Allgemeine Fahrzeugelektrik

Chassis-electrical
Châssîs-électricité
Telaio-impianto elettrico
Autobastidor-instalación eléctrica
Elsystem allmänt
Onderstel-elektrisch

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61 General Vehicle Electrical System

Specifications ..... Page 61-0/3
6113021 Component carrier – renewing 13/1
6131016 Turn indicator/ dip switch – renewing 31/1
020 Steering lock/ignition-starter switch – removing and installing 31/2
030 Light pull switch – removing and installing 31/3
040 Wiper switch – removing and installing 31/4
050 Heater (blower) switch – removing and installing 31/4
060 Heated rear window switch – removing and installing 31/5
080 Hazard warning flasher switch – removing and installing 31/5
260 Transmission-operated switch – removing and installing 31/6
270 Backup (reversing) light switch – removing and installing 31/7
280 Oil pressure sensing switch – renewing 31/7
304 Brake light switch – adjusting 31/7
340 Temperature sensing switch for auxiliary fan – renewing 31/7
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6161250 Wiper motor – removing and installing 61/1
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6171100 Windshield washer pump – removing and installing 71/1
110 Windshield washer pump – stripping and assembling 71/1

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Specifications

General Vehicle Electrical System

Model		320/6 320/6 A	323 i 323 i A *)
6113 . . . Component carrier (fuse box)			
Fuse box	No. of poles	18	
Fuses – number and rating)		9 × 8 7 × 16 2 × 25	
Spare fuses – number and rating		2 × 8 1 × 16 1 × 25	
6120 . . . Battery			
Nom. voltage	V	12	
Capacity	Amp/h	44	55
Polarity		negative earth (ground)	
6131 . . . Switches and relays			
Wiper switch Test voltage	V	13 ± 0.26	
Max. load (1 min)	Amp	20	

*) Version for Sweden

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Specifications

General Vehicle Electrical System

Model		320/6 320/6 A	323 i 323 i A *)
61 31 . . . Switches and relays, continued			
Voltage drop under continuous load	V	≦ 0.25	
Turn indicator/dip switch Test voltage	V	13 ± 0.26	
Max. load (1 min)	Amp	20	
Voltage drop under continuous	V	≦ 0.25	
Light pull switch Test voltage	V	13	
Max. load (1 min)	Amp	20	
Voltage drop under continuous load	V	≦ 0.1	
Heated rear window switch Test voltage	V	13	
Max. load (1 min)	Amp	50	
Voltage drop under continuous load	V	≦ 0.15	
Bulb (glass base)	W	1.2	

*) Version for Sweden

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Specifications

General Vehicle Electrical System

Model		a) 320/6 b) 320/6 A	a) 323 i b) 323 i A *)
6131 . . . Switches and relays, continued			
Hazard warning flasher switch Test voltage	V	13	
Max. load	Amp/min	20/2	
Voltage drop under continuous load	V	≦ 0.15	
Bulb (glass base)	W	1.2	
Oil pressure sensing switch Cut-in pressure (gauge)	bar (lb/in^2)	0.2 . . . 0.5 (2.84 . . . 7.11)	
Transmission-operated switch Test voltage	V	b) 13 ± 0.26	
Operating voltage	V	b) 9 . . . 15	
Nom. contact load (15-1; 15-2; 15-A; 15-0; 15-P)	W	b) 2	
15-R	W	b) 44	
31-13 b	VA ind.	b) 6	
Voltage drop	V	b) ≦ 0.25	

*) Version for Sweden

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Specifications

General Vehicle Electrical System

Model		320/6 320/6 A	323 i 323 i A *)
6131 . . . Switches and relays, continued			
Temperature-sensing switch, 17 °C (63°F) Operating voltage	V	9 . . . 15	–
Max. load	A/min	20/1	–
Cut-in point	°C (°F)	$+17\,^{+2}_{-3}$ ($+63\,^{+3}_{-4}$ app.)	– –
Cutout point	°C (°F)	app. + 5 (app. + 7) below cut-in point; min. + 10.5 (51)	–
Temperature-sensing switch, 91 °C (196°F) No. on hexagon		1 364 272	
Operating voltage	V	6 . . . 24	
Max. continuous load	A ind.	16	
Voltage drop	V	≦ 0,25	
Cut-in point	°C (°F)	+91 ± 2 (+196 ± 3 app.)	
Cutout point	°C (°F)	+84 ± 2 (+183 ± 3 app.)	

*) Version for Sweden

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Specifications

General Vehicle Electrical System

Model		320/6 320/6 A	323 i 323 i A *)
6131 . . . Switches and relays, continued			
Temperature-sensing, switch 99 °C (210°F) No. on hexagon		1 364 273	
Operating voltage	V	6 . . . 24	
Test voltage	V	13 ± 0.26	
Continuous load	A ind.	16	
Voltage drop	V	≦ 0.25	
Cut-in point	°C (°F)	+99 ± 2 (+210 ± 3 app.)	
Cutout point	°C (°F)	+92 ± 2 (+198 ± 3 app.)	
Blower switch (3-speed) Operating voltage	V	9 . . . 15	
Test voltage	V	13 ± 0.26	
Max. load at all contacts, for 1 min	A	40	
Voltage drop at all contacts	V	≧ 0.1	

*) Version for Sweden

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Specifications

General Vehicle Electrical System

Model		a) 320/6 b) 320/6 A	a) 323 i b) 323 i A *)
6131 . . . Switches and relays, continued			
Handbrake telltale switch Operating voltage	V	9 . . . 15	
Test voltage	V	13 ± 0.26	
Max. load (1 min)	A	10	
Voltage drop under continuous load	V	≦ 0.25	
Continuous load	A	4	
Brake light switch Test voltage	V	13 ± 0.26	
Max. load (1 min)	A	40	
Voltage drop at 5 A	V	≦ 0.25	
Continuous load	A	5	
Backup (reversing) light switch Test voltage	V	a) 13	
Max. load (1 min)	A	a) 20	
Voltage drop	V	a) ≦ 0.25	
Continuous load	A	a) 5	

*) Version for Sweden

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Specifications

General Vehicle Electrical System

Model		320/6 320/6 A	323 i 323 i A *)
6131 . . . Switches and relays, continued			
Miniature relay for auxiliary fan (stage II) Make/No.		Bosch/0 332 014 406	
Test voltage	V	13 ± 0.26	
Operating voltage	V	9 . . . 15	
Continuous load	A	30	
Coil current consumption	A	0.2	
Fuel pump relay Make/No.		–	Stribel/ . . .
Test voltage	V	–	13 ± 0.26
Operating voltage	V	–	6.8 . . . 15
Nom. current, terminals 15/87	A ind.	–	20
Short-circuit current, terminals 15/87 (1 min.)	A	–	40
Miniature diode relay for K-Jetronic fuel injection Make/No.		–	Stribel/. . .
Test voltage	V	–	13 ± 0.26

*) Version for Sweden

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Specifications

General Vehicle Electrical System

Model		320/6 320/6 A	323 i 323 i A *)
61 31 . . . Switches and relays, continued			
Operating voltage	V	–	9 . . . 15
Continuous load	A	–	9 . . . 15
Coil current	A	–	≦ 0.2
Pickup voltage	V	–	8
Drop-off voltage	V	–	≦ 2
Miniature relay Make/No.		Bosch/0 332 014 406 Hella/4 RA 003 205-00 Stribel/SR 9875 Valvar/1 364 986 Wehrle, Kirchzarten/21 201 12 V Wehrle, Tiengen/74502	
Operating voltage	V	9 . . . 15	
Coil current consumption	A	≦ 0.2	
Test voltage	A	13 ± 0.26	
Continuous load	A	30[1])	

*) Version for Sweden
[1]) 25 for Hella No. 4 RA 003 205-00 and for Wehrle Nr. 21 201 12 V

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Specifications

General Vehicle Electrical System

Model		a) 320/6 b) 320/6 A	a) 323 i b) 323 i A *)
6131 . . . Switches and relays, continued			
Hazard warning relay Make/No.		Hella TBB 44 DOT 4 DB 003 425-00 Stribel/SK 6756 719 005	
a) as hazard warning flasher unit Operating voltage	V	9 . . . 15	
Nom. load	W	4 × 21, 1 × 3, 1 × 2	
Voltage drop at nom. load	V	0.3	
b) as turn indicator unit Operating voltage	V	11 . . . 15	
Nom. load	W	2 × 21, 1 × 3	
Wipe-wash and intermittent-wipe control unit Make/No.		Hella/5 WG 002 450-07 1 353 892 Siemens/1 357 904	
Operating voltage between terminals 85, 31/15, 15 b	V	10.5 . . . 15	
between terminal F and 31	V	9 . . . 15	
Test voltage	V	13 ± 0.26	

*) Version for Sweden

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Specifications

General Vehicle Electrical System

Model		320/6 320/6 A	323 i 323 i A *)
61 31 . . . Switches and relays, continued			
Changeover relay Make/No.		–	Bosch 0 332 204 401 Hella 4 RD 003314-00
Operating voltage	V	–	9 . . . 15
Test voltage	V	–	13 ± 0.26
Pickup voltage	V	–	≦ 8
Drop-off voltage	V	–	≧ 2[1])
Coil current consumption	A	–	≦ 0.2
Continuous load at 87 at 87 a	A A	–	30 20
Voltage drop	V	–	≦ 0.25
61 61 . . . Wiper motor			
Make/No.		Bosch/0 390 241 056 SWF/. . .	
Operating voltage	V	12 ± 2.4	
Test voltage	V	13 ± 0.26	

*) Version for Sweden
[1]) ≧ 3 on Hella relay

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Specifications

General Vehicle Electrical System

Model			320/6 320/6 A	323 i 323 i A *)
61 61 . . . Wiper motor, continued				
Operating speed	Stage I	1/min	52 ± 5	
	Stage II	1/min	73 ± 8	
61 66 . . . Windshield washer pump				
Make/No.			VDO/. . . Helphos/. . .	
Operating voltage		V	10 . . . 16	
Test voltage		V	13	
Power consumption		W	45	

*) Version for Sweden

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Specifications

General Vehicle Electrical System

Model		320/6 320/6 A	323 i 323 i A *)
6131 . . . Switches and relays, continued			
		Tightening torques	
6131 . . . Switches and relays			
Oil pressure sensing switch, max.	Nm kpm lb.ft	50 5 36	
Brake light switch locknut	Nm kpm lb.ft	3 . . . 4 0.3 . . . 0.4 2.2 . . . 2.9	
Temperature-sensing switch on intake manifold, max.	Nm kpm lb.ft	30 3 22	– – –
Temperature-sensing switch on radiator	Nm kpm lb.ft	32 3.3 23.9	

*) Version for Sweden

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Electrical circuit diagram



BMW 320/6 320/6 A
323 i 323 i A

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Key to electrical circuit diagram – BMW 320/6 320/6 A
BMW 323 i 323 i A

1 Turn indicator, front right
2 Headlight, right, with parking light
3 High beam headlight, right
4 Fog light, right (special equipment)
5 Horn, right
6 Horn, left
7 Fog light, left (special equipment)
8 High beam headlight, left
9 Headlight, left, with parking light
10 Turn indicator, front left
11 Plug connector for right turn indicator
12 Connection for engine compartment light
13 Plug connector for left turn indicator
14
15
16 Engine compartment light (special equipment)
17 Switch for engine compartment light (special equipment)
18 Windshield washer pump
19 Coil[1])
20 Distributor[1])

[1]) Connection 1 with contact breaker not used with transistorized coil ignition
Connections A and B with inductive detector only on transistorized coil ignition
Wire TR 0.9 Ω/m not used on transistorized coil ignition

21 Battery
22 Power distributor with fuses
a Fog light relay (special equipment)
b) Low beam relay
c) High beam relay
d Load-shedding relay
e Auxiliary fan relay, stage II
f Plug connector to power distributor
g Horn relay
h Engine plug
i Connection for diagnosis tester
k Plug connector to wiring harness
l Connection 30
23 Auxiliary fan motor
24 Plug connector
25 Temperature-sensing switch
26 Alternator with regulator
27 Starter
28 Temperature-sensing switch
29 Oil pressure sensing switch
30 Coolant temperature sensor
31 Connection for rear fog light switch (special equipment)
32 Transmission switch with selector lever position indicator (automatic transmission cars only)
33 Wiper motor
34 Starter inhibit relay (automatic transmission cars only)
35 Handbrake contact
36 Brake fluid level telltale switch
37 Hazard warning flasher switch
38 Horn push
39 Plug connector for ignition-starter switch
40 Connection for ignition-starter switch
41 Wipe-wash-intermittent wipe control unit
42 Transmission switch lighting (automatic transmission cars only)
43 Plug connector for automatic transmission switch (automatic transmission cars only)
44 Backup (reversing) light switch (manual gearbox cars only)
45 Connection for transmission switch
46 Connection for backup (reversing) light or transmission switch
47 Plug connector for wiper switch
48 Ignition-starter switch
49 Connection for turn indicator-dip switch
50 Plug connector for turn indicator-dip switch
51 Light switch
52 Hazard warning flasher relay
53 Turn indicator-dip switch
54 Wiper switch
55 Heater blower motor
56 Heater blower switch
57 Cigar lighter
58 Lighting for switch panel
59 Plug connector for switch panel lighting
60 Ashtray light
61 Connection for radio
62 Clock
63 Instrument lighting
64 Switch for rear window heating
65 Rear fog light switch (special equipment)
66 Fog light switch (special equipment)
67 Instruments
a Oil pressure telltale
b Battery charge telltale (red)
c Headlight high beam telltale (blue)
d Plug connector, right
e Coolant thermometer
f Revolution counter
g Speedometer
h Turn indicator repeater
i Brake fluid level telltale
k Fuel level warning light
l Fuel gauge
m Plug connector, left
68 Glove box light
69 Hand lamp (special equipment)
70 Fuel pump (fuel injection cars only)
71 Door-operated switch, right
72 Fuel level sensor
73 Interior light
74 Switch for luggage compartment light (special equipment)
75 Door-operated switch, left
76 Luggage compartment light (special equipment)
77 Heated rear window
78 Plug connector
79 Brake light switch
80 Rear light cluster, left
a Turn indicator
b Brake light
c Backup (reversing) light
d Rear light
81 License plate light, left
82 License plate light, right

