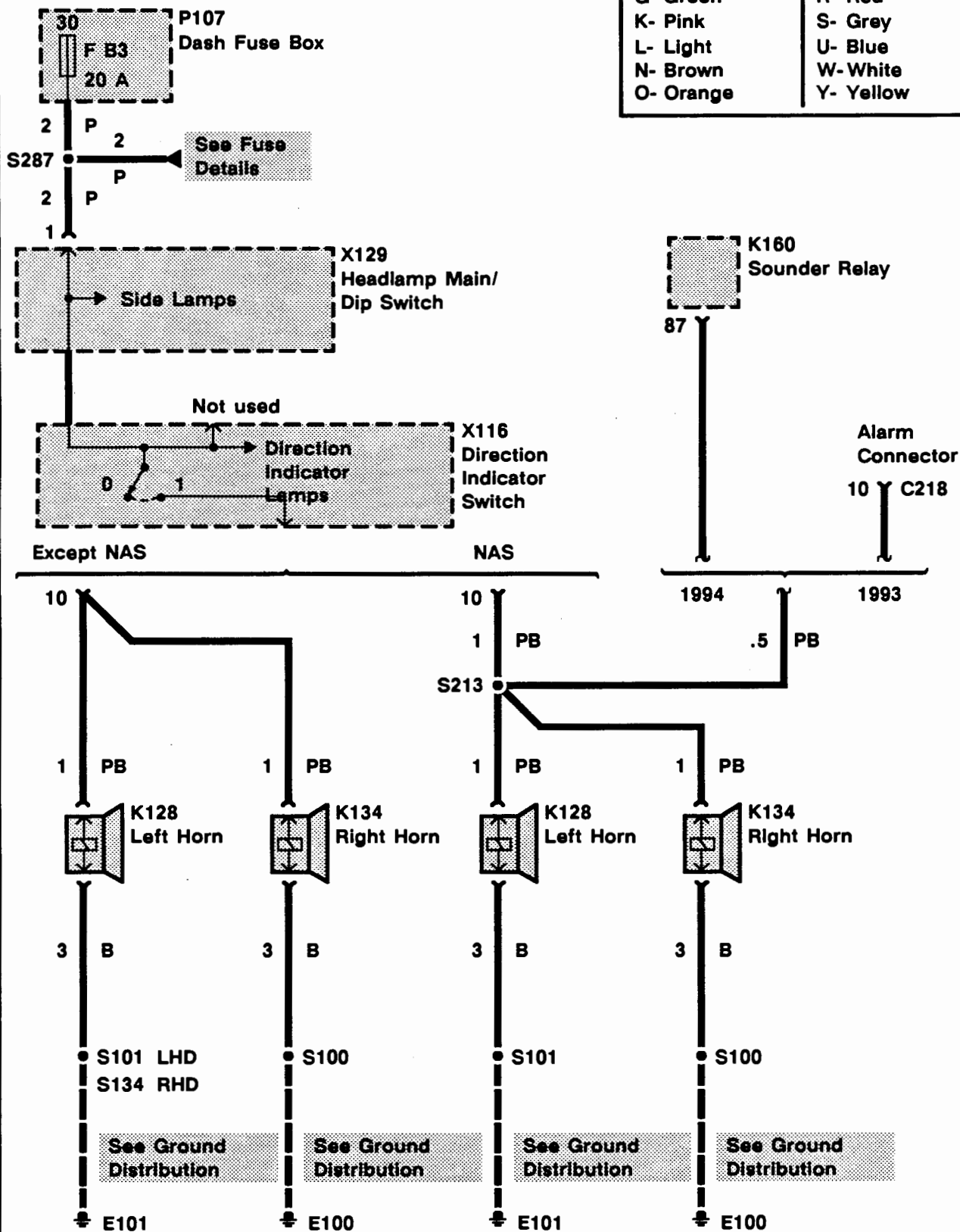


Wire Colour Chart

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



REV: AUG 93

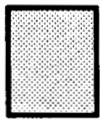
1993 RANGE ROVER

KEY INFORMATION

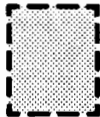
CIRCUIT DIAGRAMS

- 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

CIRCUIT OPERATION

The standard electronically-tuned audio system consists of an AM/FM cassette Radio (Z111), an Antenna Amplifier (Z105) and 4 speakers. In addition to the standard system, some vehicles may be equipped with a 4 channel Radio Amplifier (Z175), a Subwoofer Amplifier (Z176), and a Compact Disc CD Changer (Z114). The Radio is equipped with an anti-theft feature which makes the unit inoperative once battery power is removed. A 5 digit security code must be entered to restore power to the unit.

Battery voltage is provided to the Radio at all times through the PW wire. In addition to the anti-theft feature, this input voltage keeps the preset station memory alive. Whenever battery power to the unit is lost, the anti-theft code must be entered and the preset stations must be reprogrammed.

When the Radio (Z111) and the ignition are turned on, the voltage signal through the LGK wire to the control head 'wakes up' the unit. The Radio (Z111) plays, the VF display comes on and the control unit buttons illuminate. When the park lamps or headlamps are turned on, a voltage signal is sent through the RB wire to dim the VF display and control buttons for night driving.

Radio (Z111) signals are received via a coaxial cable from the side screen and Antenna Amplifier (Z105). The amplifier filters and boosts the signal from the side screen.

Power is available to the CD Changer (Z114) at all times. It is operated from the Radio (Z111) when "CD" is selected by pressing the BAND button. The Radio communicates with the changer via a DIN cable.

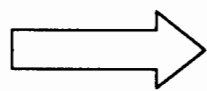
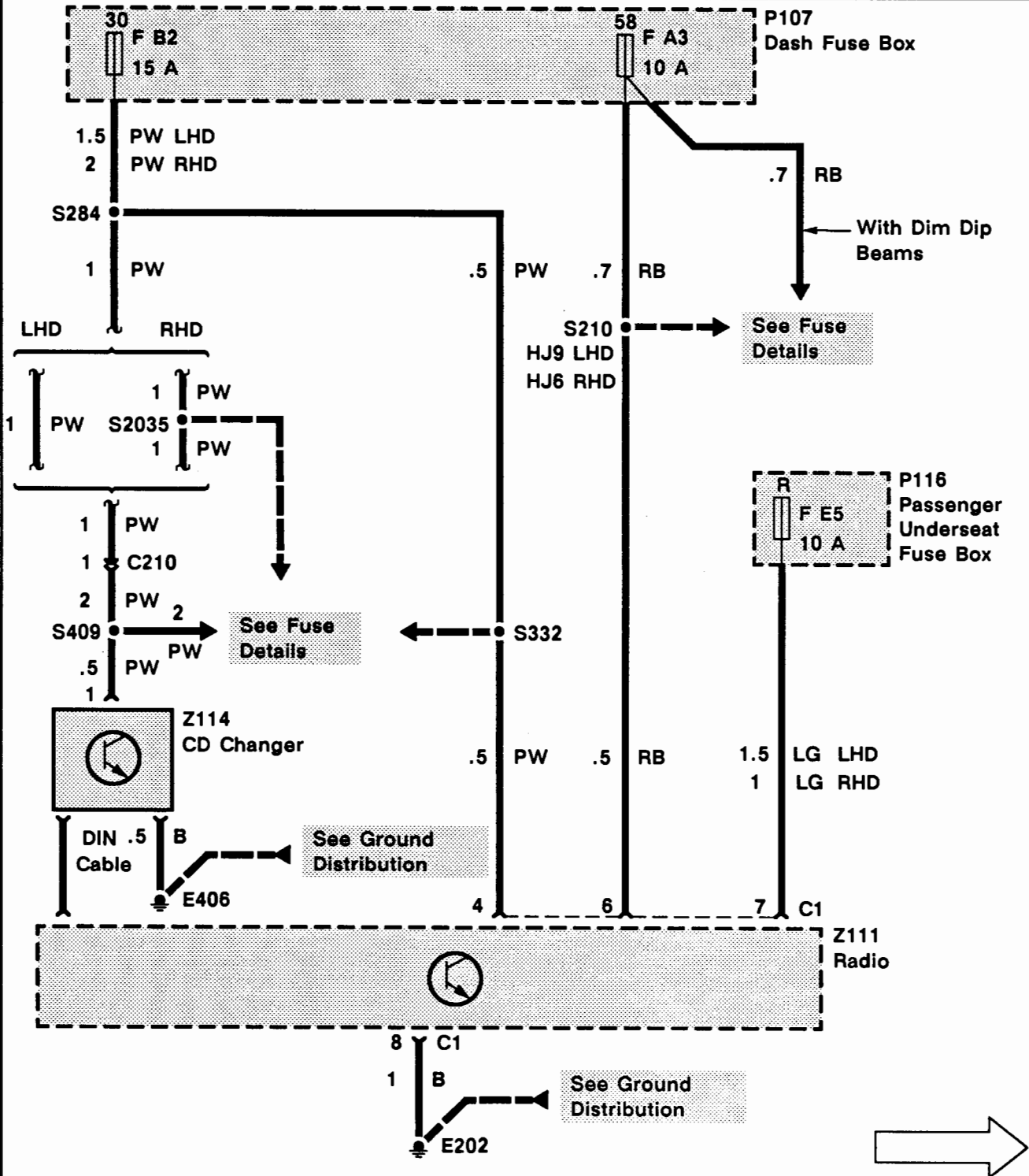
Power is supplied to the Radio (Z111) and Subwoofer Amplifiers (Z176) when the ignition is on. The amplifiers are enabled when the Radio is turned on and applies voltage to the amplifiers through the PY wires

E6 ETM

1993 RANGE ROVER

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

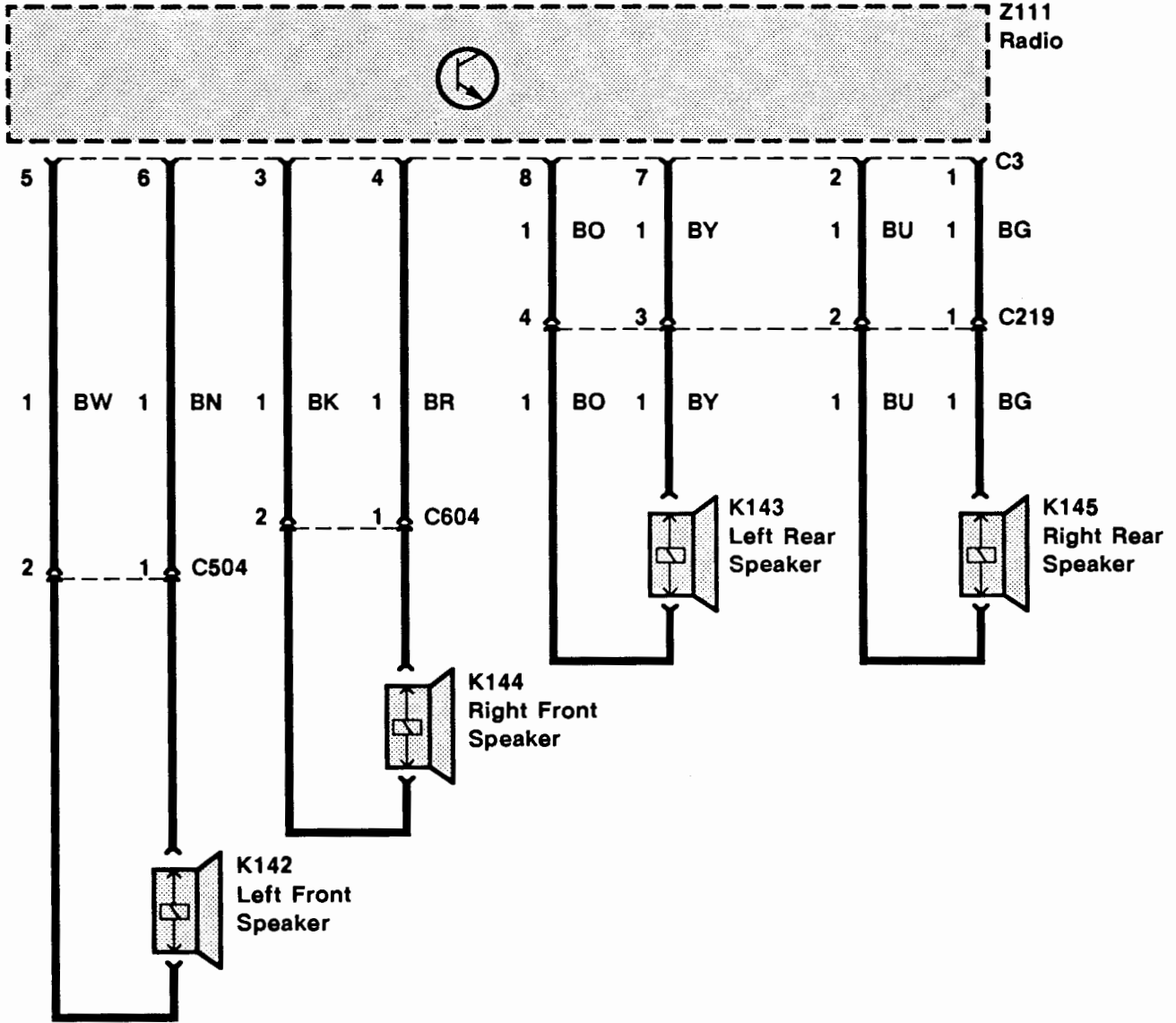


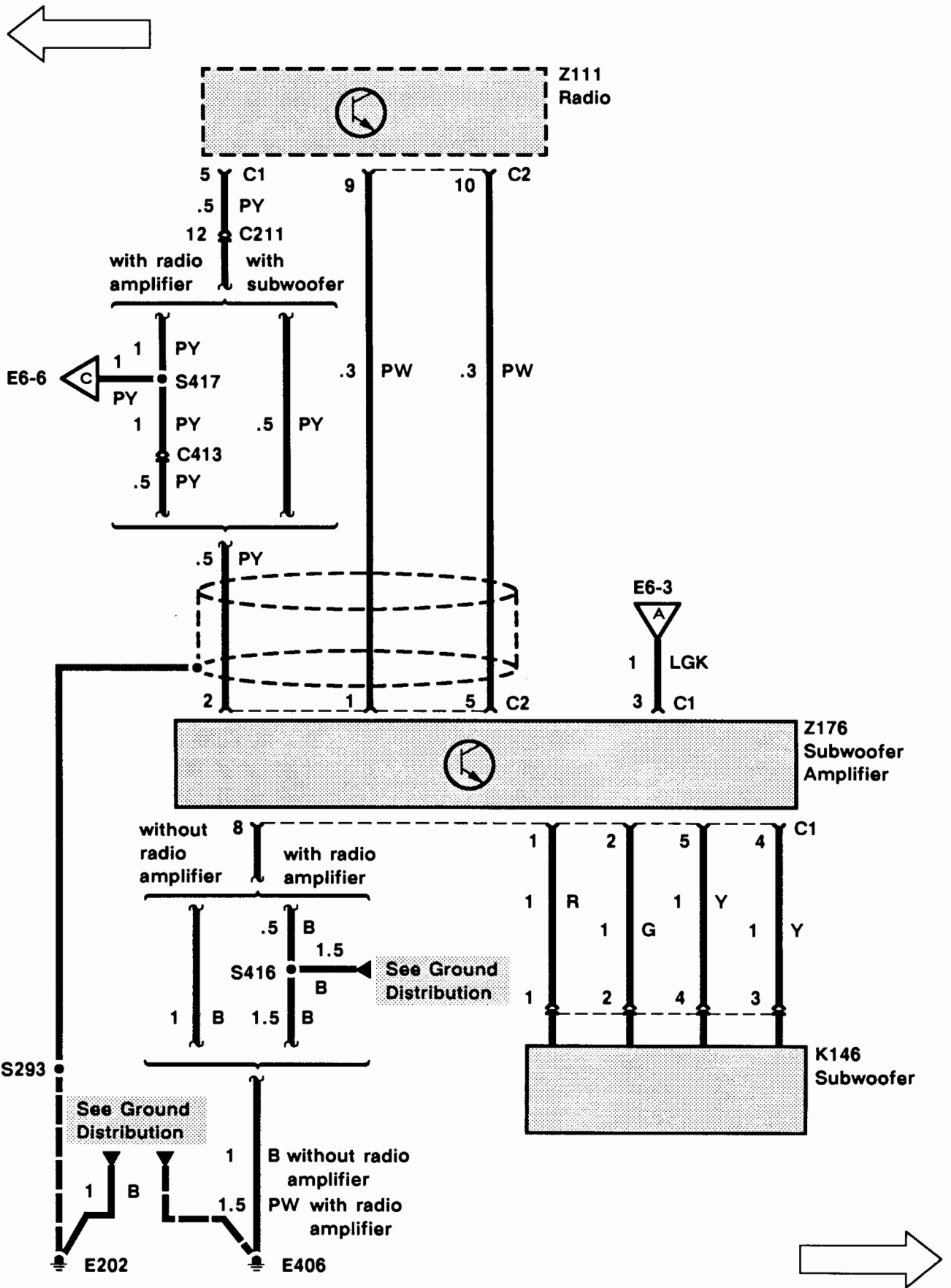
E6 ETM

1993 RANGE ROVER

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





TROUBLESHOOTING HINTS

1. Check fuses F A3, F B2, F E5, and F E6.
2. Check that Radio (Z111) connectors and coaxial cable are tight and properly connected.
3. For proper Radio (Z111) noise diagnosis, take the vehicle outside where signals are strong. Close the hood and keep away from metal buildings or other sources of Radio interference.
4. If Radio (Z111) noise is excessive when an accessory is on, install a Radio noise suppression capacitor to the power lead of that accessory.
5. If Radio (Z111) noise is excessive at all times, check antenna wiring. If OK, check spark plugs, spark plug wiring and wiring close to the ignition system which could transmit noise to the Radio (Z111) wiring.
6. If the Radio (Z111) is inoperative and 'code' is being shown on the display, follow the instructions below.

