

CIRCUIT OPERATION

The Air Suspension System is designed to maintain vehicle height under varying loads or to the driver's preference. The system adjusts the vehicle height by adjusting the volume of air supplied to each air spring located at each wheel. It should be noted that the system is not an active suspension system that controls the vehicle's dive and roll during cornering.

The system can operate in any one of five heights or modes: standard, low profile, high profile, access, and extended. The driver has the option of selecting three heights (standard, high profile, or access) using the switches on the instrument panel. The driver can also inhibit automatic system operation using the instrument panel mounted inhibit switch. When the system is inhibited, the vehicle will revert to standard height and will maintain vehicle leveling. It is recommended that the system be inhibited whenever towing a trailer.

Height Modes

Height Modes

Standard height. The standard height mode is the normal vehicle height which is approximately 790 mm between the center wheel arch and the floor.

Low profile mode. The low profile mode is approximately 20 mm below the standard height and is automatically entered when the system is not inhibited and vehicle speed is 80 kmh (50 mph) for more than 30 seconds. The light in the lower switch will illuminate.

High profile mode. The high profile mode is approximately 40 mm above the standard height and is entered when the driver selects it using the up switch and vehicle speed is below 56 kmh (35 mph). If the vehicle speed exceeds 56 kmh (35 mph) when in the high profile mode, the system will automatically enter the standard height mode. The light in the raise switch will illuminate.

Access profile mode. The access profile mode is driver selected by using the down switch and requires the vehicle to be stopped, the inhibit function off, all doors closed, and the park brake applied on manual transmission vehicles or the gear selector in P on vehicles with an automatic transmission. The access profile can be requested for 15 seconds after the ignition is turned off. The access profile is reached when the vehicle is

lowered to approximately 60 mm below the standard mode. The lower light will flash while the vehicle is lowering and remain on when completed.

Extended mode. When the vehicle is off road in standard or high profile, and the wheels hang unsupported over a rut for example, the air suspension system will enter the extended mode. Initially when the system enters this mode the system will deflate the air springs. When the system sees no change in height, the system will inflate the air springs 20 to 30 mm above the high profile position in an attempt to regain traction. The raise lamp will flash continuously. The system can operate in the extended mode for up to ten minutes. After ten minutes the system will return to the high profile unless the lower switch is pressed.

Air Suspension ECU (Z165)

The air suspension system is controlled by the Air Suspension ECU (Z165). The ECU is a microprocessor-controlled device that primarily monitors output signals from the height sensors and the driver operated switches. Based on the signals received from the height sensors and switches, the ECU determines if a height adjustment is required. If an adjustment is needed, the ECU will apply voltage to the appropriate air solenoid valves in the Air Valve Block (K163) to attain the desired height.

The ECU also controls the air suspension compressor operation based on the input signals it receives from the Reservoir Pressure Switch (X204) and the Generator. The ECU monitors the Generator output to determine whether the engine is running. The ECU will not allow compressor operation if the engine is not running.

The ECU also has diagnostic capabilities that allows it to detect some malfunctions during the monitoring process. If the ECU detects a malfunction it will flash the Up and Down warning lamps for 30 seconds. The lamps will remain lit after the 30 second period.

Compressor Operation

Before the Air Suspension ECU (Z165) will operate the compressor and dump valve, the ECU must detect that the reservoir pressure is low based on the Reservoir Pressure Switch's (X204) position when the engine is running. When these conditions are met, the ECU will apply battery voltage to the Air Suspension Compressor Relay (K156). The relay will energize and apply voltage to the compressor to run. The compressor is equipped with a thermal circuit breaker that the ECU monitors at terminal 16. If the circuit breaker opens due to an overheated compressor, the ECU will turn off the compressor by interrupting power to the compressor relay. When the reservoir pressure switch detects full pressure, the ECU will stop the compressor.

Height Sensors

The Height Sensors are variable resistors or potentiometers located at each air spring. As the height of an air spring changes, the height sensor output signal voltage changes due to the varying resistance. The sensors output voltage increases as the height is lowered and decreases as the height increases. The Air Suspension ECU (Z165) monitors the sensors output signal to determine what action is required to obtain the correct vehicle height.

Air Valve Block

The Air Valve Block (K163) contains six solenoid operated valves, an inlet valve, an exhaust valve, and one valve for each air spring. When an increase in height is required at an air spring, the ECU energizes the inlet solenoid valve and the respective air spring solenoid valve by applying voltage to their respective Air Valve Block (K163) terminal. The solenoid valves are grounded at ground E300 through Air Valve Block (K163) terminals 10 and 11. When an air release is required, the ECU energizes the exhaust solenoid valve and the respective air spring solenoid valve.

Vehicle Speed Input

The Air Suspension ECU (Z165) monitors the vehicle speed output signal at terminal 30 to determine the correct height mode. The speed

sensor output signal is a pulsing voltage and its frequency changes with the vehicle speed.

Hand Brake/Gear Input

The Air Suspension ECU (Z165) will not activate the access mode if it senses voltage at terminal 14. On vehicles equipped with an automatic transmission, voltage is applied to the ECU whenever the gear selector is any gear except park. On manual transmission vehicles, voltage is applied to the ECU terminal 14 whenever the handbrake is not applied.

Delay Relay

The Air Suspension Delay Relay (K158) supplies power to the Air Suspension ECU (Z165) and Air Valve Block (K163) when energized. Fuse F13 applies voltage to energize the relay when the ignition switch is in position 1 and 2. The relay is grounded at ground E300 through the air suspension diagnostic connector. The air suspension diagnostic connector jumper must be connected or the relay's ground circuit will be interrupted and the air suspension system will be inhibited. The Air Suspension Delay Relay (K158) is designed to remain energized for approximately 20 seconds after the ignition is turned off. This feature allows the system to operate the access function after the ignition is turned off.

Up and Down Switches

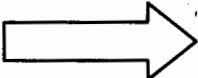
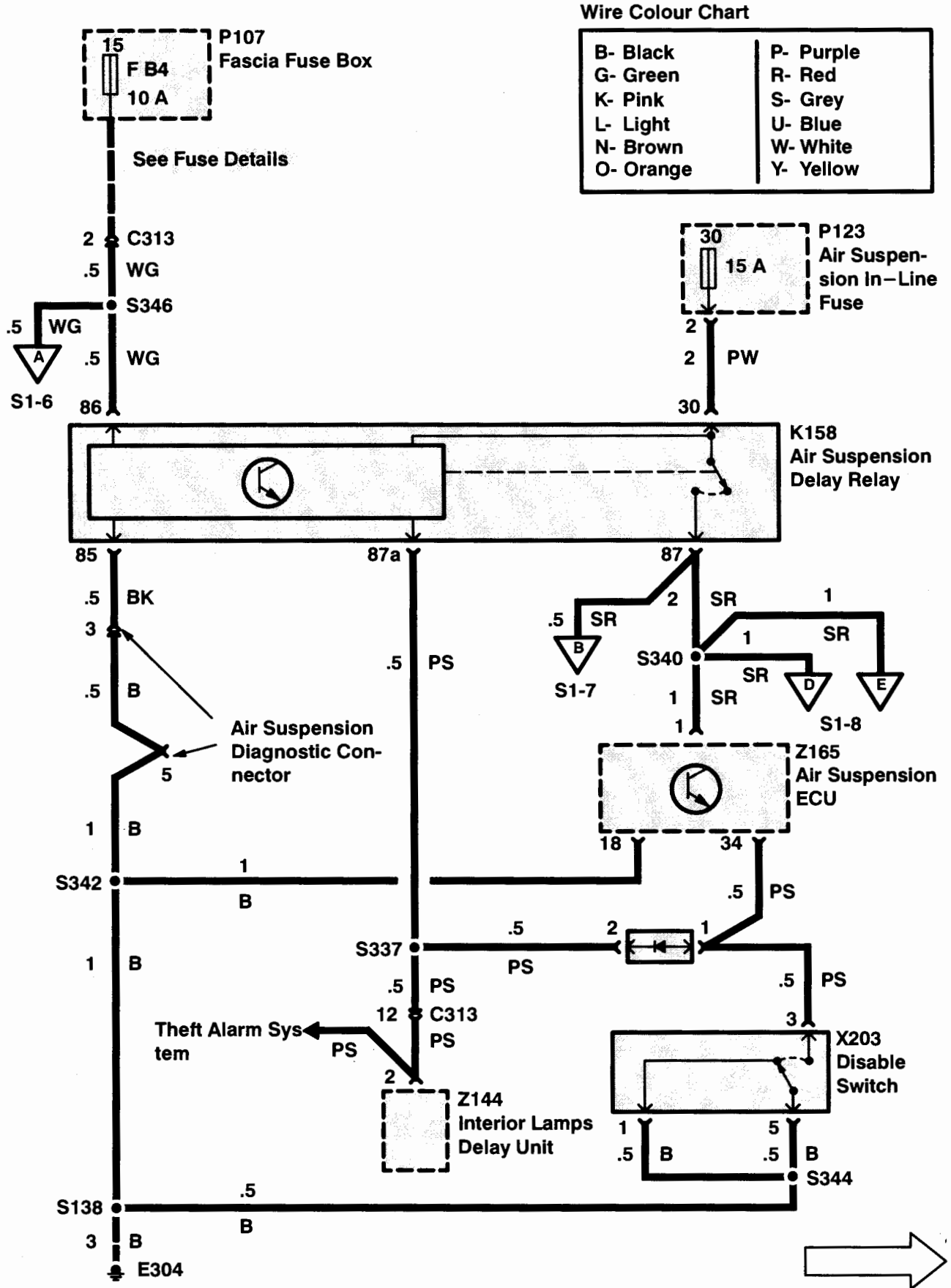
The Air Suspension Up and Down Switches are momentary. When either of these switches are depressed, the switch grounds Air Suspension ECU (Z165) terminal 33 (down) or 32 (up) momentarily. This signals the driver's desire to raise or lower the suspension.

Switch Warning Lamps

Each of the driver operated switches contains a warning lamp to indicate air suspension operation and is controlled by the Air Suspension ECU (Z165). When the ECU detects the engine running, it will illuminate all of the lamps for three seconds as a bulb check. It does this by grounding the Warning Lamp Relay (K155). When the ECU enters the access mode, the ECU will flash the down switch lamp by intermittently grounding the lamp. The lamp will stay on until the vehicle reaches the access position. When the system is in the extended mode, the ECU will flash the up switch lamp by intermittently grounding the lamp. If the ECU detects a fault in the system, the ECU will inform the driver by intermittently grounding the warning lamp relay for 30 seconds. This causes all of the warning lamps to flash for 30 seconds. After 30 seconds the lights will remain on until the repair is made.

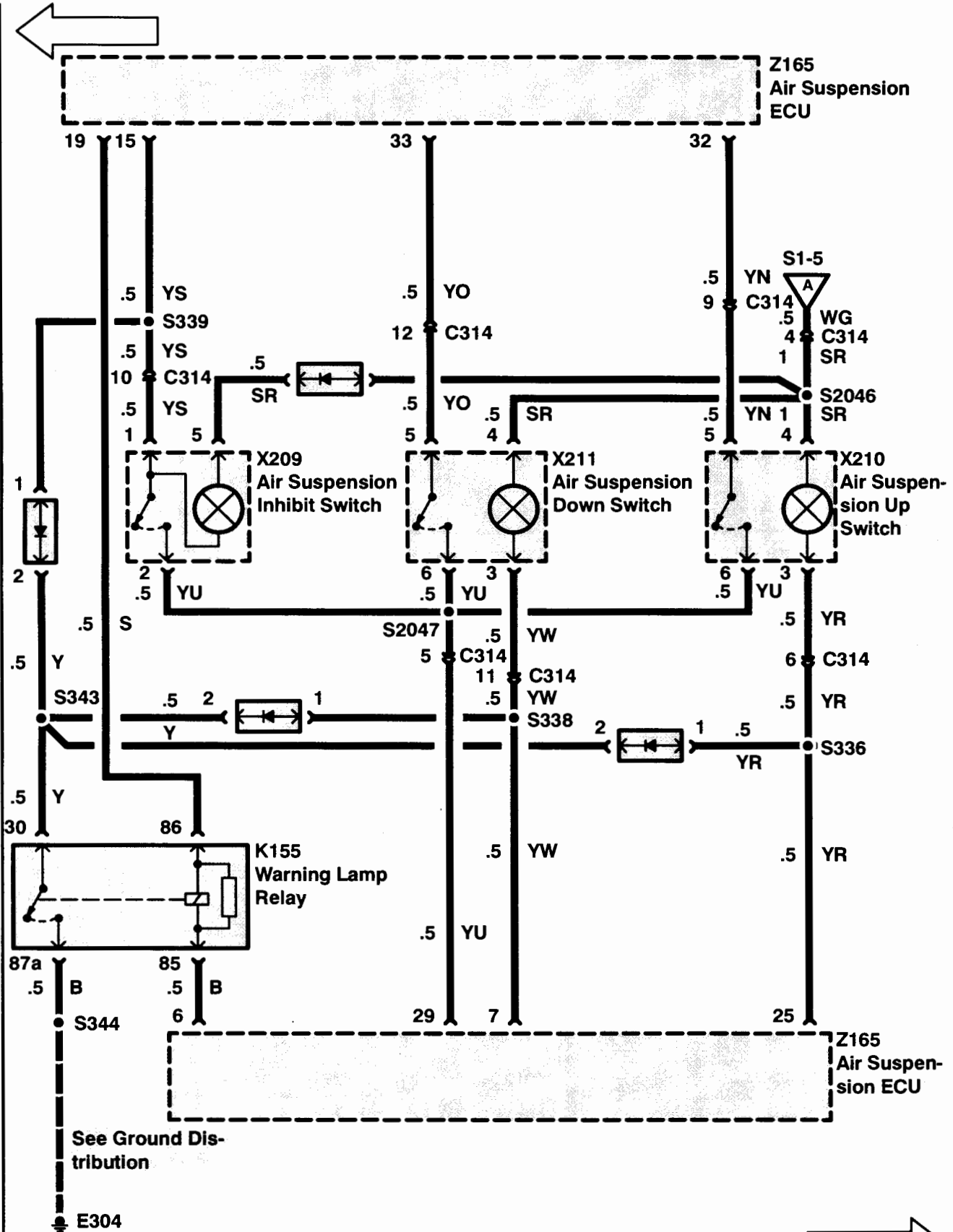
Inhibit/Disable

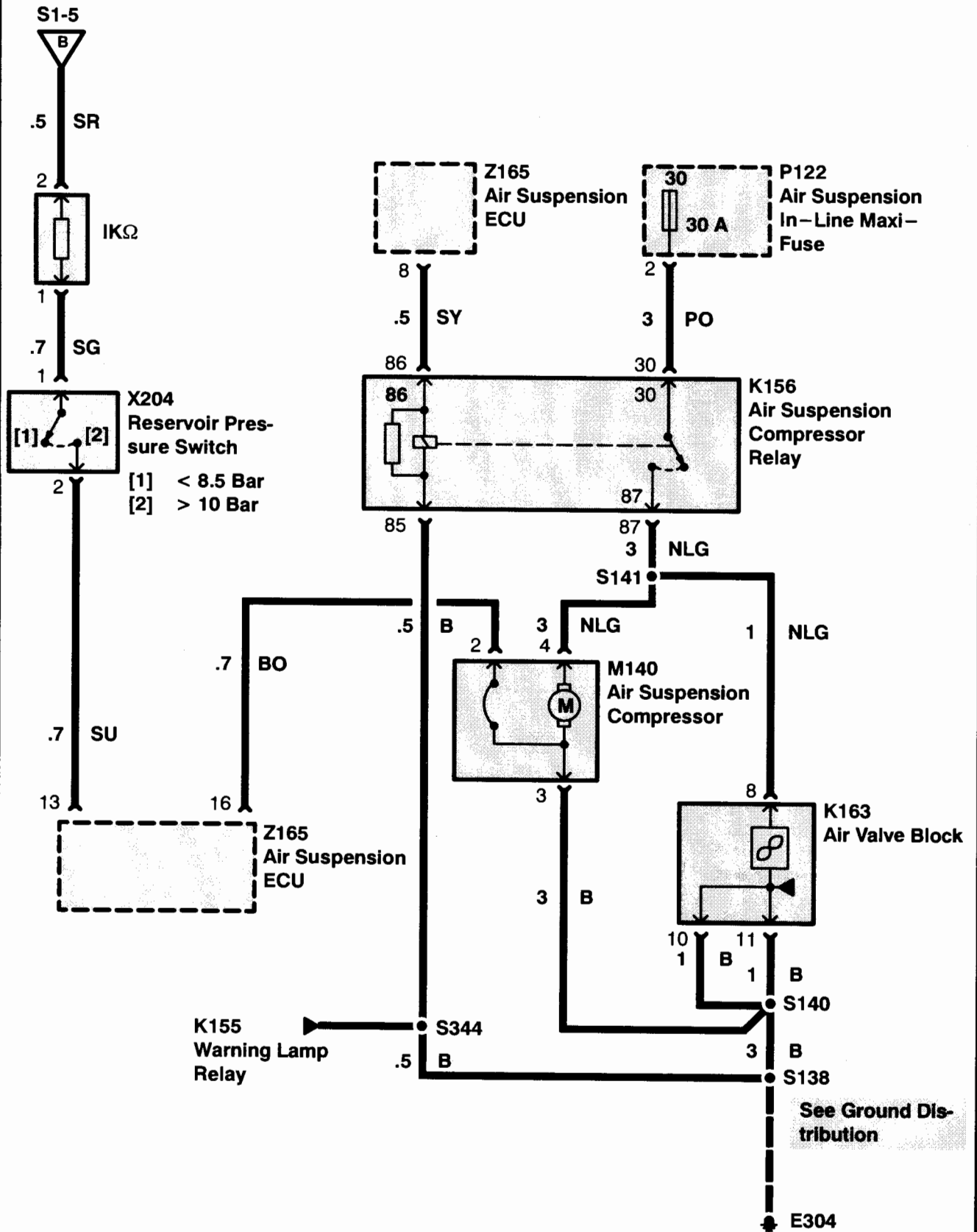
The system can be disabled by operating the disable switch located under the left front seat. It is recommended that the system be disabled using the disable switch when any service under the vehicle is required or the vehicle is to be lifted.