Electrical circuit diagram



BMW 320/6 RHD
323 i RHD

320/6 A RHD
323 i A RHD

Key to electrical circuit diagram – BMW 320/6 RHD 320/6 A RHD
BMW 323 i RHD 323 i A RHD

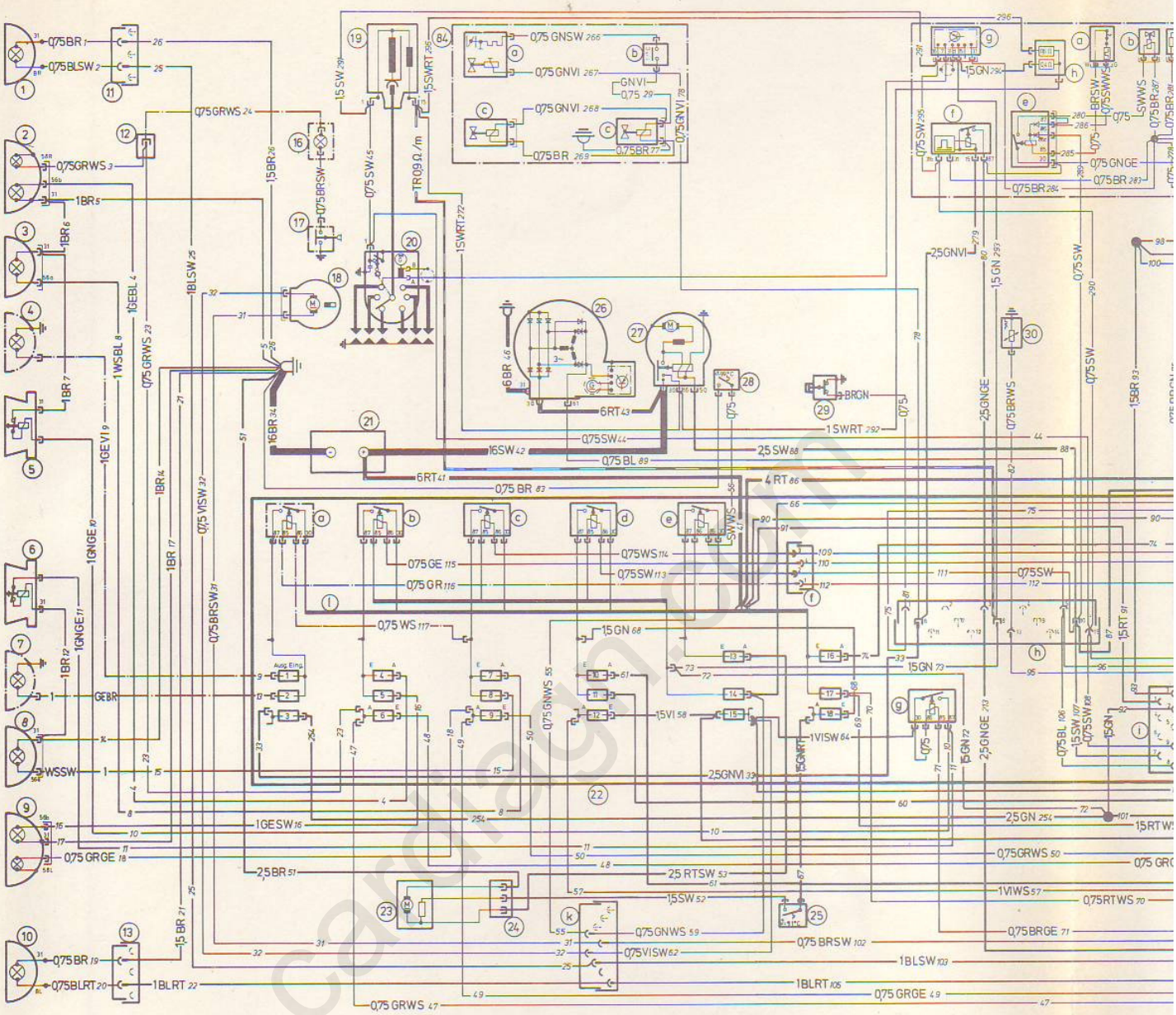
1 Turn indicator, front right
2 Headlight, right, with parking light
3 High beam headlight, right
4 Fog light, right (special equipment)
5 Horn, right
6 Horn, left
7 Fog light, left (special equipment)
8 High beam headlight, left
9 Headlight, left, with parking light
10 Turn indicator, front left
11 Plug connector to right turn indicator
12 Connection for engine compartment light
13 Plug connector for left turn indicator
14 Connection for Australian cars
15 Connection for sliding/raised vent roof
16 Engine compartment light (special equipment)
17 Switch for engine compartment light (special equipment)
18 Windshield washer pump
19 Coil[1])
20 Distributor[2])

1) Starter terminal 16 and resistor line on 6-cylinder engine and special equipment only
On 4-cylinder engine, lead 1 green in place of resitor line

2) Shown for 4-cylinder engine
Connection 1 deleted on transistorized coil ignition
Connections A and B used only on transistorized coil ignition

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21 Battery, 12 V
22 Power distributor with fuses
a Fog light relay (special equipment)
b Low beam headlight relay
c High beam headlight relay
d Load-shedding relay
e Auxiliary fan relay (stage 2)
f Plug connector to power distributor
g Horn relay
h Engine plug
i Connection for diagnosis tester
k Plug connector for wiring harness
l Connection 30
23 Auxiliary fan motor
24 Plug connector
25 Temperature-sensing switch
26 Alternator with regulator
27 Starter[1])
28 Temperature-sensing switch
29 Oil pressure sensing switch
30 Coolant temperature sensor
31
32 Transmission switch with selector lever position indicator (automatic transmission cars only)
33 Wiper motor
34 Starter inhibit relay (automatic transmission cars only)
35 Handbrake contact
36 Brake fluid level telltale switch
37 Hazard warning flasher switch
38 Horn push
39 Plug connector for ignition-starter switch
40 Connection for ignition-starter switch
41 Wipe-wash-intermittent wipe control unit
42 Transmission switch lighting (automatic transmission cars only)
43 Plug connector to transmission switch (automatic transmission cars only)
44 Backup (reversing) light switch (manual gearbox cars only)
45 Connection for special equipment
46 Connection to reversing (backup) light or transmission switch
47 Plug connector for wiper switch
48 Ignition-starter switch
49 Connection to turn indicator-dip switch
50 Plug connector to turn indicator-dip switch
51 Light switch
52 Hazard warning flasher relay
53 Turn indicator-dip switch
54 Wiper switch
55 Heater blower motor
56 Heater blower switch
57 Cigar lighter
58 Lighting for switch panel
59 Plug connector for switch panel lighting
60 Ashtray light
61 Connection for radio
62 Clock
63 Instrument lighting
64 Switch for rear window heating
65 Rear fog light switch (special equipment)
66 Fog light switch (special equipment)
67 Instruments
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b Battery charge telltale (red)
c Headlight high beam telltale (blue)
d Plug connector, right
e Coolant thermometer
f Revolution counter
g Speedometer
h Turn indicator repeater
i Brake fluid level telltale
k Fuel level warning light
l Fuel gauge
m Plug connector, left
68 Glove box light
69 Hand lamp (special equipment)
70 Fuel pump (fuel injection cars only)
71 Door-operated switch, right
72 Fuel level sensor
73 Interior light
74 Switch for luggage compartment light (special equipment)
75 Door-operated switch, left
76 Luggage compartment light (special equipment)
77 Heated rear window
78 Plug connector
79 Brake light switch
80 Rear light cluster, left
a Turn indicator
b Brake light
c Backup (reversing) light
d Rear light
e
81 License plate light, left
82 License plate light, right

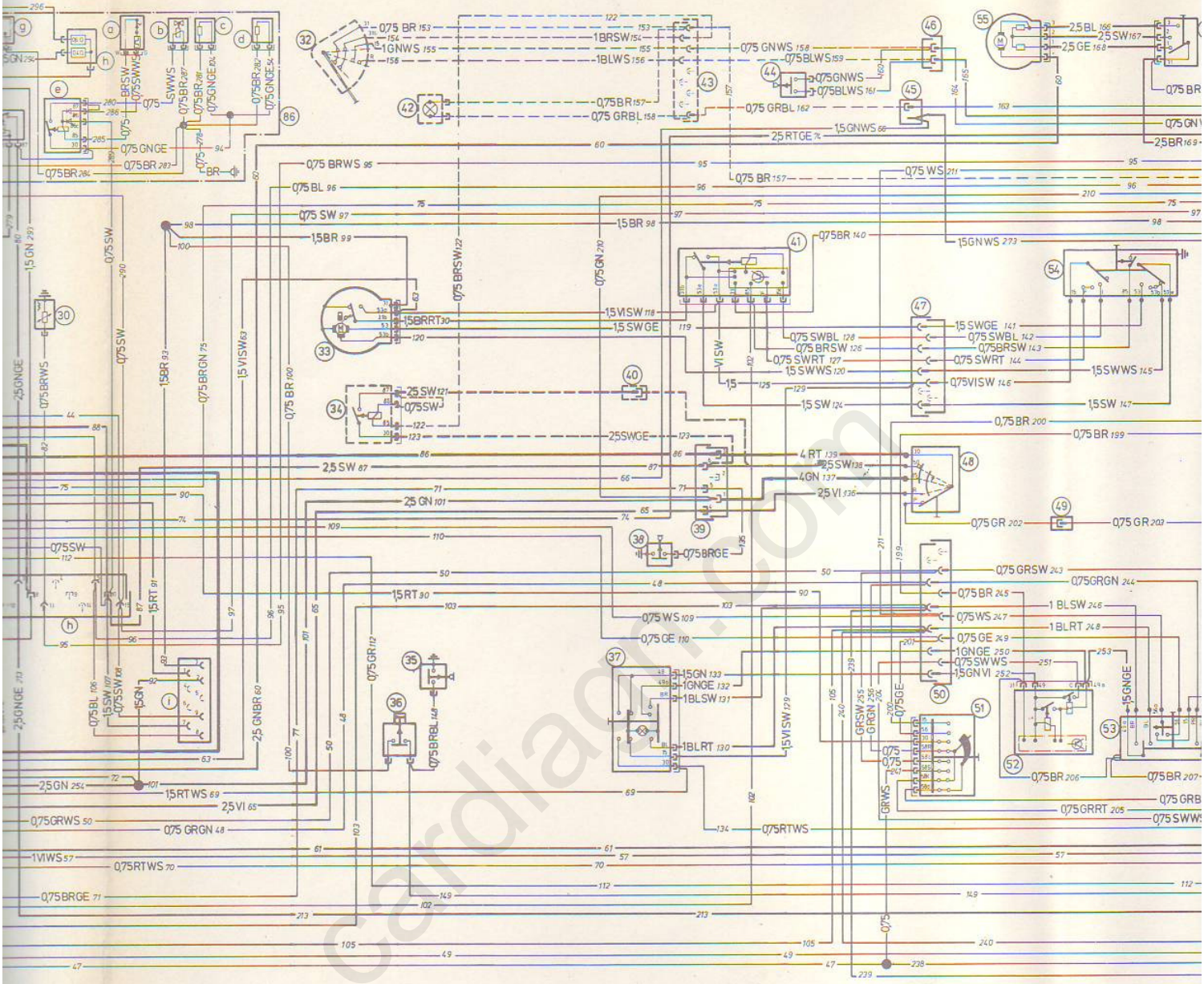


83 Rear light cluster, right
a Turn indicator
b Brake light
c Backup (reversing) light
d Rear light
84 On carburetor engined cars only:
a Automatic choke
b Coolant temperature switch
c Idle shutoff valve
85

86 On fuel injection engined cars only:
a Heat-sensitive time switch
b Starting valve
c Warm air regulator
d Additional air slide
e Diode relay
f Fuel pump relay
g Transistorized coil ignition
h Resistors
87
88
89 Rear fog light (special equipment)
90 Connection for rear fog light (special equipment)
91
92 Plug connector

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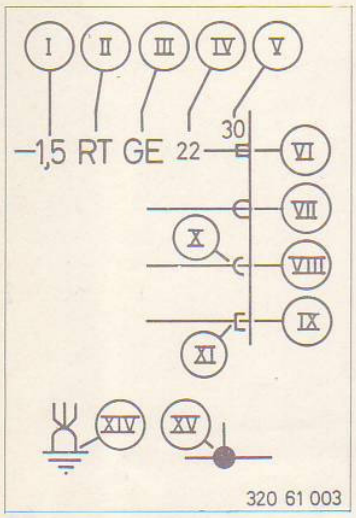
Circuit diagram – BMW 320/6, 320/6 A, 323 i, 323 i A



