

**1999**

**BMW**

**318ti**

**(E36/5)**

**Electrical**

**Troubleshooting**

**Manual**

Vehicles produced 9/98 thru 08/99



## ELECTRICAL TROUBLESHOOTING MANUAL

### SERIES 3 – E36/5 (318ti)

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#### MODEL YEAR 1999

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compact

## Schematics

The schematics divide the entire vehicle electrical system into individual circuits. Interacting electrical components are shown on one common schematic.

Switches and other components are represented in such a way that their general layout and function are self-explicit. They are arranged on the sheet such that the current path can be followed from positive (top) to negative (bottom).

**Important:** The components and wires are not drawn to scale. For instance, a lead with a length of over 1m can be shown as a lead that is only a few cm long. To ensure clear arrangement, all connectors, lines branches and connected components from the fuses to the component and from the component to ground connection are not shown within the individual cells. If required, reference can be made to cells **0670.3 Fuse Details** and **0670.4 Ground Distribution** where all lines are illustrated with all plug connections, line branches and connected components.

All circuit symbols used are listed and explained in cell **0140.0 Symbols**.

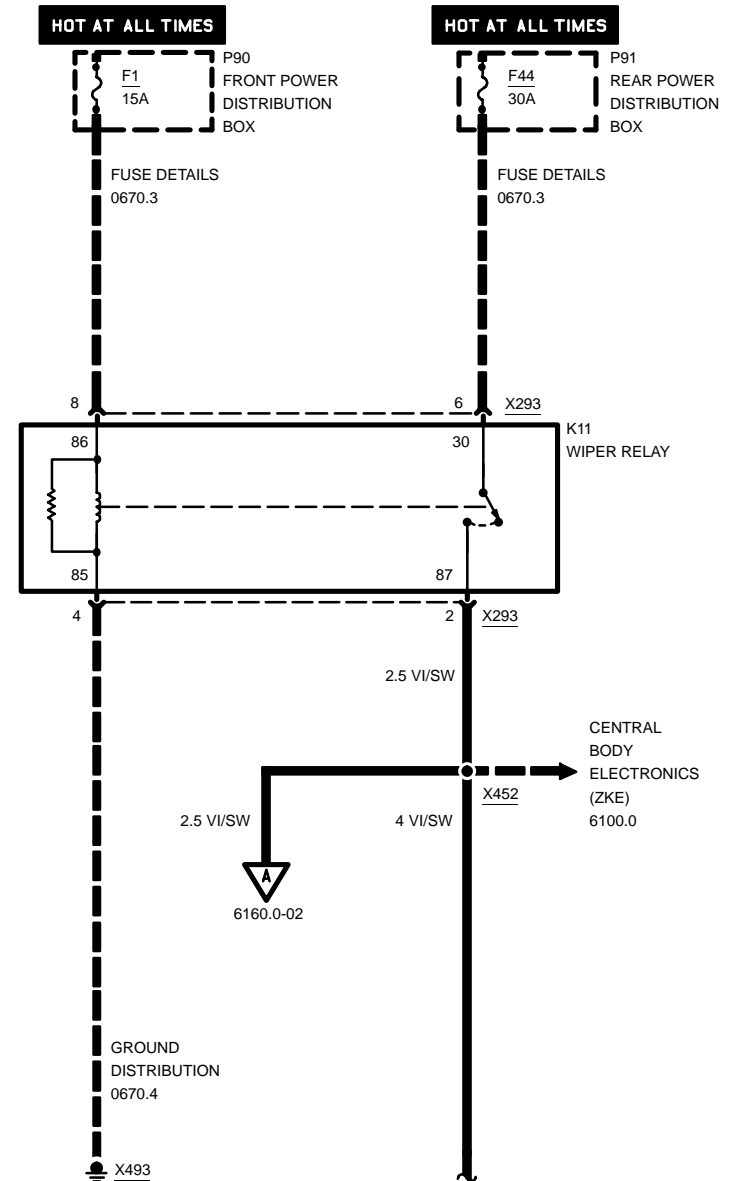
In cell **7000.0 Component Location Chart** all important connectors, ground points and components are listed in tabular form. It provides a precise description of the component locations in the vehicle.