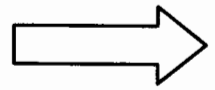
S1 ETM

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See Ground Distribution

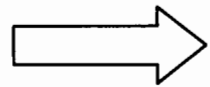
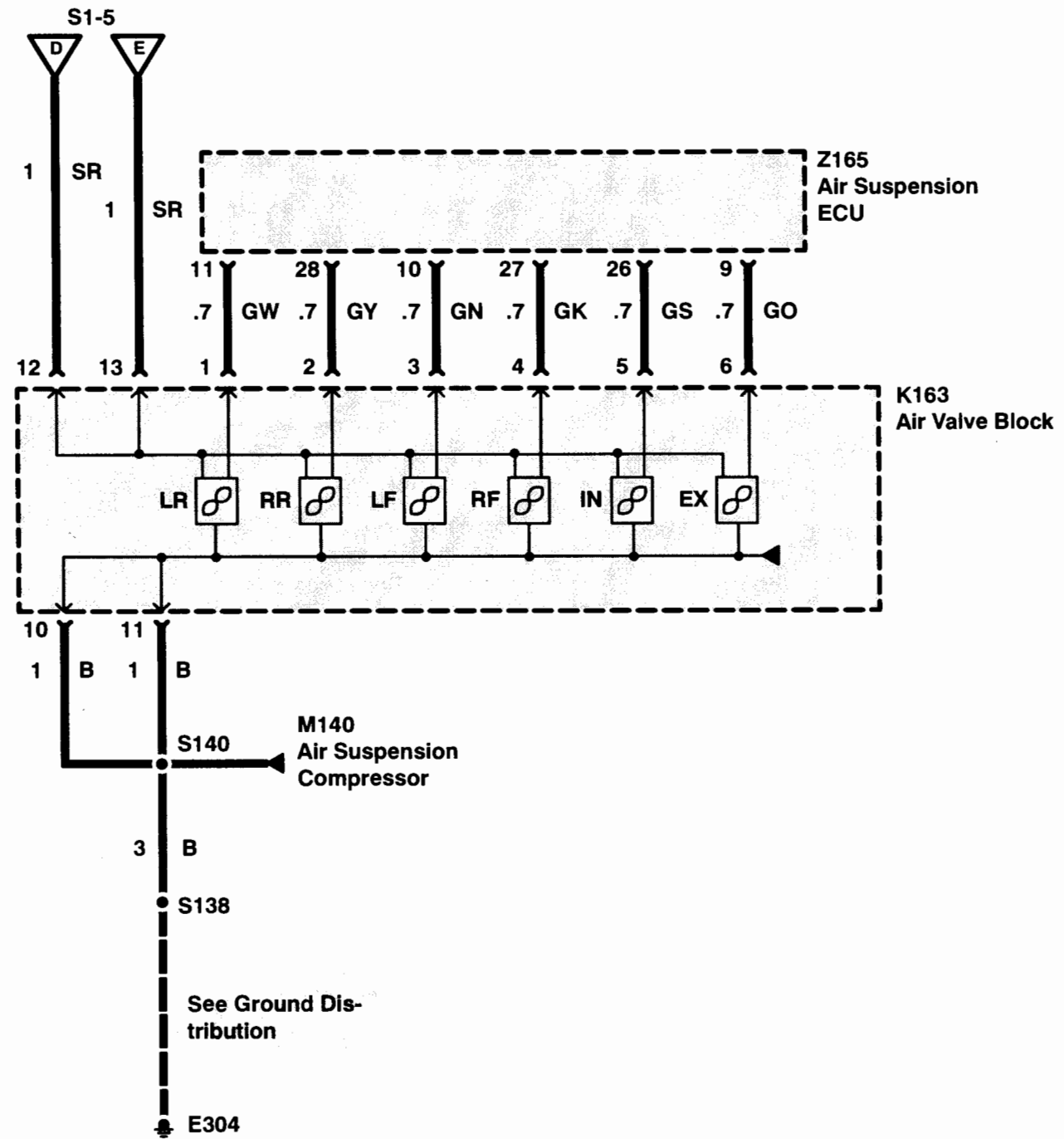


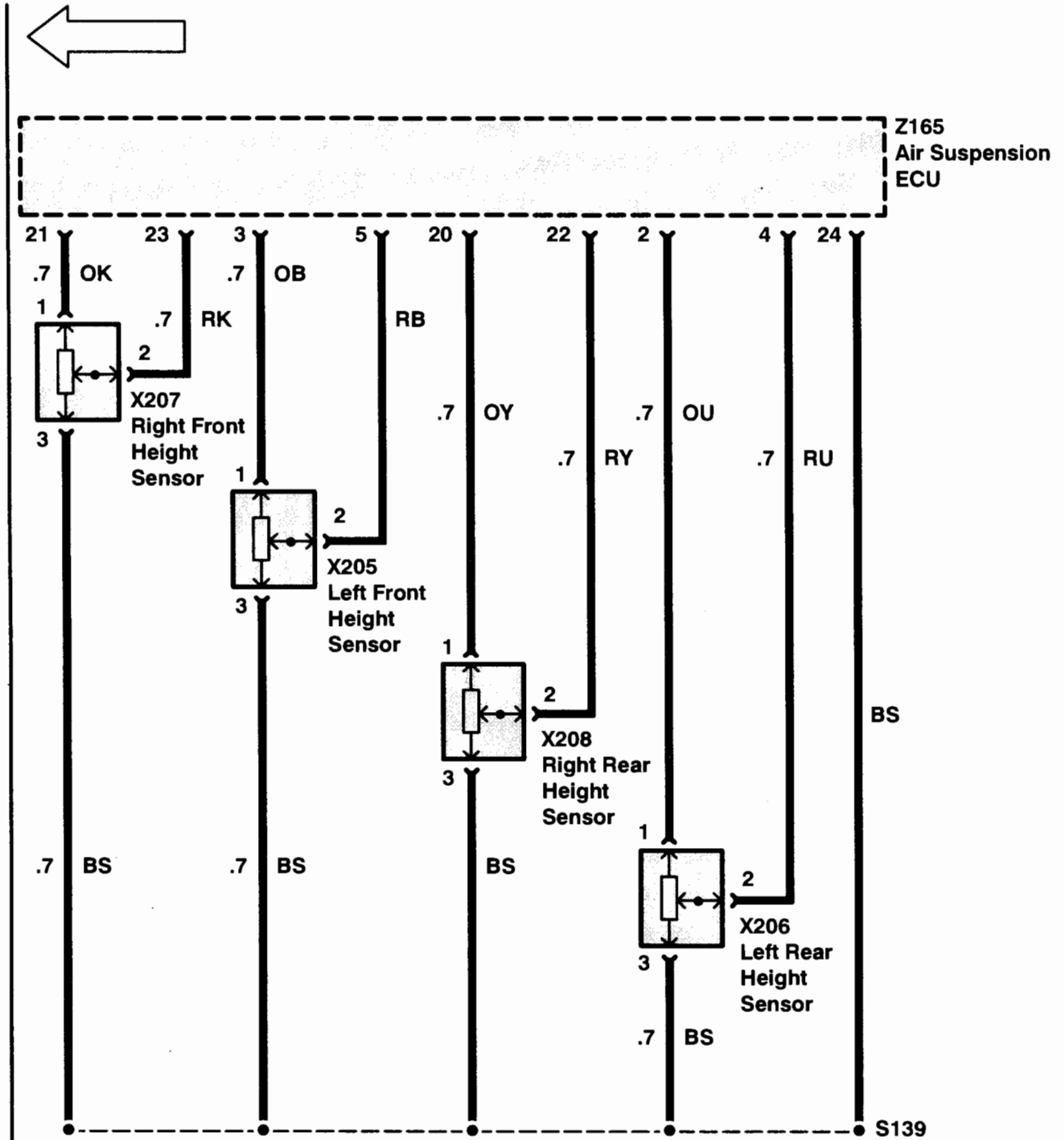
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Wire Colour Chart

B- Black	P- Purple
G- Green	R- Red
K- Pink	S- Grey
L- Light	U- Blue
N- Brown	W- White
O- Orange	Y- Yellow



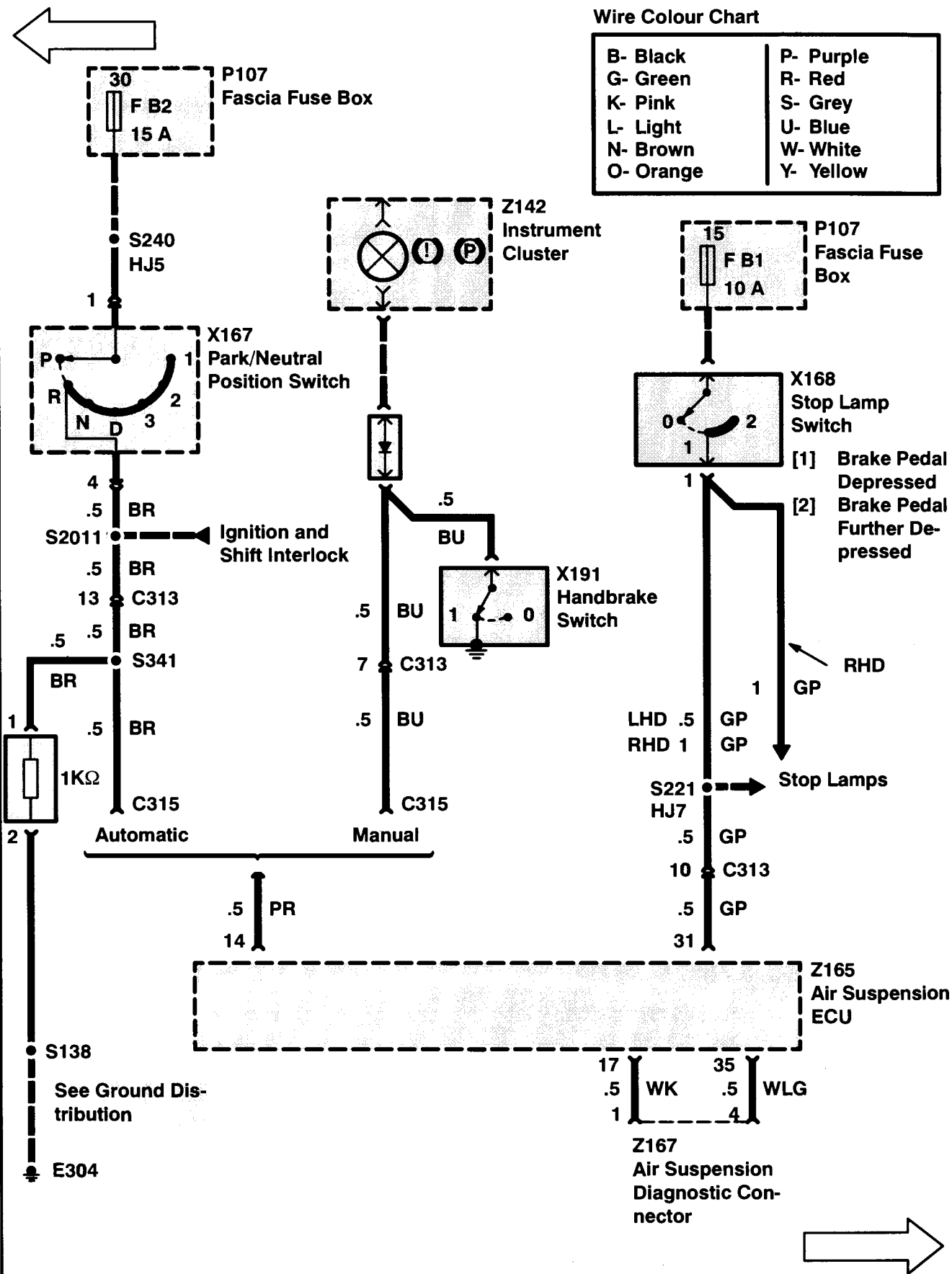


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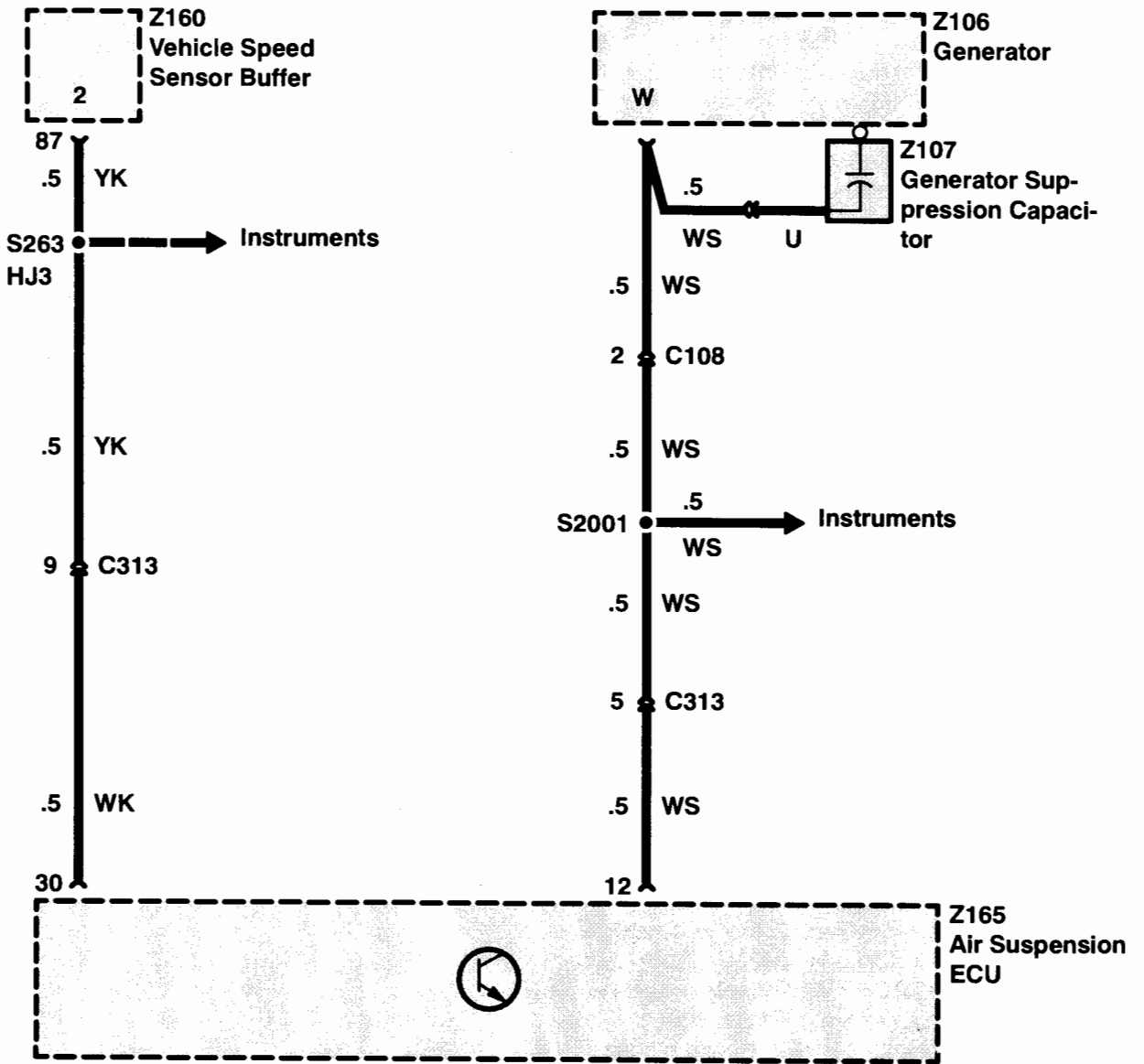
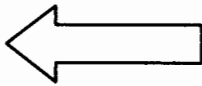
1993 RANGE ROVER

Wire Colour Chart

B- Black	P- Purple
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N- Brown	W- White
O- Orange	Y- Yellow



REV: SEPT 93



SYSTEM DIAGNOSIS

Diagnosis of the air suspension should begin with a visual check of the system's components for damage or leaks. Particular attention should be directed at the components mounted under the body (ie. height sensors, air valve block, air lines, and air springs). After the visual inspection, the Air Suspension ECU (Z165) memory should be checked for stored fault information or codes using the RTC 6834 handheld tester and air suspension smart card. The RTC 6834 handheld tester interfaces with the system when it is connected at the Air Suspension Diagnostic Connector (Z167) located under the left front seat. If an air suspension fault is found recorded in ECU memory, proceed to the "Stored Fault Diagnosis" and follow the diagnostic procedure directed for the stored fault. If no faults are recorded in the ECU memory or the air suspension ECU cannot communicate with the handheld tester, follow the directed procedure for the symptom that most closely resembles the symptom encountered.

After Repair

After a repair has been made, the Air Suspension ECU (Z165) memory should be cleared and a complete check of the system should be performed. If the repair involved height sensor or ECU replacement, the system should be recalibrated using the RTC 6834 handheld tester and air suspension smart card.

Clearing ECU Memory

Once a fault has been corrected, the fault must be cleared from the Air Suspension ECU (Z165) memory using the RTC 6834 handheld tester and the air suspension smart card. Follow the instructions given by the tester to clear the codes. The Air Suspension ECU's (Z165) memory cannot be cleared by disconnecting the battery. It should be noted that all faults must be displayed and corrected before the Air Suspension ECU (Z165) will allow its memory to be cleared.

STORED FAULT DIAGNOSIS

NOTE: It is essential that the system be disabled using the disable switch when any service under the vehicle is required or the vehicle is to be lifted.

If the RTC 6834 handheld tester displays:

1. Right Front Sensor is above limit, do test A.
2. Right Front Sensor is below limit, do test A.
3. Left Front Sensor is above limit, do test D.
4. Left Front Sensor is below limit, do test D.
5. Right Rear Sensor is above limit, do test G.
6. Right Rear Sensor is below limit, do test G.
7. Left Rear Sensor is above limit, do test J.
8. Left Rear Sensor is below limit, do test J.
9. Engine speed fault is detected, do test M.
10. Vehicle speed fault is detected, do test N.
11. Pressure switch is stuck on, do test O.
12. Left Front Valve stuck closed, do test P.
13. Cannot lower left front air spring, do test P.
14. Left Front valve stuck open, check air lines to air spring for leaks. If no air leak is found replace the Air Valve block.
15. Right Front Valve stuck closed, do test Q.
16. Cannot lower right front air spring, do test Q.
17. Right Front valve stuck open, check air lines to air spring for leaks. If no air leak is found, replace the Air Valve block.
18. Left Rear Valve stuck closed, do test R.
19. Cannot lower left rear air spring, do test R.
20. Left Rear valve stuck open, check air lines to air spring for leaks. If no air leak is found replace the Air Valve block.
21. Right Rear Valve stuck closed, do test S.
22. Cannot lower right rear air spring, do test S.
23. Right Rear valve stuck open, check air lines to air spring for leaks. If no air leak is found, replace the Air Valve block.
24. Air Compressor failure is indicated, do test T.
25. An air supply leak is indicated, do test T.
26. Exhaust valve is stuck open, do test T.
27. Inlet valve stuck closed, do test T.
28. Exhaust valve stuck closed, do test W.

SYMPTOM DIAGNOSIS

NOTE: It is essential that the system be disabled using the disable switch when any service under the vehicle is required or the vehicle is to be lifted.

1. Air suspension system does not seem to operate at all and warning lamp bulb test is not observed. Check Fuse F B4 and the 15A Air Suspension In-line Fuse (P123). If they are OK, do test AA.
2. Air suspension system does not lower when requested by driver, do test X.
3. Air suspension system will not raise when requested by driver, do test Y.
4. Air suspension system cannot be inhibited using instrument panel switch, do test Z.
5. If none of the air suspension switch warning lamps illuminate when the system is disabled, do test EE.
6. If the air suspension compressor cycles on and off frequently or seems to be running all the time, do test DD.
7. If the RTC 6834 handheld tester cannot read data from the Air Suspension ECU (Z165) and the air suspension system partially operates, do test CC.

