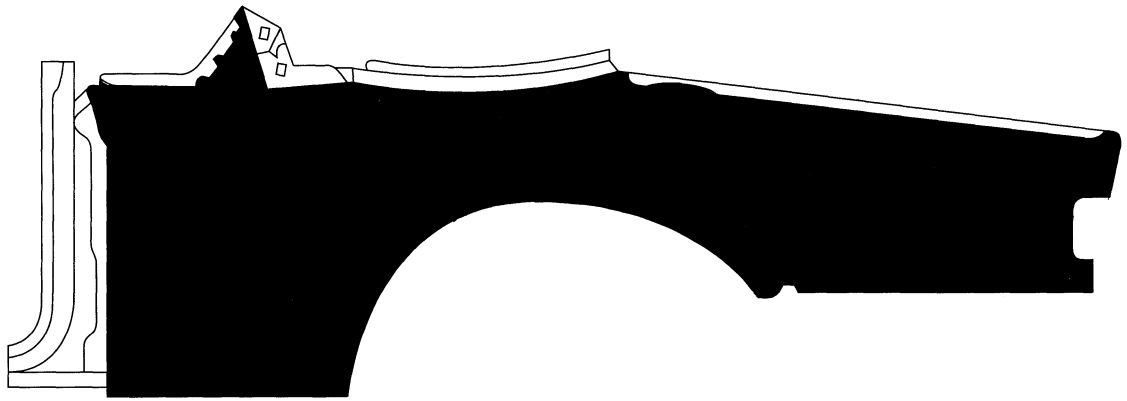
MIDDLE REINFORCEMENTS

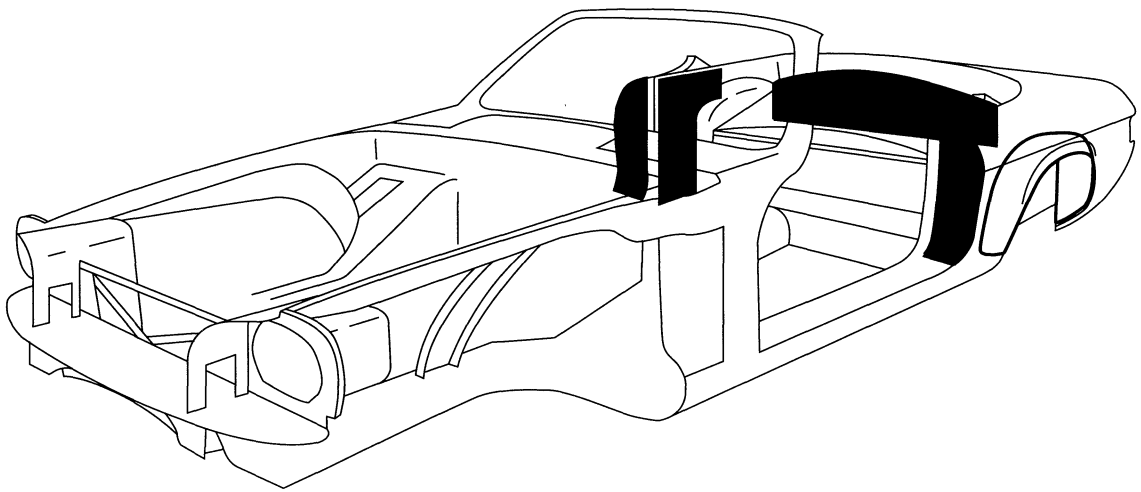
With the elimination of the roof, the middle portion of the body obviously required the most attention. A double panel rear floor was incorporated into the underframe.The rear seat area was strengthened with the addition of a new box section member. Several new panels were used to form the area for the folded convertible top.



REAR QUARTER PANEL

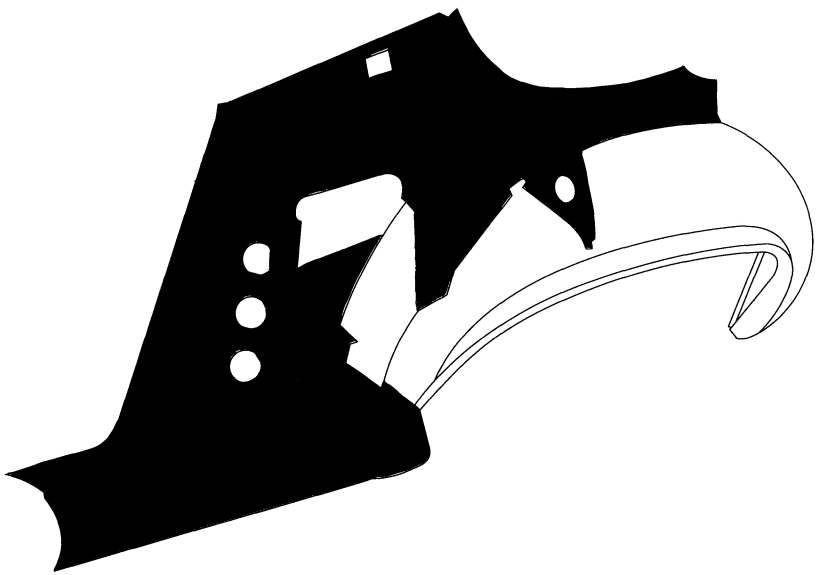
The convertible redesign required the reshaping of the rear quarter panels, rear deck, and the trunk lid.





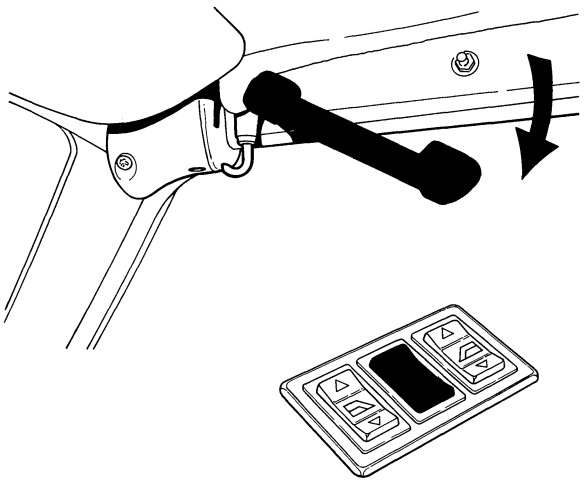
REARWARD REINFORCEMENTS

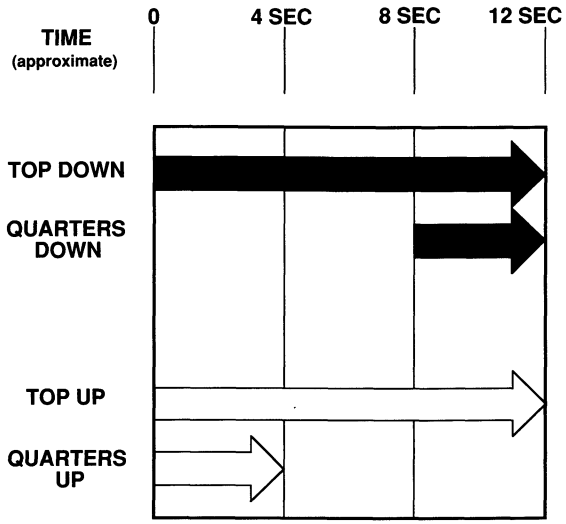
With the convertible redesign, many of the rear basic body panels required modification. The "B" posts were strengthened and an additional stiffening panel was added to the rear bulkhead. The rear wheel arches were redesigned for strength.

