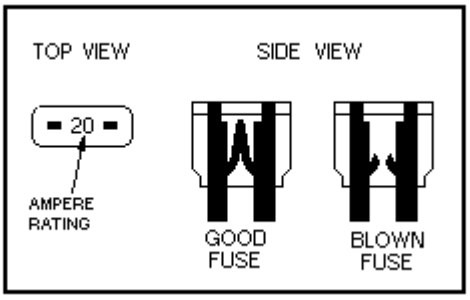
## Circuit Protection Devices

Electrical circuits on this vehicle may be protected by fuses, fuse links, maxi-fuses, circuit breakers, or a combination of these devices.

**Blade Type Fuse**

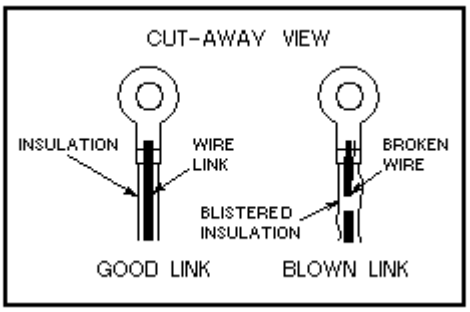



Blade type fuses have a transparent plastic housing. To check a fuse, pull it from the fuse panel and look at the fuse element through the housing. Always replace a blown fuse with a new fuse that has the same ampere rating.

The ampere rating of a blade type fuse can also be determined by following the color code shown here:

| BLADE FUSE COLOR CODING | |
|---|---|
| AMPERE RATING | HOUSING COLOR |
| 4 | Pink |
| 5 | Tan |
| 10 | Red |
| 15 | Light Blue |
| 20 | Yellow |
| 25 | Natural |
| 30 | Light Green |

**Fusible Link**



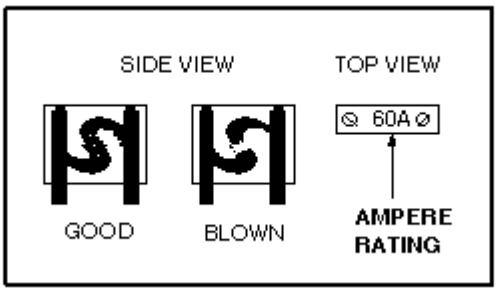

Fusible links are short lengths of wire that are smaller in diameter than the wires they are protecting. Fusible link wire is covered with a special thick, non-flammable insulation. An overload condition causes the insulation to blister. If the overload condition continues, the wire link will melt. To check a fusible link, look for blistered insulation. If the insulation is okay, pull lightly on the wire; If the fusible link stretches, the wire has melted.

When replacing fusible links, first cut the protected wire where it connected to the fuse link. Then, tightly crimp or solder the new link to the protected wire.

Fusible links are often identified by color coding of the insulation, as shown here:

| FUSIBLE LINK COLOR CODING | |
|---|---|
| **WIRE LINK SIZE** | **INSULATION COLOR** |
| 20 GA | Blue |
| 18 GA | Brown or Red |
| 16 GA | Black or Orange |
| 14 GA | Green |
| 12 GA | Gray |

**Maxi-Fuse**




Maxi-fuses have a transparent colored plastic housing. To check a maxi-fuse, look at the fuse element through the side of the housing.

To replace a maxi-fuse, pull it from the fuse box or panel. Always replace a blown maxi-fuse with a new one having the same ampere rating.

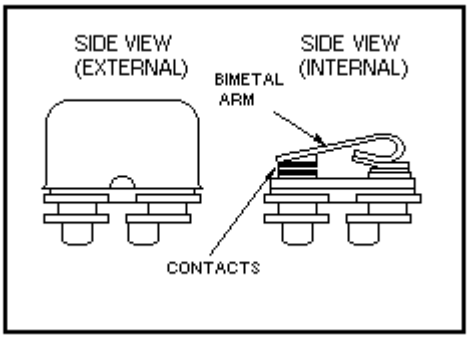
The ampere rating of a maxi-fuse can also be determined by following the color code shown here:

| MAXI-FUSE COLOR CODING | |
|---|---|
| **AMPERE RATING** | **HOUSING COLOR** |
| 30 | Light Green |
| 40 | Amber |
| 50 | Red |
| 60 | Blue |