Test A

1A

CONDITIONS
• Ignition Switch
Position: 0

RESULTS
Less than 1.5K ohms

**Z165
Air Suspension
ECU**

~~OK~~ GO TO TEST B

OK



2A

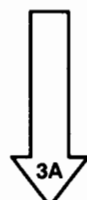
CONDITIONS
• Ignition Switch
Position: 0

RESULTS
Less than 1.5K ohms

**Z165
Air Suspension
ECU**

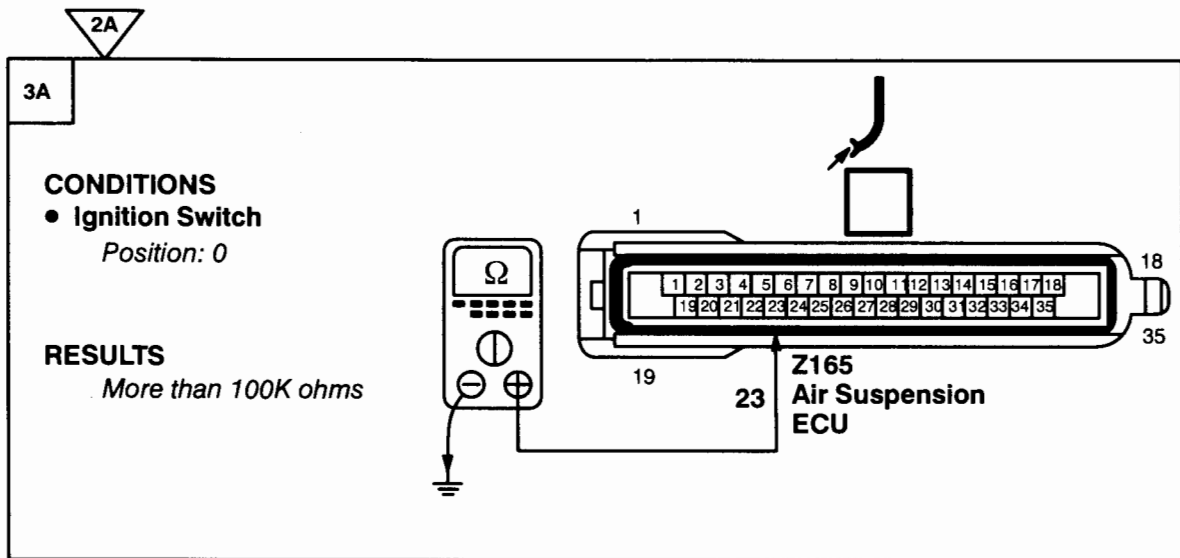
~~OK~~ GO TO TEST B

OK



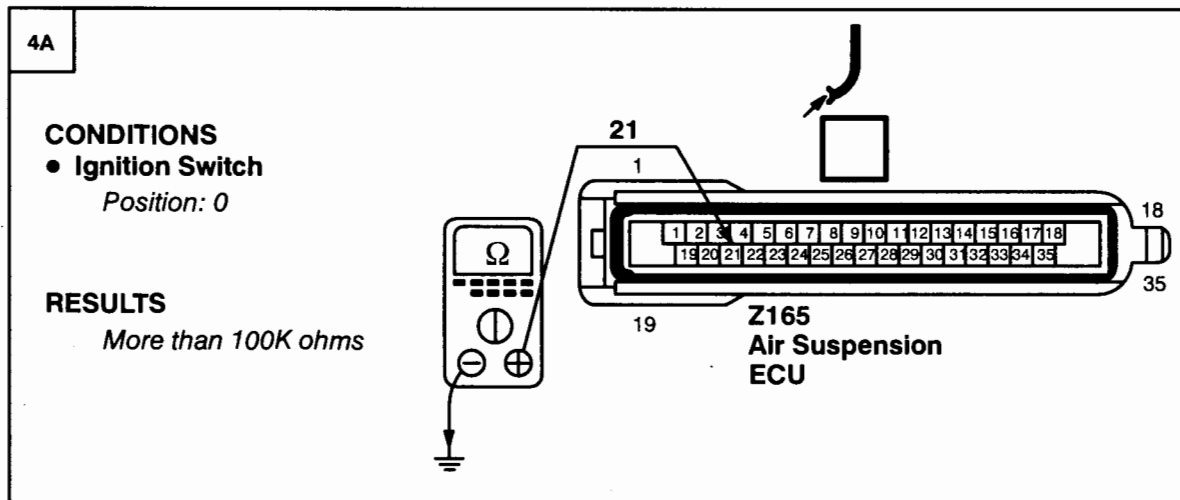
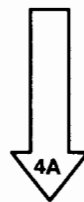
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~~OK~~ GO TO TEST C

OK



~~OK~~ GO TO TEST C

OK

- PROBLEM CAUSE**
- Check Connection to ECU by Substitution
 - Air Suspension ECU

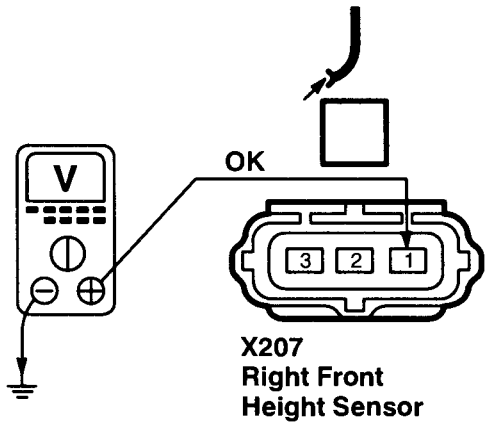
Test B

1B

CONDITIONS

- Ignition Switch
Position: II
- Reconnect Air Suspension ECU

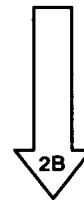
RESULTS
6-7 VOLTS



X207
Right Front
Height Sensor

~~OK~~ PROBLEM CAUSE
- OK Wire

OK

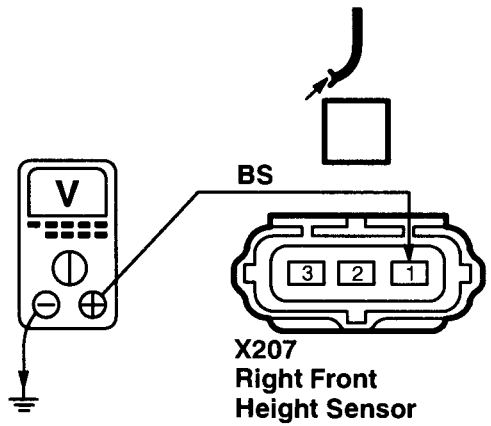


2B

CONDITIONS

- Ignition Switch
Position: II

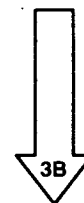
RESULTS
6-7 VOLTS



X207
Right Front
Height Sensor

~~OK~~ PROBLEM CAUSE
- BS Wire

OK



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2B

3B

CONDITIONS

- Ignition Switch
Position: 0

RESULTS
between
0 - 1500 Ω

OK

X207
Right Front
Height Sensor

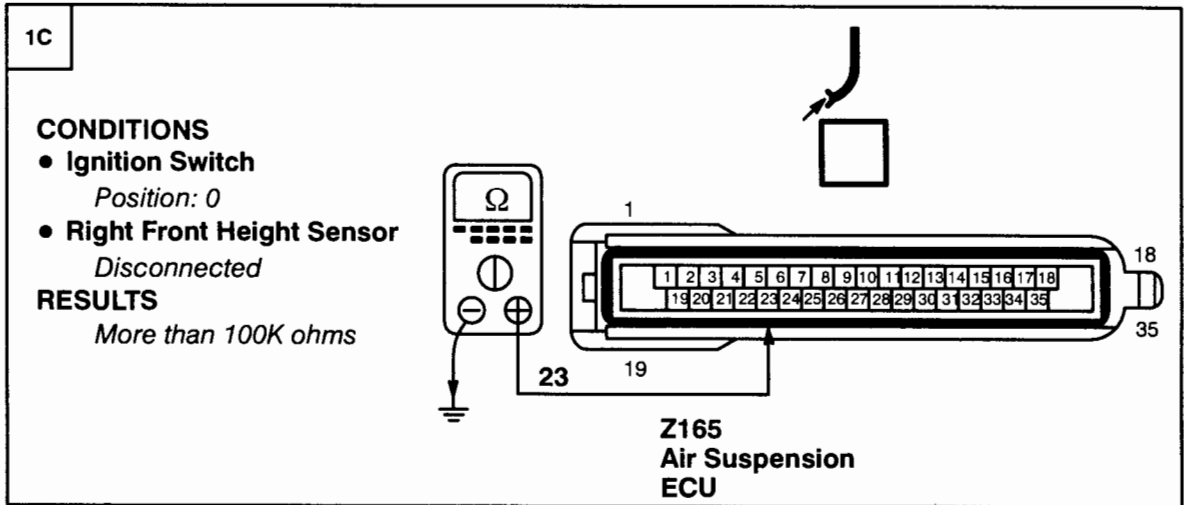


PROBLEM CAUSE
- Right Front Height Sensor



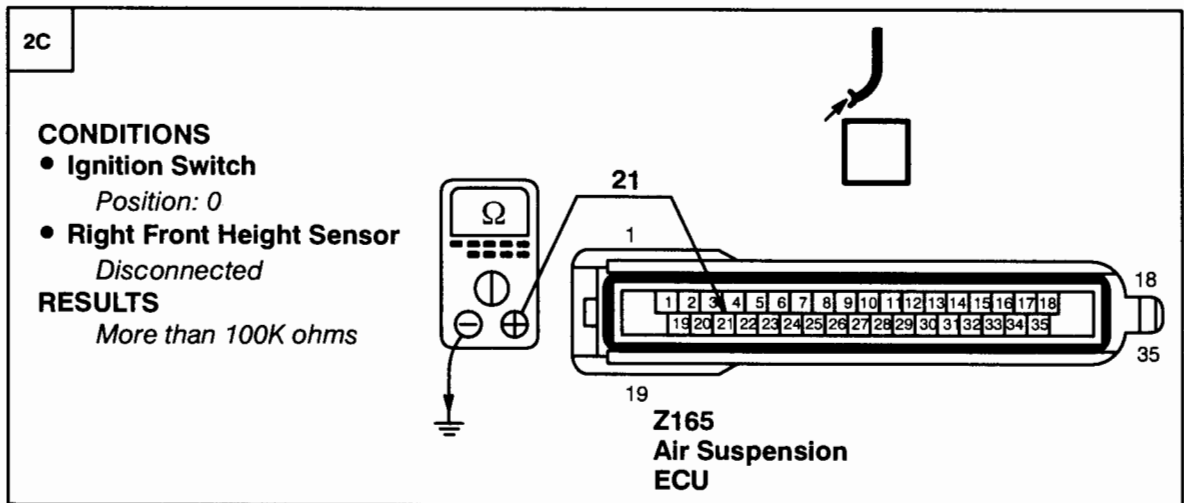
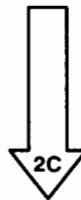
PROBLEM CAUSE
- RK Wire

Test C



OK PROBLEM CAUSE
- RK Wire

OK



OK PROBLEM CAUSE
- OK Wire

OK

PROBLEM CAUSE
- Right Front Height Sensor

Test D

1D

CONDITIONS

- Ignition Switch
Position: 0

RESULTS

Less than 1.5K ohms

**Z165
Air Suspension
ECU**



GO TO TEST E



2D

CONDITIONS

- Ignition Switch
Position: 0

RESULTS

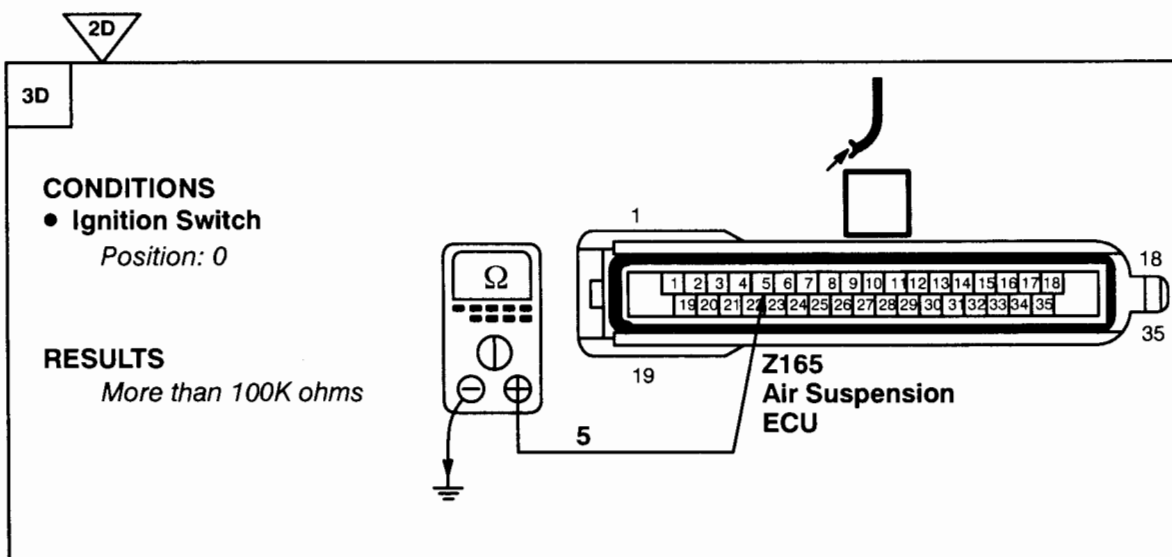
Less than 1.5K ohms

**Z165
Air Suspension
ECU**

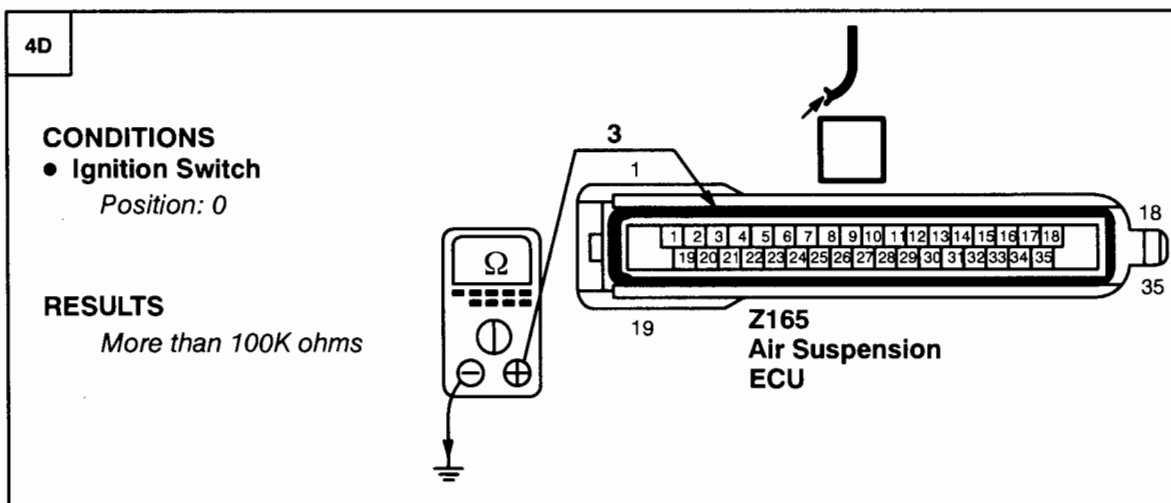
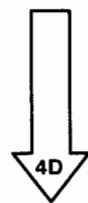


GO TO TEST E





GO TO TEST F



GO TO TEST F



PROBLEM CAUSE

- Check Connection to ECU by Substitution
- Air Suspension ECU

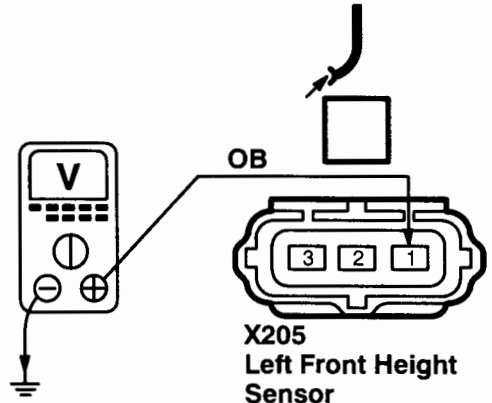
Test E

1E


CONDITIONS

- Ignition Switch
Position: II
- Reconnect Air Suspension ECU

RESULTS
6-7 VOLTS



**X205
Left Front Height
Sensor**

 **PROBLEM CAUSE**
- OB Wire



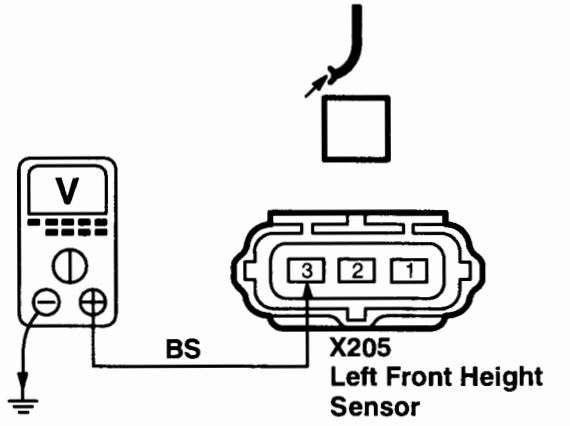


2E


CONDITIONS

- Ignition Switch
Position: II

RESULTS
6-7 VOLTS

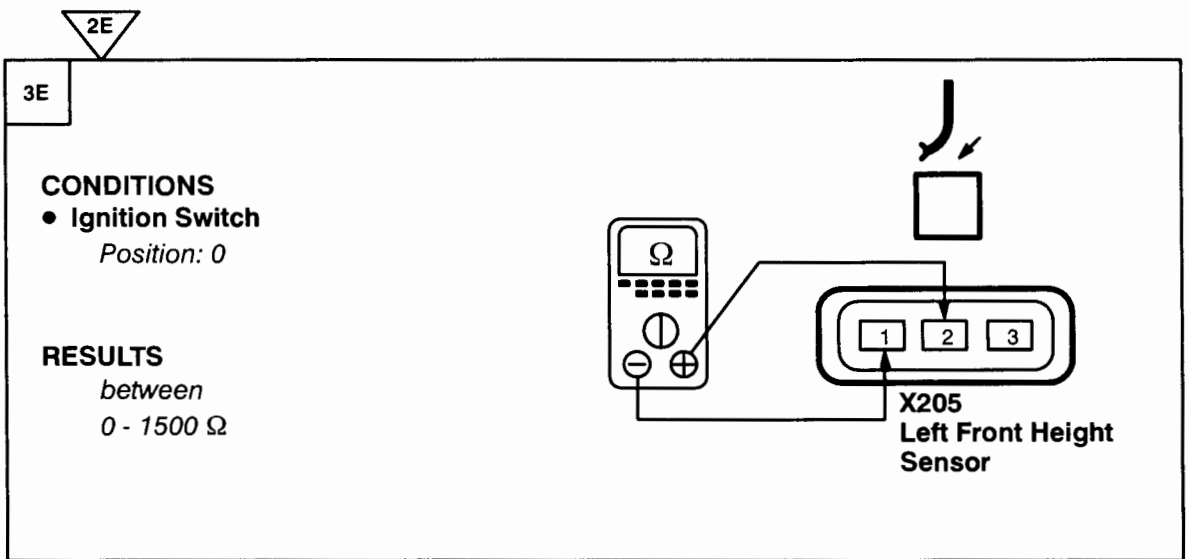


**X205
Left Front Height
Sensor**

 **PROBLEM CAUSE**
- BS Wire







PROBLEM CAUSE
- Left Front Height Sensor



PROBLEM CAUSE
- RB Wire

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Test F

1F

CONDITIONS

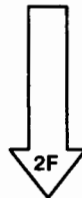
- Ignition Switch
Position: 0
- Left Front Height Sensor
Disconnected

