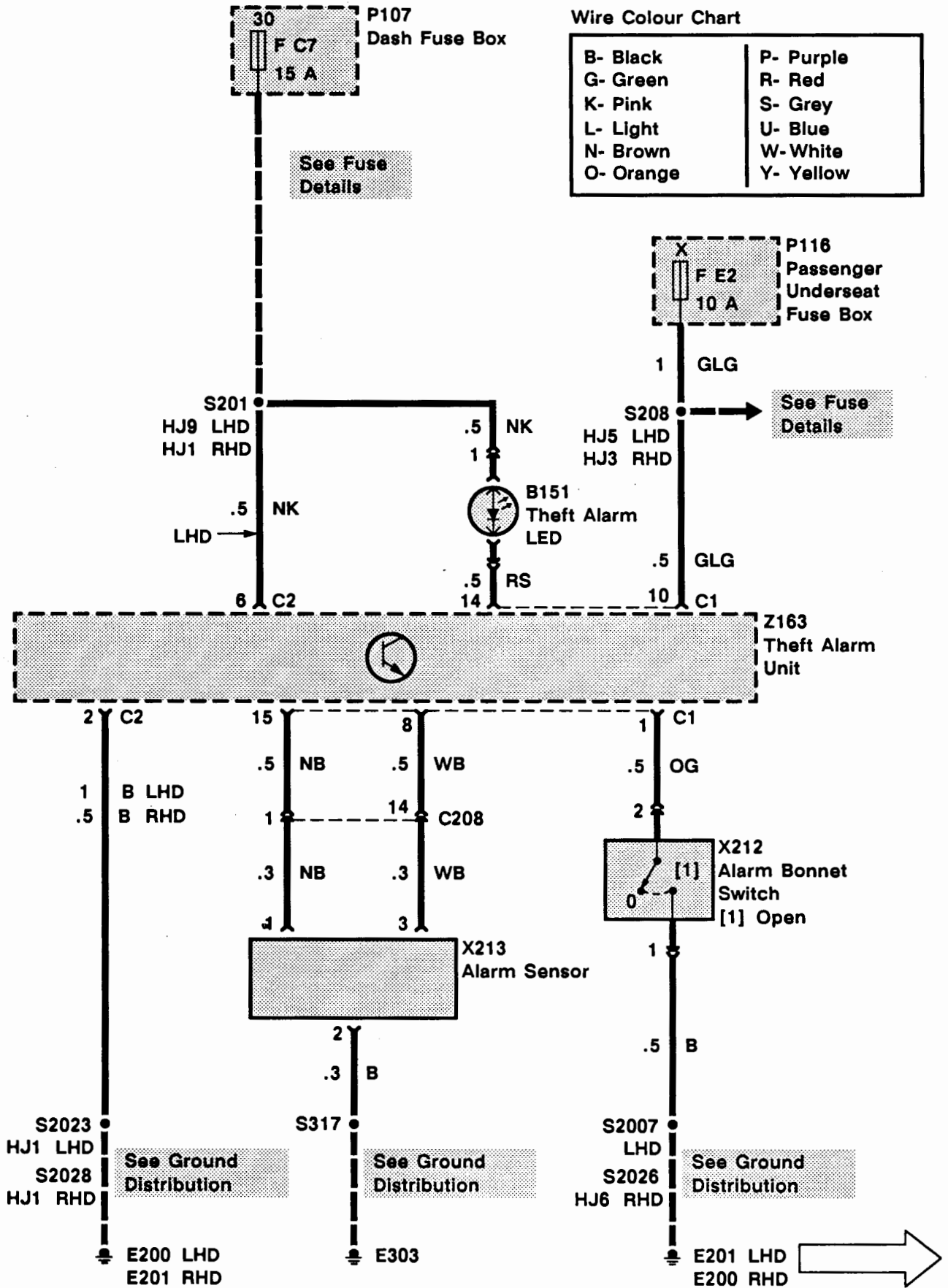


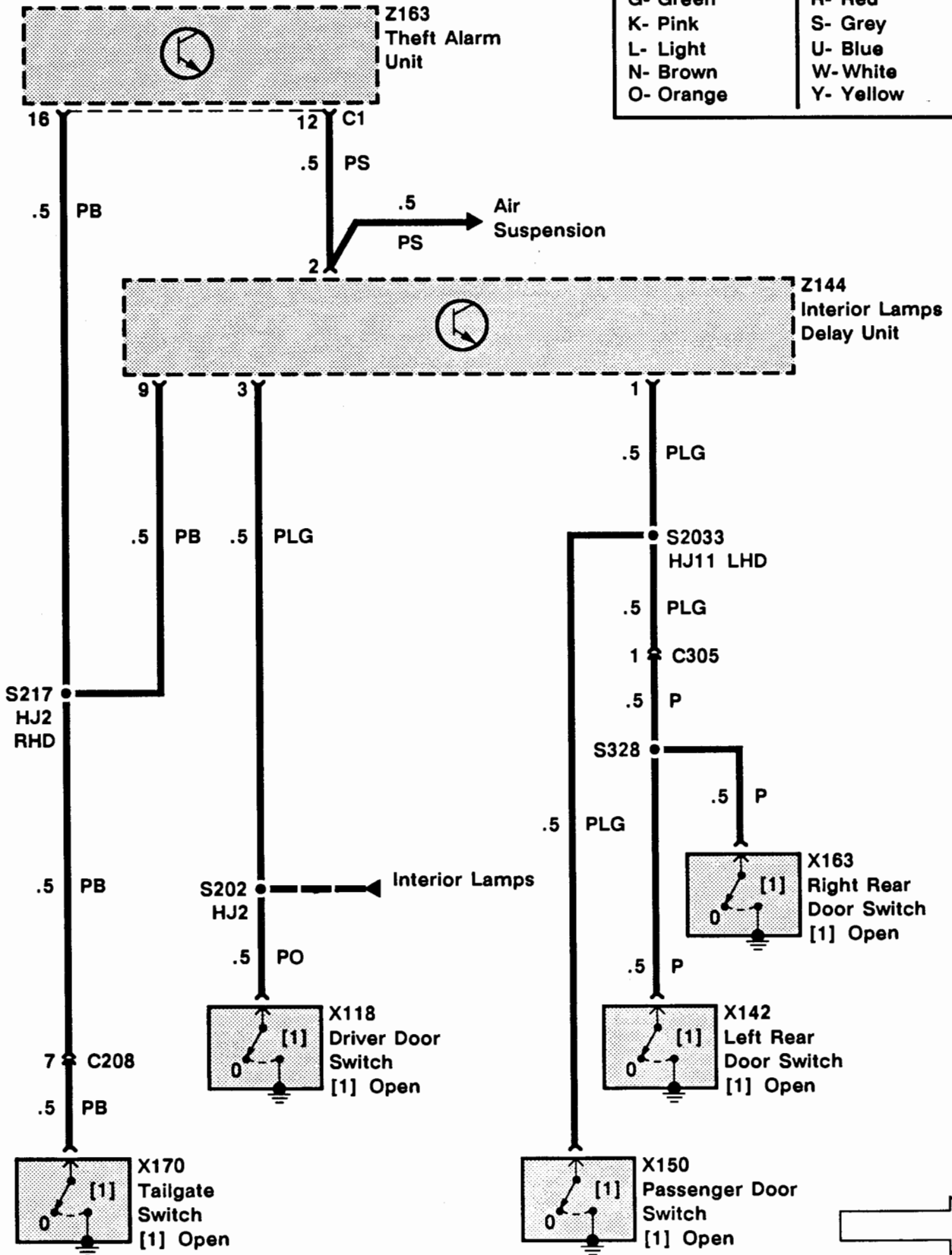
CIRCUIT OPERATION

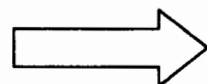
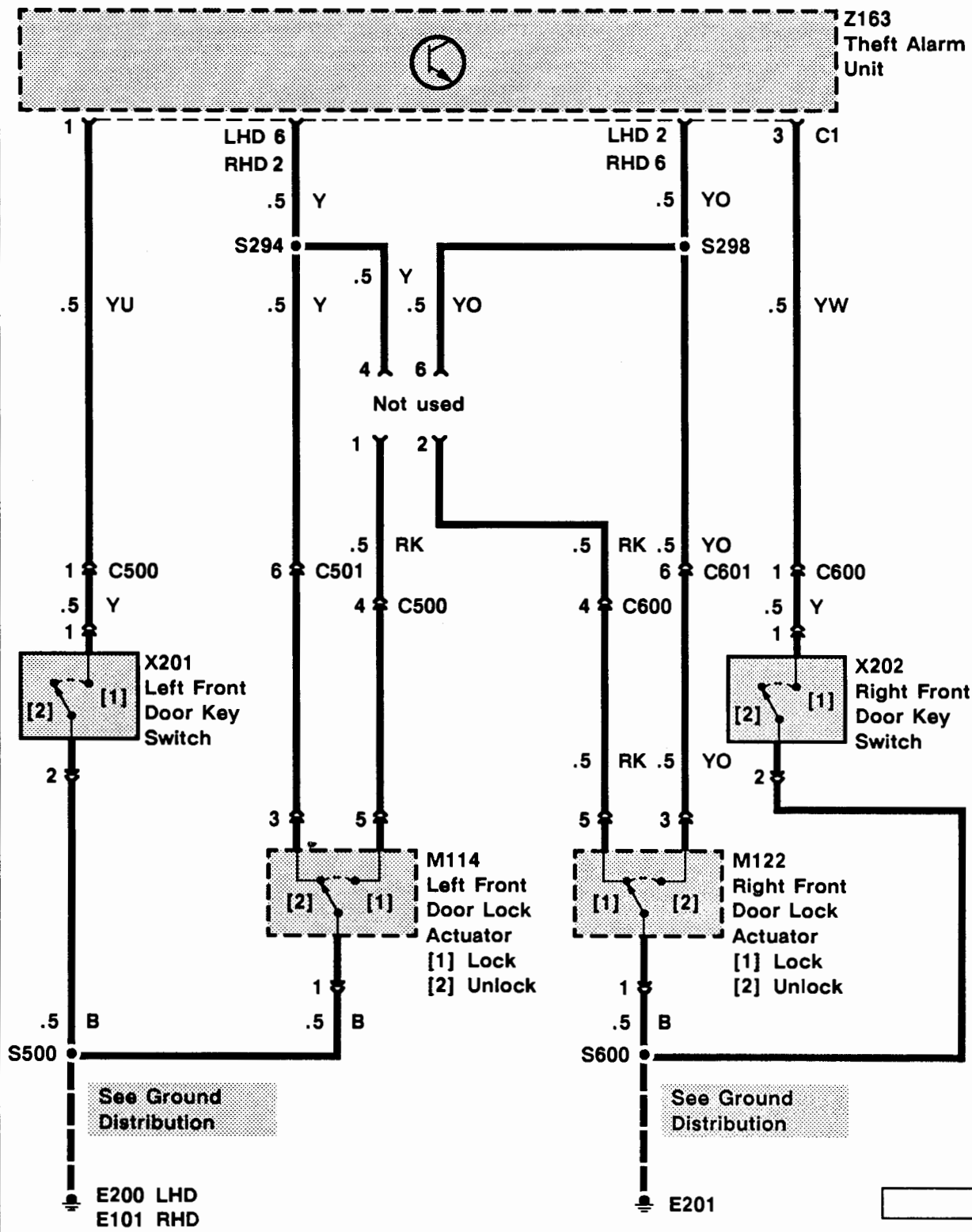
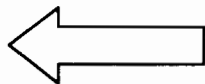
Refer to Section 86 of the 1993 Range Rover Workshop Manual Supplement.



Wire Colour Chart

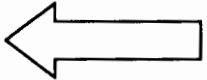
B- Black	P- Purple
G- Green	R- Red
K- Pink	S- Grey
L- Light	U- Blue
N- Brown	W- White
O- Orange	Y- Yellow





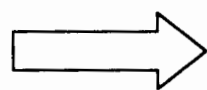
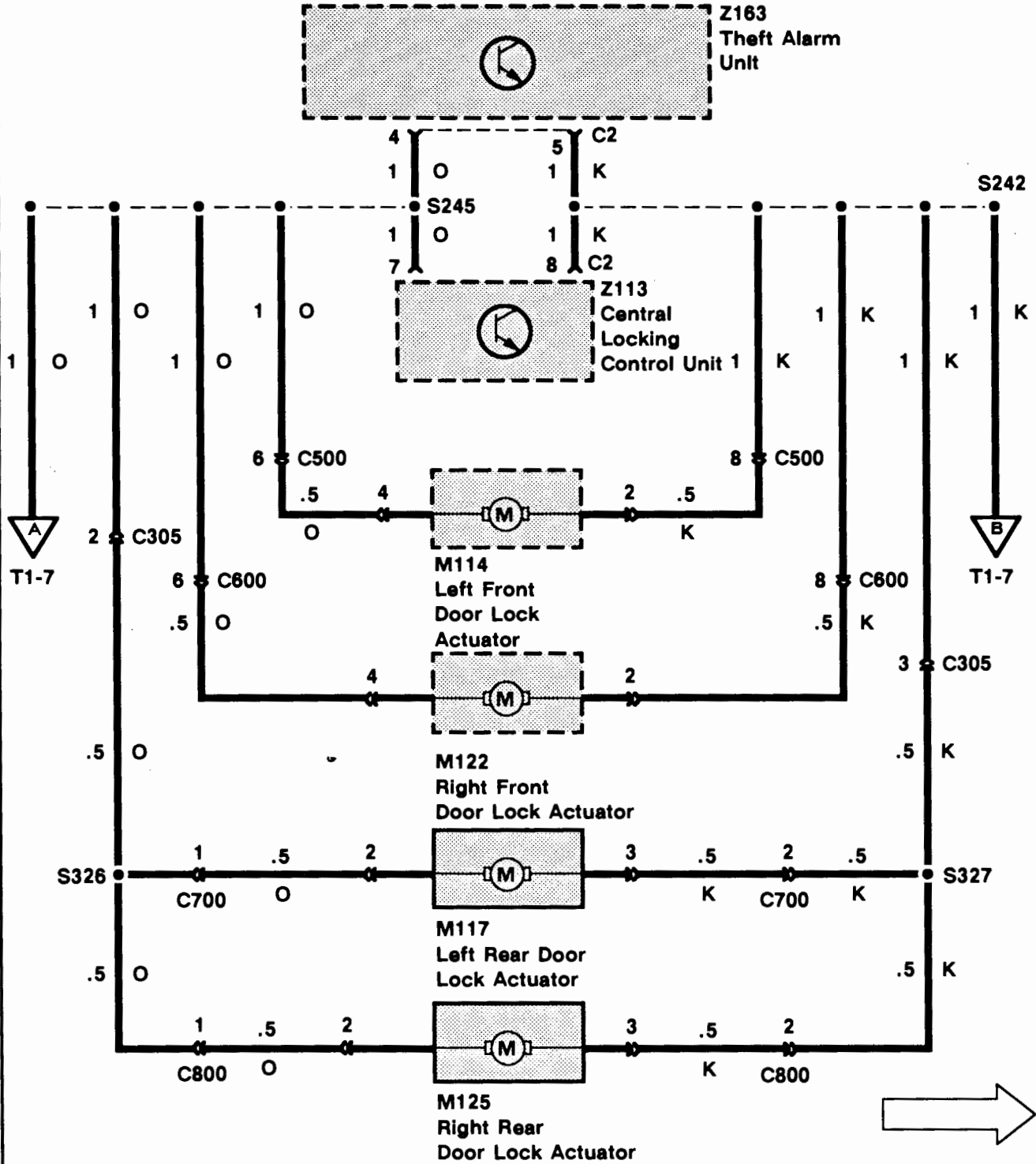
T1 ETM

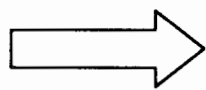
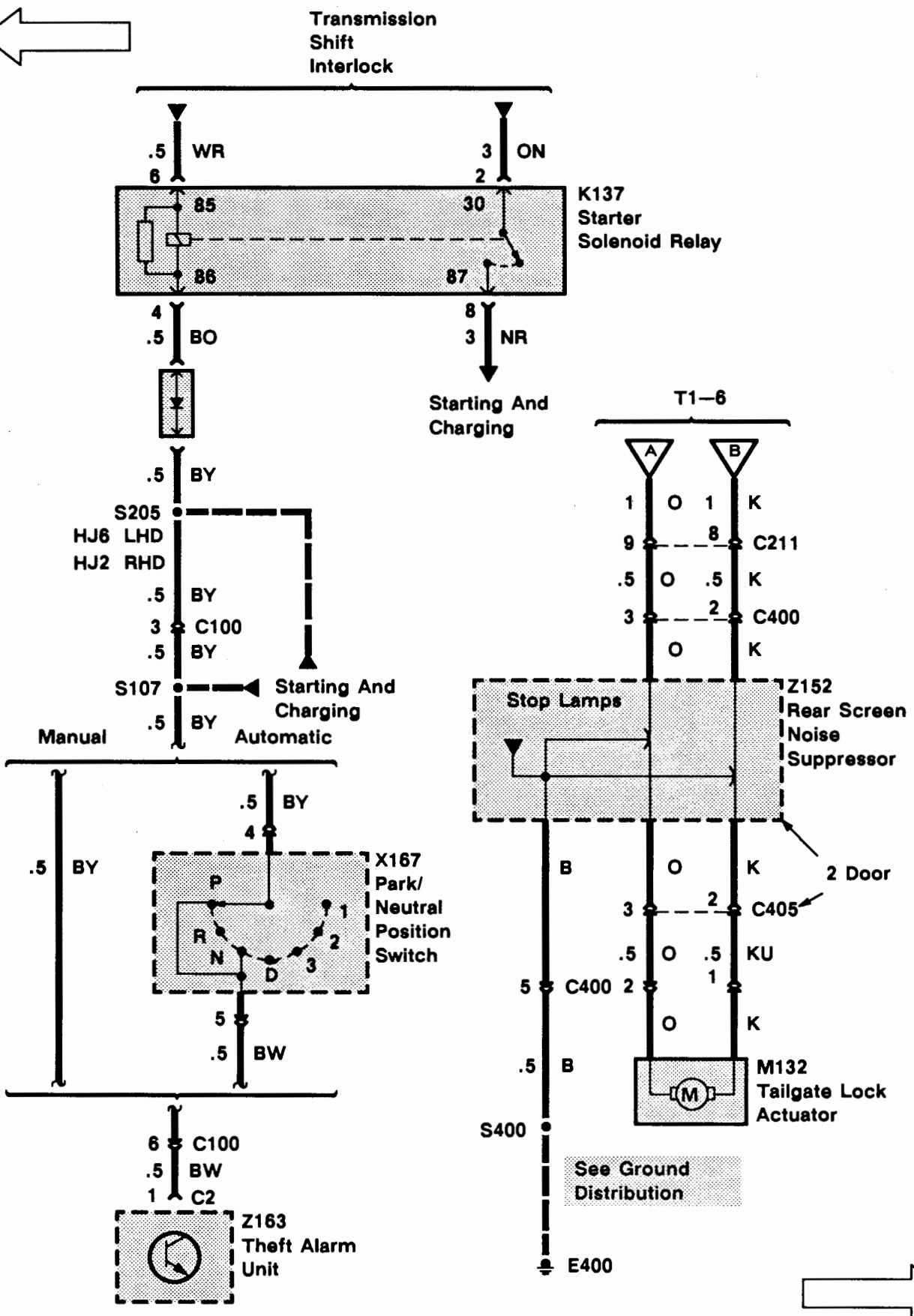
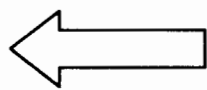
1993 RANGE ROVER



