1982 BMW 528e 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.

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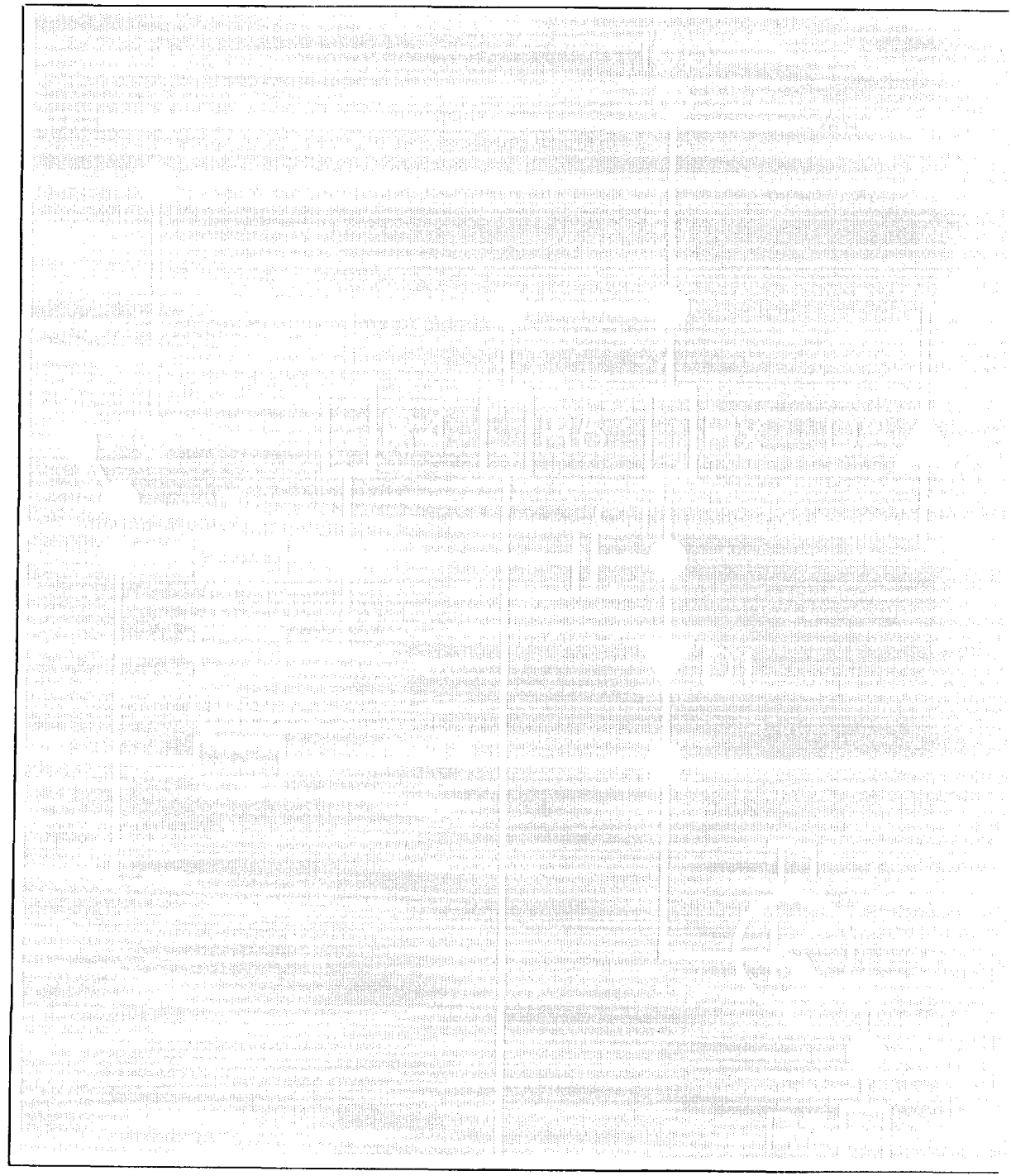


CONTENTS

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 (CROSSECTIONAL AREA IN MM^2)	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