RESULTS
More than 100K ohms

**Z165
Air Suspension
ECU**

~~OK~~ PROBLEM CAUSE
- RB Wire

OK



2F

CONDITIONS

- Ignition Switch
Position: 0
- Left Front Height Sensor
Disconnected

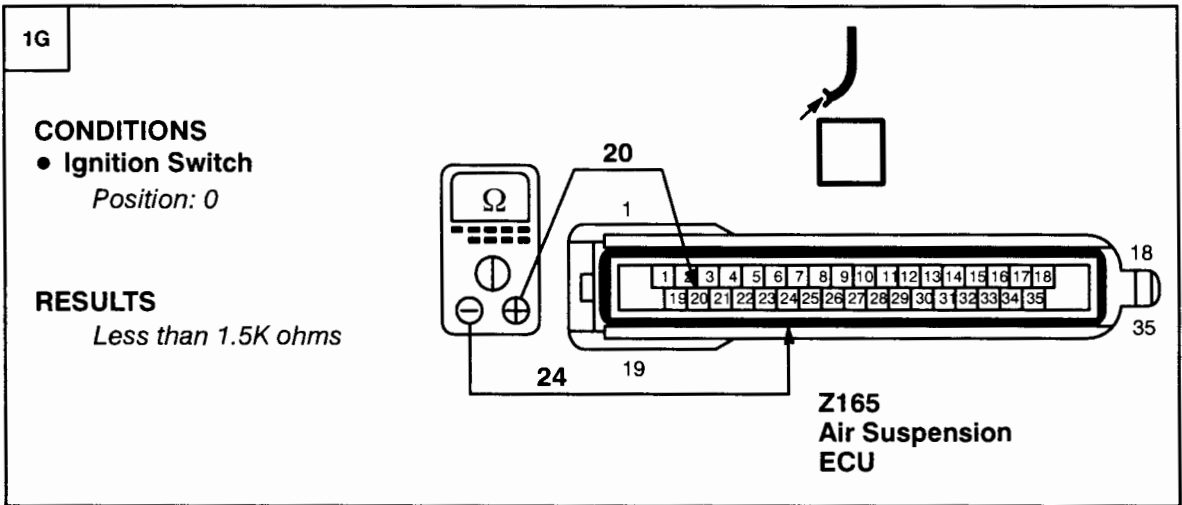
RESULTS
More than 100K ohms

**Z165
Air Suspension
ECU**

~~OK~~ PROBLEM CAUSE
- OB Wire

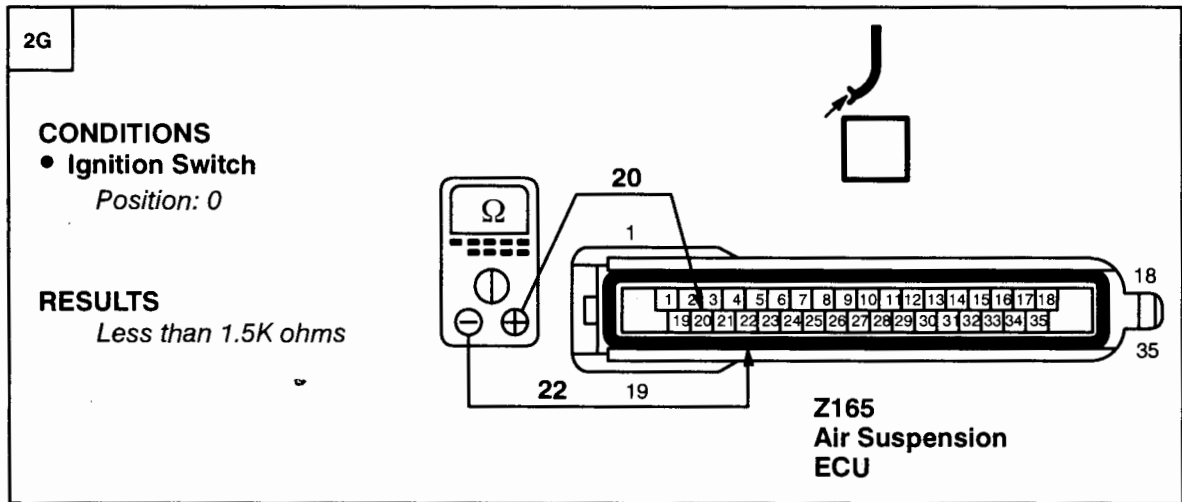
OK PROBLEM CAUSE
- Left Front Height Sensor

Test G



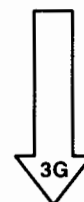
~~OK~~ GO TO TEST H

OK



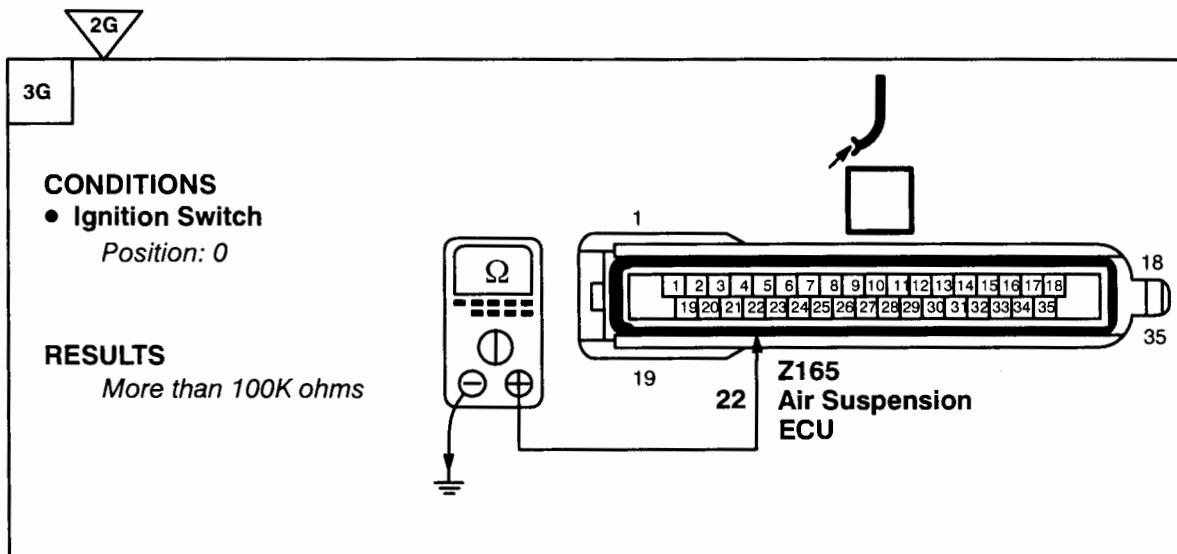
~~OK~~ GO TO TEST H

OK

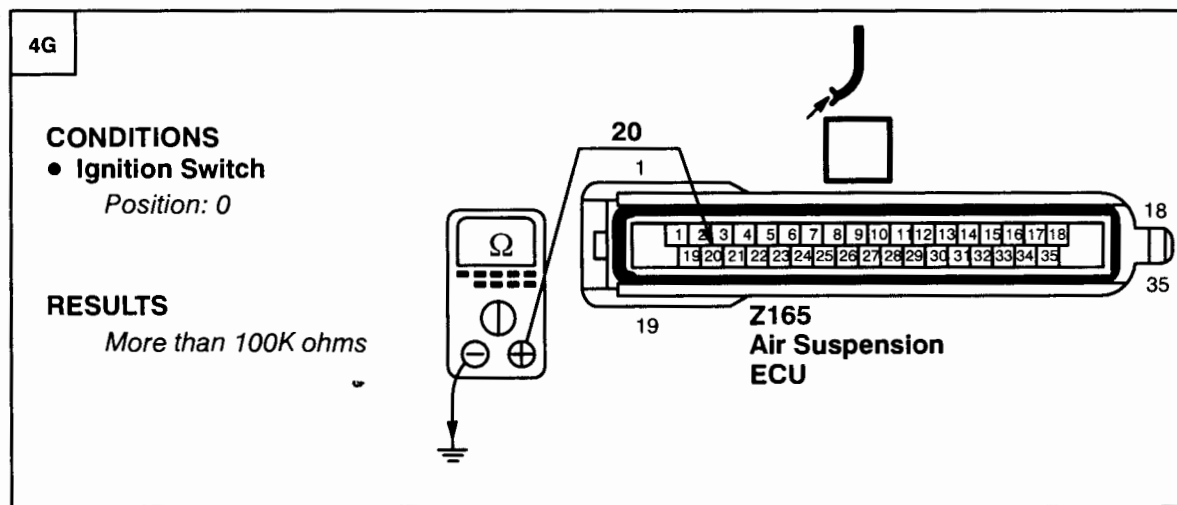
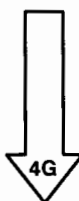


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GO TO TEST I



GO TO TEST I



PROBLEM CAUSE

- Check Connection to ECU by Substitution
- Air Suspension ECU

Test H

1H

CONDITIONS

- Ignition Switch
Position: II
- Reconnect Air Suspension ECU

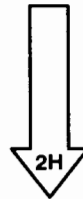
RESULTS
6-7 VOLTS

OY

X208
Right Rear
Height Sensor

~~OK~~ PROBLEM CAUSE
- OY Wire

OK



2H

CONDITIONS

- Ignition Switch
Position: II

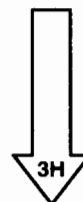
RESULTS
6-7 VOLTS

BS

X208
Right Rear
Height Sensor

~~OK~~ PROBLEM CAUSE
- BS Wire

OK



S1 ETM

1993 RANGE ROVER

2H

3H

CONDITIONS

- Ignition Switch
Position: 0
- Rear Wipe/Wash Switch

RESULTS

between
0 - 1500 Ω

X208
Right Rear
Height Sensor

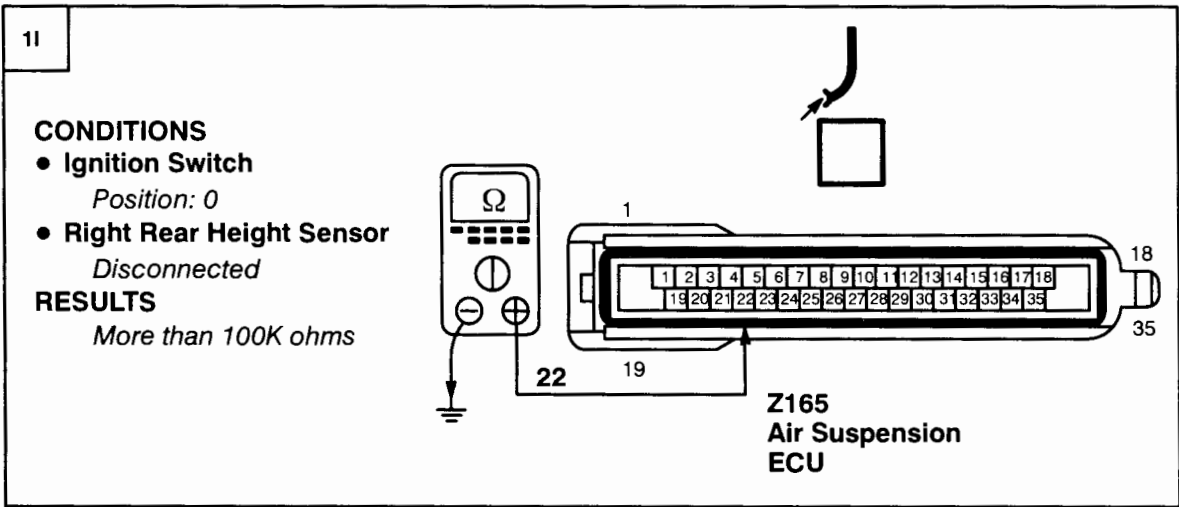


PROBLEM CAUSE
- Right Rear Height Sensor



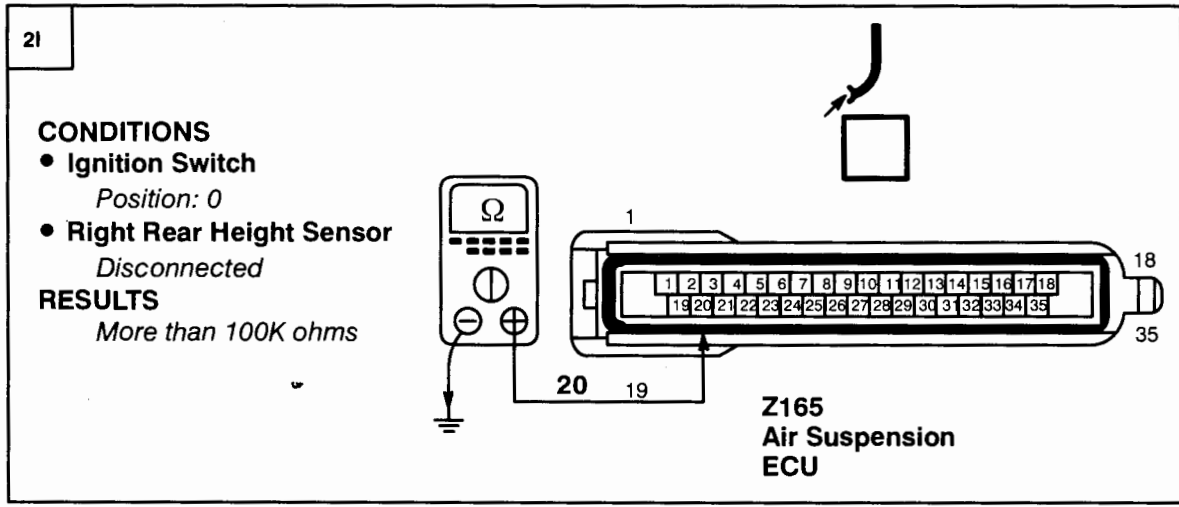
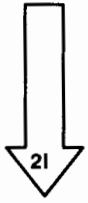
PROBLEM CAUSE
- RY Wire