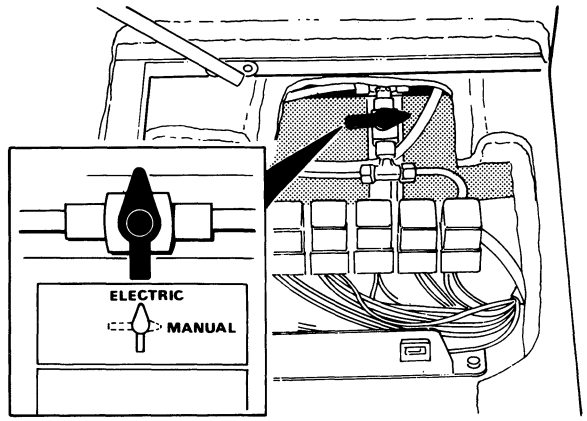


REAR WHEEL ARCH

The rear wheel arches feature double wall construction and form the outer members of the rear basic body.







NORMAL OPERATION

The convertible top operation is designed for simplicity. After releasing the two handles which lock the top at the windshield frame, press and hold the roof switch. For safety, the ignition must be in position 1 or 2, the parking brake must be applied, and the gear selector must be in PARK or NEUTRAL for the top to operate.

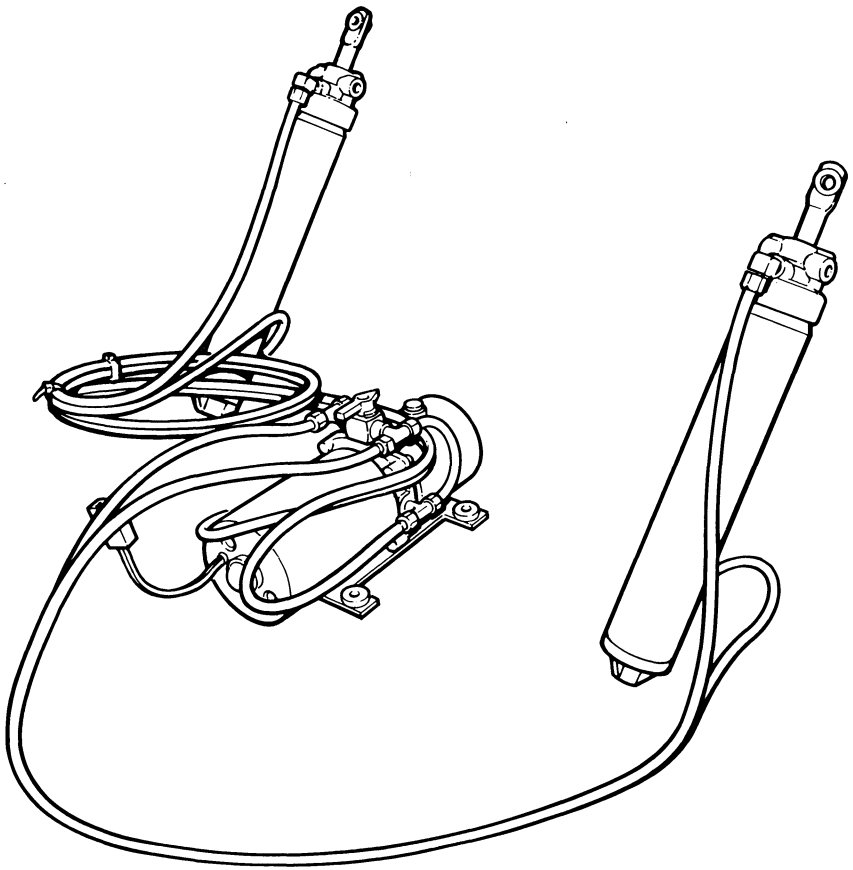
OPERATING SEQUENCE

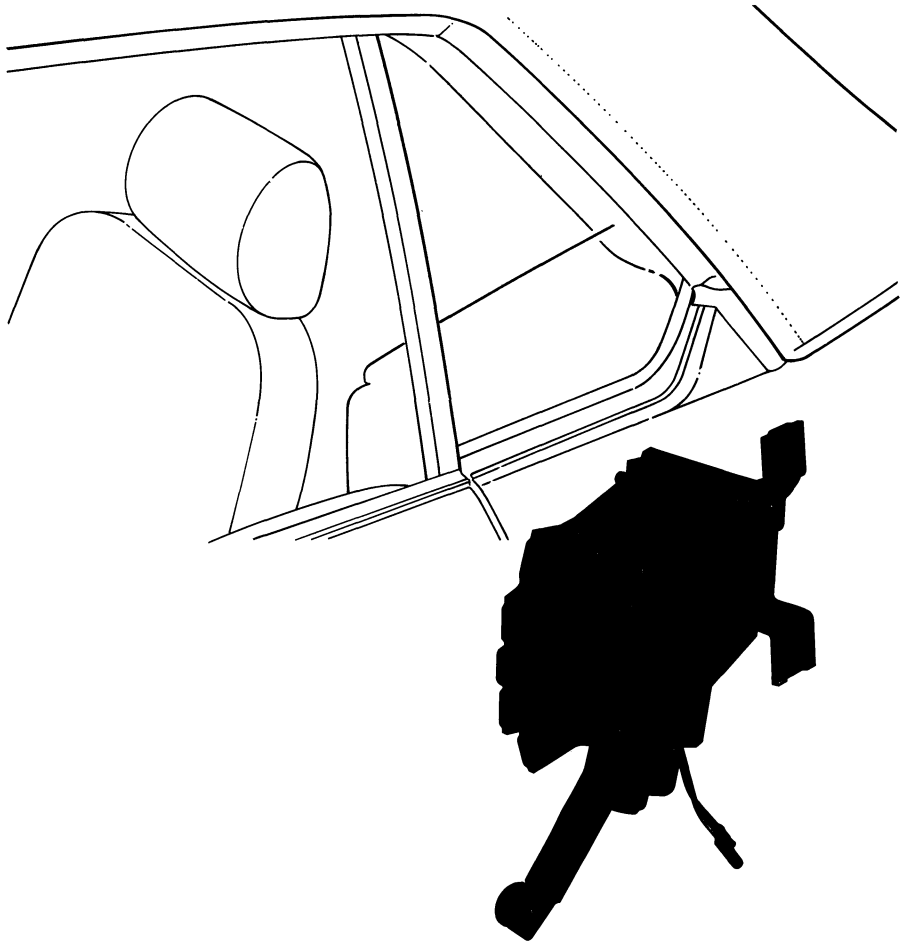
The convertible top and the rear quarter windows are operated by the roof switch in a pre-programmed sequence controlled by an ECU. When the roof switch is moved to the down position, the top and the rear quarter windows move together for approximately four seconds. The ECU then interrupts the current flow to the rear quarters and continues to operate the top for approximately eight seconds more.

The sequence is reversed when the top is raised. The ECU interrupts current flow to both the top and the rear quarters if the roof switch is held for longer than twelve seconds.

MANUAL OPERATION

The top can be lowered or raised manually if necessary. An electric-manual valve is provided on the hydraulic pump located behind the panel in the storage compartment. By turning the valve to manual, the hydraulic pump is bypassed allowing manual operation.



