



---

# **1984**

---

# **BMW 528e/533i**

---

# **Electrical**

---

# **Troubleshooting**

---

# **Manual**

---

BMW of North America, Inc.  
Montvale, New Jersey

## **FOREWORD**

In the interests of continuing technical development work we reserve the right to modify designs and equipment.

Printed in USA

©Copyright BMW of North America, Inc.  
May 1984

Not to be reproduced wholly or in part  
without written permission of BMW of  
North America, Inc.

P/N 01 00 1 467 799

**1984  
BMW 528e/533i  
Electrical  
Troubleshooting  
Manual**

**CONTENTS**

---

Index .....	2
How To Use This Manual .....	3
Symbols .....	4
Wire Size Conversion Chart ...	5
Systematic Troubleshooting ...	6
Diagnostic Connector .....	101
Power Distribution Box .....	102
Fuse Data .....	103
Schematic Diagrams .....	105
Component Charts and Figures .....	201

---

### Index—Alphabetical Listing of Electrical Circuits

	SCHEMATIC PAGE		SCHEMATIC PAGE
Accessory Connector .....	151	Lights (continued)	
Active Check Control .....	119	—Front Park .....	128
Air Conditioning .....	146	—Glove Box .....	136
Auto-Charging Flashlight .....	136	—Hazard Warning .....	126
Auxiliary Fan .....	145	—Headlights .....	124
Brake Lining Warning .....	122	—Interior .....	134
Central Locking .....	142	—License .....	129
Charging System .....	114	—Rear Marker .....	129
Cigar Lighter .....	136	—Stoplights .....	130
Cruise Control .....	130	—Tail .....	128
Diagnostic Connector .....	104	—Transmission Range .....	132
Digital Clock .....	148	—Trunk .....	129
Evaporative Control .....	110	—Turn .....	126
Fuel Control .....	111	On-Board Computer .....	148
Fuel Delivery .....	110	Power Antenna .....	144
Fuel Gauge .....	117	Power Distribution .....	105
Fuse Data .....	103	Power Distribution Box .....	102
Gauges .....	116	Power Mirrors .....	139
Ground Distribution .....	152	Power Windows .....	140
Heated Door Lock .....	138	Radio .....	144
Heater .....	146	Rear Defogger .....	138
Horn .....	137	Seatbelt Warning .....	123
Idle Speed Control .....	112	Service Interval Indicator .....	115
Ignition .....	113	Speedometer .....	116
Ignition Key Warning .....	123	Start .....	109
Lights		Sunroof .....	137
—Backup .....	135	Warning Indicators .....	116
—Dash .....	132	Windshield Washer Jet Heaters.....	150
—Fog .....	124	Wiper/Washer .....	150
—Front Marker .....	128		

The purpose of this manual is to show electrical schematics in a manner that makes electrical troubleshooting easier. Electrical components which work together are shown together on one schematic. The Wiper-Washer schematic, for example, shows all of the electrical components in one diagram. At the top of the page is the fuse (positive) that powers the circuit. The flow of current is shown through all wires, connectors, switches, and motors to ground (negative) at the bottom of the page.

Within the schematic, all switches and sensors are shown "at rest," as though the Ignition Switch were off. For identification, component names are underlined and placed next to or above each component. Notes are included, describing how switches and other components work.

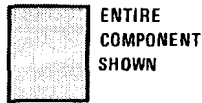
The power distribution schematic shows the current feed through all the connections from the Battery and Alternator to each fuse and the Ignition and Light Switches. If the Power Distribution schematic is combined with any other circuit schematic, a complete picture is made of how that circuit works. The Ground Distribution schematics show how several circuits are connected to common grounds.

All wiring between components is shown exactly as it exists in the vehicle; however, the wiring is not drawn to scale. To aid in understanding electrical operation, wiring inside complicated components has been simplified. The "Solid State" label designates electronic components.