Test I



~~OK~~ PROBLEM CAUSE
- RY Wire

OK



~~OK~~ PROBLEM CAUSE
- OY Wire

OK PROBLEM CAUSE
- Right Rear Height Sensor

S1 ETM

1993 RANGE ROVER

Test J

1J

CONDITIONS

- Ignition Switch
Position: 0

RESULTS

Less than 1.5K ohms

**Z165
Air Suspension
ECU**



GO TO TEST K



2J

CONDITIONS

- Ignition Switch
Position: 0

RESULTS

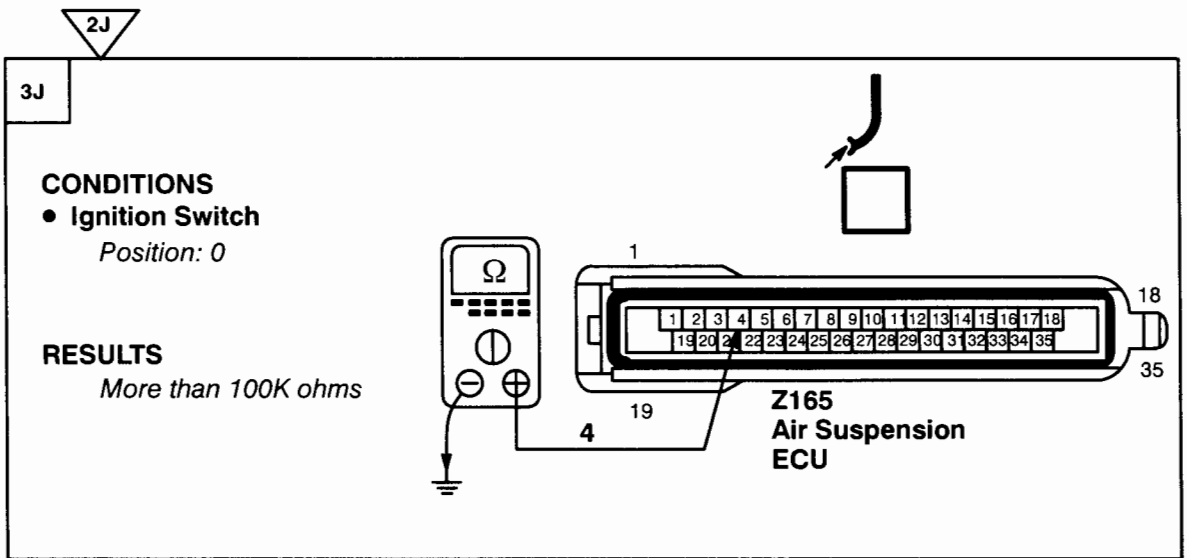
Less than 1.5K ohms

**Z165
Air Suspension
ECU**



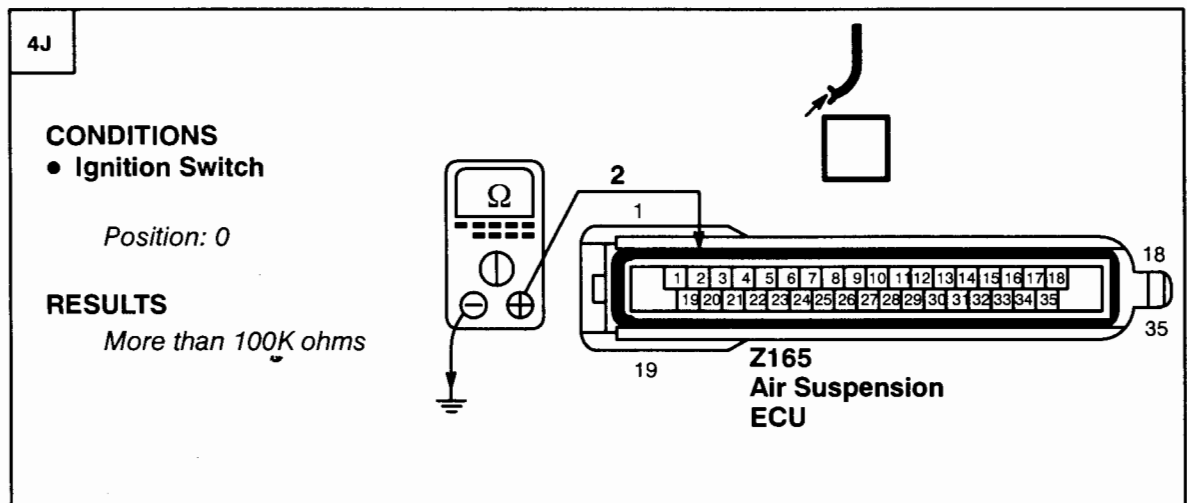
GO TO TEST K





~~OK~~ GO TO TEST L

OK



~~OK~~ GO TO TEST L

OK

PROBLEM CAUSE

- Check Connection to ECU by Substitution
- Air Suspension ECU

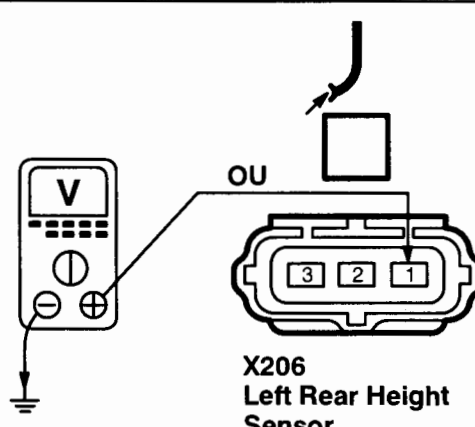
Test K

1K

CONDITIONS

- Ignition Switch
Position: II
- Reconnect Air Suspension ECU

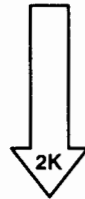
RESULTS
6-7 VOLTS



X206
Left Rear Height
Sensor

~~OK~~ PROBLEM CAUSE
- OU Wire

OK

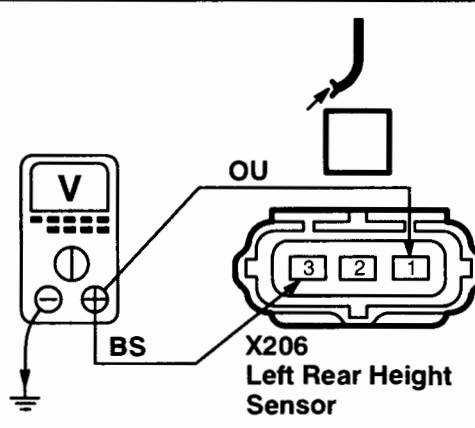


2K

CONDITIONS

- Ignition Switch
Position: II

RESULTS
6-7 VOLTS

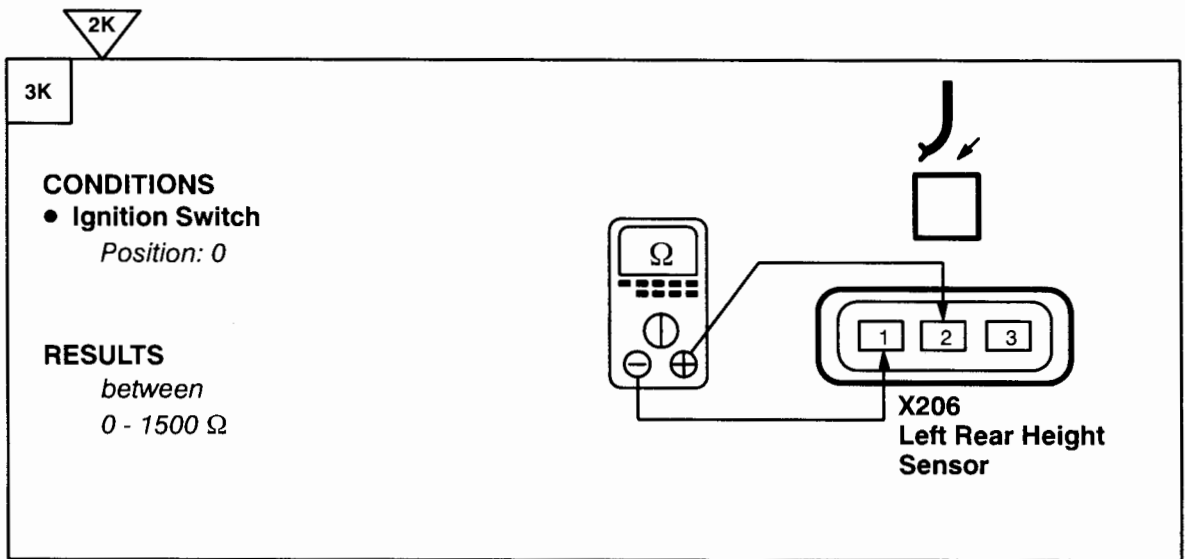


X206
Left Rear Height
Sensor

~~OK~~ PROBLEM CAUSE
- BS Wire

OK





PROBLEM CAUSE
- Left Rear Height Sensor



PROBLEM CAUSE
- RU Wire

S1 ETM

1993 RANGE ROVER

Test L

1L

CONDITIONS

- Ignition Switch
Position: 0
- Left Rear Height Sensor
Disconnected

RESULTS
More than 100K ohms

**Z165
Air Suspension
ECU**

PROBLEM CAUSE
- RU Wire



2L

CONDITIONS

- Ignition Switch
Position: 0
- Left Rear Height Sensor
Disconnected

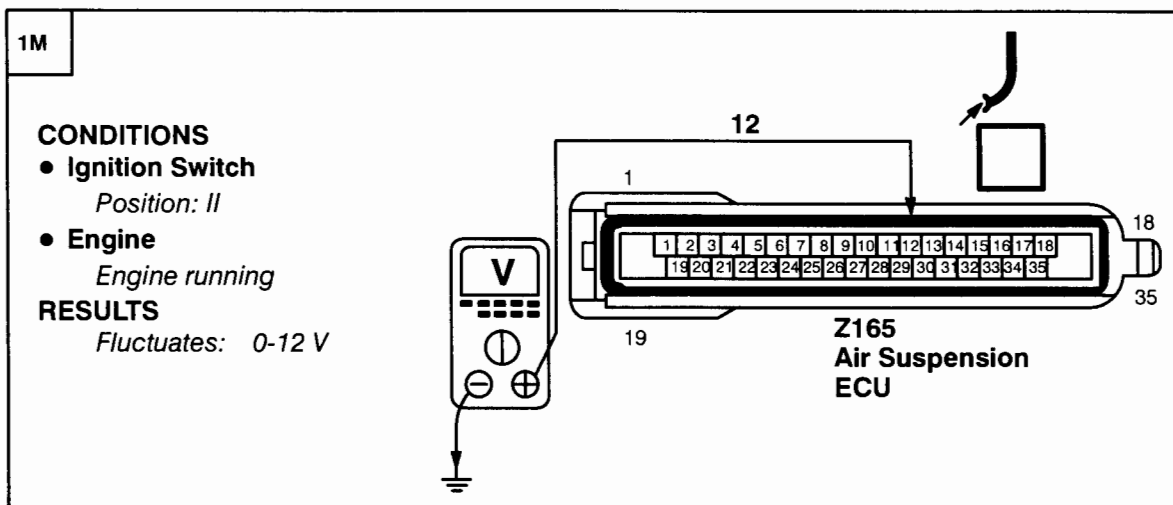
RESULTS
More than 100K ohms

**Z165
Air Suspension
ECU**

PROBLEM CAUSE
- OU Wire

PROBLEM CAUSE
- Left Rear Height Sensor

Test M



PROBLEM CAUSE

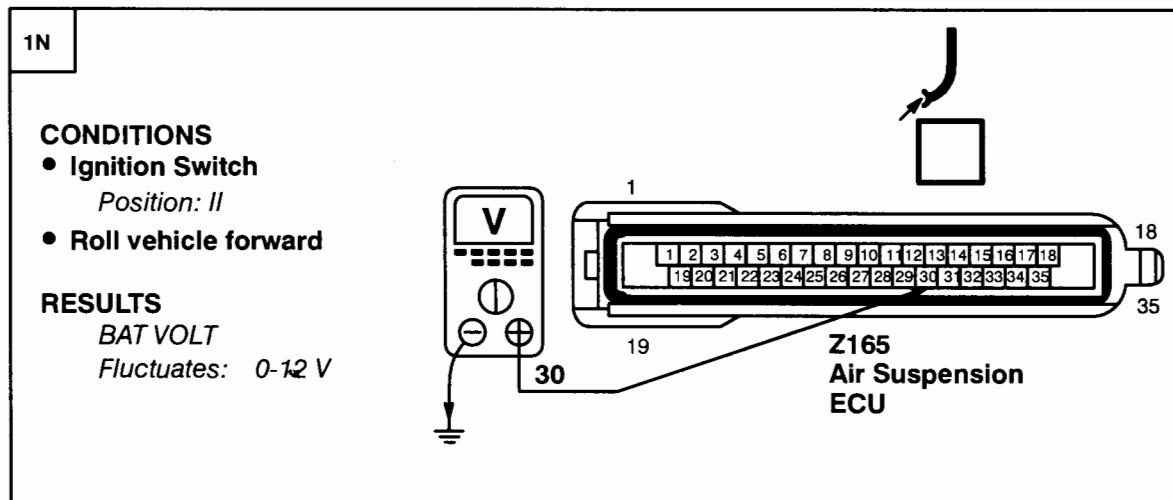
- WS Wire
- Generator



PROBLEM CAUSE

- Check Connection to ECU by Substitution
- Generator Suppression Capacitor

Test N



PROBLEM CAUSE

- WK Wire
- YK Wire



PROBLEM CAUSE

- Air Suspension ECU
- Speed Transducer
- Speed Buffer

Test O

10

CONDITIONS

- Ignition Switch
Position: 0
- Reservoir
Depressurized

RESULTS
More than 2K ohms

**Z165
Air Suspension
ECU**



PROBLEM CAUSE

- SU Wire
- Air Suspension ECU

20

CONDITIONS

- Ignition Switch
Position: 0
- Reservoir
Depressurized

RESULTS
More than 100K ohms

**X204
Reservoir Pres-
sure Switch**



PROBLEM CAUSE

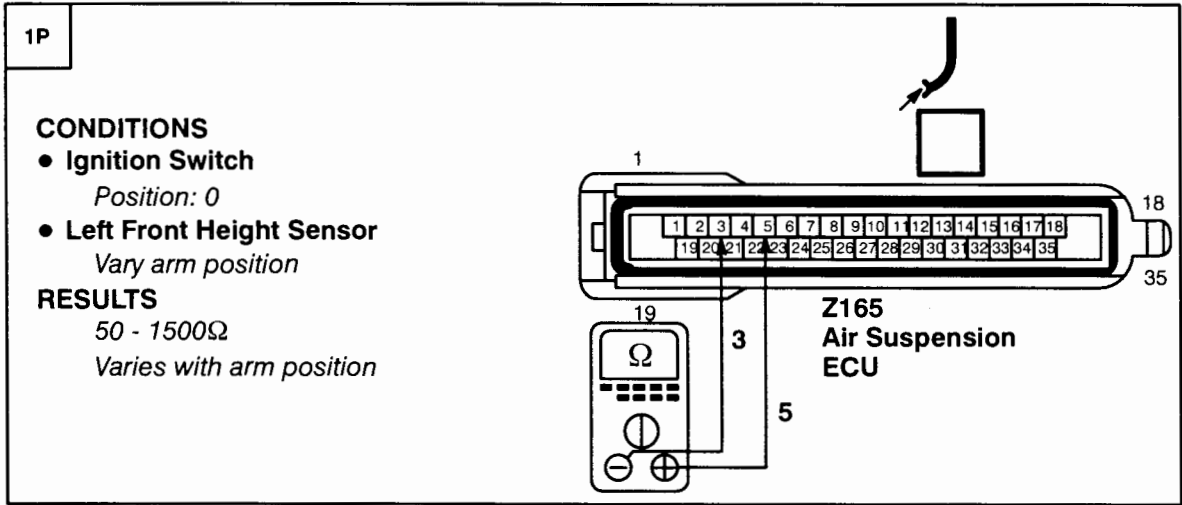
- Reservoir Pressure Switch



PROBLEM CAUSE

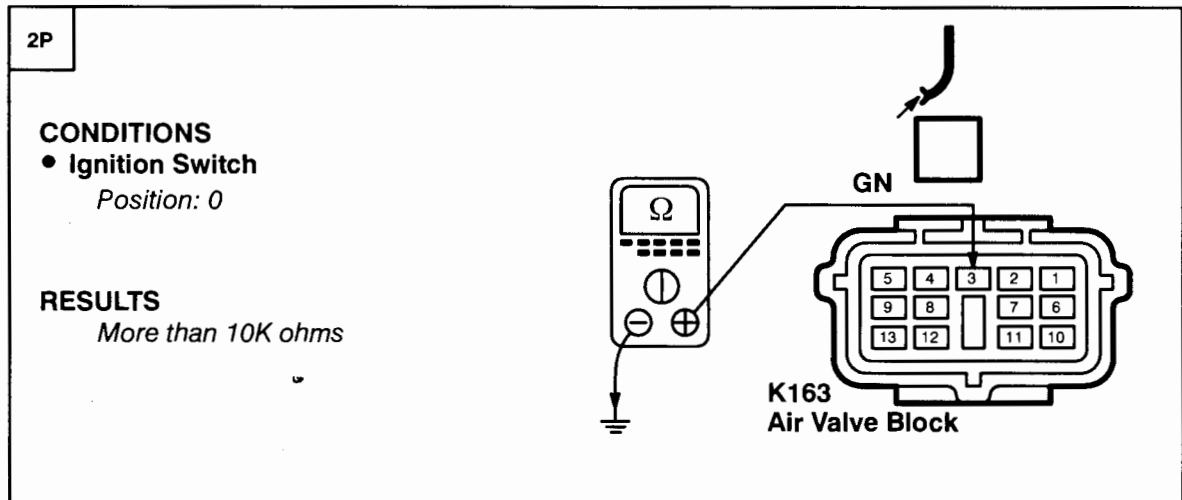
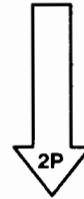
- SG Wire
- SU Wire
- 1K Resistor in SR Wire

Test P



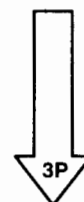
~~OK~~ PROBLEM CAUSE
- Left Front Height Sensor

OK



~~OK~~ PROBLEM CAUSE
- GN Wire

OK



S1 ETM

1993 RANGE ROVER

2P

3P

CONDITIONS

- Ignition Switch
Position: II
- Clear ECU memory

RESULTS

While depressurizing with 6834
Tester
BAT VOLT

**K163
Air Valve Block**



PROBLEM CAUSE

- GN Wire
- Air Suspension ECU



PROBLEM CAUSE

- Air Valve Block

Test Q

1Q

CONDITIONS

- Ignition Switch
Position: 0
- Right Front Height Sensor

RESULTS
50 - 1500Ω
Varies with arm position

**Z165
Air Suspension
ECU**

~~OK~~ **PROBLEM CAUSE**
- Right Front Height Sensor

OK



2Q

CONDITIONS

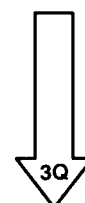
- Ignition Switch
Position: 0

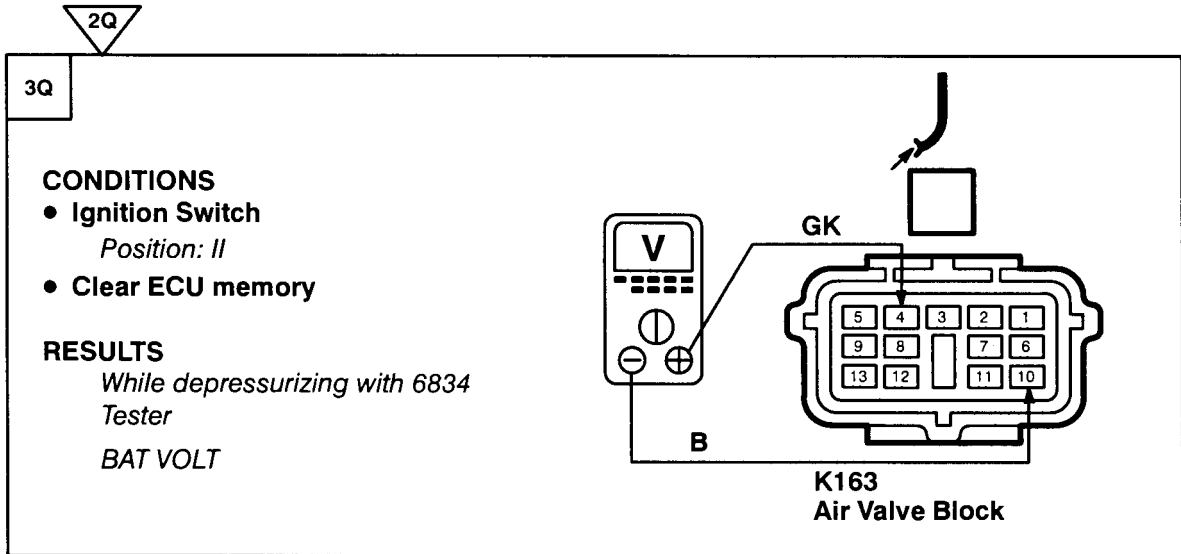
RESULTS
More than 10K ohms

**K163
Air Valve Block**

~~OK~~ **PROBLEM CAUSE**
- GK Wire

OK





PROBLEM CAUSE

- GK Wire
- Air Suspension ECU



PROBLEM CAUSE

- Air Valve Block

Test R

1R

CONDITIONS

- Ignition Switch
Position: 0
- Left Rear Height Sensor
Vary arm position

RESULTS
50 - 1500Ω
Varies with arm position

**Z165
Air Suspension
ECU**



PROBLEM CAUSE
- Left Rear Height Sensor



2R

CONDITIONS

- Ignition Switch
Position: 0

RESULTS
More than 10K ohms

**K163
Air Valve Block**



PROBLEM CAUSE
- GW Wire



S1 ETM

1993 RANGE ROVER

3R

CONDITIONS

- Ignition Switch
Position: II
- Clear ECU memory

RESULTS
While depressurizing with 6834 Tester

BAT VOLT

**K163
Air Valve Block**



- PROBLEM CAUSE**
- GW Wire
 - Air Suspension ECU



- PROBLEM CAUSE**
- Air Valve Block

Test S

1S

CONDITIONS

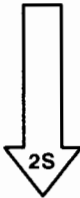
- Ignition Switch
Position: 0
- Right Rear Height Sensor
Vary arm position

RESULTS
50 - 1500Ω
Varies with arm position

**Z165
Air Suspension
ECU**



PROBLEM CAUSE
- Right Rear Height Sensor



2S

CONDITIONS

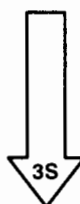
- Ignition Switch
Position: 0

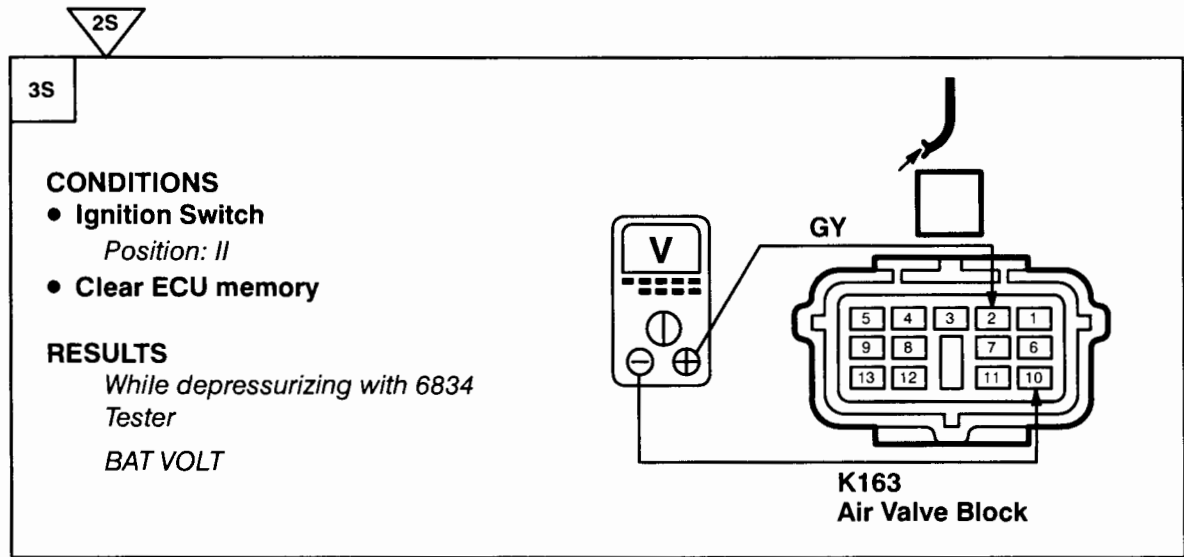
RESULTS
More than 10K ohms

**K163
Air Valve Block**



PROBLEM CAUSE
- GY Wire





PROBLEM CAUSE

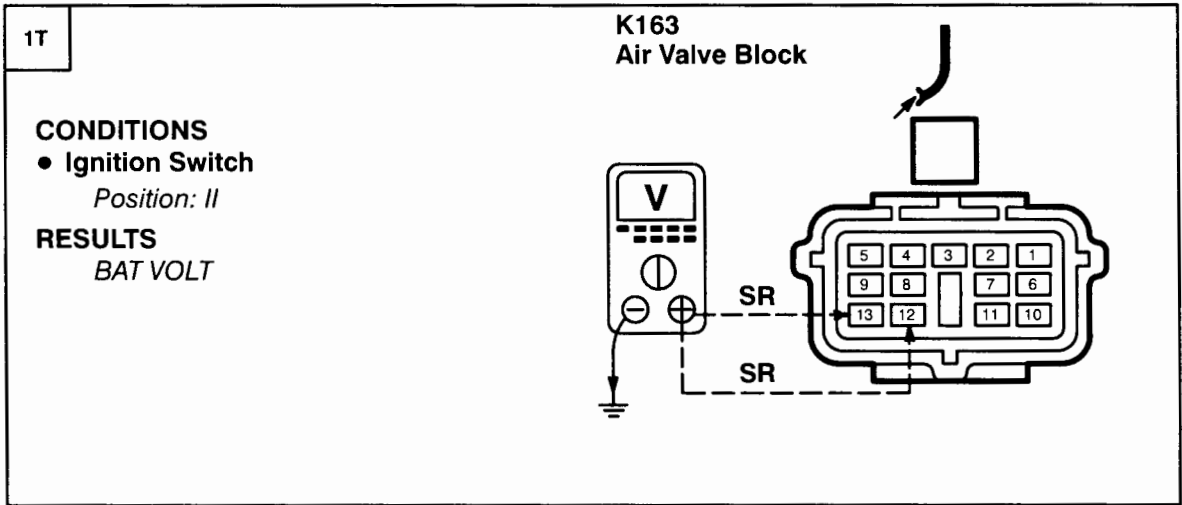
- GY Wire
- Air Suspension ECU



PROBLEM CAUSE

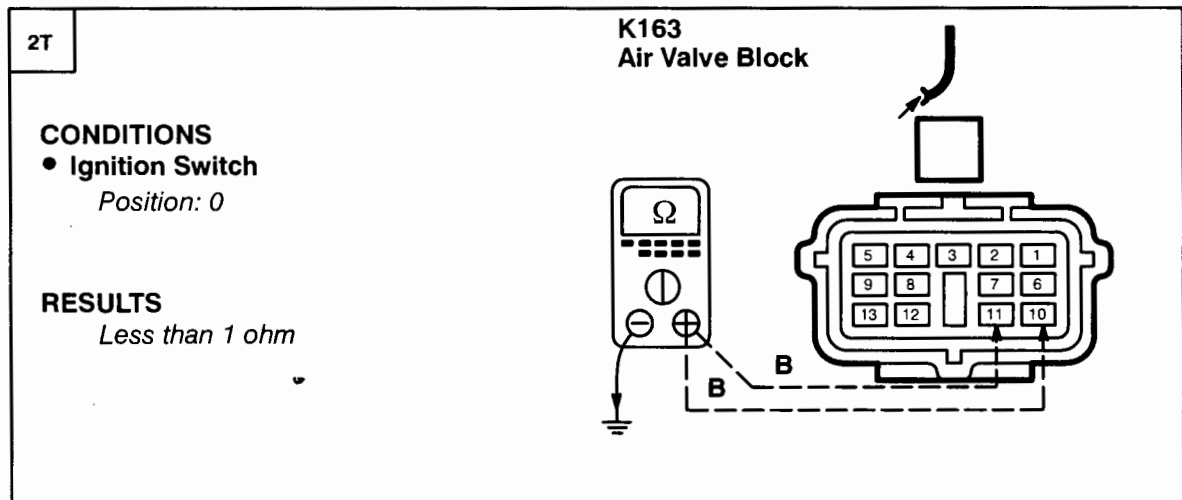
- Air Valve Block

Test T



~~OK~~ PROBLEM CAUSE
- SR Wire

OK



~~OK~~ PROBLEM CAUSE
- B Wire

OK



S1 ETM

1993 RANGE ROVER

2T

3T

CONDITIONS

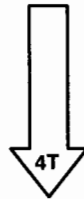
- Ignition Switch
Position: 0
- Air Suspension ECU
Disconnected