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



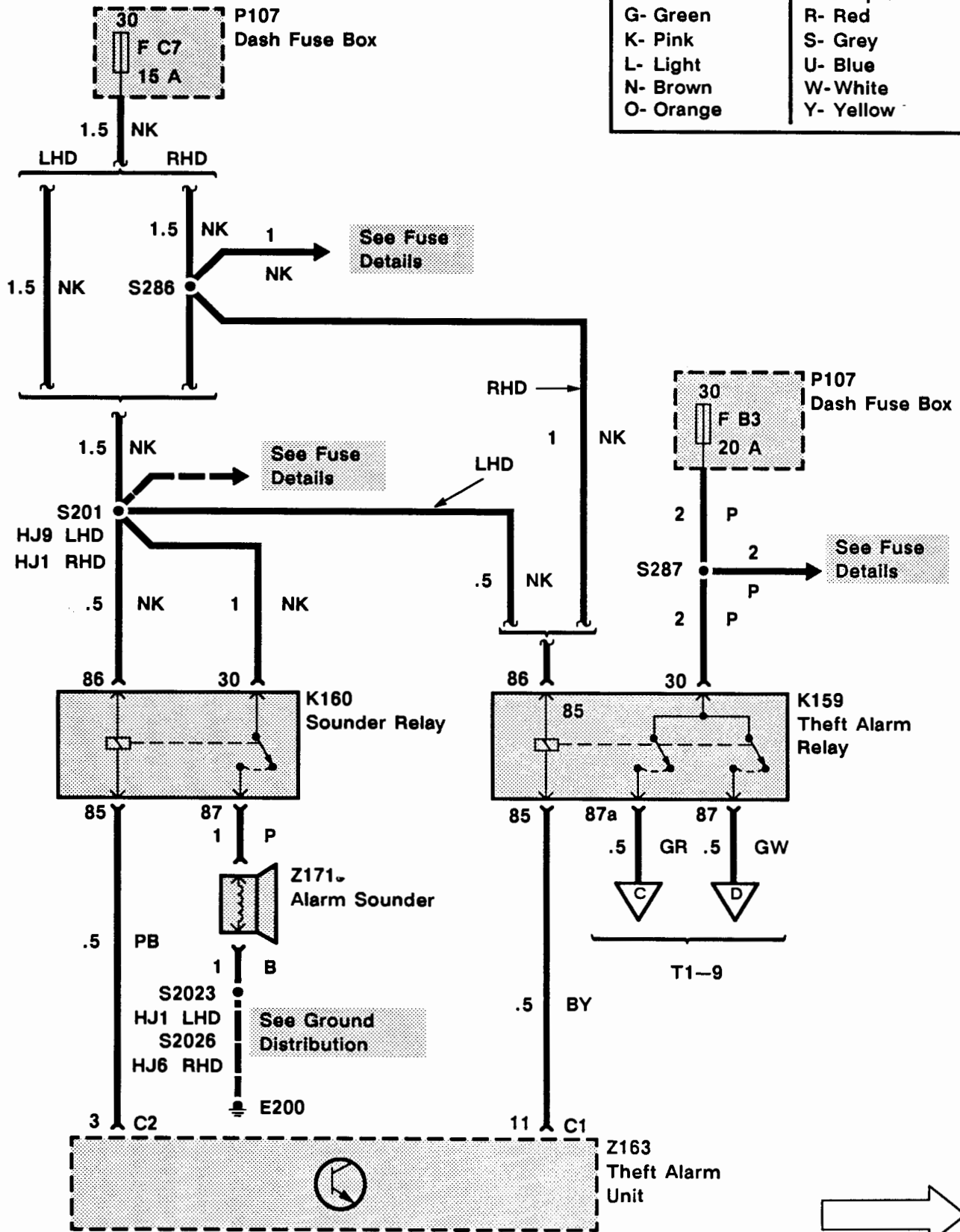


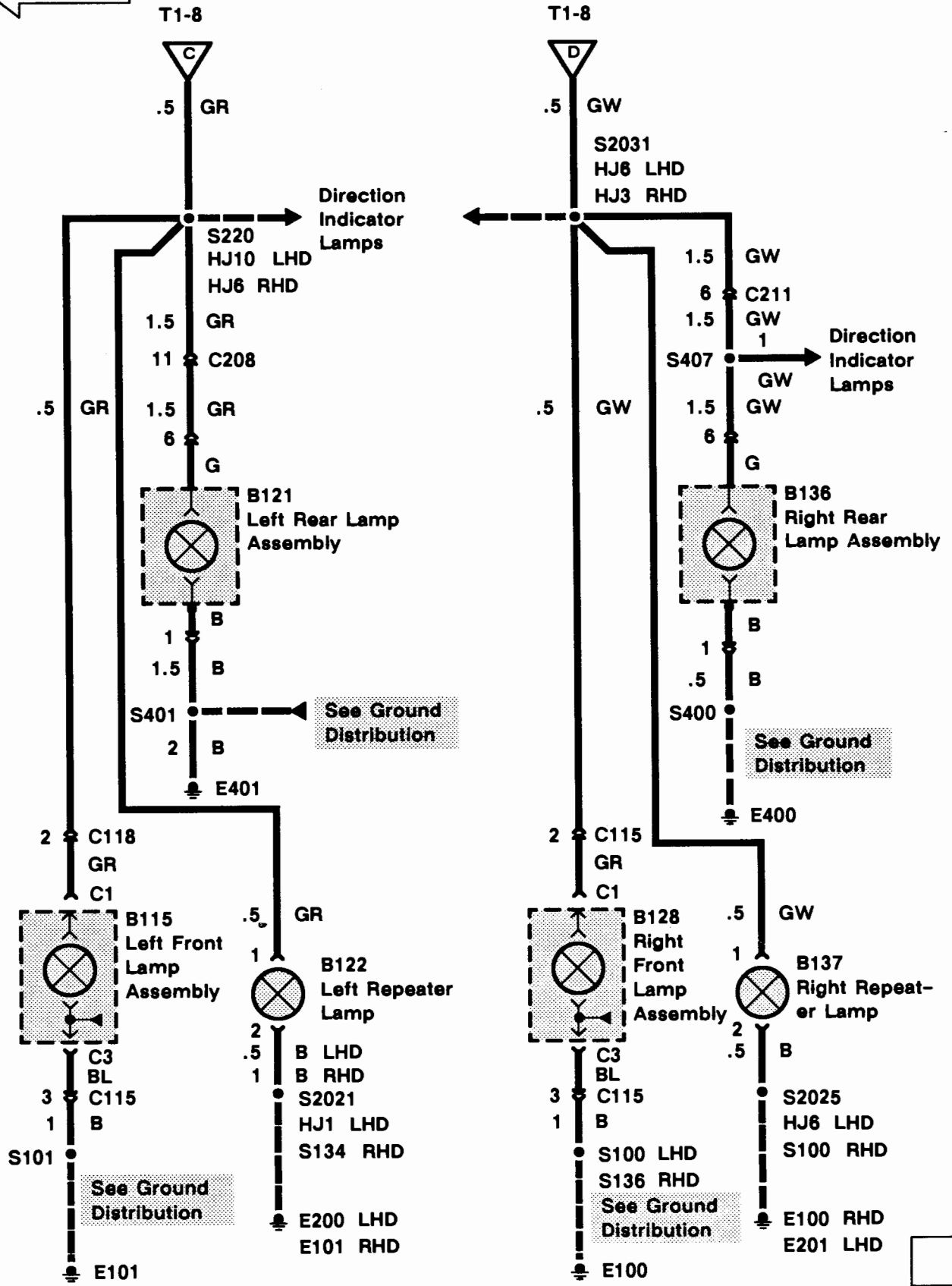
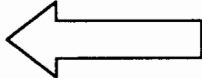
T1 ETM

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 C7, F B3, and F E2.
2. If the interior lights do not come on when a door is open, check suspect door switch and associated wiring.

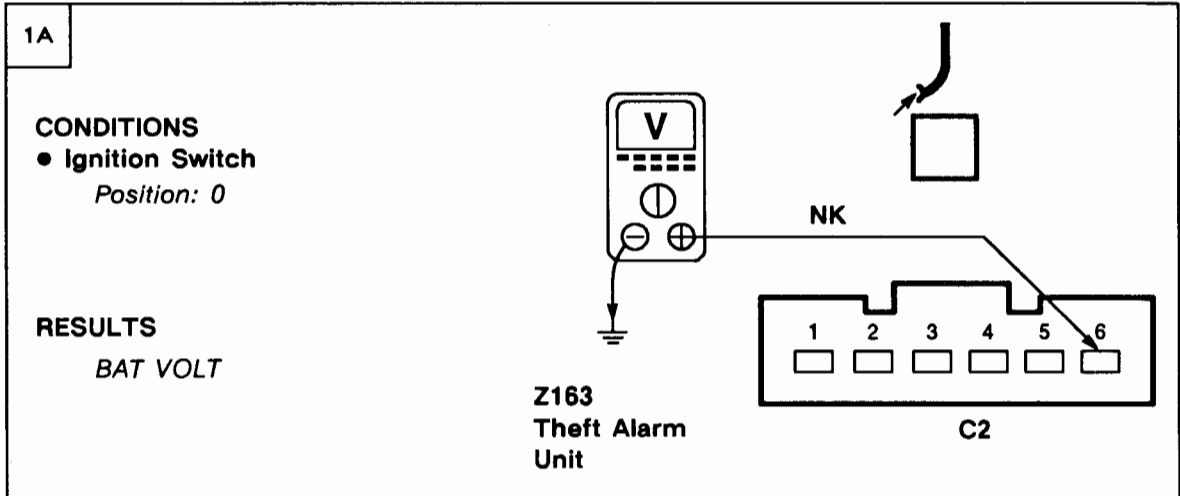
SYSTEM DIAGNOSIS

1. If the system will not arm, do Test A.
2. If the system arms, but will not trigger at all, do Test B.
3. If the Alarm Sounder (Z171) does not sound when triggered, do Test B.
4. If the hazard lights do not flash when triggered, do Test E.
5. If the system will not trigger when the bonnet is open, do Test F.
6. If the system will not trigger when the tailgate is open, do Test H.
7. If the alarm is set using the remote and the system does not trigger the alarm when there is motion inside the vehicle, do Test G.
8. If the Theft Alarm LED (B151) does not operate, do Test C.
9. If the horn sounds continuously, do Test D.
10. If the system will not disarm, do Test A.

T1 ETM

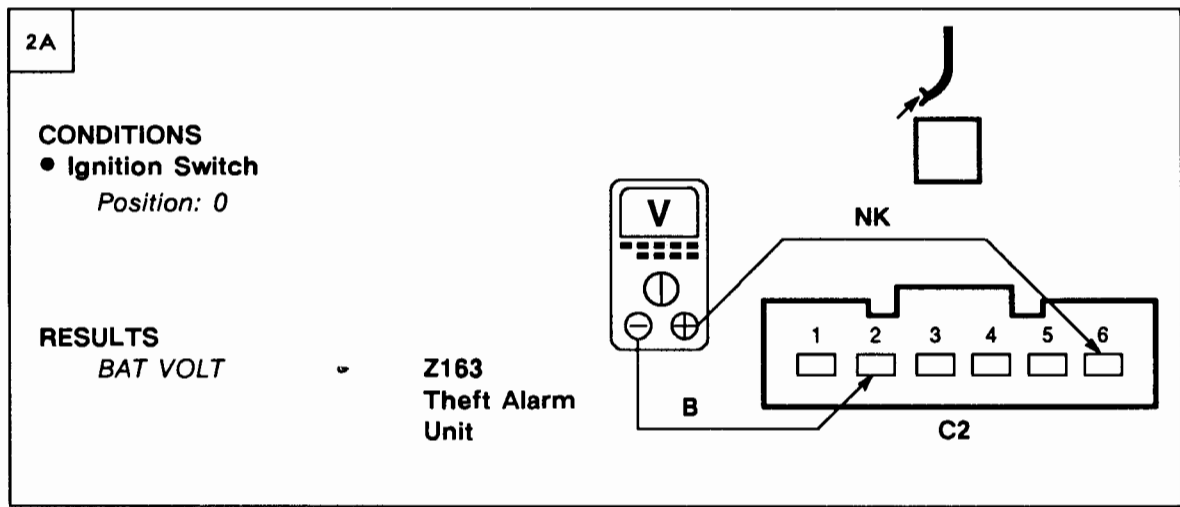
1993 RANGE ROVER

Test A



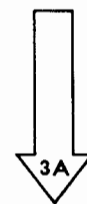
~~OK~~ PROBLEM CAUSE
- NK Wire

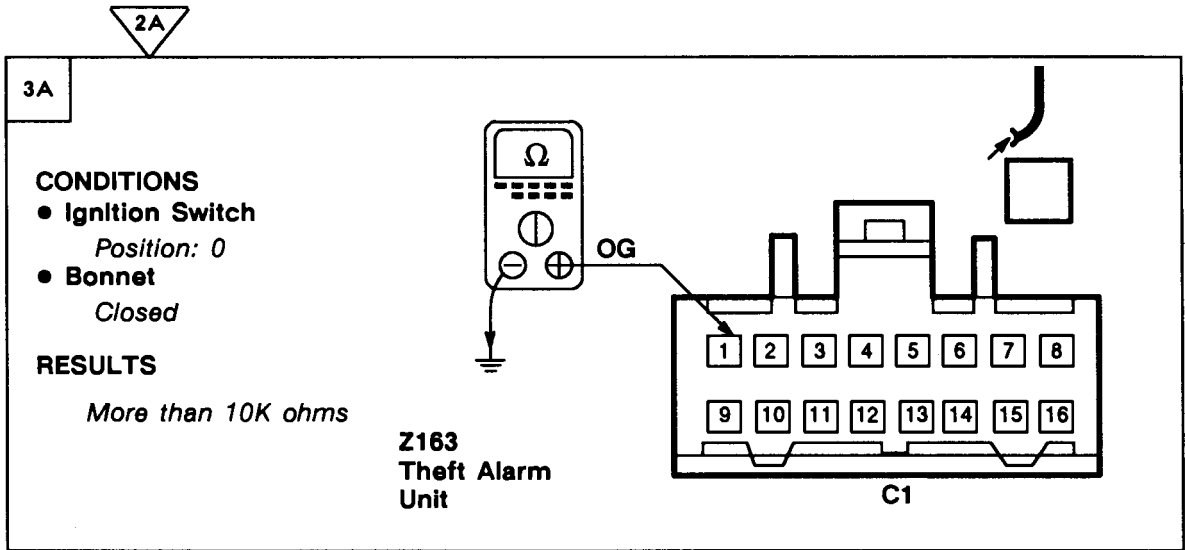
OK



~~OK~~ PROBLEM CAUSE
- B Wire

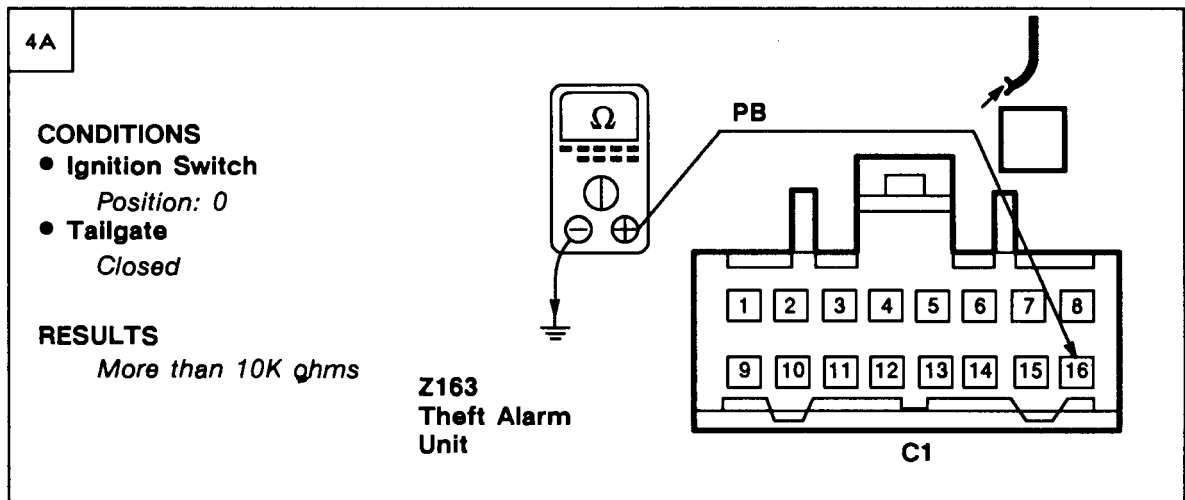
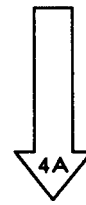
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PROBLEM CAUSE