In cell **7100.0 Component Location Views** the location of connectors and components which are difficult to locate are shown in line arts or illustrations. In cell **8000.0 Splice Location Views** all splices are listed in numerical order and illustrations are provided to assist in locating splices on larger harnesses. In cell **8500.0 Connector Views** diagrams of connectors with more than 2 pins are illustrated.

Included in this ETM are foldout block diagrams. These are overviews of the entire system (EGS, ABS, AC etc.) which helps understand the relationships between various components and control unit of the system being diagnosed.

### Example

General conventions can be explained based on the following schematic example.





## INTRODUCTION

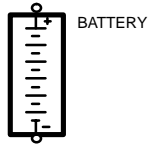
---

compact

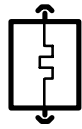
### General Conventions

1. Switches and relays are always shown in rest position (e.g. K11).
2. A component shown in a dashed frame signifies that the component is illustrated only in part (e.g. P90 and P91).
3. A component shown in a completely drawn frame signifies that the component is illustrated in full (e.g. K11).
4. The dashed line between pin 8 and pin 6 of connector X293 indicates that both pins belong to connector X293.
5. The dashed line from fuse F1 to pin 8 of connector X293 shows the positive supply of relay K11. If required, refer to cell **0670.3 Fuse Details** at fuse F1 for the complete line progressing with plug connections, line branches, wire colors and cross sections.
6. The dashed line with an arrow at splice X452 indicates that several wires lead to splice X452. All lines leading to the connection are illustrated in cell **6100.0 Central Body Electronics (ZKE)**. An interrupted line with an arrow indicates that only this one wire leads to another circuit.
7. The dashed line from pin 4 of connector X293 to ground X493 shows the ground supply for relay K11. If required, refer to cell **0670.4 Ground Distribution** at ground X493 for the complete line progression with all plug connections, line branches, wire colors and cross sections.
8. The interrupted line from splice X452 with an **A** in the open arrow is continued on page 6160.0-02. Termination of wire 4 VI/SW from splice X452 with a wavy line indicates that the wire is continued on the opposite page.

# 0140.0 SYMBOLS



BATTERY



HEATING ELEMENT



VARIABLE RESISTANCE SENSOR  
VARIABLE CONTACT IS MOVED BY AN EXTERNAL FORCE



ANTENNA



FUSE DETAILS



LOUDSPEAKER OR HORN



VARIABLE RESISTOR  
RESISTANCE IS CHANGED BY TEMPERATURE OR PRESSURE



CONTROL/POWER ELECTRONICS



FUSIBLE LINK



LIGHT



DIODE CURRENT CAN FLOW ONLY IN DIRECTION OF ARROW



HALL EFFECT SENSOR



RADIO



CIRCUIT BREAKER



PERMANENT MAGNET MOTOR ONE SPEED



ZENER DIODE TO REGULATE VOLTAGE



TRANSISTORIZED SWITCH



THERMO SWITCH



PERMANENT MAGNET MOTOR TWO SPEEDS



LIGHT EMITTING DIODE



INDUCTIVE SENSOR



SOLENOID



KNOCK SENSOR



OXYGEN SENSOR



VEHICLE SPEED SENSOR

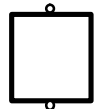
# SYMBOLS



ENTIRE COM-  
PONENT SHOWN



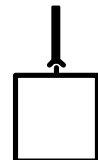
PART OF COM-  
PONENT SHOWN



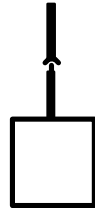
COMPONENT WITH  
SCREW TERMI-  
NALS



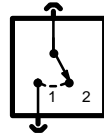
COMPONENT CASE  
ATTACHED DI-  
RECTLY TO METAL  
PART OF CAR  
(GROUNDED)



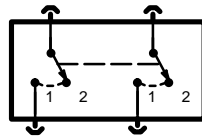
CONNECTOR AT-  
TACHED TO COM-  
PONENT



CONNECTOR AT-  
TACHED TO COM-  
PONENT LEAD  
(PIGTAIL)