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on

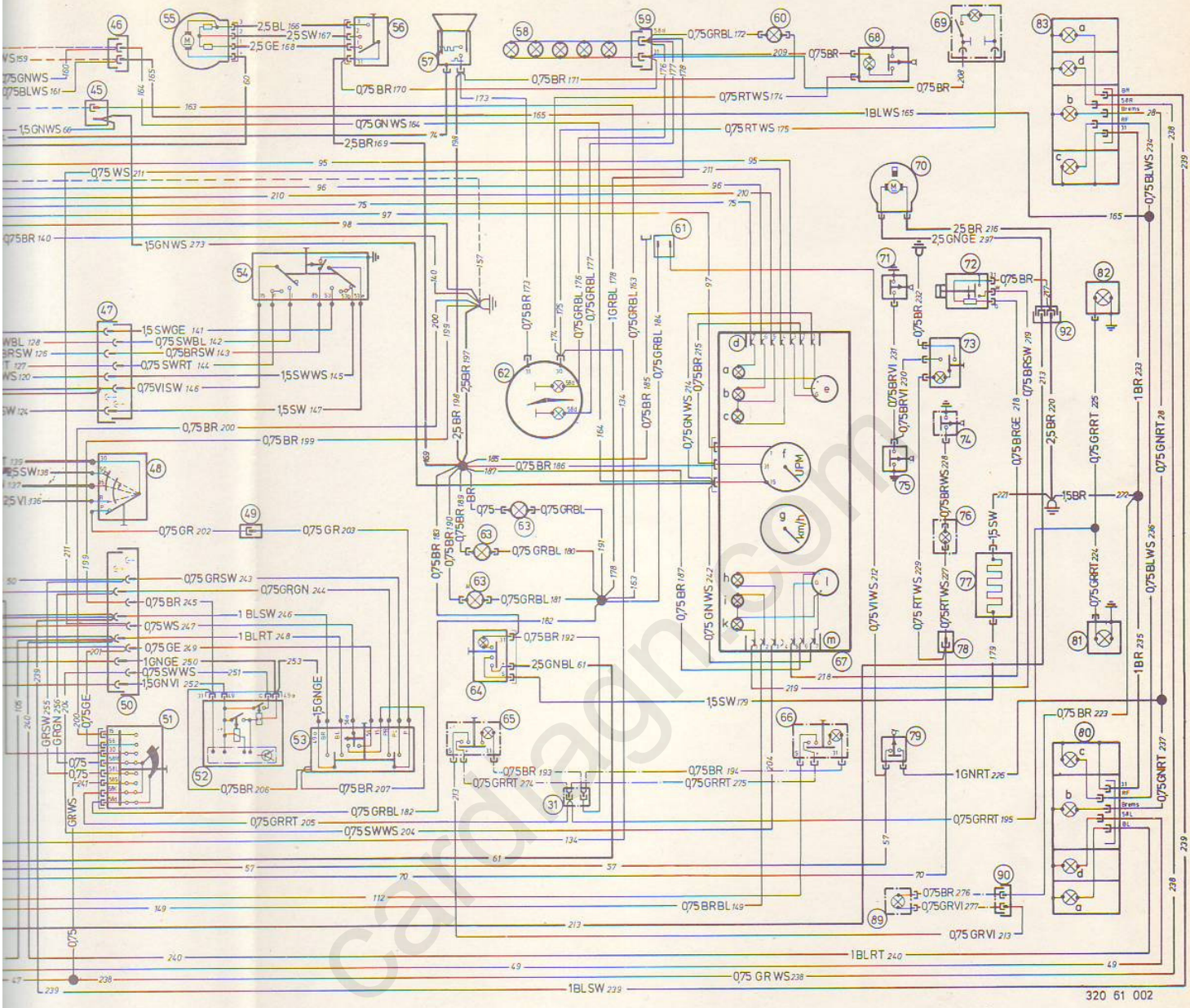
quipment)
light



Key to Drawing 320 61 003

- (I) = Cross-section, mm²
- (II) = Basic color
- (III) = Identification spiral
- (IV) = Cable number
- (V) = Terminal designation
- (VI) = Terminal (cable end tinned)
- (VII) = Screw connection (cable shoe)

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0 61 003

section, mm²

olor

cation spiral

number

al designation

al (cable end tinned)

connection (cable shoe)

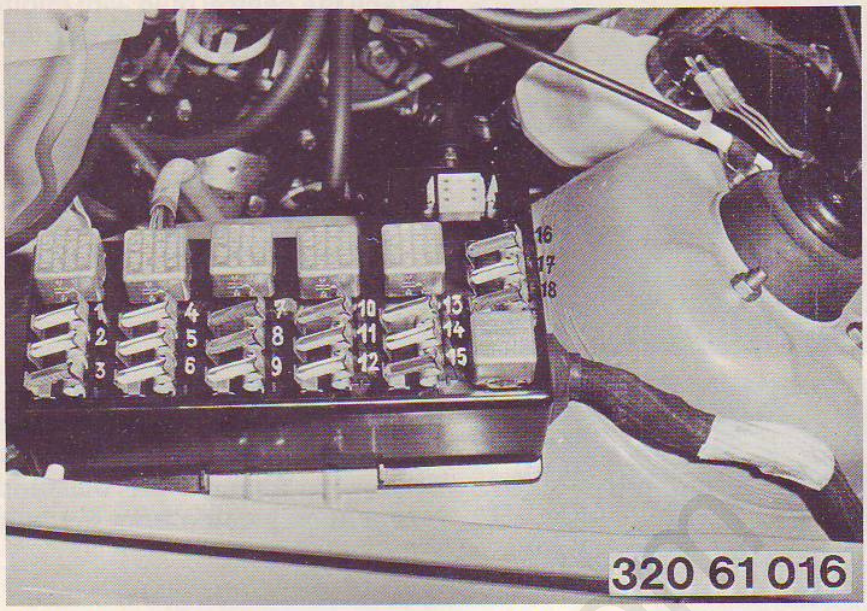
VIII	=	Round pin plug
IX	=	Flat pin plug
X	=	Round pin socket
XI	=	Flat pin socket
XIV	=	Earth (ground)
XV	=	Solder point or connector

Color code

BL	= blue
BR	= brown
GE	= yellow
GN	= green
GR	= grey
RT	= red
SW	= black
VI	= violet
WS	= white
TR	= transparent

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61 13 021 Component carrier – renewing

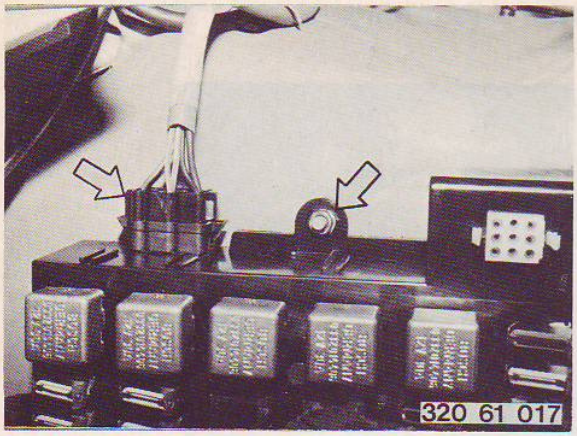


Arrangement of fuses

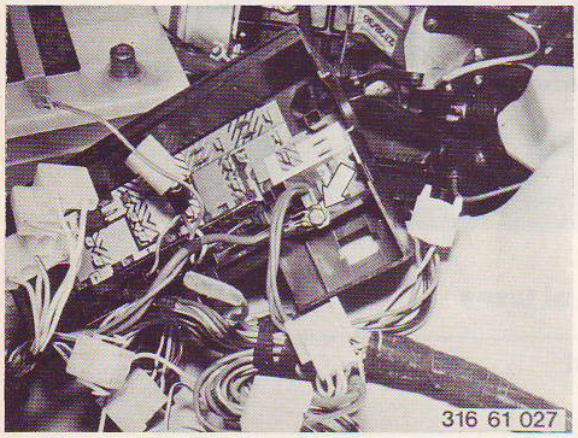
No.	Fuse (to DIN 72581 standard) Amp	Electrical equipment
1	8	Fog light, right[1])
2	8	Fog light, left[1])
3	16	Electric fuel pump, automatic cold-start device
4	8	Low beam headlight, right
5	8	Low beam headlight, left
6	8	Overnight, tail, parking lights (right), license plate, instrument, rear fog light, engine compartment light[1])
7	8	High beam headlight, right
	(16)	
8	8	High beam headlight, left
	(16)	Extra high beam headlight, right[1])
9	8	Overnight, tail, parking lights (left)
10	16	Heated rear window
	(25)	Electric sliding roof[1])
11	25	Heater blower, extra fan control, air conditioner[1])
12	8	Stop lights, radio[1])
13	25	Extra elec. fan
14	8	Backup lights, revolution counter, fuel/temperature gauges, indicator lamps for oil pressure, fuel level, parking brake, brake fluid level and high beams
15	16	Horn, turn indicators, wipe/wash system, headlight cleaners[1]), electric mirror[1])
16	16	Cigar lighter, automatic antenna[1])
17	8	Hazard lights, interior light, glove compartment light, clock, trunk light[1])
18	16	Electric auxiliary fan

[1]) Optional extra equipment

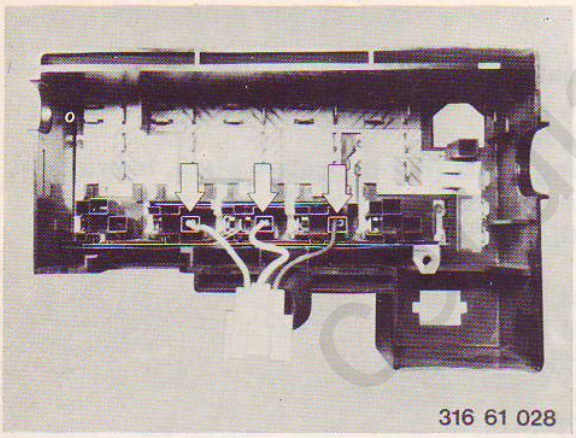
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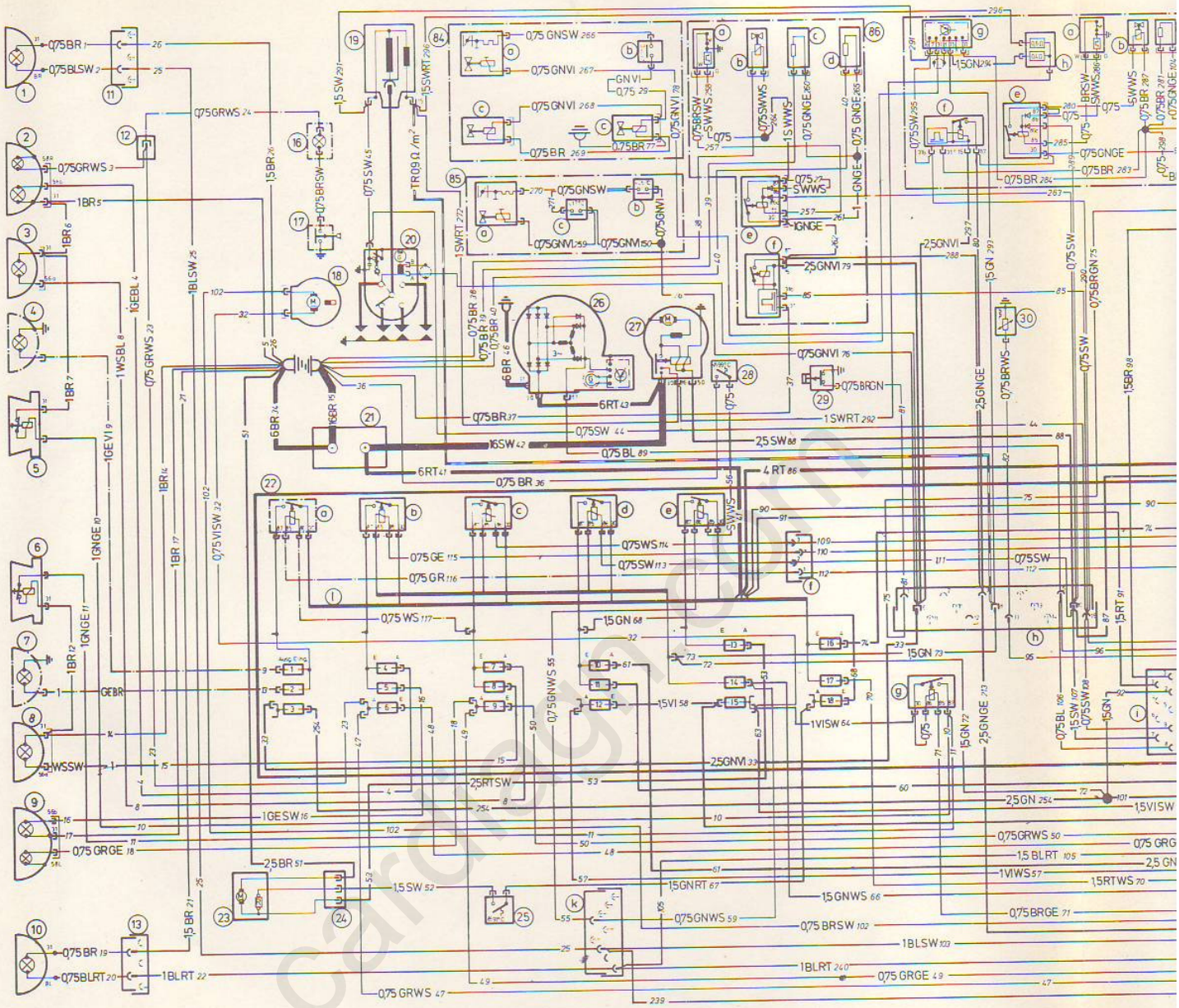
Disconnect the negative lead at the battery.
Take off the equipment carrier cover.
Detach the central plug with engine wiring harness from the equipment carrier.
Unscrew the nut.
Turn the equipment carrier through 180°.



Take off the lower cover.
Detach the various terminal strips and central plug from the defective equipment carrier in sequence. Remove the bolt and detach the power supply cable from the busbar.