Security Code Instructions

1. Obtain 5-digit security code from vehicle owner or manufacturer.
2. Enter the code number using the Radio (Z111) push-button selectors.

NOTE: If the correct code is not entered in 3 successive attempts, the Radio (Z111) will not accept another entry until the Radio has been left on for 1 hour with the ignition on.

NOTE: When entering the code, be sure to complete the sequence numbering of that 5-digit code even if you made a mistake. For example, if the correct code number sequence is 43215 and you mistakenly enter 42 instead of 43, continue the code number sequence of 215 to complete that entry. A 'beep' will sound, 'code' will still be displayed and the Radio will not operate. Re-enter the correct code 43215 and the Radio will operate.

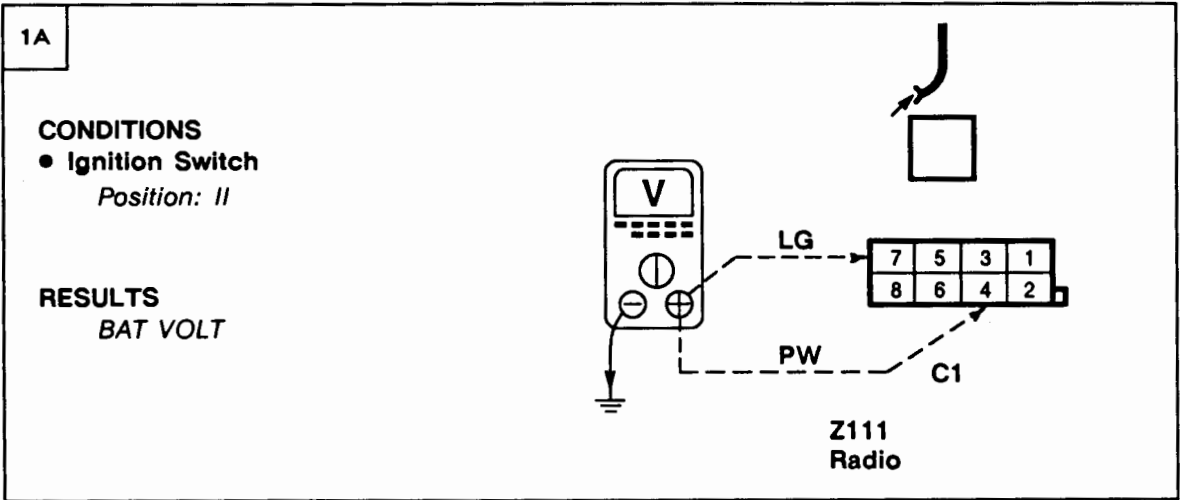
NOTE: If an audible 'beep' is heard while entering the code, STOP immediately. Begin entering the code again, starting with the first number of the 5-digit code.

NOTE: If a push-button is touched accidentally when the ignition is off, a warning tone will sound. Turn the ignition on and the tone will stop.

SYSTEM DIAGNOSIS

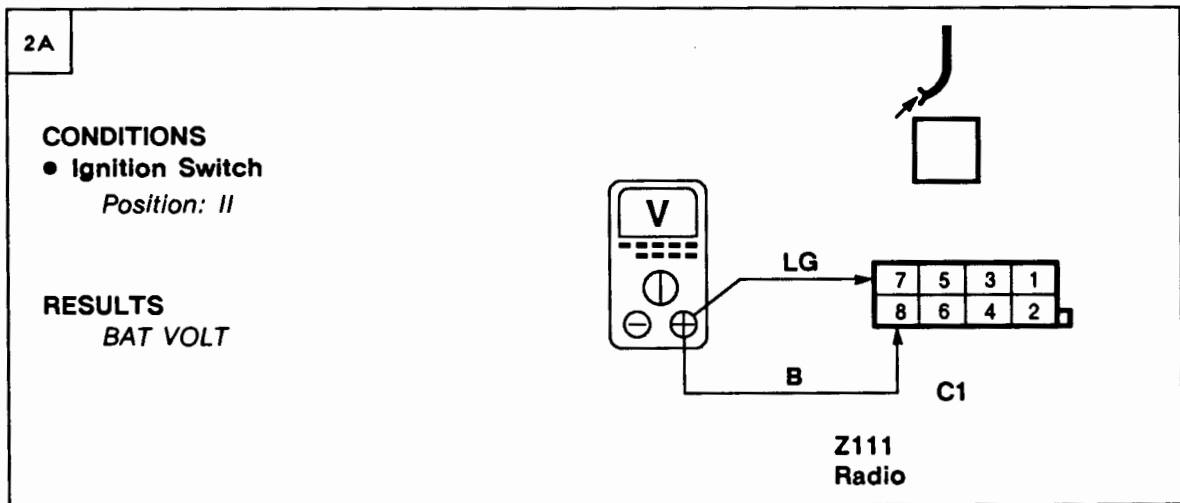
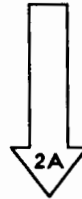
1. If Radio (Z111) does not operate at all on a vehicle not equipped with a radio amplifier, do Test A.
2. If Radio (Z111) does not operate at all and vehicle is equipped with a Radio Amplifier (Z175), do Test B.
3. If Radio scans past all frequencies when in seek mode and hiss is present over most stations, do Test C.
4. If VF display does not dim when headlamps or park lamps are turned on, do Test D.
5. If one or more speakers do not operate on a vehicle not equipped with a Radio Amplifier (Z175), do Test E.
6. If one or more speakers do not operate and vehicle is equipped with a Radio Amplifier (Z175), do Test F.
7. If the Subwoofer (Z170) does not operate, do Test H.
8. If only the CD Changer (Z114) does not operate, do Test G.

Test A



PROBLEM CAUSE

- PW Wire
- LG Wire
- F B2 Fuse
- F E5 Fuse



PROBLEM CAUSE

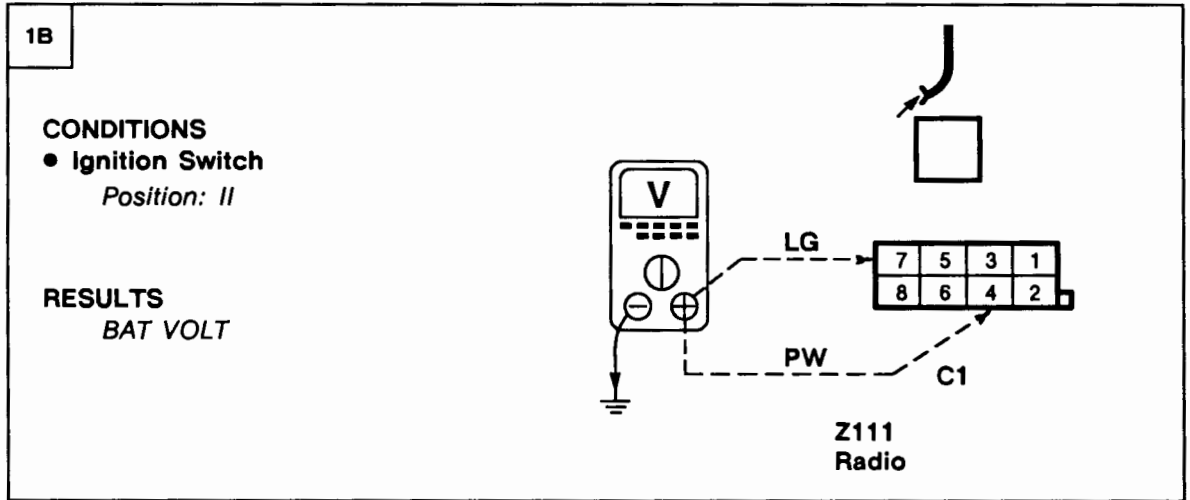
- B Wire



PROBLEM CAUSE

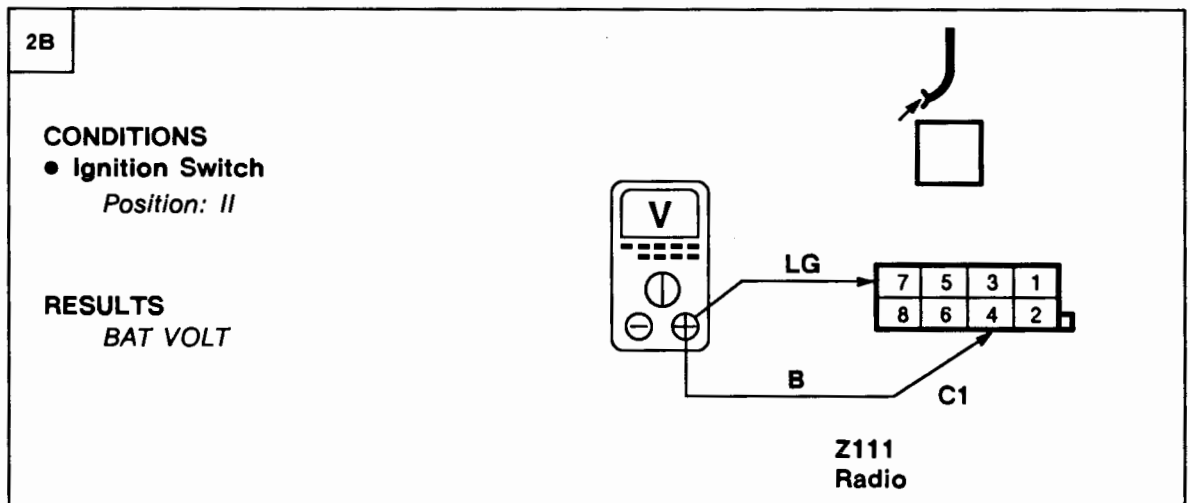
- Radio

Test B



PROBLEM CAUSE

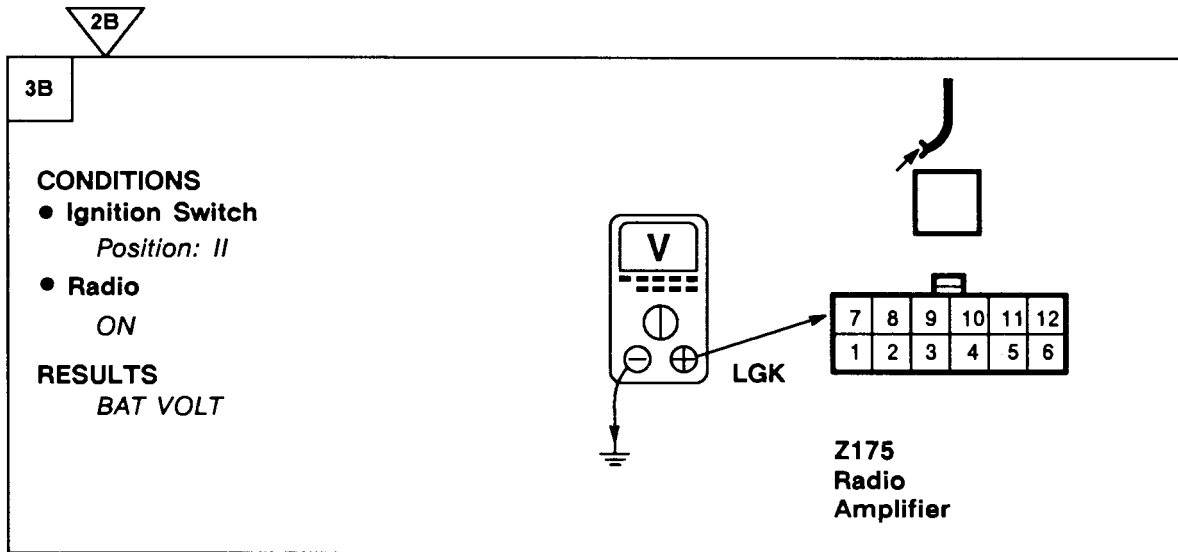
- PW Wire
- LG Wire
- F B2 Fuse
- F E5 Fuse



