Chapter 12
Body electrical systems

Contents

Degrees of difficulty

Easy, suitable for novice with little experience 

Fairly easy, suitable for beginner with some experience 

Fairly difficult, suitable for competent DIY mechanic 

Difficult, suitable for experienced DIY mechanic 

Very difficult, suitable for expert DIY or professional 

Specifications

Wiper blades

Type	19 ins. Champion X-4803

Fuses

Rating:

Red	10 A
Blue	15 A
Yellow	20 A
Green	30 A

Torque wrench settings

	Nm	lbf ft
Airbag unit to steering wheel	10	7
Airbag control	10	7
Brackets, passenger airbag	22	16
Passenger airbag to bracket	8	6
Steering to column	25	18

1 General information and precautions

Warning: Before carrying out any work on the electrical system, read through the precautions given in "Safety first!" at the beginning of this manual, and in Chapter 5.

The electrical system is of 12-volt negative earth type. Power for the lights and all electrical accessories is supplied by a lead/acid type battery, which is charged by the alternator.

This Chapter covers repair and service procedures for the various electrical components not associated with engine. Information on the battery, alternator and starter motor can be found in Chapter 5.

It should be noted that, before working on any component in the electrical system, the battery negative terminal should first be disconnected, to prevent the possibility of electrical short-circuits and/or fires.

Whenever the occasion arises, carefully check the routing of the wiring harness, ensuring that it is correctly secured by the clips or ties provided so that it cannot chafe against other components. Carefully check points such as the clutch cable bracket, clutch housing and harness support bracket, the inlet manifold, the horn mounting bracket, the starter motor terminals, and the rear bumper and number plate lamp.

If evidence is found of the harness having chafed against other components, repair the damage and ensure that the harness is secured or protected so that the problem cannot occur again.

Caution: **If the radio/cassette player fitted to the vehicle is one with an anti-theft security code, as the standard unit is, refer to *"Radio/cassette player anti-theft system - precaution"* in the Reference Section of this manual before disconnecting the battery.**

2 Electrical fault-finding - general information

Note: *Refer to the precautions given in "Safety first!" (at the beginning of this manual) and to Section 1 of this Chapter before starting work. The following tests relate to testing of the main electrical circuits, and should not be used to test delicate electronic circuits (such as anti-lock braking systems), particularly where an electronic control module is used.*

A typical electrical circuit consists of an electrical component, any switches, relays, motors, fuses, fusible links or circuit breakers related to that component, and the wiring and connectors that link the component to both the battery and the chassis. To help to pinpoint a problem in an electrical circuit, wiring diagrams are included at the end of this Chapter.

Before attempting to diagnose an electrical fault, first study the appropriate wiring diagram, to obtain a complete understanding of the components included in the particular circuit concerned. The possible sources of a fault can be narrowed down by noting whether other components related to the circuit are operating properly. If several components or circuits fail at one time, the problem is likely to be related to a shared fuse or earth connection.

Electrical problems usually stem from simple causes, such as loose or corroded connections, a faulty earth connection, a blown fuse, a melted fusible link, or a faulty relay (refer to Section 3 for details of testing relays). Visually inspect the condition of all fuses, wires and connections in a problem circuit before testing the components. Use the wiring diagrams to determine which terminal connections will need to be checked, to pinpoint the trouble-spot.

The basic tools required for electrical fault-finding include the following:

a) a circuit tester or voltmeter (a 12-volt bulb with a set of test leads can also be used for certain tests).
b) a self-powered test light (sometimes known as a continuity tester).
c) an ohmmeter (to measure resistance).
d) a battery.
e) a set of test leads.
f) a jumper wire, preferably with a circuit breaker or fuse incorporated, which can be used to bypass suspect wires or electrical components.

Before attempting to locate a problem with test instruments, use the wiring diagram to determine where to make the connections.

To find the source of an intermittent wiring fault (usually due to a poor or dirty connection, or damaged wiring insulation), a "wiggle" test can be performed on the wiring. This involves wiggling the wiring by hand, to see if the fault occurs as the wiring is moved. It should be possible to narrow down the source of the fault to a particular section of wiring. This method of testing can be used in conjunction with any of the tests described in the following sub-Sections.

Apart from problems due to poor connections, two basic types of fault can occur in an electrical circuit - open-circuit, or short-circuit.

Open-circuit faults are caused by a break somewhere in the circuit, which prevents current from flowing. An open-circuit fault will prevent a component from working, but will not cause the relevant circuit fuse to blow.

Short-circuit faults are caused by a "short" somewhere in the circuit, which allows the current flowing in the circuit to "escape" along an alternative route, usually to earth. Short-circuit faults are normally caused by a breakdown in wiring insulation, which allows a feed wire to touch either another wire, or an earthed component such as the bodyshell. A short-circuit fault will normally cause the relevant circuit fuse to blow.

Finding an open-circuit

To check for an open-circuit, connect one lead of a circuit tester or voltmeter to either the negative battery terminal or a known good earth.

Connect the other lead to a connector in the circuit being tested, preferably nearest to the battery or fuse.

Switch on the circuit, remembering that some circuits are live only when the ignition switch is moved to a particular position.

If voltage is present (indicated either by the tester bulb lighting or a voltmeter reading, as applicable), this means that the section of the circuit between the relevant connector and the battery is problem-free.

Continue to check the remainder of the circuit in the same fashion.

When a point is reached at which no voltage is present, the problem must lie between that point and the previous test point with voltage. Most problems can be traced to a broken, corroded or loose connection.

Finding a short-circuit

To check for a short-circuit, first disconnect the load(s) from the circuit (loads are the components that draw current from a circuit, such as bulbs, motors, heating elements, etc.).

Remove the relevant fuse from the circuit, and connect a circuit tester or voltmeter to the fuse connections.

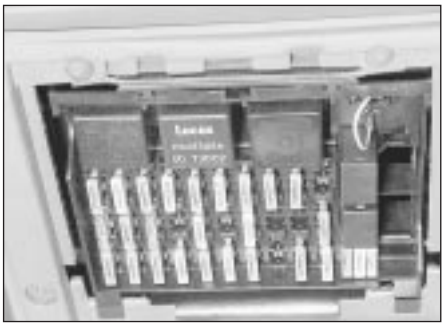
Switch on the circuit, remembering that some circuits are live only when the ignition switch is moved to a particular position.

If voltage is present (indicated either by the tester bulb lighting or a voltmeter reading, as applicable), this means that there is a short-circuit.

If no voltage is present, but the fuse still blows with the load(s) connected, this indicates an internal fault in the load(s).

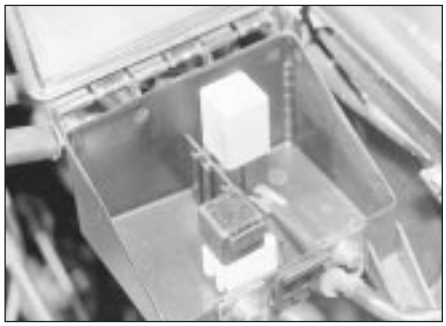
Finding an earth fault

The battery negative terminal is connected to "earth" (the metal of the engine/transmission and the car body), and most systems are wired so that they only receive a positive feed. The current returning through the metal of the car body. This means that the component mounting and the body form part of that circuit. Loose or corroded mountings can therefore cause a range of electrical faults, ranging from total failure of a circuit, to a puzzling partial fault. In particular, lights may shine dimly (especially when another circuit sharing the same earth point is in operation). Motors (e.g. wiper motors or the radiator cooling fan motor) may run slowly, and the operation of one circuit may have an affect on another. Note that on many vehicles, earth straps are used between certain components, such as the engine/transmission and the body, usually where there is no metal-



3.2 Main fuses and relays in facia panel - 2.0 litre SRi model shown

3.5 Removing a fuse - 2.0 litre model shown



3.11 Relays in engine compartment box - 2.0 litre SRi model shown

to-metal contact between components, due to flexible rubber mountings, etc.

To check whether a component is properly earthed, disconnect the battery, and connect one lead of an ohmmeter to a known good earth point. Connect the other lead to the wire or earth connection being tested. The resistance reading should be zero; if not, check the connection as follows.

If an earth connection is thought to be faulty, dismantle the connection, and clean back to bare metal both the bodyshell and the wire terminal or the component earth connection mating surface. Be careful to remove all traces of dirt and corrosion, then use a knife to trim away any paint, so that a clean metal-to-metal joint is made. On reassembly, tighten the joint fasteners securely; if a wire terminal is being refitted, use serrated washers between the terminal and the bodyshell, to ensure a clean and secure connection. When the connection is remade, prevent the onset of corrosion in the future by applying a coat of petroleum jelly or silicone-based grease.

3 Fuses and relays - general

Fuses

1 Fuses are designed to break a circuit when a predetermined current is reached, to protect the components and wiring which could be damaged by excessive current flow. Any excessive current flow will be due to a fault in the circuit, usually a short-circuit (Section 2).

2 The main fuses and relays are located in a panel at the lower right-hand side of the facia, under a hinged cover **(see illustration)**.

3 The circuits protected by the various fuses and relays are marked on the inside of the panel cover.

4 A blown fuse can be recognised from its melted or broken wire.

5 To remove a fuse, first ensure that the relevant circuit is switched off. Then open the cover and pull the relevant fuse or relay from the panel **(see illustration)**. If desired, the lower end of the panel can be tilted forwards, after releasing the retaining clips to improve access.

6 Before renewing a blown fuse, trace and rectify the cause, and always use a fuse of the correct rating. Never substitute a fuse of a higher rating, or make temporary repairs using wire or metal foil, as more serious damage or even fire could result.

7 Spare fuses are provided in the blank terminal positions in the fusebox.

8 Note that the fuses are colour-coded, see Specifications. Refer to the wiring diagrams for details of the fuse ratings and the circuits protected.

Relays

9 A relay is an electrically operated switch, which is used for the following reasons:

a) A relay can switch a heavy current remotely from the circuit in which the current is flowing, allowing the use of lighter-gauge wiring and switch contacts.

b) A relay can receive more than one control input, unlike a mechanical switch.

c) A relay can have a timer function - for example, the intermittent wiper relay.

10 Most of the relays are located at the rear of the main fusebox (remove the securing screws and pull the fusebox forwards to improve access). The rear wiper motor relay is located in the tailgate, behind the tailgate trim panel. On some models, additional engine-related relays are located in the relay box mounted on the left-hand side of the engine compartment.

11 On certain models, additional relays are located in a box at the left-hand rear of the engine compartment **(see illustration)**.

12 If a circuit or system controlled by a relay develops a fault, and the relay is suspect, operate the system. If the relay is functioning, it should be possible to hear it "click" as it is energised. If this is the case, the fault lies with the components or wiring of the system. If the relay is not being energised, then either the relay is not receiving a main supply or a switching voltage, or the relay itself is faulty. Testing is by the substitution of a known good unit, but be careful - while some relays are identical in appearance and in operation, others look similar but perform different functions.

13 To remove a relay, first ensure that the relevant circuit is switched off. The relay can then simply be pulled out from the socket, and pushed back into position.

4 Ignition switch and lock cylinder - removal and refitting

Removal

1 Disconnect the battery negative lead.

2 Turn the steering wheel as necessary to expose the two front steering column shroud securing screws, which are covered by plastic caps. Prise out the caps and remove the screws.

3 Remove the three securing screws from the underside of the lower column shroud, then remove both the upper and lower shrouds.

4 To remove the lock cylinder, insert the ignition key and turn it to position "II".

5 Insert a thin rod into the hole in the lock housing, then press the rod to release the detent spring, and pull out the lock cylinder using the key.

6 The ignition switch is secured to the steering lock housing by two grub screws. Disconnect the wiring plug, and remove the screws to extract the switch **(see illustration)**. Removal of the steering wheel, may aid removal. Refer to Chapter 10 or Section 57, as applicable. It is recommended that the switch and the lock cylinder are not both removed at the same time, so that their mutual alignment is not lost.

Refitting

7 Refitting is a reversal of removal.

4.6 Removing an ignition switch securing screw

5 Direction indicator/lighting switch - removal and refitting

Removal

1 Disconnect the battery negative lead.
2 Turn the steering wheel as necessary to expose the two front steering column shroud securing screws, which are covered by plastic caps. Prise out the caps and remove the screws.
3 Remove the three securing screws from the underside of the lower column shroud, then remove both the upper and lower shrouds.
4 Disconnect the wiring plug from the switch.
5 Depress the switch retaining clip, and withdraw the switch from the housing.

Refitting

6 Refitting is a reversal of removal.

6 Wash/wipe switch - removal and refitting

Proceed as described in Section 5.

7 Facia panel switches - removal and refitting

1 Disconnect the battery negative lead.

Lighting switch

Removal

2 Turn the switch to the "dipped beam on" position, then insert a small screwdriver or rod through the hole in the bottom of the switch knob to depress the knob retaining clip. Pull the knob from the switch **(see illustration)**.
3 Press the two now-exposed switch securing clips towards the switch spindle, then pull the switch from the facia and disconnect the wiring plug **(see illustrations)**.
4 Note that the switch assembly cannot be dismantled, and if any part of the switch is faulty, the complete assembly must be renewed.

7.6 Prising a push-button switch from the facia

7.2 Using a thin rod to depress the lightning switch knob retaining clip

Refitting

5 Refitting is a reversal of removal.

Push-button switches

Removal

6 First check beneath the switch, if there is a small hole in the facia, insert a slim screwdriver or metal rod into it. Release the switch retaining spring clip by pressing it upwards against the switch, then remove the switch and disconnect its wiring. If there is no hole, remove the switch by prising it out of the facia using a small screwdriver. Lever gently under the switch's lower edge (use adhesive tape or a piece of card to protect the facia's finish). Disconnect the switch wiring plug and withdraw the switch **(see illustration)**.

Refitting

7 Refitting is a reversal of removal.

Headlamp aim adjustment switch

8 The procedure is as described for push-button switches.

Hazard warning switch

Removal

9 Using a screwdriver, carefully prise the cap from the switch **(see illustration)**.
10 Using a screwdriver with a piece of card under the blade to avoid damage to the facia trim, prise the ventilation nozzle from the facia.
11 Prise the switch from the facia and disconnect the wiring **(see illustration)**.

7.9 Prising the cap from the hazard warning flasher switch

7.3A Press the switch securing clips towards the switch spindle . . .

7.3B . . . then pull the switch from the facia

Refitting

12 Refitting is a reversal of removal.

Heater blower motor switch

Removal

13 Remove the heater control panel, as described in Chapter 11.
14 Disconnect the wiring plug from the switch, if not already done.
15 Prise the switch out from the rear of the heater control panel.

Refitting

16 Refitting is a reversal of removal, but refer to Chapter 11, when refitting the heater control panel.

7.11 Withdrawing the hazard warning flasher switch from the facia

8 Electric door mirror switch - removal and refitting

Removal

1 Disconnect the battery negative lead.
2 Prise the plastic surround from the door interior handle.
3 Free the trim panel from the top edge of the door by releasing the securing clips. This can be done using a screwdriver, but it is preferable to use a forked tool, to minimise the possibility of damage to the trim panel and the clips.
4 Note the position of the mirror switch wiring connector in the bracket at the top of the door, then separate the two halves of the connector.
5 Prise the switch from the door trim panel, and feed the wiring through the panel.

Refitting

6 Refitting is a reversal of removal, but ensure that the wiring is correctly routed, so as not to foul the door interior handle mechanism.

9 Sunroof operating switch - removal and refitting

Removal

1 Disconnect the battery negative lead.
2 Prise the courtesy lamp from the roof trim panel, and disconnect the wiring.
3 Remove the two trim panel securing screws, and withdraw the trim panel from the roof, disconnecting the wiring from the sunroof operating switch.
4 Release the securing clips, then pull the switch from the rear face of the trim panel.

Refitting

5 Refitting is a reversal of removal.

10 Courtesy lamp switch - removal and refitting

HAYNES HiNT

Tape the wiring to the door pillar, to prevent if falling back into the door pillar. Alternatively, tie a piece of string to the wiring to retrieve it.

Removal

1 Disconnect the battery negative lead.
2 Open the door and remove the switch securing screw.
3 Withdraw the switch from the door pillar, and pull the wiring out sufficiently to prevent it from springing back into the pillar.
4 Disconnect the wiring and remove the switch.

Refitting

5 Refitting is a reversal of removal.

11 Luggage compartment lamp switch - removal and refitting

Removal

1 Disconnect the battery negative lead.
2 Open the boot lid or tailgate, as applicable, and remove the switch securing screw.
3 Withdraw the switch from the body panel, and pull the wiring out sufficiently to prevent it from springing back into the body.
4 Disconnect the wiring and remove the switch.

Refitting

5 Refitting is a reversal of removal.

12 Brake lamp switch - removal and refitting

Removal

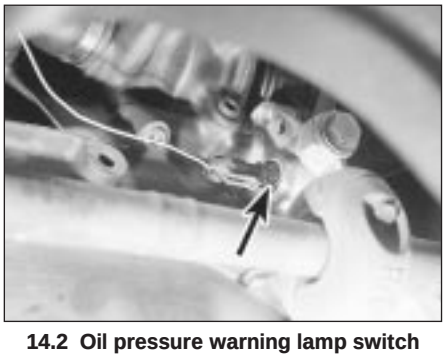
1 Disconnect the battery negative lead.
2 Remove the lower trim panel from the driver's footwell.
3 Disconnect the wiring plug from the brake lamp switch, then twist the switch anti-clockwise and remove it from its bracket.

Refitting

4 Refitting is a reversal of removal.

13 Handbrake "on" warning lamp switch - removal and refitting

For access to the switch, the handbrake lever must be removed. Removal and refitting of the switch is described as part of the handbrake lever removal and refitting procedure, in Chapter 9.



14.2 Oil pressure warning lamp switch (arrowed) viewed from underneath vehicle - SOHC model

14 Oil pressure warning lamp switch - removal and refitting

Removal

1 Disconnect the battery negative lead.
2 The switch is screwed into the oil pump, on the inlet manifold side of the engine. On 1.4 and 1.6 litre (except C16 NZ2), models the switch projects at right-angles to the crankshaft axis, while on C16 NZ2, 1.8 and 2.0 litre models it is parallel to the crankshaft **(see illustration)**.
3 In most cases the switch can be reached quite easily from above. However, on some models access will be easier if the front of the vehicle is jacked up and supported on axle stands (see "*Jacking and Vehicle Support*") (ensure that the handbrake is securely applied) and the front right-hand roadwheel is removed.
4 Disconnect the switch wire and use a spanner to unscrew the switch **(see illustration)**. As you withdraw the switch, swiftly plug the hole in the oil pump to minimise the loss of oil and to prevent the entry of dirt.

Refitting

5 Refitting is the reverse of the removal procedure; tighten the switch securely but do not overtighten it, reconnect its wire, then check and if necessary top-up the oil level, as described in Chapter 1. Wash off any spilt oil and check for leaks when the engine is restarted.

15 Cigarette lighter - removal and refitting

Removal

1 Disconnect the battery negative lead.
2 Slide the ashtray/cigarette lighter assembly from the facia, then disconnect the wiring and slide the illumination bulb from the cigarette lighter.

14.4 Unscrewing the oil pressure warning lamp switch - SOHC model (engine removed)

3 To remove the cigarette lighter assembly, simply pull it from the illumination ring assembly. If desired, the illumination ring assembly can be removed, by pulling it from the housing after depressing the retaining clips.

Refitting

4 Refitting is a reversal of removal.

16 Clock - removal and refitting

Removal

1 Disconnect the battery negative lead.
2 Using a thin-bladed screwdriver, carefully prise the clock from the facia panel.
3 Disconnect the wiring plugs and withdraw the clock **(see illustration)**.

Refitting

4 Refitting is a reversal of removal.

17 Heated front seats - general

Heating pads are fitted to the front seats of some models. Before attempting to remove a seat so equipped, disconnect the battery and the leads from the heating pad.

16.3 Disconnecting the wiring plugs from the clock

18 Instrument panel - removal and refitting

Removal

1 Disconnect the battery negative lead.
2 Remove the steering wheel, (Chapter 10).
3 Remove the steering column shrouds, and the instrument panel upper and lower trim panels, (Chapter 11).
4 Remove the single upper, and two lower, instrument panel securing screws **(see illustration)**.
5 Carefully withdraw the instrument panel, and disconnect the speedometer cable and the two wiring plugs. Note that the speedometer cable is retained by a clip, which must be pressed towards the speedometer to release the cable **(see illustration)**.

18.4 Unscrewing a lower instrument panel securing screw

18.5 Disconnecting an instrument panel wiring plug. Note speedometer cable retaining clip (arrowed)

6 If desired, the instrument panel can be dismantled, with reference to Section 19.

Refitting

7 Refitting is a reversal of removal, but ensure that the speedometer cable is not kinked or twisted between the instrument panel and the bulkhead as the panel is refitted.