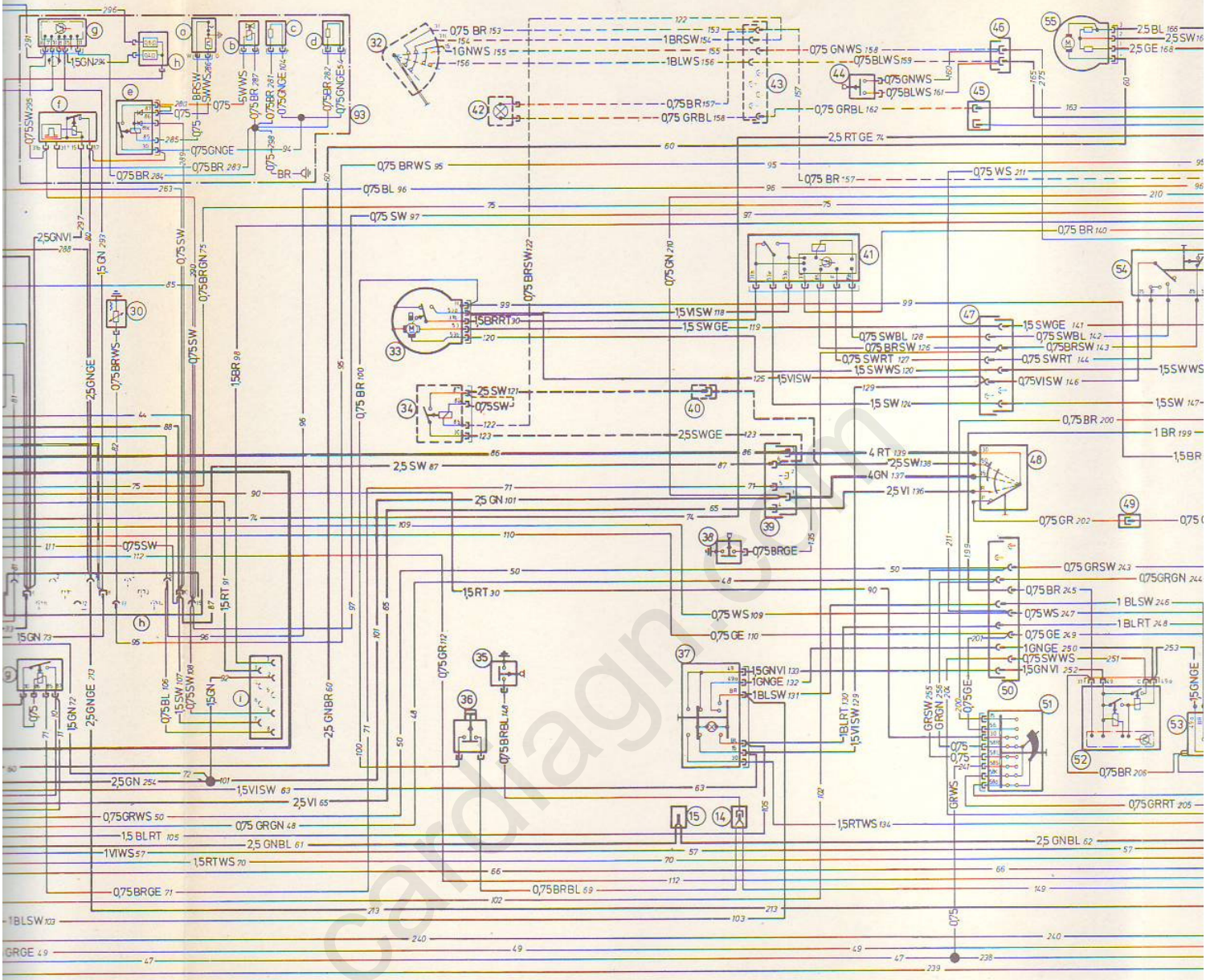
Detach the plug connector between the power distributor cable and the relays.
Detach the relays from the equipment carrier.
When installing: **Connect leads as shown in wiring diagram. Connect the two halves of the central plug together.**



83 Rear light cluster, right
a Turn indicator
b Brake light
c Backup (reversing) light
d Rear light
84 On carburetor engined cars only:
a Automatic choke
b Coolant temperature switch
c Idle shutoff valve
85 On carburetor engined 4-cylinder cars only:
a Automatic choke
b Coolant temperature switch
c Air temperature switch
86 On fuel injection 4-cylinders cars only:
a Heat-sensitive time switch
b Starting valve
c Warming-up regulator
d Additional air slide
e Diode relay
f Fuel pump relay
90 Rear fog light (special equipment)
91 Connection for rear fog light (special equipment)
92 Connection for rear fog light switch (special equipment)
93 On 6-cylinder fuel injection cars only:
a Heat-sensitive time switch
b Starting valve
c Warming-up regulator
d Additional air slide
e Diode relay
f Fuel pump relay
g Transistorized coil ignition
h Resistors
94 Plug connector

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Circuit diagram 320/6 RHD, 320/6 A RHD, 323i RHD, 323i A RHD

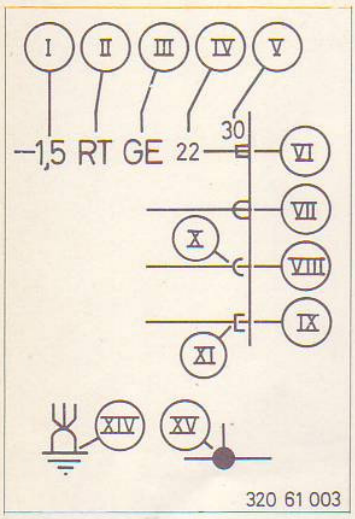


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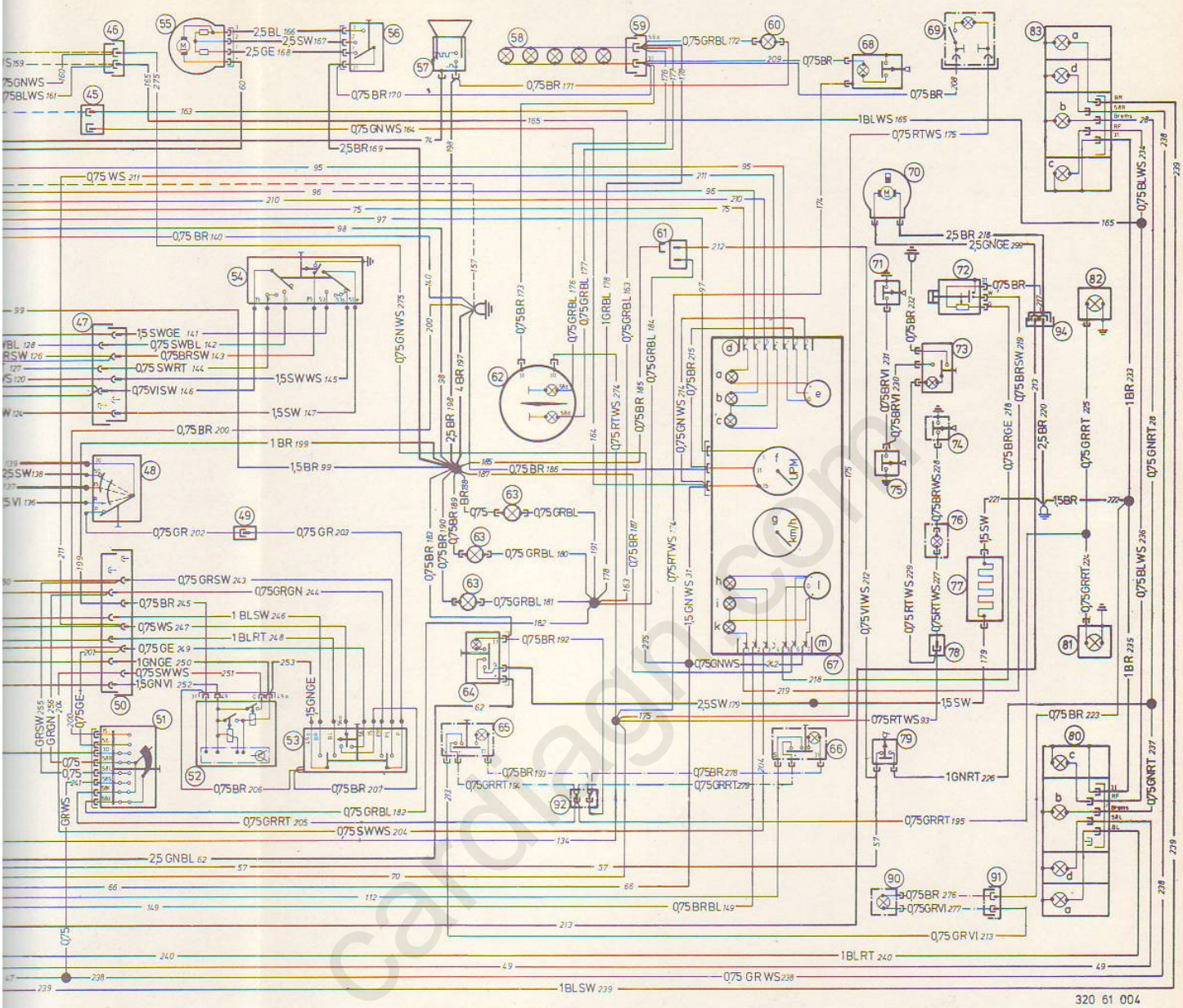


Key to Drawing 320 61 003

- (I) = Cross-section, mm²
- (II) = Basic color
- (III) = Identification spiral
- (IV) = Cable number
- (V) = Terminal designation
- (VI) = Terminal (cable end tinned)
- (VII) = Screw connection (cable shoe)

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A RHD



61 003

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umber

l designation

l (cable end tinned)

onnection (cable shoe)

VIII	=	Round pin plug
IX	=	Flat pin plug
X	=	Round pin socket
XI	=	Flat pin socket
XIV	=	Earth (ground)
XV	=	Solder point or connector

Color codes

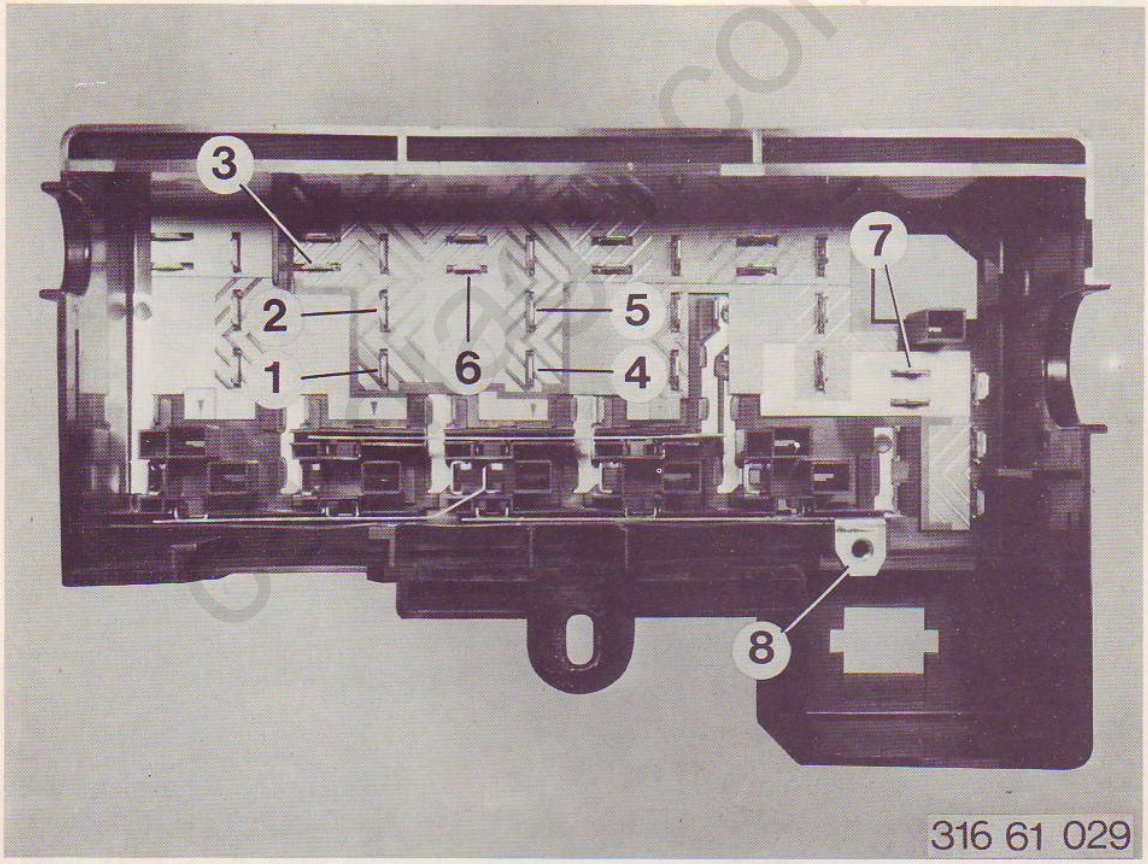
BL	= blue
BR	= brown
GE	= yellow
GN	= green
GR	= grey
RT	= red
SW	= black
VI	= violet
WS	= white
TR	= transparent

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When installing: Connections for front section of wiring harness

Color codes for wiring at equipment carrier

Fuse No.	Output
4	(1) yellow/blue
5	(2) yellow/black
6	(3) grey/white
7	(4) white/blue
8	(5) white/black
9	(6) grey/yellow
	(7) green/yellow
	(8) red

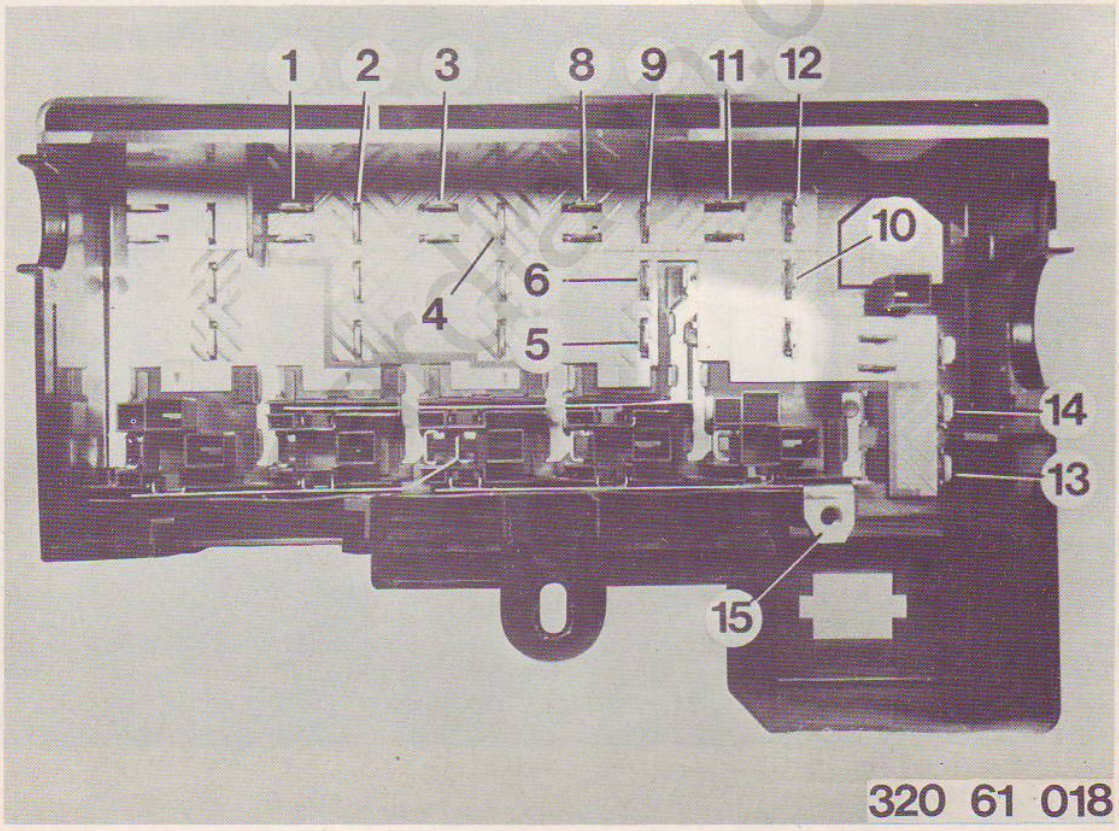


When installing: Connections for rear section of wiring harness.

