

1993

BMW

**525i, 525it, 535i,
M5 (E34)**

Electrical

Troubleshooting

Manual

Vehicles Produced 9/92 to 8/93

PN 01 00 1 468 776



ELECTRICAL TROUBLESHOOTING MANUAL

5 SERIES – E34 (525i, 525i/t, 535i, M5)

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MODEL YEAR 1993

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SEAT MOVEMENT MOTOR, DRIVER'S, M51	5200.1
SEAT MOVEMENT MOTOR, PASSENGER'S, M60	5200.0
SEAT/MIRROR MEMORY CONTROL MODULE, A21	5200.1
SEAT/MIRROR MEMORY SYSTEM (SM/SPM)	5200.1
SECONDARY AIR INJECTION CHANGEOVER VALVE, Y6132	1210.4-07
SERVOTRONIC CONTROL MODULE, A17	3240.0
SHIFT LOCK, S8522	2460.0
SHIFT LOCK, S8522	2460.2-06
SIDE MARKER LIGHT, LEFT REAR, E70	6301.0
SIDE MARKER LIGHT, RIGHT REAR, E71	6301.0
SIDE MEMORY MIRROR, DRIVER'S, Y9	5200.1
SIDE MIRROR, DRIVER'S, Y5	5116.0
SLIP CONTROL (ABS/ASC)	3450.1
SLIP CONTROL (ABS)	3450.0
SLIP CONTROL MODULE (ABS/ASC), A70	3450.1-00
SLIP CONTROL MODULE (ABS), A7	3450.0-02
SPEAKER, LEFT FRONT, H41	6561.0
SPEED SENSOR - ABS, LEFT FRONT, B2	3450.0



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SPEED SENSOR - ABS, LEFT FRONT, B2	3450.1
SPEED SENSOR - ABS, LEFT REAR, B4	3450.0
SPEED SENSOR - ABS, LEFT REAR, B4	3450.1
SPEED SENSOR - ABS, RIGHT FRONT, B1	3450.0
SPEED SENSOR - ABS, RIGHT FRONT, B1	3450.1
SPEED SENSOR - ABS, RIGHT REAR, B3	3450.0
SPEED SENSOR - ABS, RIGHT REAR, B3	3450.1
SPLICE LOCATION VIEWS	8000.0
START	1240.0
STARTER, M6510	1240.0-01
STARTER RELAY, K1	1240.0-01
STEERING COLUMN LENGTH ADJUST MOTOR, M82	3231.0-00
STEERING COLUMN POSITION SWITCH, S119z	3231.0-00
SUNROOF MOTOR, M24	5410.0
SUNROOF POSITION SWITCH, S39	5410.0
SUNROOF SWITCH, S38	5410.0
SUNROOF SWITCH, S38	5410.2
SUPPLEMENTAL RESTRAINT SYSTEM CONTROL MODULE, A12 ..	3234.0
SUPPRESSION FILTER, C900	6424.0
SYMBOLS	0140.0
TAIL LIGHT, LEFT, H25	6314.0
TAIL LIGHT, RIGHT, H30	6314.0
TELEPHONE HANDSET, U4	6561.0
TELEPHONE INTERFACE US, A192	6561.0
TELEPHONE TRANSCEIVER, H38	6561.0
TEMPERATURE SWITCH, B6235	1290.0-00
TEMPERATURE SWITCH, S36	6454.0
THIGH SUPPORT MOTOR, DRIVER'S, M65	5200.0
THIGH SUPPORT MOTOR, DRIVER'S, M65	5200.1
THIGH SUPPORT MOTOR, PASSENGER'S, M66	5200.0
THIGH SUPPORT POTENTIOMETER, R15	5200.1
THIGH SUPPORT SWITCH, PASSENGER'S, S94	5200.0
THIGH SUPPORT SWITCH, DRIVER'S, S93	5200.0
THIGH SUPPORT SWITCH, DRIVER'S, S93	5200.1
THROTTLE CONTROL MODULE (EML), A6004	1270.0-02
THROTTLE POSITION SENSOR, R6252	1210.13-05
THROTTLE POSITION SENSOR, S6250	1210.2-01