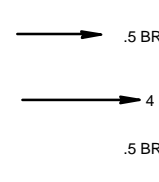
ONE POLE, TWO  
POSITION SWITCH



SWITCHES THAT  
MOVE TOGETHER  
DASHED LINE  
SHOWS A ME-  
CHANICAL CON-  
NECTION  
BETWEEN  
SWITCHES

WIRE COLOR	
BL	BLUE
BR	BROWN
GE	YELLOW
GN	GREEN
GR	GRAY
OR	ORANGE
RS	PINK
RT	RED
SW	BLACK
VI	VIOLET
WS	WHITE
TR	TRANSPARENT

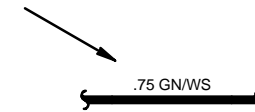
WIRE INSULATION  
IS ONE COLOR



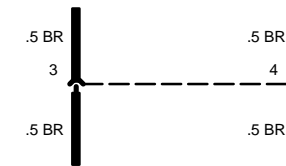
PIN NUMBER

CONNECTOR REF-  
ERENCE NUMBER  
FOR COMPONENT  
LOCATION CHART

WIRE INSULATION  
IS ONE COLOR  
WITH ANOTHER  
COLOR STRIPE  
(GREEN WITH  
WHITE)



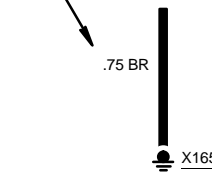
A WAVY LINE  
MEANS WIRE IS  
CONTINUED



TWO CONNEC-  
TIONS (PINS) IN  
THE SAME  
CONNECTOR

DASHED LINE INDI-  
CATES TERMINALS  
OF THE SAME  
CONNECTOR

WIRE SIZE IN MM  
SQUARED



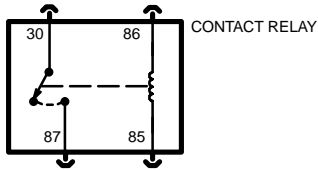
WIRE ATTACHED  
TO METAL PART  
OF CAR  
(GROUNDED)