- OG Wire
- Alarm Bonnet Switch



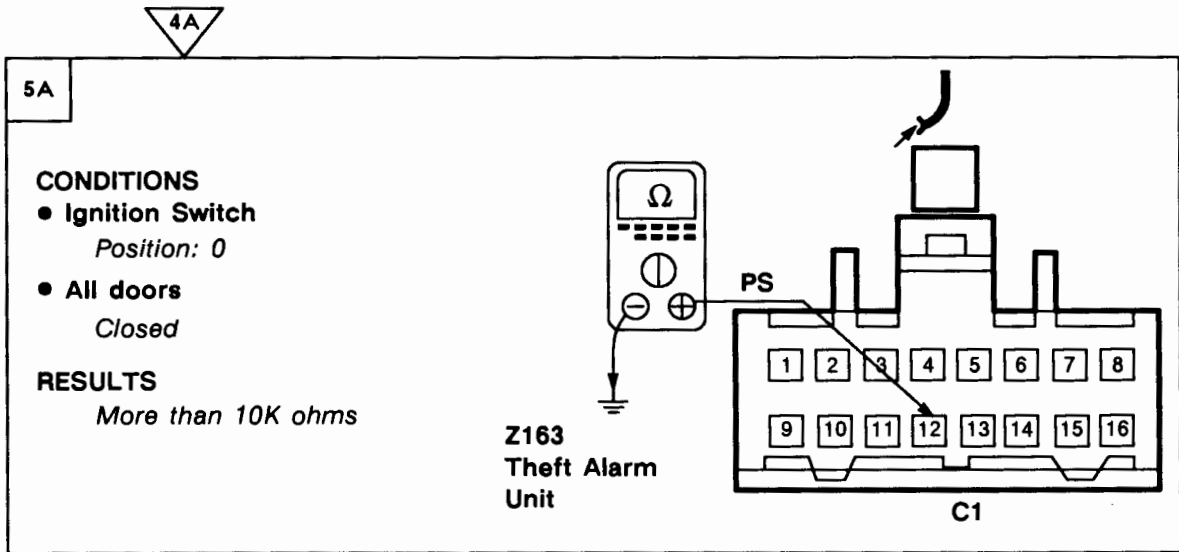
PROBLEM CAUSE

- PB Wire
- Tailgate Switch



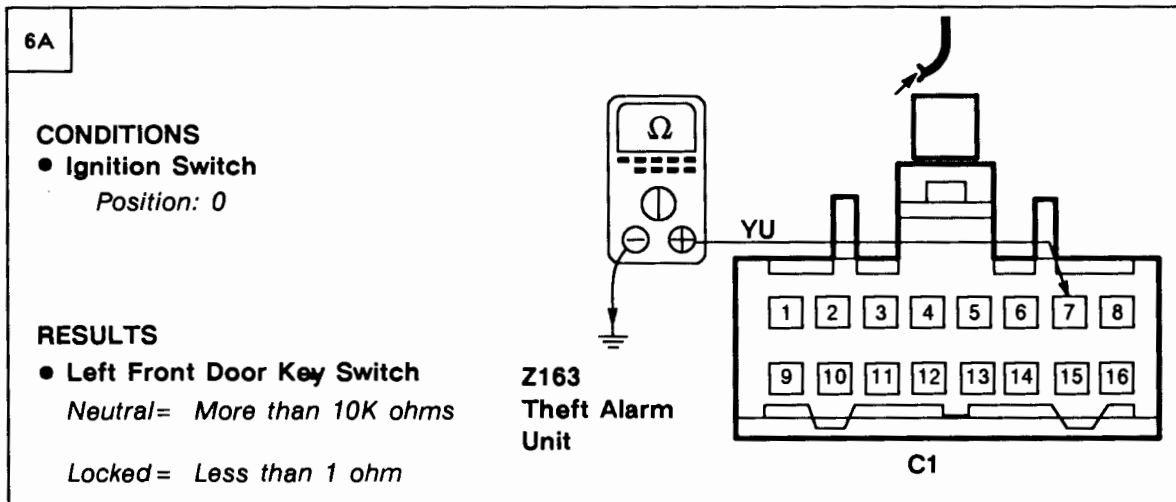
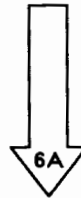
T1 ETM

1993 RANGE ROVER



~~OK~~ PROBLEM CAUSE
- PS Wire

OK

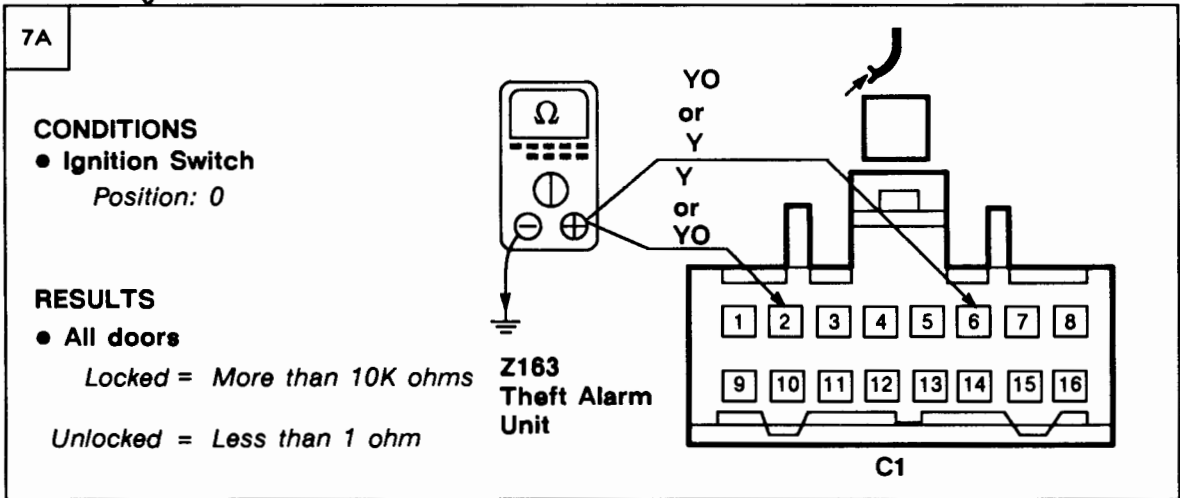


~~OK~~ PROBLEM CAUSE
- YU Wire
- Y Wire
- B Wire
- X201
Left Front Door Key Switch

OK

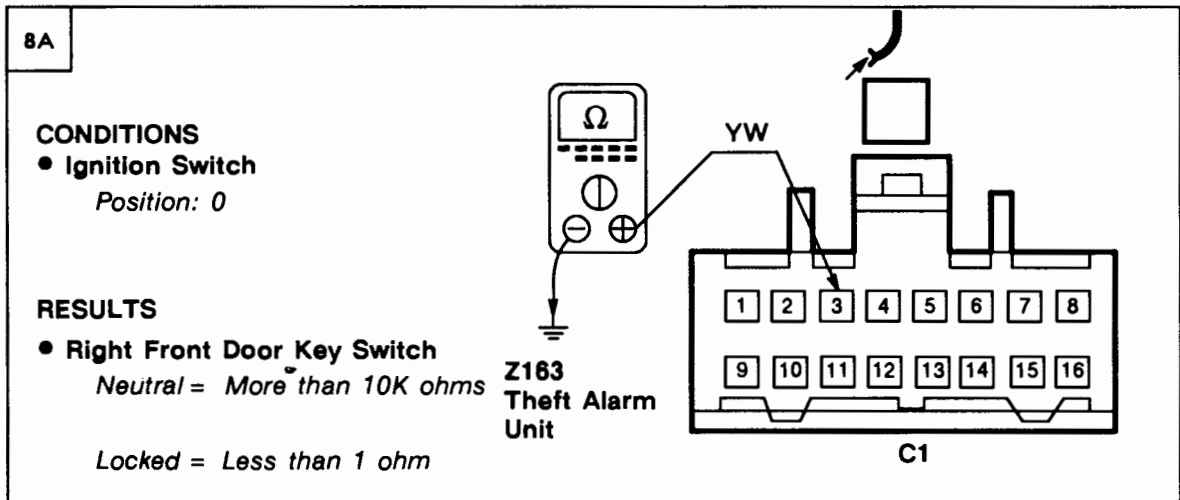
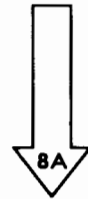


6A



PROBLEM CAUSE

- Y Wire
- YO Wire
- B Wire



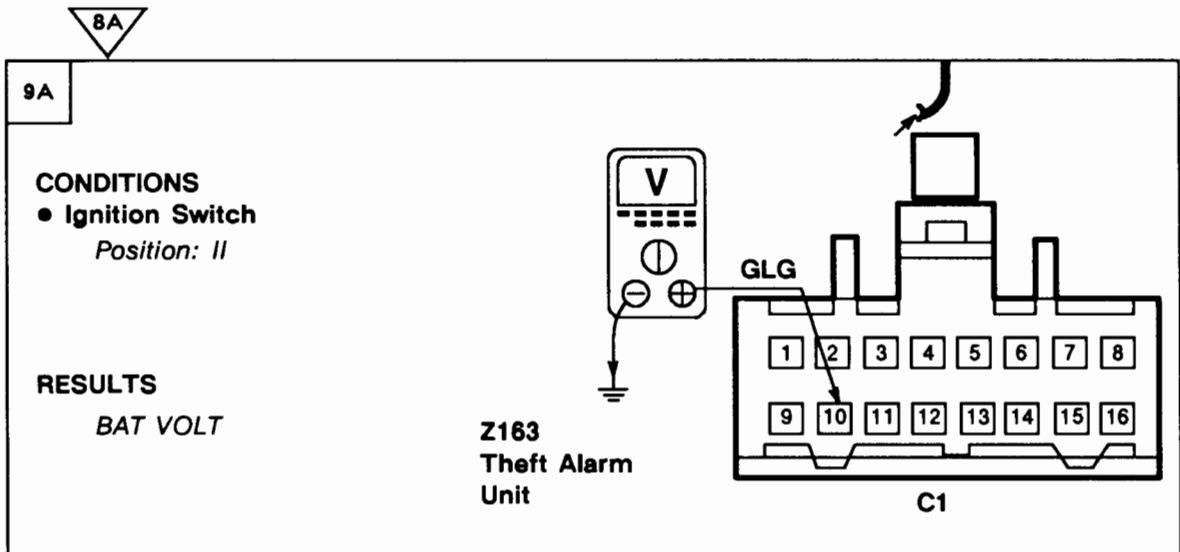
PROBLEM CAUSE

- YW Wire
- Y Wire
- Right Front Door Key Switch
- B Wire



T1 ETM

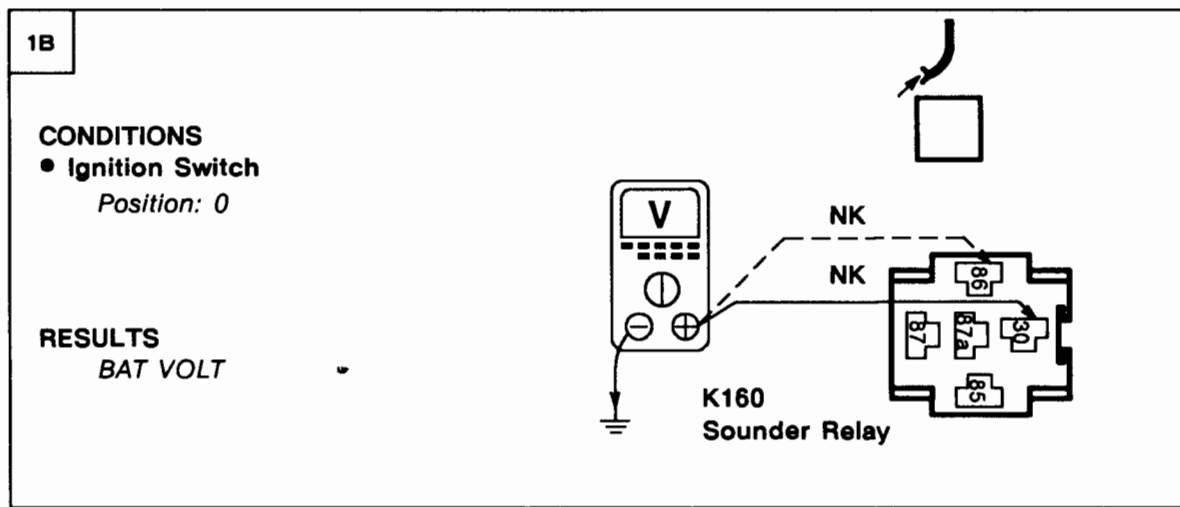
1993 RANGE ROVER



OK PROBLEM CAUSE
- GLG Wire

OK - Z163
Theft Alarm
Unit

Test B

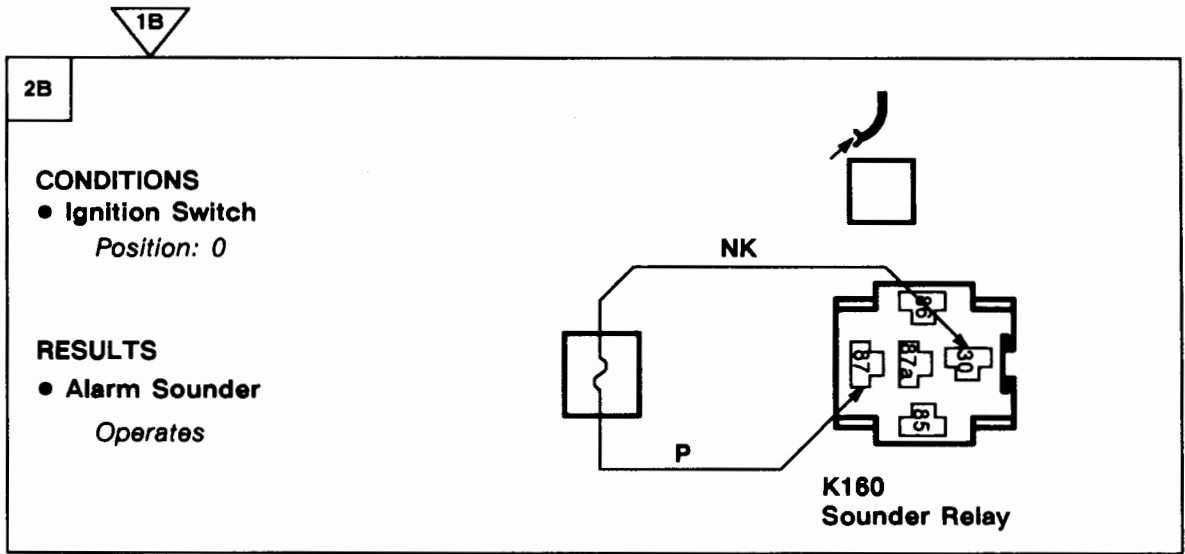


OK PROBLEM CAUSE
- NK Wire

OK

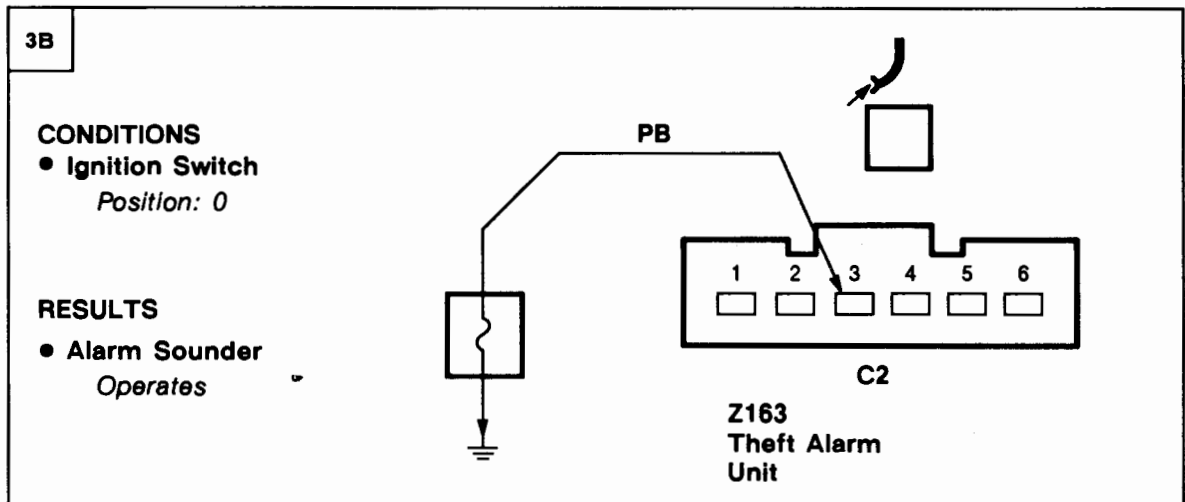
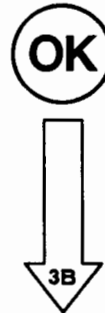
↓