WIRE SIZE CONVERSION CHART	
METRIC (CROSSSECTIONAL AREA IN MM <sup>2</sup> )	AWG (AMERICAN WIRE GAUGE)
.5	20
.75	18
1	16
1.5	14
2	14
2.5	12
4	10
6	8
8	8
16	4
20	4
25	2
32	2

WIRE INSULATION	
ABBREVIATIONS	COLOR
BK	BLACK
BR	BROWN
RD	RED
YL	YELLOW
GN	GREEN
BU	BLUE
VI	VIOLET
GY	GRAY
WT	WHITE
PK	PINK

# 4 SYMBOLS



ENTIRE COMPONENT SHOWN



PART OF A COMPONENT SHOWN



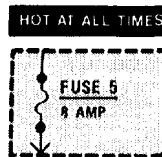
COMPONENT WITH SCREW TERMINALS



SOLID STATE (INCLUDES ONLY ELECTRONIC PARTS)



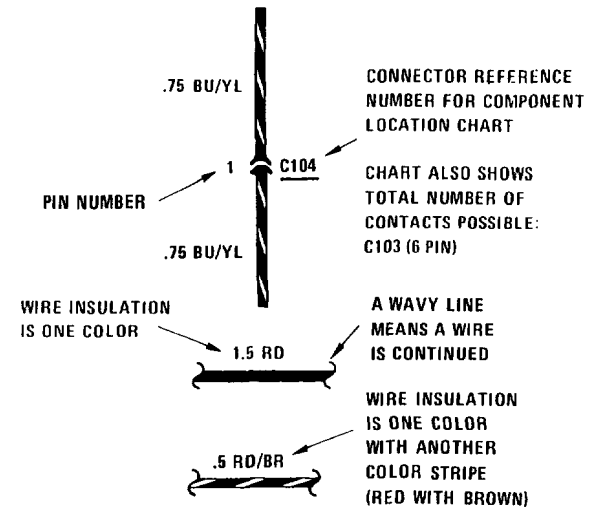
COMPONENT CASE IS DIRECTLY ATTACHED TO METAL PART OF CAR (GROUNDED)



INDICATES THAT FUSE 5 IS ALWAYS SUPPLIED WITH POWER



INDICATES THAT FUSE 6 IS SUPPLIED WITH POWER WITH THE IGNITION SWITCH IN THE RUN OR START POSITIONS

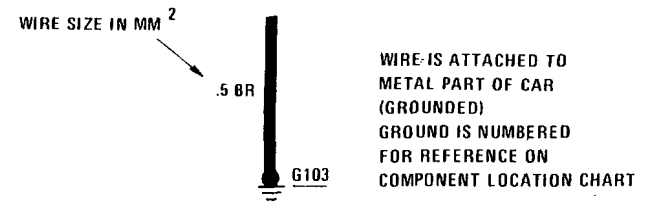


CONNECTOR REFERENCE NUMBER FOR COMPONENT LOCATION CHART

CHART ALSO SHOWS TOTAL NUMBER OF CONTACTS POSSIBLE: C103 (6 PIN)

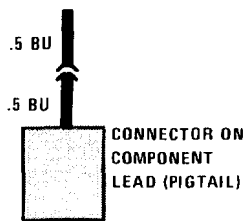
A WAVY LINE MEANS A WIRE IS CONTINUED

WIRE INSULATION IS ONE COLOR WITH ANOTHER COLOR STRIPE (RED WITH BROWN)

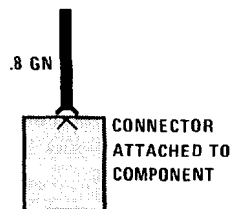


WIRE IS ATTACHED TO METAL PART OF CAR (GROUNDED) GROUND IS NUMBERED FOR REFERENCE ON COMPONENT LOCATION CHART

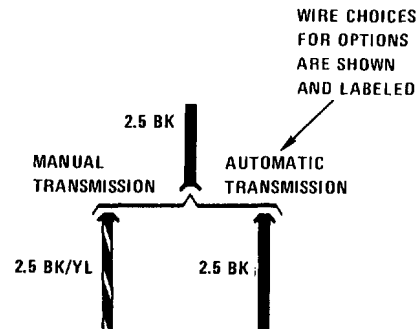
OTHER CIRCUITS THAT SHARE A GROUND ARE SHOWN IN GROUND DISTRIBUTION



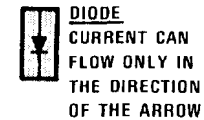
CONNECTOR ON COMPONENT LEAD (PIGTAIL)