THROTTLE POSITION SENSOR, S6251	1210.4-07
TRANSMISSION CONTROL MODULE (EGS), A8500	2460.0
TRANSMISSION CONTROL MODULE (EGS), A8500	2460.2
TRANSMISSION POSITION INDICATOR LIGHT, E82	6300.0
TRANSMISSION RANGE SELECTOR LIGHT, E9500	6300.0
TRANSMISSION VALVE UNIT, Y8505	2460.0
TRANSMISSION VALVE UNIT, Y8505	2460.2
TRUNK COMPARTMENT LIGHT, E32	6320.0
TRUNK LID LIGHT, E33	6320.0
TRUNK LIGHT, LEFT, H90	6320.0
TRUNK LIGHT, RIGHT, H91	6320.0
TRUNK LOCK MOTOR, M17	5126.0
TURN/HAZARD LIGHTS	6313.0
TURN LIGHT, LEFT FRONT, H7	6313.0
TURN LIGHT, LEFT REAR, H6	6313.0
TURN LIGHT, RIGHT FRONT, H4	6313.0
TURN LIGHT, RIGHT REAR, H5	6313.0
UNCOUPLING DIODE (KL61), V9501	1230.0-00
UNDERHOOD LIGHT, E20	6300.0
UNDERHOOD LIGHT SWITCH, S19	6300.0
UNLOADER RELAY, TERMINAL 15, K9	0670.2
UNLOADER RELAY, TERMINAL 61, K61	1230.0-00
UNLOADER RELAY, TERMINAL R, K3	0670.2
VEHICLE SPEED SENSOR, B10	6200.0
VOLUME AIR FLOW SENSOR, B6233	1210.1-09
VOLUME AIR FLOW SENSOR, B6233	1210.2-09
WASHER FLUID LEVEL SWITCH, S64	6200.2
WASHER JET HEATER, LEFT, E51	6169.0
WASHER JET HEATER, RIGHT, E52	6169.0
WASHER PUMP, M4	6160.0
WATER PUMP, M37A	6450.5
WATER VALVE ASSEMBLY, Y4	6450.5
WHEEL CAMBER CONTROL MODULE, B22	6200.0
WIDE OPEN THROTTLE CUT-OFF RELAY, K86	6450.5
WINDOW DEFOGGER, REAR	6424.0
WINDOW LIMIT SWITCH, DRIVER'S, S43	5133.0
WINDOW LIMIT SWITCH, LEFT REAR, S45	5133.0



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WINDOW LIMIT SWITCH, PASSENGER'S, S44	5133.0
WINDOW LIMIT SWITCH, REAR, S170	5126.0-06
WINDOW LIMIT SWITCH, RIGHT REAR, S46	5133.0
WINDOW MOTOR, DRIVER'S, M21	5133.0
WINDOW MOTOR, LEFT REAR, M20	5133.0
WINDOW MOTOR, PASSENGER'S, M23	5133.0
WINDOW MOTOR, REAR, M96	5126.0-06
WINDOW MOTOR RELAY, K90	5126.0-06
WINDOW MOTOR, RIGHT REAR, M22	5133.0
WINDOW OPENING SWITCH, REAR, S147	6162.0
WINDOW SWITCH LEFT, REAR, S41	5133.0
WINDOW SWITCH RIGHT, REAR, S42	5133.0
WINDOW WASHER RELAY, REAR, K89	6162.0
WINDOW WIPER MOTOR, REAR, M94	6162.0
WINDOW WIPER RELAY I, REAR, K91w	6162.0
WINDOW WIPER RELAY II, REAR, K92	6162.0
WINDSHIELD WASHER JET HEATERS	6169.0
WIPER MOTOR, M3	6160.0
WIPER RELAY, K11	6160.0
WIPER/WASHER FLUID LEVEL SWITCH, REAR, S176	6200.0
WIPER/WASHER SWITCH, S5	6160.0
WIPER/WASHER SWITCH, S5	6162.0
ZKE CENTRAL LOCKING (ZV)	5126.0
ZKE DOOR LOCK HEATING (TSH)	5120.0
ZKE HEADLIGHT WASHER (SRA)	6167.0
ZKE INTERIOR LIGHTS CONTROL (IB)	6330.0
ZKE POWER WINDOWS (FH)	5133.0
ZKE SUNROOF (SHD)	5410.0

BMW
5

0110.0

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 1 m can be shown as a lead which is only a few cm long. To enhance the clarity of the schematics, all connectors and splices between fuses and components as well as between grounds and components have been omitted. If this information should be required, it may be referenced in cells **0670.3 Fuse Details** and **0670.4 Ground Distribution**.