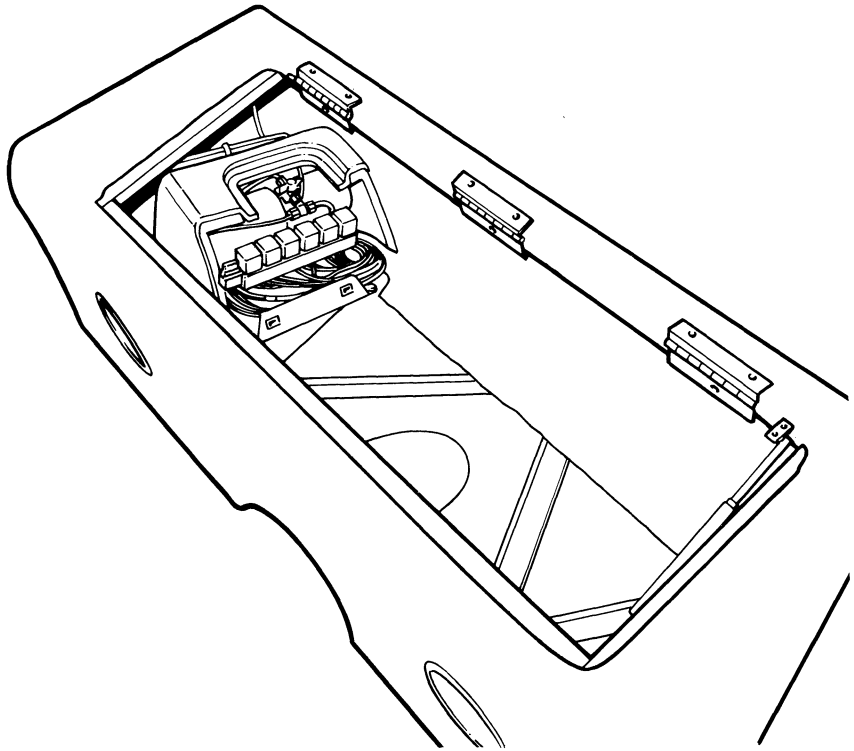


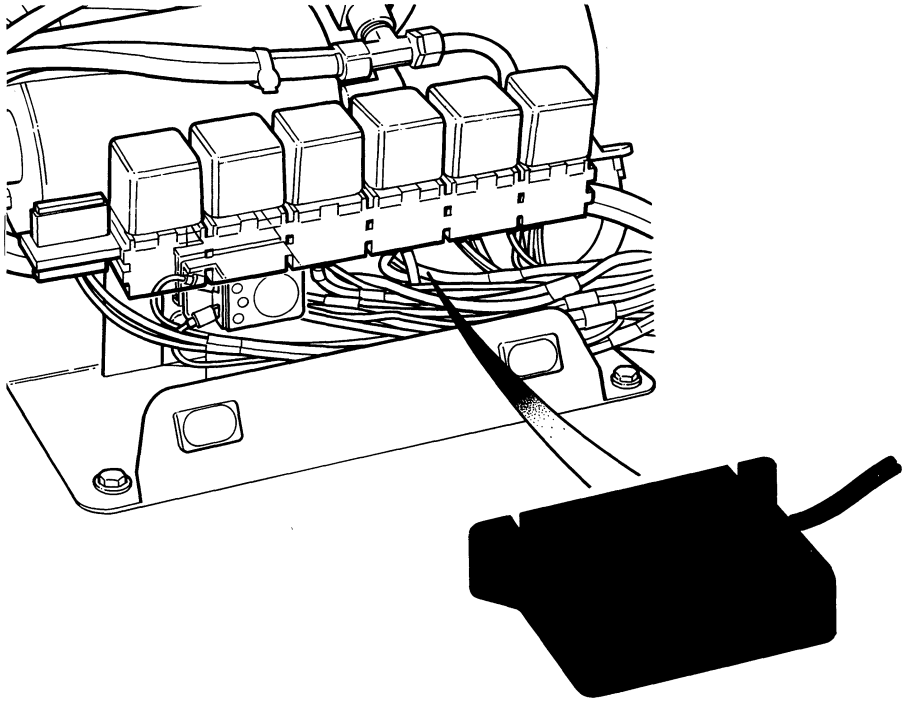
CONVERTIBLE TOP MECHANISM

The convertible top operating system consists of an electro-hydraulic pump and a pair of hydraulic cylinders for raising and lowering the top. The pump is powered via two heavy duty change-over relays.

REAR QUARTER WINDOWS

The two quarter windows operate with the top mechanism and are powered via two sets of change-over relays.



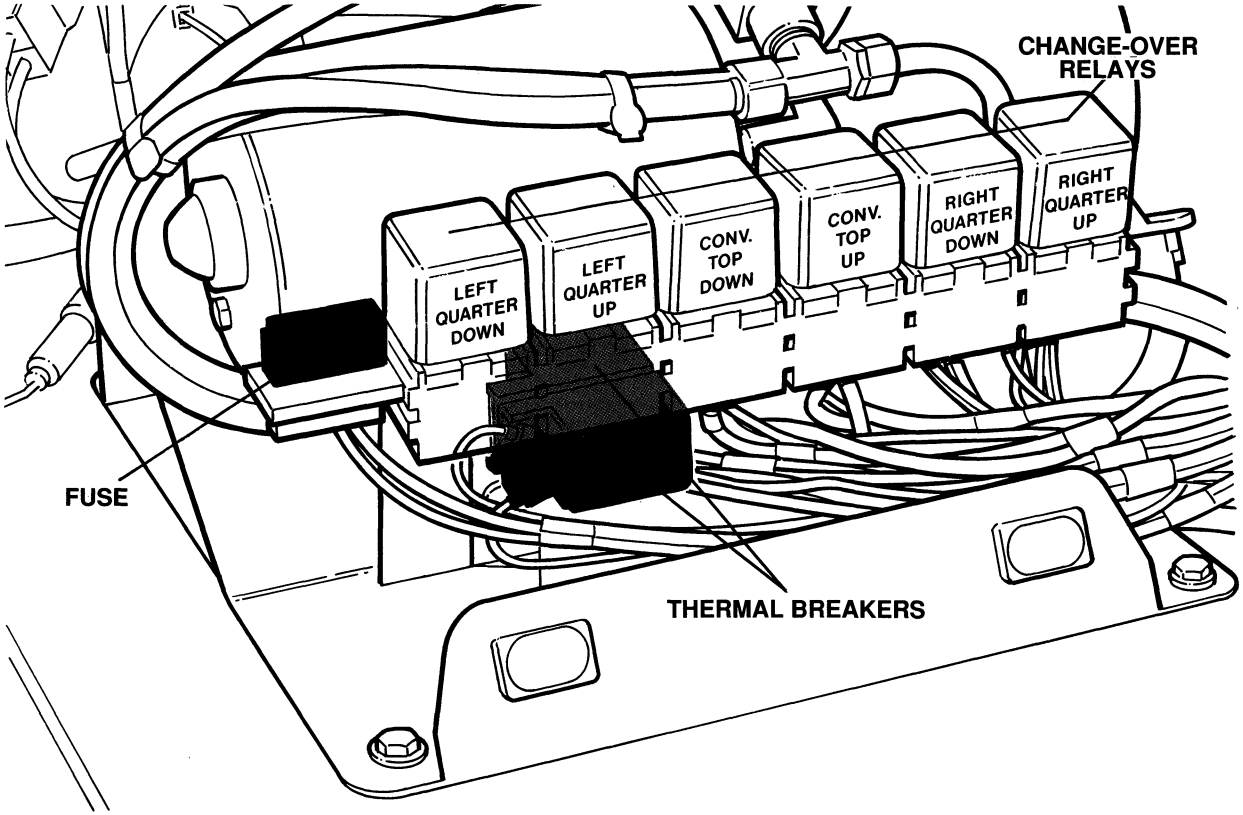


COMPONENT PANEL

The component panel containing the hydraulic pump and the electrical components is located behind the panel in the storage compartment.