2B



OK PROBLEM CAUSE

- P Wire
- B Wire
- Alarm Sounder



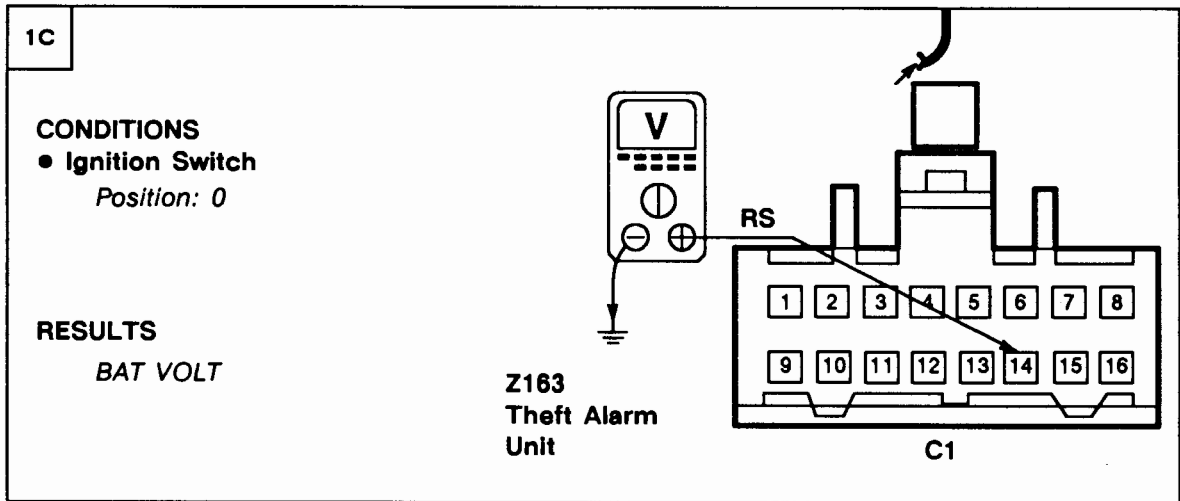
OK PROBLEM CAUSE

- PB Wire
- Sounder Relay

OK PROBLEM CAUSE

- Theft Alarm Unit

Test C



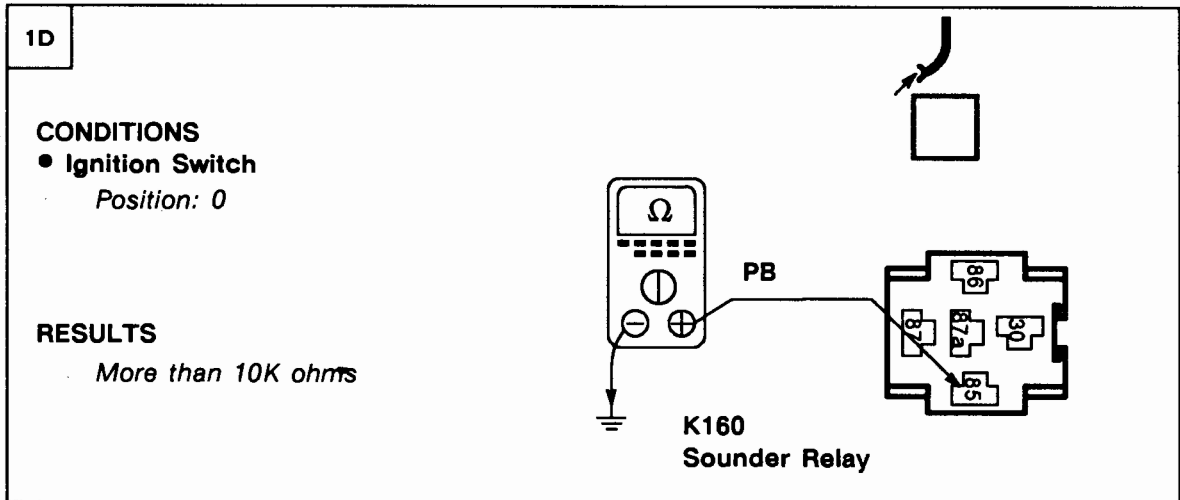
PROBLEM CAUSE

- RS Wire
- NK Wire
- B151
Theft Alarm LED



- Z163
Theft Alarm Unit

Test D



PROBLEM CAUSE

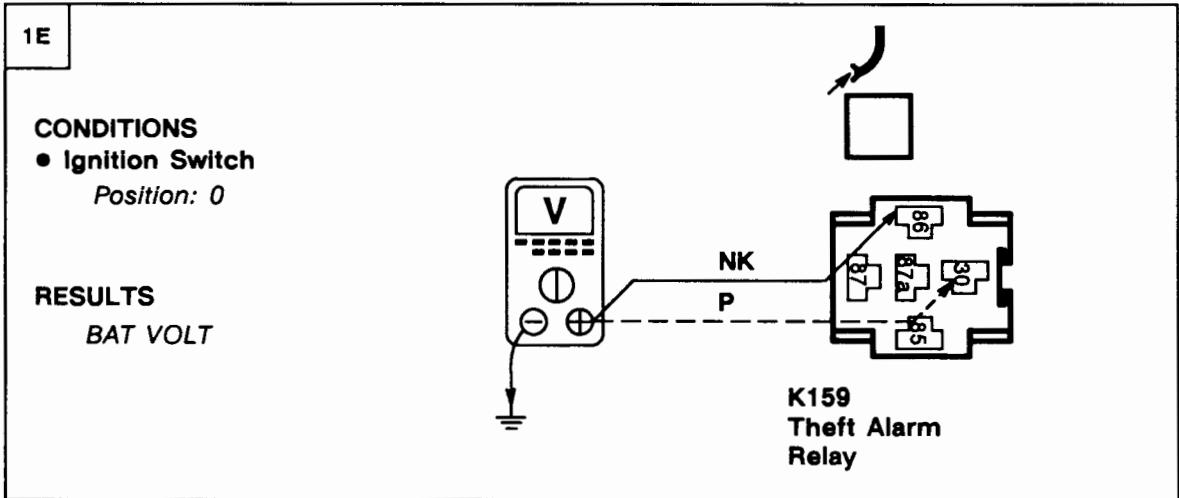
- PB Wire
- Z163
Theft Alarm Unit



PROBLEM CAUSE

- K160
Sounder Relay

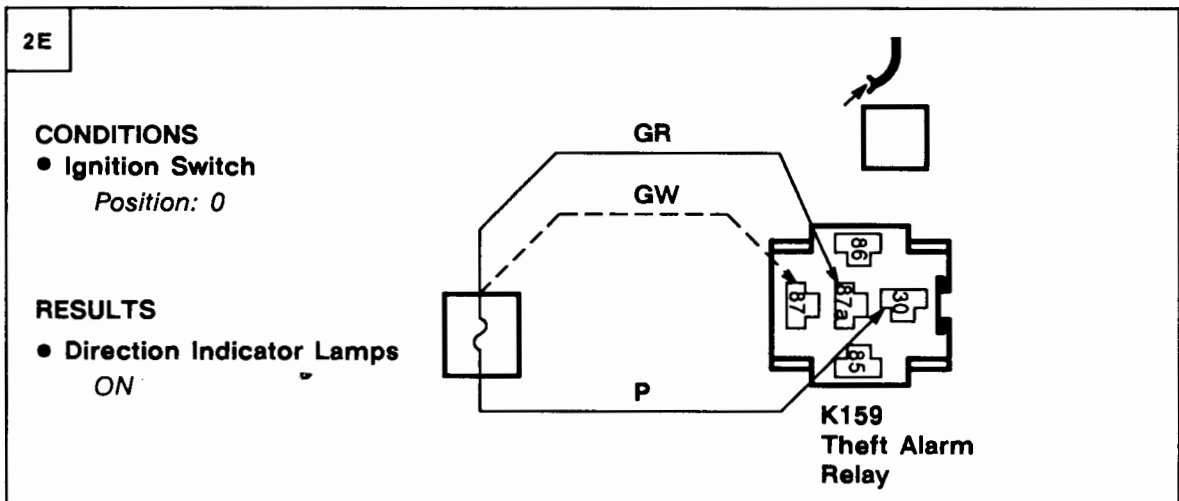
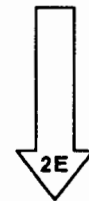
Test E



OK PROBLEM CAUSE

- NK Wire
- B Wire

OK



OK PROBLEM CAUSE

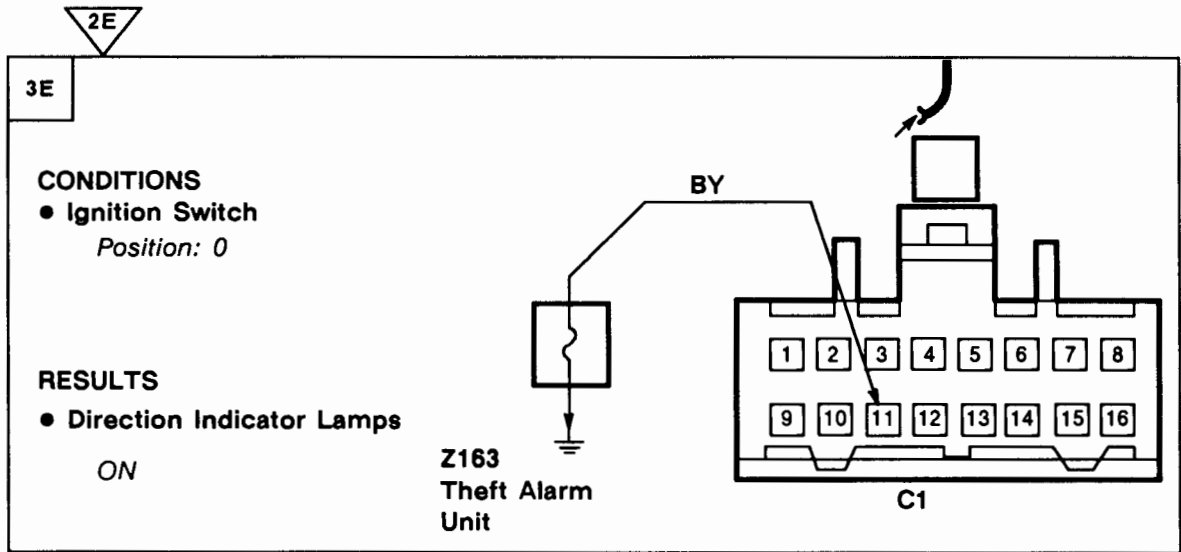
- GR Wire
- GW Wire

OK



T1 ETM

1993 RANGE ROVER



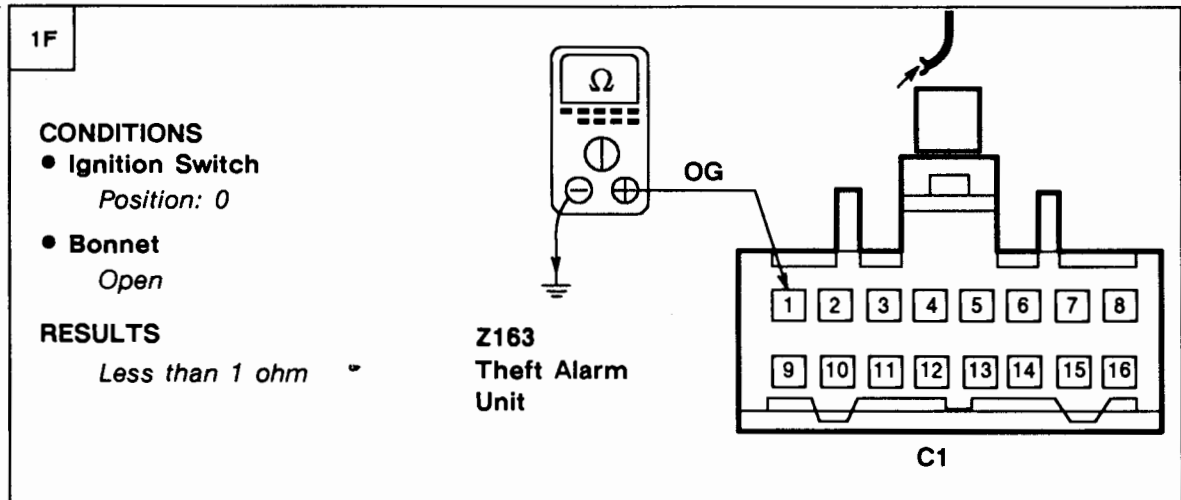
PROBLEM CAUSE

- BY Wire
- Theft Alarm Relay



- Z163
Theft Alarm
Unit

Test F



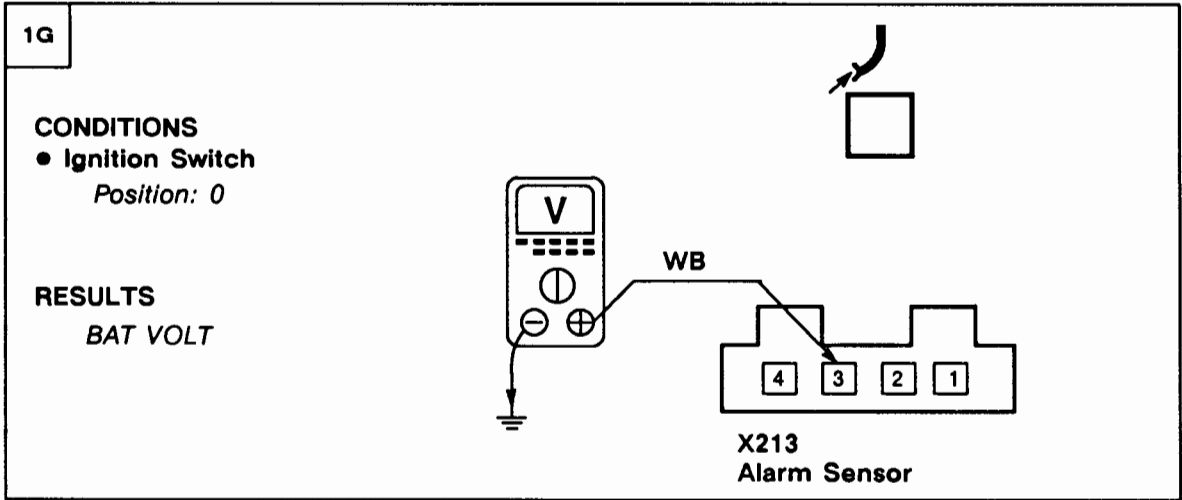
PROBLEM CAUSE

- OG Wire
- B Wire
- X212
Alarm Bonnet
Switch



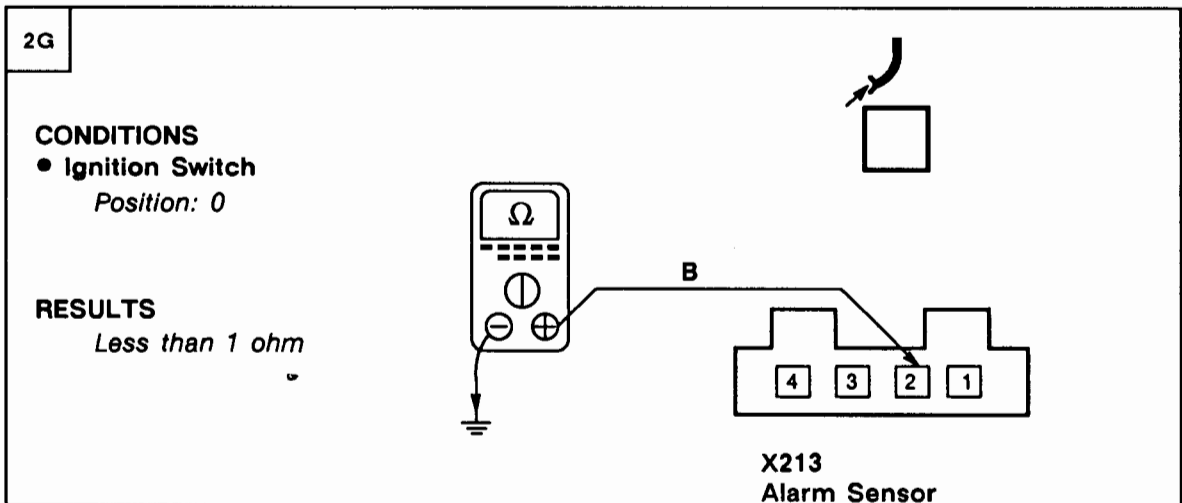
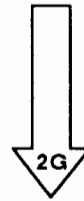
- Z163
Theft Alarm
Unit

Test G



OK PROBLEM CAUSE
 - WB Wire
 - Theft Alarm Unit

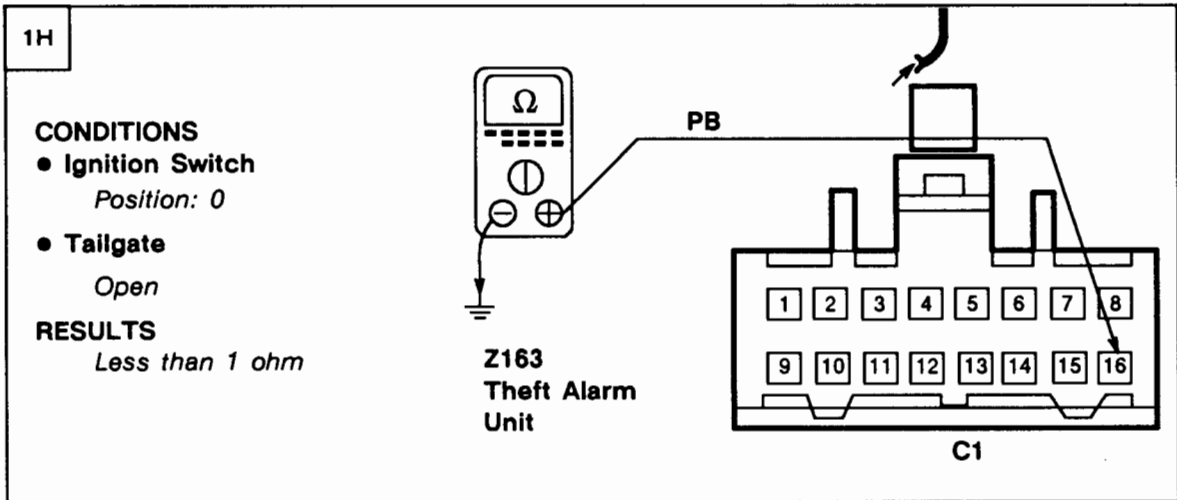
OK



OK PROBLEM CAUSE
 - B Wire

OK PROBLEM CAUSE
 - NB Wire
 - Alarm Sensor
 - Theft Alarm Unit

Test H



PROBLEM CAUSE

- PB Wire
- X170
Tailgate
Switch



- Z163
Theft Alarm
Unit

CIRCUIT OPERATION

The theft alarm system is designed to offer easy remote locking and unlocking of the vehicle without having to actively select the alarm function. When armed, all doors, tailgate and bonnet are protected against unauthorized access.

When an intrusion is detected, the horn will sound intermittently and the hazard lights will flash for 30 seconds.

With the theft alarm system, the central locking functions are controlled by the alarm ECU and may be operated by the key, sill buttons or the handset.

Vehicle status is indicated by three devices:

1. the horn
2. the hazard lights
3. the dashboard LED

When the vehicle arms, the hazard lights will flash three times and the dashboard LED will flash rapidly for 10 seconds and then at a lower rate for the duration of the period the vehicle is armed. When the vehicle is disarmed, the hazard lights will flash once and the dashboard LED will extinguish. If the LED remains lit after the system has been disarmed, it indicates that the alarm has been triggered. Turning on the ignition will extinguish the LED.

Key Activation

Use of the key will actuate or deactivate the system. The time to lock or unlock with the key must be less than 5 seconds. The alarm will sound if the key is held in the unlocked position longer than 5 seconds while the system is armed.

Partially Armed Mode

If a door, the tailgate or the bonnet is left open when the system is armed, the hazard lights will not flash and the dashboard LED will not light for 10 seconds. This indicates a mislock condition. If the open door, tailgate or bonnet is subsequently closed, after a 5 second delay, the doors will unlock and immediately relock and the system will be fully armed

Handset Transmitter

The handset LED will give one short flash when the button is pressed and released. If the button is held down, the handset LED will light again after 2 seconds.

The handset contains a set of random rolling codes programmed into the ECU before it leaves the factory. Each time the handset is pressed, a different code is transmitted to the ECU.

The batteries of the handset need to be replaced when:

- the handset LED flashes continuously when the button is pressed, or,
- when arming the vehicle, the hazard lights flash once for 3 seconds, instead of three times.

Inertia Switch

An inertia switch is incorporated in the alarm system ECU. If ignition is on and the vehicle receives an impact sufficient to activate the inertia switch, the ECU will unlock the door locks and activate the hazard flashers. Central locking will remain disabled for 30 seconds. To reset, turn the ignition switch off and then on after the 30 seconds have elapsed.

For power up and ECU replacement, refer to Section 86 of the Range Rover Workshop Manual P/N LHAWMUSA01.

Theft Alarm Unit (Z163)

The Theft Alarm Unit (Z163) receives power at all times. It receives a ground signal from the Alarm Bonnet Switch (X212) with the bonnet open. It receives a ground signal from the Tailgate Switch (X170) with the tailgate open. It receives ground signals from various door switches (X118, X163, X142, X150) via the Interior Lamps Delay Unit (Z144) when the doors are open.

It receives a ground signal from the Left and Right Front Door Key Switches (X201, X202), if the switches are closed by turning the key in any direction.

It receives a ground signal from the Left and Right Lock Actuators (M114, M122) when the doors are unlocked.

When the Theft Alarm Unit interprets any of these signals as an unauthorized access to the vehicle, it sends a ground signal to the Theft Alarm Relay (K159) and the Sounder Relay (K160). Both relays are energized, applying voltage to the horns and the hazard lights.