GROUND NUM-  
BERED FOR REF-  
ERENCE ON COM-  
PONENT LOCATION  
CHART

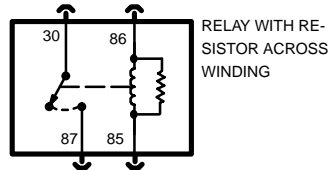


# SYMBOLS

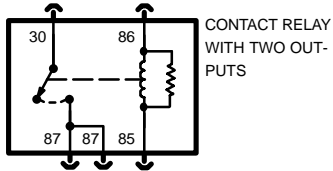
compact



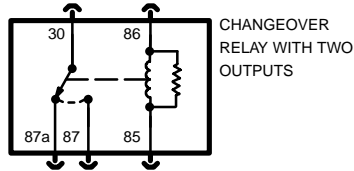
CONTACT RELAY



RELAY WITH RESISTOR ACROSS WINDING



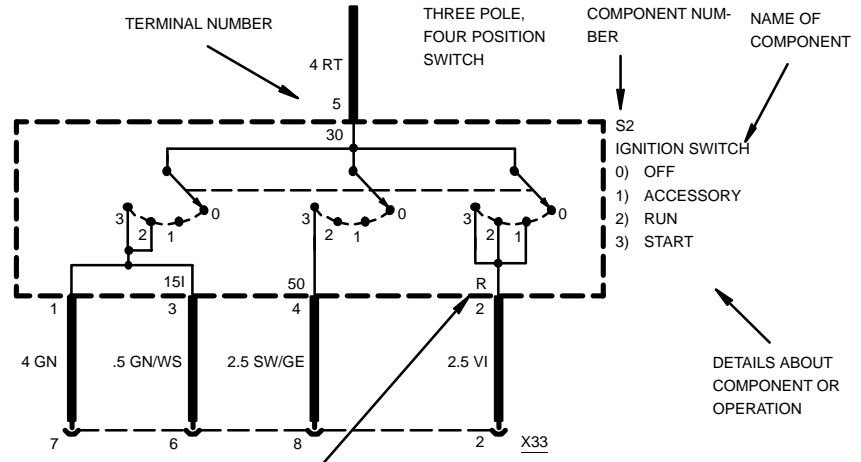
CONTACT RELAY WITH TWO OUTPUTS



CHANGEOVER RELAY WITH TWO OUTPUTS

TERMINAL NUMBER    DESCRIPTION

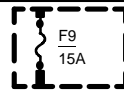
30	RELAY INPUT
85	RELAY OUTPUT (WINDING)
86	RELAY INPUT (WINDING)
87	RELAY OUTPUT (ENERGIZED)
87a	RELAY OUTPUT (AT REST)



"R" IS ENERGIZED IN ACCY, RUN, OR START

TERMINAL NUMBER	DESCRIPTION	TERMINAL NUMBER	DESCRIPTION
50	VOLTAGE: IGNITION SWITCH IN START	15I	VOLTAGE: IGNITION SWITCH IN RUN
30	VOLTAGE: SUPPLIED AT ALL TIMES	R	VOLTAGE: IGNITION SWITCH IN ACCESSORY, RUN OR START
15	VOLTAGE: IGNITION SWITCH IN RUN OR START	31	GROUND

**HOT AT ALL TIMES**



INDICATES THAT FUSE 9 IS SUPPLIED WITH POWER AT ALL TIMES

POWER STATUS

**HOT AT ALL TIMES**

**HOT IN RUN AND START**

**HOT IN ACCY, RUN AND START**

DESCRIPTION

VOLTAGE: SUPPLIED AT ALL TIMES

VOLTAGE: IGNITION SWITCH IN RUN OR START

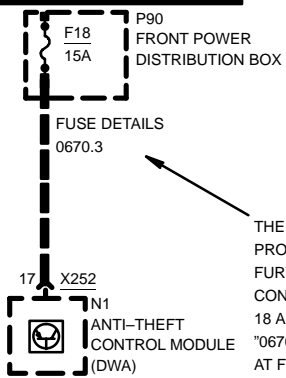
VOLTAGE: IGNITION SWITCH IN ACCESSORY, RUN OR START



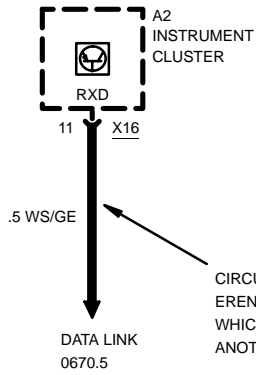
# SYMBOLS

compact

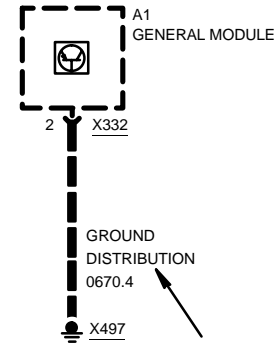
## HOT IN ACCY, RUN AND START



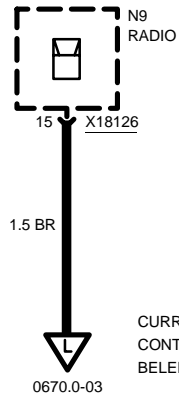
THE COMPLETE WIRE PROGRESSION AND FURTHER CIRCUITS CONNECTED TO FUSE 18 ARE SHOWN IN CELL "0670.3 FUSE DETAILS" AT FUSE 18



CIRCUIT REFERENCE-A WIRE WHICH CONNECTS TO ANOTHER CIRCUIT



THE COMPLETE WIRE PROGRESSION AND FURTHER CIRCUITS CONNECTED TO GROUND X497 ARE SHOWN IN CELL "0670.4 GROUND DISTRIBUTION" AT GROUND X497