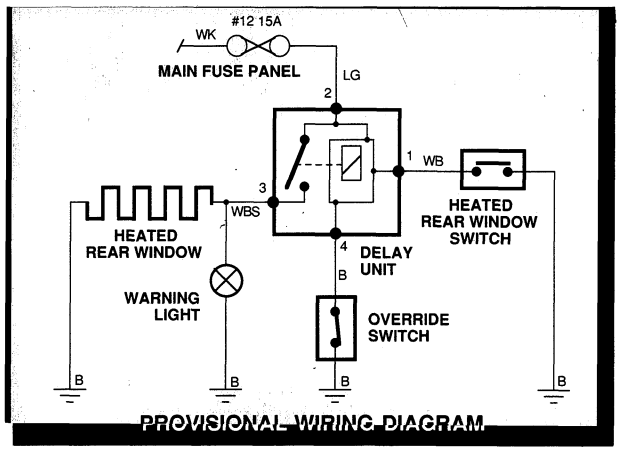
ELECTRONIC CONTROL UNIT

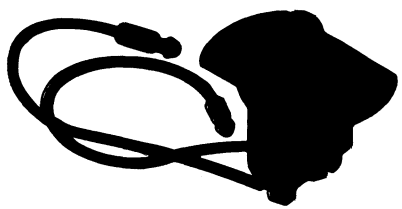
The ECU is mounted on the component panel under the change-over relays.



RELAYS, BREAKERS, AND FUSE

The six change-over relays, two thermal breakers, and pump fuse are all mounted on the component panel. Battery power for the system is provided at the battery spur located in the trunk.





HEATED REAR WINDOW OVERRIDE SWITCH

The override switch is located on a bracket behind the left side quarter window trim panel. It is operated by the top mechanism to switch off the heated rear window when the top is lowered.

HYDRAULIC SYSTEM

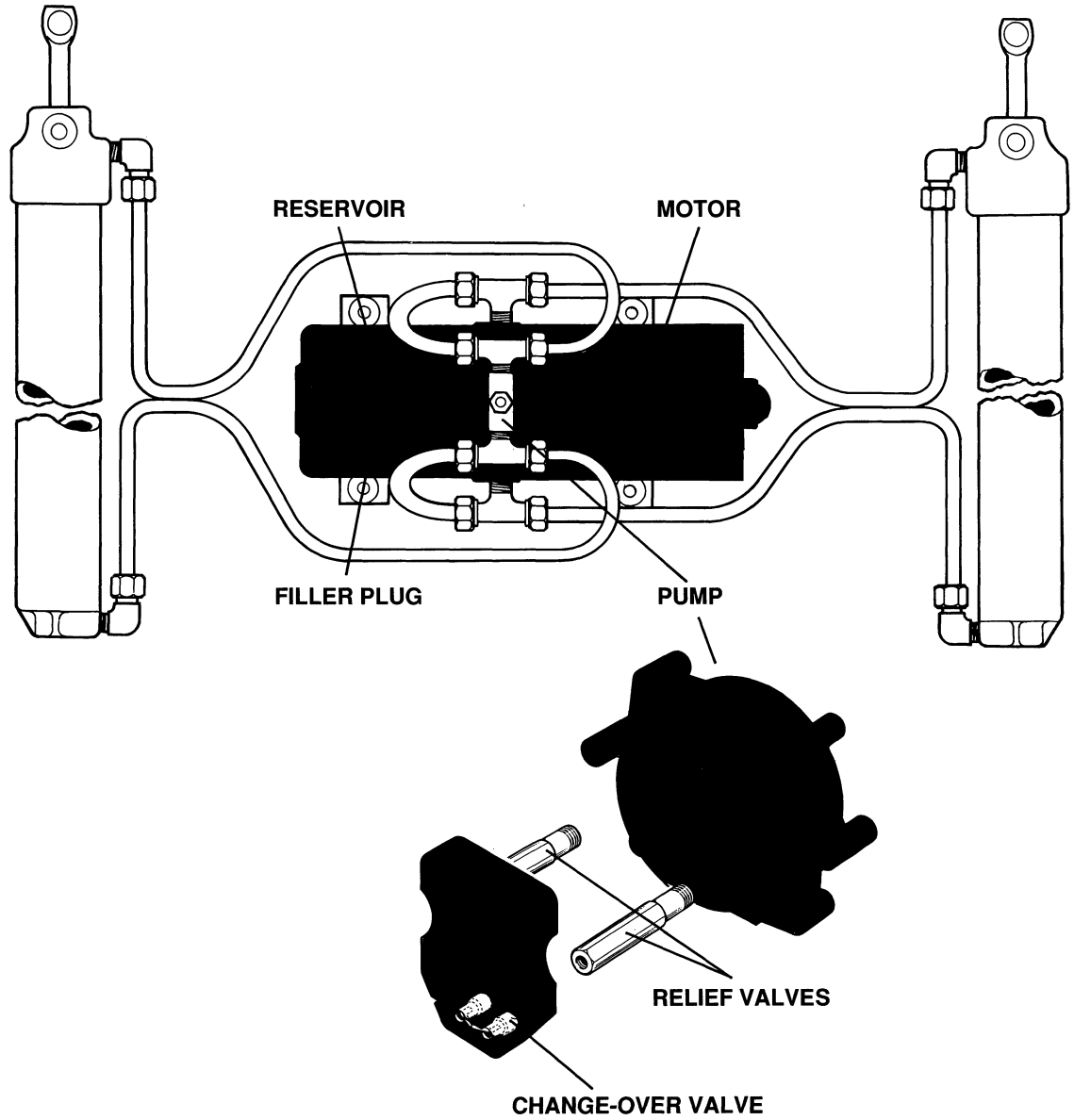
An electric motor is connected directly to the hydraulic pump. The motor can rotate in either direction depending on power input for lowering or raising the convertible top.

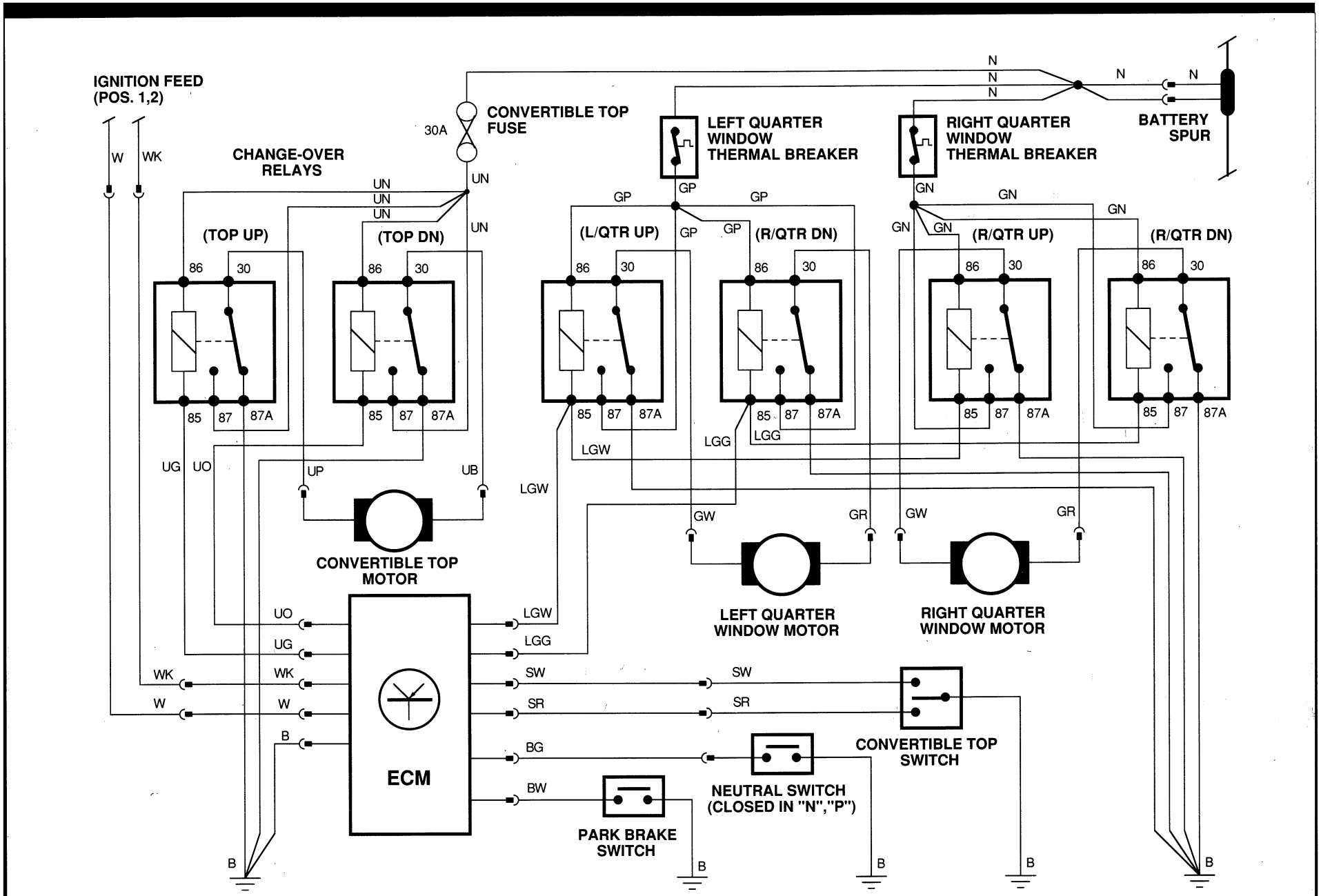
The hydraulic pump is a crescent-type design. A change-over valve directs the oil delivery depending on the driven direction. Normal system operating pressure is 190 psi. Two relief valves are used, one in each pump outlet.