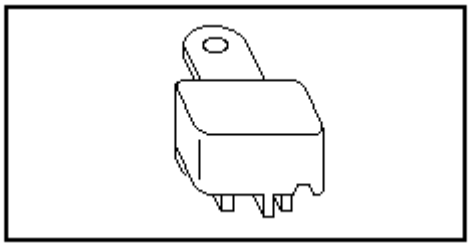
**Circuit Breaker**
Some circuits are protected by circuit breakers (abbreviated "c. b." in fuse chart). They can be Fuse Panel mounted or in-line. Like fuses, they are rated in amperes.

Each circuit breaker conducts current through an arm made of two types of metal bonded together (bimetal arm). If the arm starts to carry too much current, it heats up. As one metal expands faster than the other the arm bends, opening the contacts. Current flow is broken. A circuit breaker can be the cycling or non-cycling type.

**Fuse Panel Mounted Cycling Type**

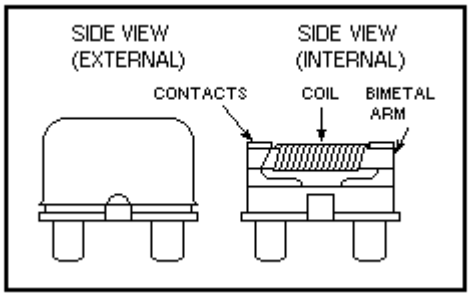


**In - Line Mounted Cycling Type**

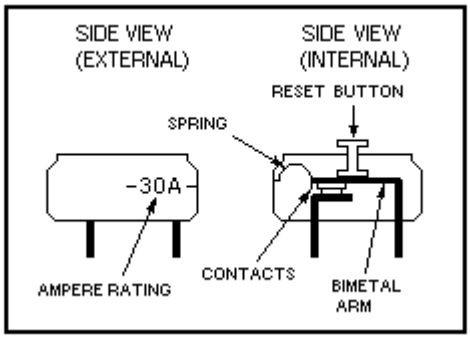


In the cycling type, the bimetal arm cools and straightens out. This cycle repeats as long as the overcurrent exists and power is applied.

**Fuse Panel Mounted Non - Cycling Type**




**Fuse Panel Mounted Manual Reset Type**

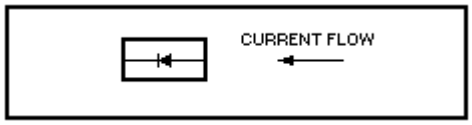



Two types of non-cycling circuit breakers are used; one is reset by removing power from the circuit, and the other is reset by depressing a reset button.

In the first type, there is a coil wrapped around the bimetal arm. When an overcurrent exists and the contacts open, a small current passes through the coil. This current through the coil is not enough to operate a load, but it does heat up both the coil and the bimetal arm. This keeps the arm in the open position until power is removed.

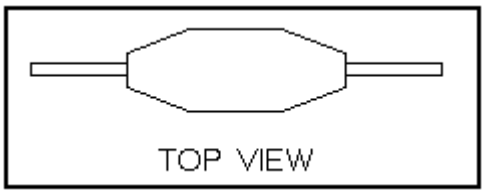
In the second type, a spring pushes the bimetal arm down and holds the contacts together. When an overcurrent condition exists and the bimetal arm heats up, the bimetal arm bends enough to overcome the spring and the contacts snap open. The contacts stay open until the reset button is pushed and the contacts snap together again.

**Diode**




Diodes are electrical devices that permit current to flow in one direction only. The current flows in the direction indicated by the arrow.