Color code for wiring at equipment carrier

Fuse No.	Output	Input
6	① grey/white	② grey/green
9	③ grey/yellow	④ grey/black
10	⑤ green/blue	
11	⑥ green/brown	
12	⑧ violet/white	⑨ violet
14	10 green/white	
15	11 violet/black	12 violet
16	13 red/yellow	
17	14 red/white	
17	15 red	

Horn relay: Brown/yellow, terminal 85
violet/white, terminal 86
violet/white, terminal 30/5 I (twin cable)

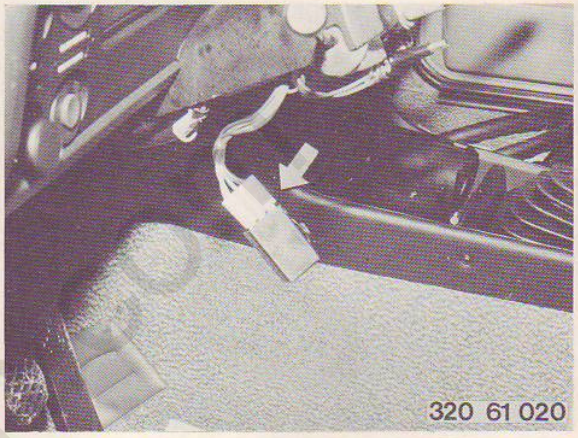


61 31 016 Turn indicator and dip switch – renewing

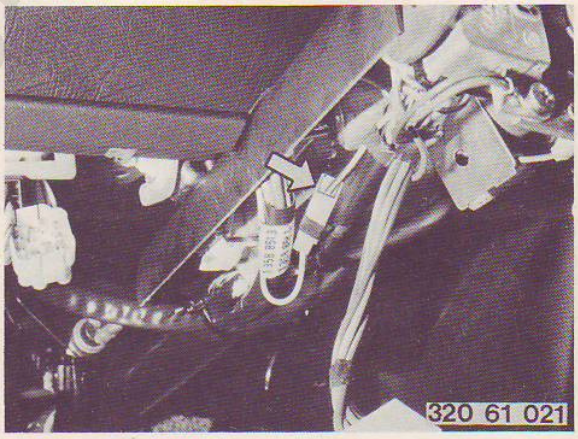
Remove the lower trim panel – 32 31 020.
Remove the steering wheel – 32 33 000.
Disconnect the negative lead at the battery.
Separate the plug connection.



Disconnect the hazard warning relay and pull off the plug.



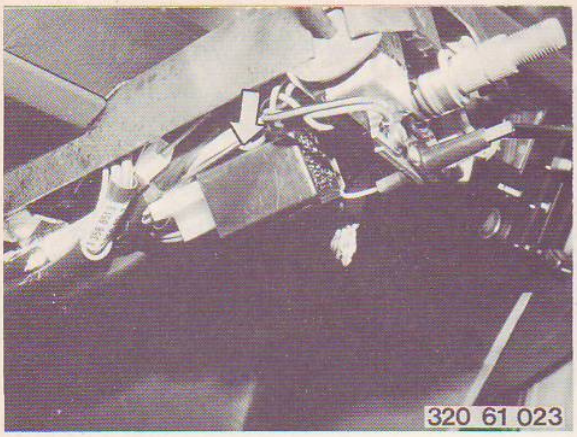
Separate the parking light plug connector and detach the cable straps from the steering column.
When installing: **Check condition of cable straps and renew if necessary.**



Remove screws and detach switch complete with wiring harness.
When installing: **Attach earth (ground) lead (1) together with switch.**



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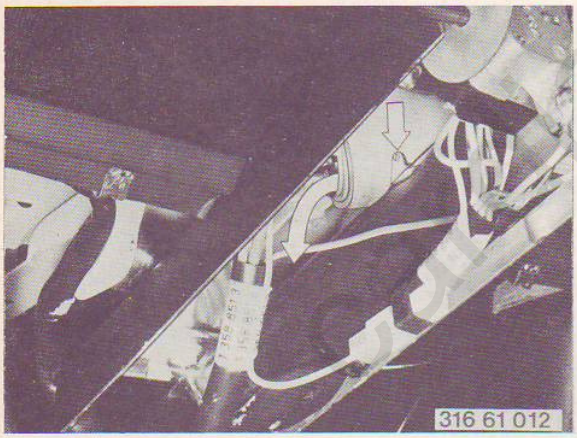


61 31 020 Steering lock and ignition-starter switch – removing and installing

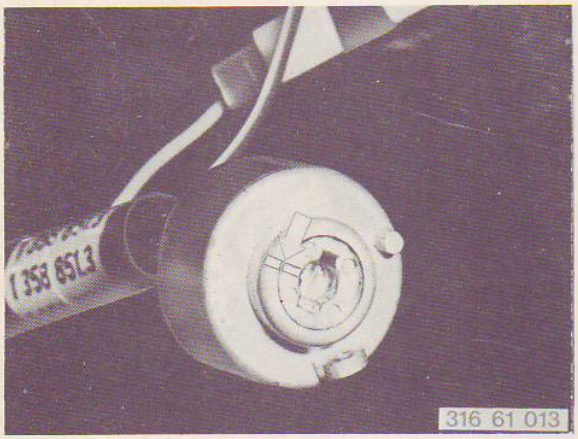
Disconnect negative lead at battery.
Remove and install lower trim – 32 31 020.
Detach hazard warning relay from retaining plate.



Pull off connectors for parking light and horn leads.
Detach cable straps from steering column.
When installing: **check condition of cable straps and renew if necessary.**



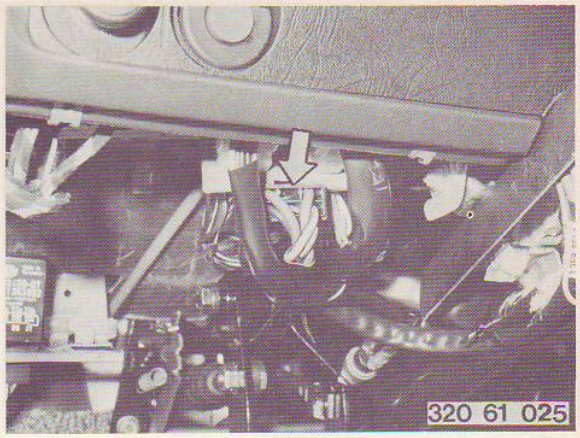
Remove grub screw and take out ignition-starter switch.



When installing: **Turn ignition switch to the "O" position. The marks on the ignition-starter switch should be opposite one another.**

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Separate the central plug connection.



61 31 030 Main light switch – removing and installing

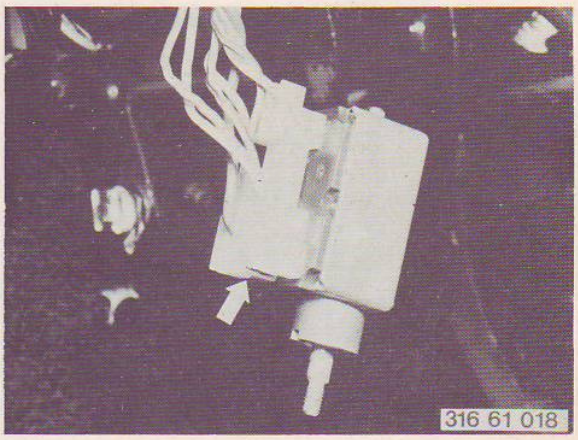
Detach the lower left facia trim – 51 45 180.
Disconnect the negative lead at the battery.
Unscrew the main light switch knob.
Warning: Use a pin or drift of suitable size to prevent the light switch shaft from turning.



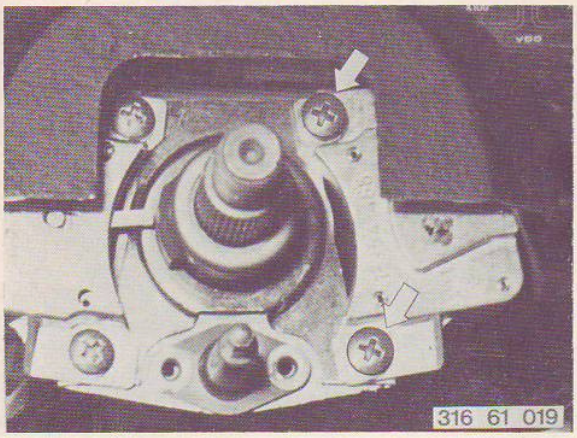
Unscrew the switch locking plate with a pin screwdriver and remove the complete switch with backing plate.



Detach the multi-pin plug from the switch.

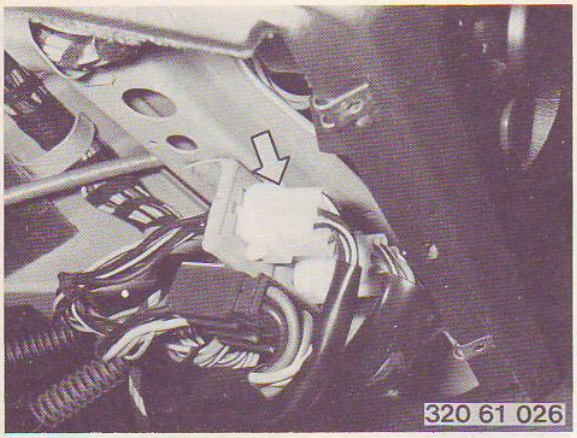


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61 31 040 Wiper switch – removing and installing

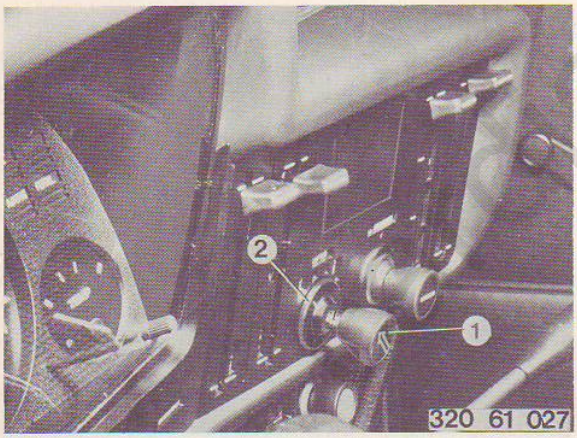
Remove and install the lower trim – 32 31 020.
Remove and install the steering wheel – 32 33 000.
Disconnect the negative lead at the battery.
Remove the screws.

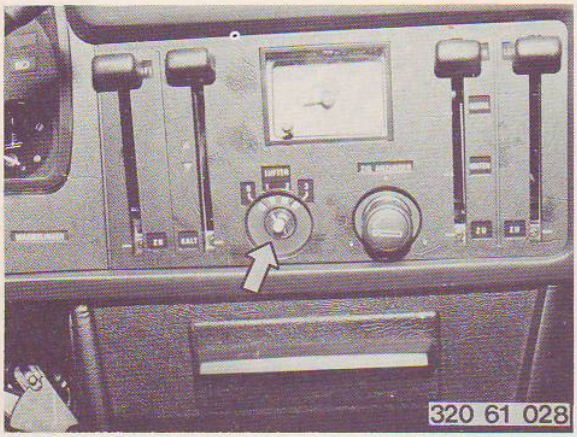


Detach the central plug.
Detach the cable straps from the steering column.
When installing: Check condition of cable straps and renew if necessary.

61 31 050 Heater blower switch – removing and installing

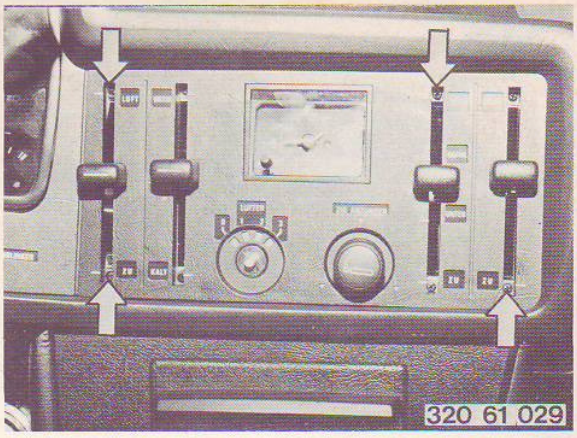
Disconnect the negative lead at battery.
Pull off knob (1) and plate (2).