CURRENT PATH IS CONTINUED AS LABELED

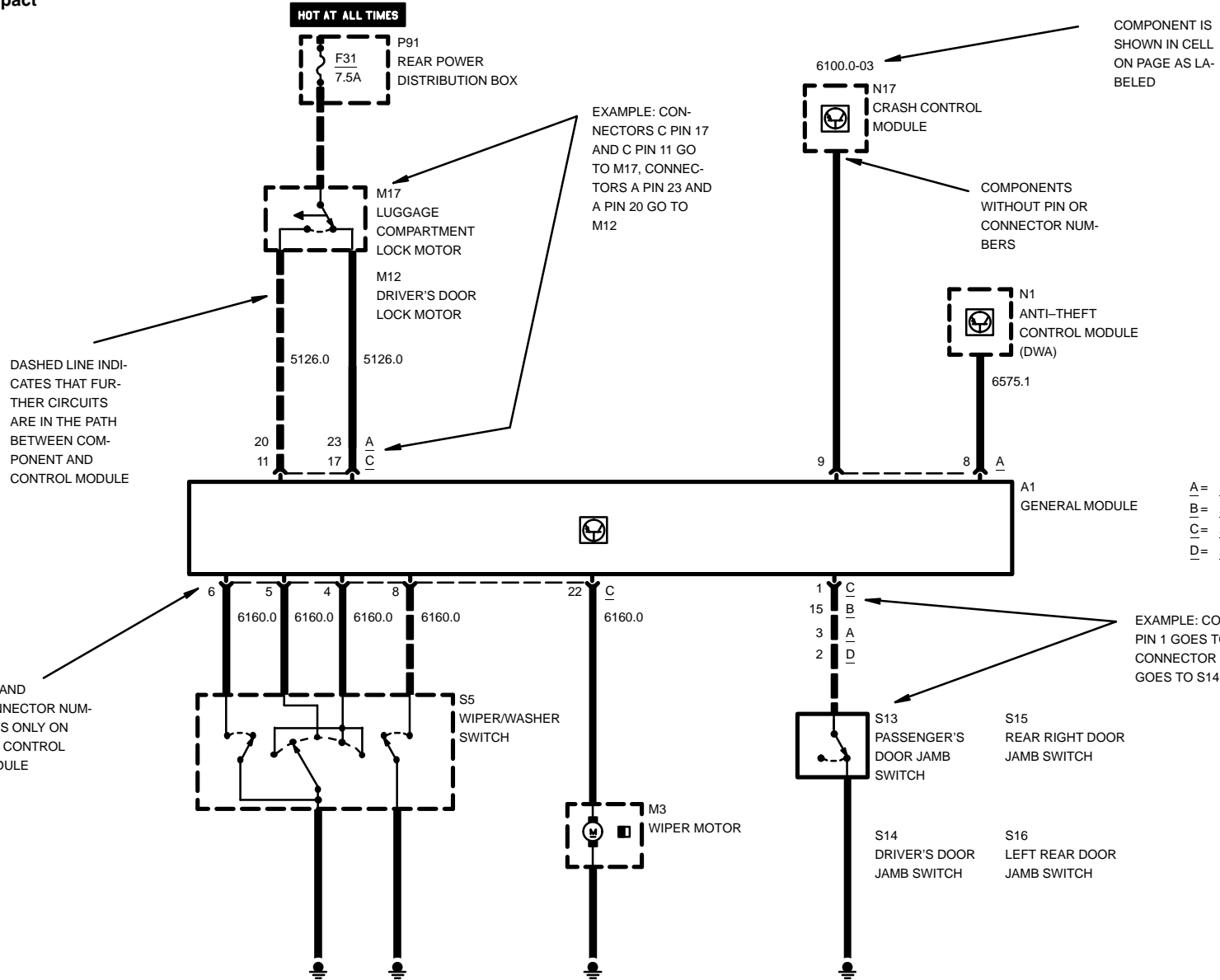


ARROW SHOWS DIRECTION OF CURRENT FLOW AND IS REPEATED WHERE CURRENT PATH CONTINUES