CONNECTOR ATTACHED TO COMPONENT



WIRE CHOICES FOR OPTIONS ARE SHOWN AND LABELED

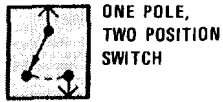


DIODE CURRENT CAN FLOW ONLY IN THE DIRECTION OF THE ARROW

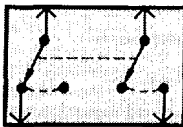
CIRCUIT REFERENCE - A WIRE WHICH CONNECTS TO ANOTHER CIRCUIT



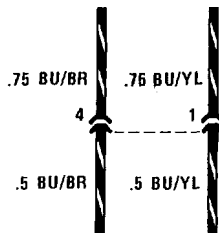
ACTIVE CHECK CONTROL



ONE POLE,  
TWO POSITION  
SWITCH



SWITCHES THAT  
MOVE TOGETHER  
DASHED LINE SHOWS  
A MECHANICAL  
CONNECTION  
BETWEEN SWITCHES



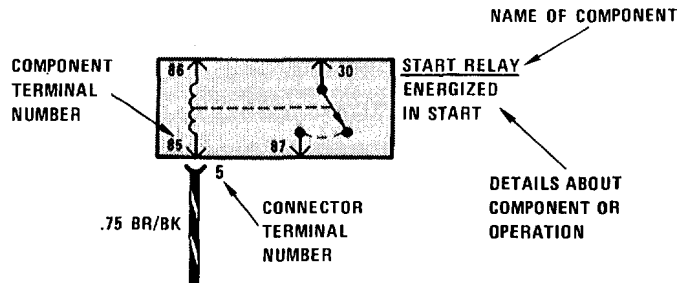
TWO CONNECTIONS  
(PINS) IN THE SAME  
CONNECTOR

DASHED LINE SHOWS  
PARTS OF THE  
SAME CONNECTOR



RELAY SHOWN  
WITH NO  
CURRENT  
FLOWING  
THROUGH  
COIL

WHEN COIL IS  
ENERGIZED, SWITCH  
IS PULLED CLOSED



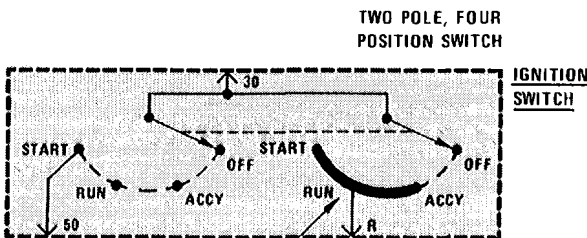
NAME OF COMPONENT

START RELAY  
ENERGIZED  
IN START

DETAILS ABOUT  
COMPONENT OR  
OPERATION

CONNECTOR  
TERMINAL  
NUMBER

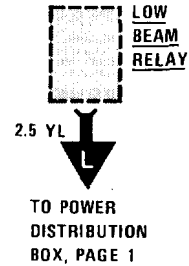
.75 BR/BK



TWO POLE, FOUR  
POSITION SWITCH

IGNITION  
SWITCH

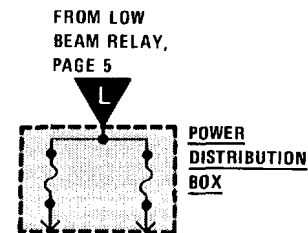
"R" IS ENERGIZED  
IN ACCY, RUN OR START



LOW  
BEAM  
RELAY

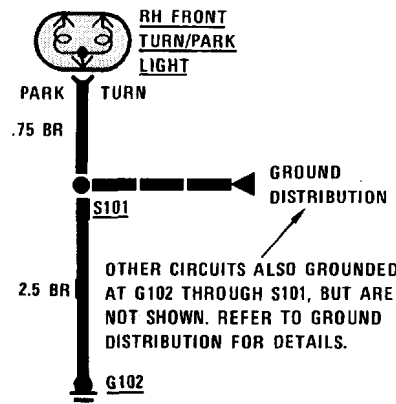
2.5 YL  
TO POWER  
DISTRIBUTION  
BOX, PAGE 1

CURRENT PATH  
IS CONTINUED  
AS LABELED.  
THE ARROW SHOWS  
DIRECTION OF CURRENT  
FLOW AND IS REPEATED  
WHERE CURRENT  
PATH CONTINUES.