Unscrew the switch retaining plate with a pin screwdriver.

Pull off the control knobs and detach the switch panel.



Carefully detach the central plug from the switch.
Take off the switch.
When installing: **Make sure that the switch is correctly located in the switch panel.**



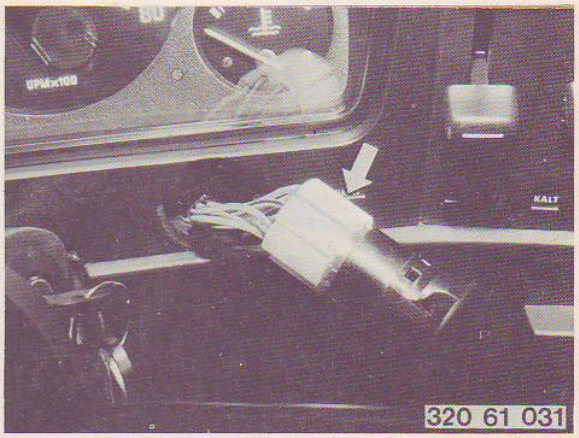
61 31 060 Switch for heated rear window – removing and installing

Disconnect negative lead from battery.
Lift out switch and pull off plug.



61 31 080 Switch for hazard warning flashers – removing and installing

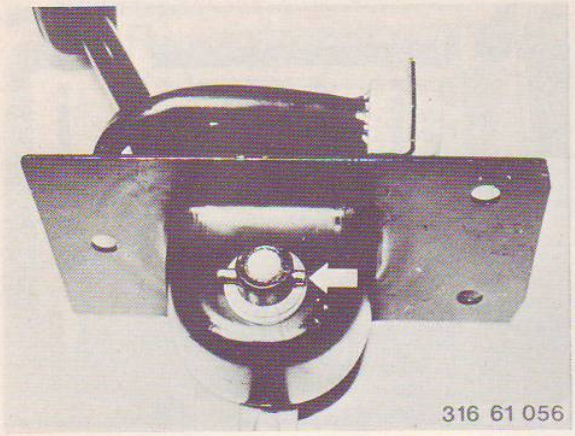
Disconnect negative lead at battery.
Lift out switch and pull off plug.



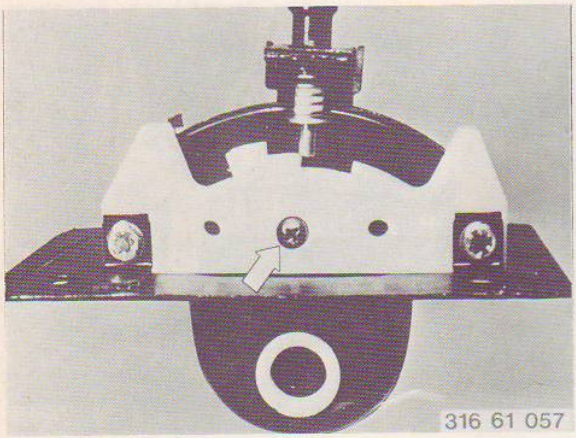
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61 31 260 Transmission switch – removing and installing

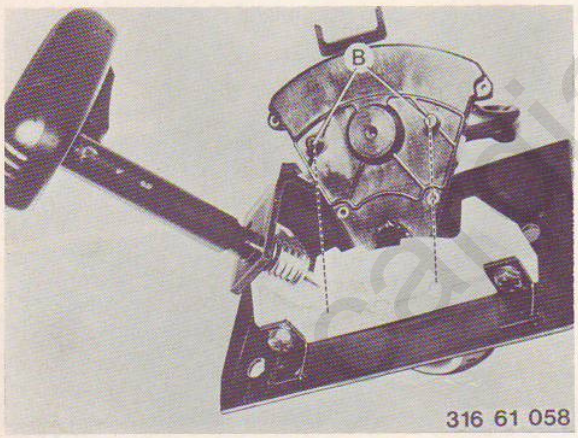
Remove and install complete selector lever with pivot mount – 35 16 050.
Drive out locating collet and detach lower part of selector lever.


316 61 056

Remove bolt.

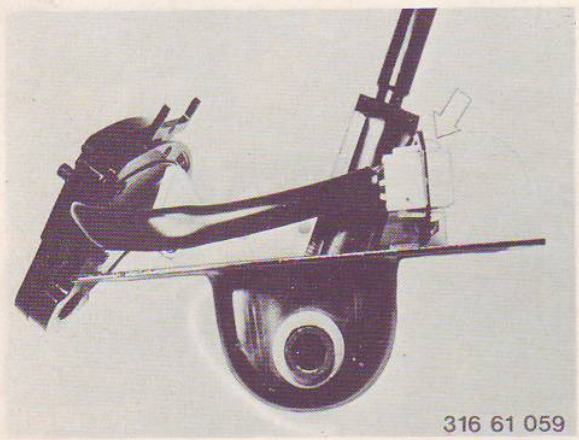

316 61 057

Take out the transmission switch.
When installing: **the two pins (B) on the transmission switch must locate in the holes provided on the selector gate.**
Connect the drive element to the selector lever.



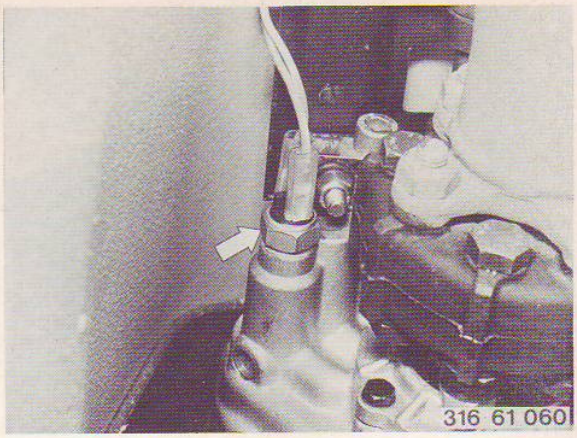
316 61 058

Detach plug housing and light from holder.
Take off transmission switch.


316 61 059

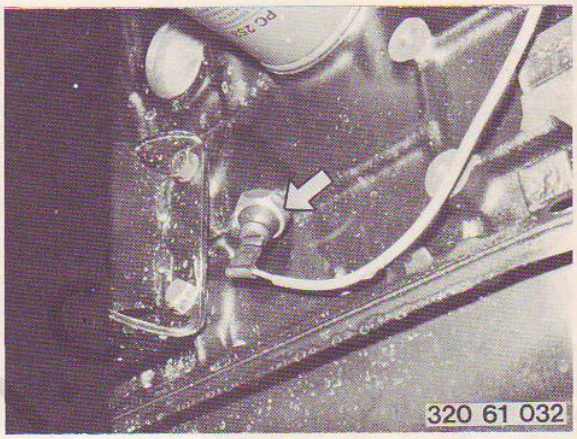
61 31 270 Switch for backup (reversing) light – removing and installing

Detach lead from switch.
Unscrew switch from gearbox.
When installing: **use a new sealing ring.**
Note correct tightening torque[1]).



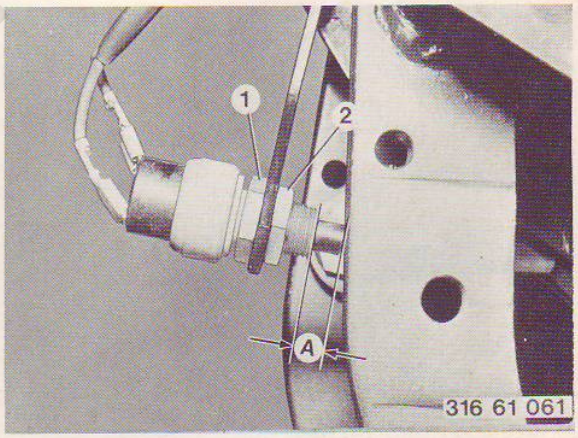
61 31 280 Oil pressure sensing switch – renewing

Detach lead and unscrew switch.
When installing: **note correct tightening torque[1]).**
Use a new sealing ring. Check oil level.



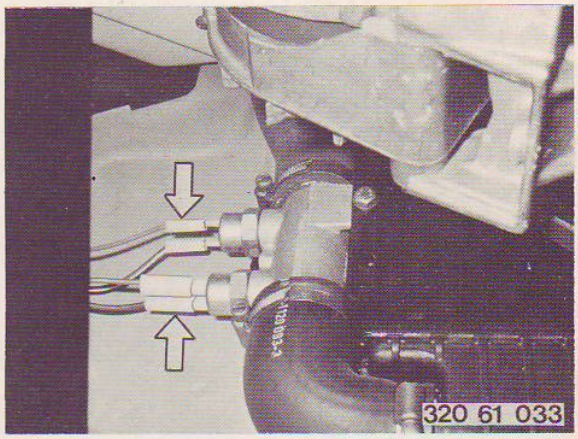
61 31 304 Brake light switch – adjusting

Detach and attach lower left facia trim – 51 45 180.
Loosen nuts (1 ... 2) and adjust brake light switch so that 5 ... 6 mm (0.20 ... 0.24 in) of the contact button is visible (A) when in contact with the brake pedal.



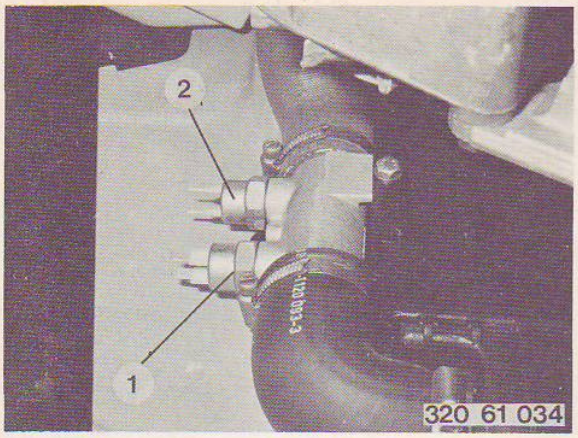
61 31 340 Temperature-sensitive switch for auxiliary fan – renewing

Pull off the leads.
When installing: **do not confuse leads for stages 1 and 2.**

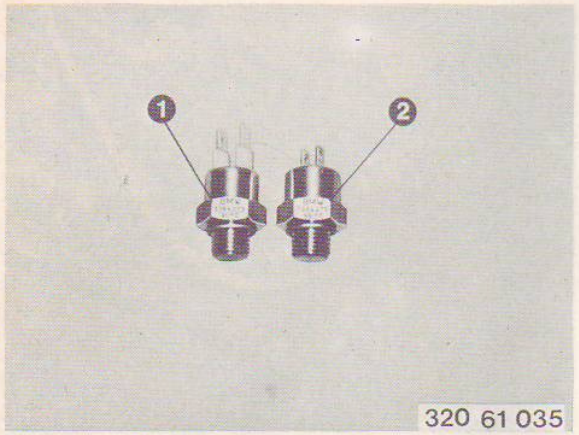


1) See specifications

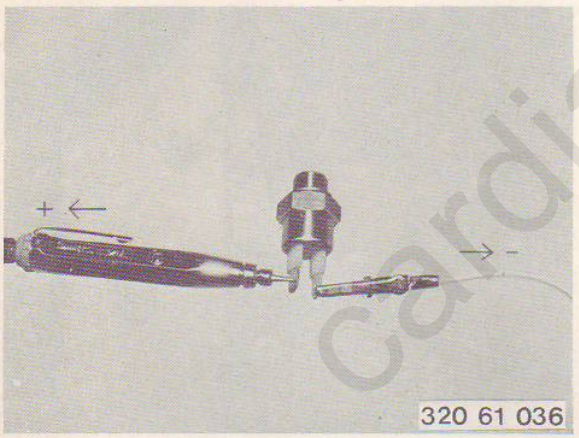
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Remove the temperature-sensitive switch.
1 = 91°C (196°F) temperature-sensitive switch (stage 1)
2 = 99°C (210°F) temperature-sensitive switch (stage 2)
When installing: **use a new sealing ring. Restore coolant level in cooling system and bleed system – 17 00 039.**
Note correct tightening torque[1]).



Distinguishing features: BMW No. and temperature in degrees are stamped on hexagon body of temperature-sensitive switch.
1 = 1 364 272 91°C (196°F)
2 = 1 364 273 99°C (210°F)



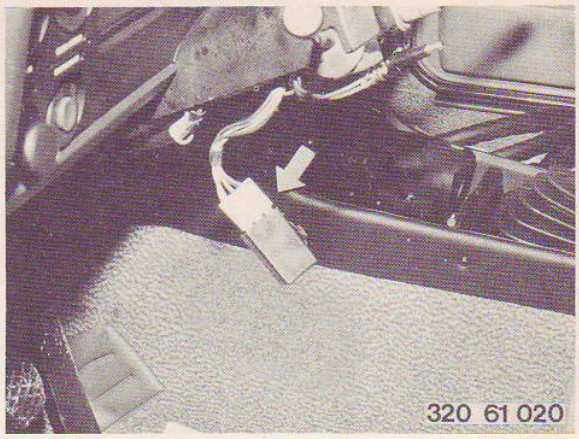
Testing method: connect test lamp to battery + and to flat pin plug of temperature-sensitive switch (which should be cool). Earth (ground) the second flat pin plug of the switch. The test lamp must not light up. If it does, the temperature-sensitive switch must be renewed.
Note correct cut-in and cutout points[1]).