19 Instrument panel components - removal and refitting

1 With the instrument panel removed, as described in Section 18, continue as follows.

Panel illumination and warning lamp bulbs

Removal

2 Twist the relevant bulbholder clockwise, and withdraw it from the printed circuit board on the rear of the instrument panel **(see illustration)**.
3 The bulbs are integral with the bulbholders, and must be renewed as a unit.

Refitting

4 Refitting is a reversal of removal.

Voltage stabiliser

Removal

5 Remove the single securing screw from the rear of the instrument panel, then pull the voltage stabiliser from the contacts on the printed circuit board **(see illustration)**.

Refitting

6 Refitting is a reversal of removal.

Fuel and temperature gauges - "low series" models

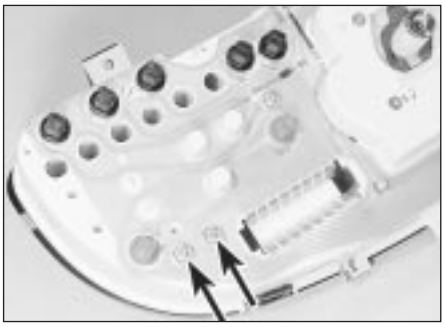
Removal

7 Pull the trip meter reset pin from the front of the panel.
8 Release the two retaining clips at the top of the panel, and remove the panel shroud **(see illustration)**.
9 Unscrew the two securing nuts, and withdraw the relevant gauge through the front of the instrument panel.

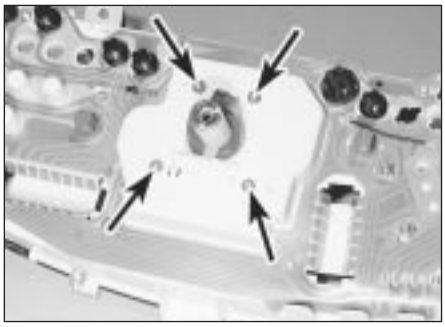
19.2 Withdrawing an instrument panel illumination lamp bulb

19.5 Instrument panel voltage stabiliser (arrowed)

19.8 Removing the instrument panel shroud



19.12 Tachometer securing nuts (arrowed)



19.14 Speedometer securing screws (arrowed)

Refitting

10 Refitting is a reversal of removal.

Fuel and temperature gauge assembly - "high series" models

11 The procedure is as described in paragraphs 7 to 10 inclusive, except that the gauge assembly is secured by four nuts.

Tachometer

12 The procedure is as described in paragraphs 7 to 10 inclusive except that the tachometer is secured by three nuts **(see illustration)**.

Speedometer

Removal

13 Proceed as described in paragraphs 7 and 8.
14 Extract the four securing screws from the rear of the panel **(see illustration)**.

Refitting

15 Refitting is a reversal of removal.

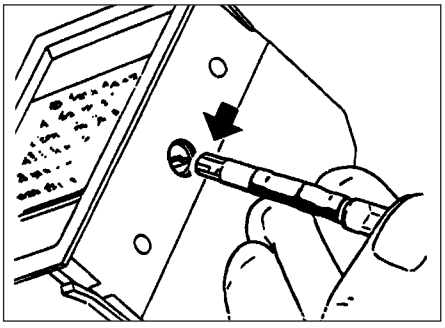
Printed circuit board

Removal

16 Remove all bulbs and instruments, and the voltage stabiliser, as described previously in this Section.
17 Carefully peel the printed circuit board from the instrument panel.

Refitting

18 Refitting is a reversal of removal, but ensure that the printed circuit board is seated correctly on the rear of the instrument panel.



20.6 Removing the trip computer display module illumination bulb

20 Trip computer components - removal and refitting

1 Disconnect the battery lead.

Display module

Removal

2 Using a thin-bladed screwdriver, carefully prise the module from the facia panel.
3 Disconnect the wiring plug and withdraw the module.

Refitting

4 Refitting is a reversal of removal.

Display module illumination bulb

Removal

5 Remove the display module, as described previously in this Section.
6 Using a length of rubber sleeving of similar diameter, or an alternator tool, extract the bulb by inserting the tool through the hole in the side of the display module **(see illustration)**.

Refitting

7 Refitting is a reversal of removal.

Operating switch

Removal

8 Remove the rear section of the centre console, as described in Chapter 11.
9 Release the wiring plug from the switch using a screwdriver.
10 Lift the switch, then pull it down and out from the centre console.

Refitting

11 Refitting is a reversal of removal.

Outside air temperature sensor

Removal

12 The sensor is located at the left-hand end of the front bumper **(see illustration)**.
13 Prise the cover cap from the bumper, then unclip the sensor, and disconnect the wiring plug.

Refitting

14 Refitting is a reversal of removal.

21 Check control system components - removal and refitting

1 Disconnect the battery negative lead.

Warning lamp bulbs

2 The warning lamp bulbs are located in the instrument panel, and removal and refitting are described in Section 19.

Control module

Removal

3 The control module is located behind the passenger side of the facia, above the glovebox.
4 Remove the glovebox assembly, as described in Chapter 11.
5 Disconnect the control module wiring plug, then release the control module from its mounting and withdraw the unit.

Refitting

6 Refitting is a reversal of removal.

Coolant level sensor

Removal

7 The coolant level sensor is integral with the coolant expansion tank cap.
8 Disconnect the wiring from the top of the cap, then unscrew the cap and withdraw it from the expansion tank.
9 If faulty, the complete cap assembly must be renewed.

Refitting

10 Refitting is a reversal of removal.

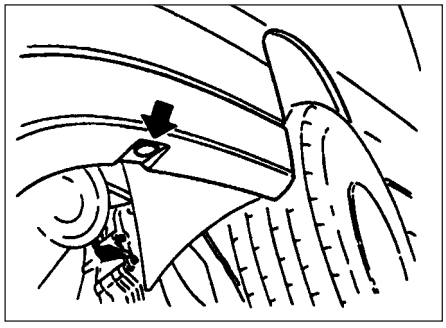
Washer fluid level sensor

Removal

11 The sensor is mounted in the side of the fluid reservoir.
12 Disconnect the wiring from the sensor, then unscrew the sensor from the fluid reservoir. If the fluid level is above the level of the sensor, be prepared for fluid spillage.

Refitting

13 Refitting is a reversal of removal.



20.12 Trip computer outside air temperature sensor location (arrowed)

21.18 Engine oil level sensor - DOHC model

22.5 Horn viewed from behind with radiator removed - single horned model

Brake fluid level sensor

14 The procedure is as described for the coolant level sensor in paragraphs 7 to 10 inclusive.

Engine oil level sensor

Removal

15 Apply the handbrake, jack up the front of the vehicle, and support securely on axle stands (see "*Jacking and Vehicle Support*") positioned under the body side members.
16 On DOHC models, remove the engine undershield, as described in Chapter 11.
17 Disconnect the sensor wiring plug.
18 Unscrew the three or four sensor securing screws, as applicable, and withdraw the sensor, manipulating the float through the hole in the sump **(see illustration)**. Recover the sealing ring. Be prepared for some oil spillage.
19 Examine the condition of the sealing ring, and renew if necessary.

Refitting

20 Refitting is a reversal of removal. On completion, check, and if necessary top-up, the engine oil level.

Bulb failure sensor

Removal

21 The bulb failure sensor is mounted behind the fuse/relay panel in the facia.
22 Release the retaining clips from the lower end of the fuse/relay panel, and tilt it forwards.

22.10 Horn mounting bracket securing bolt (arrowed) - twin horned model

23 Reach up behind the fuse/relay panel, and pull the sensor from its socket.

Refitting

24 Refitting is a reversal of removal.

22 Horn(s) - removal and refitting

1 On models with a single horn, the horn is located in front of the radiator. On models with twin horns, the horns are located beneath the washer fluid reservoir, at the left-hand end of the front bumper.

Single horn

Removal

2 Disconnect the battery negative lead.
3 Remove the radiator grille panel, with reference to Chapter 11.
4 Disconnect the wiring from the rear of the horn.
5 Reach up behind the mounting bracket, and unscrew the single nut securing the horn to the bracket **(see illustration)**. Withdraw the horn.

Refitting

6 Refitting is a reversal of removal.

Twin horns

Removal

7 Disconnect the battery negative lead.
8 Apply the handbrake, then jack up the front of the vehicle, and support securely on axle stands (see "*Jacking and Vehicle Support*") positioned under the body side members.
9 Remove the securing screws, and withdraw the plastic cover (where fitted) from the bumper/front wing to expose the horns.
10 Remove the bolt securing the horn mounting bracket to the bracket below the washer fluid reservoir **(see illustration)**.
11 Withdraw the horns and disconnect the wiring.
12 If desired, the horns can be unbolted from the bracket.

Refitting

13 Refitting is a reversal of removal.

23 Interior lamps - removal and refitting

Removal

1 Disconnect the battery negative lead.
2 Using a thin-bladed screwdriver, prise the lamp from its location and disconnect the wiring **(see illustration)**.

Refitting

3 Refitting is a reversal of removal.

24 Interior lamp bulbs - renewal

1 Disconnect the battery negative lead.

Courtesy lamp

Note: *Some later models are fitted with courtesy lamps for the rear seat passengers, as well as front.*

Removal

2 Using a thin-bladed screwdriver, prise the lamp from its location and disconnect the wiring.
3 On models fitted with a courtesy lamp with integral map reading lamps, the lens must be levered from the housing for access to the bulbs.

23.2 Withdrawing the courtesy lamp

24.10 Removing the underbonnet lamp bulb

4 Remove the courtesy lamp bulbs by carefully prising it from its location using a thin-bladed screwdriver. Where applicable, the map reading lamp bulbs are a push fit in the bulbholders.

Refitting

5 Refitting is a reversal of removal.

Glovebox lamp

Removal

6 Using a thin-bladed screwdriver, prise the lamp from its location and disconnect the wiring.
7 Carefully prise the bulb from the lamp.

Refitting

8 Refitting is a reversal of removal.

25.5A Unscrewing the lower headlamp securing screw

25.5B Unscrewing an upper headlamp securing screw

24.16 Removing the clock illumination lamp bulbholder

Luggage compartment, underbonnet and kerb lamps

Removal

9 Using a thin-bladed screwdriver, prise the lamp from its location; disconnect the wiring.
10 Carefully prise the bulb from the lamp **(see illustration)**.

Refitting

11 Refitting is a reversal of removal

Cigarette lighter illumination lamp

Removal

12 Slide the ashtray/cigarette lighter assembly from the facia, then disconnect the wiring and pull the bulbholder from the rear of the cigarette lighter housing.
13 The bulb is a push fit in the bulbholder.

Refitting

14 Refitting is a reversal of removal.

Clock illumination lamp

15 Remove the clock, (Section 16).
16 Twist the bulbholder and pull it from the rear of the clock **(see illustration)**.
17 The bulb is a push fit in the bulbholder.

Trip computer display module illumination lamp

18 Refer to Section 20.

Heater control panel illumination lamp

Removal

19 Remove the heater control panel, as described in Chapter 11.

25.5C Withdrawing a headlamp unit

24.20 Heater control panel illumination lamp bulbholder withdrawn

20 Pull the bulbholder from the rear of the control panel **(see illustration)**.
21 The bulb is a push fit in the bulbholder.

Refitting

22 Refitting is a reversal of removal.

Facia panel switch illumination lamp

23 If a bulb fails in one of the facia panel switches, the complete switch assembly must be renewed, as described in Section 7, as no individual spare parts are available.

Vanity mirror illumination lamp

Removal

24 Lower the sunvisor and, using a thin-bladed screwdriver, prise out the mirror and diffuser assembly. Pull the bulb(s) from the spring contacts.

Refitting

25 Refitting is a reversal of removal.

25 Headlamp unit - removal and refitting

Removal

1 Remove the radiator grille panel, as described in Chapter 11.
2 Remove the front indicator lamp unit, as described in Section 29.
3 Remove the cover from the rear of the headlamp unit, and disconnect the wiring plugs from the bulbs.
4 If applicable, disconnect the wiring plug from the headlamp aim adjustment motor.
5 Remove the three securing screws, and withdraw the headlamp unit **(see illustrations)**. Feed the wiring through the headlamp casing as it is removed.
6 If required, the headlamp lens can be removed by releasing the spring clips around its edge.

Refitting

7 Refitting is a reversal of removal.
8 On completion, have the headlamp alignment checked, with reference to Section 27.

26 Headlamp aim adjustment motor - removal and refitting

Removal

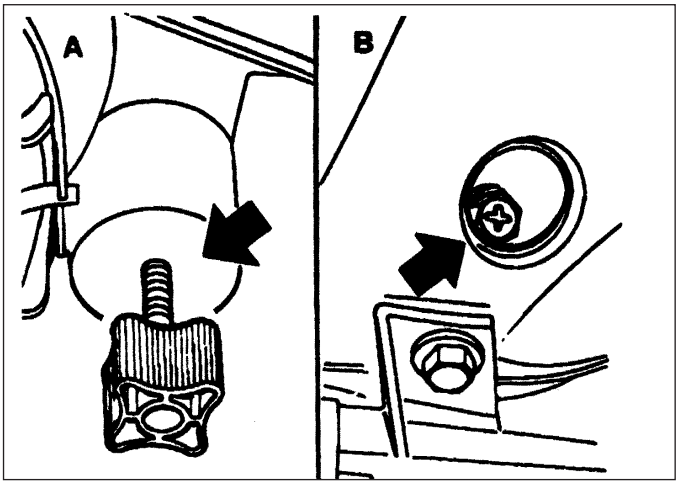
1 Remove the headlamp, (Section 25).
2 Twist the motor clockwise to release it from the headlamp, then carefully disconnect the motor from the balljoint **(see illustrations)**.

Refitting

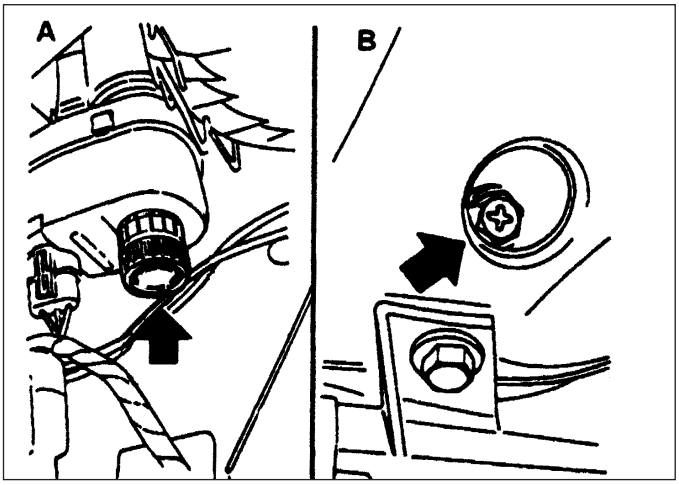
3 Refitting is a reversal of removal, but ensure that the motor is correctly engaged with the balljoint.

26.2A Headlamp aim adjustment motor (headlamp removed)

26.2B Headlamp aim adjuster balljoint (arrowed)



27.3A Headlamp alignment adjustment screws - models without electric aim adjustment
A Vertical adjustment screw B Horizontal adjustment screw



27.3B Headlamp alignment adjustment screws - models with electric aim adjustment
A Vertical adjustment screw B Horizontal adjustment screw

27 Headlamps - alignment

1 Correct alignment of the headlamp beams is most important, not only to ensure good vision for the driver, but also to protect other drivers from being dazzled.
2 Accurate alignment should be carried out using optical beam setting equipment.
3 In an emergency, adjustments may be made by turning the adjustment screws shown **(see illustrations)**. If an adjustment is made, the alignment should be checked using beam setting equipment at the earliest opportunity.
4 All 1992-on models are fitted with the headlamp aim adjustment system, operated through the facia-mounted switch **(see illustration)**.

a) Position '0', is for correct alignment if just the driving seat is occupied.
b) Position '1', if all seats are occupied.
c) Position '2', if all seats occupied and luggage.
d) Position '3', for just driver and luggage.

28 Headlamp dim-dip system - general, removal and refitting

General

1 The system (where fitted) is governed by the dim-dip control unit mounted either behind and above the glovebox (early models), or behind the main fuse panel (later models).
2 The control unit uses the oil pressure warning lamp circuit to ensure that, when the engine is running and the sidelamps are switched on, reduced current is fed to the headlamp dipped-beam circuits. This lights the headlamps with approximately one-sixth of their normal power so that the vehicle cannot be driven using sidelamps alone.
3 To locate the dim-dip control unit, open the main fuse panel covering flap and unclip it from its bottom and top mountings (Section 3). Then use a torch to see whether the unit is fastened to the plastic bracket behind the facia and fuse panel. The unit is usually rectangular, of black plastic, and can be identified by the colours of the five wires leading to it (see applicable wiring diagram).

27.4 The headlamp aim adjustment switch - 1992-on models

Removal

4 If the unit can be seen, remove the driver's side lower facia and footwell trim panels (Chapter 11), then unscrew the four retaining screws and lower the plastic bracket until the control unit can be detached.
5 If the unit cannot be seen, remove the glovebox assembly (Chapter 11). The unit will be fastened to the underside of the facia top surface.

Refitting

6 Refitting is the reverse of the removal procedure.

29 Front indicator lamp unit - removal and refitting

Removal

1 Disconnect the battery negative lead.
2 Remove the single indicator lamp unit securing screw, which is accessible through the hole in the upper body panel **(see illustration)**.
3 Pull the lamp unit forwards to release it from the body, then disconnect the wiring plug **(see illustration)**.

Refitting

4 Refitting is a reversal of removal.

30 Side repeater lamp - removal and refitting

Removal

1 Disconnect the battery negative lead.
2 Remove the wheel arch liner, as described in Chapter 11.
3 Working in the engine compartment, disconnect the wiring plug, and detach the earth lead from the body panel.
4 Working under the wheel arch, depress the retaining tabs and manipulate the lamp through the outside of the wing, pulling the wiring and the grommet from the inner wing panel.
5 The lens can be removed from the lamp by twisting it to release the retaining clips.
6 Check the condition of the rubber sealing ring, and renew if necessary.

Refitting

7 Refitting is a reversal of removal.

31 Front foglamp - removal, refitting and adjustment

Removal

1 Disconnect the battery negative lead.
2 Removing (if necessary) the radiator grille panel, as described in Chapter 11, disconnect the appropriate foglamp wiring plug.
3 Apply the handbrake, jack up the front of the vehicle and support it securely on axle stands (see "*Jacking and Vehicle Support*") positioned under the body side members.
4 If removing the driver's side foglamp, remove the securing screws and withdraw the plastic cover from the bumper/front wing to expose the lamp mountings.
5 Unscrew the three securing bolts and withdraw the lamp and wiring, the two bottom bolts are obvious, but the third is well hidden at the top of the lamp.

29.2 Unscrewing the front indicator lamp unit securing screw

29.3 Disconnecting the front indicator lamp unit wiring plug

Refitting

6 Refitting is a reversal of removal, but on completion check the foglamp adjustment.

Adjustment

7 The vertical aim of the foglamps can be adjusted by turning the adjuster screw at the rear of the lamp in the required direction. It will be necessary to remove the plastic cover (driver's side only) from the bumper/front wing to expose the adjuster screw **(see illustration)**.

32 Rear lamp unit - removal and refitting

Removal

1 Disconnect the battery negative lead.
2 Working in the luggage compartment, remove the cover from the rear of the lamp.
3 Release the top and bottom retaining clips, and pull the bulbholder from the lamp. Disconnect the wiring plug.
4 Remove the securing screws, and withdraw the lamp unit from outside the vehicle.
5 Note that the lens cannot be renewed separately, and if damaged, the complete lamp unit must be renewed.

Refitting

6 Refitting is a reversal of removal.

31.7 Foglamp aim adjustment screw (arrowed)

33 Number plate lamp - removal and refitting

Removal

1 Disconnect the battery negative lead.
2 Using a thin-bladed screwdriver, carefully prise the lamp surround from the bumper.
3 Pull the lamp from the bumper, and disconnect the wiring.

Refitting

4 Refitting is a reversal of removal.

34 Exterior lamp bulbs - renewal

Note: *The glass envelopes of the headlamp and foglamp bulbs must not be touched with the fingers. If the glass is accidentally touched, it should be washed with methylated spirits and dried with a soft cloth. Failure to observe this procedure may result in premature bulb failure*
1 Disconnect the battery negative lead.

Headlamps

Removal

2 Working in the engine compartment, release the retaining clip, and remove the cover from the rear of the headlamp **(see illustration)**.

34.2 Removing the cover from the rear of the headlamp

34.3A Release the spring clip . . .

34.3B . . . and withdraw the headlamp bulb

34.6 Pull the sidelamp bulbholder from the headlamp . . .

3 Pull the wiring plug from the base of the bulb, then release the spring clip, grasp the bulb by its contacts and carefully withdraw it **(see illustrations)**. Do not touch the bulb glass.