PROBLEM CAUSE

- B Wire

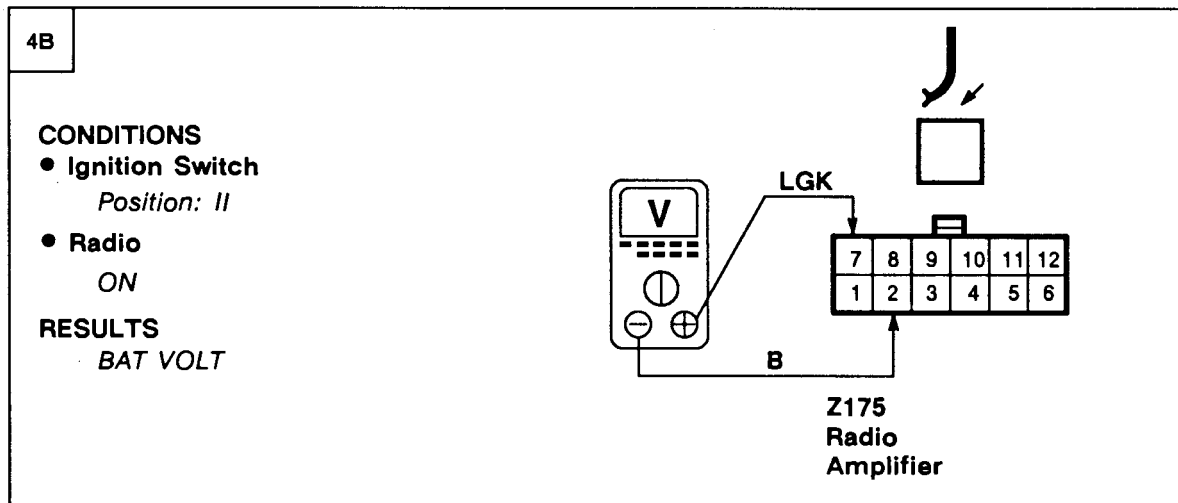




~~OK~~ **PROBLEM CAUSE**

- LGK Wire
- F E6 Fuse

OK

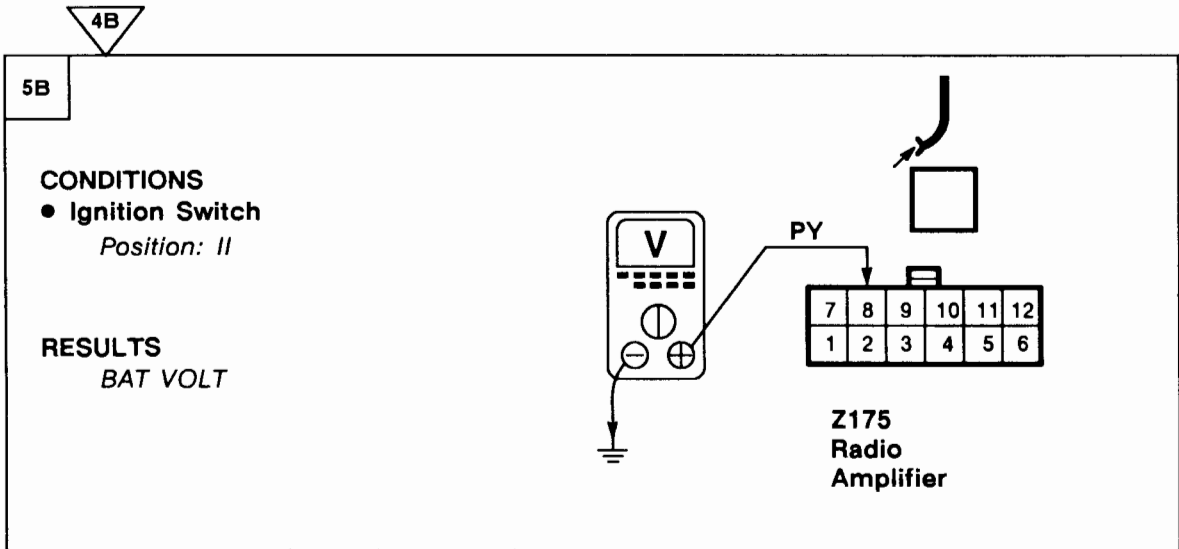


~~OK~~ **PROBLEM CAUSE**

- B Wire

OK



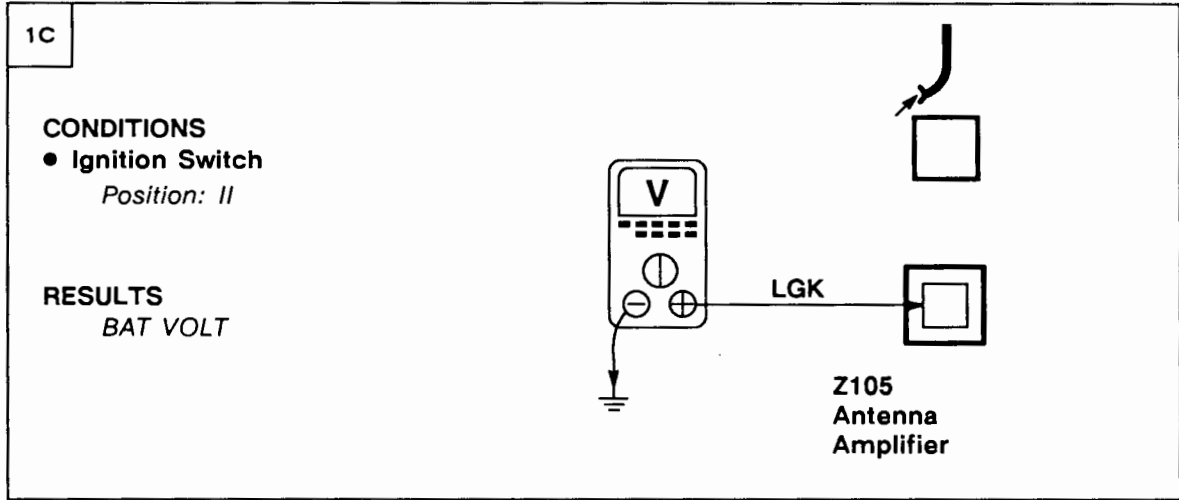


PROBLEM CAUSE
 - PY Wire
 - Radio



PROBLEM CAUSE
 Radio Amplifier

Test C

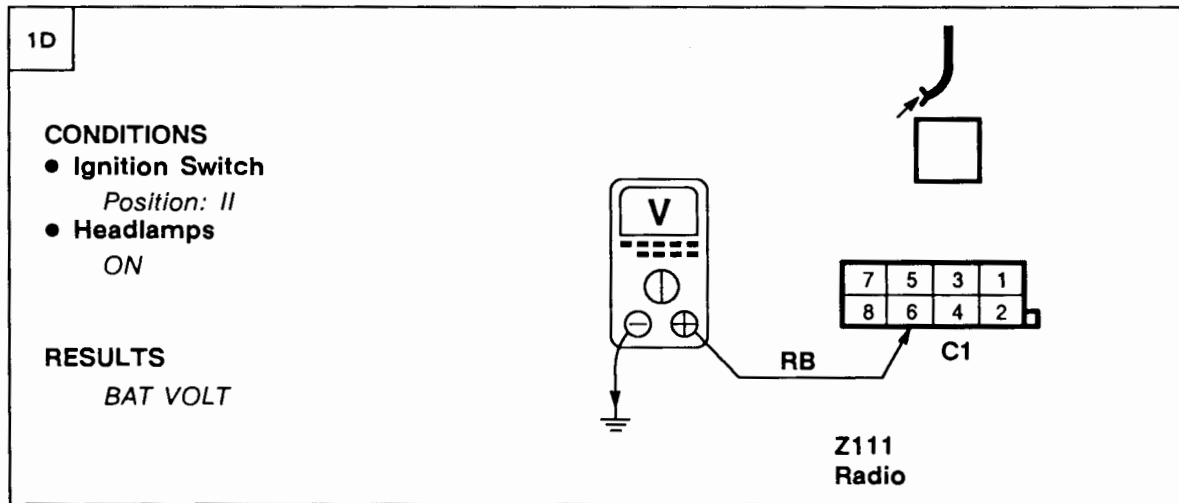


PROBLEM CAUSE
- LGK Wire



PROBLEM CAUSE
- Coaxial Cable
- Radio
- Antenna Amplifier

Test D



PROBLEM CAUSE
- RB Wire



- Radio

Test E

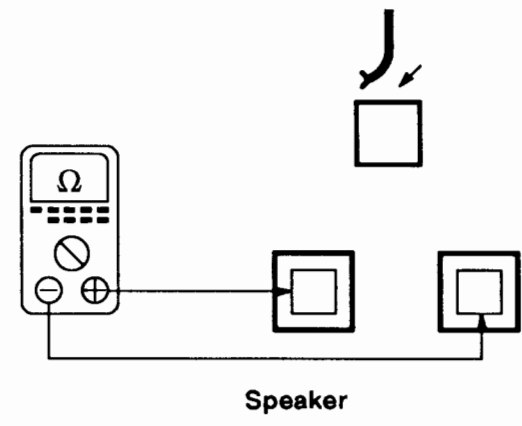
1E

CONDITIONS

- Connect for less than 1 second

RESULTS

Speaker 'pops'



Speaker

OK PROBLEM CAUSE
- Speaker

OK PROBLEM CAUSE
- Speaker wiring
- Radio

Test F

1F

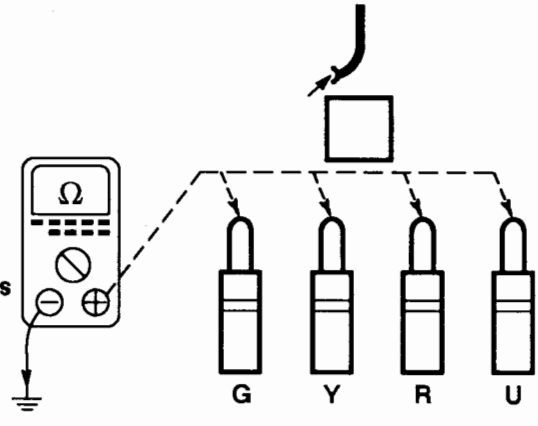
CONDITIONS

- Ignition Switch
Position: 0

RESULTS

More than 10K ohms

X214
Radio
Amplifier
Connectors



G Y R U

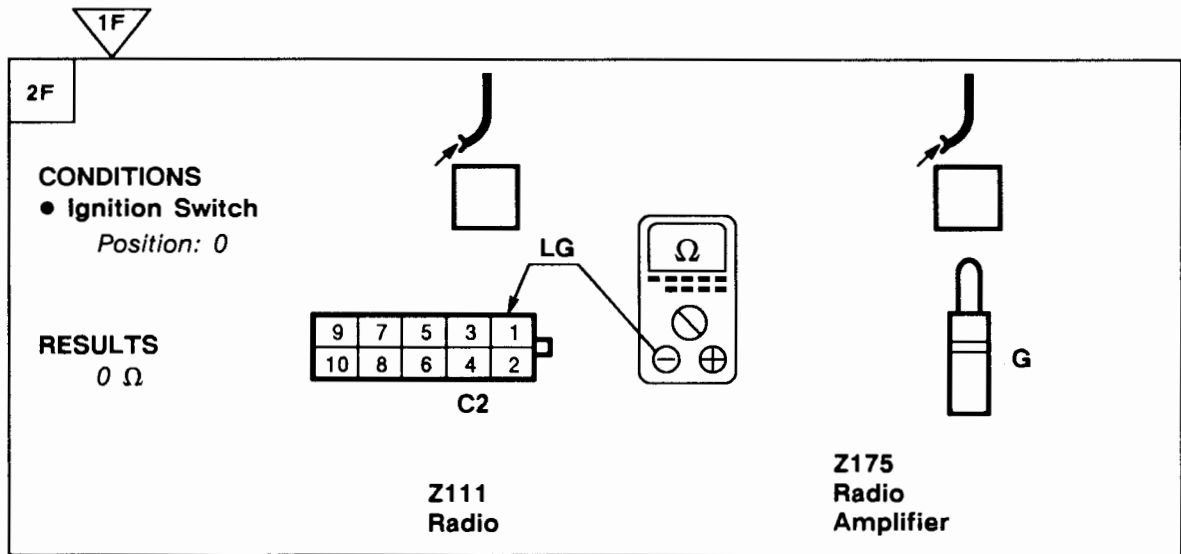
OK PROBLEM CAUSE
- wire (short)

OK



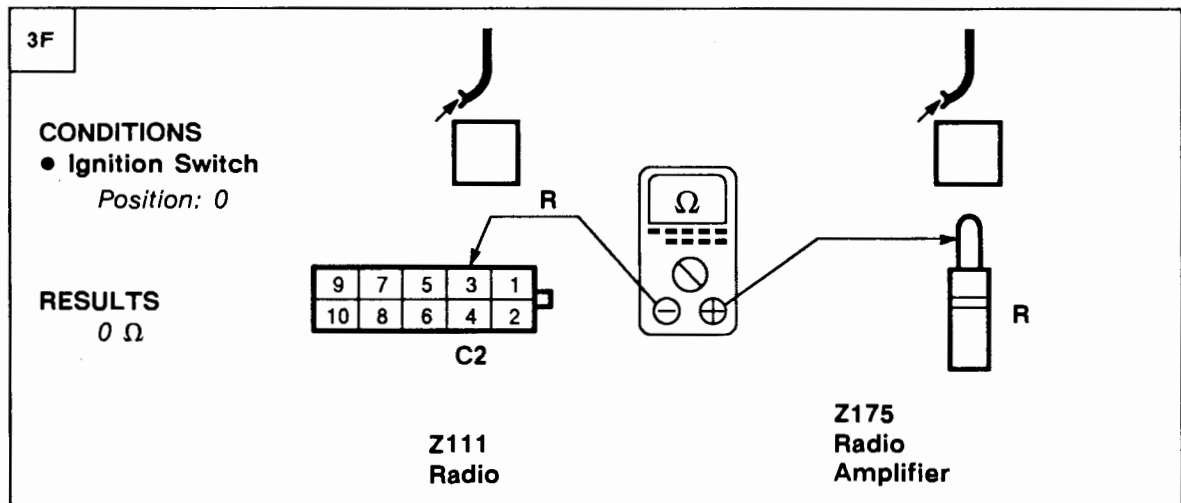
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~~OK~~ PROBLEM CAUSE
 - LG Wire