[1]) See specifications

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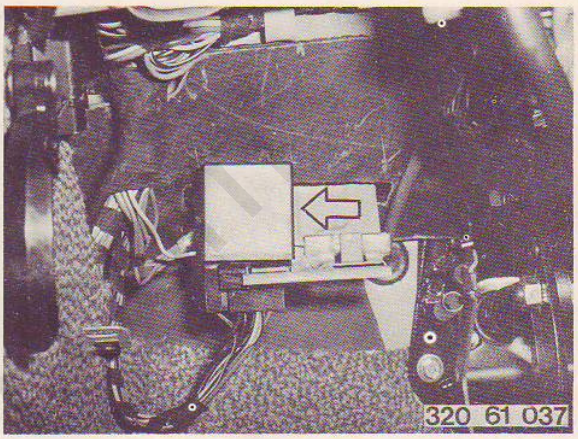
61 31 360 Hazard warning flasher relay – removing and installing

Disconnect negative lead at battery.
Remove and install lower section of trim – 32 31 020.
Disconnect the hazard warning flasher relay and pull off the plug.



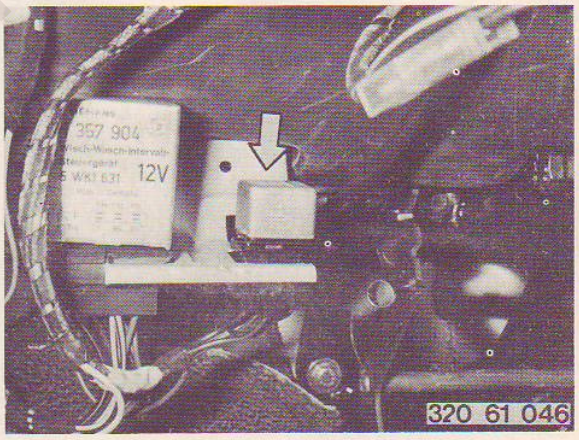
61 31 370 Wipe-wash-intermittent wipe control unit – removing and installing

Disconnect the negative lead from the battery.
Detach and attach the lower left facia trim – 51 45 180.
Detach the control unit from its mount and pull off the plug.



61 31 400 Starter inhibit relay – renewing

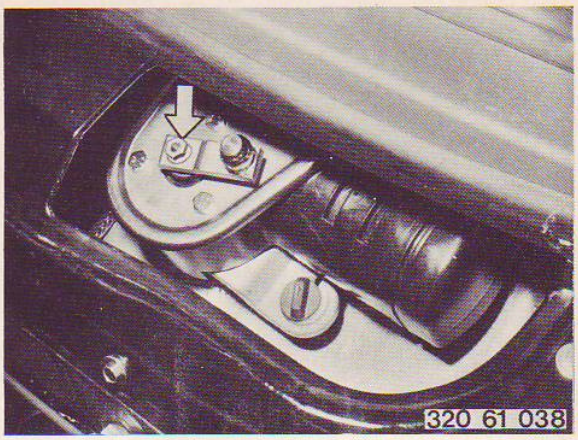
Detach and attach the lower left facia trim – 51 45 180.



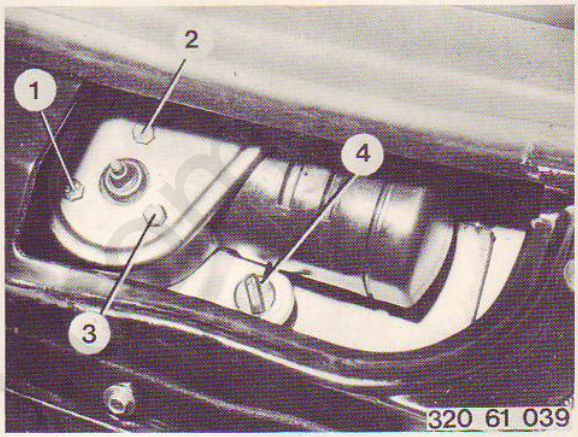
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61 61 250 Wiper motor – removing and installing

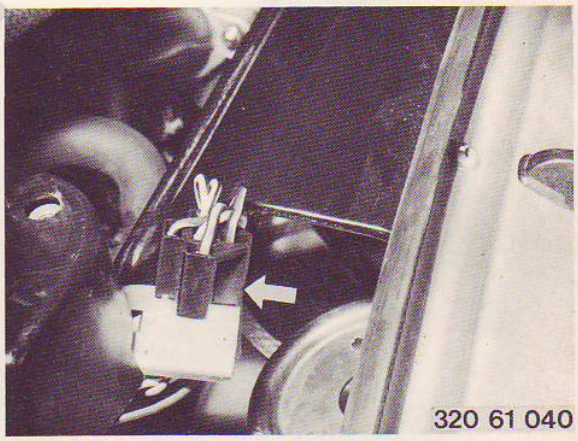
Disconnect the negative lead from the battery.
Disconnect the drive linkage.
Mark the end position of motor crank movement, and detach the crank.



Unscrew bolts (1 ... 3) and loosen stop buffer (4).
When installing: **tighten the stop buffer until the wiper motor is supported.**



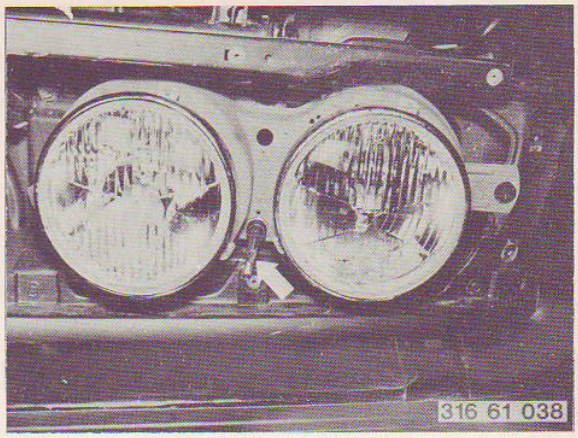
Remove the wiper motor and pull off the central plug.



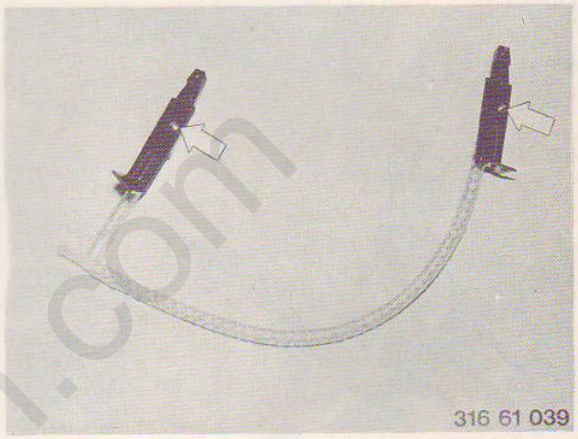
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61 63 005 Headlight cleaning system – subsequently installing

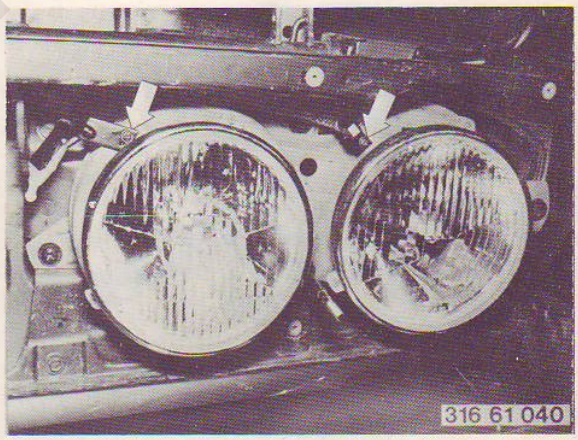
Remove and install both side front grilles – 51 13 060.
Disconnect the negative lead from the battery.
Secure the headlight wiper motor to the support frame.
The side with the inscription faces down.
Important: install toothed washer between wiper motor and support frame.
Push the rubber protective cap on fully.
The motors are marked 'L' (left) and 'R' (right).



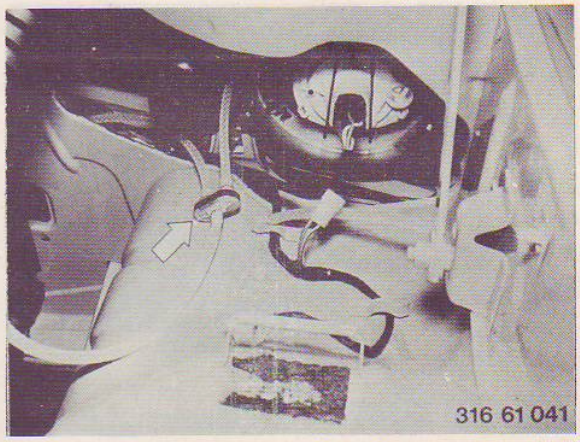
Attach the hose with the spray jets to the angle bracket.
Important: angle brackets are marked as follows:
LA = left low beam headlight
LF = left high beam headlight
RA = right low beam headlight
RF = right high beam headlight



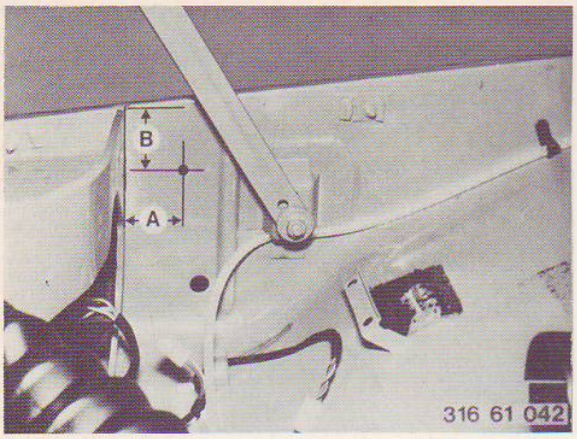
Secure the spray jets to the support frame with 3.5 x 13 mm self-tapping screws.
Make sure that the angle bracket locates correctly in the lock.



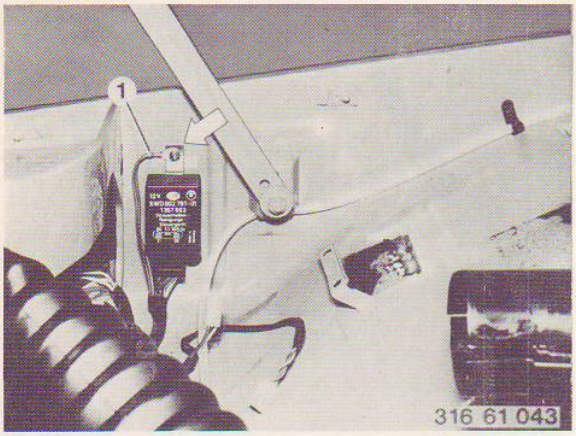
Run the hose with junction block along the wiring harness to the left and right headlights, and secure.
Connect the hose to the spray jets.



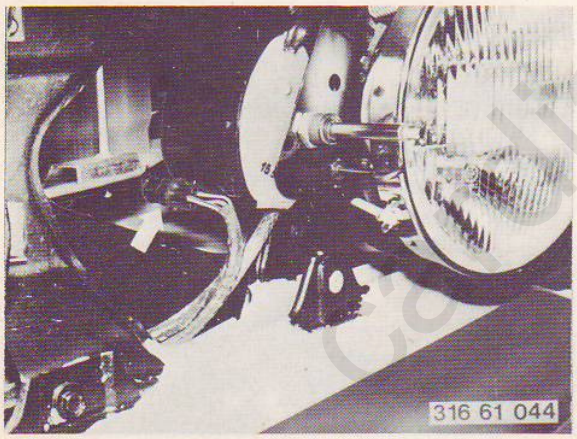
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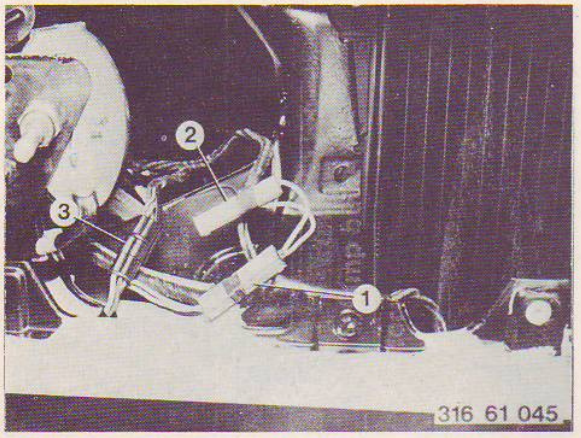
Detach the standard washer fluid tank.
Drill a 3.5 mm (0.14 in) diameter hole for the headlight cleaning control unit.
Distance
A = 40 mm (1.57 in)
B = 50 mm (1.97 in).



Connect the auxiliary wiring harness to the cleaning control unit. Attach the control unit with earth (ground) cable (1) to the wheel arch.



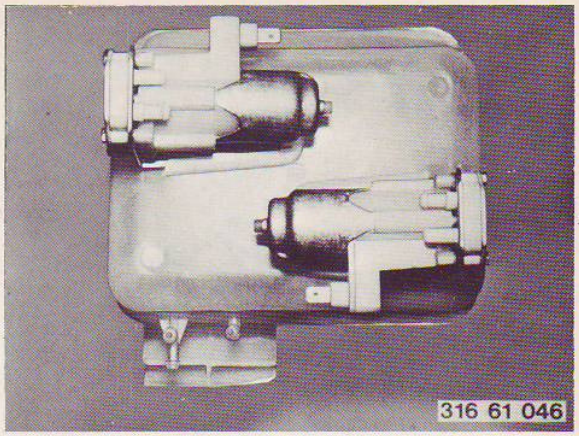
Run the additional wiring along the existing harness, and secure.
Connect the round pin plug with the left wiper motor.



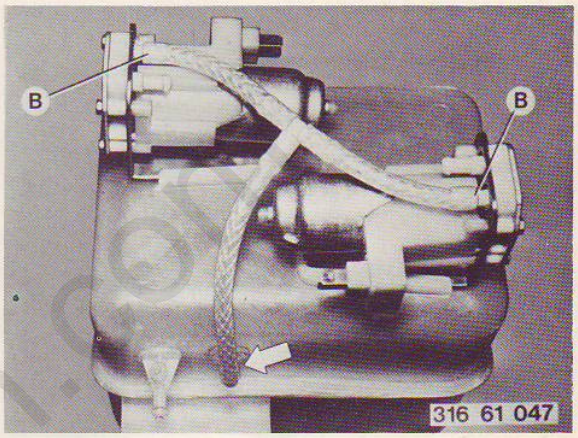
Connect the existing terminal strip (1) for the engine compartment light to terminal strip (2) for the additional wiring.
Connect the round-pin plug (3) to the right wiper motor.