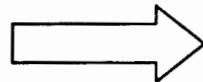
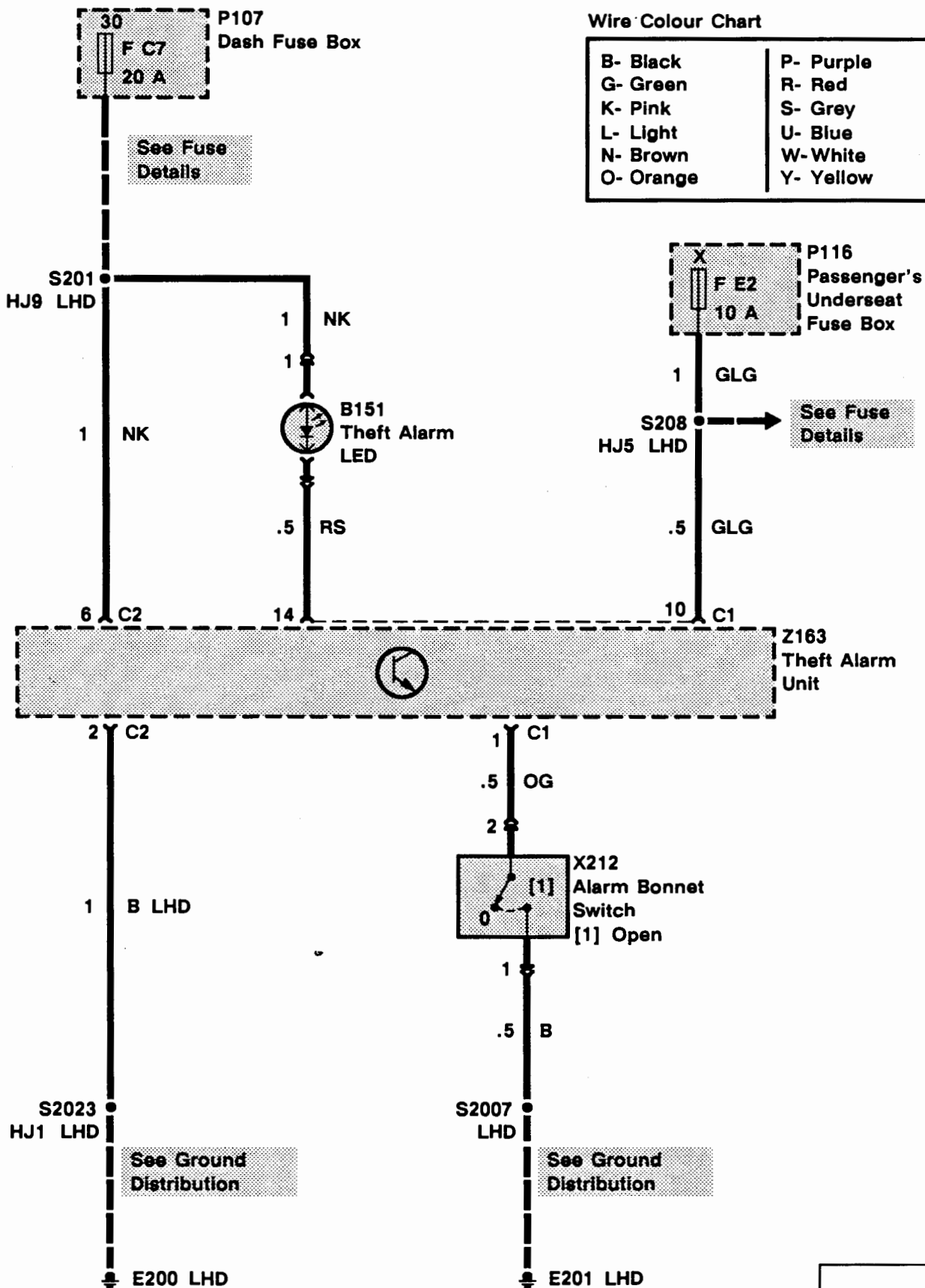
Interior Lamps Delay Unit (Z144)

When the alarm is disarmed, the Interior Light Relay (K165) grounds the wire between the Tailgate Switch (X170) and the Interior Lamps Delay Unit (Z144).

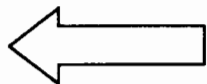
The Interior Lamps Delay Unit is then triggered and turns the light on after a programmed delay.

T2 ETM

1994 RANGE ROVER

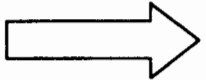
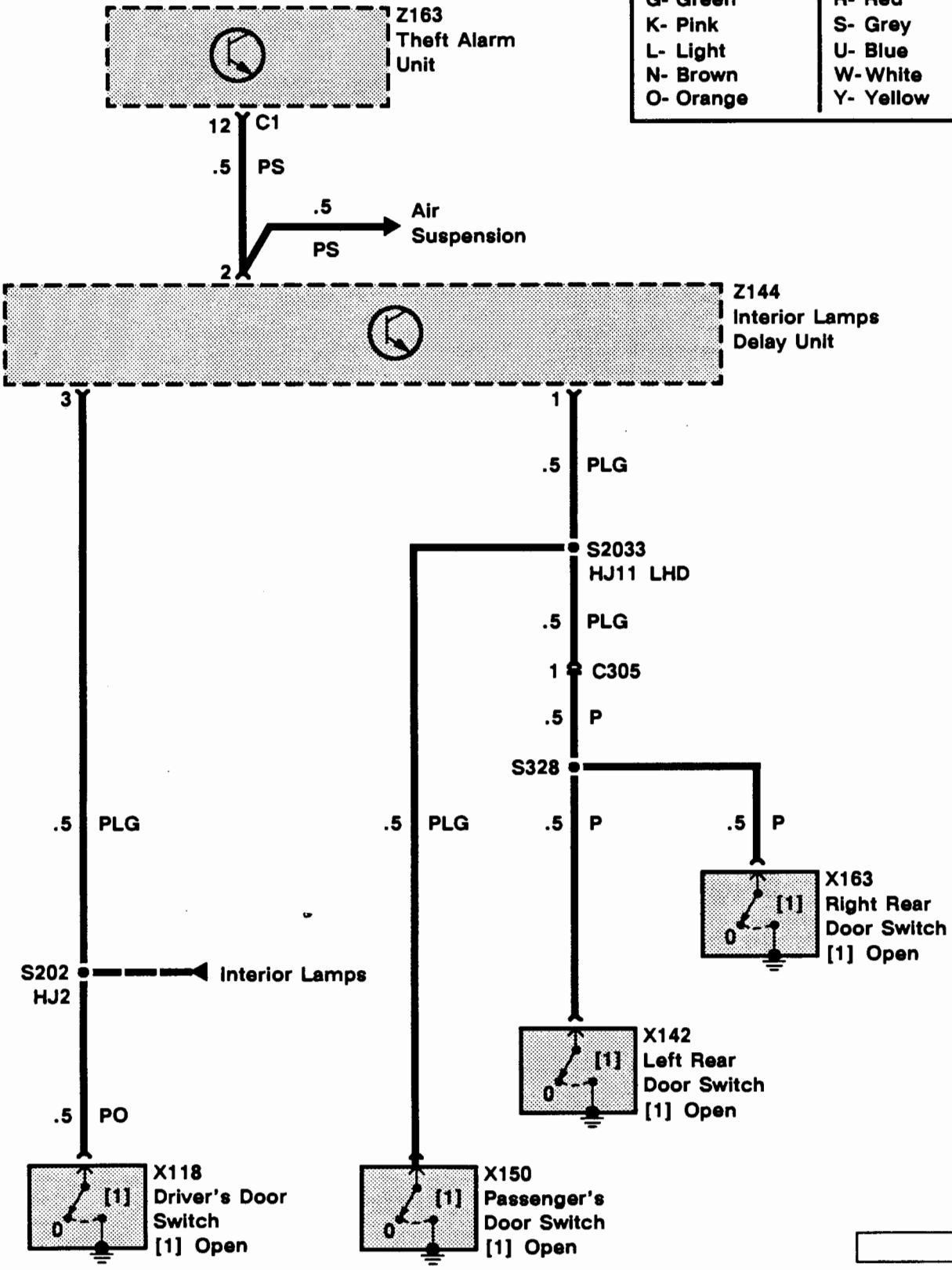


ADD: AUG 93



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

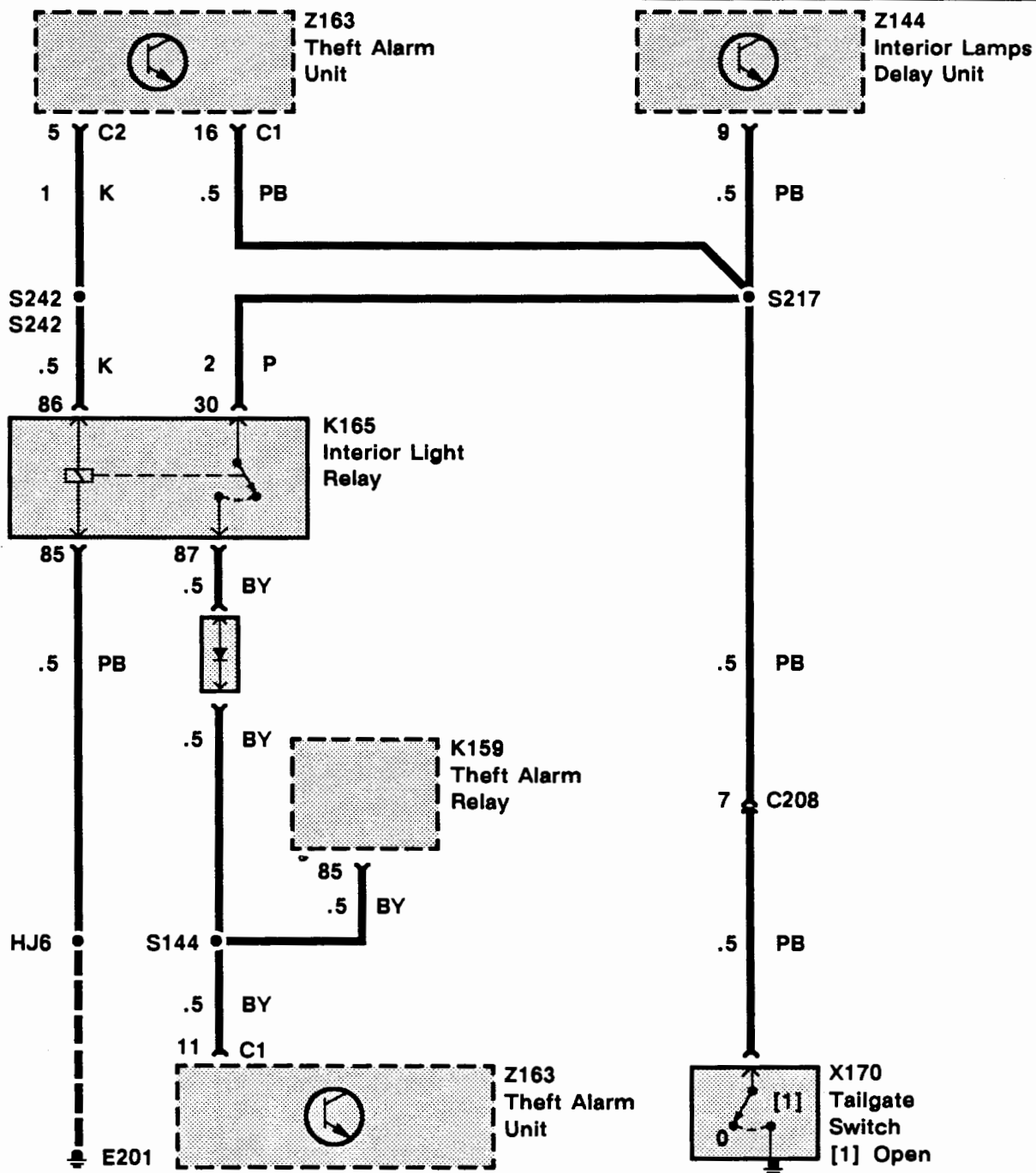


T2 ETM

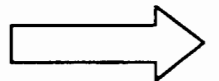
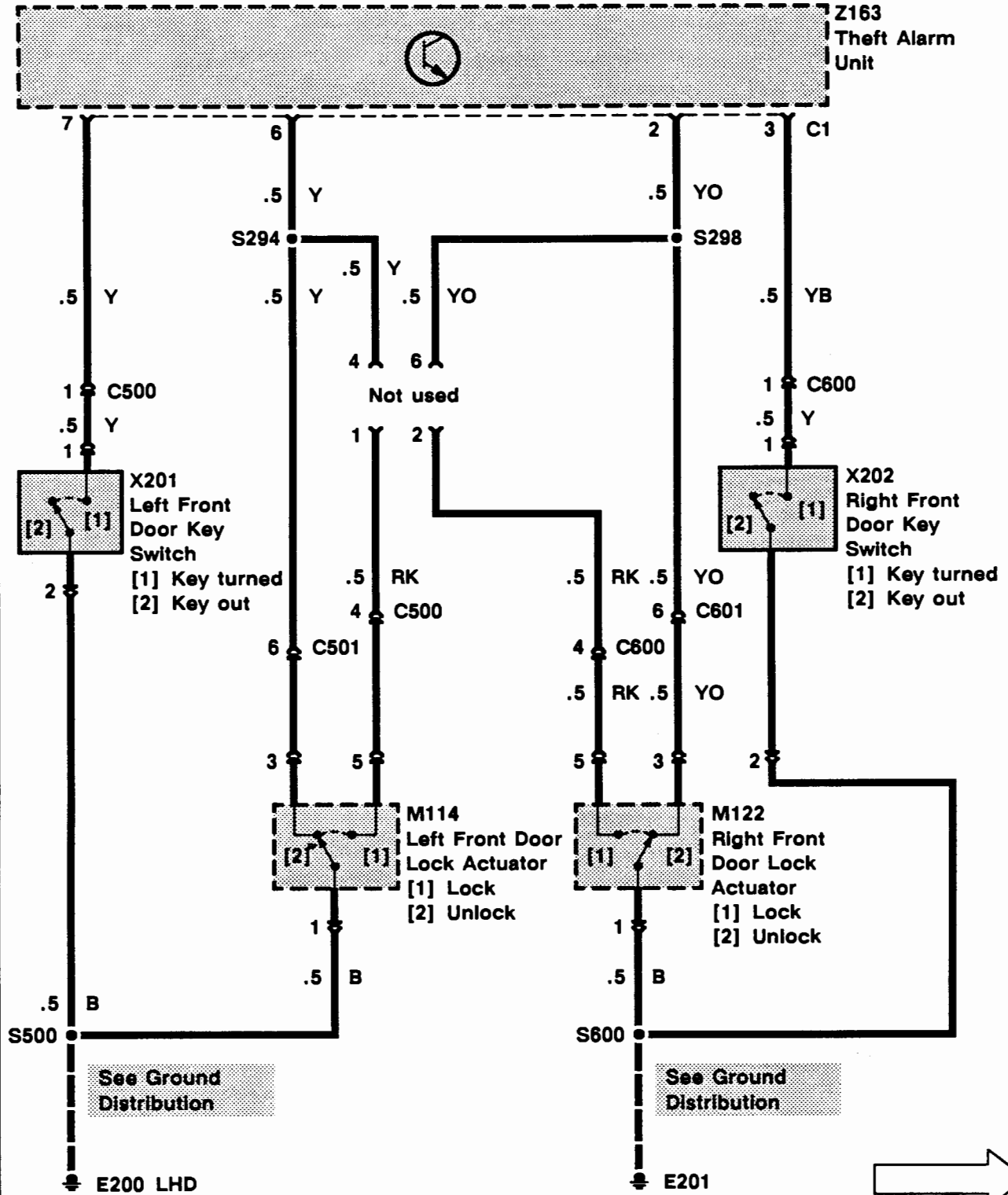
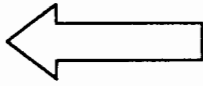
1994 RANGE ROVER