Refitting

4 Refitting is a reversal of removal.

Sidelamps

Removal

5 Working in the engine compartment, release the retaining clip, and remove the cover from the rear of the headlamp.
6 Pull the wiring plug from the bulbholder, then pull the bulbholder from the headlamp **(see illustration)**.
7 The bulb is a push fit in the bulbholder **(see illustration)**.

Refitting

8 Refitting is a reversal of removal.

Front indicator lamp

Removal

9 Working in the engine compartment, disconnect the wiring plug from the bulbholder.
10 Twist the bulbholder anti-clockwise, and pull it from the lamp unit **(see illustration)**.
11 The bulb is a bayonet fit in the bulbholder **(see illustration)**.

Refitting

12 Refitting is a reversal of removal.

Front indicator side repeater lamp

Removal

13 Twist the lamp lens anti-clockwise, and pull it from the lamp.
14 The bulb is a push fit in the lamp **(see illustration)**.

Refitting

15 Refitting is a reversal of removal, but ensure that the rubber sealing ring is correctly seated between the lens and the body panel.

Front foglamp

Removal

16 To improve access, apply the handbrake, jack up the front of the vehicle, and support securely on axle stands (see "*Jacking and Vehicle Support*") positioned under the body side members.
17 Remove the securing screws, and withdraw the plastic cover (driver's side only) from the bumper/front wing to expose the foglamp.
18 Remove the security screw, and withdraw the cover from the base of the lamp **(see illustration)**.
19 Release the spring clip, using a screwdriver if necessary, then grasp the bulb by its contacts and carefully withdraw it. Do not touch the bulb glass **(see illustration)**.
20 Pull the wiring plug from the base of the bulb.

Refitting

21 Refitting is a reversal of removal.

Rear lamp unit

Removal

22 Working in the luggage compartment, remove the cover from the rear of the lamp.
23 Release the top and bottom retaining clips, and pull the bulbholder from the lamp,

34.07 . . . then pull the bulb from the bulbholder

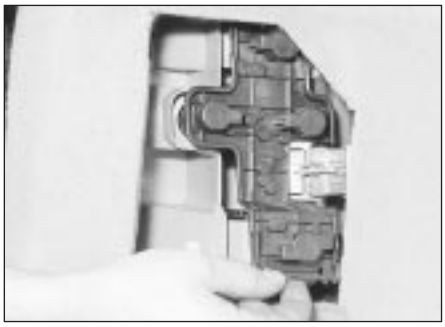
34.10 Withdraw the front indicator lamp bulbholder (lamp removed) . . .

34.11 . . . then remove the bulb

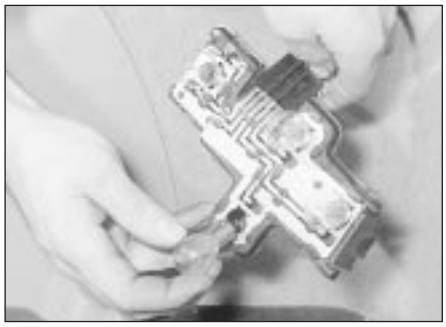
34.14 Removing a front indicator side repeater lamp bulb

34.18 Removing a front foglamp cover securing screw

34.19 Withdrawing a foglamp bulb



34.23 Release the rear lamp unit bulbholder retaining clips . . .



34.24 . . . then remove the relevant bulb

34.27 Unclip the lens from the rear number plate lamp . . .

34.28 . . . then remove the bulb

taking care not to strain the wiring **(see illustration)**.

24 The bulbs are a bayonet fit in the bulbholder **(see illustration)**. Note that the brake/tail lamp bulb has offset bayonet pins so that it can only be fitted in one position; ensure that the correct type of replacement is obtained.

Refitting

25 Refitting is a reversal of removal.

Rear number plate lamp

Removal

26 Using a thin-bladed screwdriver, carefully prise the lamp surround from the bumper.

27 Pull the lamp from the bumper, taking care not to strain the wiring, and unclip the lens **(see illustration)**.

28 The bulb is a bayonet fit in the lamp **(see illustration)**.

Refitting

29 Refitting is a reversal of removal.

35 Wiper blades - renewal

Removal

1 The wiper blades should be renewed when they no longer clean the glass effectively.

2 Lift the wiper arm away from the glass. On some models it may be more convenient to do this with the bonnet open.

3 With the blade at 90° to the arm, depress the spring clip and slide the blade from the hook **(see illustration)**.

4 If necessary, extract the two metal inserts and unhook the wiper rubber.

35.3 Removing a wiper blade

36.4 Windscreen wiper arms - 1992-on models

Refitting

5 Refitting is a reversal of removal, but where applicable, make sure that the cut-outs in the metal inserts securing the rubber to the blade face each other.

36 Wiper arms - removal and refitting

Windscreen and rear window wipers

Removal

1 The wiper motor should be in its parked position before removing the wiper arm. Mark the position of the blade on the glass with adhesive tape as a guide to refitting.

2 Lift the hinged covers, and remove the nuts and washers securing the arms to the spindles.

3 Prise the arms from the spindles, using a screwdriver if necessary. Take care not to damage the paintwork.

Refitting

4 Refitting is a reversal of removal. Note that the passenger side wiper arm is longer than that fitted to the driver's side. Ensure that the arms are fitted to their correct locations, as incorrect installation can cause the blades to foul one another when being used **(see illustration)**.

Headlamp wipers

5 The procedure is as described in paragraphs 1 to 4, but the washer hose must be disconnected from the stub on the body panel.

37 Washer nozzles - removal and refitting

Models up to 1990

Removal

1 To remove a nozzle, carefully prise it from its location using a thin-bladed screwdriver. Take care not to damage the paintwork.

2 Disconnect the washer hose and withdraw the nozzle.

Refitting

3 To refit, reconnect the washer hose to the nozzle, and push the nozzle into its locating hole.
4 The nozzles can be adjusted by inserting a pin into the jet, and swivelling it to the required position.

1991-on models

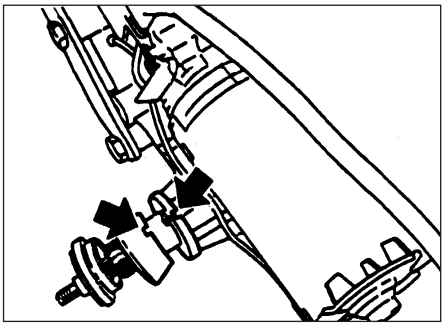
5 The nozzles on all later models are fitted with twin jets.
6 On some later models, the nozzles are heated; the circuit is fed through fuse 29 and is live whenever the ignition is switched on. Current is regulated by a Positive Temperature Coefficient (PTC) resistor that takes outside temperature into account.

38 Windscreen wiper motor and linkage - removal and refitting

Removal

1 Disconnect the battery negative lead.
2 Remove the wiper arms, as described in Section 36.
3 Remove the windscreen cowl panel, as described in Chapter 11.
4 Disconnect the wiring plug from the motor **(see illustration)**.

39.5 Tailgate wiper motor assembly. Note earth leads under heads of securing bolts



39.7 Cut-out in tailgate wiper motor drive spindle rubber seal must engage with notch in drive spindle

38.4 Disconnecting the windscreen wiper motor wiring plug

5 Unscrew the three bolts securing the motor/linkage assembly to the body, then withdraw the assembly **(see illustrations)**.
6 If desired, the motor can be removed from the linkage by unscrewing the three securing bolts. Do not attempt to dismantle the linkage.

Refitting

7 Refitting is a reversal of removal.

39 Tailgate wiper motor - removal and refitting

Removal

1 Disconnect the battery negative lead.
2 Remove the wiper arm, as described in Section 36.
3 Extract the securing screws, and remove the rear tailgate trim panel.
4 Disconnect the motor wiring plug.
5 Unscrew the two motor securing bolts, noting the earth leads under the bolt heads **(see illustration)**.
6 Manipulate the motor assembly from the tailgate.

Refitting

7 Refitting is a reversal of removal, ensuring that the cut-out in the drive spindle rubber seal engages with the notch in the drive spindle **(see illustration)**.

40.5A Unscrew the headlamp wiper motor securing bolts . . .

38.5A Unscrew the windscreen wiper motor/linkage assembly securing bolts . .

38.5B . . . then withdraw the assembly

40 Headlamp wiper motor - removal and refitting

Removal

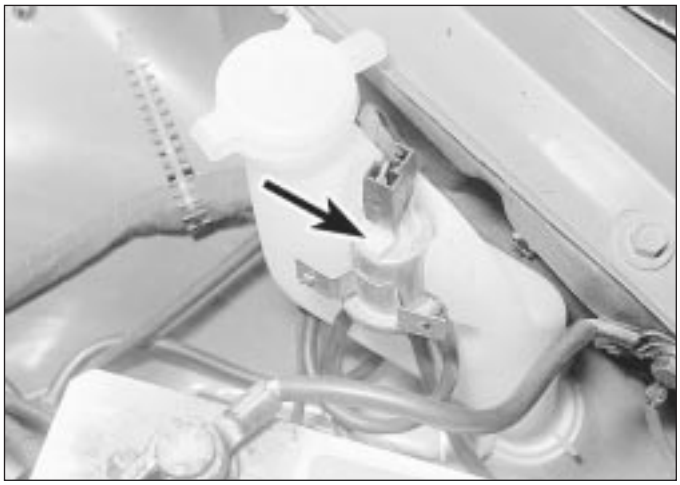
1 Disconnect the battery negative lead.
2 Remove the wiper arm, as described in Section 36.
3 Remove the headlamp, as described in Section 25.
4 Disconnect the motor wiring plug.
5 Unscrew the two bolts securing the motor mounting bracket to the body panel, then withdraw the motor **(see illustrations)**.

Refitting

6 Refitting is a reversal of removal.

40.5B . . . and withdraw the motor

41.17 Horn/washer fluid reservoir support bracket securing bolt (arrowed) - model with headlamp wash



43.1 Headlamp washer fluid non-return valve (arrowed)

41 Washer fluid reservoir - removal and refitting

1 Disconnect the battery negative lead.

Models without headlamp wash

Removal

2 Disconnect the wiring from the washer pump.
3 Disconnect the washer fluid hose from the pump. Be prepared for fluid spillage.
4 Remove the screw(s) securing the reservoir to the body, and withdraw the reservoir.

Refitting

5 Refitting is a reversal of removal.

Models with headlamp wash

Removal

6 On models with headlamp wash, the reservoir is in two sections, the upper section, which can be removed from the engine compartment, and the lower section, which must be removed from under the wheel arch.
7 Disconnect the wiring from the headlamp wash non-return valve in the top of the reservoir.
8 Disconnect the washer fluid hoses from the non-return valve. Be prepared for fluid spillage.
9 Remove the screw securing the upper section of the reservoir to the wing panel.
10 Loosen the plastic collar securing the upper section of the reservoir to the lower section, then withdraw the upper section of the reservoir from the engine compartment.
11 To remove the lower section of the reservoir, continue as follows.
12 Apply the handbrake, then jack up the front of the vehicle, and support on axle stands (see "*Jacking and Vehicle Support*") positioned under the body side members.
13 Remove the securing screws, and withdraw the plastic cover from the bumper/front wing to expose the lower section of the reservoir.
14 Remove the horns, (Section 22).
15 Remove the wheel arch liner, (Chapter 11).
16 Disconnect the wiring and the fluid hoses from the washer pump. Be prepared for fluid spillage.
17 Unscrew the bolts securing the horn/reservoir support bracket and the reservoir to the body, then withdraw the bracket and the reservoir **(see illustration)**.

Refitting

18 Refitting is a reversal of removal.

42 Washer pump - removal and refitting

1 Disconnect the battery negative lead.

Models without headlamp wash

Removal

2 Disconnect the wiring and the fluid hose from the pump. Be prepared for fluid spillage.
3 Pull the pump from the reservoir, being prepared for fluid spillage if the reservoir still contains fluid.
4 Examine the condition of the sealing grommet, and renew if necessary, and clean the gauze filter at the end of the pump pick-up tube.

Refitting

5 Refitting is a reversal of removal.

Models with headlamp wash

6 Apply the handbrake, then jack up the front of the vehicle, and support on axle stands positioned under the body side members.
7 Remove the securing screws, and withdraw the plastic cover from the bumper/front wing to expose the lower section of the fluid reservoir.
8 Remove the wheel arch liner, (Chapter 11).
9 Proceed as described in paragraphs 2 to 5 inclusive.

43 Headlamp washer fluid non-return valve - removal and refitting

Removal

1 The valve is located on a bracket attached to the upper section of the washer fluid reservoir **(see illustration)**.
2 Disconnect the battery negative lead.
3 Disconnect the wiring and the fluid hoses from the valve. Be prepared for fluid spillage.
4 Remove the screw securing the valve bracket to the reservoir, and withdraw the valve.

Refitting

5 Refitting is a reversal of removal.

44 Electric window components - removal and refitting

Note: *Whenever any of the electric window components are removed, after refitting the components, the electric window controls must be programmed, as described in Section 45.*
1 Disconnect the battery negative lead.

Rear door-mounted switches

Removal

2 Prise the plastic surround from the door interior handle.
3 Carefully prise the switch from its location, and disconnect the wiring plug.

Refitting

4 Refitting is a reversal of removal, but make sure that the wiring is routed so that it does not foul the electric window or lock operating components.

Centre console-mounted switches

Removal

5 The switches must be removed as a complete assembly, and cannot be dismantled. If one of the switches is faulty, the complete assembly must be renewed.
6 Remove the rear section of the centre console, as described in Chapter 11.
7 Release the securing clips, and withdraw the switch assembly through the top of the centre console.

Refitting

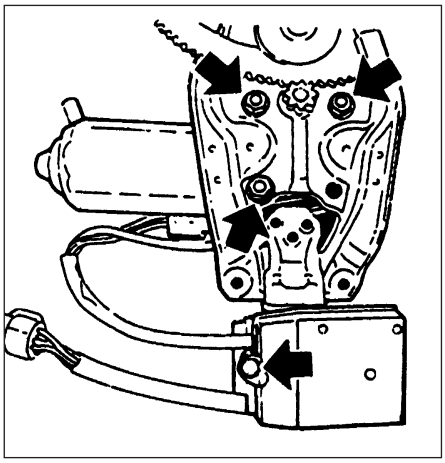
8 Refitting is a reversal of removal.

Operating motors

9 Remove the door window regulator, as described in Chapter 11.
10 To remove the motor assembly from the front door window regulator, unscrew the three motor securing nuts, and the single screw securing the pulse pick-up unit to the regulator assembly. Withdraw the motor, complete with the pulse pick-up unit. Note that if the motor or pick-up unit is/are faulty, the two components must be renewed as an assembly, as no spare parts are available **(see illustration)**.
11 The motor assembly fitted to the rear door window regulator is an integral part of the regulator, and no attempt should be made at dismantling. If faulty, the complete motor/regulator assembly must be renewed, as no spares are available.

45 Electric window controls - programming

1 Whenever the battery is disconnected, or any of the electric window components are removed, on completion of work, the electric window controls must be programmed as follows.
2 Close all doors, and switch on the ignition.
3 Close one of the windows by pressing the relevant operating switch. Press and hold the switch for a further five seconds after the relevant window has fully closed.



44.10 Front door electric window motor securing nuts and pulse pick-up securing screw (arrowed)

4 Repeat the procedure for the remaining window(s).

46 Central door locking components - removal and refitting

1 Disconnect the battery negative lead.

Electronic control module

Removal

2 The module is mounted in the driver's footwell, behind the side trim panel.
3 Remove the driver's footwell side trim panel, as described in Chapter 11.
4 Unscrew the two securing nuts, and lift the module from the body panel **(see illustration)**.
5 Depress the retaining clip to release the wiring plug, then withdraw the module.

Refitting

6 Refitting is a reversal of removal.

Operating switch

Removal

7 The operating switch takes the form of a microswitch, mounted inside the door at the rear of the exterior handle assembly.
8 Remove the door inner trim panel, as described in Chapter 11.
9 Peel back the plastic insulating sheet sufficiently to gain access to the exterior handle.
10 Unclip the microswitch from the rear edge of the exterior handle assembly, and disconnect the switch wiring plug from the door wiring harness, then withdraw the switch **(see illustration)**.

Refitting

11 Refitting is a reversal of removal.

Door lock operating motor

Removal

12 Remove the door lock, as described in Chapter 11.
13 Disconnect the lock operating rod from the motor.
14 Remove the two securing screws, and withdraw the motor from the lock assembly.

Refitting

15 Refitting is a reversal of removal.

Tailgate/boot lid lock operating motor

Removal

16 On Hatchback models, extract the securing screws and remove the rear tailgate trim panel.
17 Remove the two securing screws, and manipulate the motor to disconnect the lock operating rod.
18 Withdraw the motor and disconnect the wiring plug **(see illustration)**.

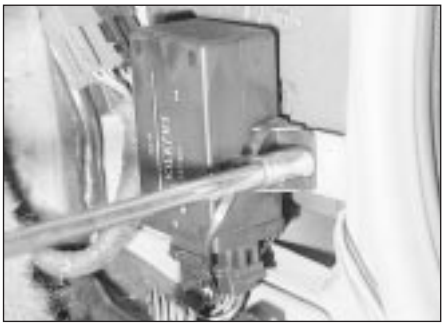
Refitting

19 Refitting is a reversal of removal.

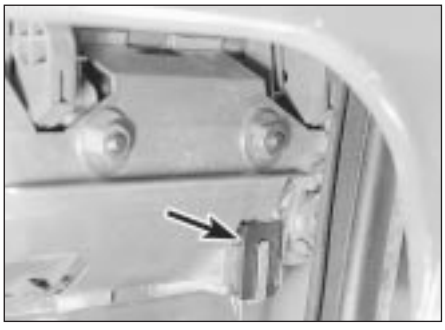
Fuel filler flap lock operating motor

Removal

20 Remove the right-hand rear quarter trim panels, as described in Chapter 11.
21 Disconnect the wiring plug from the rear of the motor **(see illustration)**.



46.4 Unscrewing a central door locking control module securing nut



46.10 Central door locking operating microswitch (arrowed) in driver's door

46.18 Disconnecting the wiring plug from the tailgate lock operating motor - Hatchback model

22 Unscrew the two screws securing the motor to the mounting bracket, then manipulate the motor to disconnect the lock operating rod. Withdraw the motor.

Refitting

23 Refitting is a reversal of removal.

47 Aerial - removal and refitting

HAYNES HiNT

Always clean the aerial mast in an upwards direction. This should minimise dirt being forced down, into the mast sections.

Removal

1 On models with an electric aerial, disconnect the battery negative lead.
2 Remove the left-hand rear quarter trim panel, as described in Chapter 11.
3 Remove the screw securing the earth lead(s) to the body panel **(see illustration)**.
4 Remove the screw securing the aerial bracket to the body panel, then ensure that the aerial is fully retracted, and pull it through the grommet in the bodywork into the luggage compartment. Disconnect the wiring plug on models with an electric aerial, and disconnect the aerial lead **(see illustrations)**.

47.4A Unscrewing the radio aerial bracket securing screws - electric aerial

47.4B Disconnecting the aerial lead - electric aerial

46.21 Disconnecting the wiring plug from the fuel filler flap operating motor - Hatchback model

Refitting

5 Refitting is a reversal of removal, but ensure that the rubber grommet is correctly seated in the bodywork.

48 Aerial mast, electric - removal and refitting

HAYNES HiNT

Always clean the aerial mast in an upwards direction. This should minimise dirt being forced down, into the mast sections.

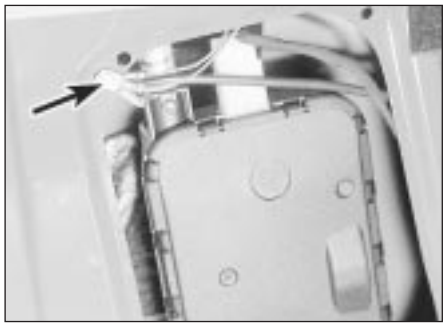
Removal

1 The mast on "factory fitted", fully automatic electric aerials, can be replaced separately.
2 Extend the aerial as far as possible, by switching on the radio.
3 Unscrew the mounting nut.
4 Pull the sprung sleeve upwards and clear of its base.
5 The assembly can now be removed from the clutch mechanism, by pulling the assembly upwards.

Refitting

6 Insert the ball end of the mast assembly into the base.

48.7 Push the mast assembly down, until it engages in the clutch mechanism



47.3 Radio aerial earth lead securing screw (arrowed) - electric aerial

7 Carefully push the mast assembly down as far as possible, until it engages into the clutch mechanism **(see illustration)**.
8 Switch the radio off to retract the aerial.
9 If the aerial does not fully retract into its base, guide the remaining mast into the base by hand.
10 Insert the sprung sleeve into the base and tighten the mounting nut.
11 Check the aerial works properly by turning the radio on and off a few times.