OIL SPECIFICATION

Type **JLM 10153**
(available through Jaguar parts)

Quantity **800cc**





PROVISIONAL WIRING DIAGRAM

HYDRAULIC ACTUATION UNIT

The hydraulic actuation unit contains the reservoir and the components used for pressure application, boost application, and anti-lock valving.

Actuating Piston The actuating piston transmits the motion from the brake pedal to the control valve and the boost piston.

Control Valve The control valve opens and closes the high pressure line from the accumulator to the actuator hydraulic booster.

Hydraulic Booster The boost piston is independent from the actuating piston and applies boost pressure on the master cylinder piston.

Master Cylinder The master cylinder operates the front brakes only.

Main Valve The solenoid activated main valve is opened under anti-lock conditions to apply boost pressure directly to the master cylinder and the front brake circuits.

Central Valve The central valve opens under anti-lock conditions to allow boost pressure to be applied directly to the front brakes.

Positioning Sleeve The positioning sleeve is used during anti-lock operation to minimize brake pedal pulsations.

Solenoid Valves The six solenoid valves direct hydraulic pressure and hydraulic return in the three brake circuits during anti-lock conditions.

MOTOR PUMP UNIT

The motor pump unit supplies the system operating hydraulic pressure.

Pump The pump is driven by an electric motor and is switched on and off to maintain a range of operating pressure.

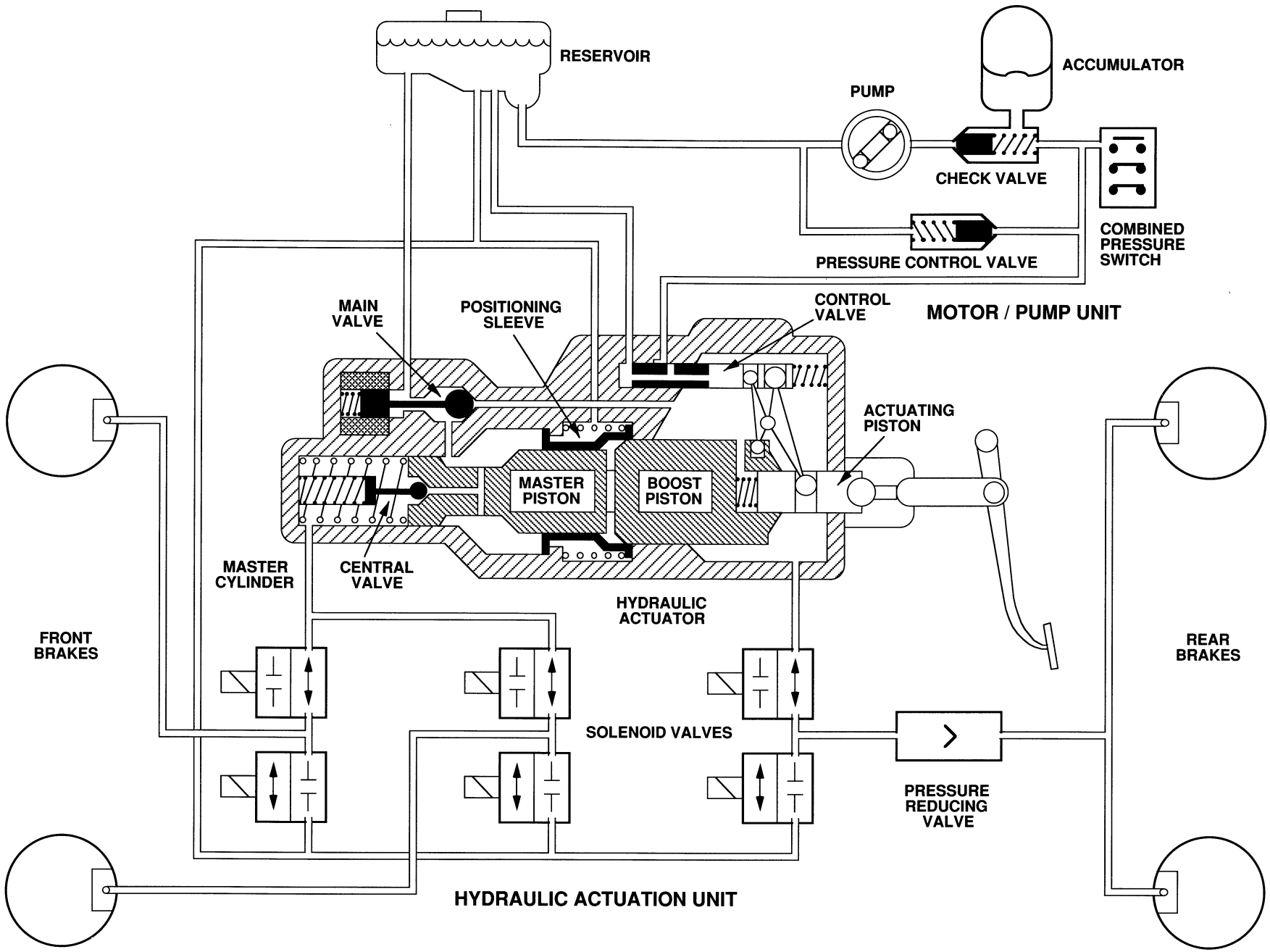
Accumulator The accumulator stores the pump pressure and provides reserve for normal, anti-lock, and pump failure operations. A check valve prevents pressure loss.

Pressure Control Valve The pressure control valve limits the maximum system pressure.

Combined Pressure Switch Two sets of contacts in the pressure operated switch signal the ECU for activation of warnings and anti-lock shut down. The other contacts switch the pump on and off.

PRESSURE REDUCING VALVE

Since the rear brakes operate directly off boost pressure, a pressure limiting device is necessary. The pressure reducing valve is located in the rear brake circuit and limits the pressure applied to the rear brakes.


RESERVOIR
ACCUMULATOR
PUMP
CHECK VALVE
COMBINED PRESSURE SWITCH
PRESSURE CONTROL VALVE
MAIN VALVE
POSITIONING SLEEVE
CONTROL VALVE
MOTOR / PUMP UNIT
ACTUATING PISTON
MASTER PISTON
BOOST PISTON
MASTER CYLINDER
CENTRAL VALVE
HYDRAULIC ACTUATOR
FRONT BRAKES
REAR BRAKES
SOLENOID VALVES
PRESSURE REDUCING VALVE
HYDRAULIC ACTUATION UNIT

BRAKES NOT APPLIED

Control Valve
The control valve is open to the reservoir and closed to accumulator pressure from the motor pump unit.