RESULTS
More than 10K ohms

**K163
Air Valve
Block**

~~OK~~ PROBLEM CAUSE
- GS Wire

OK



4T

CONDITIONS

- Ignition Switch
Position: II
- Clear ECU memory

RESULTS
*While depressurizing with 6834 tester
BAT VOLT*

**K163
Air Valve
Block**

~~OK~~ PROBLEM CAUSE
- GS Wire
- Air Suspension ECU

OK PROBLEM CAUSE
Go to Test U

Test U

1U

CONDITIONS

- Ignition Switch
Position: 0

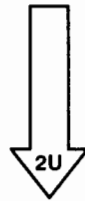
RESULTS
BAT VOLT

**K156
Air Suspension
Compressor
Relay**



PROBLEM CAUSE

- Air Suspension In-Line Fuse
- PO Wire



2U

CONDITIONS

- Ignition Switch
Position: 0

RESULTS
Less than 1 ohm

**K156
Air Suspension
Compressor
Relay**



PROBLEM CAUSE

- B Wire



S1 ETM

1993 RANGE ROVER

2U

3U

CONDITIONS

- Engine
Engine running
- Air Suspension Up Switch

ON
- Disconnect Reservoir Pressure Switch

RESULTS
BAT VOLTS

**K156
Air Suspension
Compressor
Relay**

~~OK~~ PROBLEM CAUSE
Go to Test V

OK
↓
4U

4U

CONDITIONS

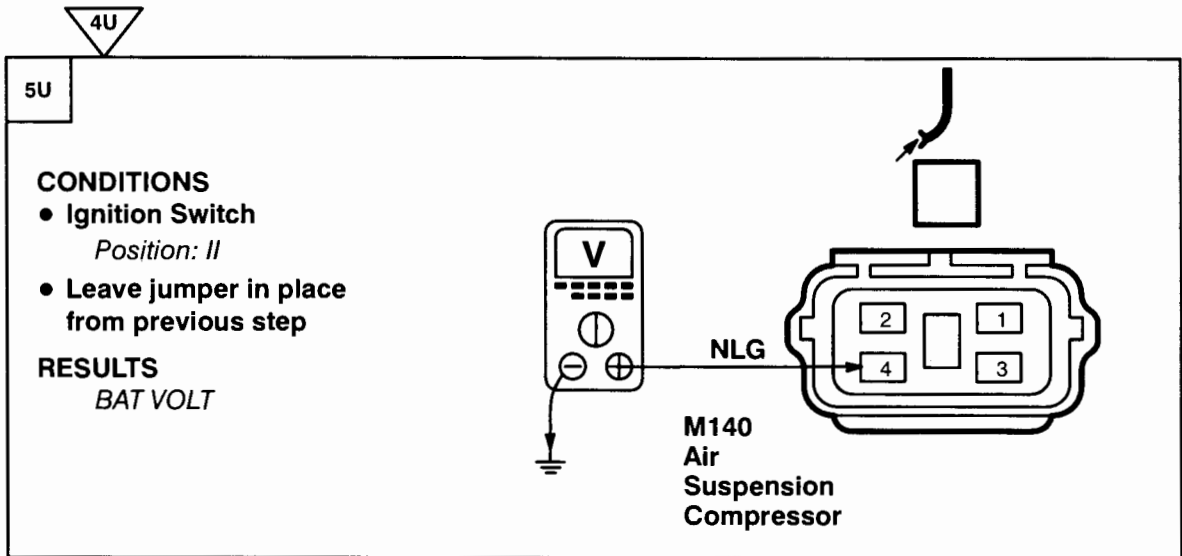
- Ignition Switch
Position: II

RESULTS
Compressor operates

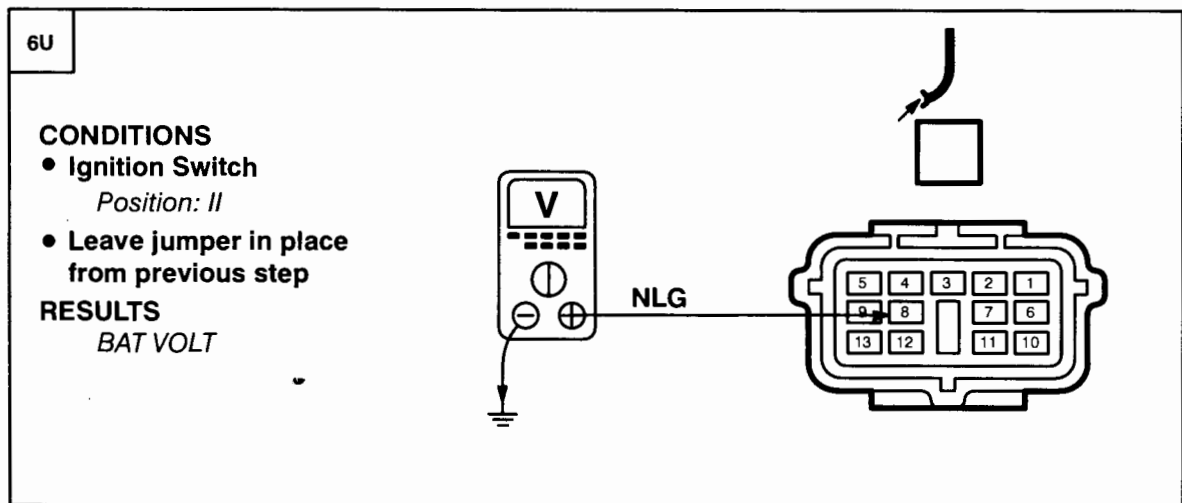
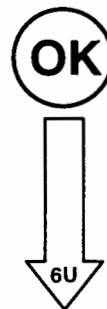
**K156
Air Suspension
Compressor
Relay**