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

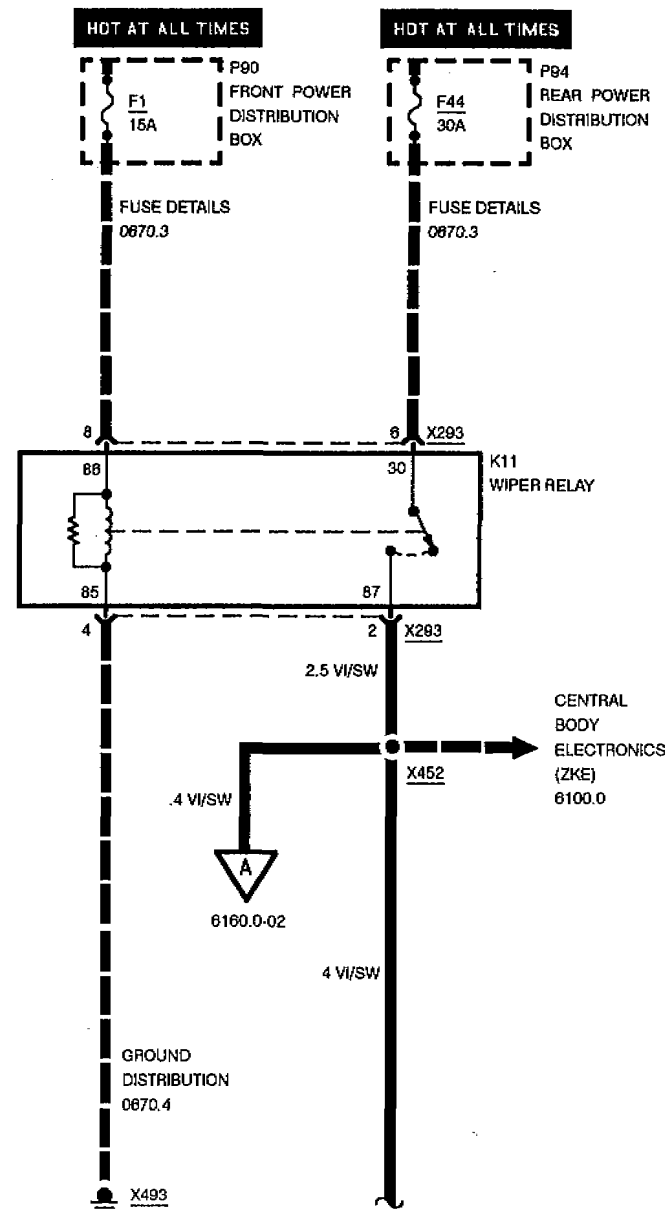
In cell **7000.0 Component Location Chart** all important connectors, ground points and components are listed in tabular form. It provides a precise description of the component locations in the vehicle.

In cell **7100.0 Component Location Views** the locations of the connectors and components which are difficult to locate are shown in photographs. In cell **8500.0 Connector Views** diagrams of all connectors with more than three 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 module of the system being diagnosed.

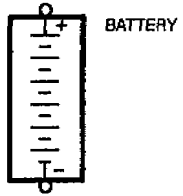
Example

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



General Conventions

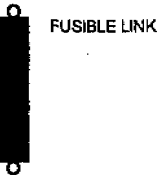
1. Switches and relays are always shown in rest position (e.g. K11).
2. A component shown in a dashed frame signifies that the component is illustrated only in part (e.g. P90 and P91).
3. A component shown in a completely drawn frame signifies that the component is illustrated in full (e.g. K11).
4. 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.