Pump
The pump is switched on or off as determined by system pressure.

Accumulator
The accumulator stores boost pressure for use as soon as the brakes are applied.

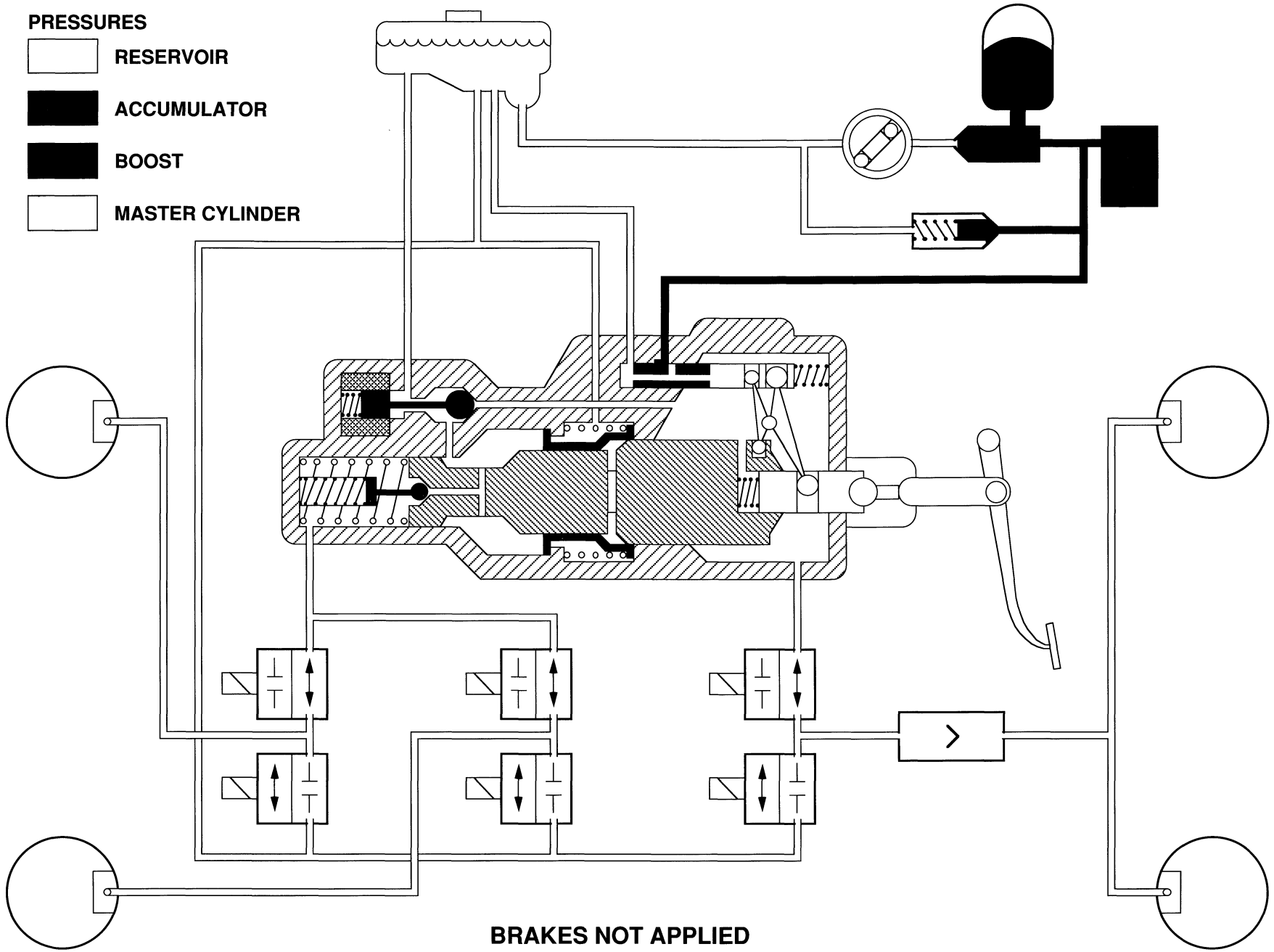
Boost Piston
The boost piston is retracted.

Positioning Sleeve
The positioning sleeve is at rest.

Master Cylinder
The master cylinder is at rest.

Main Valve
The main valve is switched off.

Equalized Hydraulic Pressure The hydraulic pressure is equalized throughout the system (except in the accumulator to control valve line).



BRAKES NOT APPLIED

BRAKES APPLIED— NORMAL OPERATION

Control Valve
As the driver applies force to the brake pedal, the actuating piston moves forward. The lever mechanism moves the control valve forward, opening the port from the accumulator and closing the return port to the reservoir. Boost pressure is applied to the boost piston and the rear brakes.

Boost Piston
The boost piston increases the pedal force acting on the master cylinder piston.

Main Valve
The main valve remains at rest, connecting the master cylinder to the reservoir.

Central Valve
As the master cylinder piston moves forward, the central valve closes and pressure is built up in the front brake circuits.

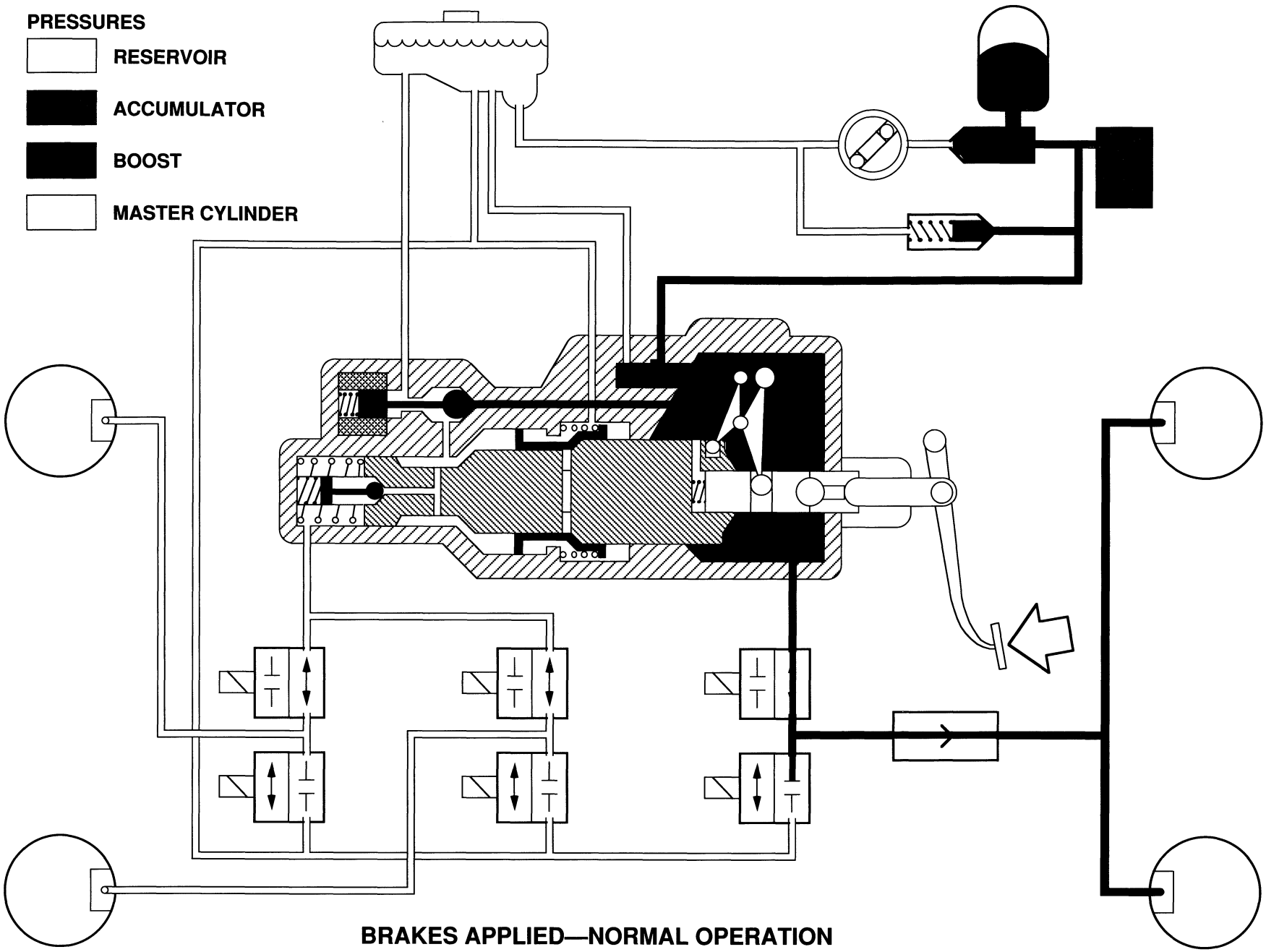
Positioning Sleeve
The positioning sleeve moves forward with the boost piston. The displaced fluid returns to the reservoir through the main valve, which is at rest.