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



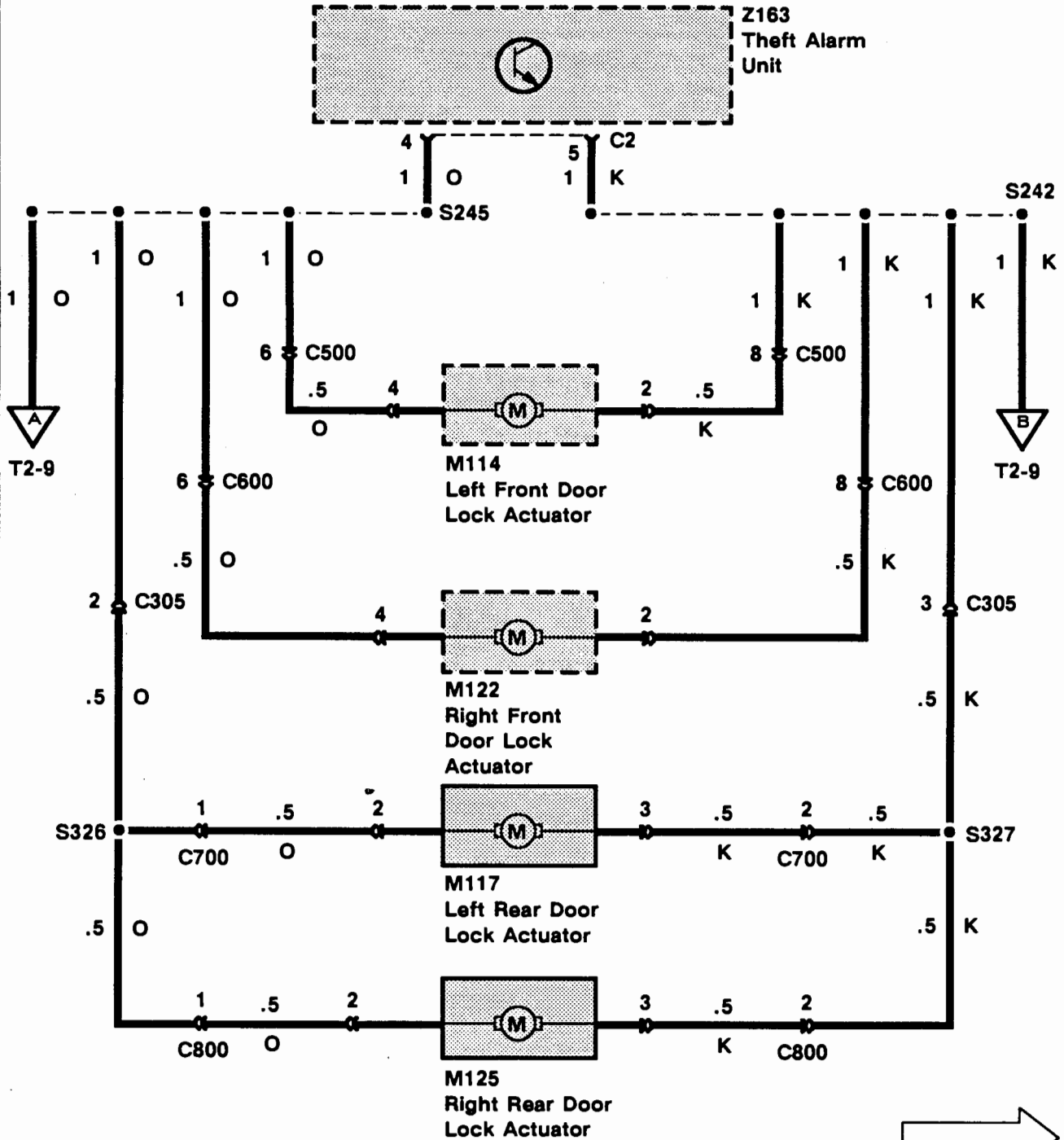
ADD: AUG 93



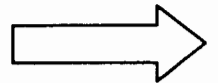
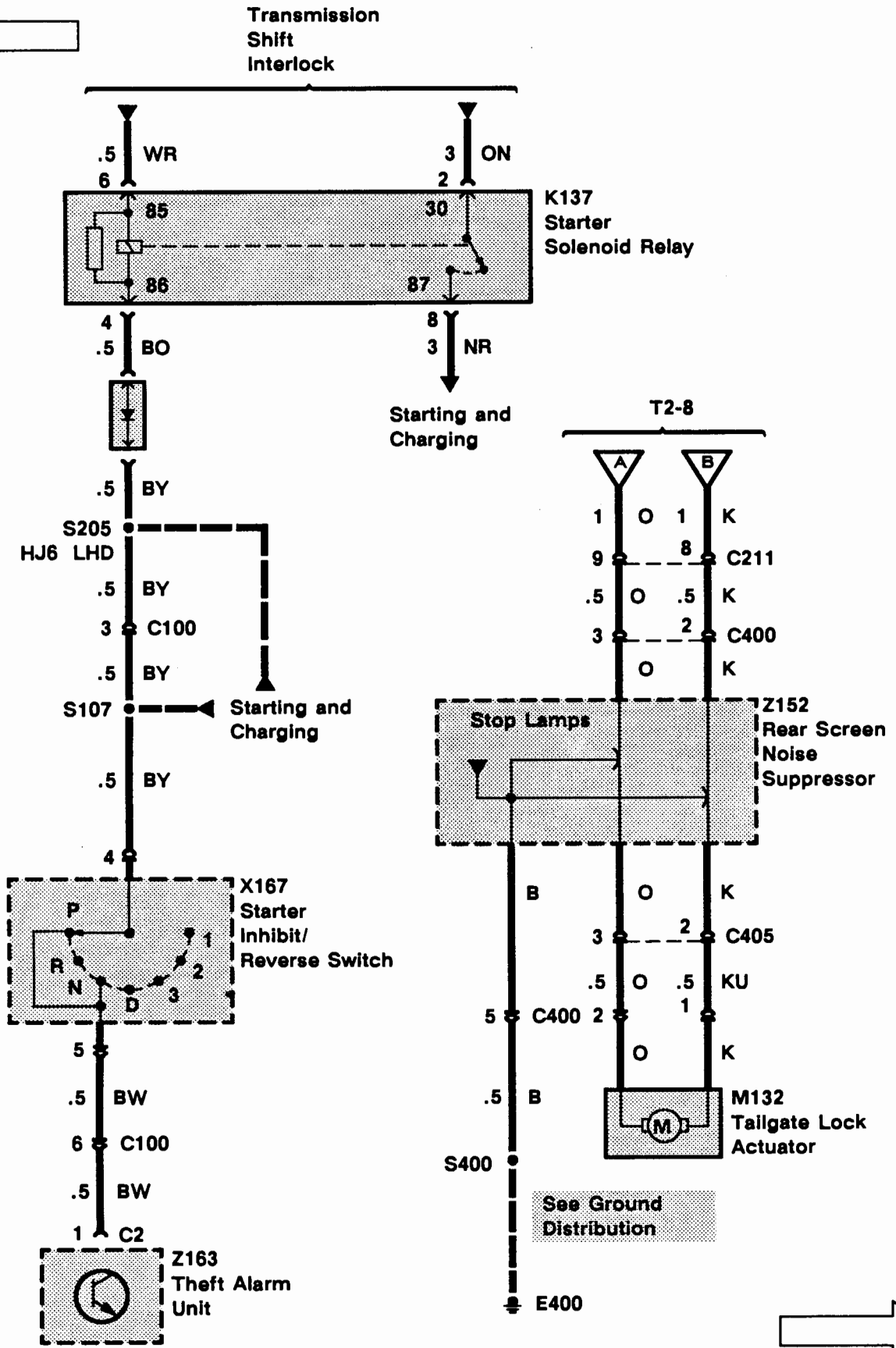
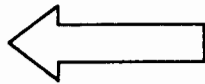
ADD: AUG 93

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



ADD: AUG 93

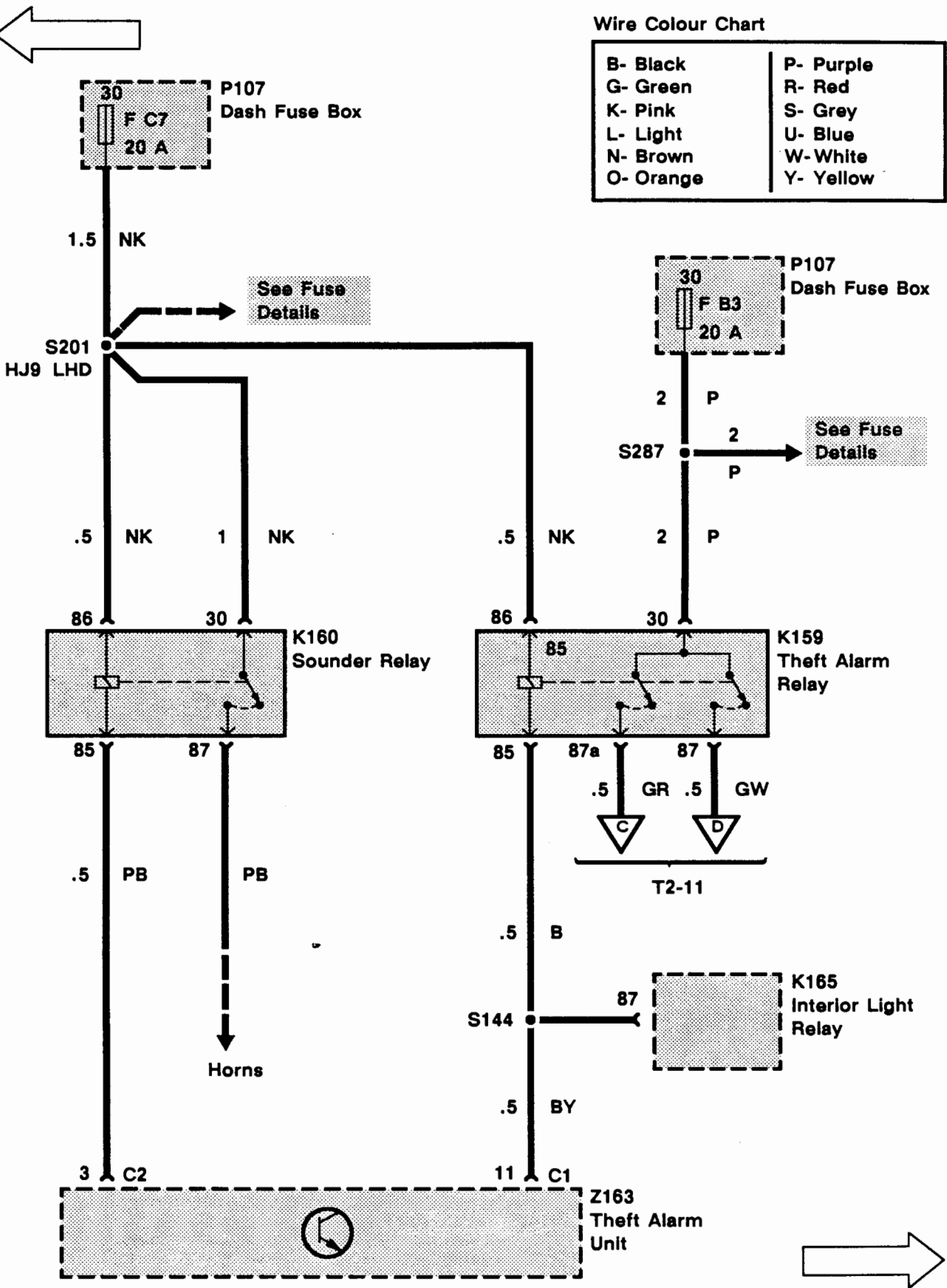


T2 ETM

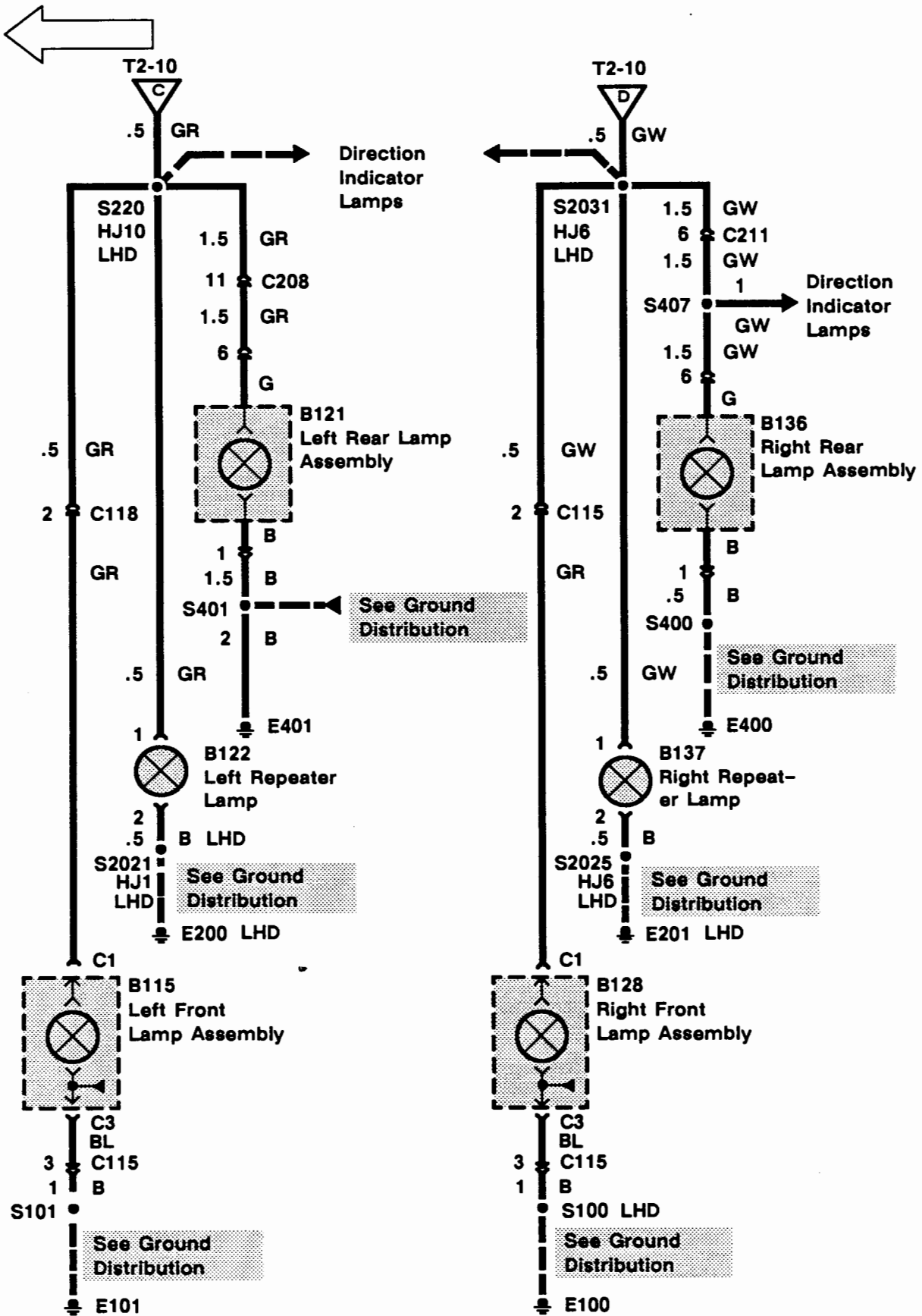
1994 RANGE ROVER

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



ADD: AUG 93



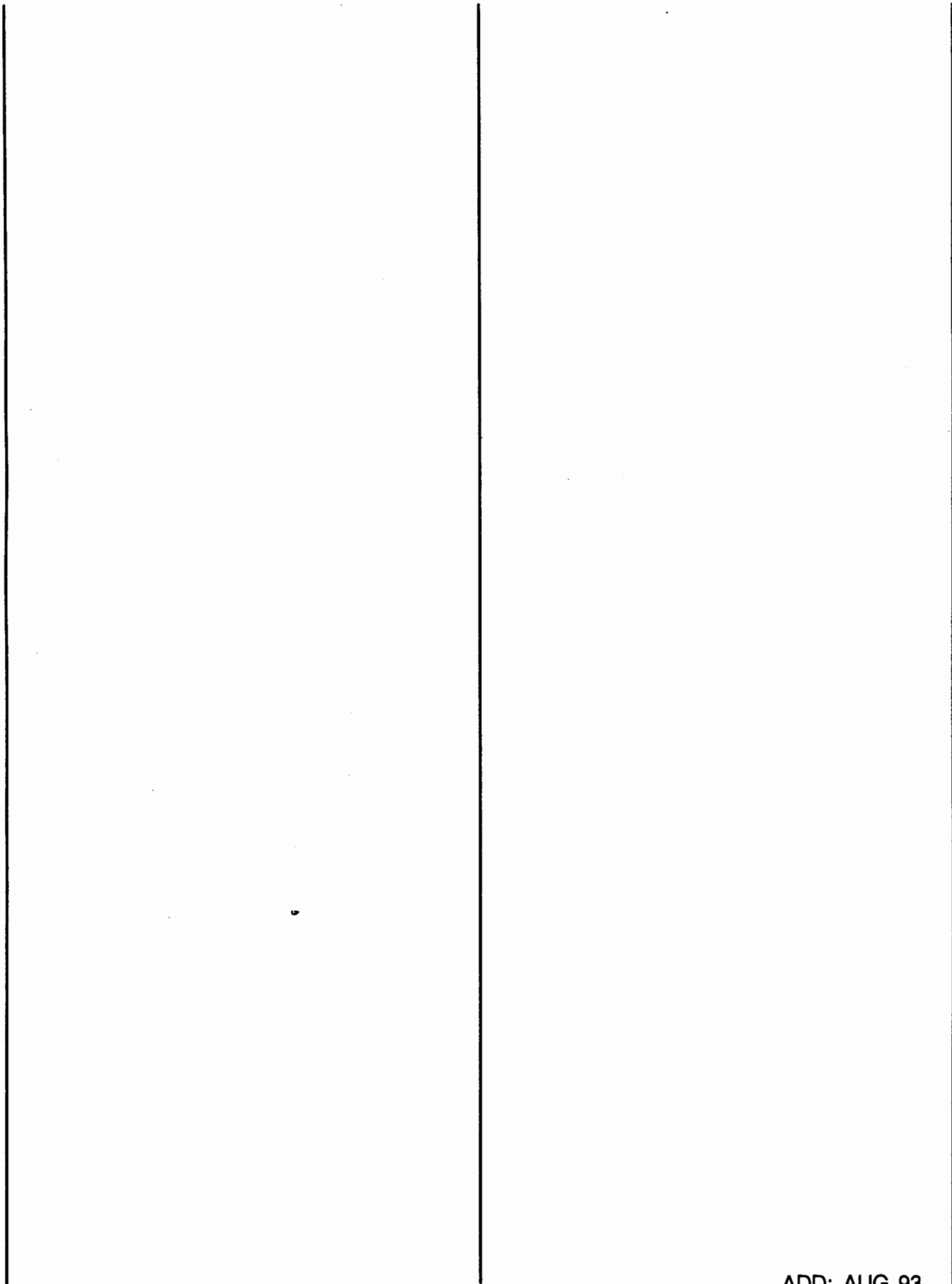
ADD: AUG 93

TROUBLESHOOTING HINTS

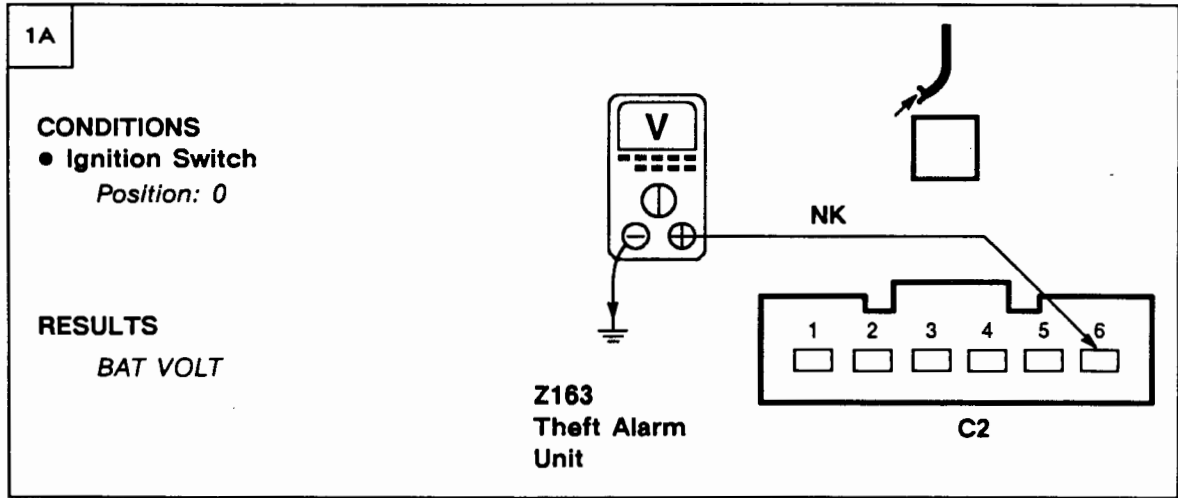
1. Check Fuses F C7, F B3, and F E2.
2. If the interior lights do not come on when a door is open, check suspect door switch and associated wiring.