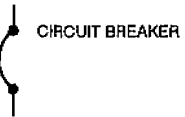
BATTERY



FUSE DETAILS



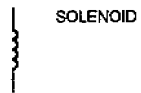
FUSIBLE LINK



CIRCUIT BREAKER



THERMO SWITCH



SOLENOID



SOLENOID CONTROLLED VALVE
OR CLUTCH SOLENOID



HEATING ELEMENT



LOUDSPEAKER OR HORN



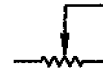
LIGHT



PERMANENT MAGNET MOTOR
ONE SPEED



PERMANENT MAGNET MOTOR
TWO SPEEDS



VARIABLE RESISTANCE
SENSOR
VARIABLE CONTACT IS
MOVED BY AN EXTERNAL
FORCE



VARIABLE RESISTOR
RESISTANCE IS CHANGED
BY TEMPERATURE OR
PRESSURE



INDUCTIVE SENSOR



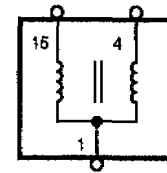
DIODE
CURRENT CAN FLOW ONLY
IN DIRECTION OF ARROW



ZENER DIODE
TO REGULATE VOLTAGE



LIGHT EMITTING DIODE



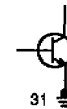
IGNITION COIL



CONTROL/POWER ELECTRONICS



RADIO



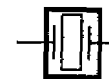
TRANSISTORIZED SWITCH



OXYGEN SENSOR

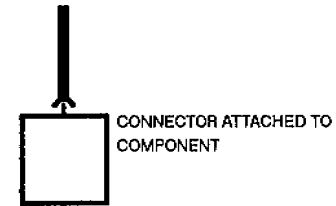
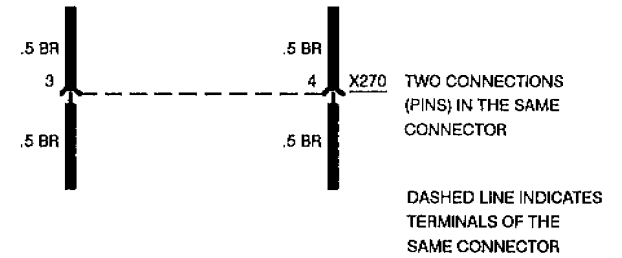
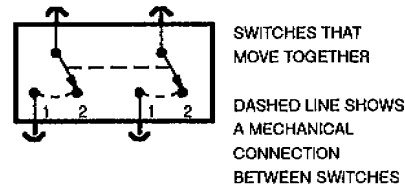
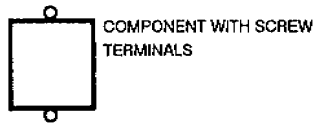
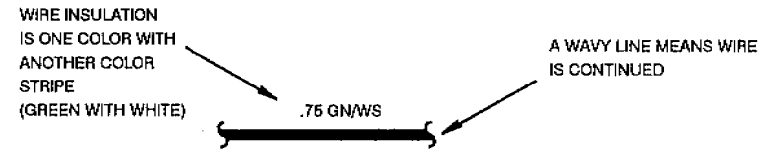
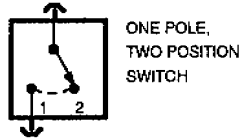
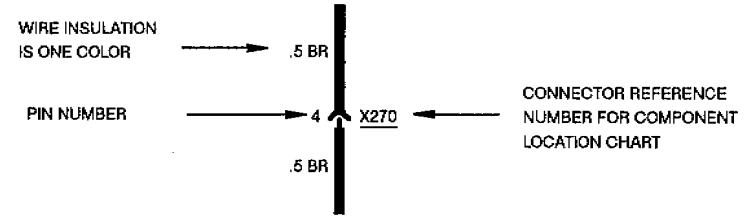
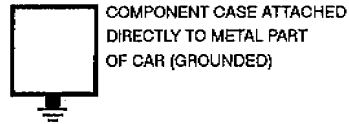


VEHICLE SPEED SENSOR

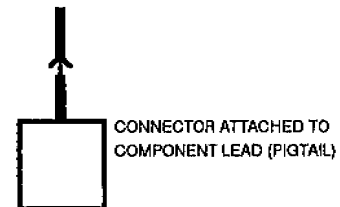
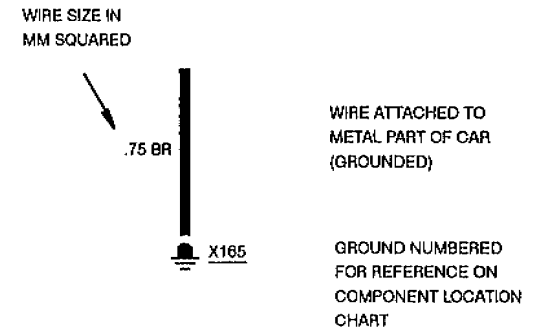