# SYMBOLS

## BLOCK DIAGRAM

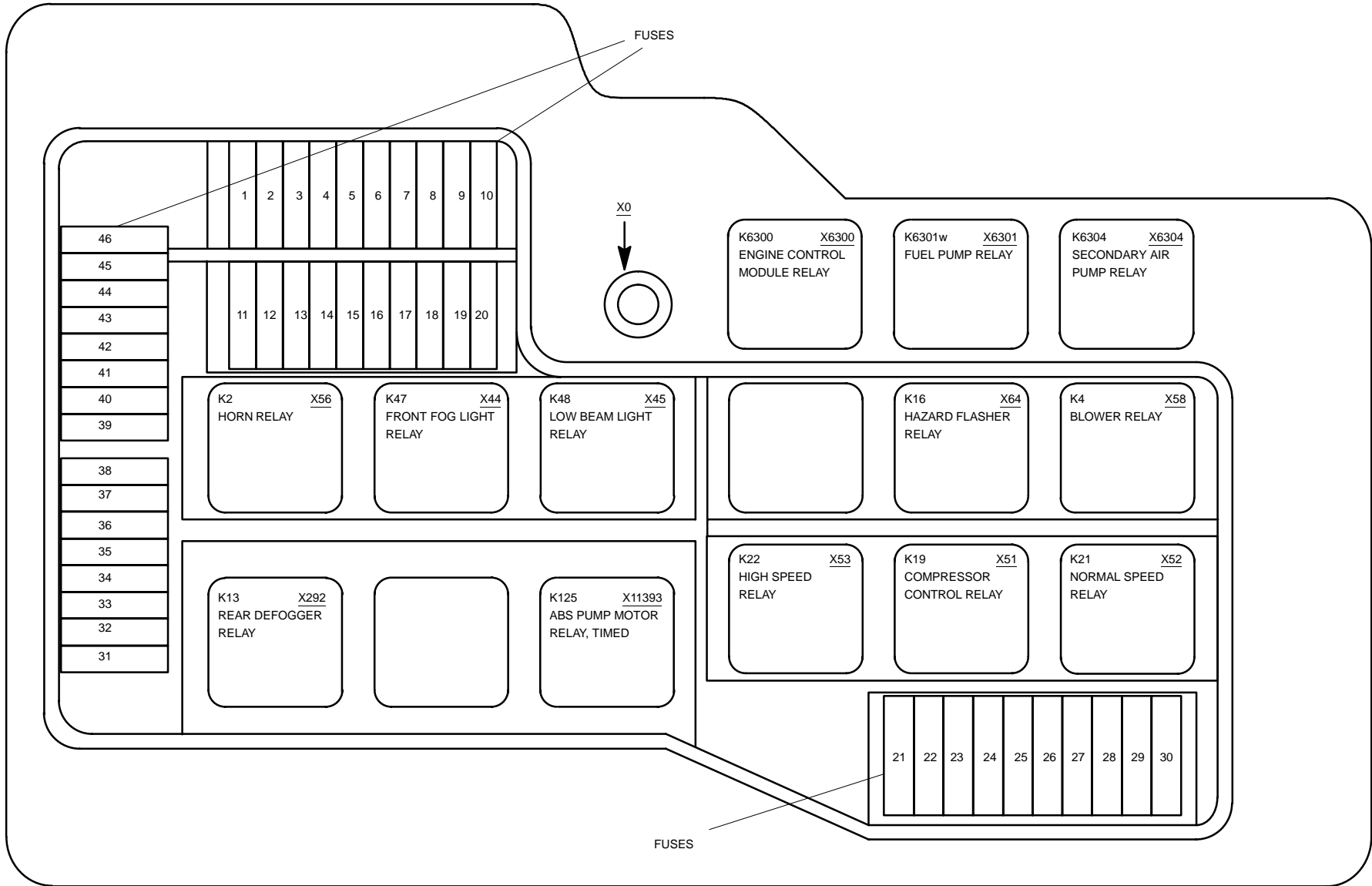


- A = X253 DESCRIPTION OF THE CONTROL MODULE
- B = X254 DESCRIPTION OF THE CONTROL MODULE
- C = X255 CONNECTORS
- D = X332 CONNECTORS