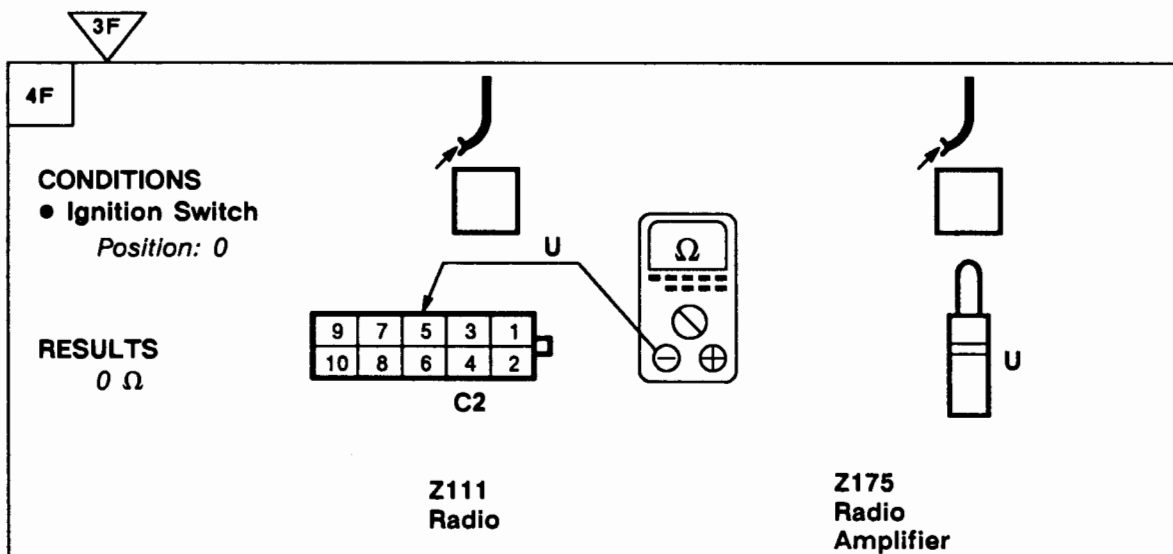
OK



~~OK~~ PROBLEM CAUSE
 - R Wire

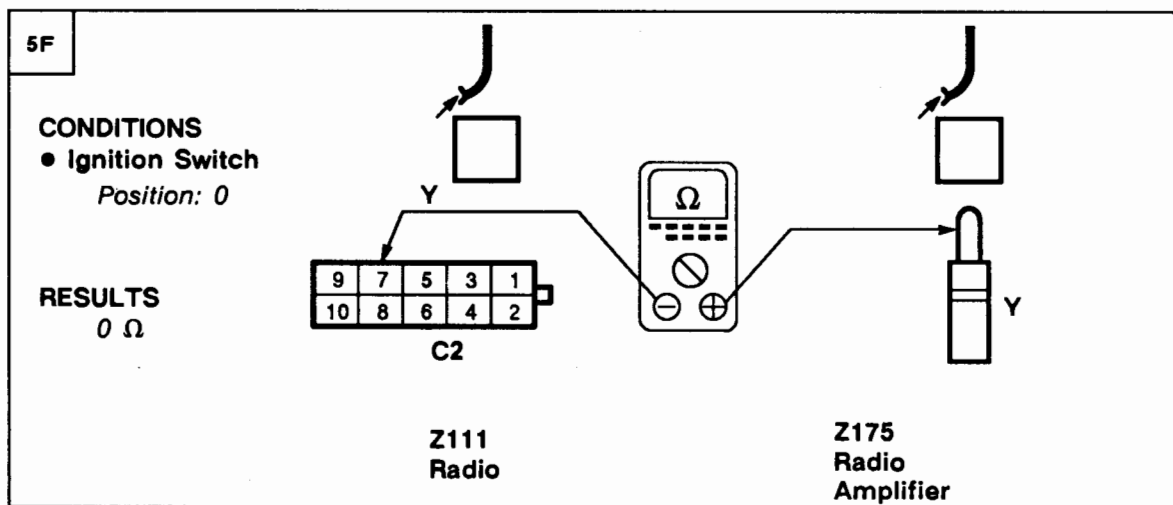
OK





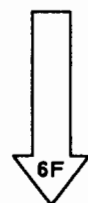
~~OK~~ PROBLEM CAUSE
 - U Wire

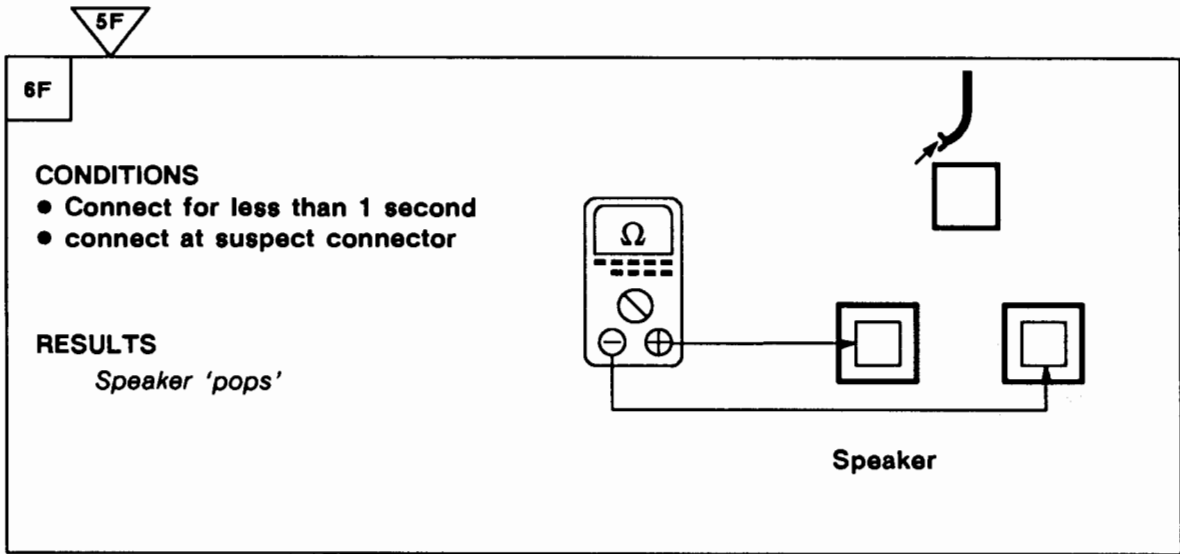
OK



~~OK~~ PROBLEM CAUSE
 - Y Wire

OK

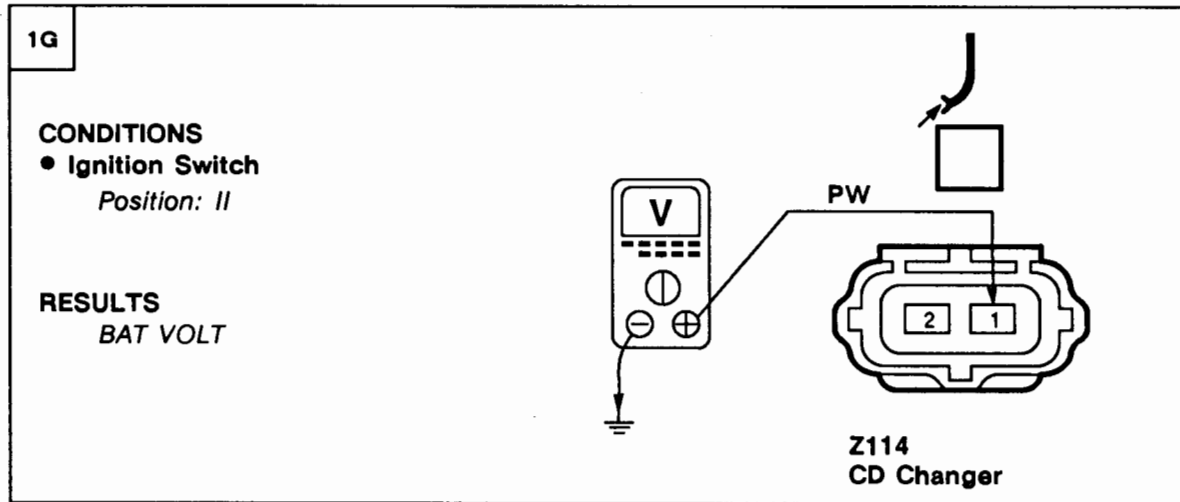




~~OK~~ PROBLEM CAUSE
- Speaker

OK PROBLEM CAUSE
- Speaker wiring
- Amplifier

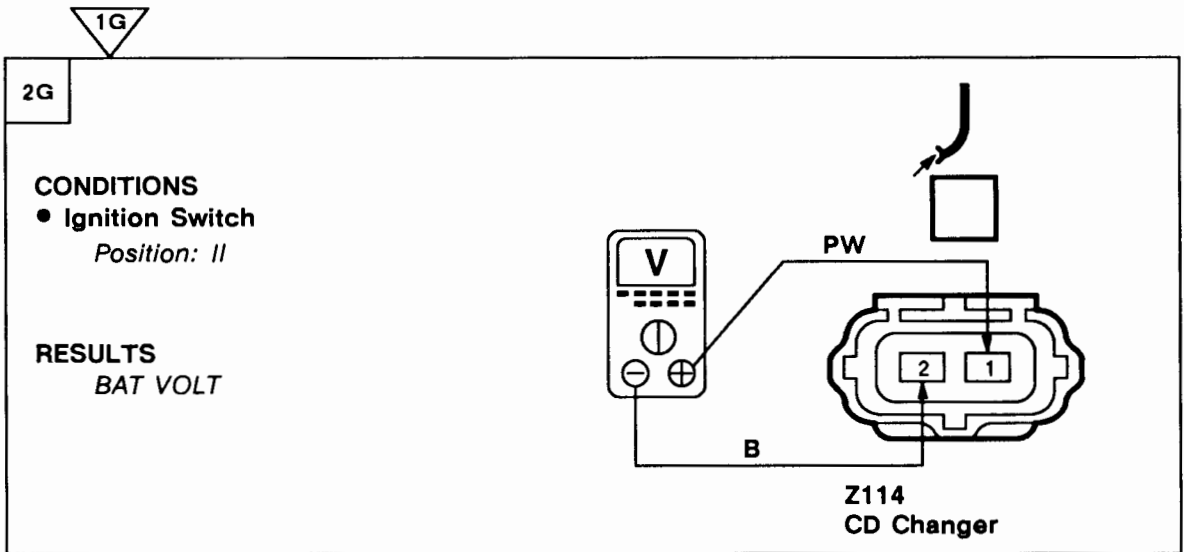
Test G



~~OK~~ PROBLEM CAUSE
- PW Wire

OK

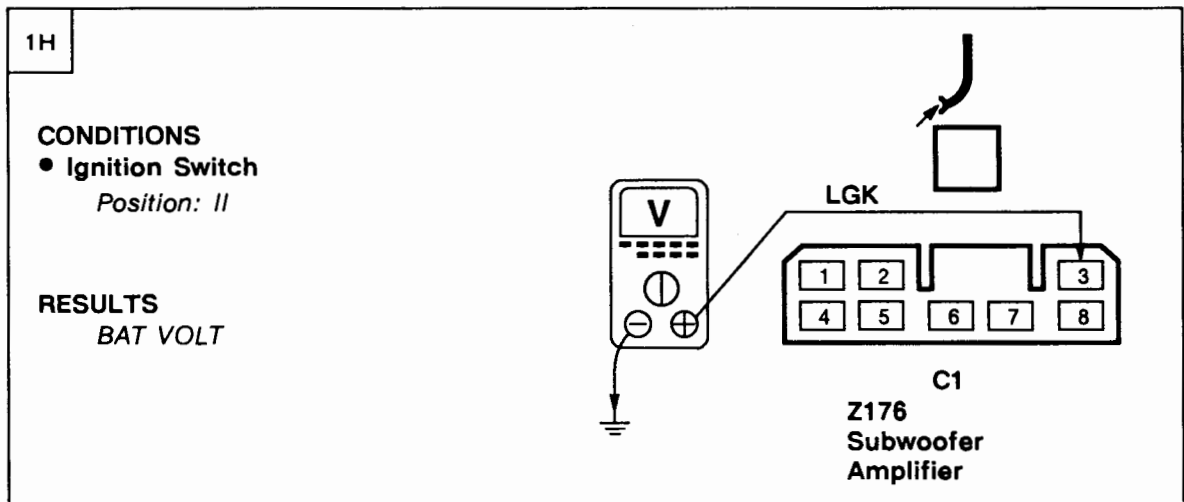
↓
2G



OK PROBLEM CAUSE
- B Wire

OK PROBLEM CAUSE
- Cable
- CD Changer
- Radio

Test H



OK PROBLEM CAUSE
- LGK Wire

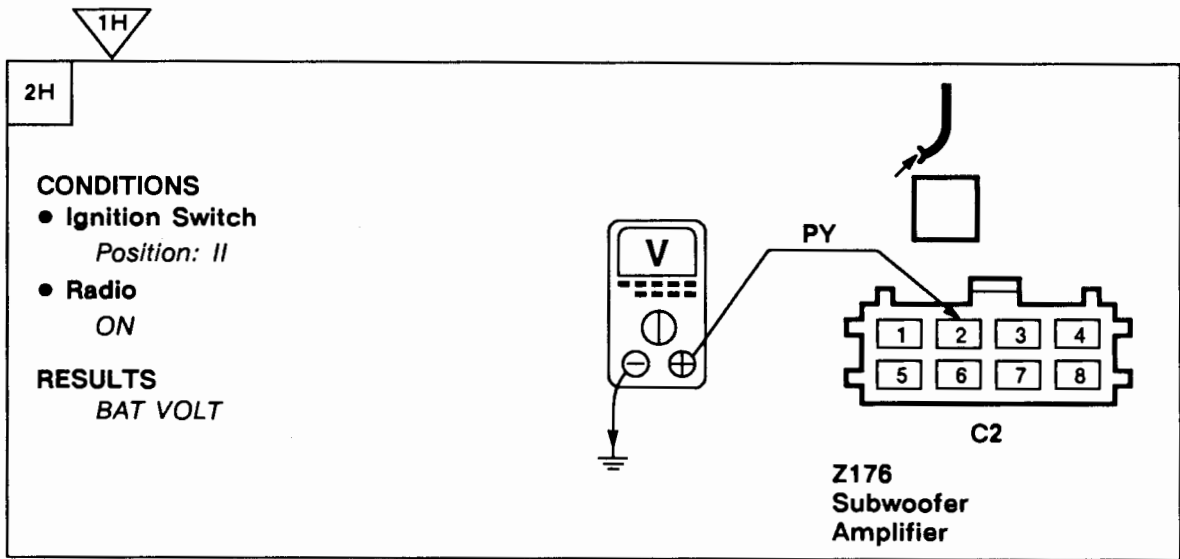
OK

↓

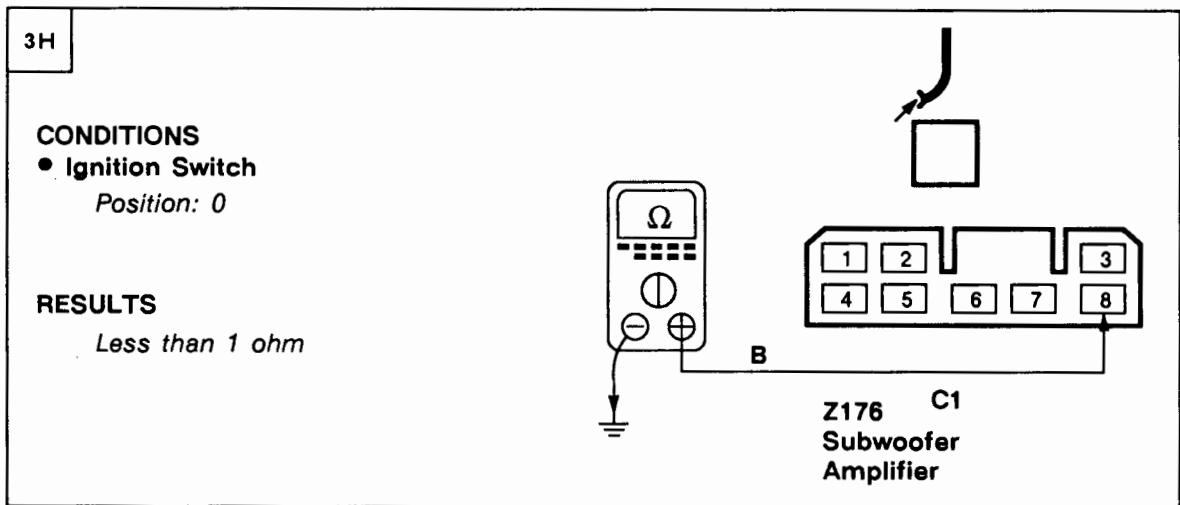
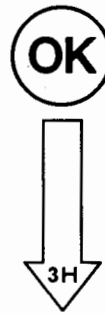
2H