Pressure Reducing Valve
Boost pressure is applied to the rear brakes through the pressure reducing valve.

Solenoid Valves
All solenoid valves are at rest, allowing pressure application and preventing return to the reservoir.

Boost Pressure Control As the boost pressure increases, it acts between the boost piston and the actuating piston, moving the actuating piston back, which moves the control valve to close the port from the accumulator. The control valve closes the accumulator pressure port when the pedal force and boost force acting on the actuating piston equalize. The return port to the reservoir remains closed. The resulting pressure in the booster is proportional to the pedal force; low pedal force=low pressure; high pedal force=high pressure.

"Dynamic," "Static" During normal operation, boost pressure is applied directly to the rear brake circuit, thus the description "dynamic." The front brake master cylinder is supplied with reservoir gravity pressure only, thus the description "static."



BRAKES APPLIED—NORMAL OPERATION

BRAKES APPLIED— ANTI-LOCK OPERATION

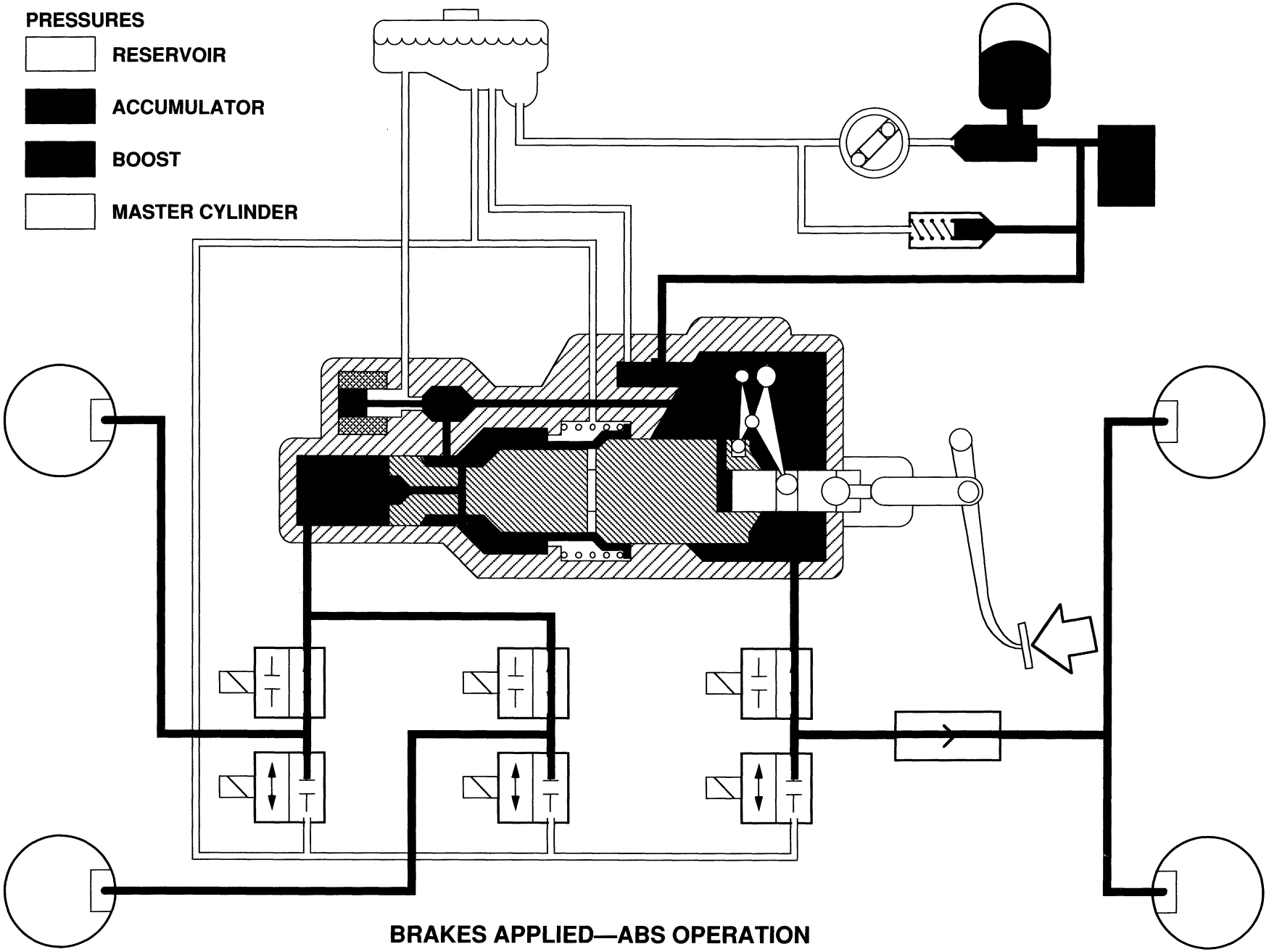
Main Valve
When the ECU senses the need for ABS control, it activates the main switch, which moves the main valve, closing the reservoir feed line and applying boost pressure to the master cylinder circuit.

Central Valve
The central valve is held open by the pressure allowing boost pressure to be applied directly to the front brake circuits.

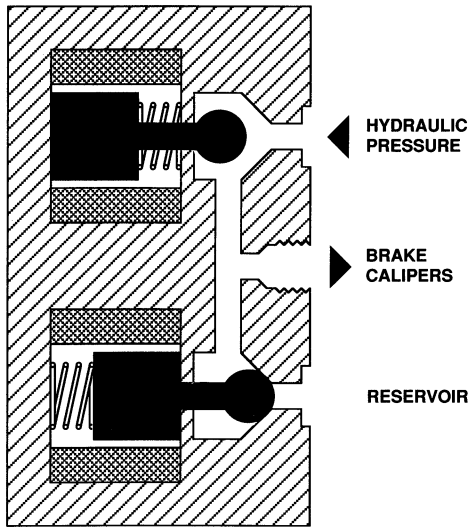
Positioning Sleeve
The positioning sleeve is gradually moved to its rest position by the boost pressure. This action pushes back the boost piston, the actuating piston, and the brake pedal, preventing ABS pulsations from being transmitted to the brake pedal.

Solenoid Valves
The solenoid valves are modulated as necessary by the ECU to prevent wheel lock. Refer to page 28 for solenoid valve operation.