49 Speakers - removal and refitting

1 Disconnect the battery negative lead.

Facia-mounted speaker

Removal

2 Using a thin-bladed screwdriver, carefully prise the speaker from the top of the facia panel. Take care not to damage the facia trim **(see illustration)**
3 Disconnect the wiring and withdraw the speaker. If desired, the plastic trim panel can be unclipped from the top of the speaker.

Refitting

4 Refitting is a reversal of removal.

Front door-mounted speaker

Removal

5 Remove the door inner trim panel, as described in Chapter 11.

49.2 Removing a facia-mounted speaker (viewed through windscreen)

49.6 Withdrawing a front door-mounted speaker - wiring plug arrowed

6 Remove the three securing screws, and withdraw the speaker from the door. Disconnect the wiring plug **(see illustration)**.

Refitting

7 Refitting is a reversal of removal, but note that the speaker can only be fitted one way up, so that the lug on the bottom of the speaker rim engages with the corresponding hole in the door skin.

Rear speaker - Hatchback models

Removal

8 Remove the upper rear quarter trim panel, as described in Chapter 11.
9 Remove the four securing screws, and withdraw the speaker.

Refitting

10 Refitting is a reversal of removal.

Rear speaker Saloon models

Removal

11 Carefully prise the trim cover from the parcel shelf, to expose the speaker.
12 Remove the four securing screws, withdraw the speaker and disconnect the wiring.

Refitting

13 Refitting is a reversal of removal.

50 Radio/cassette player - removal and refitting

Removal

1 All the radio/cassette players fitted to the Cavalier range have DIN standard fixings. Two special tools, obtainable from in-car entertainment specialists, are required for removal.
2 Disconnect the battery negative lead.
3 Unscrew the four grub screws from the corners of the radio cassette player, using an Allen key or hexagon bit **(see illustration)**.
4 Insert the tools into the holes exposed by removal of the grub screws, and push them until they snap into place. Pull the tools outwards to release the unit **(see illustration)**.
5 Pull the unit forwards, and withdraw it from the facia.

Refitting

6 To refit the radio/cassette player, simply push the unit into the facia until the retaining lugs snap into place, then refit the grub screws.

51 Sunroof motor - removal and refitting

Removal

1 Ensure that the sunroof is fully closed.
2 Disconnect the battery negative lead.
3 Prise the courtesy lamp from the roof trim panel, and disconnect the wiring.
4 Remove the two trim panel securing screws, and withdraw the trim panel from the roof, disconnecting the wiring from the sunroof operating switch.
5 Disconnect the wiring plugs from the motor.
6 Unscrew the securing nut, and withdraw the motor assembly.

50.3 Unscrew the grub screws . . .

Refitting

7 Refitting is a reversal of removal.

52 Speedometer cable - removal and refitting

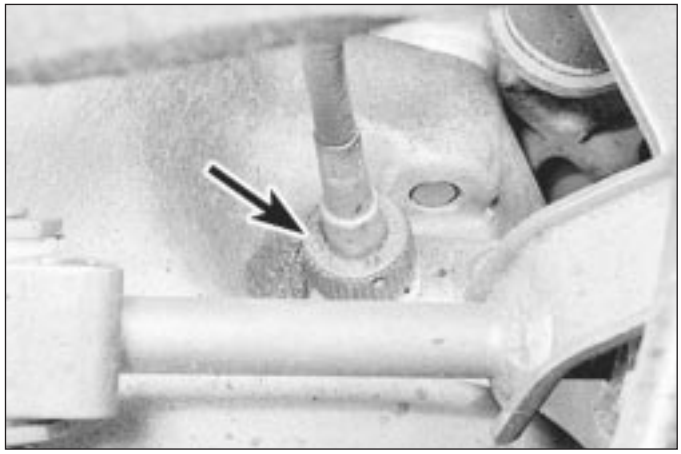
Removal

1 Remove the instrument panel, as described in Section 18.
2 Pull the cable through the bulkhead into the engine compartment, noting its routing.
3 Working in the engine compartment, unscrew the securing sleeve and disconnect the speedometer cable from the top of the transmission **(see illustration)**.
4 The cable can now be withdrawn from the vehicle, noting its routing so that it can be refitted in the same position.

Refitting

5 Refitting is a reversal of removal, ensuring that the cable is correctly routed. Make sure that the cable is not kinked or twisted between the instrument panel and the bulkhead as the instrument panel is refitted. Note that the cable should be routed to the right of the steering column support bracket.

50.4 . . . and withdraw the radio/cassette player using the special tools



52.3 Speedometer cable securing sleeve (arrowed) at transmission - SOHC model

53 Anti-theft alarm - general

1 Certain models are fitted with an anti-theft alarm as standard equipment.
2 The alarm system is triggered by door, bonnet and boot lid/tailgate mounted switches, and by ultrasonic sensors mounted inside the passenger compartment **(see illustration)**.
3 The alarm features a self-diagnostic function, and any faults should be referred to a Vauxhall dealer, who will have access to the necessary specialist diagnostic equipment.

54 Anti-theft alarm system components - removal and refitting

Control unit

Removal

1 Disconnect the battery negative lead.
2 Remove the driver's side lower facia panel as described in Chapter 11.
3 If necessary, remove the footwell side trim panel as described in Chapter 11.
4 Undo the control unit retaining bolt, disconnect the wiring plug and remove the unit from its location.

Refitting

5 Refitting is a reversal of removal.

Ultrasonic sensor

6 Disconnect the battery negative lead.
7 Remove the centre body pillar trim panel as described in Chapter 11.
8 Carefully release the ultrasonic sensor trim panel and withdraw it downwards.
9 Release the ultrasonic sensor from its location, disconnect the wiring plug and remove the unit from the car.

Refitting

10 Refitting is a reversal of removal.

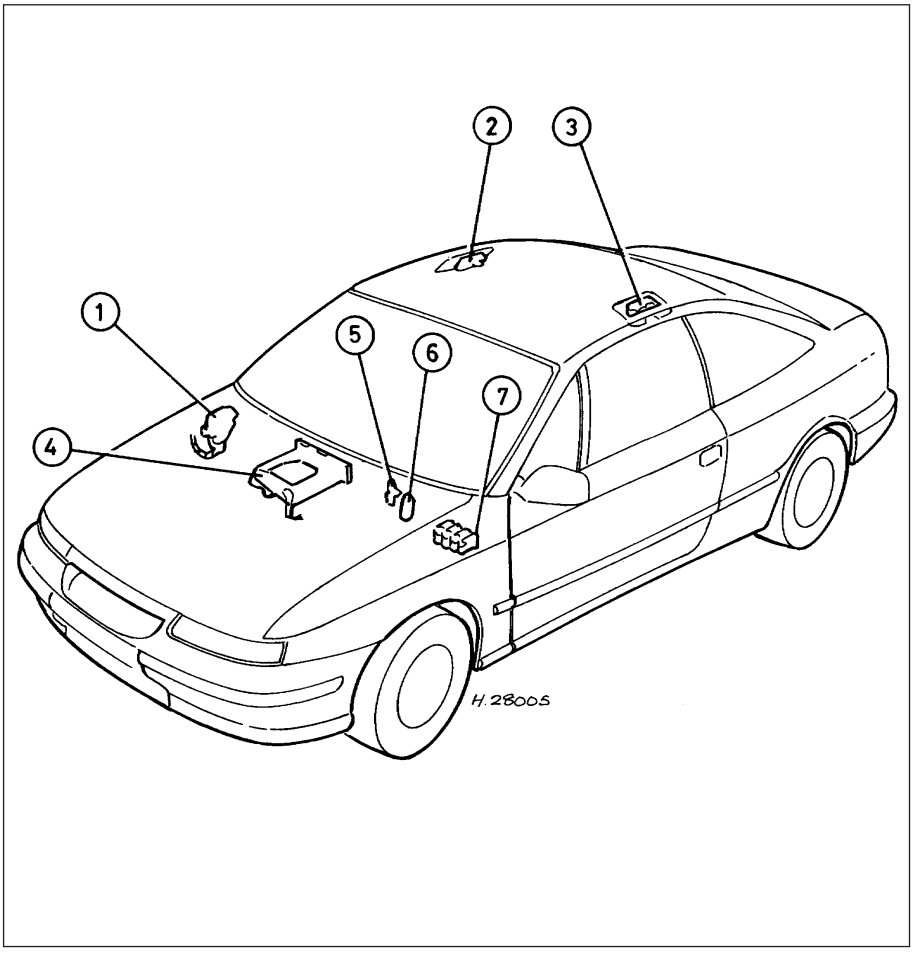
Bonnet contact unit

Removal

11 Disconnect the battery negative lead.
12 Using a screwdriver, depress the catch at the base of the contact unit and withdraw the contact from its location.
13 Disconnect the contact wiring and remove the unit.

Refitting

14 Refitting is a reversal of removal.



53.2 Anti-theft alarm system component locations
(Calibra model shown - component locations identical on Cavalier)

1 Control unit
2 Ultrasonic sensor with LED
3 Ultrasonic sensor with probe
4 Radio contact
5 Bonnet contact unit
6 Horn
7 Relay

55 Airbag - general

Warning: Before starting any work on airbag or related components, disconnect the battery. Cover the battery's terminals and wait a minimum of 1 minutes as a precaution against accidental firing of the airbag unit. This period ensures that any stored energy in the back-up capacitor is dissipated. Handle the airbag unit with extreme care as a precaution against personal injury, and always hold it with the cover facing away from the body. If in doubt concerning any proposed work involving the airbag unit or its control circuitry, consult a Vauxhall dealer or other qualified specialist.

All 1993 Cavalier models are available with an airbag that is designed to prevent serious chest and head injuries to the driver during an accident. A similar bag for the front seat passenger is also available on certain models. Sensors in the centre of the car measure the vehicle deceleration rate and pass these signals to a microprocessor. This unit analyses the sensor data and compares the information with pre-programmed values stored in its memory, triggering the airbag if the deceleration is severe. The airbag is inflated in 50 milliseconds by a gas generator that forces the bag out of the module cover in the centre of the steering wheel.

No repairs are possible on the airbag unit or its associated parts. The contents of the following Sections are confined to removal and refitting of the airbag, purely for access to other non-related components.

Should a fault be suspected on the airbag unit, indicated by the warning light on the instrument panel, or if the car has been involved in an accident, however minor, consult a Vauxhall dealer immediately. Do not attempt to dismantle any of the airbag components or carry out any work whatsoever, other than the procedures described in the following Sections.

On vehicles fitted with a passenger side airbag, **do not** fit accessories in the airbag zone. Items like telephones, cassette storage boxes, additional mirrors, etc., can be ripped off and cause serious injury, if the airbag inflates.

56 Airbag unit, drivers side - removal and refitting

Warning: Read warning at the beginning of Section 55, before starting work.

Note: *On power steering models in particular, it will be advantageous to jack up the front of the car and support it on axle stands placed under the body side members, so that the steering wheel can be turned more easily.*

Removal

1 Disconnect the battery negative lead and cover the battery terminal. Wait a minimum of 1 minute.
2 With the steering wheel positioned in the straight-ahead position, turn it 90° clockwise so that the left-hand spoke is accessible from the rear.
3 Using a Torx type socket, undo the first airbag retaining bolt from the rear of the steering wheel **(see illustration)**.
4 Turn the steering wheel 180° anti-clockwise so that the right-hand spoke is accessible from the rear.
5 Undo the second retaining bolt from the rear of the steering wheel.
6 Return the steering wheel to the straight-ahead position then carefully lift up the airbag unit.
7 Disconnect the wiring plug and remove the airbag from the car.

Warning: Stand the unit with the cover uppermost and do not expose it to heat sources in excess of 100ºC. Do not attempt to open or repair the airbag unit, or apply any voltage to it. Do not use any airbag unit that is visibly damaged or has been tampered with.

Refitting

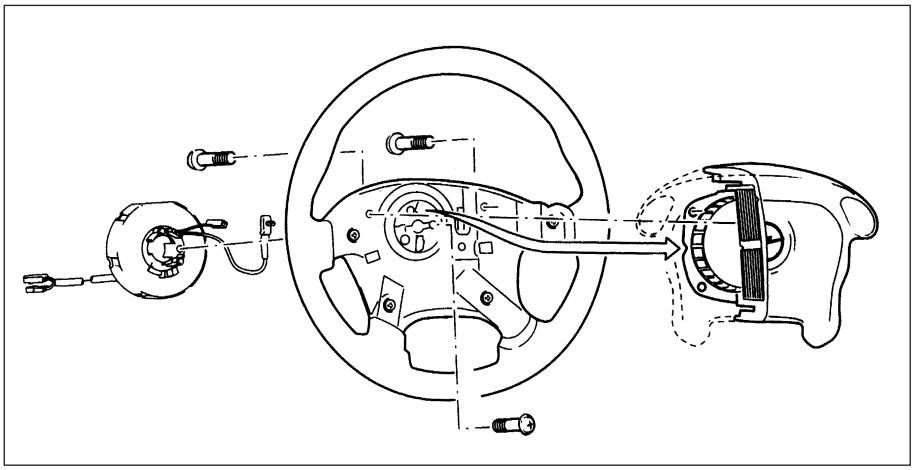
8 Refitting is a reversal of removal.

57 Steering wheel (with airbag) - removal and refitting

Note: *Read warning at the beginning of Section 55, before starting work. A two-legged puller will be required for this operation. Note also that the steering wheel is a very tight fit on the shaft.*

Removal

1 Remove the airbag unit as described previously.
2 Ensure that the steering wheel is in the straight ahead position.
3 From the centre of the steering wheel unscrew the two screws securing the airbag contact unit.

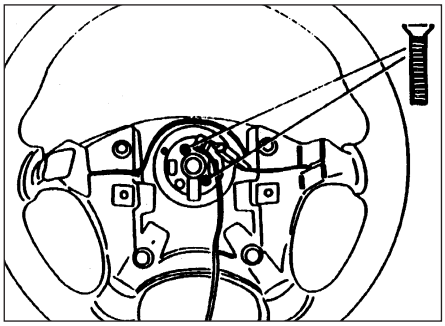


56.3 Airbag, steering wheel and contact unit details

4 Using a screwdriver, prise back the tabs on the lockwasher securing the steering wheel retaining nut.
5 Unscrew and remove the steering wheel retaining nut and the lockwasher.
6 Make alignment marks between the steering wheel and the end of the column shaft.
7 A suitably small two-legged puller must now be fitted to the steering wheel in order to pull it from the column shaft.
8 Once the steering wheel has been released from the column shaft, disconnect the horn wiring and remove the steering wheel.

Refitting

9 Begin refitting by positioning the steering wheel on the column shaft, ensuring that the marks made on removal are aligned, and that the wheel correctly engages with the airbag contact unit. It may be necessary to tap the steering wheel fully home on the column shaft using a metal tube and socket.
10 Reconnect the horn wiring.
11 Refit the lockwasher and the steering wheel retaining nut, and tighten the nut to the specified torque. Bend up the lockwasher to secure.
12 Refit the two screws securing the airbag contact unit.
13 Refit the airbag as described previously.



58.3 Airbag contact unit retaining screws

58 Airbag contact unit - removal and refitting

Note: *Read warning at the beginning of Section 55, before starting work.*

Removal

1 Remove the airbag and the steering wheel as described previously.
2 Remove the steering column upper and lower shrouds, referring to Chapter 10, if necessary.
3 Disconnect the contact unit wiring plug below the steering column and withdraw the contact unit from the column, noting its fitted position as a guide to reassembly **(see illustration)**.

Refitting

4 Before refitting the contact unit, ensure that the front wheels are in the straight-ahead position.
5 Place the contact unit on the column in the correct position as noted during removal.
6 Route the wiring harness under the steering column lock/ignition switch and connect the wiring plug.
7 Refit the steering column shrouds.
8 Refit the steering wheel and airbag as described previously.

59 Airbag unit, passengers side - removal and refitting

Note: *Read warning at the beginning of Section 55, before starting work.*

Removal

1 Disconnect the battery, cover the terminals and wait at least 1 minute.
2 Remove the glovebox assembly. Refer to Chapter 11, for further details if necessary.
3 Remove the right hand ventilation air duct.

4 Disconnect the plug connections.
5 Unbolt the six M6 nuts from the two side brackets.
6 Remove the airbag unit **(see illustration).**

Refitting

4 Refitting is a reversal of removal.

60 Bracket, passenger airbag unit - removal and refitting

Note: *Read warning at the beginning of Section 55, before starting work. This process involves removal of the windscreen, refer to Chapter 11, before starting work.*

Removal

1 Remove the passenger side airbag unit as described in Section 59.
2 Remove the airbag unit cover.
3 Remove the water deflector from in front of the windscreen.
4 Remove the windscreen.
5 The brackets can now be unbolted.

Refitting

4 Refitting is a reversal of removal.

61 Airbag control unit - removal and refitting

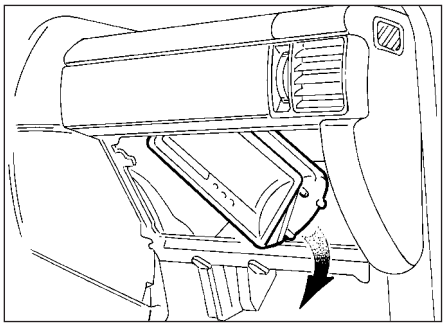
Note: *Read warning at the beginning of Section 55, before starting work.*

Removal

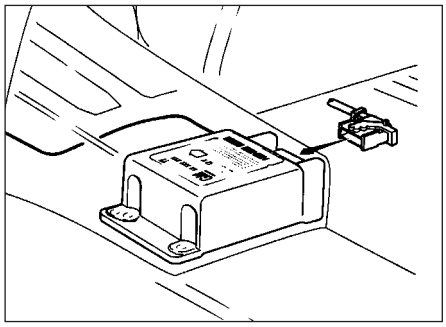
1 Disconnect the battery negative lead and cover the battery terminal to prevent accidental reconnection.
2 Remove the centre console rear section as described in Chapter 11.
3 Disconnect the control unit wiring plug, then undo the three nuts and remove the unit from the car **(see illustration)**.

Refitting

4 Refitting is a reversal of removal.



59.6 Removing the passenger side airbag



61.3 Airbag control unit details

62 Wiring diagrams - general

1 The wiring diagrams are of the current flow type, each circuit being shown in the simplest possible fashion. Note that since the diagrams were originally written in German (to the DIN standard), all wire colours and abbreviations used on the diagrams themselves are in German. Refer to the information given overleaf for clarification.
2 The bottom line of the diagram represents the "earth" or negative connection; the numbers below this line are track numbers, enabling circuits and components to be located using the key.
3 The lines at the top of the diagram represent "live feed" or positive connection points. The line marked "30" is live at all times, that marked "15" is live only when the ignition is switched on.
4 Numbers on the diagram that are framed in square boxes at the end of a wire show the track reference number in which that wire is continued. At the point indicated will be another framed number referring back to the circuit just left.
5 As an example of how to use the diagrams, trace with the help of the following text the reversing lamp switch circuit located between track reference numbers 496 and 498 on the 1991 model year diagram on page 12•40.
6 Starting at the top of track 497, the supply for the circuit comes from the line "15", showing that the circuit is fed only when the ignition is switched on, through fuse 22 (F22, rated at 10 amps). Note that this fuse can also protect the feed for several other circuits, some of which may not be applicable to the vehicle being worked on.
7 If the vehicle in question has a manual transmission (MT), the circuit continues along a black wire of 0.75 mm cross-section (as shown by "SW 0.75" in the wire path), through terminal 12 of connector X5 to the reversing lamp switch S7. From the switch the circuit continues along a white wire, with a black tracer and of 0.75 mm cross-section (WSSW 0.75), through terminal 2 of connector X5 and terminal 1 of connector X6, to the reversing lamp bulbs (E17 and E18). The circuit is completed by a brown wire from each bulbholder to earth; in this case the "earth" wire simply attaches the component to the nearest piece of metal bodywork, but in other cases earthing is achieved by the component mounting and no wire is needed. The diagram shows, as simply as possible, that when the switch contacts (which are normally open) are closed by the driver selecting reverse gear, current is allowed to flow to earth through the switch and bulbs causing the reversing lamps to light.
8 If the vehicle in question has automatic transmission (AT), the circuit differs in that the "live feed" goes from fuse 22 to terminal "F" of the transmission selector lever position switch connector X46 (track reference number 773). When position "R" is selected, terminals "F" and "G" are connected so that the circuit feed continues (back to track reference number 496, the "RFS/reversing lamp" circuit) along the same route described above for manual transmission models.