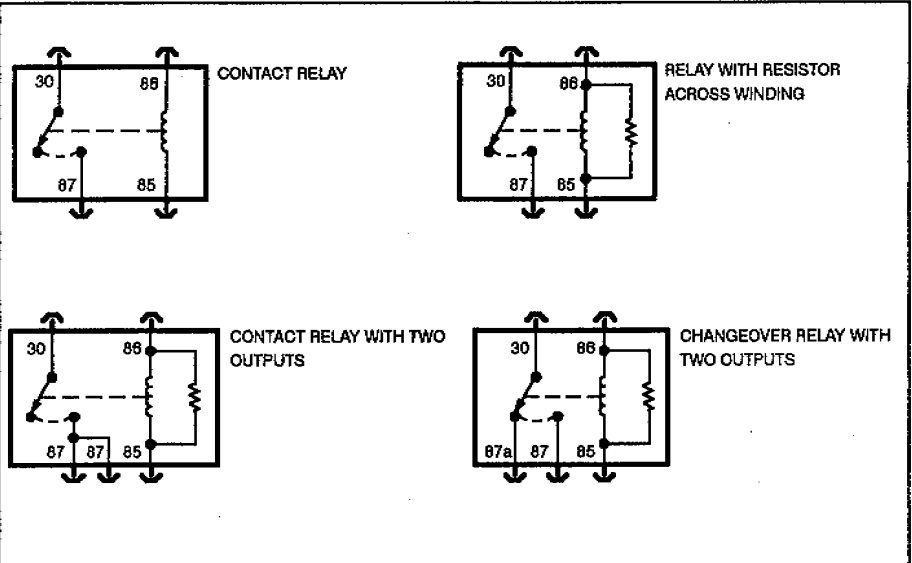
KNOCK SENSOR

SYMBOLS

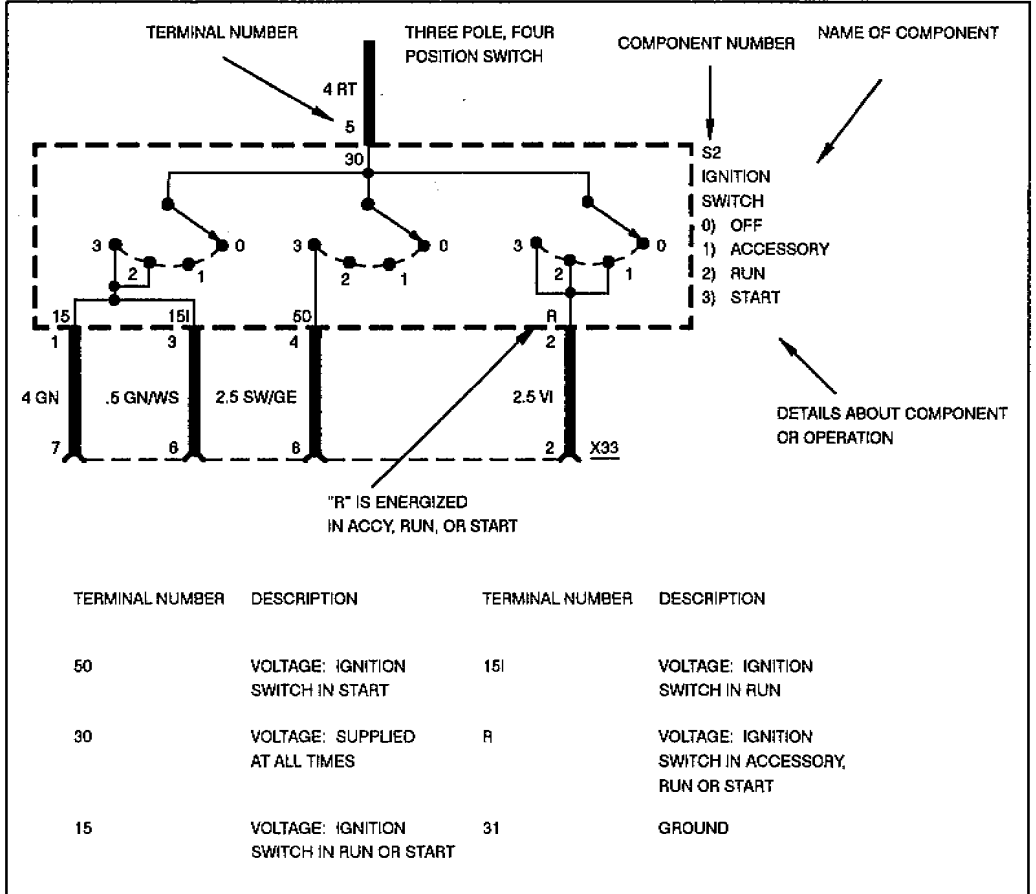


WIRE COLOR	
BL	BLUE
BR	BROWN
GE	YELLOW
GN	GREEN
GR	GRAY
OR	ORANGE
RS	PINK
RT	RED
SW	BLACK
VI	VIOLET
WS	WHITE
TR	TRANSPARENT