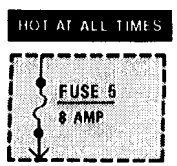
ABBREVIATIONS	COLOR
BK	BLACK
BR	BROWN
RD	RED
YL	YELLOW
GN	GREEN
BU	BLUE
VI	VIOLET
GY	GRAY
WT	WHITE
PK	PINK

4 SYMBOLS

ENTIRE COMPONENT SHOWN

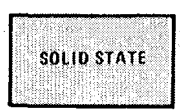
COMPONENT CASE IS DIRECTLY ATTACHED TO METAL PART OF CAR (GROUNDED)

PART OF A COMPONENT SHOWN

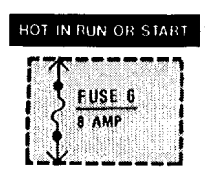


INDICATES THAT FUSE 5 IS ALWAYS SUPPLIED WITH POWER

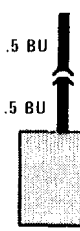
COMPONENT WITH SCREW TERMINALS



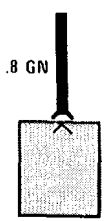
SOLID STATE (INCLUDES ONLY ELECTRONIC PARTS)



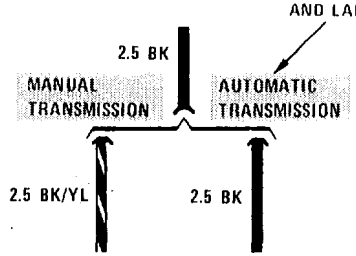
INDICATES THAT FUSE 6 IS SUPPLIED WITH POWER WITH THE IGNITION SWITCH IN THE RUN OR START POSITIONS



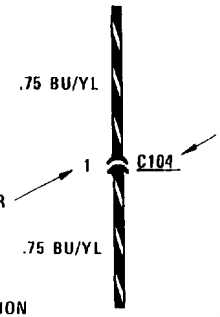
CONNECTOR ON COMPONENT LEAD (PIGTAIL)



CONNECTOR ATTACHED TO COMPONENT

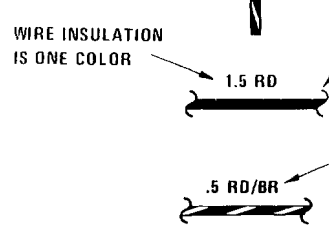


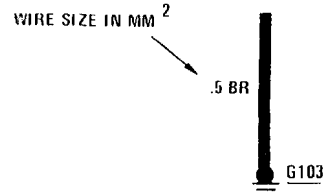
WIRE CHOICES FOR OPTIONS ARE SHOWN AND LABELED



CONNECTOR REFERENCE NUMBER FOR COMPONENT LOCATION CHART

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





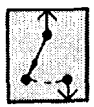
WIRE IS ATTACHED TO METAL PART OF CAR (GROUNDED)
GROUND IS NUMBERED FOR REFERENCE ON COMPONENT LOCATION CHART