Explanations of abbreviations used in wiring diagrams

ABS	Anti-lock braking system
AC	Air conditioning
AZV	Trailer hitch
AT	Automatic transmission
ATC	Automatic temperature control
BR	Trip (on-board) computer
CC	Check control system
CRC	Cruise control
D	Diesel
DS	Theft protection
DT	Turbo Diesel
DWA	Anti-theft warning system
DZM	Tachometer
EFC	Electric folding roof (Convertible)
EKS	Pinch guard (electric windows)
EMP	Radio
EUR	Euronorm (emission control standard) engine
EZ + EI	Plus ignition system (with self-diagnosis)
EZV	Ecotronic
FH	Electric windows
GB	Great Britain
HS	Heated rear window
HW	Rear window wiper
HZG	Heating
HRL	Luggage compartment lamp
INS	Instrument panel
IRL	Courtesy lamps
KAT	Catalytic converter
KBS	Wiring harness
KV	Contact breaker distributor
L3.1	Bosch Jetronic fuel injection system
LCD	Liquid crystal display (LCD) instruments
LHD	Left-hand drive
4WD	Four-wheel-drive
LWR	Headlamp aim adjustment
M1.5	Bosch Motronic M1.5 engine management system
M2.5	Bosch Motronic M2.5 engine management system
MOT	Motronic (general)
MT	Manual gearbox
MUL	Multec fuel injection system
N	Norway
NS	Front foglamps
NSL	Rear foglamps
OEL	Oil level/pressure check system
OPT	Optional equipment
PBSL	Park and brake shift block (automatic transmission, selector lever in position ‘P’)
P/N	Park/neutral (automatic transmission)
POT	Potentiometer
RC	Rear suspension level control system
RFS	Reversing lamps
RHD	Right-hand drive
S	Sweden
SD	Sunroof
SH	Heated seats
SRA	Headlamp washers and wipers
TANK	Fuel level sender unit
TD	Turbo Diesel
TEMP	Temperature gauge
TFL	Daytime driving lamps
TKS	Courtesy lamp (door pillar) switches
TSZI	Transistorised ignition (inductive-triggered) system
VGS	Carburettor
WEG	Odometer frequency/roadspeed sensor
WHR	Rear suspension level control system
WS	Warning buzzer
ZV	Central locking
ZYL	Cylinder

Colour codes

BL	Blue	RT	Red
HBL	Light blue	WS	White
BR	Brown	SW	Black
GE	Yellow	LI	Lilac
GR	Grey	VI	Violet
GN	Green		

Wiring identification

Example: GEWS 1.5

GE - Wire basic colour
WS - Wire tracer colour
1.5 - Wire cross-section in mm^2

Note: *Not all items shown are fitted to all models. Refer to Section 62 (Chapter 12) for details of diagram usage.*

Key to wiring diagrams for 1989 models

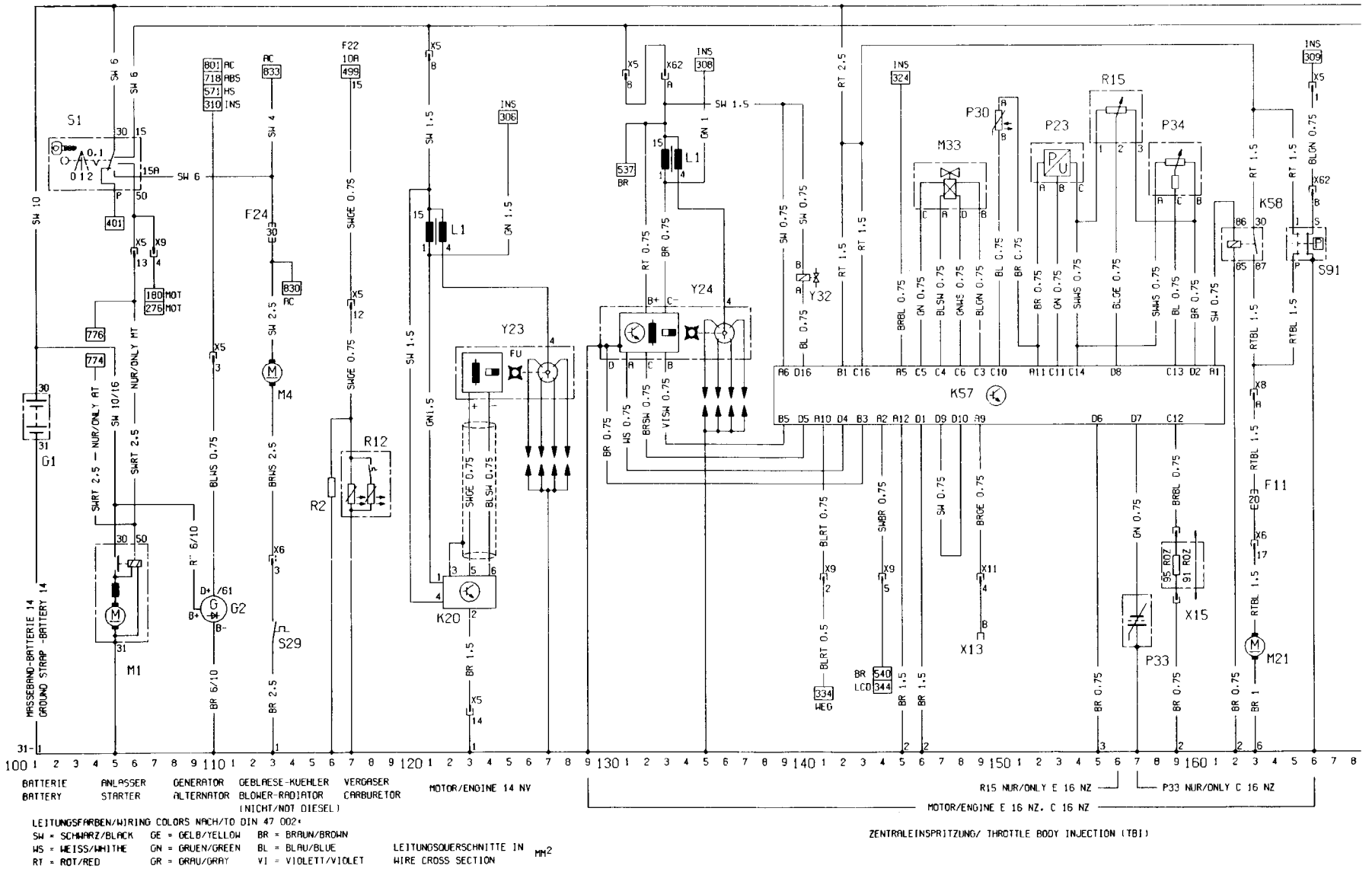
No	Description	Track
E1	Sidelamp - left	406
E2	Tail lamp - left	302, 380, 407
E3	Number plate lamp	413
E4	Side lamp right	409
E5	Tail lamp right	382, 410
E6	Engine compartment lamp	416
E7	Headlamp main beam - left	437
E8	Headlampmain beam - right	438
E9	Headlampdipped beam - left	384, 439
E10	Headlamp dipped beam - right	386, 440
E11	Instrument illumination lamps	328 to 329
E12	Gear selector lever illumination lamp (automatics)	799
E13	Luggage compartment lamp	485
E14	Courtesy lamp	487
E15	Glovebox lamp	599
E16	Cigarette lighter illumination lamp	598
E17	Reversing lamp - left	497
E18	Reversing lamp - right	498
E19	Heated rearwindow	572
E20	Front foglamp - left	448
E21	Front foglamp - right	447
E24	Rear foglamp - left	454
E25	Seat heater - front left	575
E30	Seat heater - front right	579
E32	Clock illumination lamp	552
E38	Trip computer illumination lamp	539
E39	Rear foglamp - right	455
E41	Courtesy lamp (with delay)	488 to 490
E50	Kerb lamp - driver's door	635
E51	Kerb lamp - passenger door	653
F1 to F30	Fuse (in fusebox)	Various
F32	Fuse - mixture preheating (not UK)	232
F33	Fuse - electronic carburettor (not UK)	201
F34	Fuse (in relay box, engine compartment)	834
F35	Voltage stabiliser	302
F36	Fuse - fuel filter heating (Diesel models)	866
G1	Battery	101
G2	Alternator	110
G3	Battery - Diesel models	846
G6	Alternator - Diesel models	850 to 852
H2	Horn	591
H3	Direction indicator warning lamp	318, 320
H4	Oil pressure warning lamp	310
H5	Brake fluid level warning lamp	313
H6	Hazard warning flasher warning lamp	470
H7	Alternator charge warning lamp	310
H8	Headlamp main beam warning lamp	322
H9	Brake lamp - left	388
H10	Brake lamp - right	390
H11	Direction indicator lamp - front left	472
H12	Direction indicatorlamp - rear left	473
H13	Direction indicator lamp - front right	481
H14	Direction indicator lamp - rear right	482
H16	Glow plug warning lamp (Diesel models)	323
H17	Trailer direction indicator warning lamp	321
H18	Horns (twin)	592, 593
H19	Headlamps-on warning buzzer	494, 495
H21	Handbrake-on warning lamp	315
H23	Radio/cassette player	585, 586
H25	Door mirror heater warning lamp	678
H26	ABS warning lamp	319
H30	Engine fault warning lamp	324
H33	Direction indicator side repeater lamp - left	476
H34	Direction indicator side repeater lamp - right	478
H42	Automatic transmission warning lamp	325
H45	Four-wheel-drive warning lamp	327
H46	Catalytic converter temperature warning lamp (not UK)	329
K1	Relay-heated rear window	571 to 572
K5	Relay - front foglamps	448 to 450
K6	Relay - air conditioning (not UK)	801 to 802
K7	Relay - air conditioning blower (not UK)	808 to 809
K8	Relay - intermittent windscreen wipe	503 to 506
K9	Relay - headlamp wash	522 to 523
K10	Relay - direction indicator/hazard warning flashers	467 to 469
K20	HEI ignition control unit	122 to 124
K25	Relay - glow plugs (Diesel models)	856 to 859
K30	Relay - intermittent rear window wipe	515 to 517
K35	Relay - door mirror heater	683 to 685
K37	Central locking control unit	606 to 612
K45	Relay - mixture preheating (not UK)	231 to 232
K47	Relay - surge arrester (ABS)	702 to 703
K50	ABS control unit	707 to 721
K51	Relay - cooling fan	830 to 831
K54	Electronic carburettor control unit (not UK)	203 to 226
K55	Relay - electronic carburettor (not UK)	203 to 206
K57	Fuel injection control unit (not UK)	139 to 161
K58	Relay - fuel pump (not UK)	162 to 163
K59	Relay - daytime running lamps (not UK)	420 to 426
K61	Motronic M4.1 control unit	170 to 194
K62	Dim-dip control unit	428 to 432
K63	Relay - horn	593 to 594
K64	Relay - air conditioning blower (not UK)	802 to 803
K67	Relay - cooling fan	827 to 828
K68	Relay - fuel injection system	294 to 299, 196 to 199
K69	Motronic M2.5 control unit	267 to 297
K71	Ride control unit (not UK)	739 to 754
K80	Relay - fuel filter heater (Diesel models)	865 to 866
K82	Relay - engine revolution	862 to 863
K83	Four-wheel-drive control unit	725 to 731

Key to wiring diagrams for 1989 models (continued)

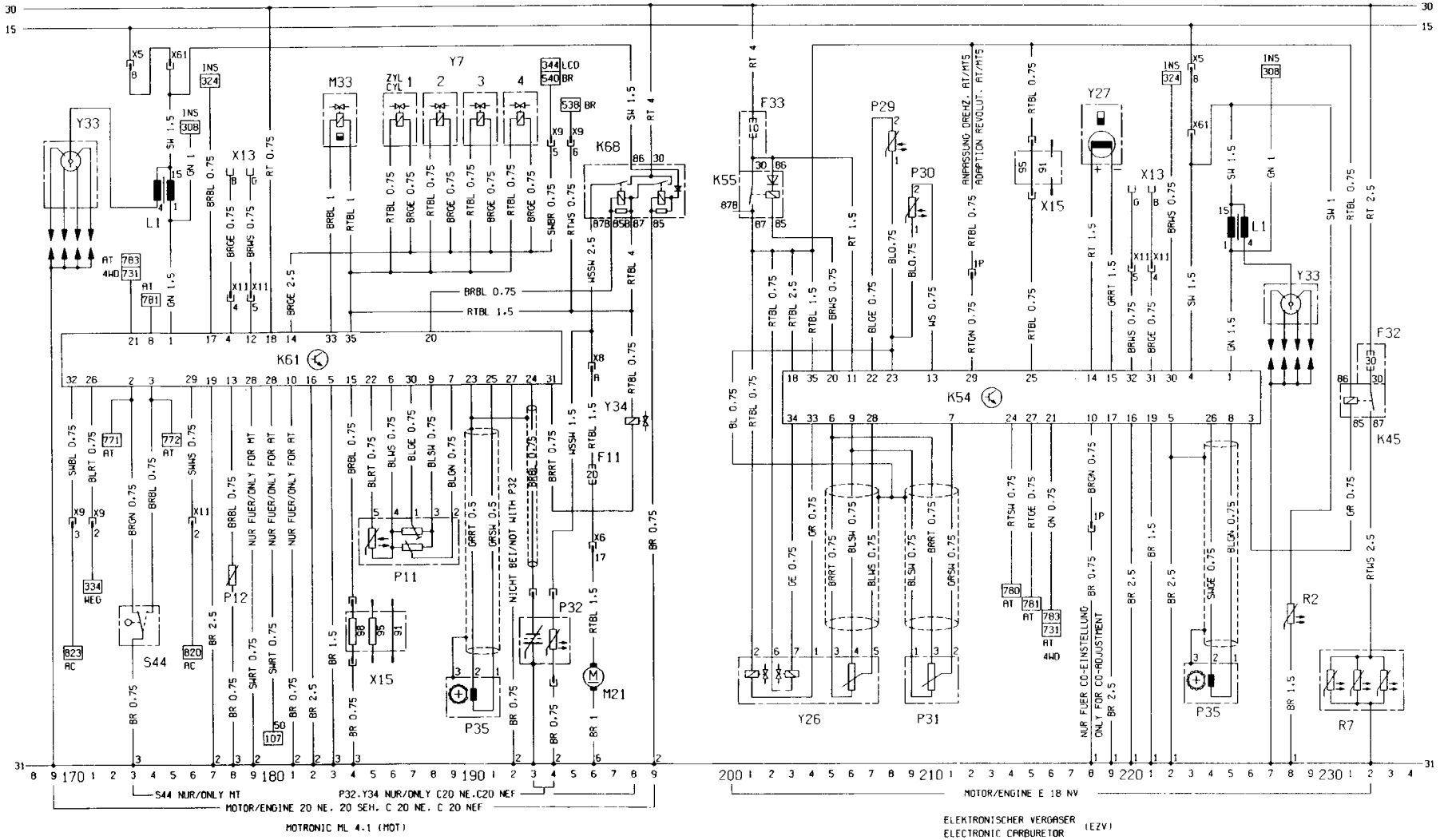
No	Description	Track
K84	MSTS ignition control unit	247 to 256
K85	Automatic transmission control unit	771 to 797
K86	Check control unit	370 to 392
K87	Relay - auxiliary cooling fan	833 to 834
K88	Catalytic converter temperature control unit (not UK)	760 to 762
K89	Relay - rear fog lamps	444 to 447
K90	Relay - air conditioning compressor (not UK)	820 to 821
K93	Relay - air conditioning compressor (not UK)	821 to 822
L1	Ignition coil	121 to 122, 133 to 134, 174 to 175, 225 to 226, 243 to 244, 261 to 262
M1	Starter motor	105 to 106
M2	Windscreen wiper motor	501 to 504
M4	Cooling fan motor	113
M6	Headlamp wiper motor - left	525 to 527
M7	Headlamp wiper motor - right	529 to 531
M8	Rear window wiper motor	513 to 515
M13	Sunroof motor	692 to 694
M18	Central locking motor - driver's door	607 to 610
M19	Central locking motor - left rear door	622 to 624
M20	Central locking motor - right rear door	626 to 628
M21	Fuel pump	163, 196, 299
M26	Electric aerial motor	584 to 585
M30	Door mirror motor and heater - driver's door	674 to 676
M31	Door mirror motor and heater - passenger door	680 to 682
M32	Central locking motor - passengerdoor	614to617
M33	Idle speed adjuster	146 to 149, 183 to 184, 277 to 278
M37	Central locking motor - boot lid/tailgate	618 to 621
M39	Headlamp aim adjustment motor - left	557 to 560
M40	Headlamp aim adjustment motor - right	561 to 564
M41	Central locking motor - fuel filler flap	623 to 625
M43	Ride control actuator - front left (not UK)	739 to 741
M44	Ride control actuator - front right (not UK)	743 to 745
M45	Ride control actuator - rear left (not UK)	747 to 749
M46	Ride control actuator - rear right (not UK)	751 to 753
M47	Electric window motor - front left	636 to 640
M48	Electric window motor - front right	654 to 658
M49	Electric window motor - rear left	642 to 646
M50	Electric window motor - rear right	660 to 664
M55	Washer fluid pump	518 to 519
P1	Fuel gauge	304
P2	Coolant temperature gauge	306
P3	Clock	551
P4	Fuel level sender unit	304
P5	Coolant temperature sensor	306
P7	Tachometer	308
P8	Oil pressure gauge	341
P9	Voltmeter	339
P10	Oil pressure sensor	341
P11	Airflow meter (Motronic M4.1)	185 to 189
P12	Coolant temperature sensor	178, 272
P13	Trip computer outside air temperature sensor	542 to 543
P14	Distance sensor (not UK)	336 to 337
P17	ABS wheel sensor - front left	707
P18	ABS wheel sensor - front right	710
P19	ABS wheel sensor - rear left	712
P20	ABS wheel sensor - rear right	714
P21	Speedometer frequency sensor (not UK)	332
P23	Pressure sensor	249 to 250
P24	Oil temperature sensor	251
P24	Automatic transmission fluid temperature sensor	795
P27	Brake pad wear sensor - front left	375
P28	Brake pad wear sensor - front right	375
P29	Inlet manifold temperature sensor (not UK)	207 to 208
P30	Coolant temperature sensor	209 to 210, 150
P31	Throttle position sensor (not UK)	209 to 211
P32	Oxygen sensor - heated (not UK)	193 to 194, 291 to 292
P33	Oxygen sensor	157
P34	Throttle position sensor	158 to 160, 780
P35	Crankshaft speed/position sensor	189 to 191, 223 to 225, 281 to 282
P39	Trailer bulb failure sensor	392 to 394
P43	Electronic speedometer	336
P44	Air mass meter (Motronic M2.5)	294 to 296
P45	Automatic transmission input speed sensor	787 to 788
P46	Knock sensor	284 to 285
P47	Distributor 'Hall-effect' sensor (Motronic M2.5)	287 to 288
P48	Automatic transmission distance sensor	785 to 786
P50	Catalytic converter temperature sensor (not UK)	761 to 762
R2	Carburettor preheating	116, 228
R3	Cigarette lighter	596 to 597
R5	Glow plugs (Diesel models)	858 to 859
R7	Mixture preheating (not UK)	232
R12	Automatic choke	117
R15	Mixture adjustment potentiometer (not UK)	155 to 157
R19	Cooling fan motor resistor	828, 848
S1	Ignition switch	102 to 106, 851 to 852
S2.1	Lighting switch	404 to 407
S2.2	Courtesy lamp switch	487
S2.3	Instrument illumination lamp dimmer	328
S3	Heater blower switch	837 to 844
S4	Heated rear window switch	570 to 571
S5.2	Dipped beam switch	438, 439
S5.3	Direction indicator switch	480 to 482
S5.4	Sidelamp switch	401 to 402
S7	Reversing lamp switch	497
S8	Brake lamp switch	462
S9.2	Windscreen wiper switch	501 to 504
S9.5	Rear window wash/wiper switch	516 to 518
S10	Automatic transmission switch	770 to 776
S11	Brake fluid level warning sensor	313
S13	Handbrake-on warning switch	315
S14	Oil pressure switch	310
S15	Luggage compartment lamp switch	485
S17	Passenger door courtesy lamp switch	490

Key to wiring diagrams for 1989 models (continued)