**Mega Fuse**

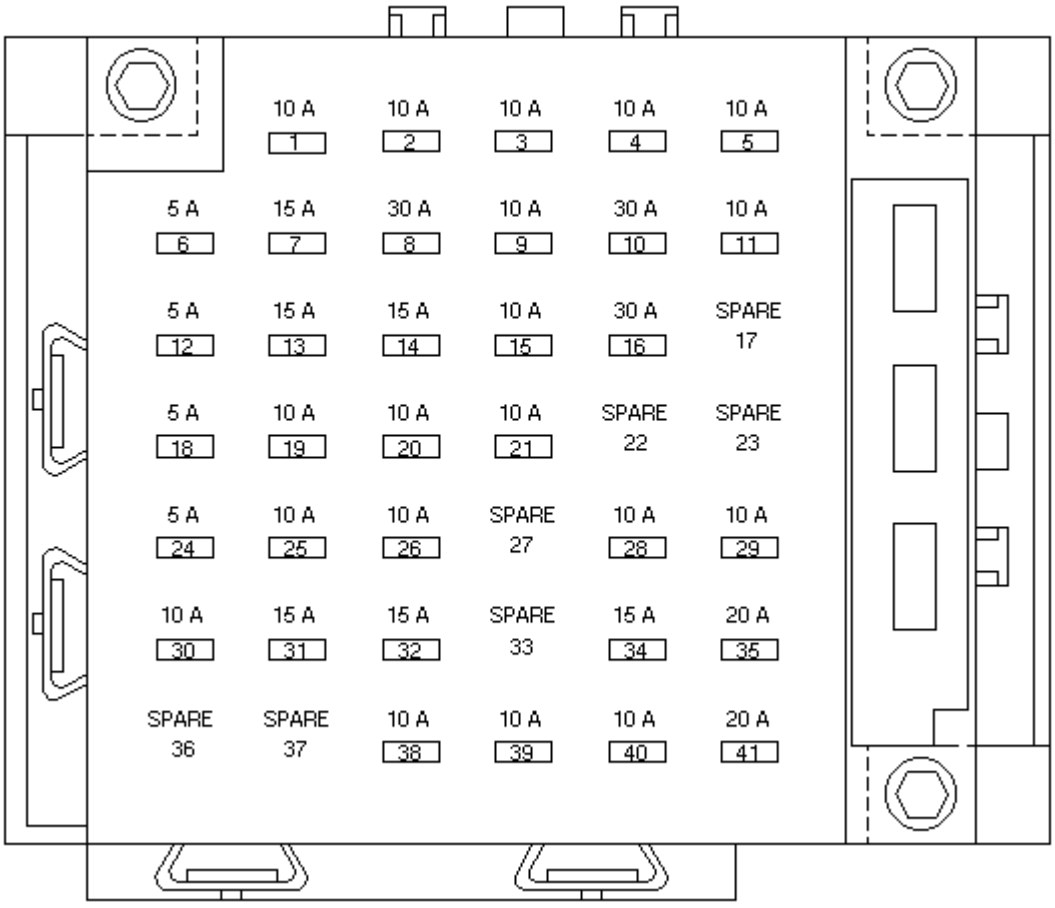



Mega fuse protects the charging circuit. In the event that the mega fuse is blown due to the charging circuit failure, the generator field circuit is disabled.

**Power Distribution**
The Generator/Voltage Regulator and Battery are connected together at the Power Distribution Box. Other circuits originate at the Power Distribution Box and are protected by fuses.

All Mega/Maxi-Fuses and Mini-Fuses in the Power Distribution Box, the Ignition Switch and the Lighting Control Module (Integrated Main Light Switch) are powered at all times. Fuses 1, 2, 7, 8, 13, 14, 19, 20, 25, 26, 31, 32, 35, 38, 39 and 41, are also powered at all times. All other fuses are powered through the Ignition Switch, and Rear Window Defrost Control.