SYSTEM DIAGNOSIS

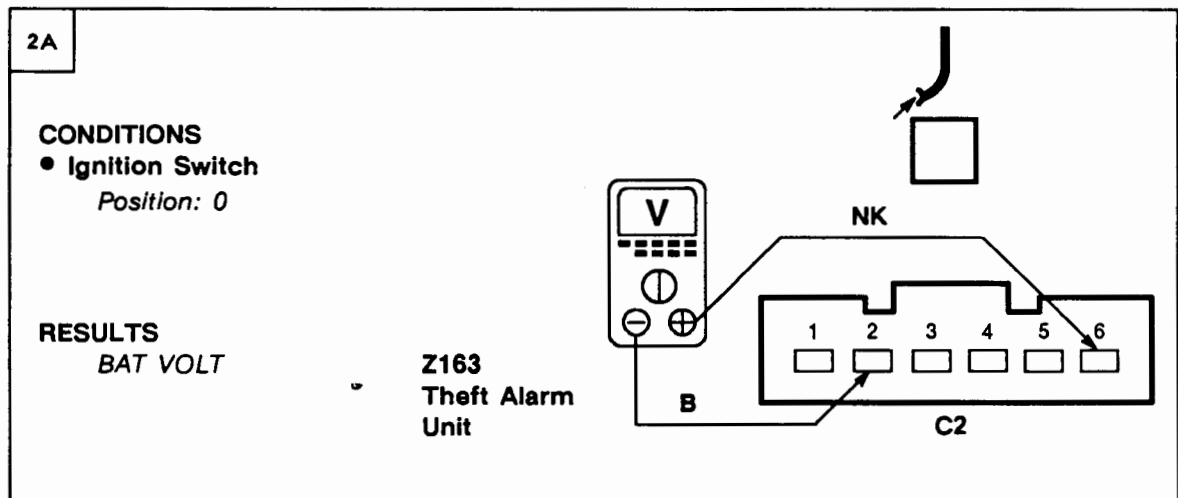
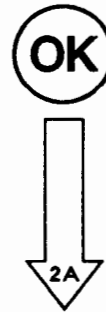
1. If the system will not arm, do Test A.
2. If the system arms, but will not trigger at all, do Test B.
3. If the horns do not sound when triggered, do Test B.
4. If the direction indicator lamps do not flash when triggered, do Test E.
5. If the system will not trigger when the bonnet is open, do Test F.
6. If the system will not trigger when the tailgate is open, do Test G.
7. If the Theft Alarm LED (B151) does not operate, do Test C.
8. If the horn sounds continuously, do Test D.
9. If the system will not disarm, do Test A.



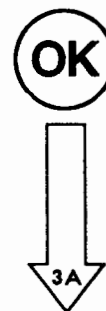
Test A

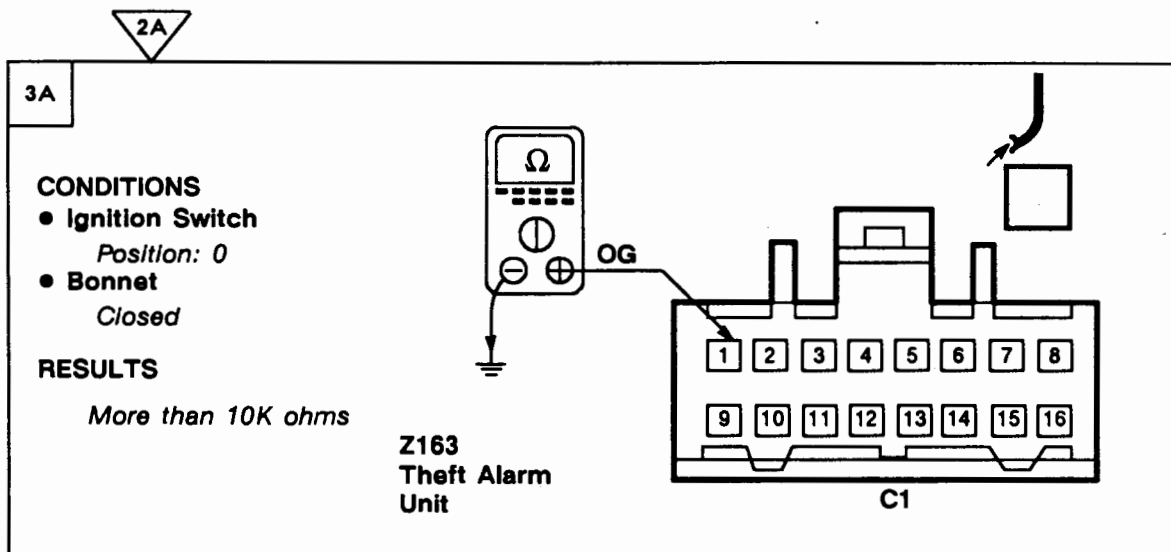


~~OK~~ PROBLEM CAUSE
- NK Wire



~~OK~~ PROBLEM CAUSE
- B Wire



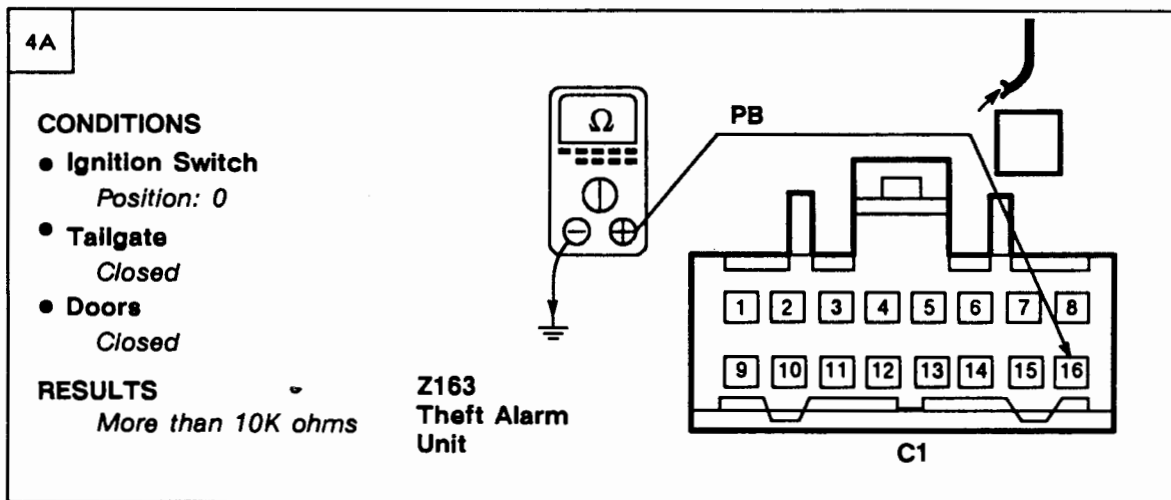


OK
PROBLEM CAUSE
 - OG Wire
 - Alarm Bonnet Switch

OK

↓

4A

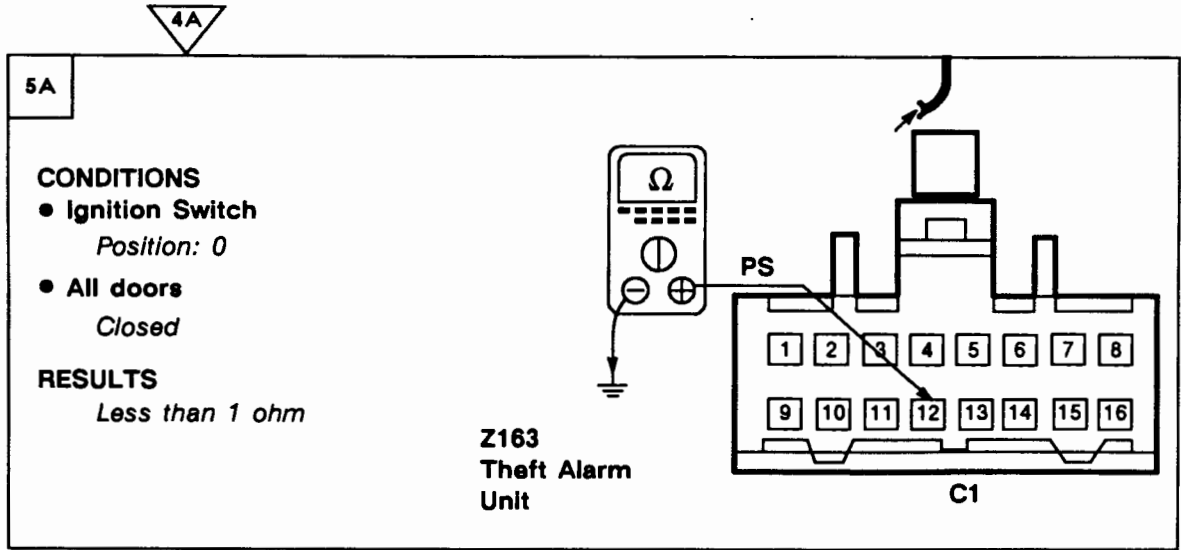


OK
PROBLEM CAUSE
 - PB Wire
 - Tailgate Switch

OK

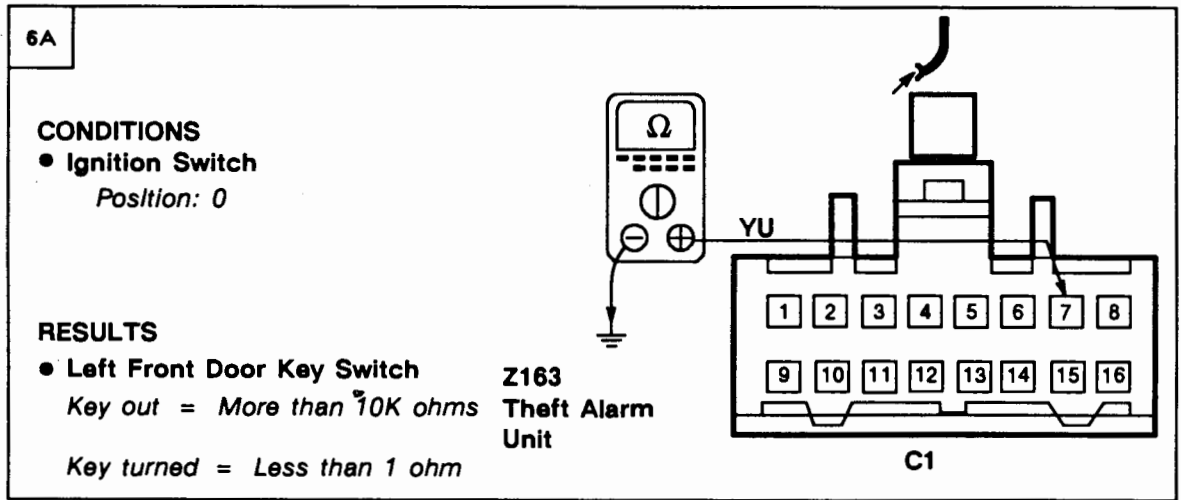
↓

5A



PROBLEM CAUSE

- PS Wire
- Interior Lamps
Delay Unit
- PLG Wires
- All Door Switches

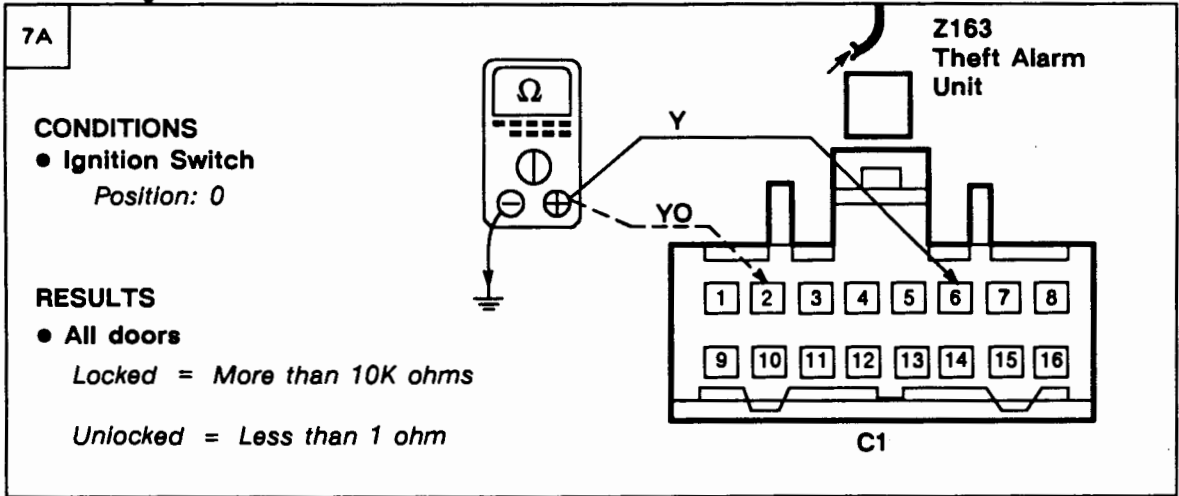


PROBLEM CAUSE

- Y Wire
- B Wire
- Left Front Door
Key Switch

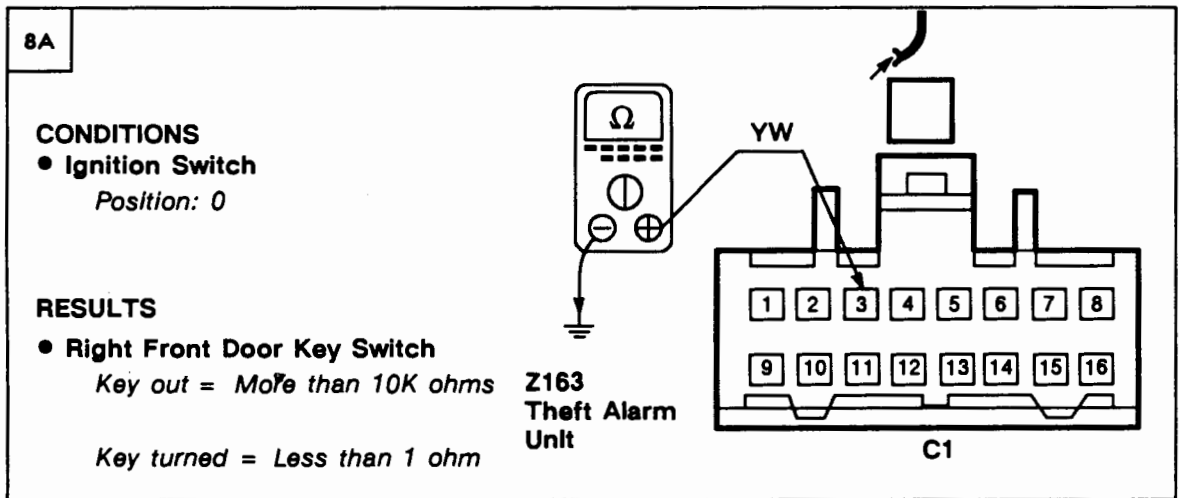
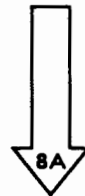


6A



PROBLEM CAUSE

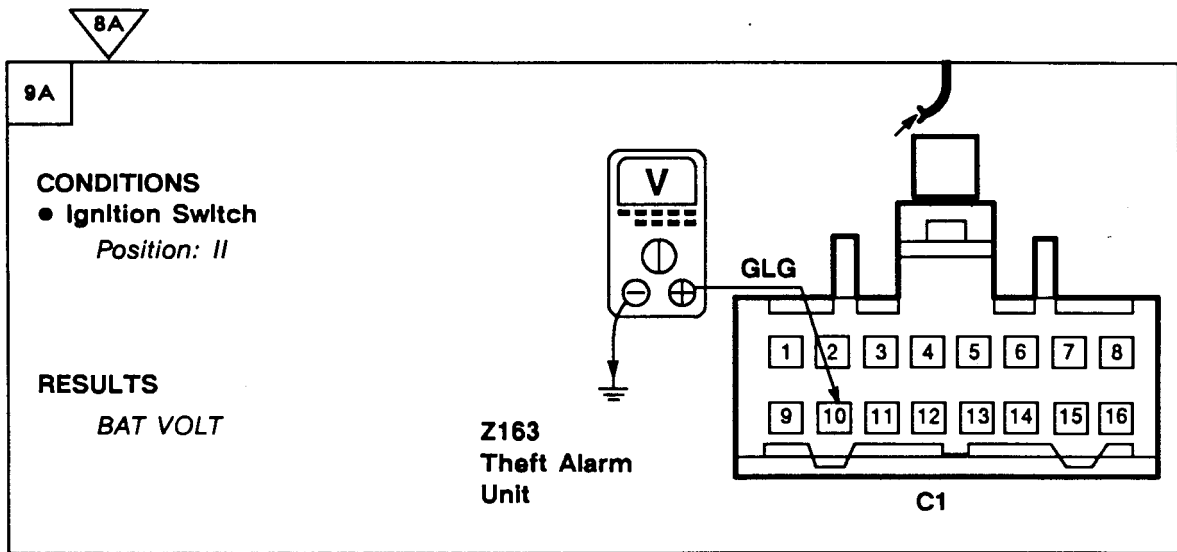
- Y Wire
- YO Wire
- B Wire
- Left or Right Front Door Lock Actuator