# 0670.0 POWER DISTRIBUTION CHART

## FRONT POWER DISTRIBUTION BOX

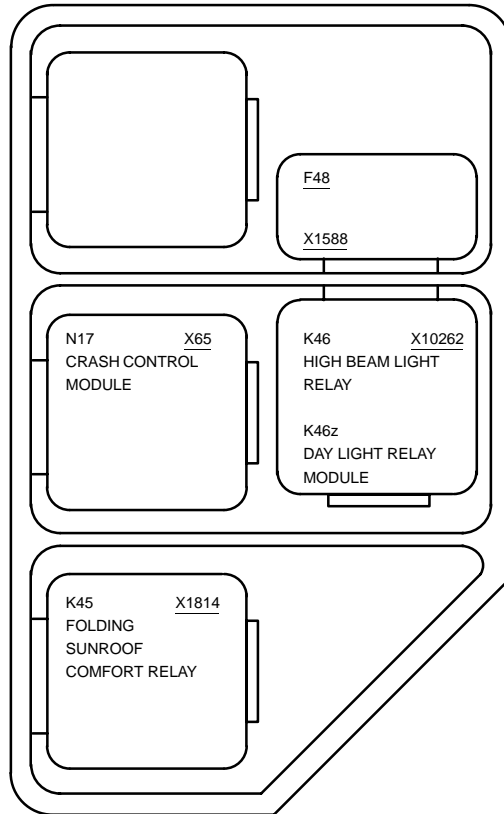






# POWER DISTRIBUTION CHART

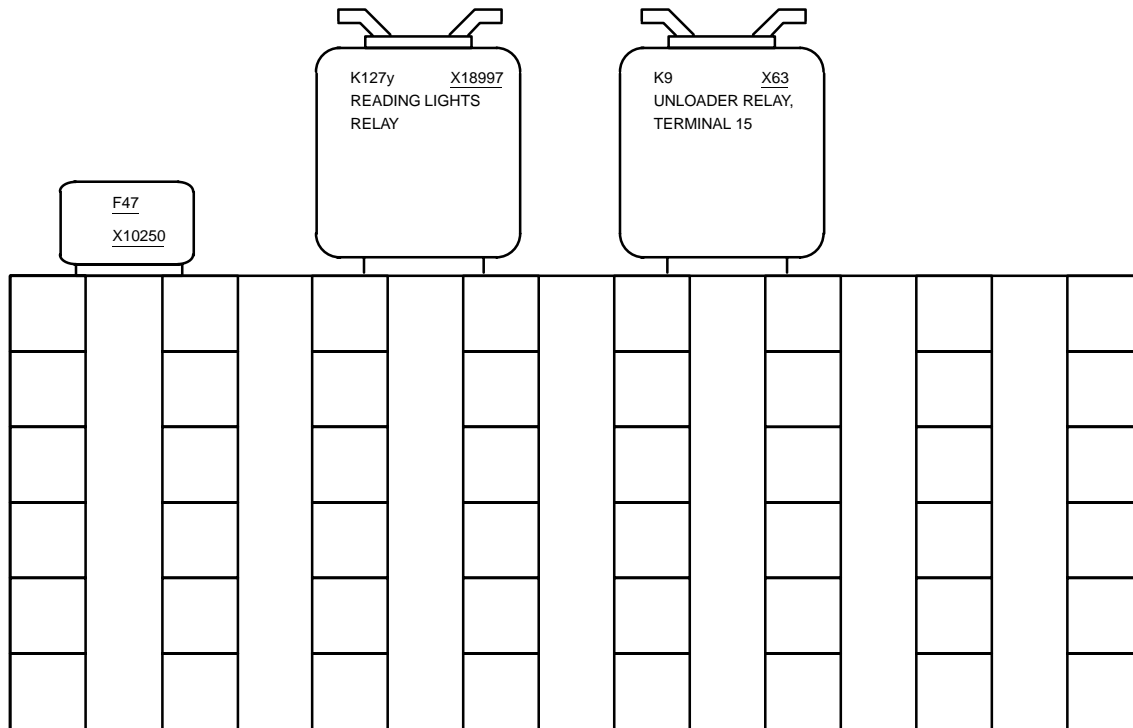
## RELAY PANEL UNDER LH SIDE OF DASHBOARD





# POWER DISTRIBUTION CHART

## SPLICE PANEL UNDER LH SIDE OF DASHBOARD





# 0670.1 FUSE CHART

## FUSES 1 TO 29

	FUSE NUMBER																												
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
	30A	5A	30A	15A	30A	30A	5A	15A	20A	30A	7.5A	7.5A		30A	15A	5A	15A			30A	5A	5A	5A	10A	5A	10A	5A	5A	7.5A
<b>1210.20</b> ENGINE CONTROL SYSTEM (DME M5.2, 4-CYLINDER M44)		●														●		●											
<b>1230.0</b> CHARGING SYSTEM																													
<b>1240.0</b> START																													●
<b>2460.2</b> ELECTRONIC TRANSMISSION CONTROL (EGS A4S 270R)																											●	●	●
<b>3234.0</b> SUPPLEMENTAL RESTRAINT SYSTEM (AIR BAG)																												●	
<b>3450.1</b> SLIP CONTROL (ABS/ASC)										●											●							●	
<b>5116.0</b> POWER MIRRORS																									●				
<b>5126.0</b> ZKE CENTRAL LOCKING (ZV)							●																						●
<b>5133.0</b> ZKE POWER WINDOWS (FH)															●														
<b>5200.0</b> POWER SEATS					●																								
<b>5203.0</b> HEATED SEATS			●																				●						
<b>5410.1</b> POWER TILT/SLIDE SUNROOF (SHD)	●																												
<b>5410.4</b> ELECTRIC FOLDING SUNROOF	●																												
<b>6100.0</b> CENTRAL BODY ELECTRONICS (ZKE IV)							●							●															
<b>6133.0</b> HORN								●																					
<b>6135.1</b> DRIVE-AWAY PROTECTION (EWS III)																												●	
<b>6160.1</b> WIPER/WASHER MODULE (WWM)		●																											