~~OK~~
↓
5U

OK PROBLEM CAUSE
- Air Suspension
Compressor Relay



~~OK~~ PROBLEM CAUSE
- NLG Wire



~~OK~~ PROBLEM CAUSE
- NLG Wire

OK PROBLEM CAUSE
- Air Valve Block

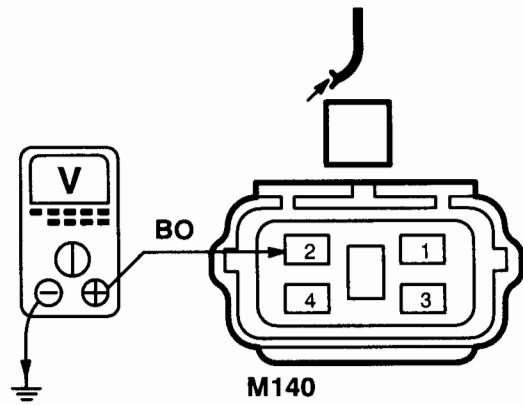
Test V

1V

CONDITIONS

- Ignition Switch
Position: II

RESULTS
BAT VOLT



**M140
Air Suspension
Compressor**



PROBLEM CAUSE

- BO Wire
- Air Suspension ECU

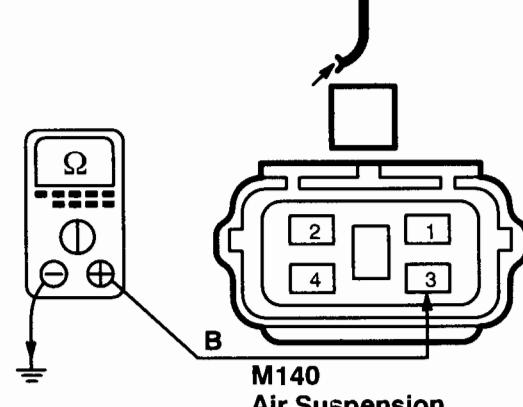


2V

CONDITIONS

- Diagnostic Plug
Separated

RESULTS
Less than 1 ohm



**M140
Air Suspension
Compressor**



PROBLEM CAUSE

- B Wire



PROBLEM CAUSE

- Air Suspension Compressor Relay

Test W

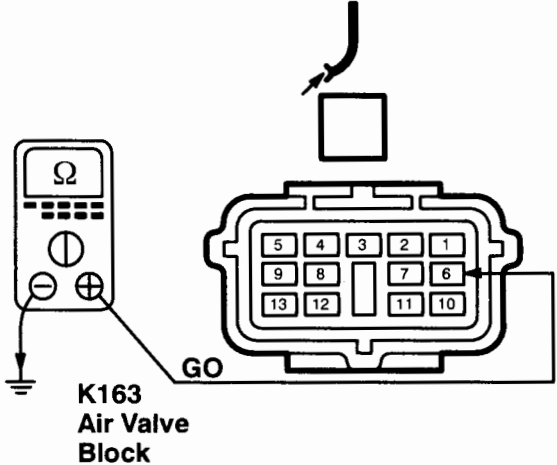
1W

CONDITIONS

- Ignition Switch
Position: 0

RESULTS

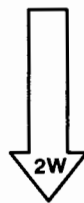
More than 100K ohms



K163
Air Valve
Block



PROBLEM CAUSE
- GO Wire



2W

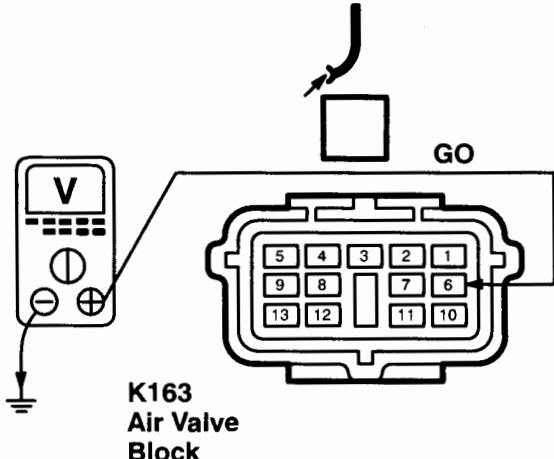
CONDITIONS

- Ignition Switch
Position: II

RESULTS

While depressurizing with 6834 tester

BAT VOLT



K163
Air Valve
Block



PROBLEM CAUSE
- GO Wire
- Air Suspension ECU

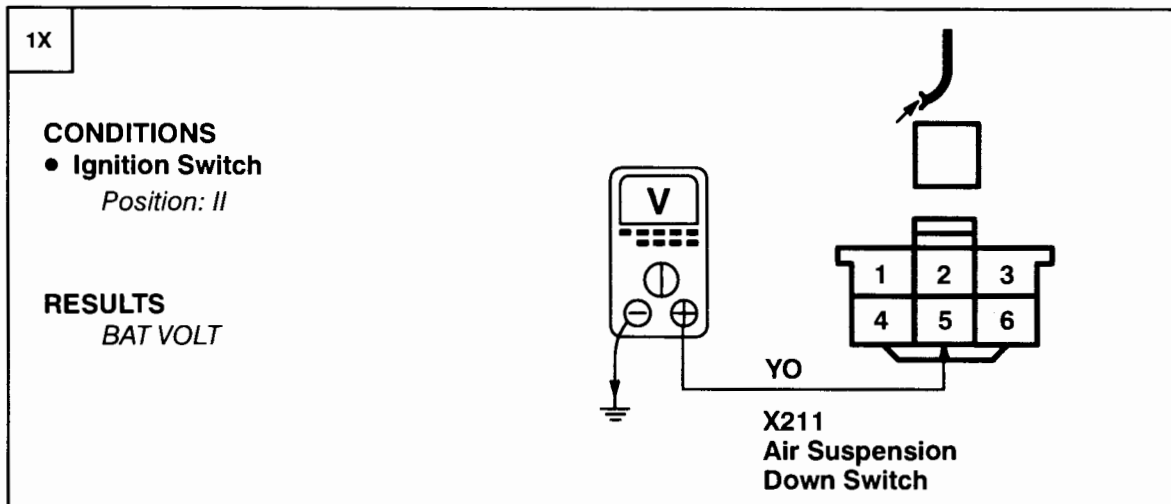


PROBLEM CAUSE
- Air Valve Block

S1 ETM

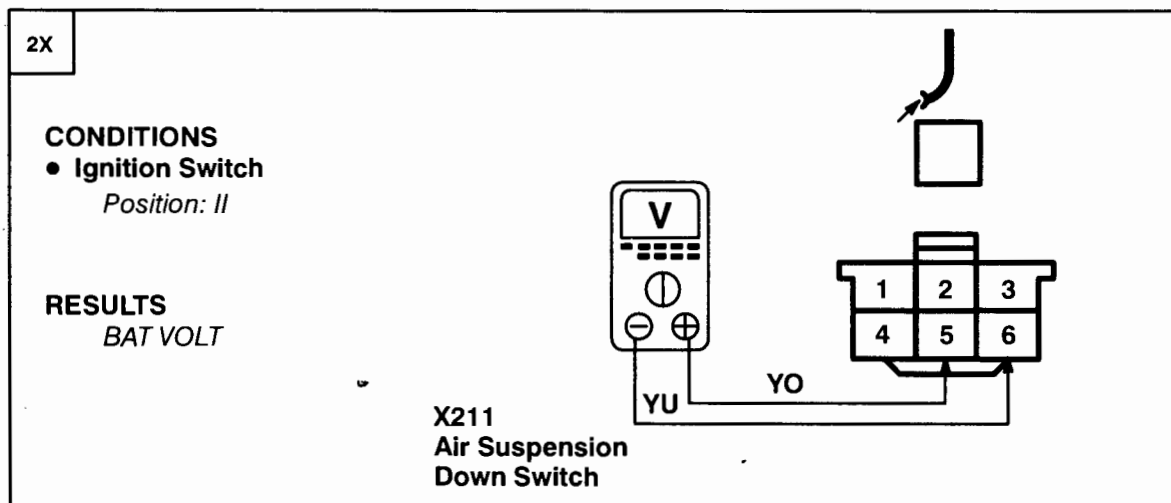
1993 RANGE ROVER

Test X



PROBLEM CAUSE

- YO Wire
- Air Suspension ECU



PROBLEM CAUSE

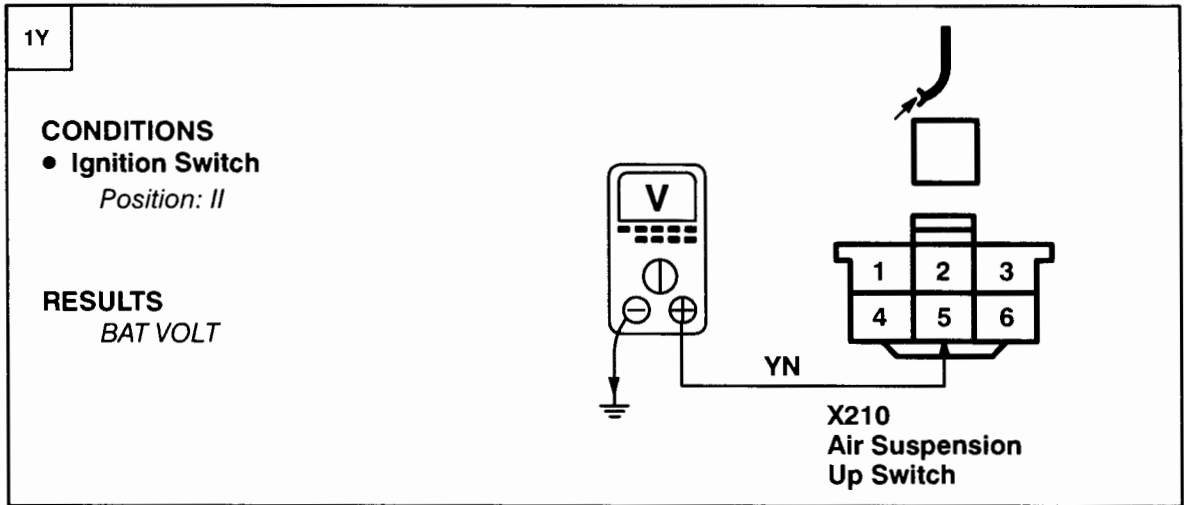
- YU Wire
- Air Suspension ECU



PROBLEM CAUSE

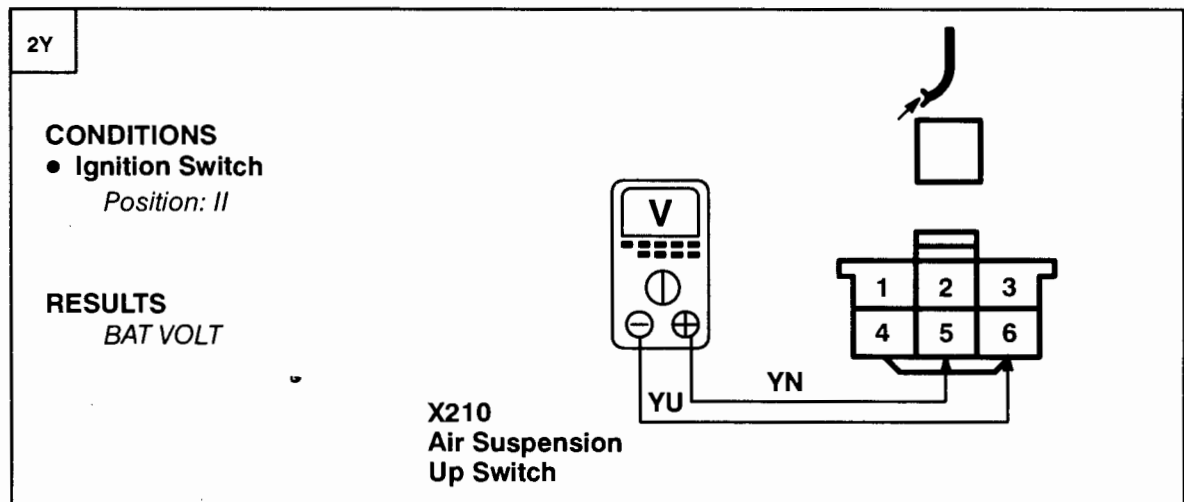
- Air Suspension
Down Switch

Test Y



PROBLEM CAUSE

- YN Wire
- Air Suspension ECU



PROBLEM CAUSE

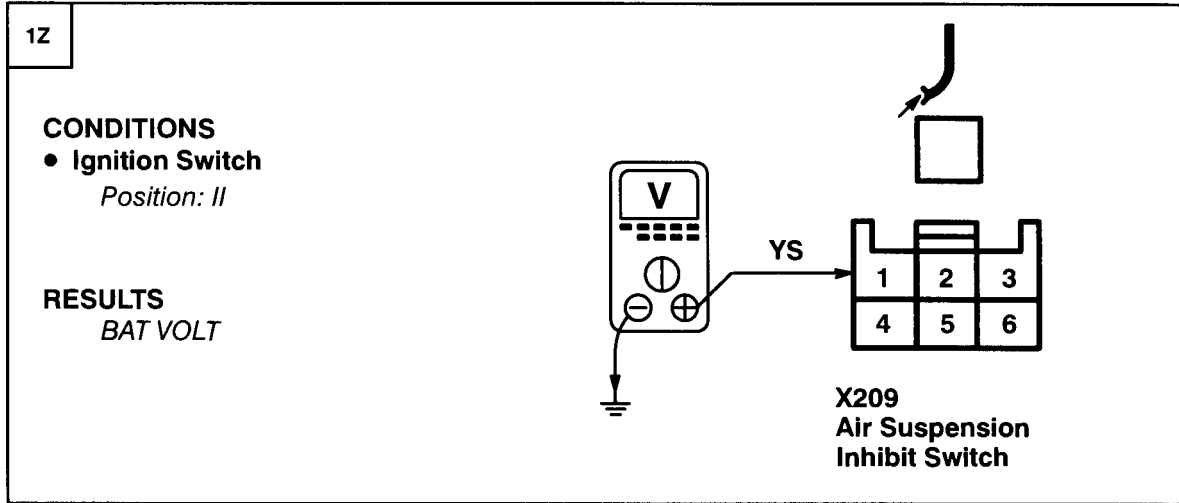
- YU Wire
- Air Suspension ECU



PROBLEM CAUSE

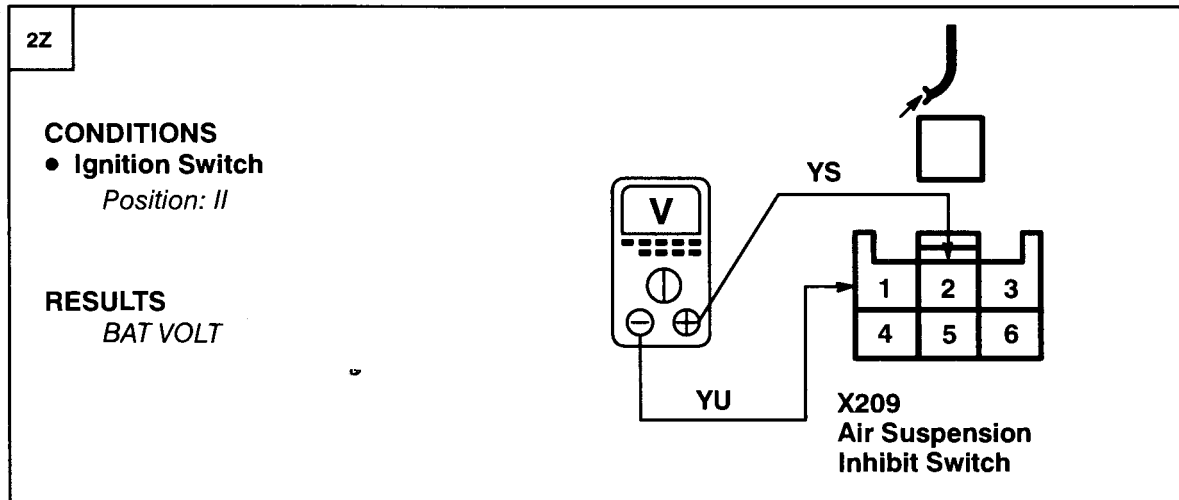
- Air Suspension Up Switch

Test Z



PROBLEM CAUSE

- YS Wire
- Air Suspension ECU



PROBLEM CAUSE

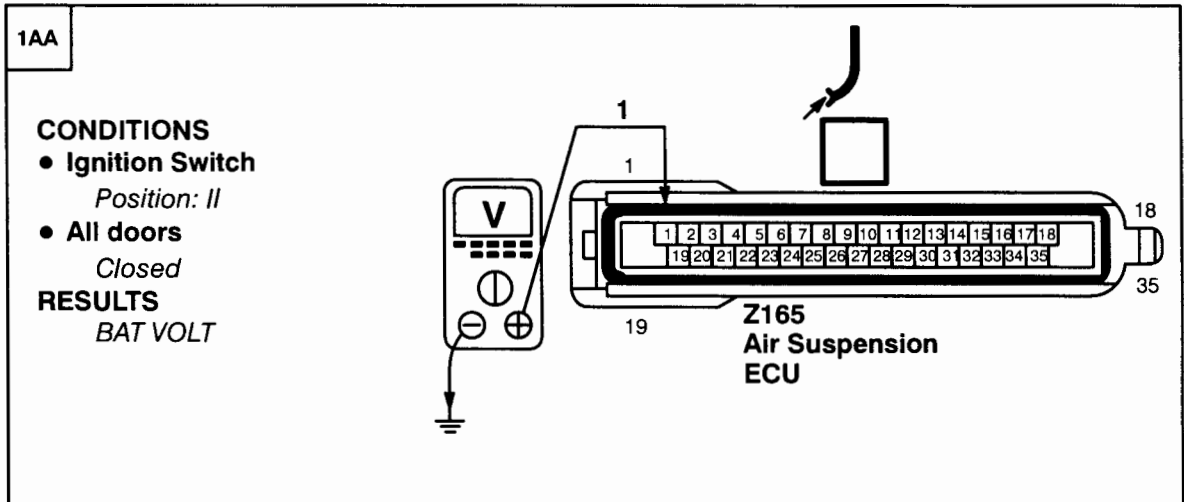
- YU Wire
- Air Suspension ECU



PROBLEM CAUSE

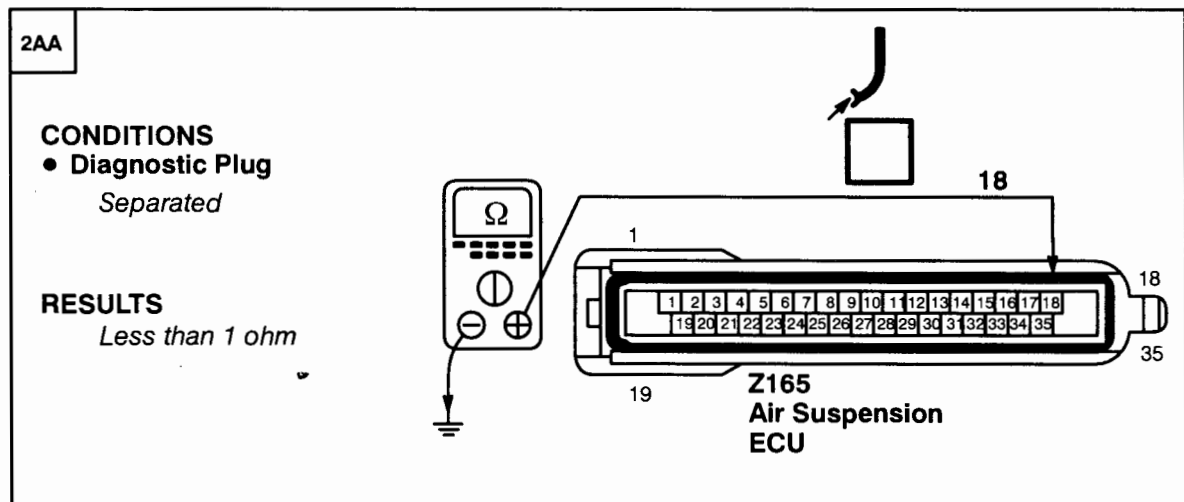
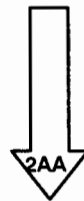
- Air Suspension Inhibit Switch

Test AA



OK PROBLEM CAUSE
- Go to Test BB

OK



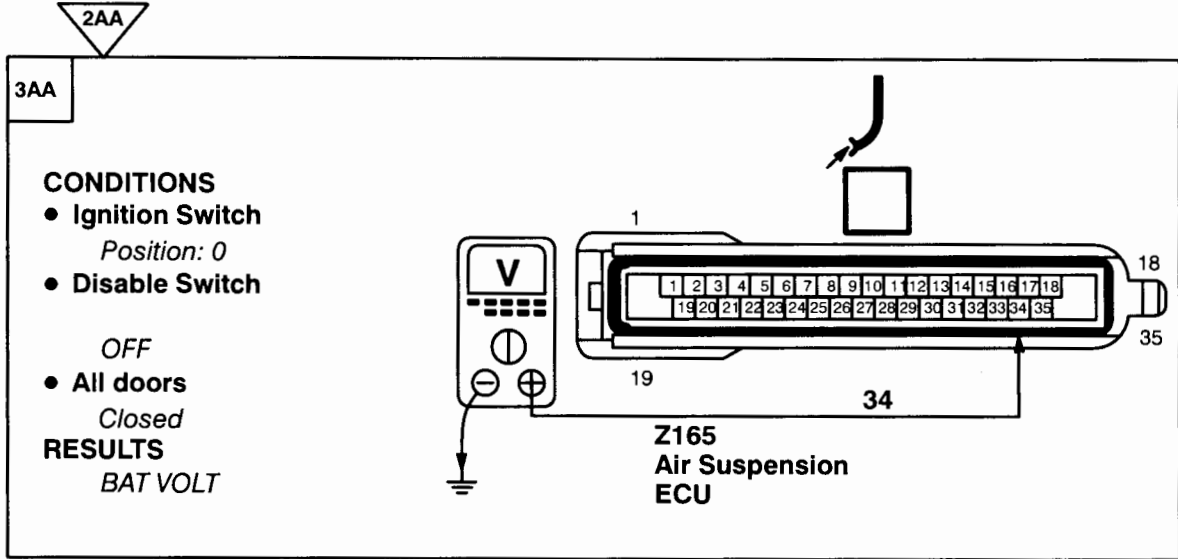
OK PROBLEM CAUSE
- B Wire

OK



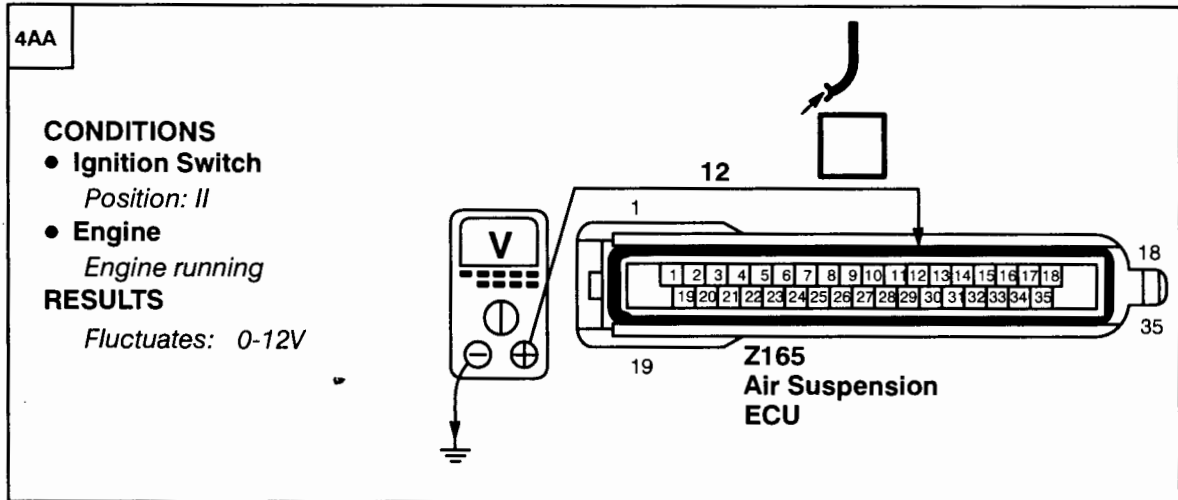
S1 ETM

1993 RANGE ROVER



PROBLEM CAUSE

- PS Wire
- Disable Switch
- Interior Lamps Delay Unit



PROBLEM CAUSE

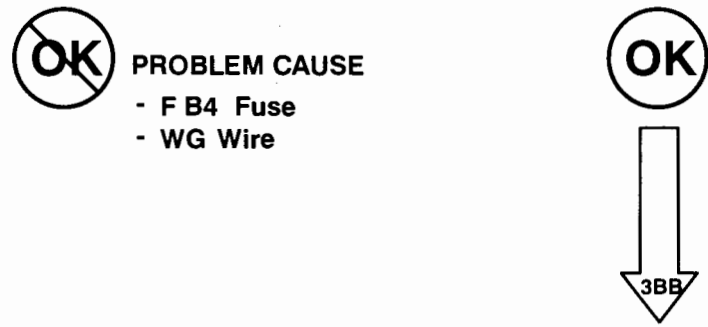
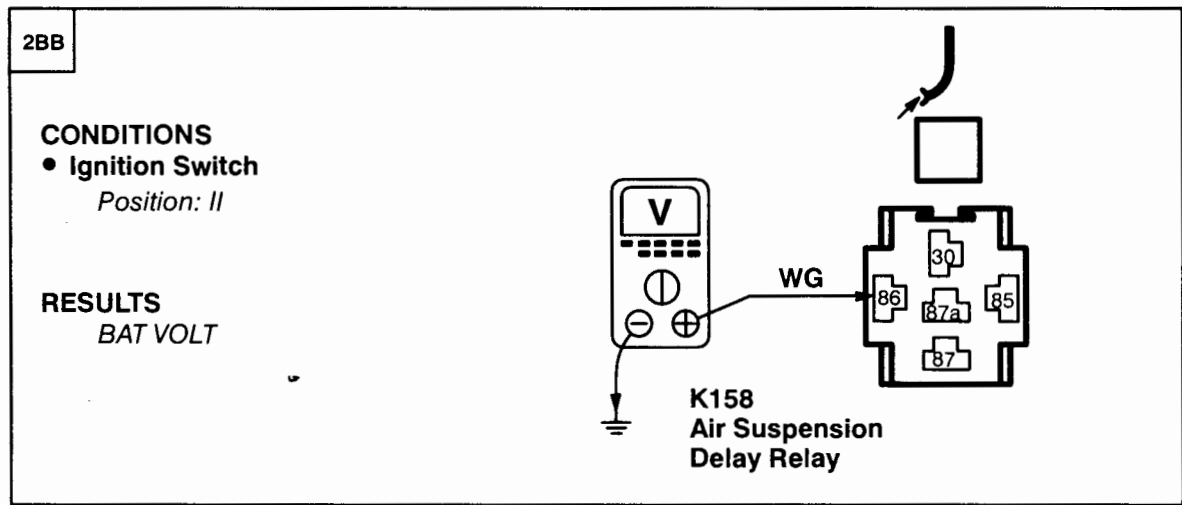
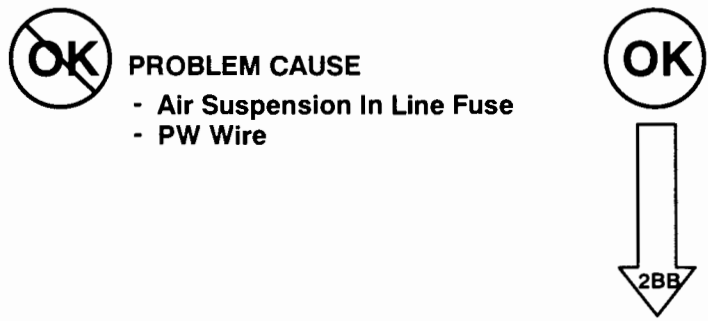
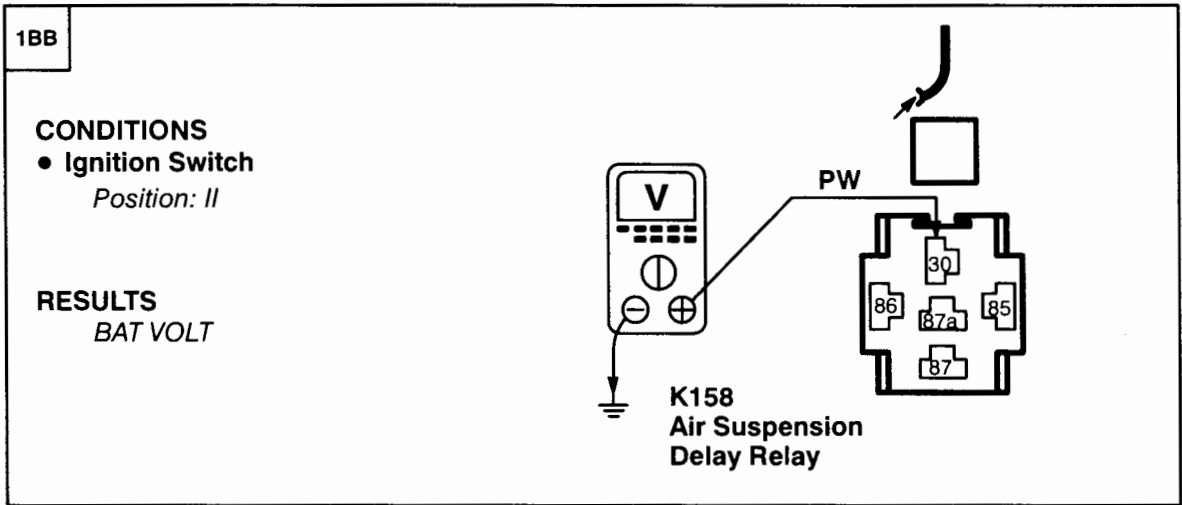
- WS Wire



PROBLEM CAUSE

- Air Suspension ECU

Test BB



S1 ETM

1993 RANGE ROVER

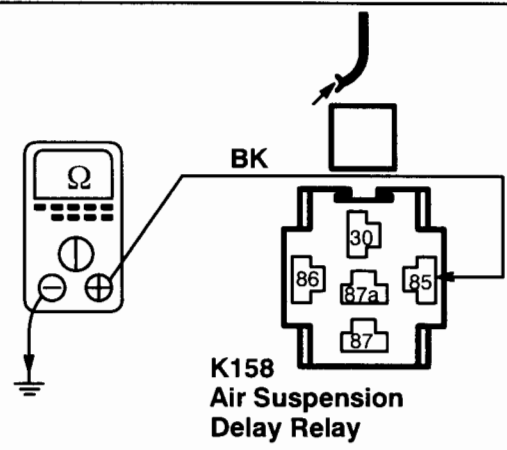
2BB

3BB

CONDITIONS

- Ignition Switch
Position: 0

RESULTS
Less than 1 ohm

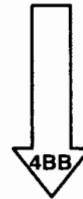


K158
Air Suspension
Delay Relay



PROBLEM CAUSE

- BK Wire
- Air Suspension Diagnostic Connector
- B Wire



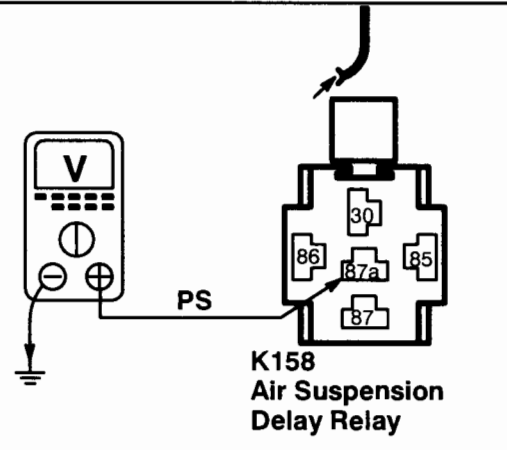
4BB

4BB

CONDITIONS

- Ignition Switch
Position: 0
- All doors
Closed

RESULTS
BAT VOLT



K158
Air Suspension
Delay Relay



PROBLEM CAUSE

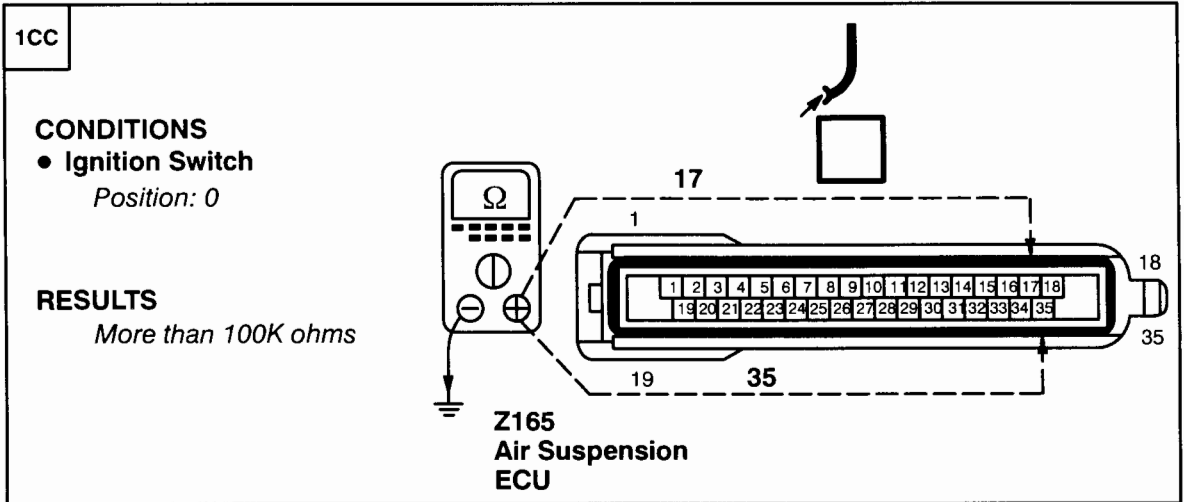
- PS Wire
- Interior Lamps Delay Unit
- Disable Switch
- Door Switches