E6 ETM

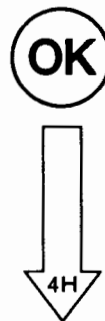
1993 RANGE ROVER



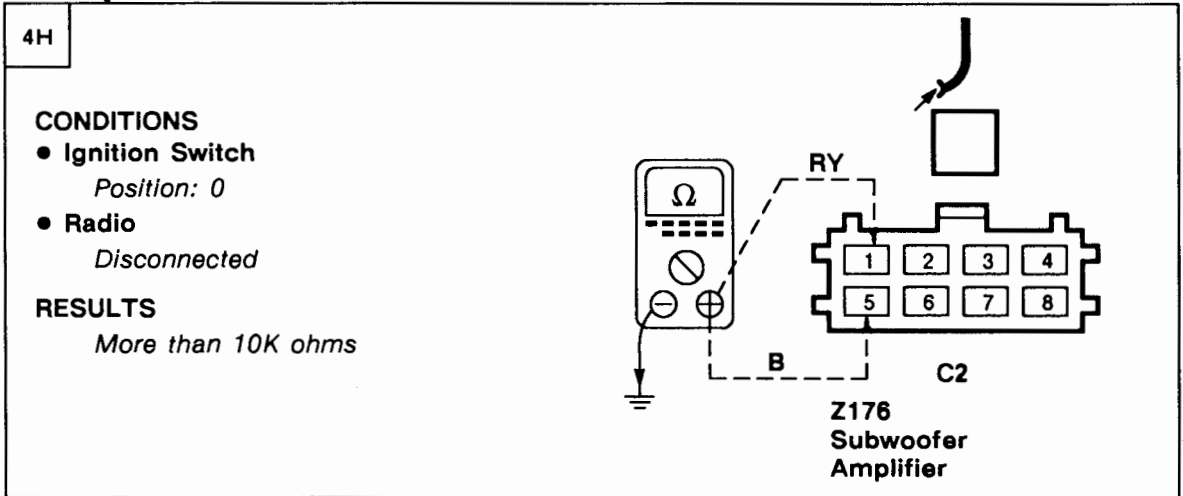
~~OK~~ PROBLEM CAUSE
- PY Wire



~~OK~~ PROBLEM CAUSE
- B Wire

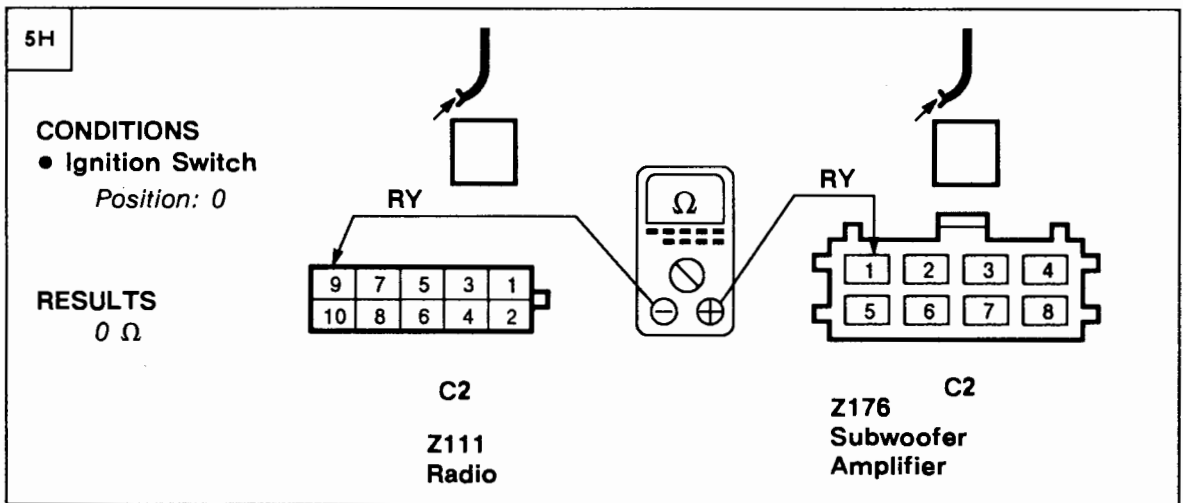


3H



PROBLEM CAUSE

- RY Wire
- B Wire



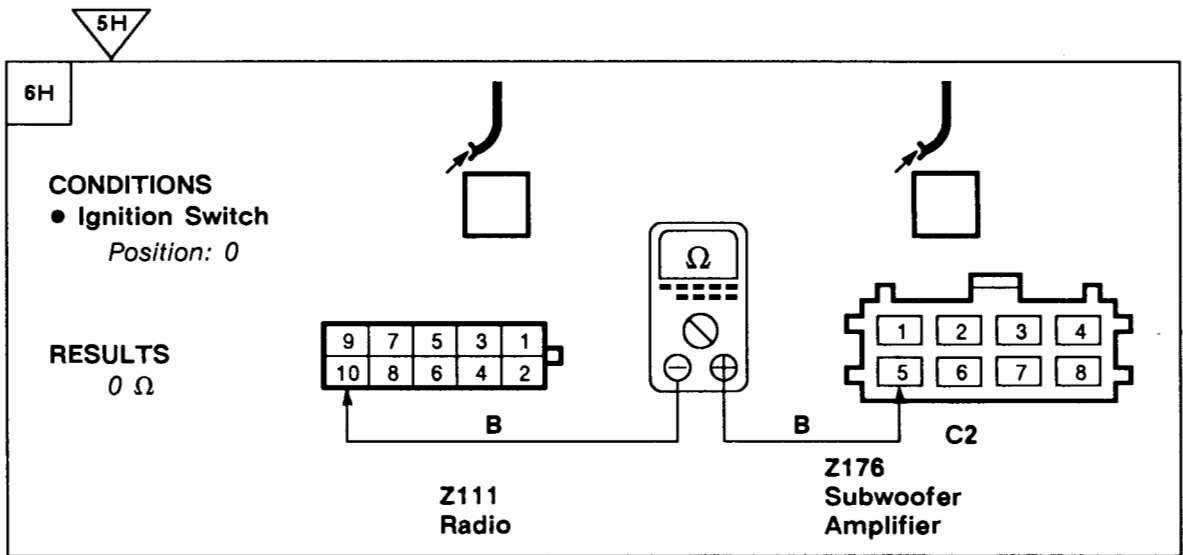
PROBLEM CAUSE

- RY Wire



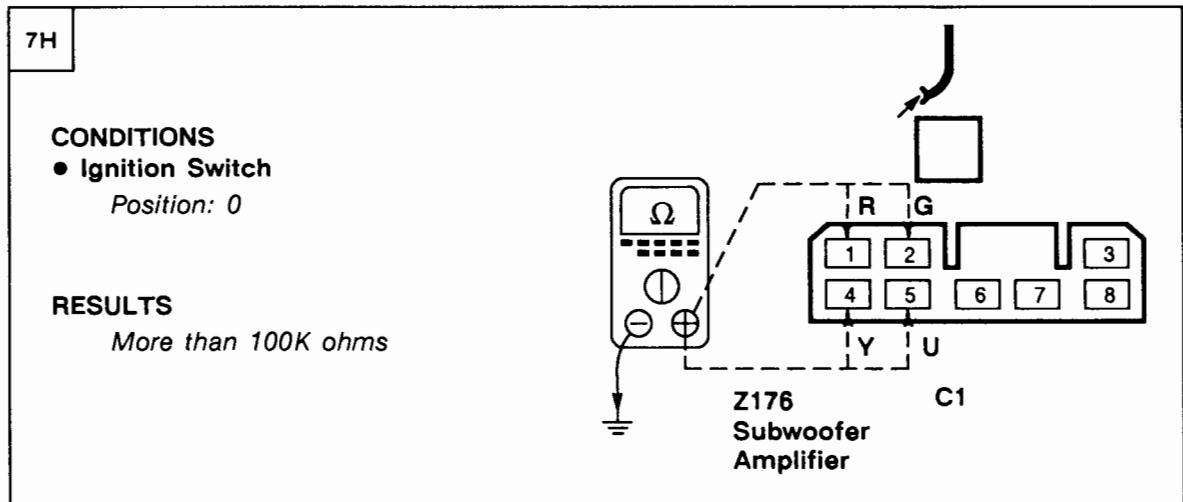
E6 ETM

1993 RANGE ROVER



~~OK~~ PROBLEM CAUSE
- B Wire

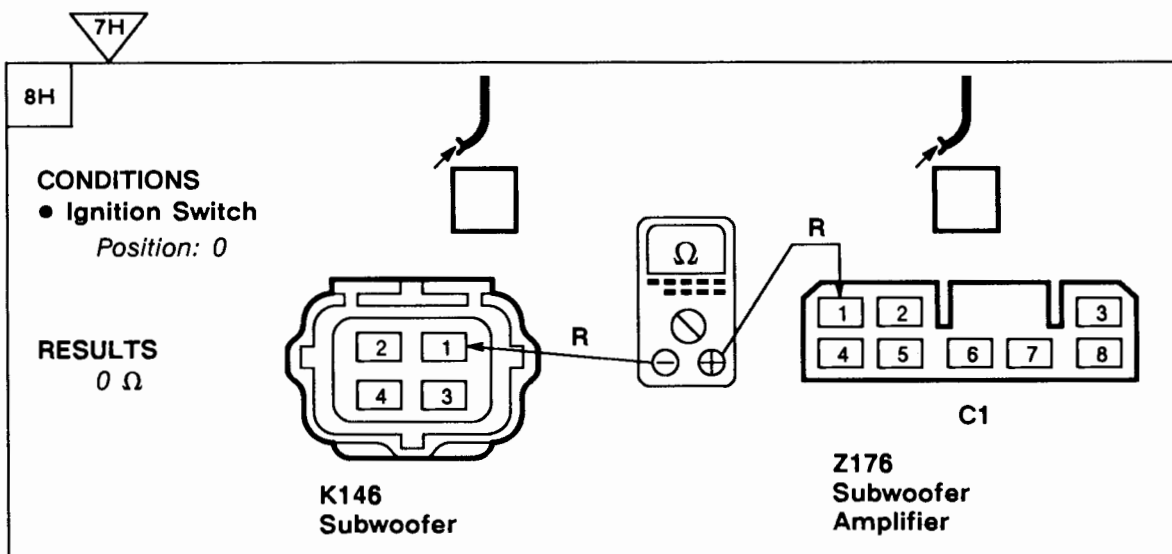
OK



~~OK~~ PROBLEM CAUSE
- wire (short)
- Subwoofer

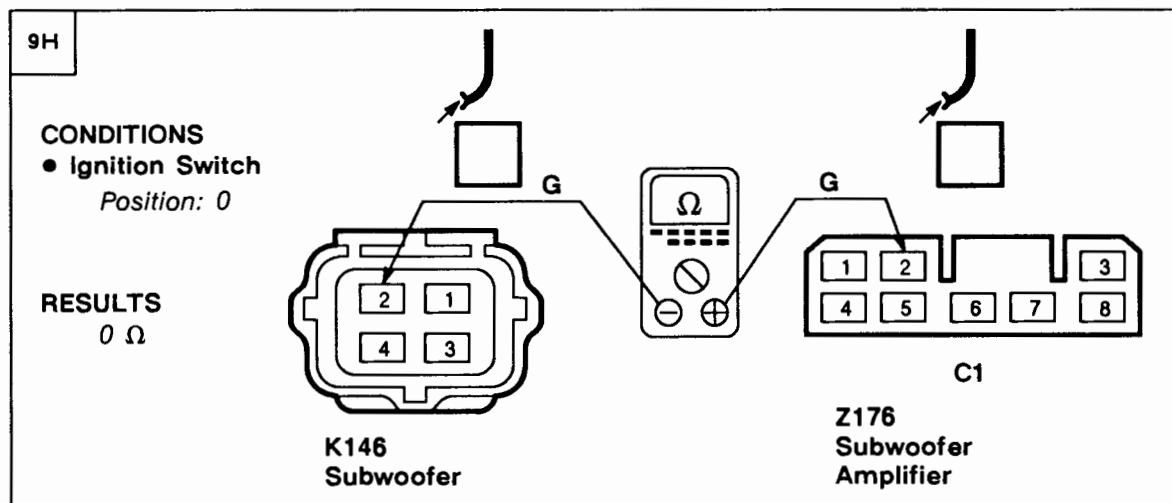
OK





~~OK~~ PROBLEM CAUSE
 - R Wire

OK



~~OK~~ PROBLEM CAUSE
 - G Wire

OK



11H

12H

CONDITIONS

- Ignition Switch
Position: II
- Install a known good Subwoofer
- Radio
ON

RESULTS

- Subwoofer Speakers
Operate



PROBLEM CAUSE
- Subwoofer Amplifier
- Radio



PROBLEM CAUSE
- Subwoofer

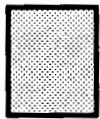
1993 RANGE ROVER

KEY INFORMATION

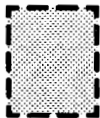
CIRCUIT DIAGRAMS

- 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

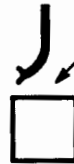
- If the diagram is accompanied by text:
 - Read the Circuit Operation before proceeding with the electrical diagnosis.
 - Read the Troubleshooting Hints before performing the System Diagnosis.
 - Tests follow the System Diagnosis.
 - When performing the System Diagnosis, be certain that all components 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

CIRCUIT OPERATION

The NAS audio system consists of an AM/FM cassette/CD control head, an Antenna Amplifier (Z105), an amplifier, a 6 disc CD Changer (Z114) and (if equipped) a subwoofer. The control head is equipped with an anti-theft feature which makes the unit inoperative once battery power is removed. A 5 digit security code must be entered to restore power to the unit.

Battery voltage is provided to the control head at all times through the PW wire. In addition to monitoring the anti-theft feature, this input keeps the preset station memory alive.

Whenever battery power to the unit is lost, the anti-theft code must be entered and the preset stations must be reprogrammed.

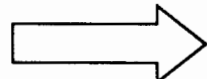
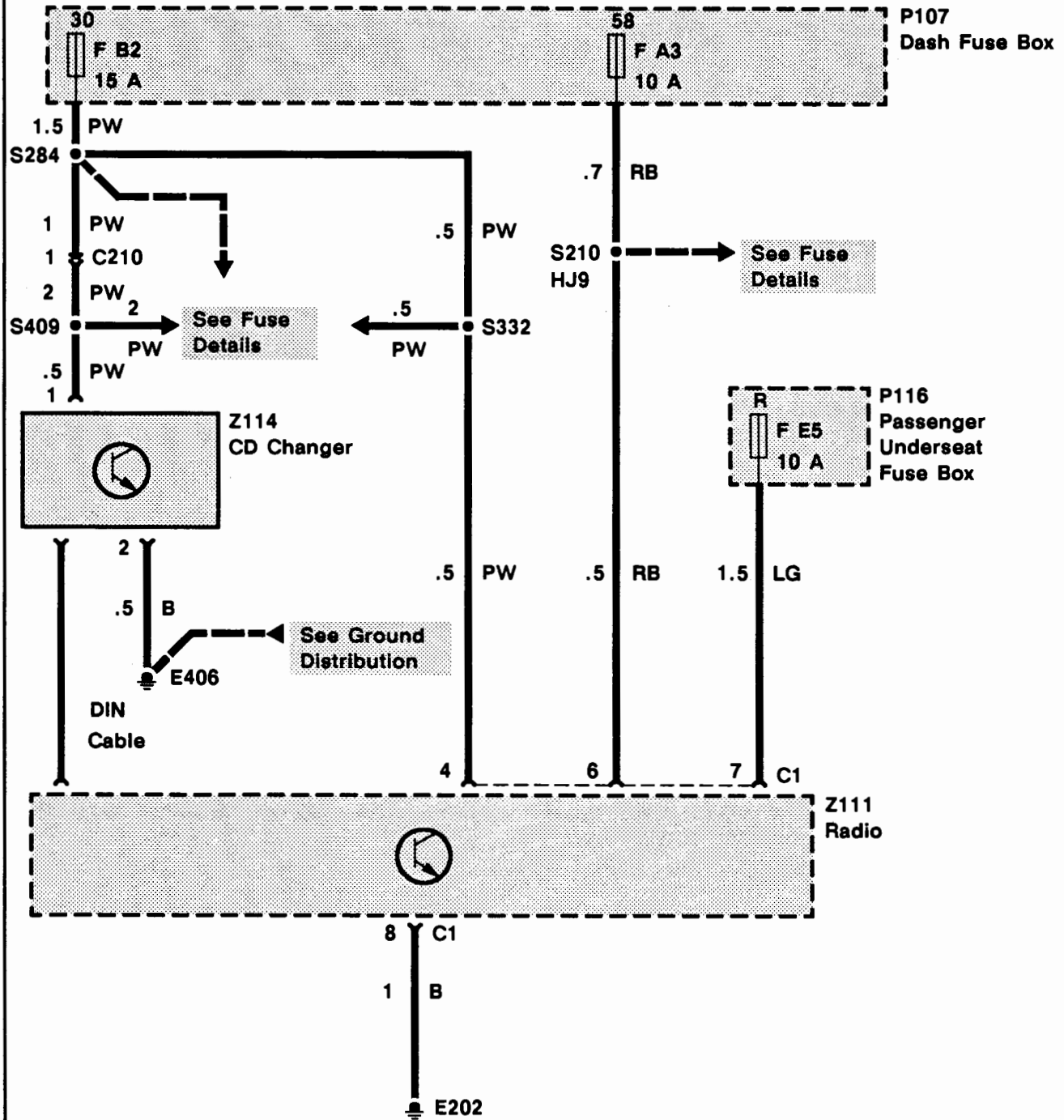
When the Radio (Z111) and the ignition are turned on, the voltage signal through the LG wire and the control head 'wakes up' the unit. The Radio (Z111) plays, the VF display comes on and the control unit buttons illuminate. The VF display is dimmed when the headlights or park lights are turned on. When the lights are on, voltage from fuse F A3 is applied to the Radio (Z111) terminal 6 signalling the Radio (Z111) to dim the display. Radio (Z111) signals are received via a coaxial cable from the side screens and Antenna Amplifier (Z105). The amplifier filters and boosts the signal from the rear side screens.

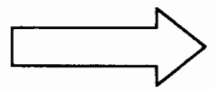
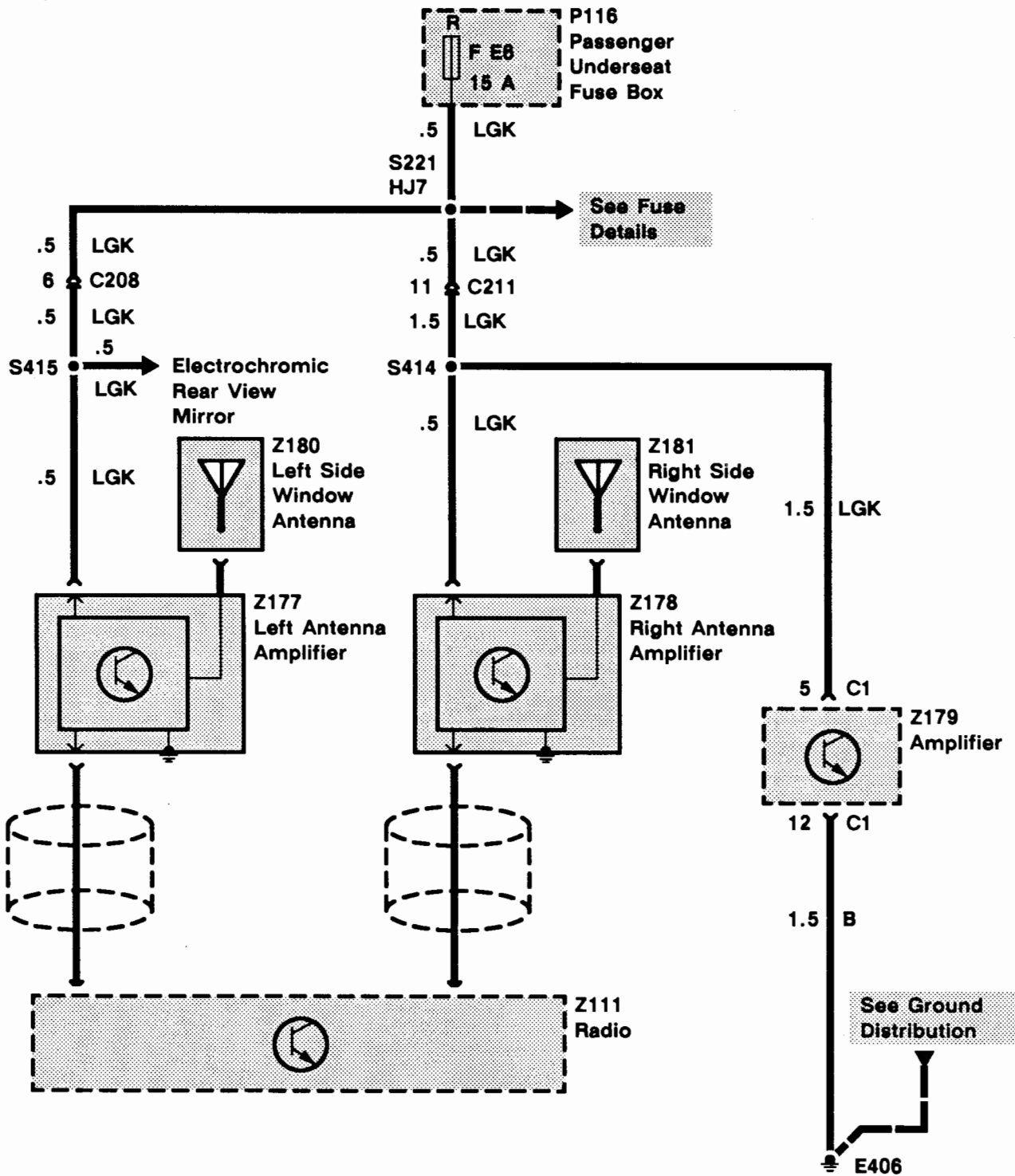
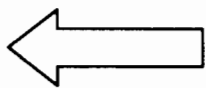
Power is available to the CD Changer (Z114) at all times. It is operated from the control head when 'CD' is selected by pressing the BAND button. The control head communicates with the Changer (Z114) via a DIN cable.