**I/P Fuse Panel**

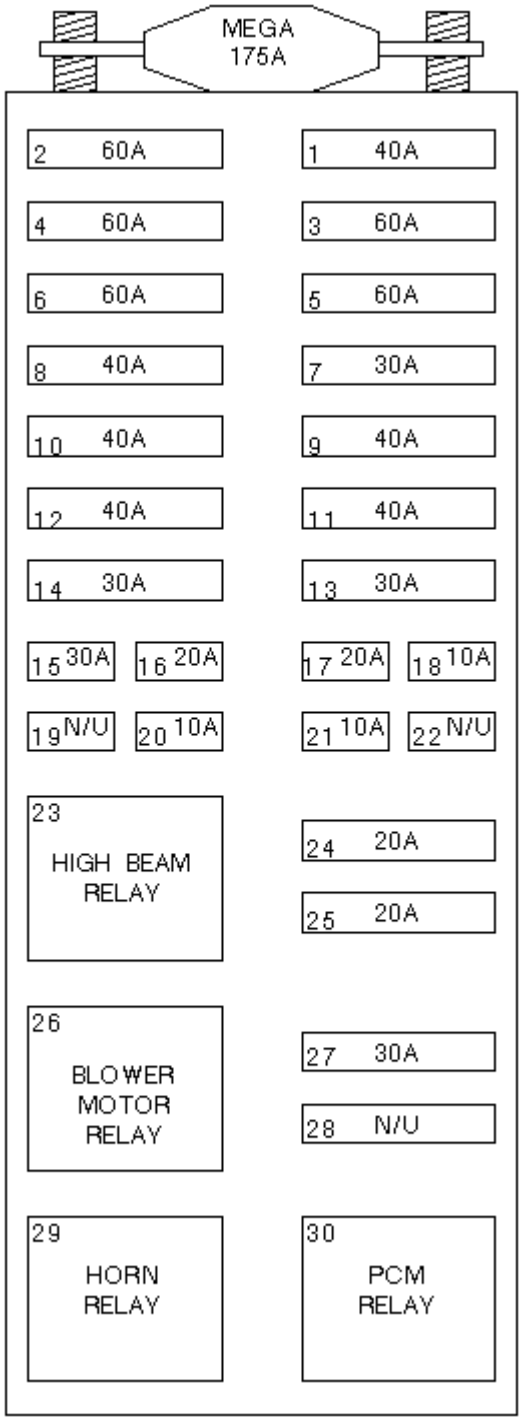



**Instrument Panel Fuse Panel**

| FUSE | AMPS | CIRCUITS PROTECTED |
|---|---|---|
| 1 | 10 | Lighting Control Module: Anti-Theft Indicator Lamp, PWM Dimming Output Illumination Lamps for Microphone, RR and LR Door Ashtrays, Heated Seat Switches, Rear Defrost Control Switch, EATC Control Panel, Message Center Switches, Speed Control Switches, Cigar Lighter, Console and Ashtray, Navigation Display Module and Navigation Switches |
| 2 | 10 | Front Control Unit, Mobile Telephone Transceiver, Clock |
| 3 | 10 | Multi-Function Switch, Cornering Lamps |
| 4 | 10 | Power Door Locks and Power Windows Switch Backlights, Front Radio Control Unit, Mobile Telephone Transceiver, Lighting Control Module, Electronic Day/Night Mirror, Compass Module, Clock |
| 5 | 10 | Front Control Unit, Virtual Image Instrument Cluster, Air Bag Diagnostic Monitor, Traction Control Switch, Lighting Control Module (LCM), Light Sensor Amplifier |
| 6 | 5 | SCP Bus + |
| 7 | 15 | Lighting Control Module (LCM): LF Turn Lamp, Left Turn Indicator (VIC), Multi-Function Switch, LF and RF Side Marker Lamps, RF and LF Park Lamps, RR and LR Tail Lamps, RR Stop/Turn Lamps |
| 8 | 30 | Fuel Filler Door Release Switch, Trunk Lid Relay, Navigation Module |
| 9 | 10 | Air Bag Diagnostic Monitor, EATC Module, Blower Motor Relay |
| 10 | 30 | Windshield Wiper Motor, Wiper Control Module |
| 11 | 10 | Ignition Coils, Radio Interference Capacitor, PCM Power Relay |
| 12 | 5 | SCP Bus + |
| 13 | 15 | Lighting Control Module (LCM): RF Turn Lamp, Right Turn Indicator (VIC), RR Side Marker Lamps, Tail Lamps, License Lamps, LR Stop/Turn Lamps, Clock Illumination. |
| 14 | 15 | Cigar Lighter |
| 15 | 10 | Heated Seat Switch Assembly, Navigation Module, Navigation Display Module |
| 16 | 30 | Moonroof Switch |
| 17 | - | NOT USED |
| 18 | 5 | SCP Bus - |