"Dynamic," "Dynamic" During ABS operation both the front and rear brake circuits are "dynamic" as the front brakes are also operated directly by boost pressure.

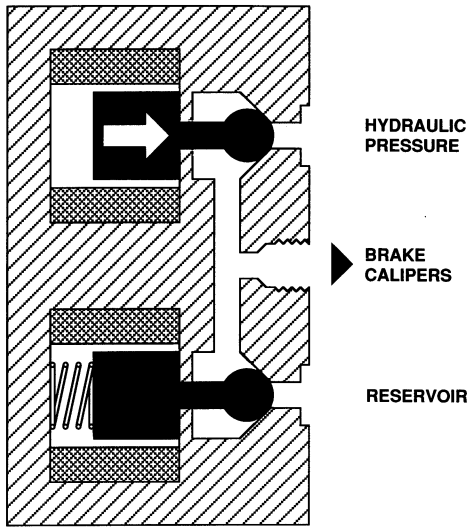


BRAKES APPLIED—ABS OPERATION

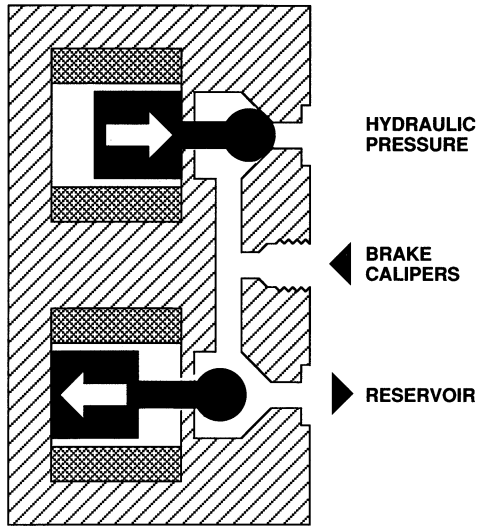


SOLENOID VALVES

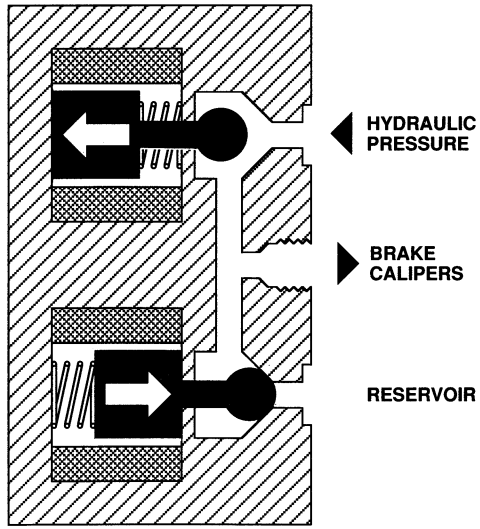
A pair of solenoid valves for one control circuit is shown. During normal braking operation, the solenoid valves are not controlled by the ECU and no current is applied. The inlet valve is open and the outlet valve is closed, porting hydraulic pressure to the brake caliper circuits. During ABS operation, the valves are modulated in three phases by the ECU as necessary to prevent wheel lock. The three phases are repeated up to six times per second until wheel lock is eliminated.



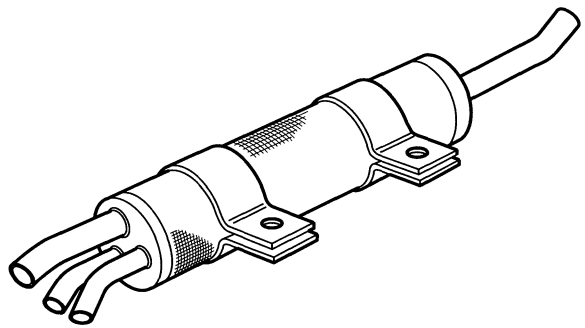
Phase One: Pressure Hold
To maintain brake pressure, the ECU activates the inlet valve, which closes and prevents additional hydraulic pressure application. The outlet valve remains closed, preventing return to the reservoir.



Phase Two: Pressure Reduce
If a wheel still has a tendency to lock with the pressure maintained, the ECU activates both valves, which prevents hydraulic pressure application, and allows return to the reservoir— decreasing the pressure in the brake circuit.



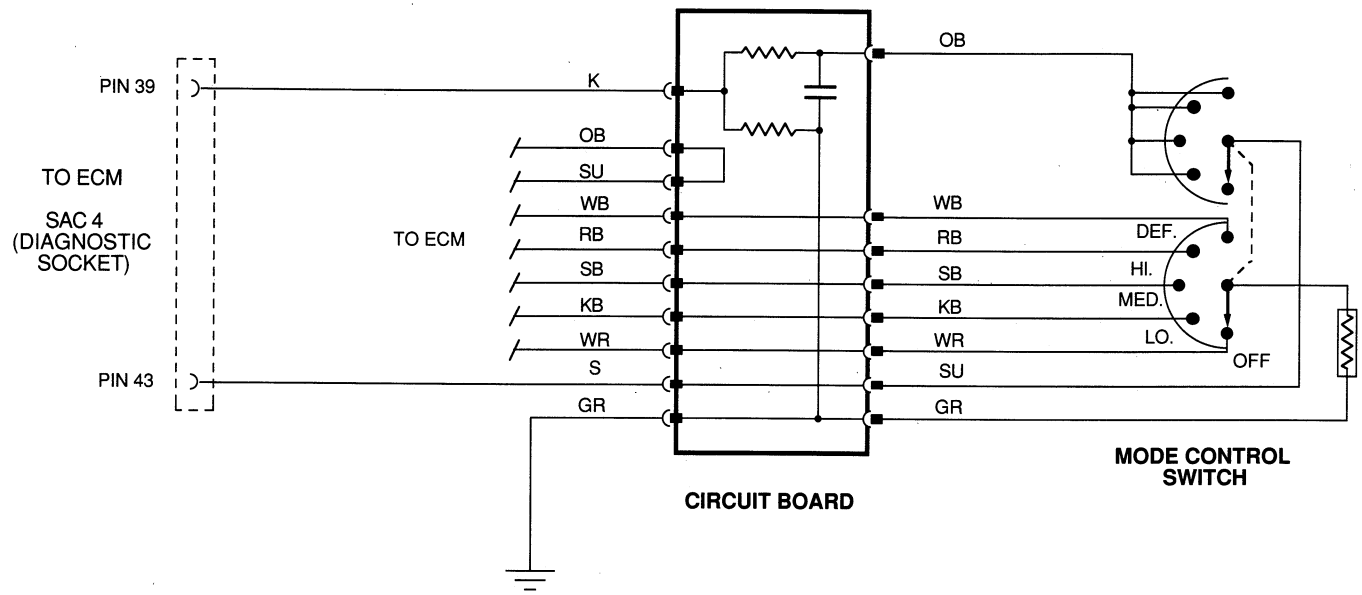
Phase Three: Pressure Increase
As the wheel accelerates, the ECU deactivates both valves, allowing hydraulic pressure to be applied to the brakes.



FUEL COOLER

The XJ-S fuel system incorporates a cooler which cools the recirculating fuel as it returns to the tank. The cooler is in operation only when the air conditioning compressor is switched on by the climate control system. This arrangement takes into consideration that fuel cooling is only necessary when ambient air temperatures are high enough to require air conditioning.

With the convertible, it is likely that the top will be lowered and the climate control system switched off in warm weather. To ensure that the fuel is cooled under these conditions, provision is made for normal air conditioning compressor operation when the climate control system is switched off.



PROVISIONAL WIRING DIAGRAM

COMPRESSOR OPERATION

Full-time normal compressor operation is accomplished by an internal modification to the climate control unit. An additional printed circuit board is inserted between the mode control switch and the electronic control module. Note that the pink and slate wires connect to the ECM at the diagnostic socket SAC 4.

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