OTHER CIRCUITS THAT SHARE A GROUND ARE SHOWN IN GROUND DISTRIBUTION

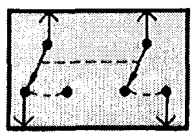
DIODE
CURRENT CAN FLOW ONLY IN THE DIRECTION OF THE ARROW

CIRCUIT REFERENCE – A WIRE WHICH CONNECTS TO ANOTHER CIRCUIT

ACTIVE CHECK CONTROL

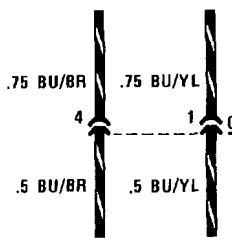


ONE POLE, TWO POSITION SWITCH



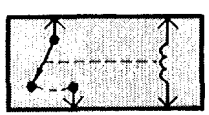
SWITCHES THAT MOVE TOGETHER

DASHED LINE SHOWS A MECHANICAL CONNECTION BETWEEN SWITCHES



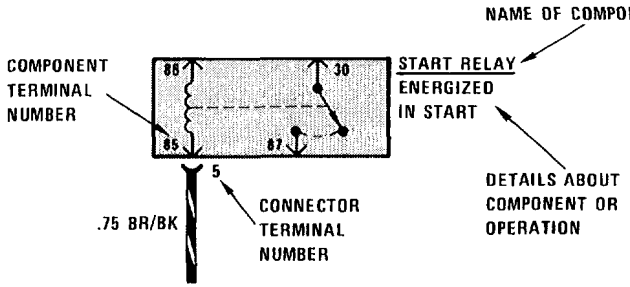
TWO CONNECTIONS (PINS) IN THE SAME CONNECTOR

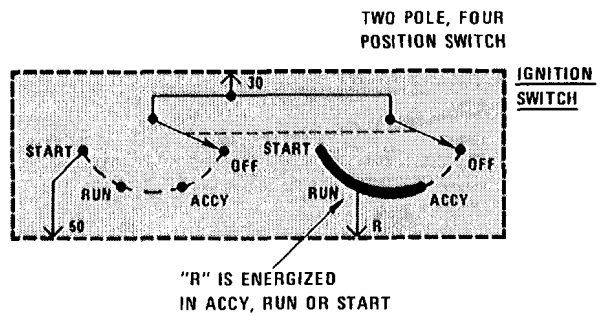
DASHED LINE SHOWS PARTS OF THE SAME CONNECTOR

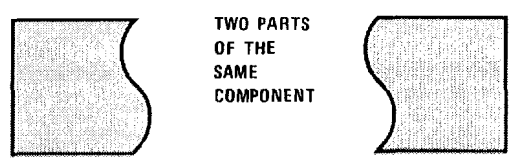


RELAY SHOWN WITH NO CURRENT FLOWING THROUGH COIL

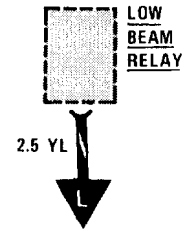
WHEN COIL IS ENERGIZED, SWITCH IS PULLED CLOSED



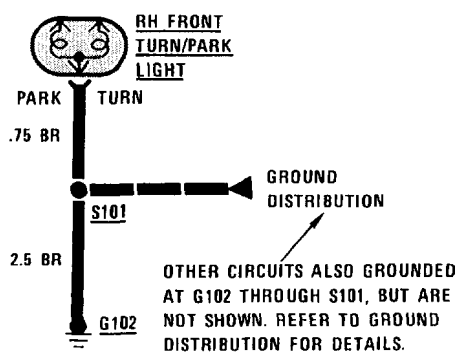




TWO PARTS OF THE SAME COMPONENT



LIGHT EMITTING DIODE



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

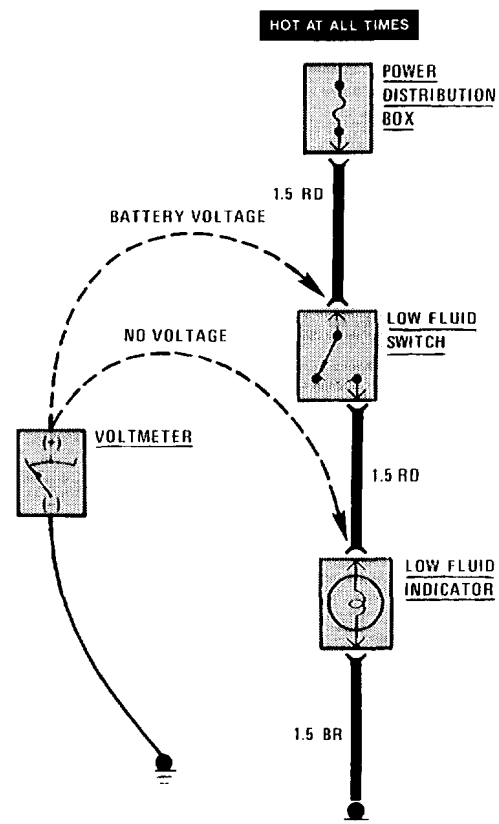
Isolating the problem (Step 3 of TROUBLESHOOTING PROCEDURES) requires the use of a **voltmeter** and/or **ohmmeter.** A voltmeter measures voltage at selected points in a circuit. An ohmmeter measures a circuit's resistance to current flow. It has an internal battery that provides current to the circuit 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