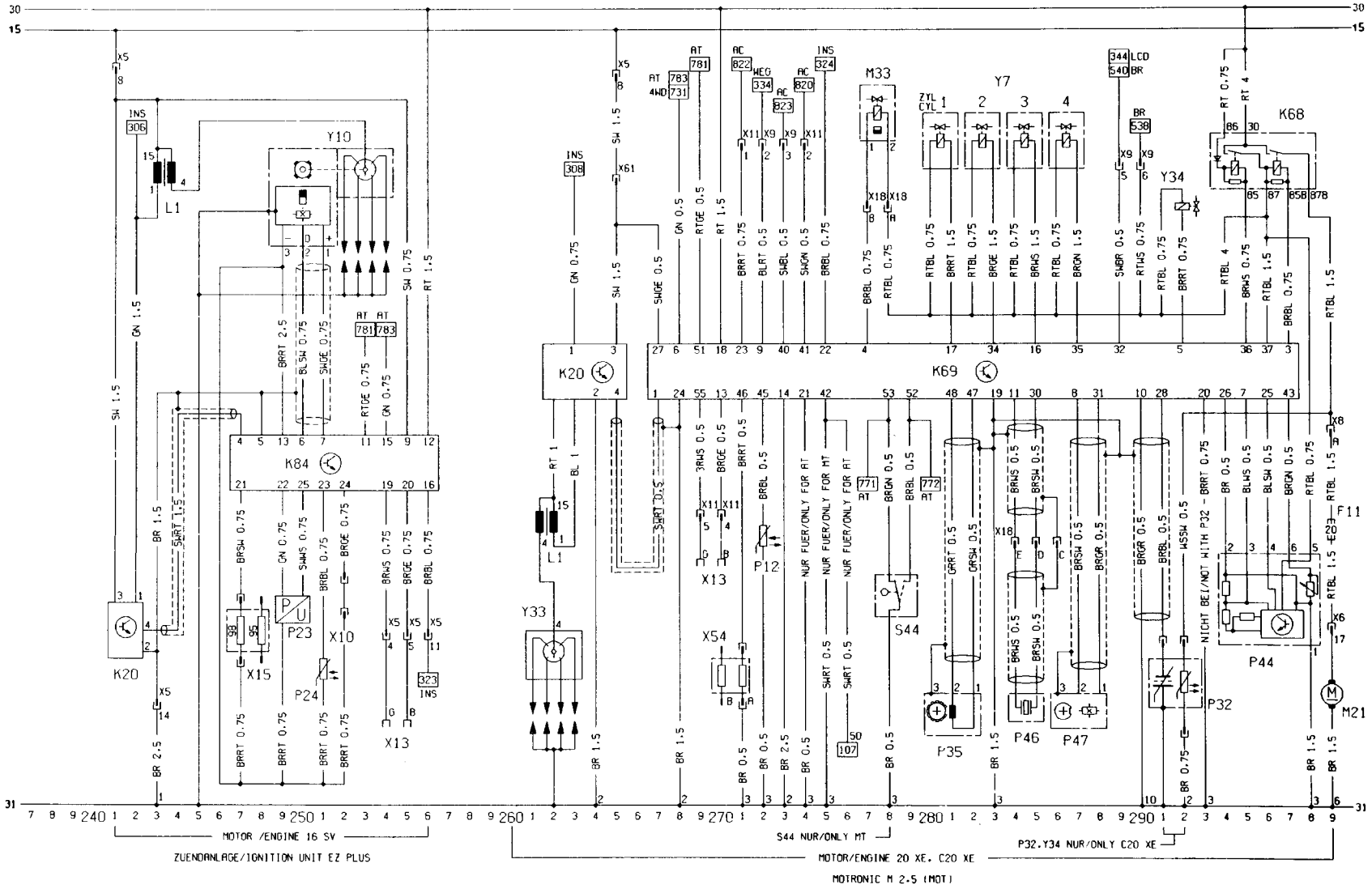
No	Description	Track
S21	Front foglamp switch	450 to 452
S22	Rear foglamp switch	455 to 457
S27	Air conditioning compressor low-pressure switch (not UK)	821
S28	Air conditioning compressor high-pressure switch (not UK)	821
S29	Cooling fan switch	113
S30	Seat heater switch - front left	575 to 577
S31	Rear door courtesy lamp switch - left	491
S32	Rear door courtesy lamp switch - right	492
S35	Sunroof travel microswitch	692
S36	Sunroof travel microswitch	694
S37	Electric windows switch assembly	637 to 663
S37.1	Electric window switch - front left	637 to 639
S37.2	Electric window switch - front right	655 to 657
S37.3	Electric window switch - rear left	643 to 645
S37.4	Electric window switch - rear right	661 to 663
S37.5	Electric windows safety cut-out switch	641 to 642
S37.6	Electric windows anti-jam switch	659
S37.7	Electric windows automatic control	646 to 651
S39	Electric windows switch - rear left door	647 to 649
S40	Electric windows switch - rear right door	665 to 667
S41	Central locking switch driver'sdoor	601 to 603
S42	Central locking switch passenger door	605
S44	Throttle position sensor	173 to 174, 278 to 279
S47	Driver's door courtesy lamp switch	493 to 494
S51	Cooling fan switch (not UK models)	825 to 827
S52	Hazard warning flasher switch	469 to 474
S55	Seat heater switch - front right	579 to 581
S57	Sunroof switch	690 to 696
S63.1	Trip computer function reset switch	543
S63.2	Trip computer clock hours adjustment switch	544
S63.3	Trip computer function select switch	545
S63.5	Trip computer clock minutes adjustment switch	546
S64	Horn switch	591 to 594
S68.1	Door mirror adjustment switch	672 to 677
S68.2	Door mirror heater switch	679 to 680
S68.3	Door mirror left/right selector switch	673 to 677
S76	Air conditioning compressor switch - high-pressure, cooling fan (not UK)	832
S82	Washer pump switch	371
S91	Oil pressure switch (not UK models)	165 to 166
S93	Coolant level sensor	372
S95	Oil level sensor	373
S98	Headlamp aim adjustment switch	556 to 558
S99	Electric windows switch - driver's door	634
S100	Electric windows switch - passenger door	652
S104	Kickdown switch (automatics)	792
S105	Start-up assistance switch (automatics)	796 to 798
S106	Economy/power programme switch (automatics)	791
S107	Throttle position sensor	771 to 776
S108	Cooling fan switch (Diesel models)	847 to 848
S109	Air conditioning compressor switch (not UK)	817
S110	Ride control switch (not UK)	738 to 743
S115	Automatic transmission fluid temperature sensor	793
S116	Brake lamp switch	464 to 465
S117	Four-wheel-drive hydraulic pressure switch	729
S118	Air conditioning refrigerant temperature switch (not UK)	829
U2	Trip computer	538 to 548
U4	ABS hydraulic modulator assembly	705 to 718
U4.1	ABS hydraulic pump relay	706 to 709
U4.2	ABS solenoid valves relay	715 to 718
U4.3	ABS hydraulic pump	705
U4.4	ABS diode	717
U4.5	ABS solenoid valve - front left	710
U4.6	ABS solenoid valve - front right	711
U4.7	ABS solenoid valve - rear left	712
U4.8	ABS solenoid valve - rear right	713
U5.1	Check control tail lamp and dipped beam bulb failure warning lamp	362
U5.2	Check control brake lamp bulb failure warning lamp	363
U5.3	Check control coolant oil level warning lamp	360
U5.5	Check control brake pad wear warning lamp	364
U5.6	Check control washer fluid level warning lamp	359
U5.7	Check control coolant level warning lamp	361
U7	Air conditioning control unit (not UK)	806 to 824
U7.6	Air conditioning blower switch (not UK)	806 to 811
U7.8	Air conditioning switch (not UK)	813 to 824
U12.1	Temperature switch (Diesel models)	865
U12.2	Fuel filter heater (Diesel models)	866
U13.1	Automatic transmission solenoid valve - shift 1	784
U13.2	Automatic transmission solenoid valve - shift 2	785
U13.3	Automatic transmission solenoid valve - lock-up control	786
U13.4	Automatic transmission solenoid valve - pressure control	787
V1	Brake fluid level warning lamp test diode (not UK)	312
V8	Air conditioning compressor diode (not UK)	820
X1	Trailer electrical socket	453 ,458 to 460
X2	Accessory electrical connectors	587
X5 to X62	Wiring connectors	Various
Y1	Air conditioning compressor clutch (not UK)	821
Y4	Headlamp washer solenoid valve	523
Y5	Fuel solenoid valve (Diesel models)	860
Y7	Fuel injectors	186 to 193, 280 to 287
Y10	Distributor (Hall-effect)	249 to 253
Y23	Distributor (Inductive discharge)	123 to 127
Y24	Distributor (Inductive discharge) (not UK)	129 to 136
Y26	Throttle valve positioner (not UK)	201 to 207
Y27	Pre-throttle valve (not UK)	218 to 219
Y30	Cold start valve (Diesel models)	863
Y32	Fuel injector (not UK)	140
Y33	Distributor	170, 262
Y34	Fuel tank ventilation valve (not UK)	198, 292
Y43	Air conditioning vacuum control (not UK)	815 to 818
Y44	Four-wheel-drive solenoid valve	731



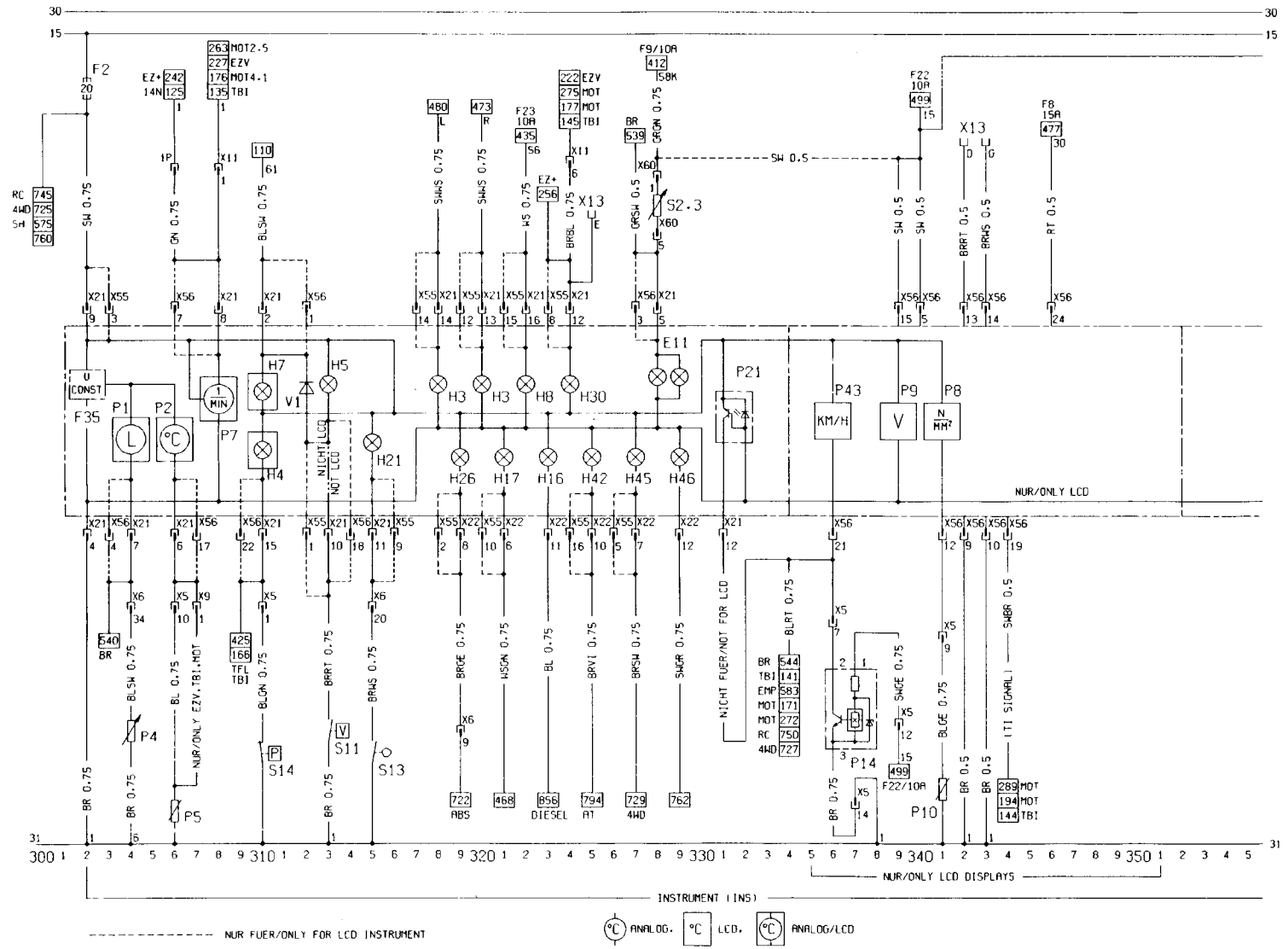
Wiring diagram for 1989 models



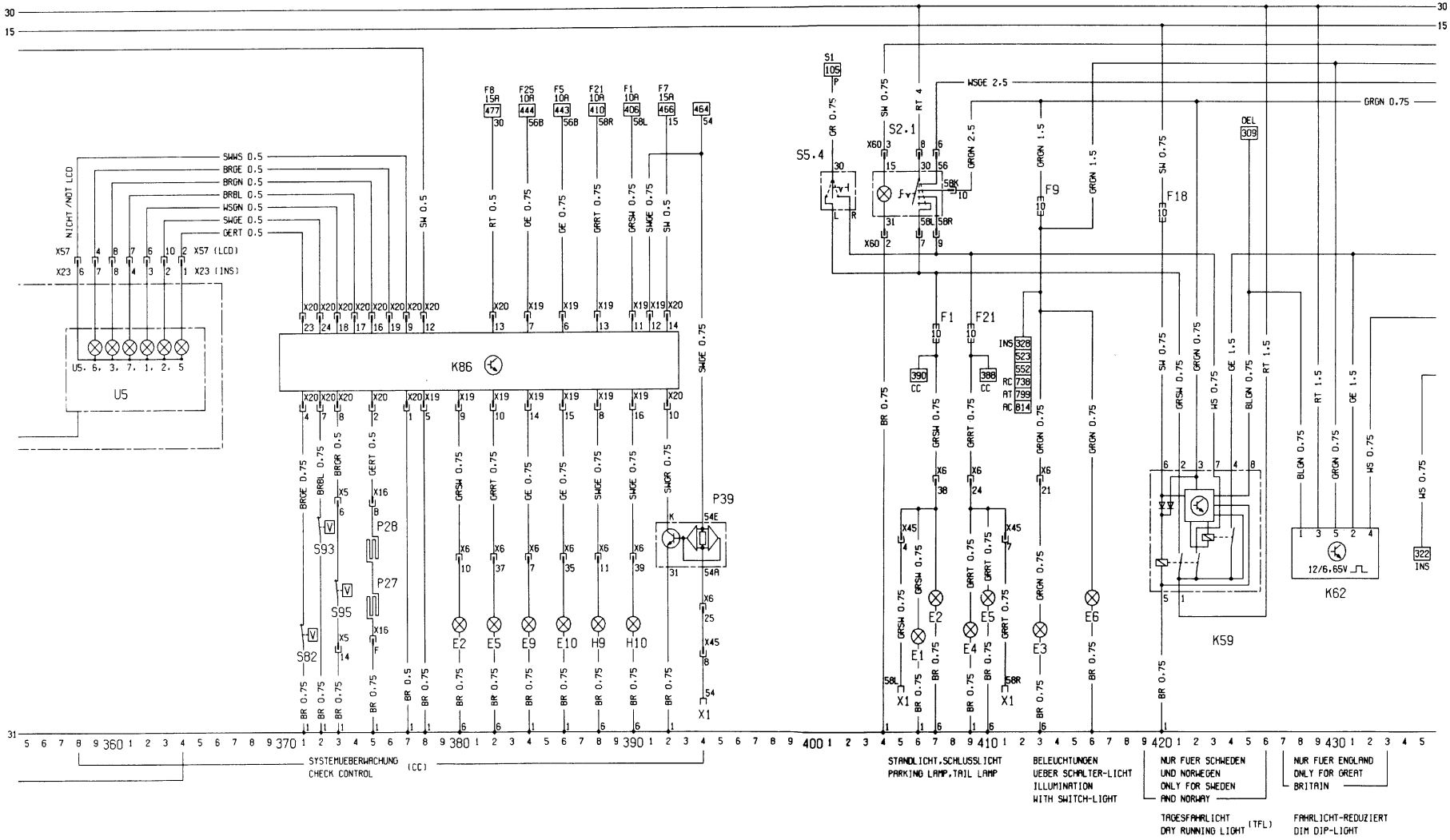
Wiring diagram for 1989 models (continued)



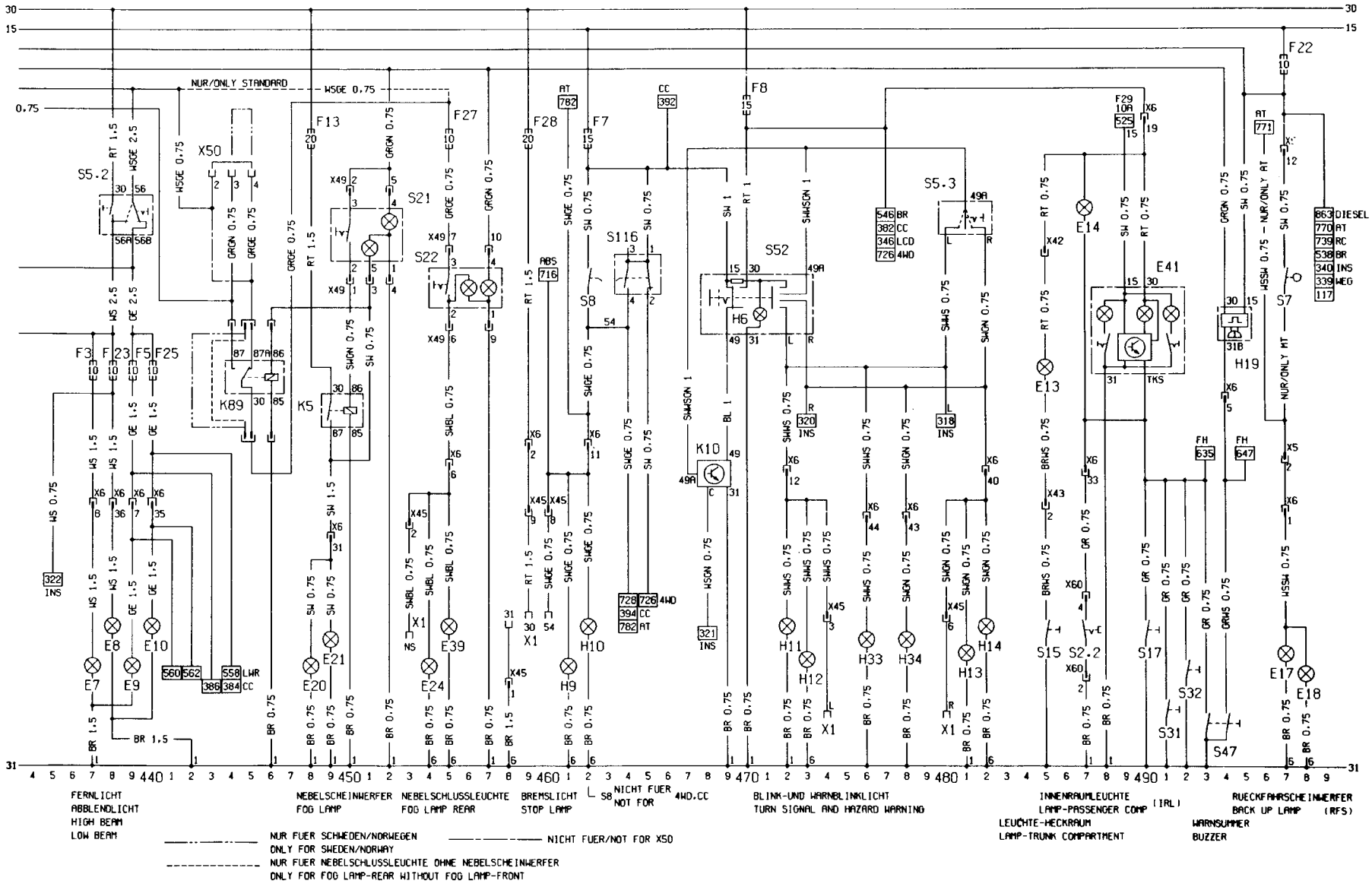
Wiring diagram for 1989 models (continued)