<b>6169.0</b> WINDSHIELD WASHER JET HEATERS																								●					
<b>6211.0</b> INSTRUMENT CLUSTER																							●				●		
<b>6213.0</b> CLOCK																													



# FUSE CHART

compact

## FUSES 1 TO 29

	FUSE NUMBER																												
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
	30A	5A	30A	15A	30A	30A	5A	15A	20A	30A	7.5A	7.5A		30A	15A	5A		15A		30A	5A	5A	5A	10A	5A	10A	5A	5A	7.5A
<b>6300.0</b> LIGHT SWITCH DETAILS																													
<b>6312.0</b> HEADLIGHTS/FOG LIGHTS																													
<b>6313.0</b> TURN/HAZARD LIGHTS																													
<b>6314.0</b> PARK/TAIL/UNDERHOOD LIGHTS																													
<b>6320.0</b> LICENSE PLATE/LUGGAGE COMPARTMENT LIGHTS																													
<b>6322.0</b> BACK UP LIGHTS																													
<b>6325.0</b> BRAKE LIGHTS																													
<b>6330.3</b> INTERIOR LIGHTS																													
<b>6332.0</b> INTERIOR ACCESSORIES																													
<b>6350.0</b> CRASH CONTROL MODULE																													
<b>6410.7</b> HEATING CONTROL (HS)																													
<b>6424.0</b> REAR WINDOW DEFOGGER																													
<b>6450.6</b> INTEGRATED HEATING- AND CLIMATE CONTROL																													
<b>6510.0</b> RADIO/CD PLAYER (PROVISIONS)																													
<b>6510.1</b> RADIO/HIFI																													
<b>6561.0</b> CELLULAR TELEPHONE (PROVISIONS)																													
<b>6571.0</b> CRUISE CONTROL (TEMPOMAT)																													
<b>6575.2</b> ANTI-THEFT SYSTEM (ALPINE)																													
<b>6581.3</b> BOARD COMPUTER (BC - LOW)																													

03/00

0670.1-01

1999