The amplifier receives power with the ignition on. It is enabled when the Radio (Z111) is turned on, sending a voltage signal through the PY wire.

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



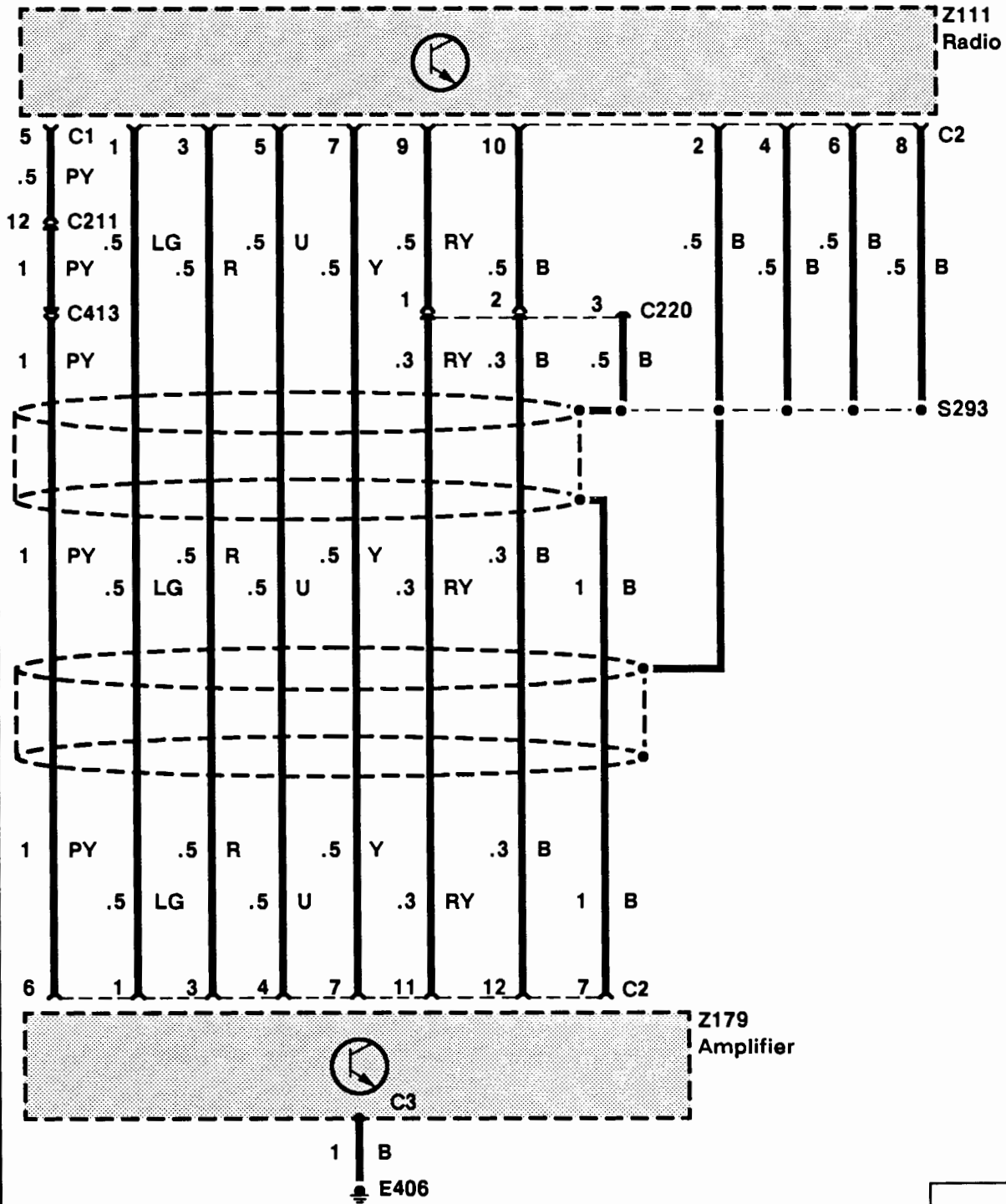


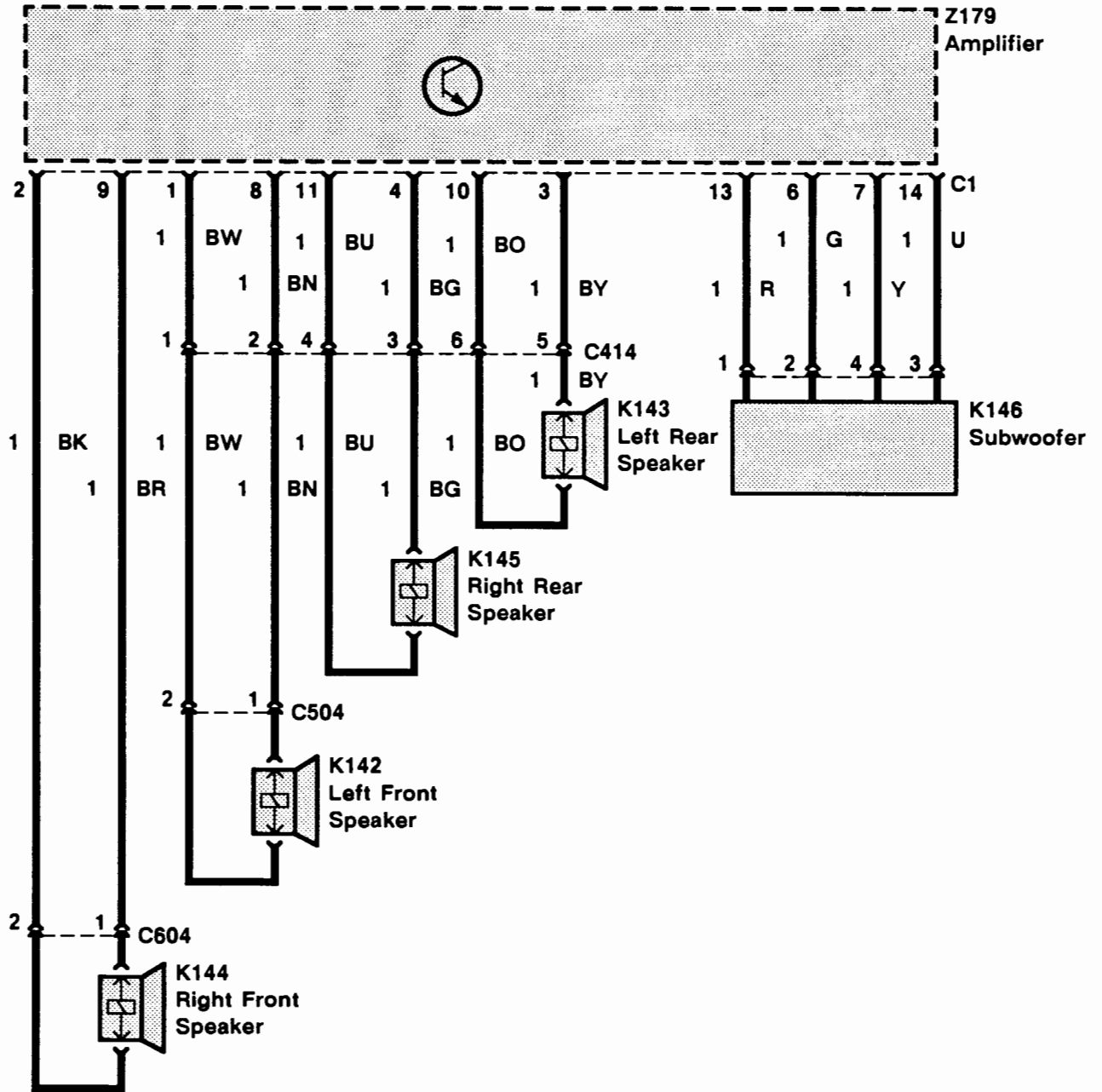
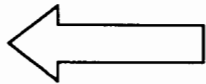
E7 ETM

1993 RANGE ROVER

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





TROUBLESHOOTING HINTS

1. Check fuses F A3, F B2, F E5, and F E6.
2. Check that Radio (Z111) connectors and coaxial cable are tight and properly connected.
3. For proper Radio (Z111) noise diagnosis, take the vehicle outside where signals are strong. Close the hood and keep away from metal buildings or other sources of Radio interference.
4. If Radio (Z111) noise is excessive when an accessory is on, install a Radio noise suppression capacitor to the power lead of that accessory.
5. If Radio (Z111) noise is excessive at all times, check antenna wiring. If OK, check spark plugs (P118), spark plug wiring and wiring close to the ignition system which could transmit noise to the Radio wiring.
6. If the Radio (Z111) is inoperative and 'code' is being shown on the display, follow the instructions below.

Security Code Instructions

1. Obtain 5-digit security code from vehicle owner or manufacturer.
2. Enter the code number using the Radio (Z111) push-button selectors.

NOTE: If the correct code is not entered in 3 successive attempts, the Radio (Z111) will not accept another entry until the Radio has been left on for 1 hour with the ignition on.

NOTE: When entering the code, be sure to complete the sequence numbering of that 5-digit code even if you made a mistake. For example, if the correct code number sequence is 43215 and you mistakenly enter 42 instead of 43, continue the code number sequence of 215 to complete that entry. A 'beep' will sound, 'code' will still be displayed and the Radio will not operate. Re-enter the correct code 43215 and the Radio will operate.

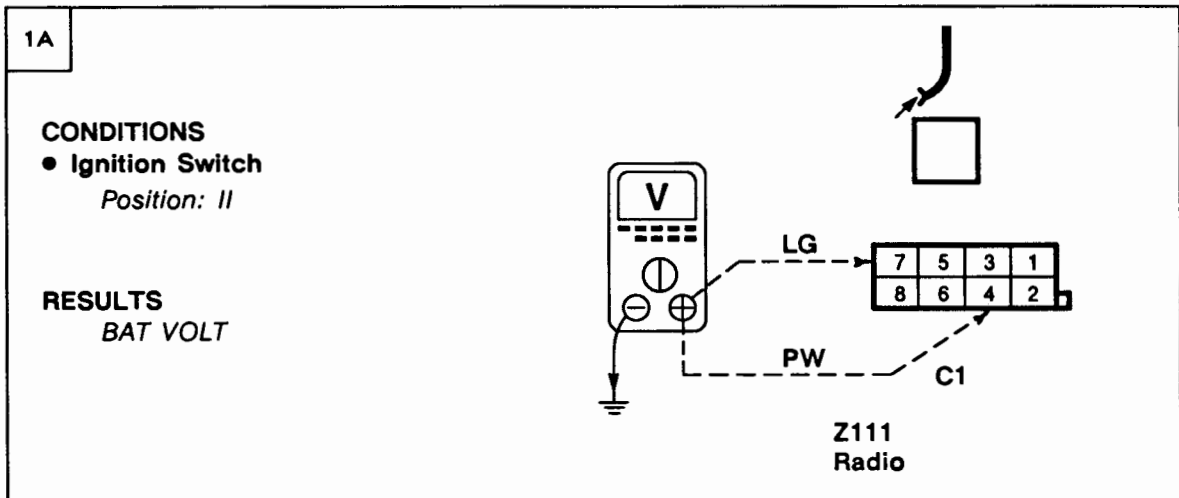
NOTE: If an audible 'beep' is heard while entering the code, STOP immediately. Begin entering the code again, starting with the first number of the 5-digit code.

NOTE: If a push-button is touched accidentally when the ignition is off, a warning tone will sound. Turn the ignition on and the tone will stop.

SYSTEM DIAGNOSIS

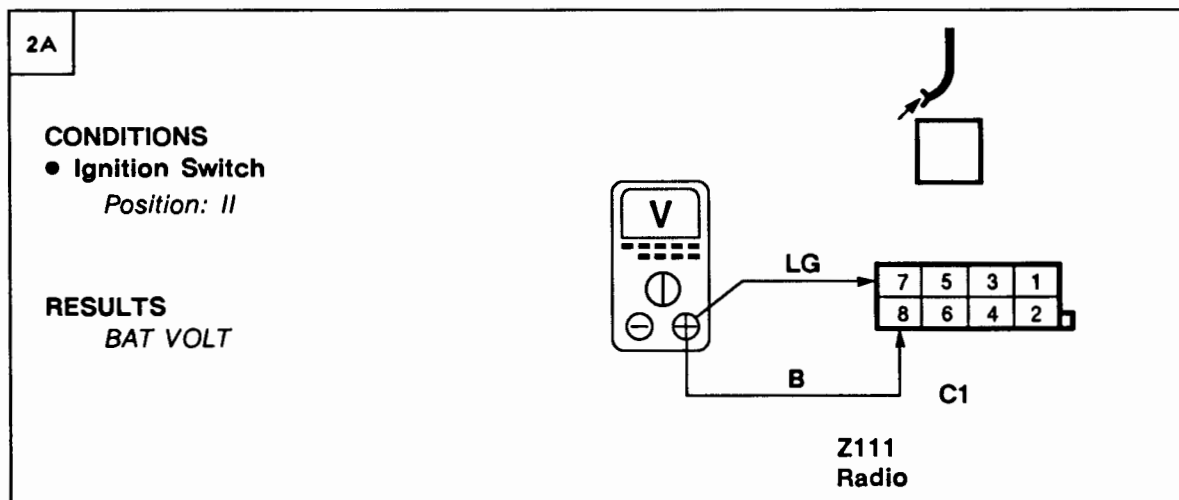
1. If Radio (Z111) and cassette do not operate at all, do Test A.
2. If Radio (Z111) scans past all frequencies when in seek mode and hiss is present over most stations, do Test B.
3. If VF display intensity does not dim when the headlights are on, do Test C.
4. If one or more (but not all) speakers do not operate, do Test D.
5. If only the CD Changer (Z114) does not operate, do Test E.