PROBLEM CAUSE

- YW Wire
- Y Wire
- Right Front Door Key Switch
- B Wire

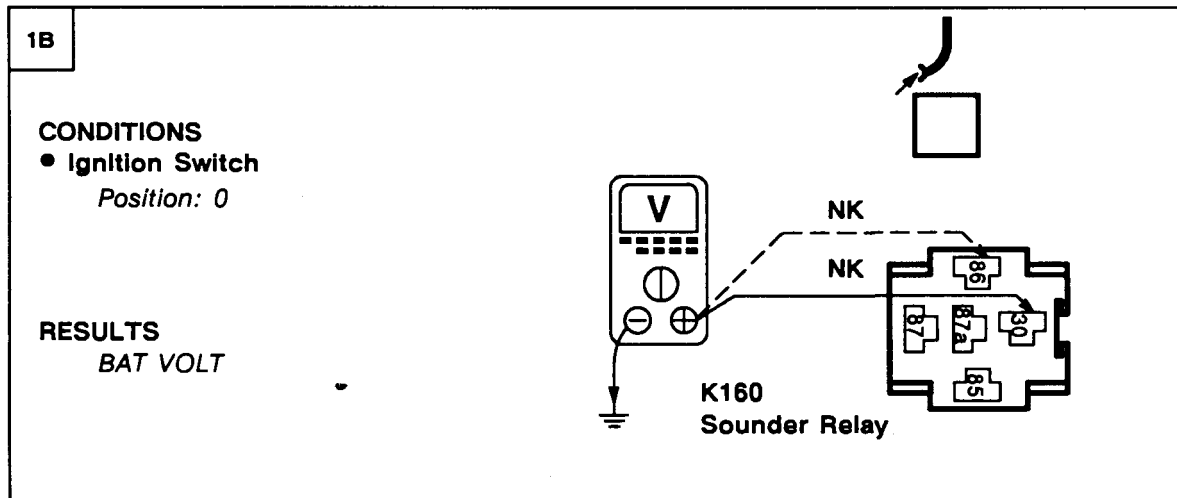




~~OK~~ PROBLEM CAUSE
- GLG Wire

OK PROBLEM CAUSE
- Theft Alarm
Unit

Test B

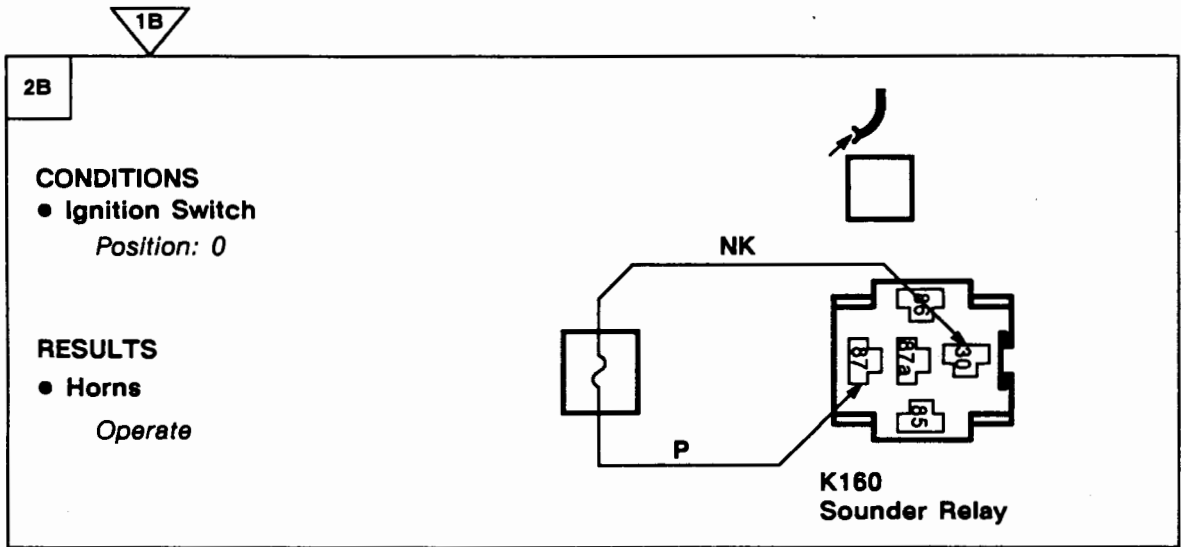


~~OK~~ PROBLEM CAUSE
- NK Wire

OK

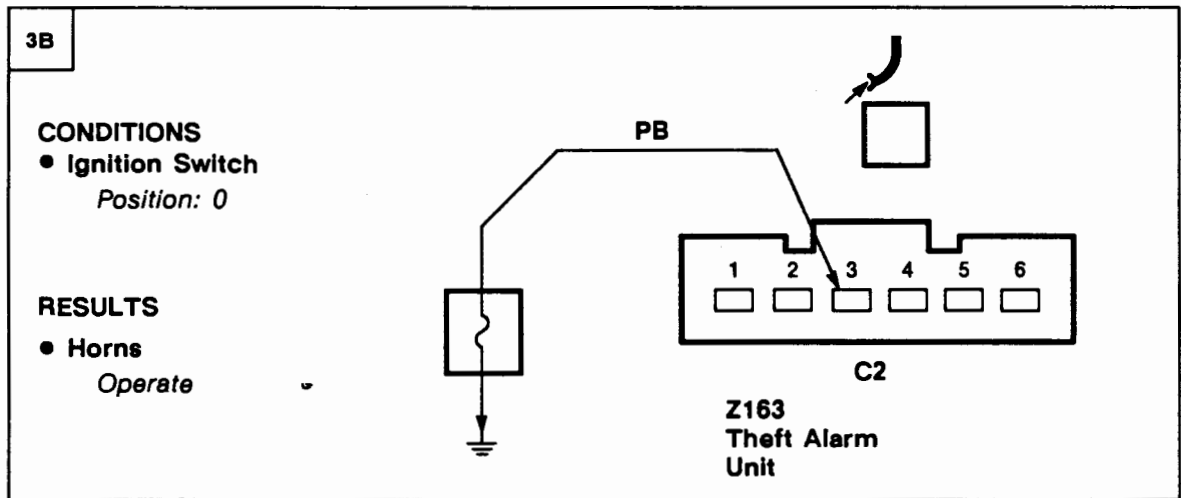
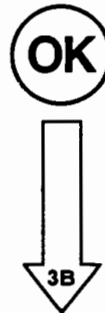
↓

2B



OK PROBLEM CAUSE

- P Wire
- B Wire
- Horns



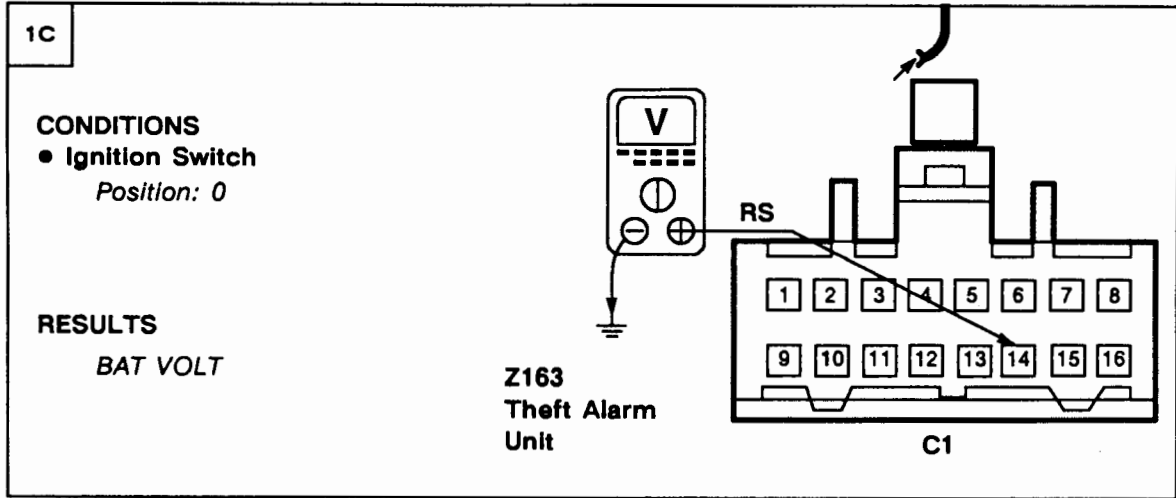
OK PROBLEM CAUSE

- PB Wire
- Sounder Relay

OK PROBLEM CAUSE

- Theft Alarm Unit

Test C



PROBLEM CAUSE

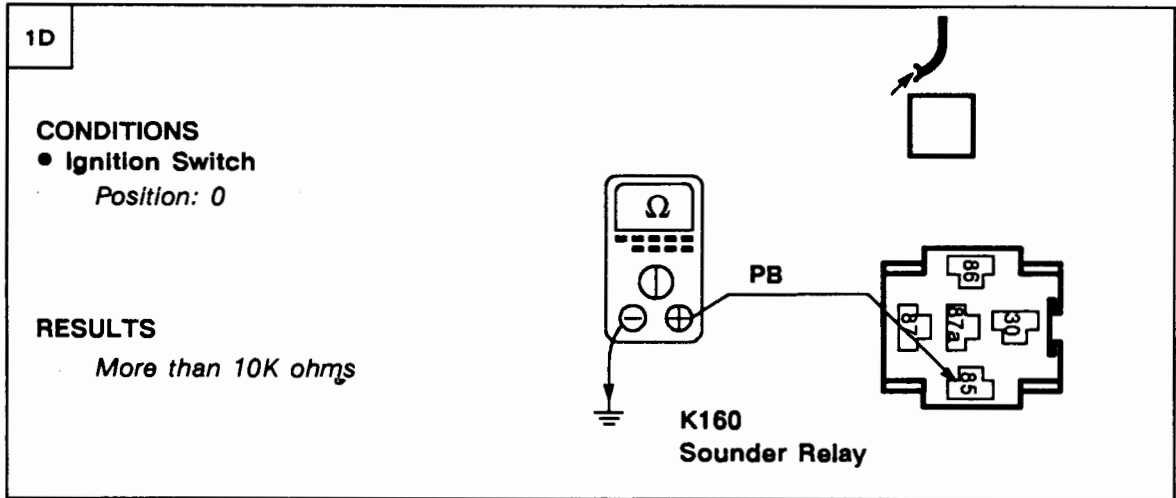
- RS Wire
- NK Wire
- Theft Alarm LED



PROBLEM CAUSE

- Theft Alarm Unit

Test D



PROBLEM CAUSE

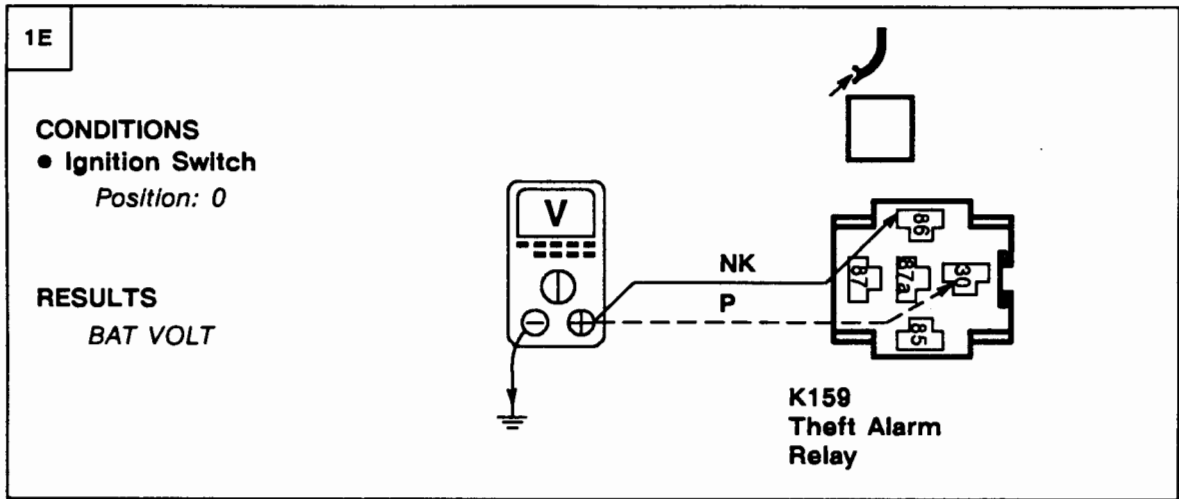
- PB Wire
- Theft Alarm Unit



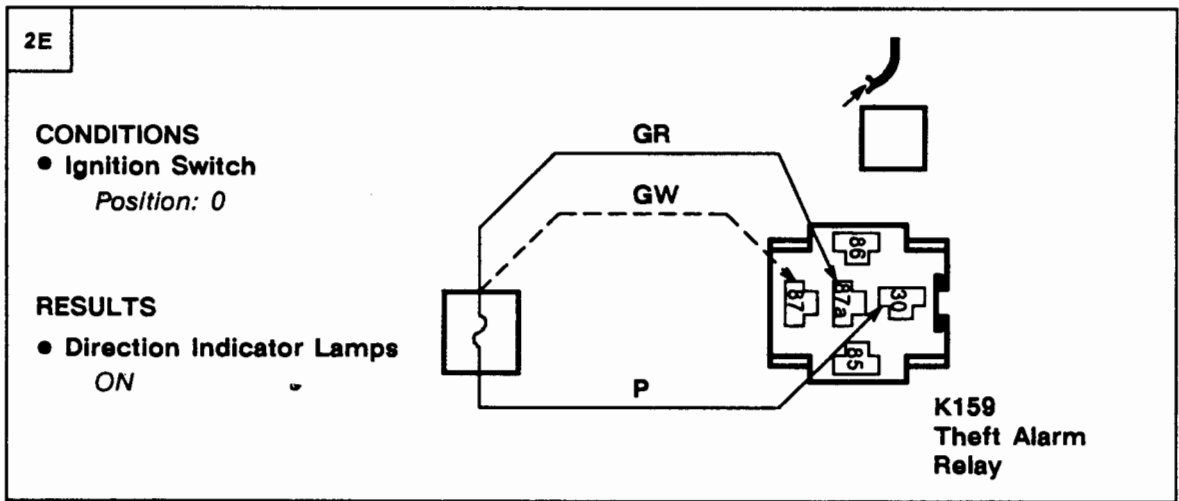
PROBLEM CAUSE

- Sounder Relay

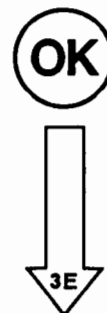
Test E

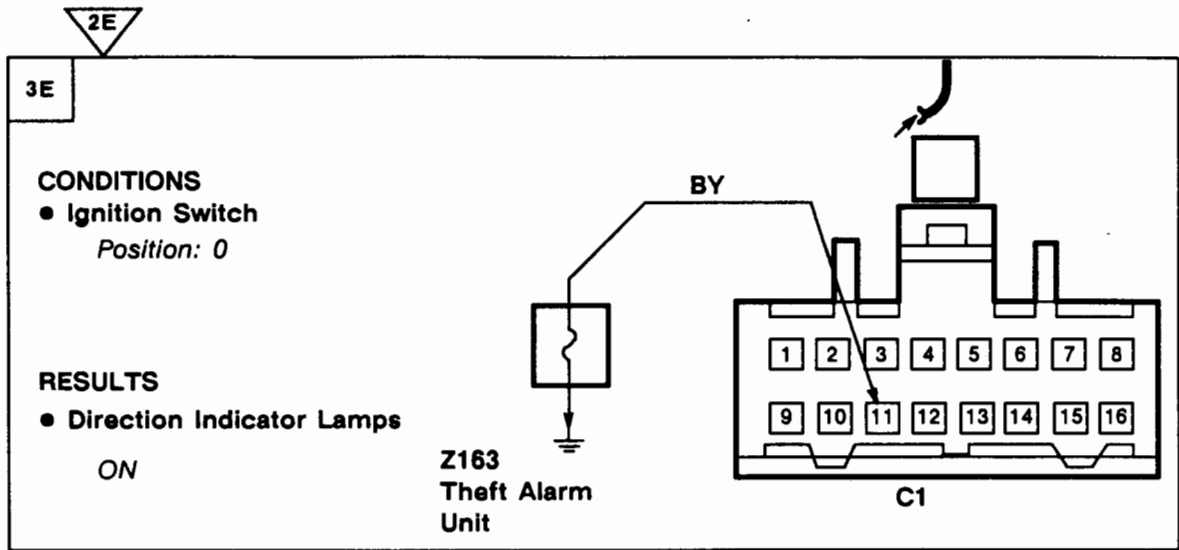


~~OK~~ **PROBLEM CAUSE**
 - NK Wire
 - P Wire



~~OK~~ **PROBLEM CAUSE**
 - GR Wire
 - GW Wire





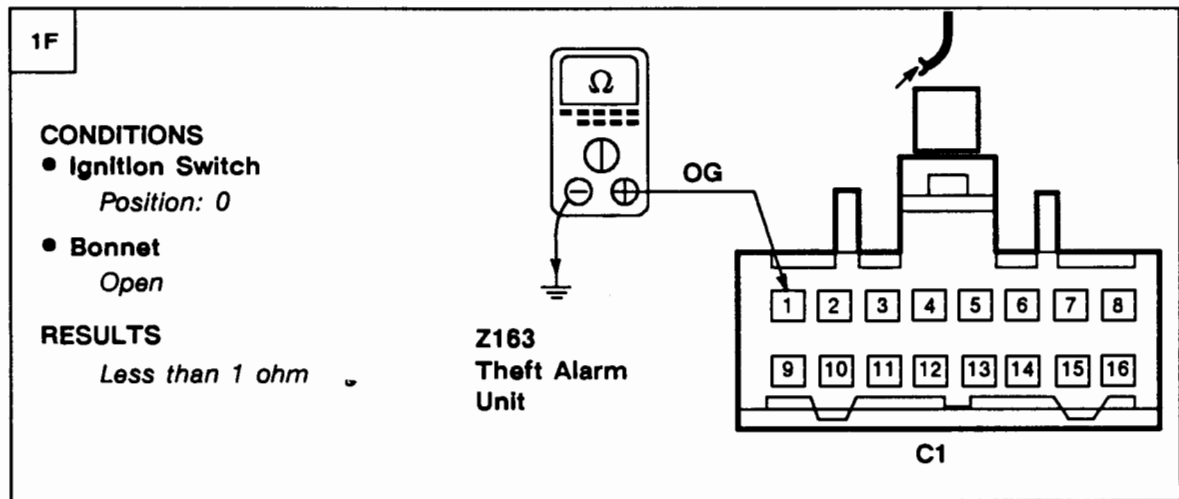
OK PROBLEM CAUSE

- BY Wire
- Theft Alarm Relay

OK PROBLEM CAUSE

- Theft Alarm Unit

Test F



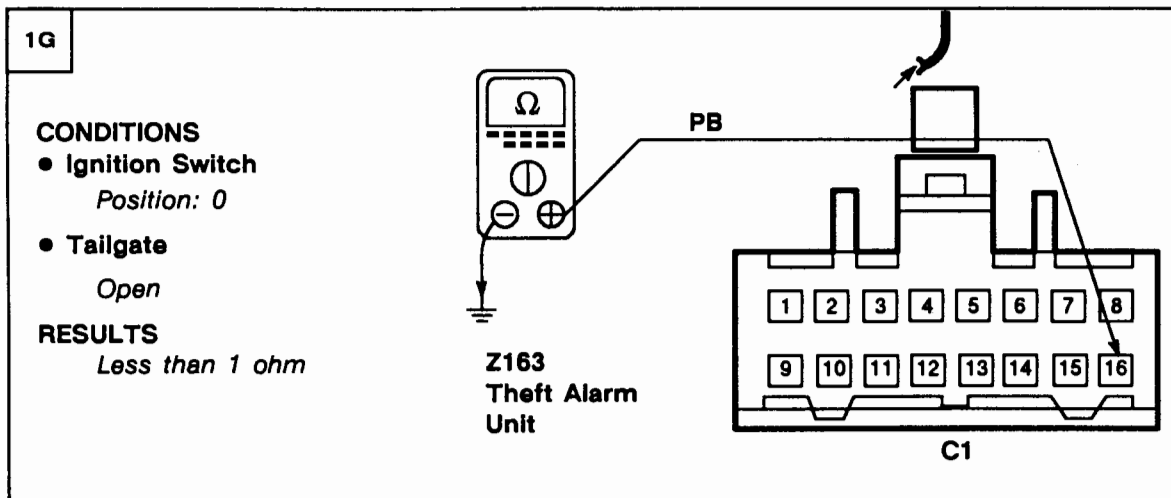
OK PROBLEM CAUSE

- OG Wire
- B Wire
- Alarm Bonnet Switch

OK PROBLEM CAUSE

- Theft Alarm Unit

Test G



PROBLEM CAUSE

- PB Wire
- Tailgate Switch



PROBLEM CAUSE

- Theft Alarm Unit

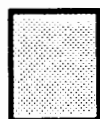
1994 RANGE ROVER

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