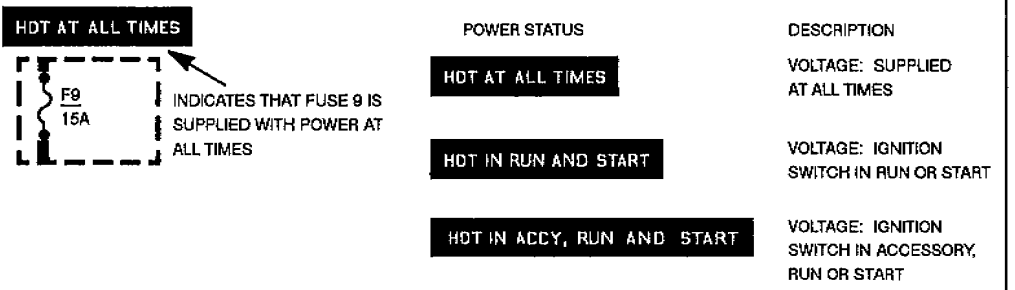




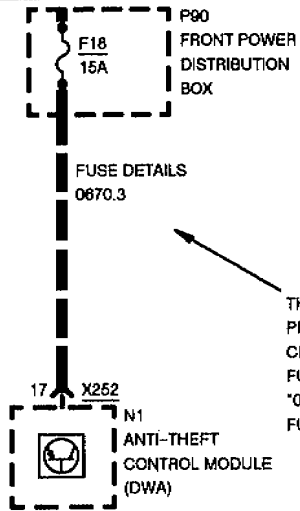
TERMINAL NUMBER	DESCRIPTION
30	RELAY INPUT
85	RELAY OUTPUT (WINDING)
86	RELAY INPUT (WINDING)
87	RELAY OUTPUT (ENERGIZED)
87a	RELAY OUTPUT (AT REST)



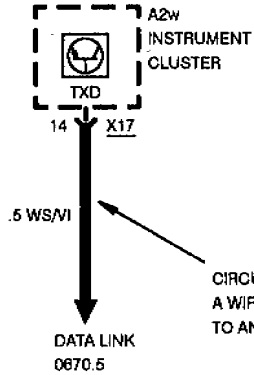
TERMINAL NUMBER	DESCRIPTION	TERMINAL NUMBER	DESCRIPTION
50	VOLTAGE: IGNITION SWITCH IN START	15i	VOLTAGE: IGNITION SWITCH IN RUN
30	VOLTAGE: SUPPLIED AT ALL TIMES	R	VOLTAGE: IGNITION SWITCH IN ACCESSORY, RUN OR START
15	VOLTAGE: IGNITION SWITCH IN RUN OR START	31	GROUND



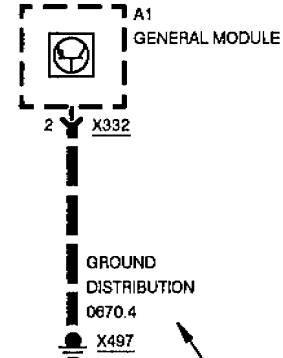
HOT IN ACCY, RUN AND START



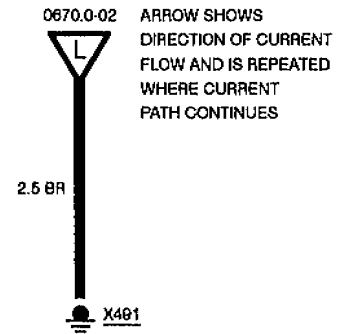
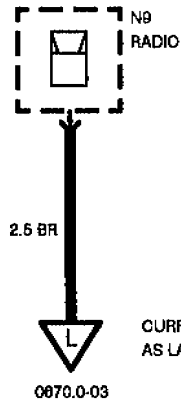
THE COMPLETE WIRE PROGRESSION AND FURTHER CIRCUITS CONNECTED TO FUSE 18 ARE SHOWN IN CELL "0670.3 FUSE DETAILS" AT FUSE 18



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



SYMBOLS BLOCK DIAGRAM