| FUSE | AMPS | CIRCUITS PROTECTED |
|---|---|---|
| 19 | 10 | Lighting Control Module (LCM): Left Headlamp, DRL |
| 20 | 10 | Multi-Function Switch: Flash to Pass, Cornering Lamps |
| 21 | 10 | ABS EVAC and Fill Connector, ABS Control Module |
| 22 | - | NOT USED |
| 23 | - | NOT USED |
| 24 | 5 | SCP Bus - |
| 25 | 10 | Lighting Control Module (LCM): Right Headlamp |
| 26 | 10 | Virtual Image Instrument Cluster, EATC Module |
| 27 | - | NOT USED |
| 28 | 10 | Shift Lock Actuator, Vehicle Dynamic Module, Virtual Image Instrument Cluster, Rear Window Defrost Control |
| 29 | 10 | Remote Chassis Unit, Navigation Module |
| 30 | 10 | Heated Mirrors |
| 31 | 15 | Lighting Control Module (LCM): FCU, Navigation Display Module, Electronic Day/Night Mirror, RH and LH I/P Courtesy Lamp, Door Courtesy Lamps, RH and LH Map Lamps, RR and LR Reading Lamps, Engine Compartment Lamp, RH and LH Visor Lamps, Storage Bin Lamp, Trunk Lid Lamp, Glove Box Lamp. |
| 32 | 15 | Speed Control DEAC. Switch, Brake ON/OFF (BOO) Switch |
| 33 | - | NOT USED |
| 34 | 15 | EATC Module, Transmission Range Sensor, Speed Control Servo/Amplifier Assembly, DRL Module, Intake Manifold Runner Control |
| 35 | 20 | Heated Seat Modules |
| 36 | - | NOT USED |
| 37 | - | NOT USED |
| 38 | 10 | Data Link Connector (DLC) |
| 39 | 10 | Power Door Locks, Power Seats, Power Mirrors, Keyless Entry, Memory Seat/Mirrors, LF Seat Module, LF Door Module |
| 40 | 10 | Blend Door Actuator, Low Tire Pressure Sensor (LTPS) |
| 41 | 20 | LF Door Module |

## Power Distribution Box




**Power Distribution Box**

| MEGA-FUSE | AMPS | CIRCUITS PROTECTED |
|---|---|---|
| - | 175 | Generator/Voltage Regulator |
| **MAXI-FUSE** | **AMPS** | **CIRCUITS PROTECTED** |
| 1 | 40 | Blower Motor Relay |
| 2 | 60 | Constant Control Relay Module (CCRM), Engine Cooling Fans |
| 3 | 60 | Compressor Relay |
| 4 | 60 | Anti-Lock Brake Control Module, ABS EVAC and Fill Connector |
| 5 | 60 | I/P Fuse Panel |
| 6 | 60 | I/P Fuse Panel |
| 7 | 30 | Vehicle Dynamic Module |
| 8 | 40 | Rear Window Defrost Control |
| 9 | 40 | I/P Fuse Panel, LF Door Module, LR Window Switch |
| 10 | 40 | RR Window Switch, RF Window Switch |
| 11 | 40 | Ignition Switch |
| 12 | 40 | Ignition Switch |
| 13 | 30 | I/P Fuse Panel, LF 4way Power Lumbar Switch, LF Seat Module, Heated Seat |
| 14 | 30 | RF 4way Power Lumbar Switch, RF Seat Control Switch |

| MINI-FUSES | AMPS | CIRCUITS PROTECTED |
|---|---|---|
| 15 | 30A | Subwoofer Amplifier, Remote Chassis Unit, CD Changer |
| 16 | 20A | HI Beam Relay, Daytime Running Lamps (DRL) Module |
| 17 | 20A | Horn Relay |
| 18 | 10A | Air Bag Diagnostic Monitor |
| 19 | - | NOT USED |
| 20 | 10A | Powertrain Control Module |
| 21 | 10A | Generator/Voltage Regulator |
| 22 | - | NOT USED |
| **MAXI-FUSES** | **AMPS** | **CIRCUITS PROTECTED** |
| 23 | RELAY | Headlamps |
| 24 | 20 | Constant Control Relay Module, Fuel Pump |
| 25 | 20 | Electronic Air Management Relay, Electronic Management Control Switch |
| 26 | RELAY | Blower Motor |
| 27 | 30 | Powertrain Control Module (PCM), Power Distribution Box |
| 28 | - | NOT USED |
| 29 | RELAY | Horn |
| 30 | RELAY | Powertrain Control Module (PCM) |