FROM LOW  
BEAM RELAY,  
PAGE 5

POWER  
DISTRIBUTION  
BOX



RH FRONT  
TURN/PARK  
LIGHT

PARK TURN  
.75 BR

GROUND  
DISTRIBUTION

2.5 BR  
OTHER CIRCUITS ALSO GROUNDED  
AT G102 THROUGH S101, BUT ARE  
NOT SHOWN. REFER TO GROUND  
DISTRIBUTION FOR DETAILS.

G102



LIGHT  
EMITTING  
DIODE

## 6 SYSTEMATIC TROUBLESHOOTING

### TROUBLESHOOTING PROCEDURE

#### 1. Verify the Problem

Operate the problem circuit to check the accuracy of the complaint. Note the symptoms of the inoperative circuit.

#### 2. Analyze the Problem

Refer to the schematic of the problem circuit in the ETM. Determine how the circuit is supposed to work by tracing the current path(s) from the power feed through the circuit components to ground. Then based on the symptoms you noted in step 1 and your understanding of circuit operation, identify one or more possible causes of the problem.

#### 3. Isolate the Problem

Make circuit tests to prove or disprove the preliminary diagnosis made in step 2. Keep in mind that a logical simple procedure is the key to efficient troubleshooting. Test for the most likely cause of failure first. Try to make tests at points which are easily accessible.

#### 4. Repair the Problem

Once the specific problem is identified, make the repair using the proper tools and safe procedures.

#### 5. Check the Problem

Operate the circuit to check for satisfactory circuit operation. Good repair practice calls for rechecking all circuits you have worked on.

### TROUBLESHOOTING TOOLS

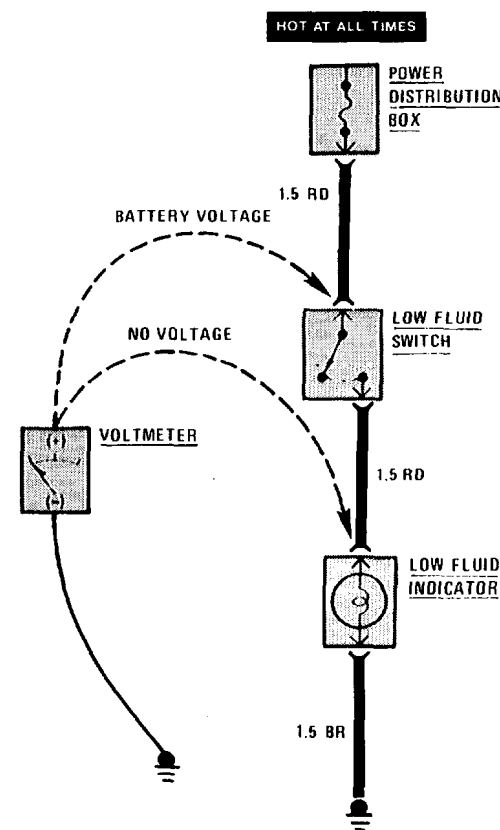
Isolating the problem (Step 3 of TROUBLESHOOTING PROCEDURES) requires the use of a **voltmeter** and/or **ohmmeter**. A voltmeter measures voltage at selected points in a circuit. An ohmmeter measures a circuit's resistance to current flow. It has an internal battery that provides current to the circuit under test. Disconnect the car battery when using an ohmmeter because the battery voltage will cause the ohmmeter to give false readings. Also, do not use an ohmmeter on solid-state components. The voltage that the ohmmeter applies to the circuit could damage these components.

### TROUBLESHOOTING TESTS

#### Voltage Test

This test measures voltage in a circuit. By taking measurements at several points (terminals or connectors) along the circuit, you can isolate the problem.

To take a voltage measurement, connect the negative lead of the voltmeter to the battery's negative terminal or other known good ground. Then connect the positive lead of the voltmeter to the point you want to test. The voltmeter will measure the voltage present at that point in the circuit.



Voltage Test