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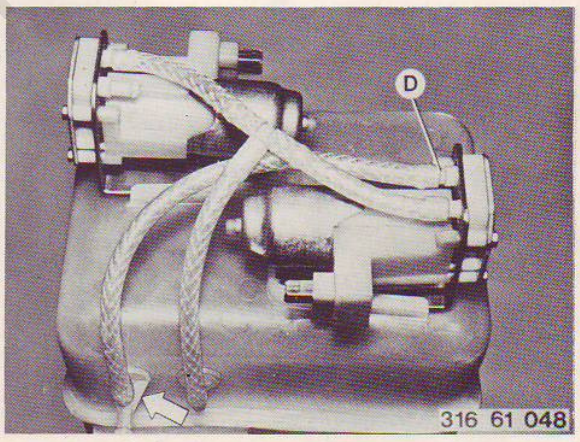
Detach the pump from the standard fluid tank just removed.
Attach both fluid pumps to the new tank.



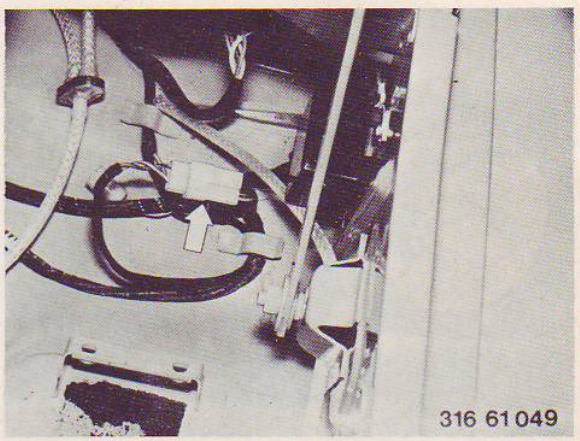
Connect hose with T-piece to pump (B) and to tank.



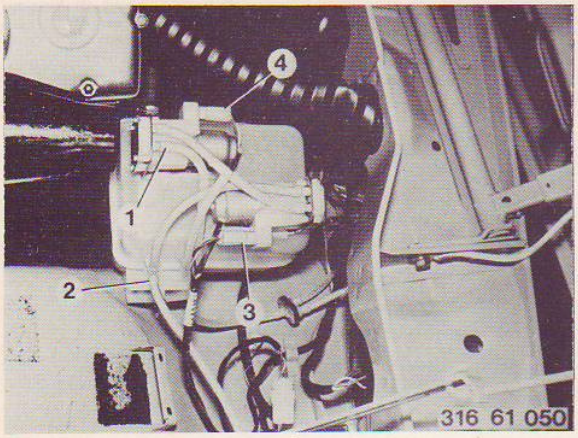
Connect hose to pump (D) and to tank.



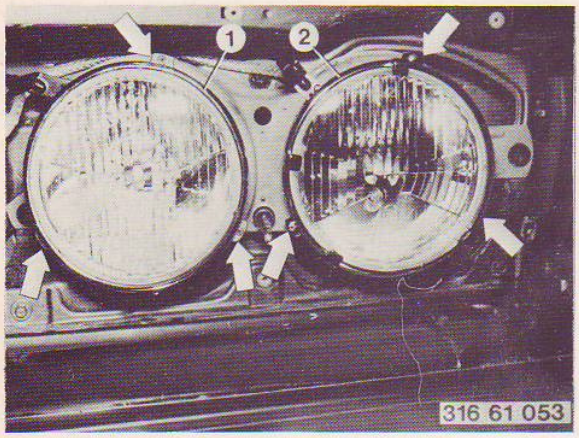
Connect the large central plug (additional wiring) to the small plug from the fluid pump previously removed.



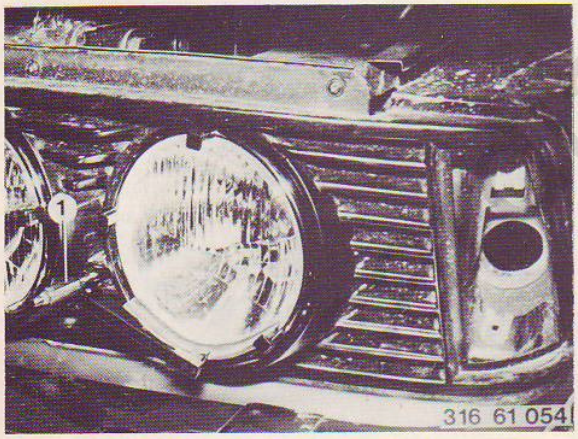
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Connect the hose (1) for the headlights to pump (D) and the hose (2) for the windshield to the tank.
Connect central plug (3) – short lead – and central plug (4) – long lead – to the washer pumps.
Attach the fluid tank.



Detach the headlight bezel (1) and install a headlight bezel (2) with stop buffer for wiper blades.



Attach grilles and new headlight cover caps.
Attach wiper blades for low beam headlights with spacing sleeve (1).
Cover spacing sleeve (1) with insulating tube.



Attach wiper blades for high beam headlights with nut and spring washer.
Press on the protective cap.

Electrical circuit diagram



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Electrical circuit diagram
Checking operation
Reconnect the negative lead to the battery.
Add water.
Adjust the direction of the headlight cleaning jets with a fine needle until the water strikes the headlight glass.

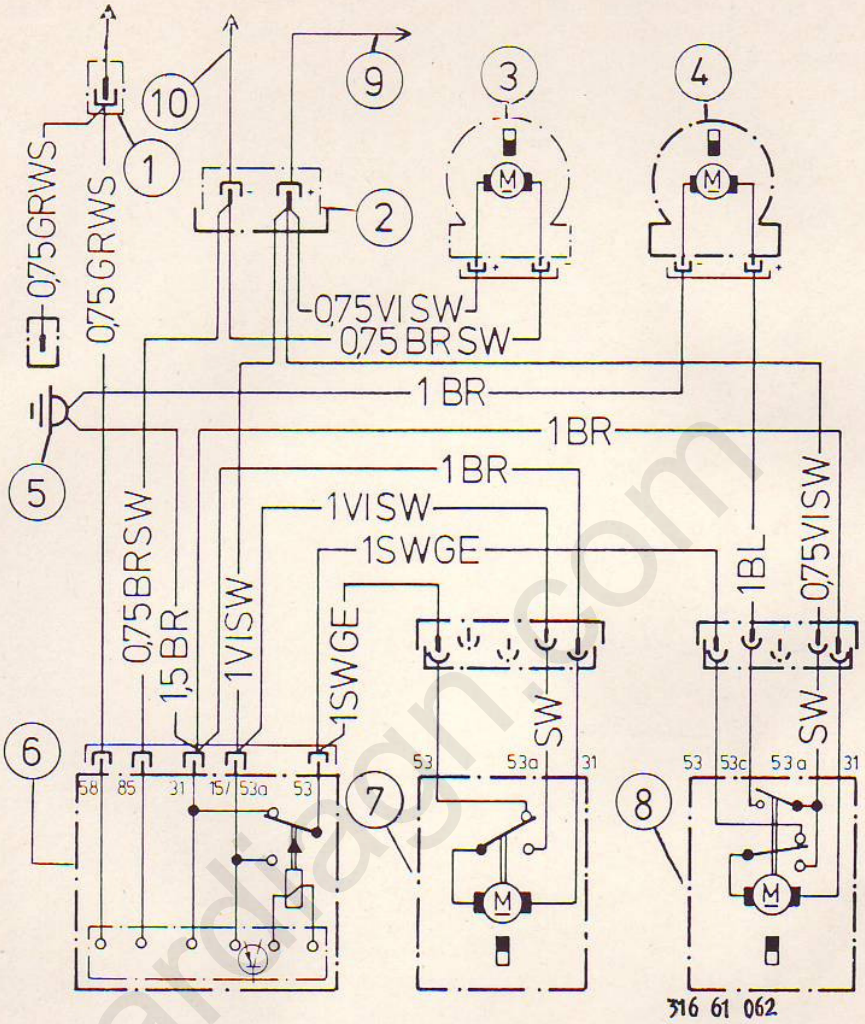
Switch on the lights.
When the windshield washer switch is operated, the headlight cleaning system will run for approx. 5 seconds, then switch off.
The headlight cleaning system cannot be run a second time until approx. 30 seconds have elapsed.

(1) = Connection for engine compartment light
(2) = Plug connector (additional cable with washer pump wiring harness)
(3) = Washer pump for windshield
(4) = Washer pump for headlight cleaning
(5) = Earth (ground) on headlight cleaning control unit
(6) Headlight cleaning control unit
(7) = Left wiper motor
(8) = Right wiper motor
(9) = to power distributor, fuse 12
(10) = to wipe-wash-intermittent-wipe control unit, terminal 85

Color codes
BL = blue
BR = brown
GE = yellow
GN = green
GR = grey
RT = red
SW = black
VI = violet
WS = white

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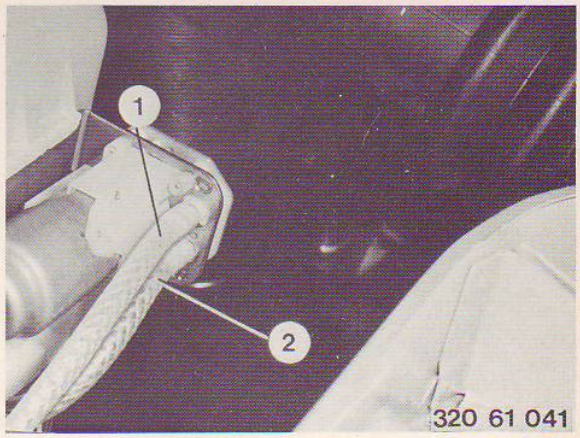
Circuit diagram for headlight cleaning system



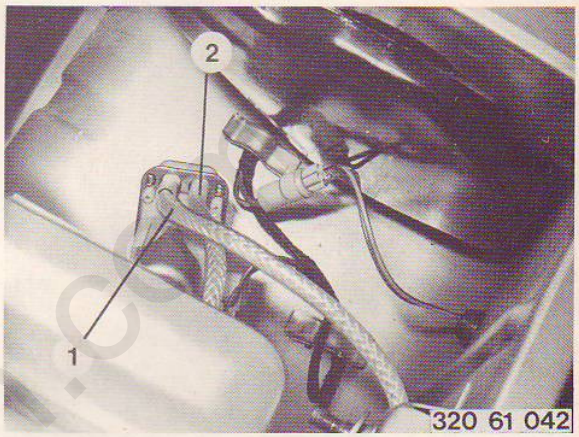
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61 71 100 Windshield washer pump – removing and installing

Detach hoses (1) and (2). Pull the washer pump out of its mount and detach the plug.

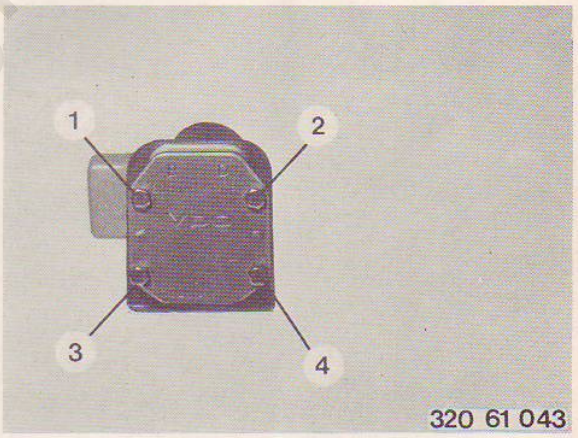


When installing: **hose (1) runs from pump (D) to the spray jets. Hose (2) runs from pump (B) to the tank. Restore the correct fluid level.**

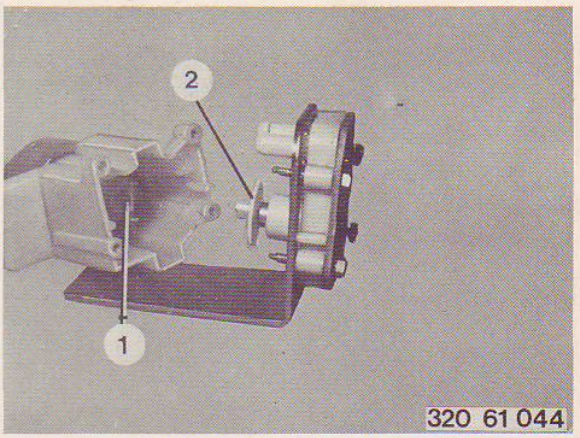


61 71 110 Windshield washer pump – stripping and assembling

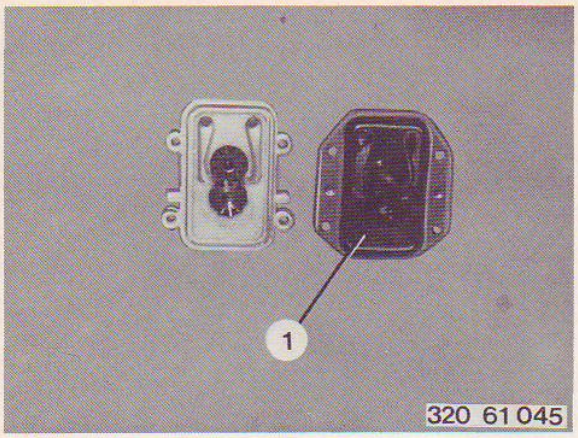
Remove and install the washer pump – 61 71 100.
Remove bolts (1 . . . 4) and separate motor from pump.



When installing: **driver of motor (1) must be properly engaged in driving disc (2) of pump.**



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Take off cover. Clean all parts with alcohol spirit and dry with compressed air.
When installing: **check condition of gasket (1) and renew if necessary.**

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