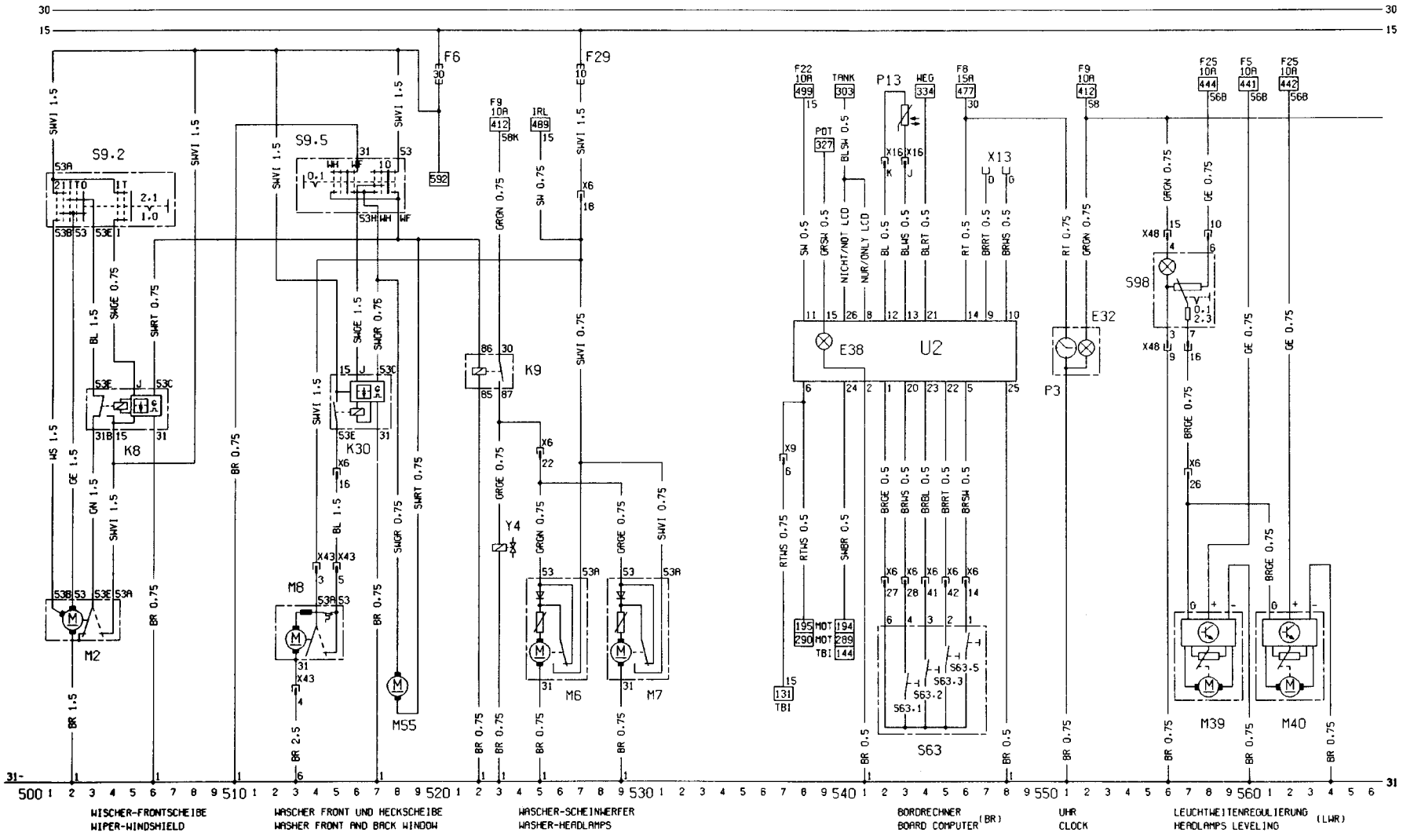
Wiring diagram for 1989 models (continued)



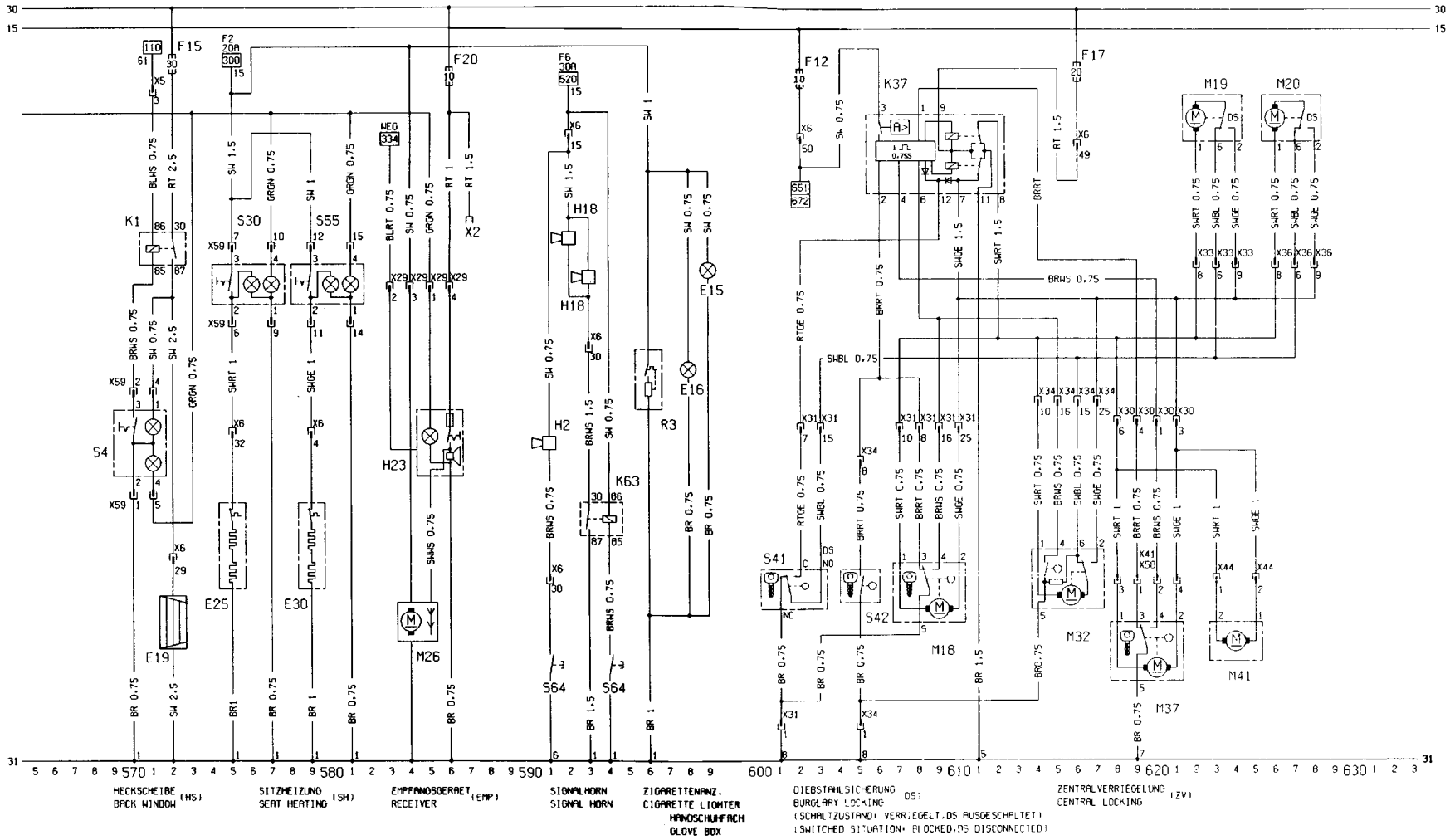
Wiring diagram for 1989 models (continued)



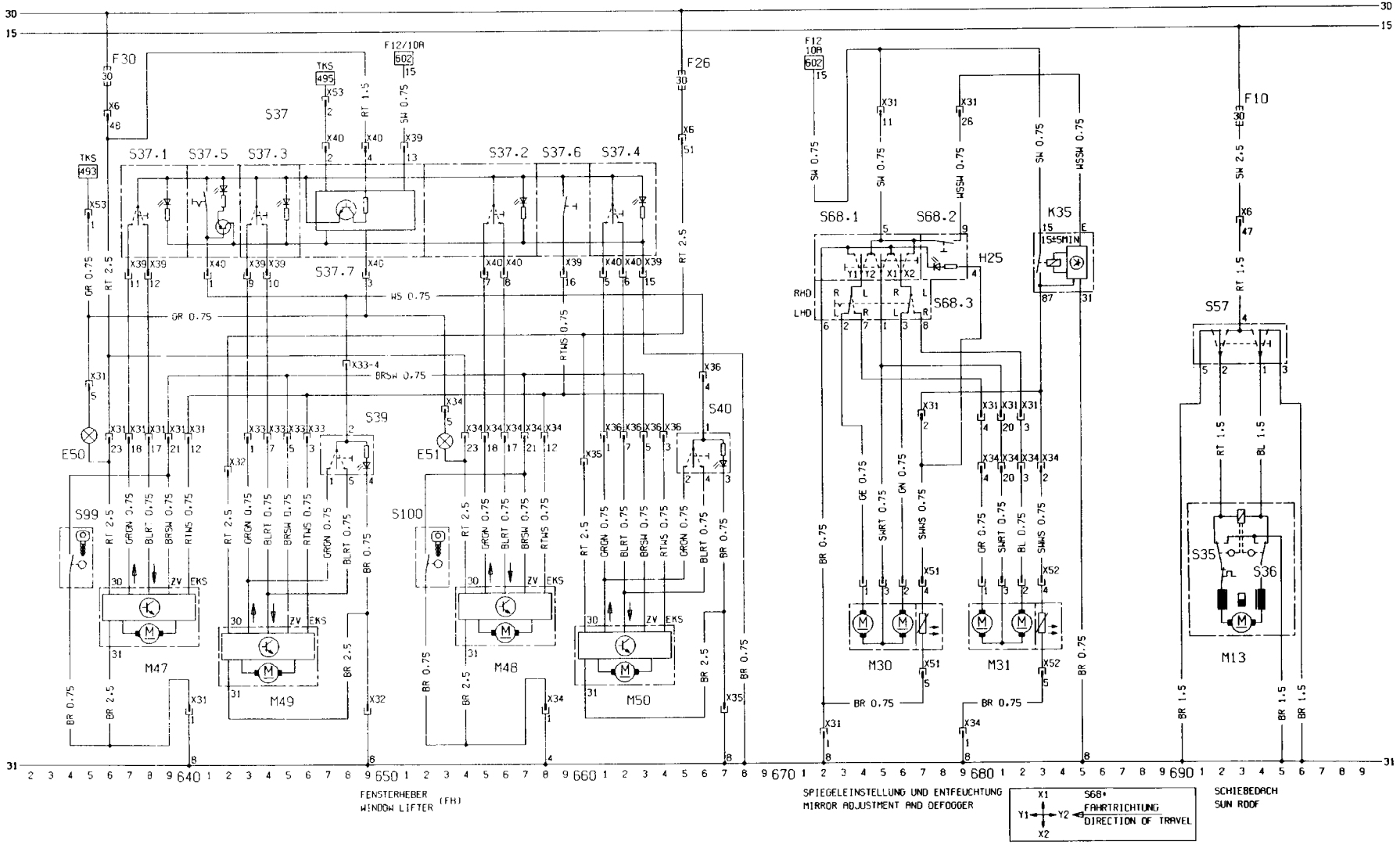
Wiring diagram for 1989 models (continued)



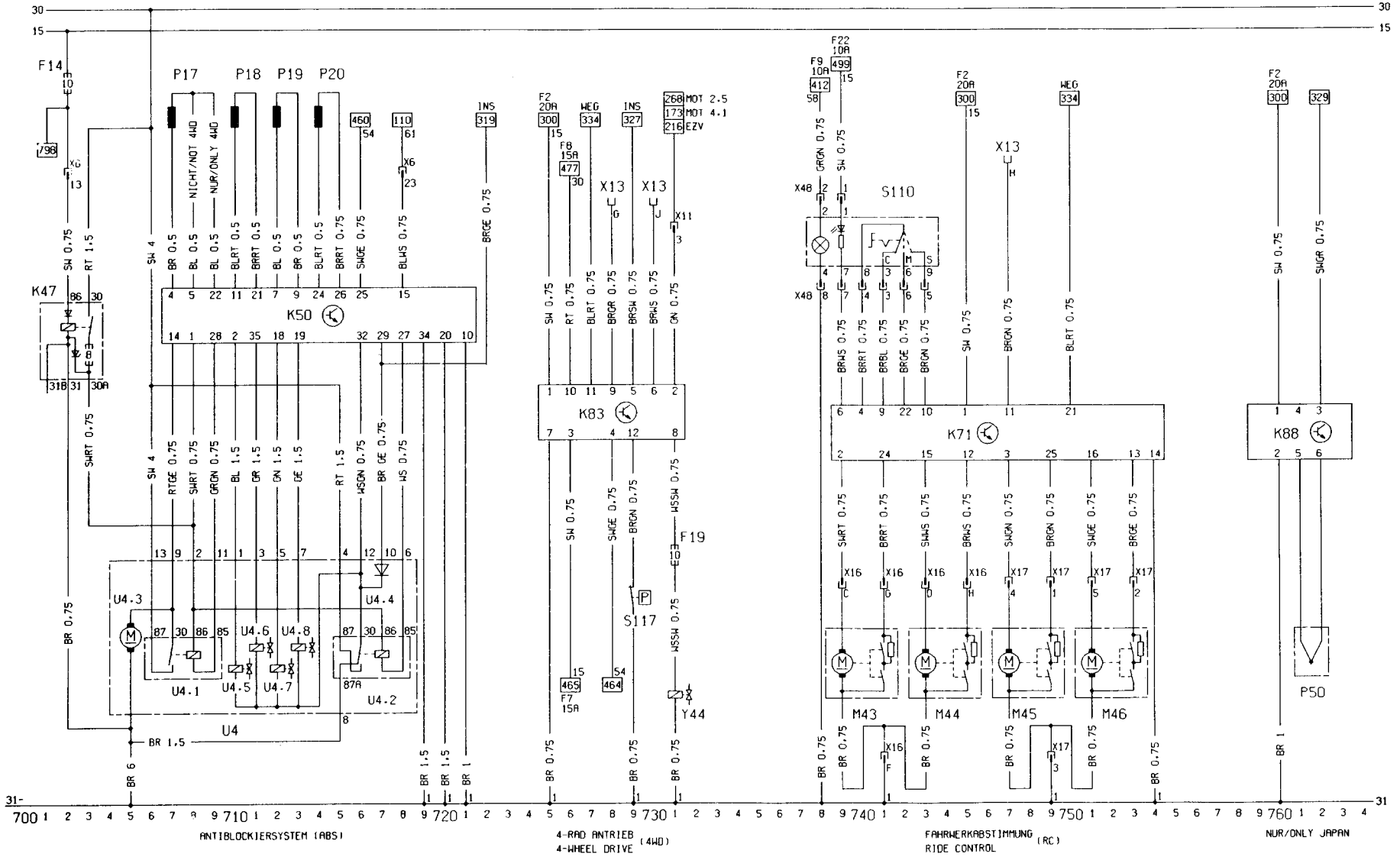
Wiring diagram for 1989 models (continued)



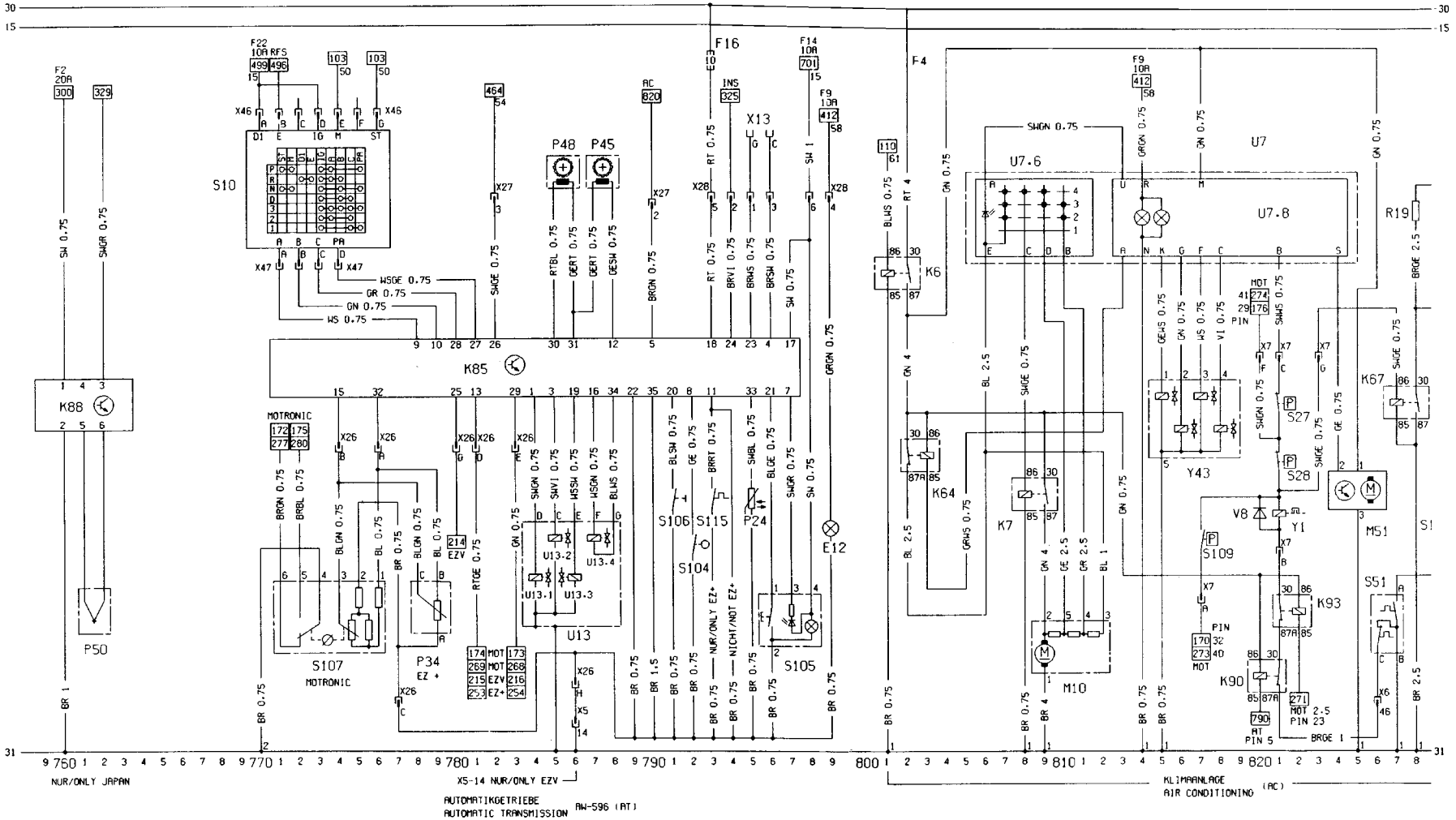
Wiring diagram for 1989 models (continued)



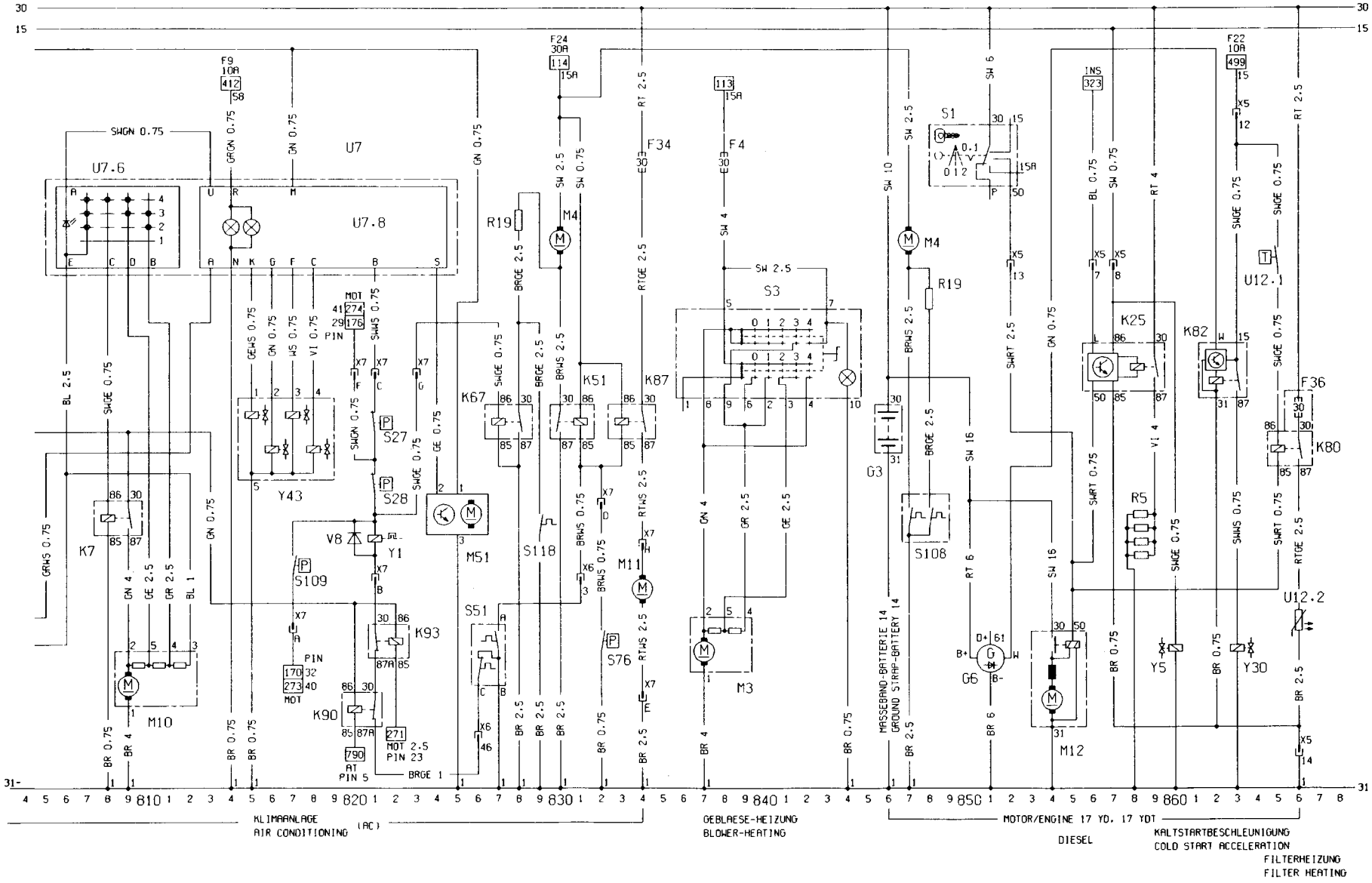
Wiring diagram for 1989 models (continued)