Test A



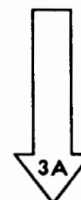
PROBLEM CAUSE

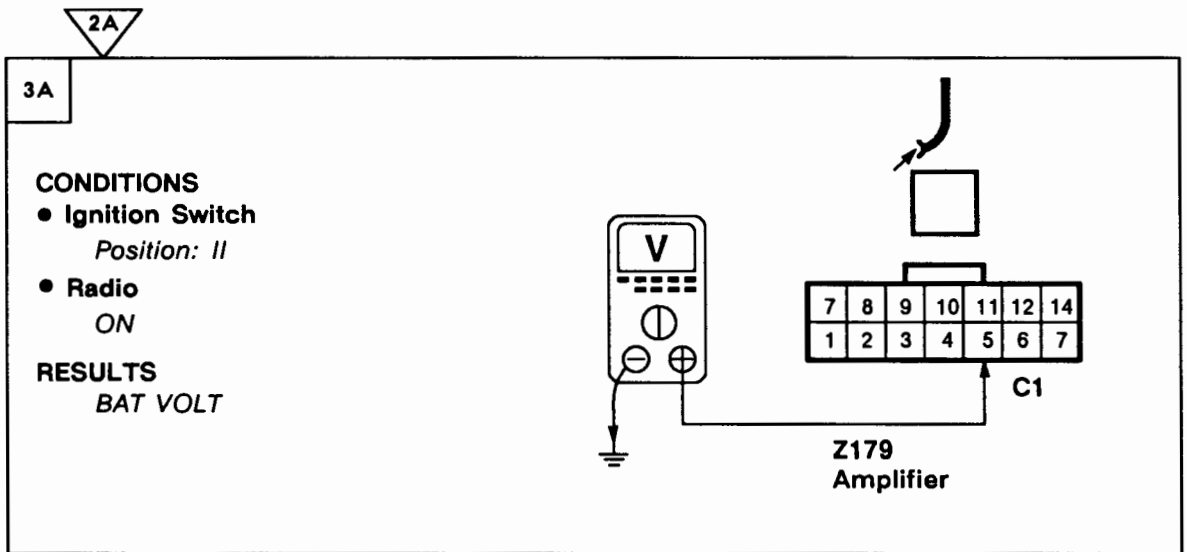
- PW Wire
- LG Wire
- F B2 Fuse
- F E5 Fuse



PROBLEM CAUSE

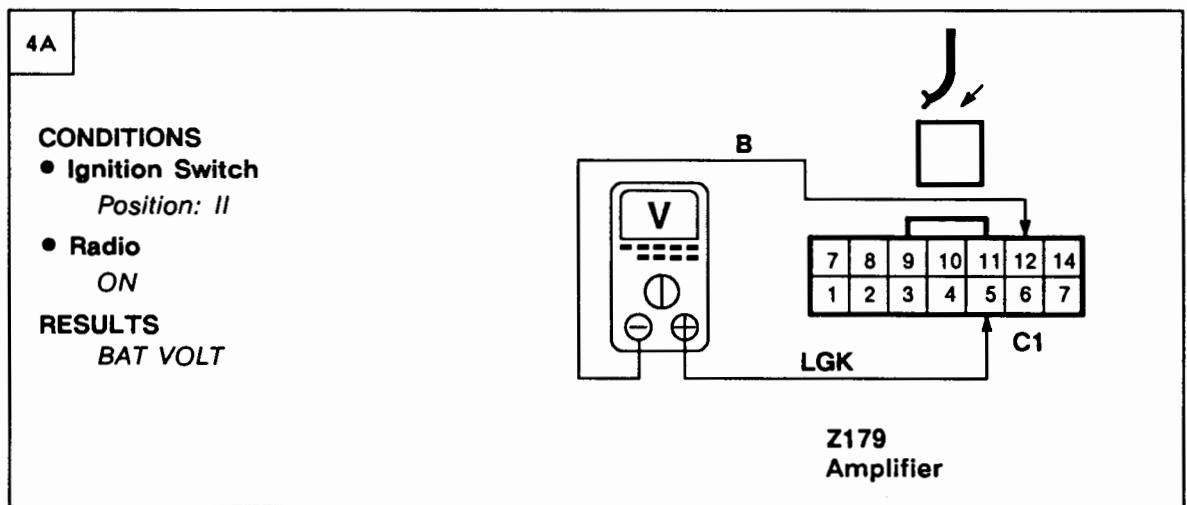
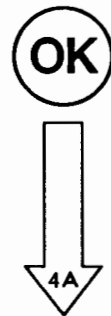
- B Wire





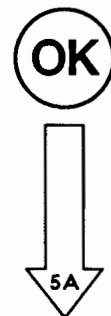
~~OK~~ **PROBLEM CAUSE**

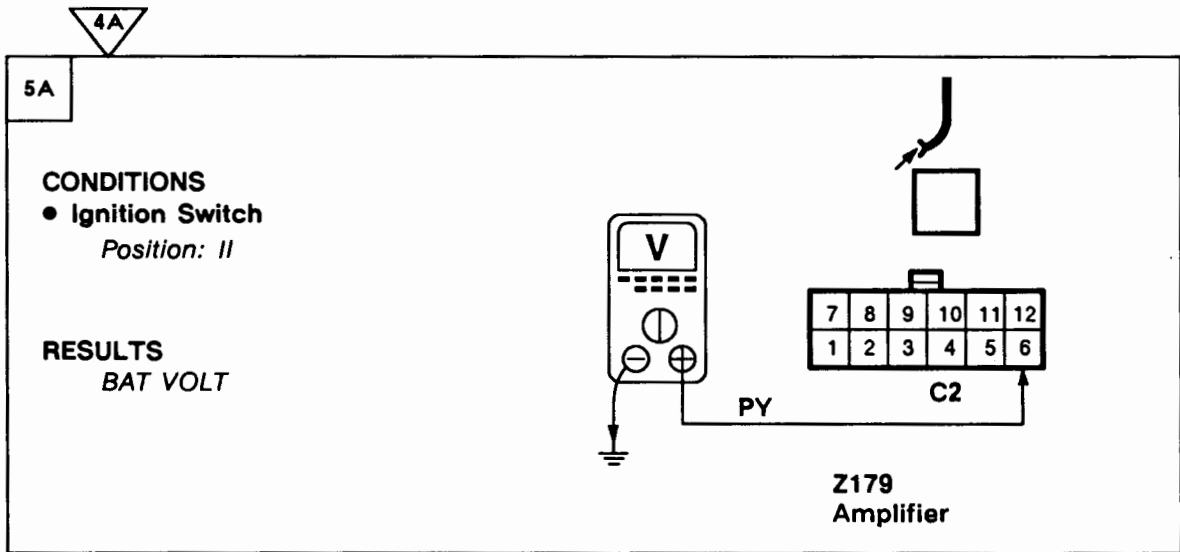
- LGK Wire
- F E6 Fuse



~~OK~~ **PROBLEM CAUSE**

- B Wire

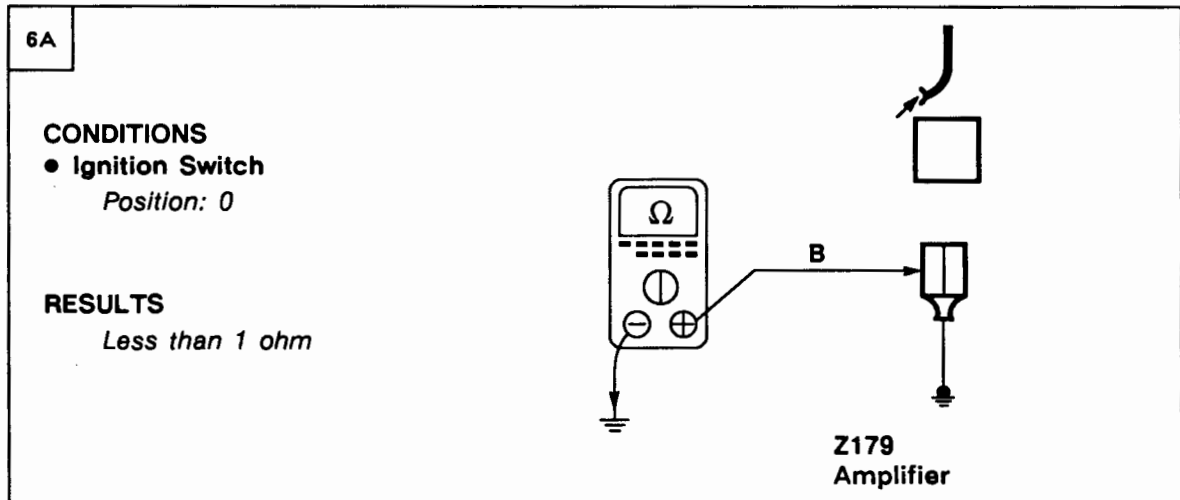




OK PROBLEM CAUSE

- PY Wire
- Radio

OK



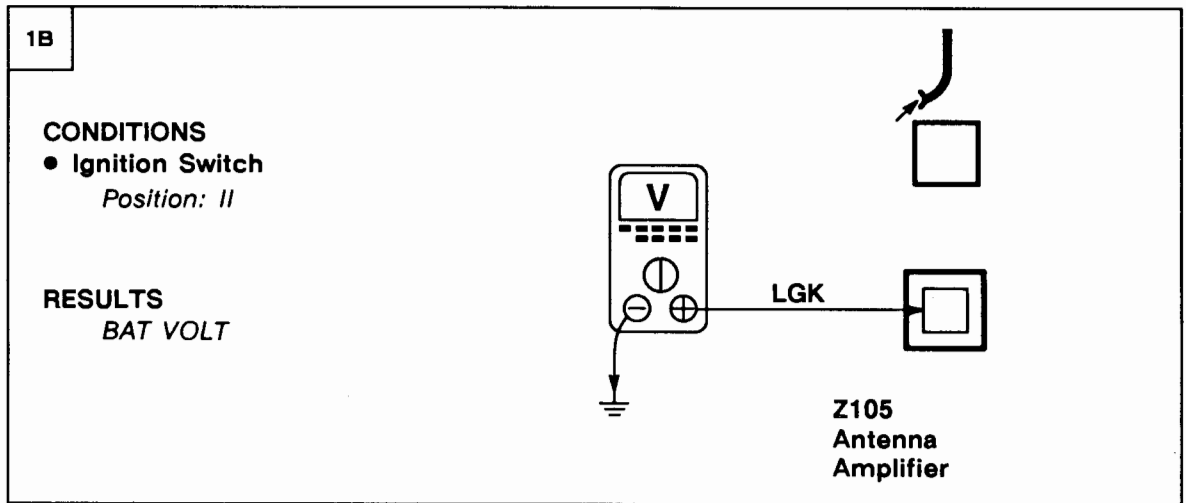
OK PROBLEM CAUSE

- B Wire

OK PROBLEM CAUSE

- Radio
- Amplifier

Test B

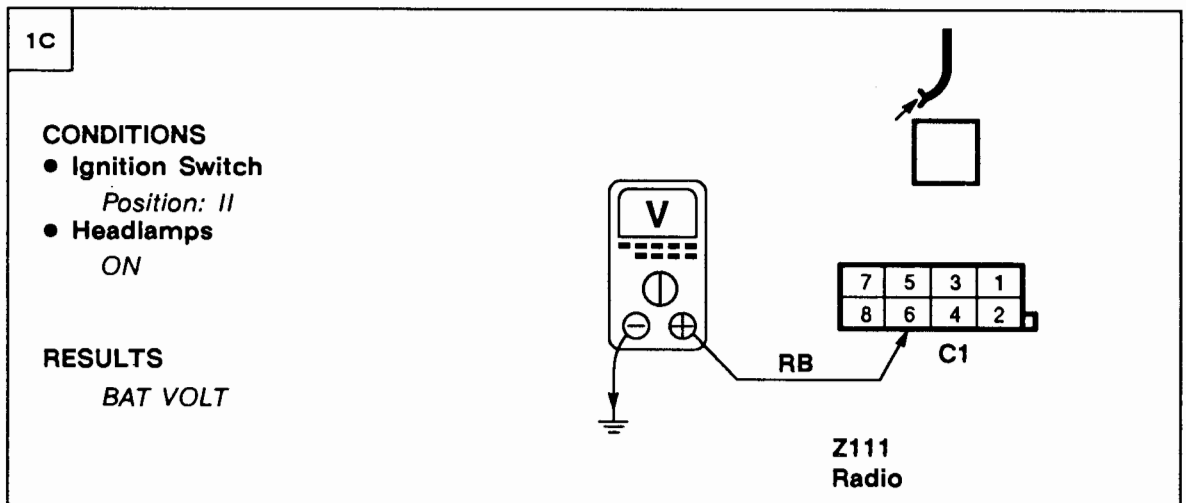


PROBLEM CAUSE
- LGK Wire



PROBLEM CAUSE
- Coaxial Cable
- Radio
- Antenna Amplifier

Test C

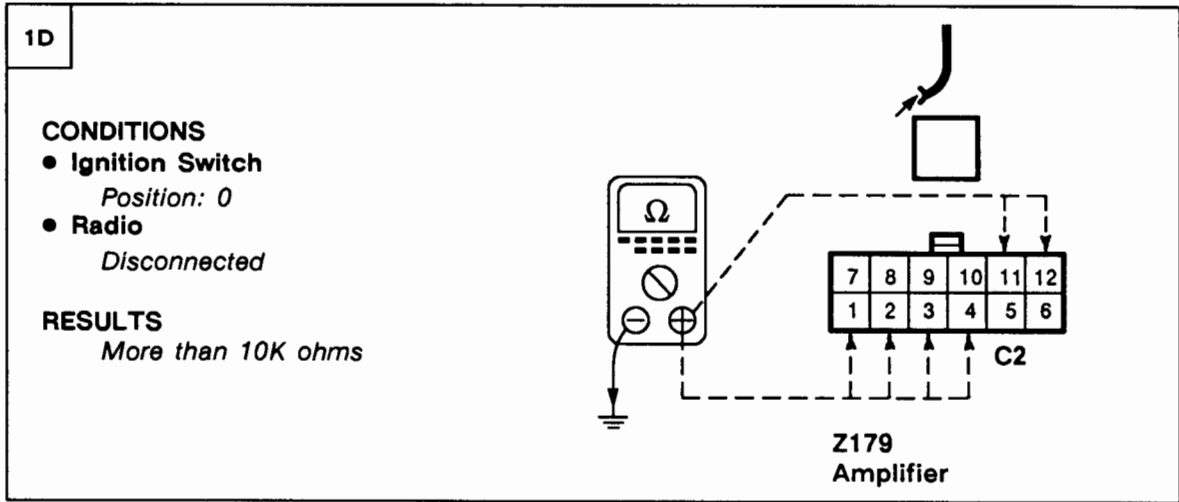


PROBLEM CAUSE
- RB Wire

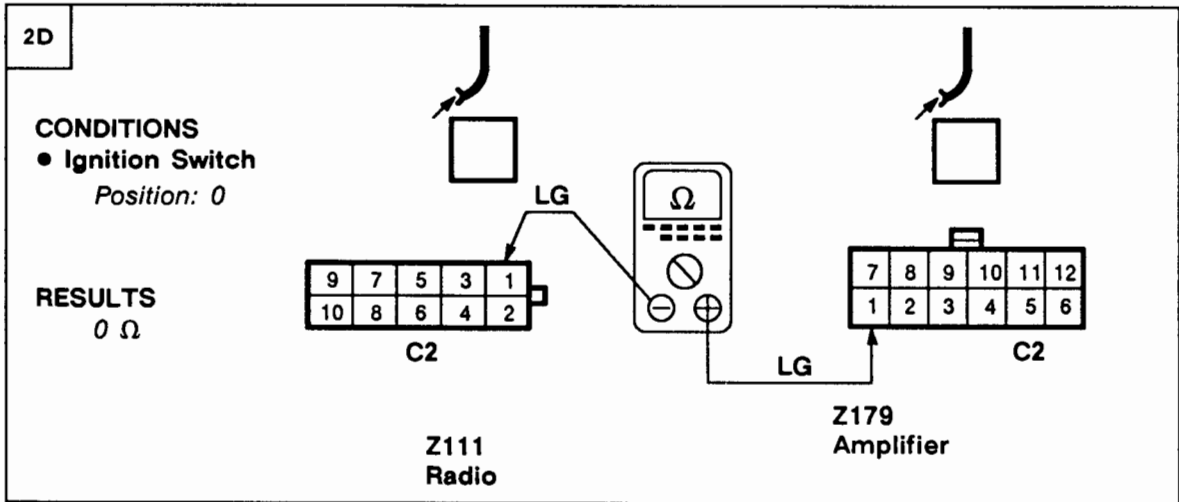
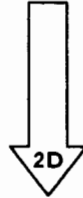