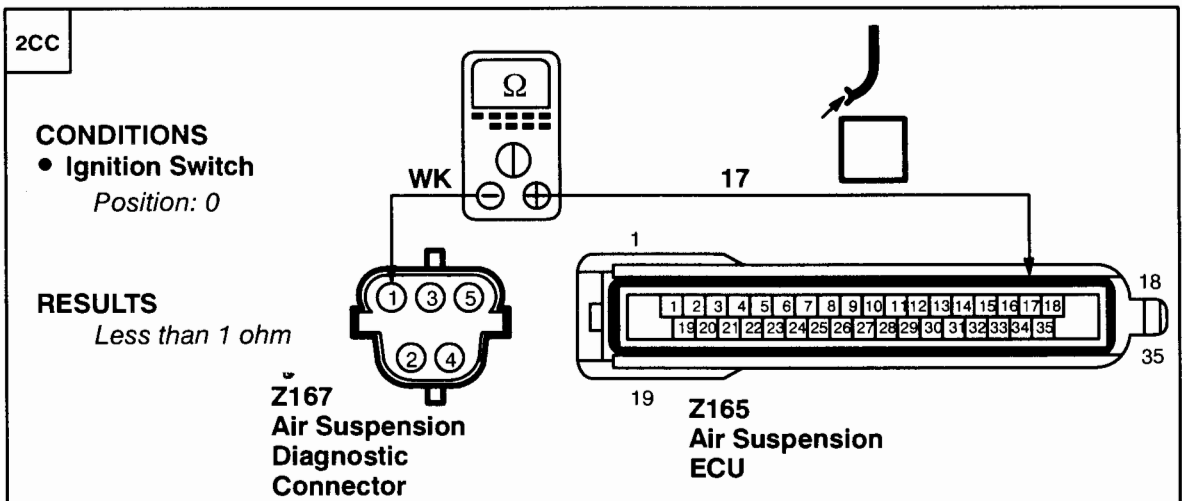
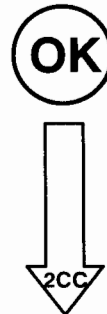
PROBLEM CAUSE

- SR Wire
- Air Suspension Delay Relay

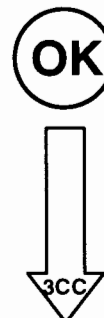
Test CC



~~OK~~ **PROBLEM CAUSE**
 - WK Wire
 - WLG Wire

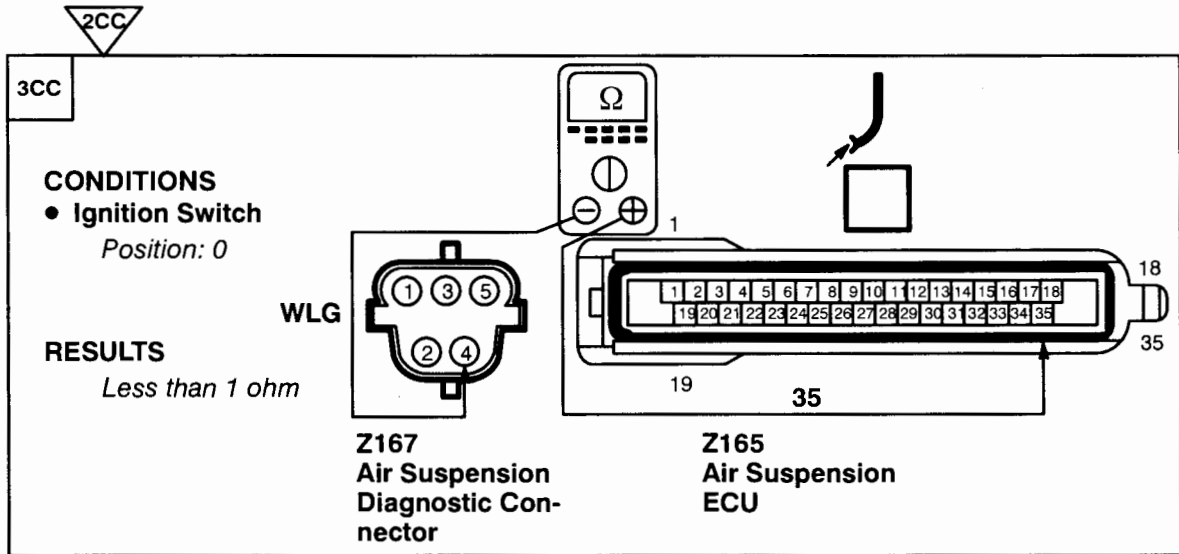


~~OK~~ **PROBLEM CAUSE**
 - WK Wire



S1 ETM

1993 RANGE ROVER

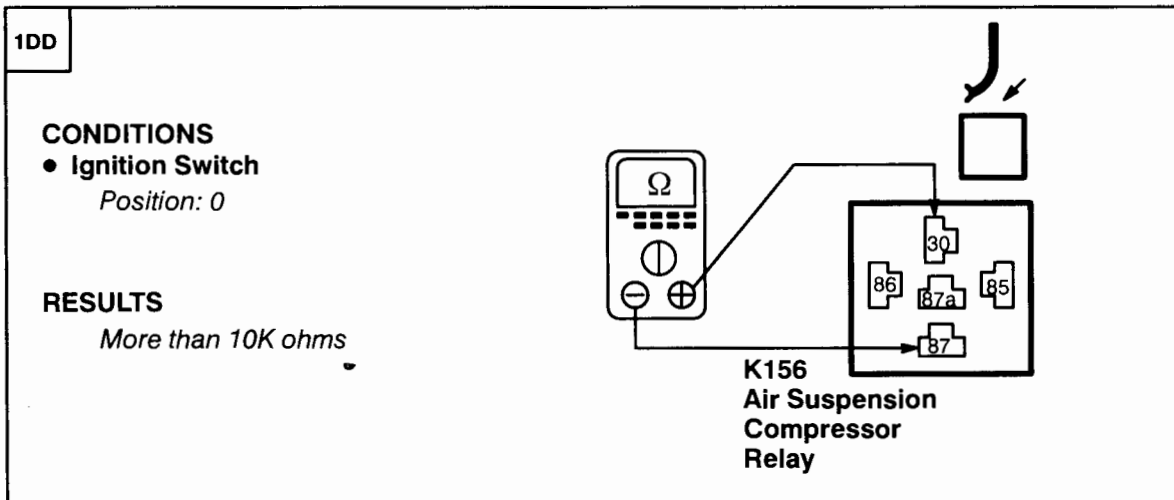


PROBLEM CAUSE
- WLG Wire



PROBLEM CAUSE
- Incorrect test card or
test lead
- Air Suspension ECU

Test DD



PROBLEM CAUSE
- Air Suspension Compressor Relay



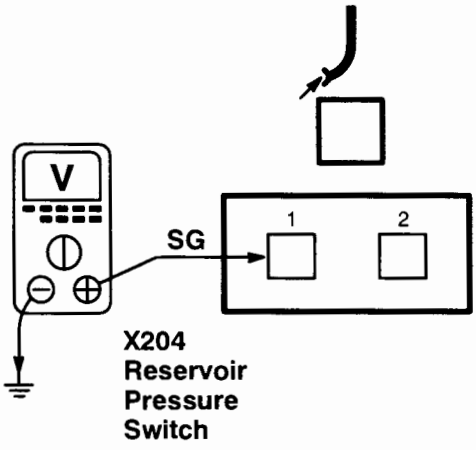
1DD

2DD

CONDITIONS

- Ignition Switch
Position: II

RESULTS
BAT VOLT



X204
Reservoir
Pressure
Switch

~~OK~~ PROBLEM CAUSE

- SG Wire
- Resistor
- SR Wire

OK



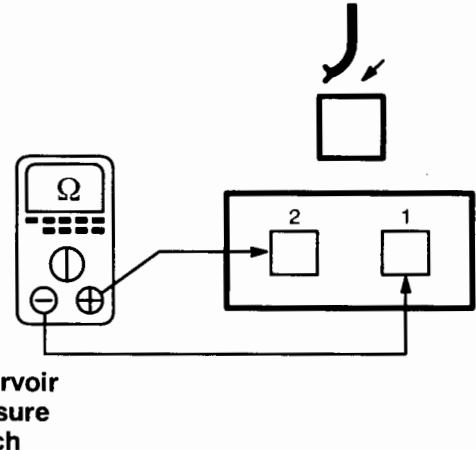
3DD

3DD

CONDITIONS

- Ignition Switch
Position: 0
- Reservoir
Depressurized

RESULTS
More than 100K ohms



X204
Reservoir
Pressure
Switch

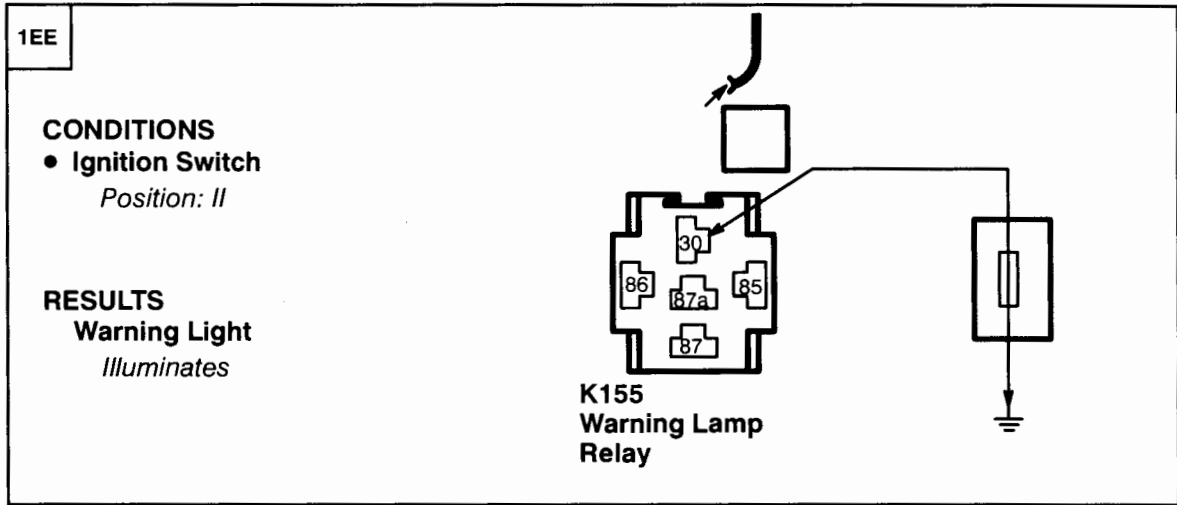
~~OK~~ PROBLEM CAUSE

- Reservoir Pressure Switch

OK PROBLEM CAUSE

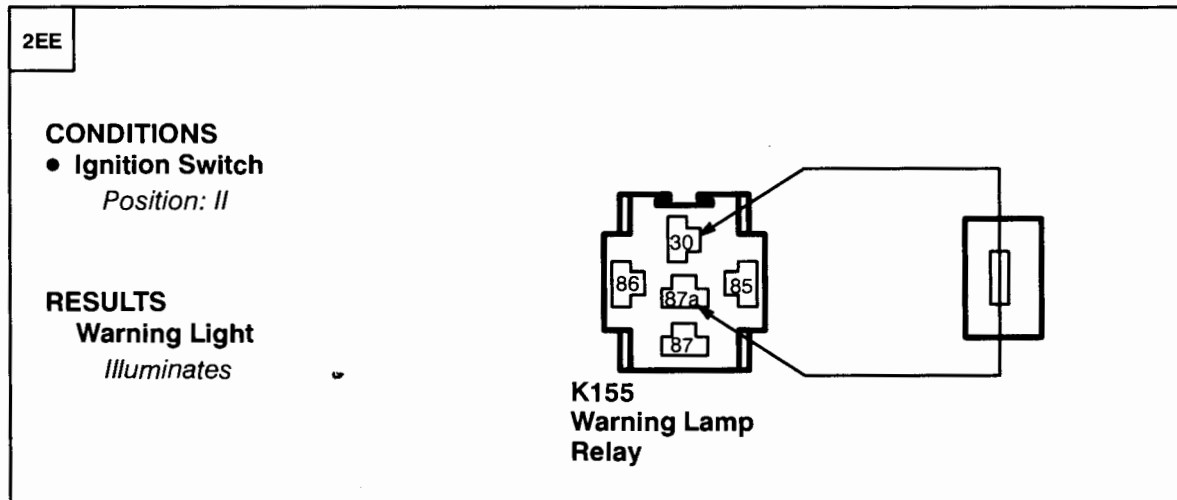
- SU Wire
- Air Suspension ECU

Test EE



PROBLEM CAUSE

- Y Wire
- Fault Diodes in Switch Harness



PROBLEM CAUSE

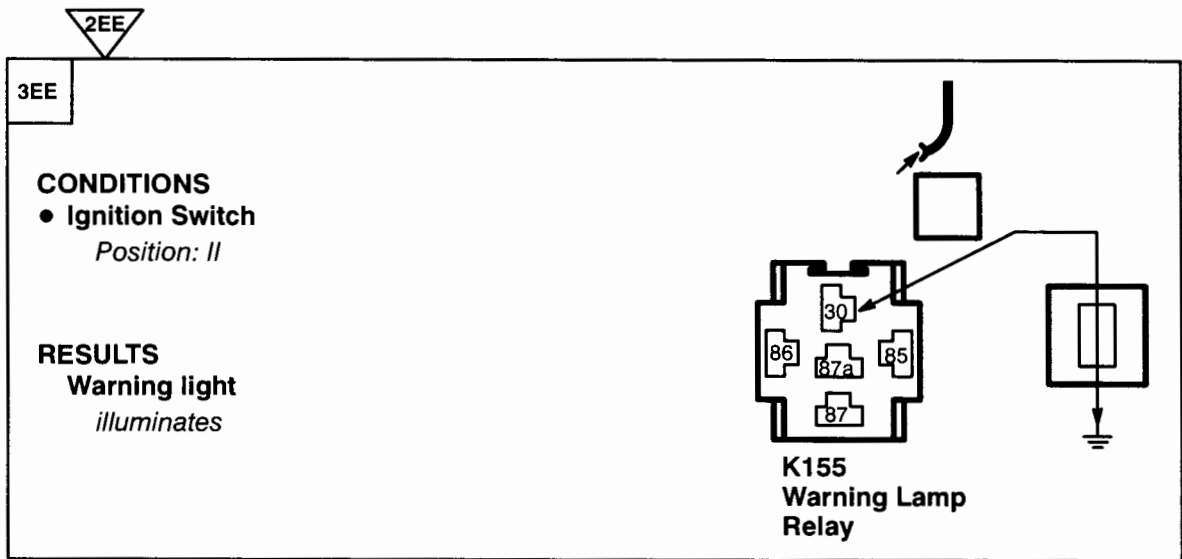
- B Wire



PROBLEM CAUSE

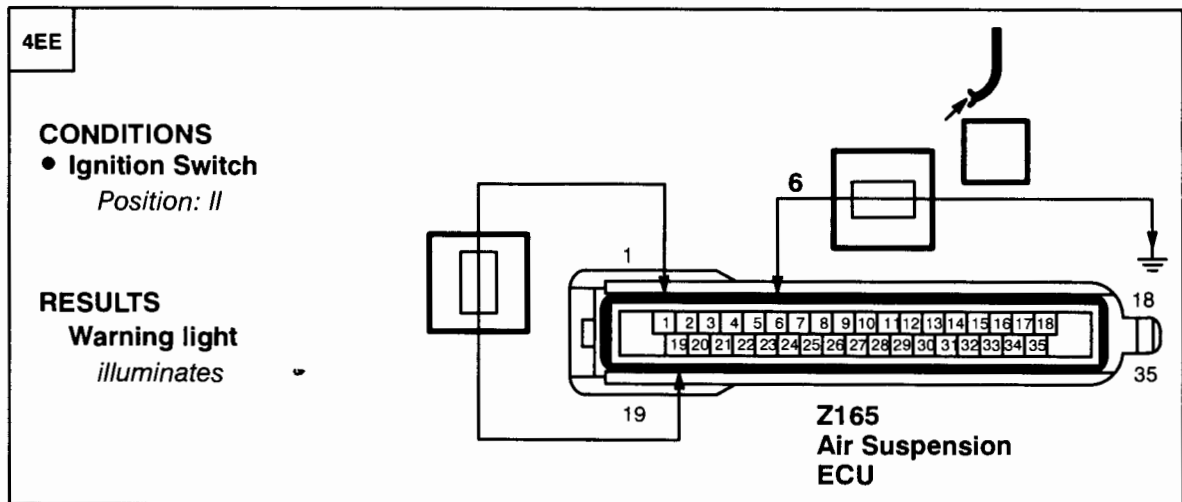
- Warning Lamp Relay





~~OK~~ PROBLEM CAUSE
- Y Wire

OK



~~OK~~ PROBLEM CAUSE
- B Wire
- Warning Lamp Relay

OK PROBLEM CAUSE
- Air Suspension ECU

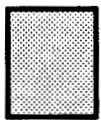
1993 RANGE ROVER

KEY INFORMATION

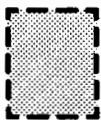
CIRCUIT DIAGRAMS

- Circuit diagrams are arranged so that current flow is from the top of the diagram (current source) to the bottom of the diagram (ground).
- Only those components that work together in the circuit are shown. If only part of a component is used in the circuit, then only that part of the component is shown.

● Remember:



Entire component



Part of a component

TERMINAL NUMBER

DESIGNATION

50	Battery voltage: Ignition Switch in position III
30	Battery voltage: supplied constantly
15	Battery voltage: Ignition Switch in position II or III
R	Battery voltage: Ignition Switch in positions I, II
31	Ground

See Introduction (i) for additional circuit diagram symbols.

DIAGNOSIS

- If the diagram is accompanied by text:
 - Read the Circuit Operation before proceeding with the electrical diagnosis.
 - Read the Troubleshooting Hints before performing the System Diagnosis.
 - Tests follow the System Diagnosis.
 - When performing the System Diagnosis, be certain that all components disconnected in previous steps are reconnected unless otherwise directed.



Component is disconnected.
Backprobe harness connector



Component is connected.
Backprobe harness connector



Component is disconnected.
Probe component



Component is disconnected.
Probe harness connector



Probe in-line connector