- Radio

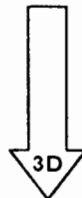
Test D

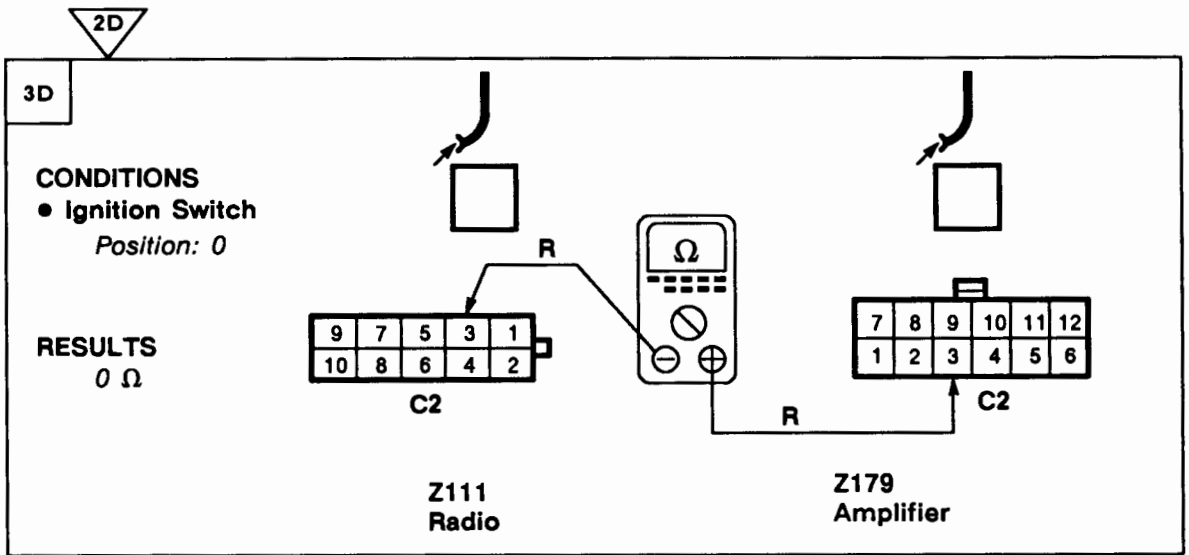


PROBLEM CAUSE
- wire (short)



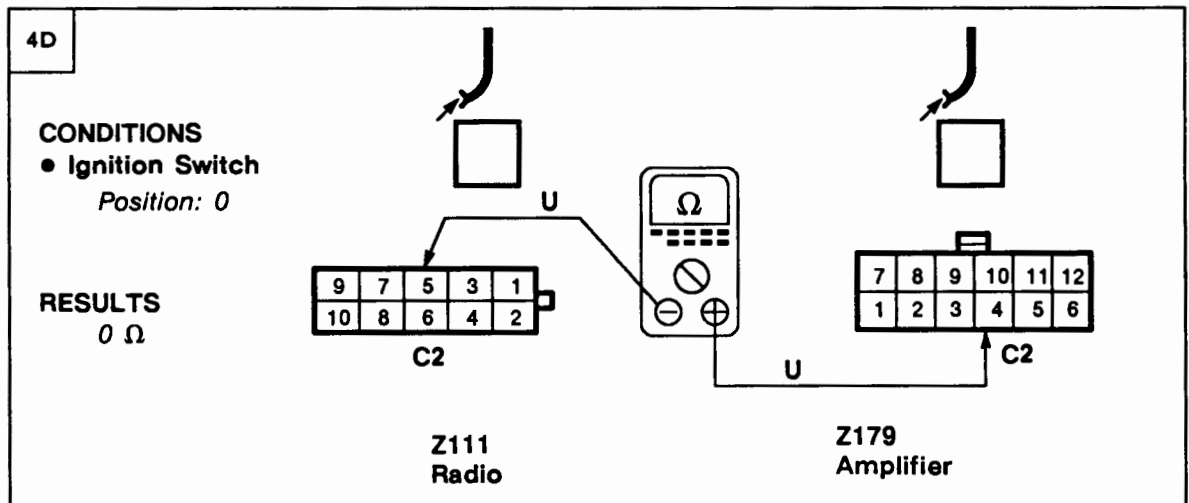
PROBLEM CAUSE
- LG Wire





~~OK~~ PROBLEM CAUSE
 - R Wire

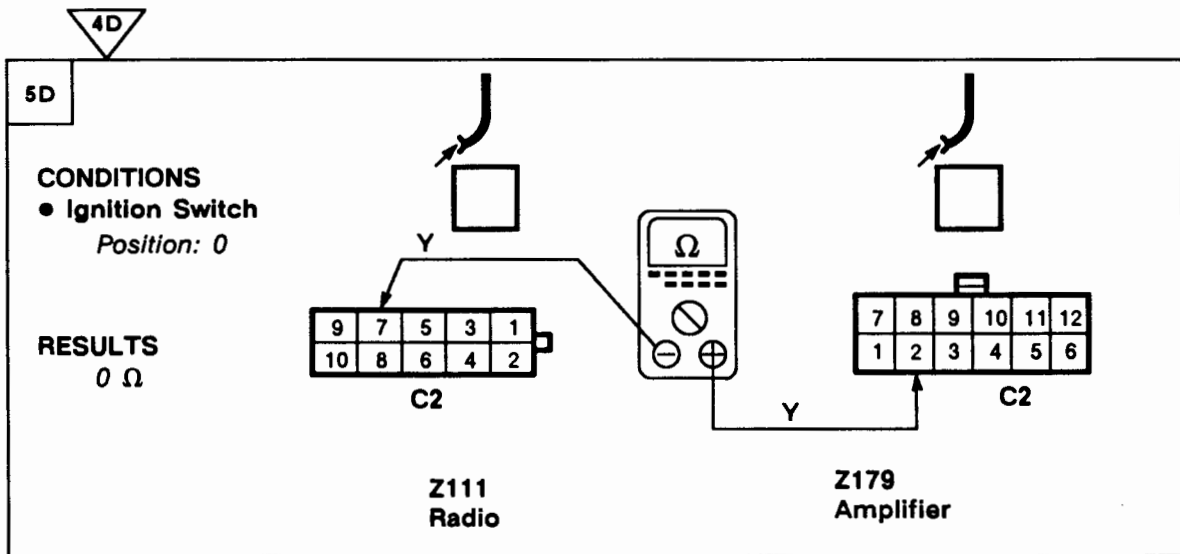
OK



~~OK~~ PROBLEM CAUSE
 - U Wire

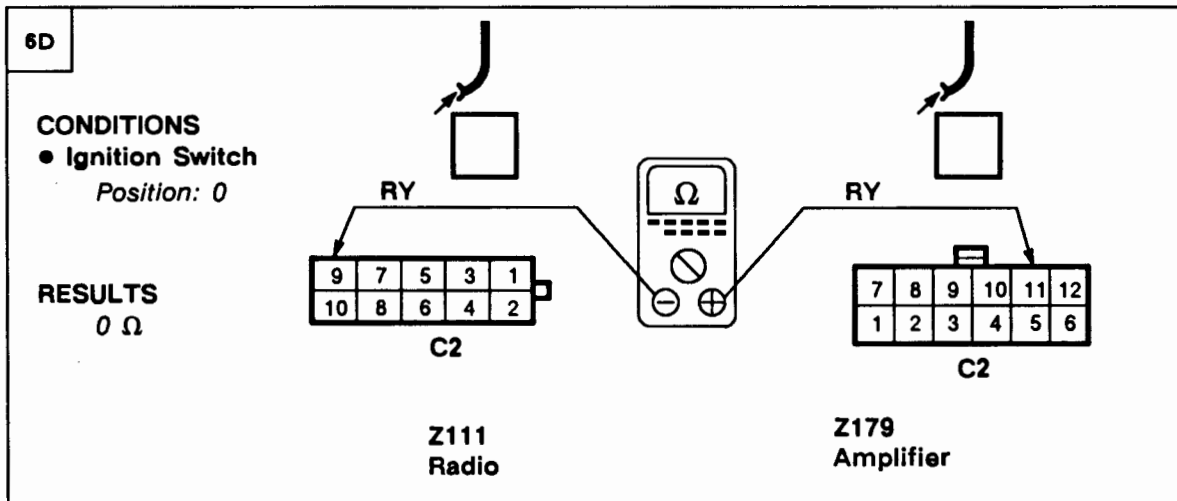
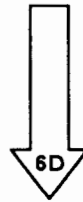
OK





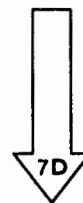
~~OK~~ PROBLEM CAUSE
 - Y Wire

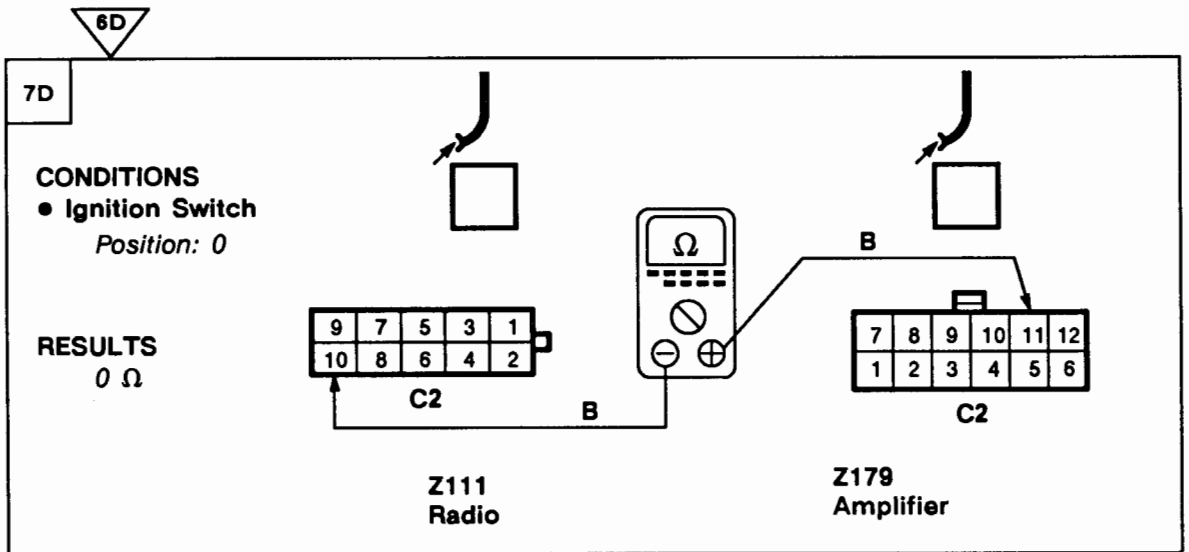
OK



~~OK~~ PROBLEM CAUSE
 - RY Wire

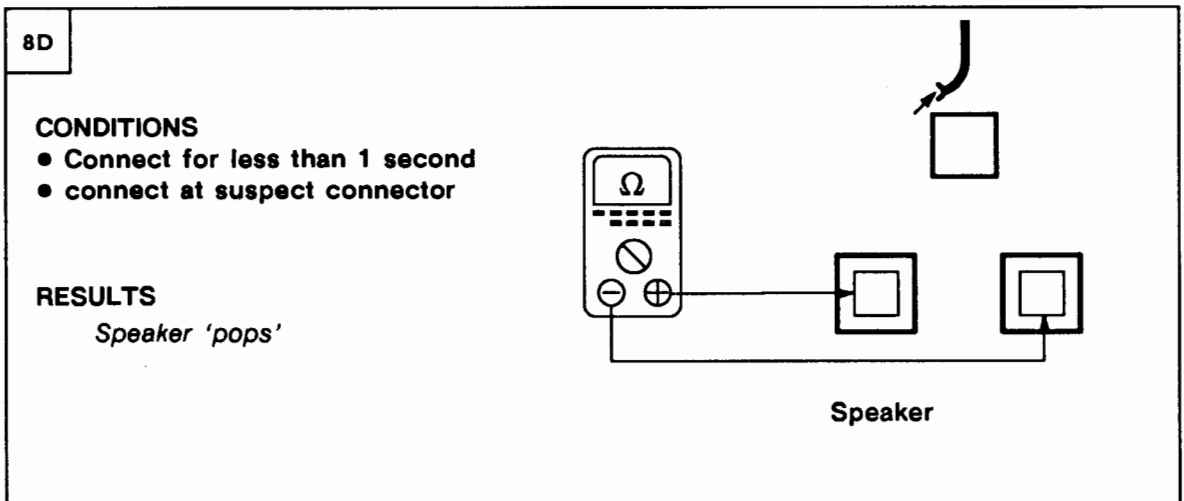
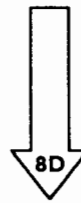
OK





~~OK~~ PROBLEM CAUSE
- B Wire

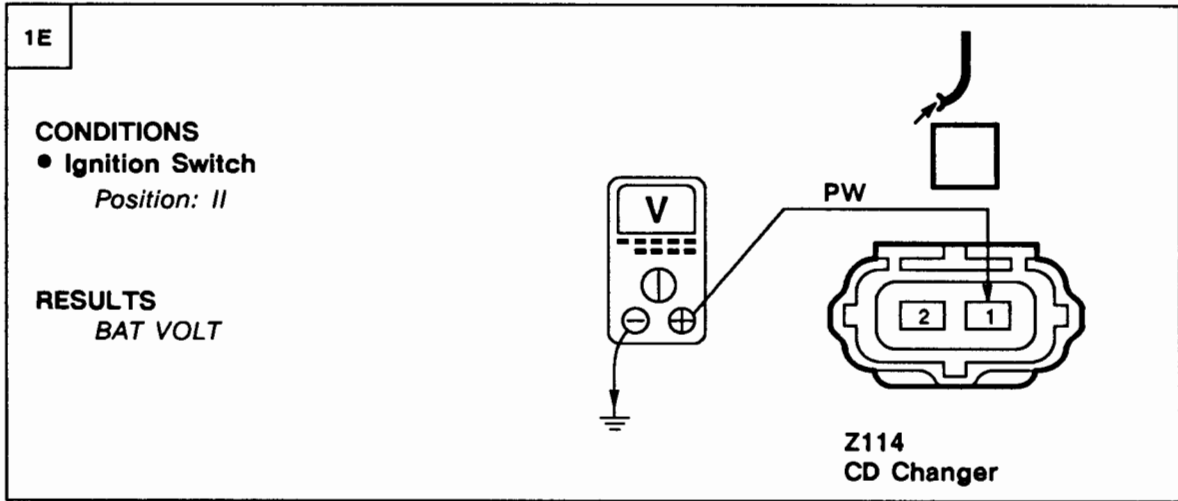
OK



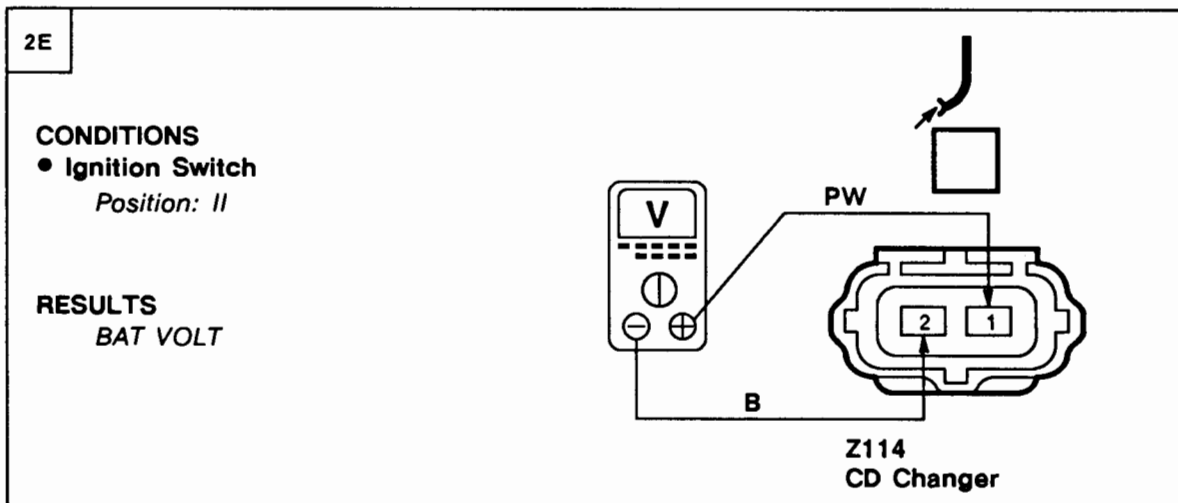
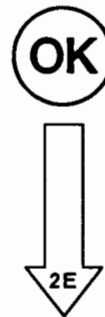
~~OK~~ PROBLEM CAUSE
- Speaker

OK PROBLEM CAUSE
- Speaker wiring
- Amplifier

Test E



OK PROBLEM CAUSE
 - PW Wire
 - B Wire



OK PROBLEM CAUSE
 - B Wire

OK PROBLEM CAUSE
 - DIN Cable
 - CD Changer
 - Radio