Wiring diagram for 1989 models (continued)



Wiring diagram for 1989 models (continued)



Wiring diagram for 1989 models (continued)

Wiring diagrams for 1991 models

Location of applicable circuits	Track
Air conditioning system	800 to 850
Alternator	111
Anti-lock braking system (ABS)	701 to 722
Anti-theft alarm system	633 to 647
Automatic transmission control system	773 to 799
Battery	100
Brake lamps	461 to 462
Carburettor	118 to 121
Central locking system	600 to 627
Check control system	347 to 371
Cigarette lighter	597 to 598
Clock	661 to 663
Courtesy lamps - front	487 to 494
Courtesy lamps - rear	569 to 573
Direction indicator and hazard warning lamps	467 to 482
Door mirrors	536 to 548
Electric windows	665 to 699
Engine compartment lamp	415
Foglamps - front	444 to 452
Foglamps - rear	444 to 457
Fuel injection and ignition (Multec) - C16 NZ engine	129 to 164
Fuel injection and ignition (Multec) - C18 NZ engine	972 to 997
Fuel injection/ignition (Motronic M1.5) - 2.0 litre sohc	168 to 199
Fuel injection/ignition (Motronic M2.5) - 2.0 litre dohc	261 to 299
Glovebox lamp	599
Headlamp aim adjustment system	758 to 766
Headlamp dim-dip	427 to 431
Headlamp washers	519 to 532
Headlamps	437 to 442
Headlamps “ON” warning buzzer	493 to 495
Heated front seats	560 to 566
Heated rear window	549 to 556
Heater blower motor	853 to 862
Horn(s)	592 to 596
Ignition (HEI) - 14 NV engine	121 to 128
Ignition (MSTS/EZ+) - 16 SV, 18 SV engines	236 to 256
Instruments	301 to 344
Luggage compartment lamp	485
Radiator cooling fan	113, 115
Radio/cassette player	586 to 591
Rear number plate lamp	413
Reversing lamps	496 to 498
Side and tail lamps	401 to 410
Starter motor	102 to 110
Sunroof	863 to 870
Tailgate wiper	510 to 516
Trip computer	650 to 662
Windscreen and tailgate washers	511 to 529
Windscreen wipers	501 to 506

Key to wiring diagrams for 1991 models

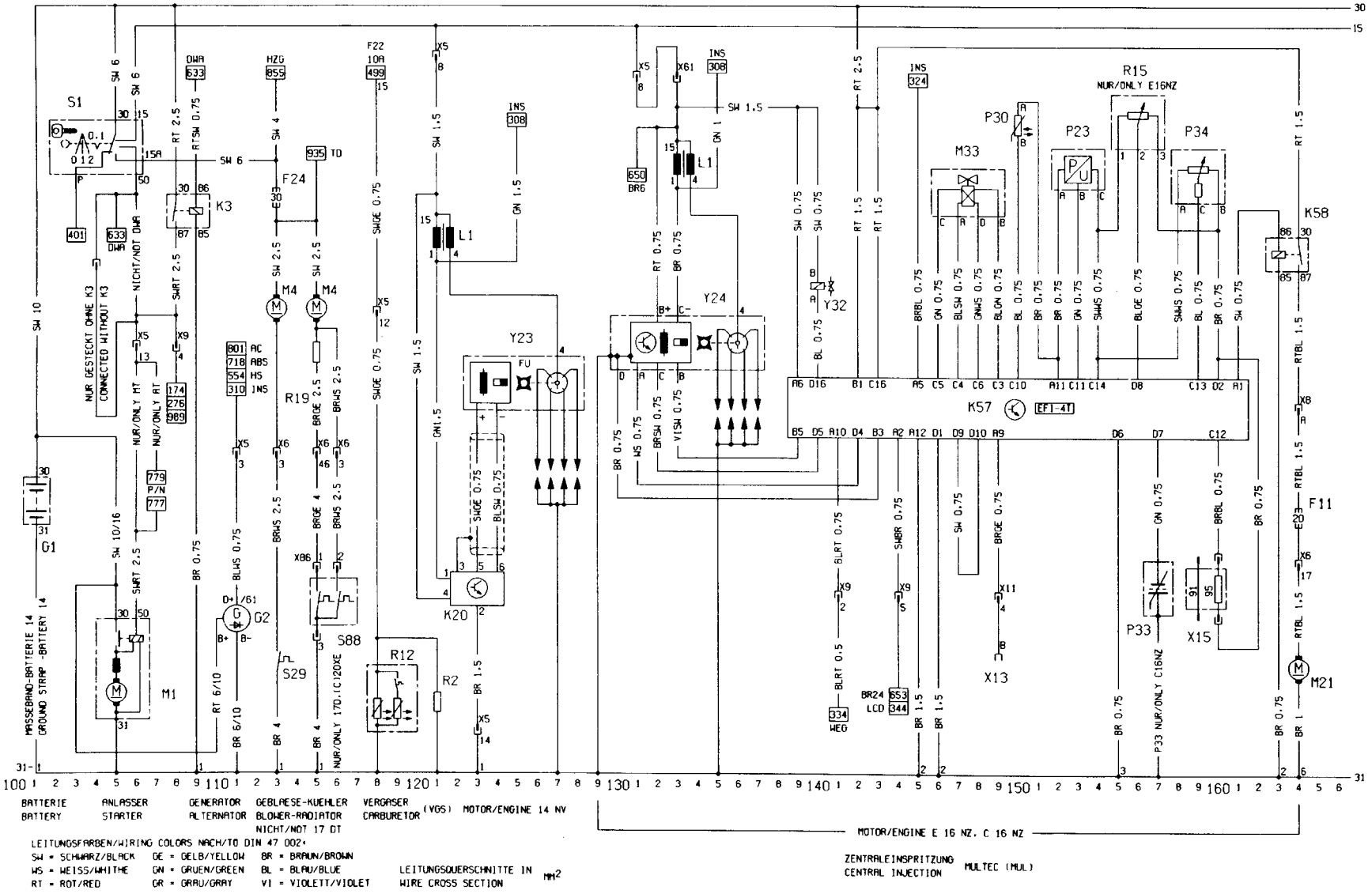
No	Description	Track
E1	Side lamp - left	406
E2	Tail lamp - left	356, 374, 407
E3	Number plate lamp	413
E4	Side lamp - right	409
E5	Tail lamp - right	358, 376, 410
E6	Engine compartment lamp	415
E7	Headlamp main beam - left	437
E8	Headlamp main beam - right	438
E9	Headlamp dipped beam - left	360, 378, 439
E10	Headlamp dipped beam - right	362, 380, 440
E11	Instrument illumination lamps	328 to 329
E12	Selector lever illumination lamp (automatic transmission)	799
E13	Luggage compartment lamp	485
E14	Courtesy lamp	487
E15	Glovebox lamp	599
E16	Cigarette lighter illumination lamp	596
E17	Reversing lamp - left	497
E18	Reversing lamp - right	498
E19	Heated rear window	552
E20	Front foglamp - left	448
E21	Front foglamp - right	447
E24	Rear foglamp - left	454
E25	Driver’s seat heater	580
E27	Courtesy lamp - rear left	569 to 570
E28	Courtesy lamp - rear right	572 to 573
E30	Passenger front seat heater	564
E32	Clock illumination lamp	663
E38	Trip computer illumination lamp	654
E39	Rear foglamp - right	455
E41	Courtesy lamp (with delay)	488 to 490
E50	Kerb lamp - driver’s door	666
E51	Kerb lamp - passenger door	684
F1 on	Fuses	Various
G1	Battery	101
G2	Alternator	111
G3	Battery - (Diesel models)	882, 901
G6	Alternator - (Diesel models)	884 to 886, 909 to 911
H1	Radio/cassette player	589 to 590, 634
H2	Horn	592
H3	Direction indicator warning lamp	315 to 320
H4	Oil pressure warning lamp	310
H5	Brake fluid level warning lamp	313
H6	Hazard warning flasher lamp	470
H7	Alternator charge warning lamp	310
H8	Headlamp main beam warning lamp	322
H9	Brake lamp - left	364, 382, 461
H10	Brake lamp - right	366, 384, 462
H11	Direction indicator lamp - front left	472
H12	Direction indicator lamp - rear left	473
H13	Direction indicator lamp - front right	461
H14	Direction indicator lamp - rear right	482
H15	Fuel level warning lamp	305
H16	Glow plug warning lamp (Diesel models)	323
H17	Trailer direction indicator warning lamp	321
H18	Horn	593
H19	Headlamps-on warning buzzer	494 to 495
H21	Handbrake-on warning lamp	315
H25	Door mirror warning lamp	542, 952
H26	ABS warning lamp	319
H30	Engine fault warning lamp	324
H33	Direction indicator side repeater lamp - left	476
H34	Direction indicator side repeater lamp - right	478
H42	Automatic transmission warning lamp	325
H45	Four-wheel-drive warning lamp	327
H46	Catalytic converter temperature warning lamp	329
H47	Anti-theft alarm horn	638
H48	Horn	594
K3	Relay - starter motor (anti-theft alarm)	109 to 110
K5	Relay - front foglamps	448 to 450
K6	Relay - air conditioning	801 to 802
K7	Relay - air conditioning blower	804 to 805
K8	Relay - intermittent windscreen wipe	503 to 506
K9	Relay - headlamp wash	519 to 520
K10	Relay - direction indicator/hazard warning flashers	467 to 469

Key to wiring diagrams for 1991 models (continued)

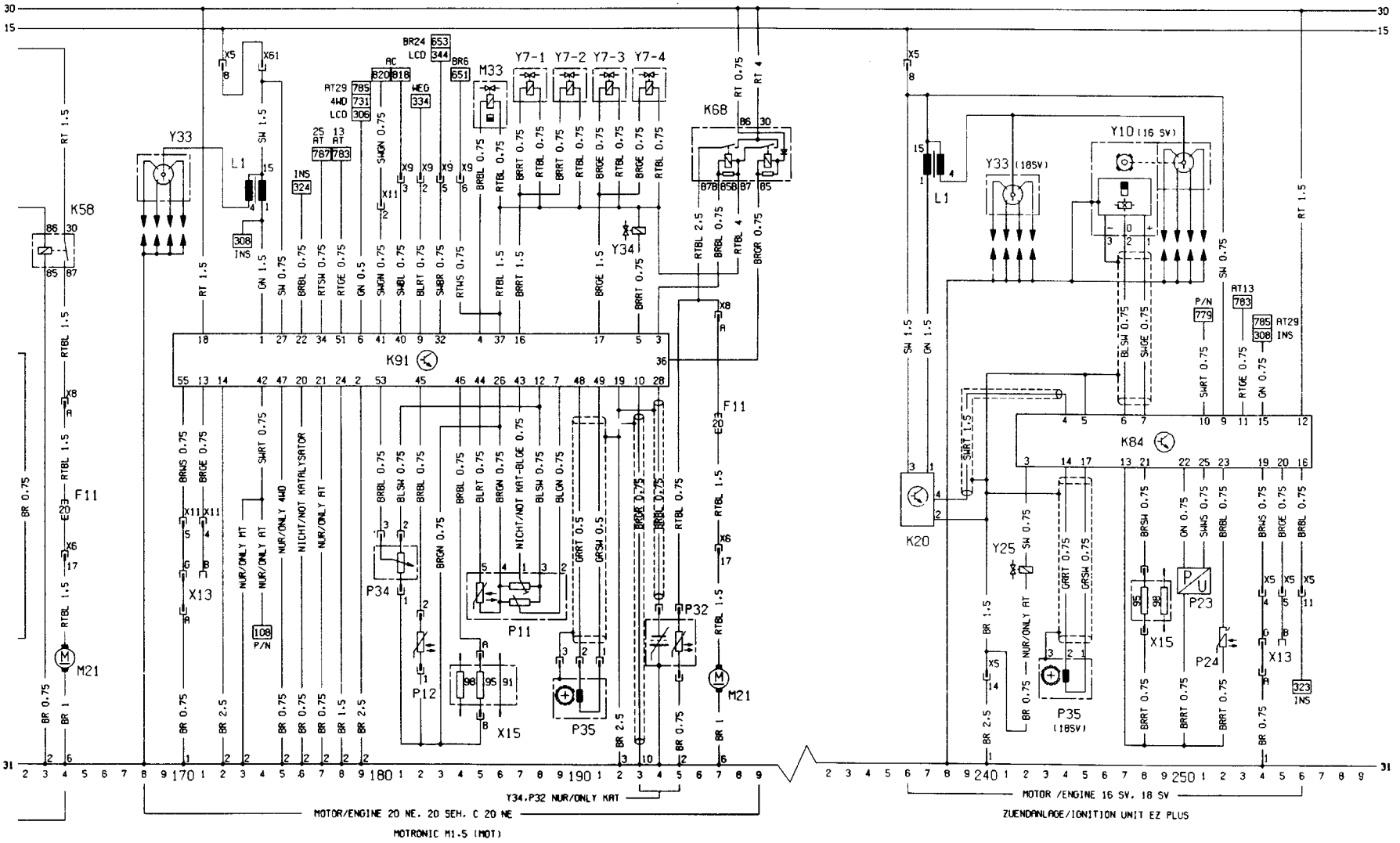
No	Description	Track
K20	Ignition amplifier module	122 to 124, 236 to 237, 975 to 976
K25	Relay - glow plugs (Diesel models)	889 to 892
K30	Relay - intermittent rear window wipe	513 to 515
K35	Relay - door mirror heater	550 to 552
K37	Central locking control unit	606 to 612
K47	Relay - surge arrester (ABS)	702 to 703, 735 to 736
K50	ABS control unit	707 to 721, 740 to 754
K51	Relay - cooling fan	829 to 830, 842 to 843, 837 to 838
K57	Multec electronic control unit (ECU)	139 to 161
K58	Relay - fuel pump	163 to 164, 996 to 997
K59	Relay - daytime running lamps	420 to 426
K62	Dim-dip control unit	427 to 431
K63	Relay - horn	594 to 595
K64	Relay - air conditioning blower	802 to 803
K67	Relay - cooling fan	825 to 826, 849 to 850
K68	Relay - fuel injection system	196 to 199
K69	Motronic M2.5 module	267 to 297
K73	Relay - headlamp main beam relay (Calibra only)	432 to 433
K76	Glow plug control unit (Turbo diesel models)	916 to 921
K77	Relay - glow plugs (Turbo diesel models)	923 to 924
K78	Relay - preresistor (Turbo diesel models)	926 to 927
K79	Alternator charge warning lamp relay	911 to 913
K80	Relay - fuel filter heater (Diesel models)	898 to 899, 931 to 932
K82	Relay - engine revolution	895 to 896
K83	Four-wheel-drive control unit	725 to 731
K84	MSTS ignition module	242 to 256
K85	Automatic transmission control unit	774 to 797
K86	Check control unit	347 to 368
K87	Relay - auxiliary cooling fan	832 to 833, 839 to 840, 940 to 941
K88	Catalytic converter temp. control unit	758 to 760, 966 to 968
K89	Relay - rear foglamps	444 to 447
K90	Relay - air conditioning compressor	820 to 821
K91	Motronic M1.5 module	170 to 194
K94	Anti-theft alarm control unit	633 to 647
K97	Relay - headlamp washer pump time delay	530 to 532
K101	Relay - electric mirror parking position	961 to 964
K102	Parking brake control unit (automatic transmission)	769 to 771
K103	Relay - cooling fan	845 to 847
K107	Multec electronic control unit (ECU)	978 to 996
L1	Ignition coil	121 to 122, 133 to 134, 173, 174, 237 to 238, 974 to 975
M1	Starter motor	105 to 106
M2	Windscreen wiper motor	501 to 504
M3	Heater blower motor	854 to 856
M4	Radiator cooling fan motor	113, 115, 829, 847, 935
M6	Headlamp wiper motor - left	522 to 524
M7	Headlamp wiper motor - right	526 to 528
M8	Rear window wiper motor	511 to 513
M10	Air conditioning blower motor	805 to 808
M11	Cooling fan motor	840, 941
M12	Starter motor (Diesel models)	887 to 888, 905 to 906
M13	Sunroof motor assembly	865 to 869
M13.1	Sunroof motor	866 to 868
M13.2	Sunroof travel microswitch	866
M13.3	Sunroof travel microswitch	868
M18	Central locking motor - driver's door	607 to 610
M19	Central locking motor - left rear door	621 to 623
M20	Central locking motor - right rear door	625 to 627
M21	Fuel pump	164, 197, 229, 997
M24	Headlamp washer pump	532
M26	Electric aerial motor	588 to 589
M30	Door mirror motor and heater - driver's door	538 to 541
M31	Door mirror motor and heater - passenger door	544 to 547
M32	Central locking motor - passenger door	613 to 616
M33	Idle speed adjuster/idle air control stepper motor	146 to 149, 185 to 186, 277 to 278, 985 to 988
M39	Headlamp aim adjuster motor - driver's side	759 to 762
M40	Headlamp aim adjuster motor - passenger side	763 to 766
M41	Central locking motor - fuel filler	623 to 624
M47	Electric window motor - front left	667 to 671
M48	Electric window motor - front right	685 to 689
M49	Electric window motor - rear left	673 to 677
M50	Electric window motor - rear right	691 to 695
M55	Windscreen and rear window washer pump	516
M60	Central locking motor (Calibra models)	627 to 628
M61	Sunroof assembly (Calibra models)	872 to 880
M61.1	Sunroof motor (Calibra models)	873 to 876
M61.2	Relay 1 - sunroof motor (Calibra models)	872 to 873
M61.3	Relay 2 - sunroof motor (Calibra models)	878 to 880
M62	Door mirror motor - driver's door	947 to 953
M63	Door mirror motor - passenger door	956 to 962
P1	Fuel gauge	304
P2	Coolant temperature gauge	306
P3	Clock	662
P4	Fuel level sender unit	304
P5	Coolant temperature gauge sender	306
P7	Tachometer	308
P8	Oil pressure gauge	341
P9	Voltmeter	339
P10	Oil pressure sensor	341
P11	Airflow meter (Motronic M1.5)	185 to 189
P12	Coolant temperature sensor	182, 272
P13	Trip computer outside air temperature sensor	655 to 656
P14	Distance sensor	336 to 337, 915 to 916
P17	ABS wheel sensor - front left	707, 740
P18	ABS wheel sensor - front right	710, 742
P19	ABS wheel sensor - rear left	712, 744
P20	ABS wheel sensor - rear right	713, 746
P21	Speedometer frequency sensor	332
P23	Pressure sensor	152 to 154, 984 to 986
P24	Automatic transmission fluid temperature sensor	252, 795
P25	Bulb failure sensor	373 to 386
P27	Brake pad wear sensor - front left	351, 396
P28	Brake pad wear sensor - front right	351, 396
P30	Coolant temperature sensor	150, 982
P32	Oxygen sensor - heated	194 to 195, 291 to 292
P33	Oxygen sensor	157, 991
P34	Throttle position sensor/potentiometer	158 to 160, 180 to 181, 777 to 778, 987 to 989
P35	Crankshaft speed/position sensor	189 to 191, 281 to 282, 982 to 984
P39	Trailer bulb failure sensor	368 to 370, 387 to 389
P43	Electronic speedometer	336
P44	Air mass meter (Motronic M2.5)	294 to 298
P45	Automatic transmission input speed sensor	791 to 792
P46	Knock sensor	284 to 285
P47	Distributor "Hall-effect" sensor (Motronic M2.5)	287 to 288
P48	Automatic transmission output speed sensor	789 to 790
P50	Catalytic converter temperature sensor	759 to 760, 977 to 978
P53	Anti-theft alarm sensor - driver's side	639 to 642
P54	Anti-theft alarm sensor - passenger side	644 to 647
P55	Coolant temperature sensor (Turbo diesel models)	919
R2	Carburettor preheating	121
R3	Cigarette lighter	597
R5	Glow plugs (Diesel models)	891 to 892, 922 to 924
R12	Automatic choke	118
R13	Heated windscreen washer nozzle - left	526
R14	Heated windscreen washer nozzle - right	528
R15	Mixture adjustment potentiometer	155 to 157
R19	Cooling fan motor resistor	115, 832, 935
R22	Glow plugs resistor (Turbo diesel models)	927
S1	Ignition switch	105 to 106, 885 to 886, 905 to 906

Key to wiring diagrams for 1991 models (continued)

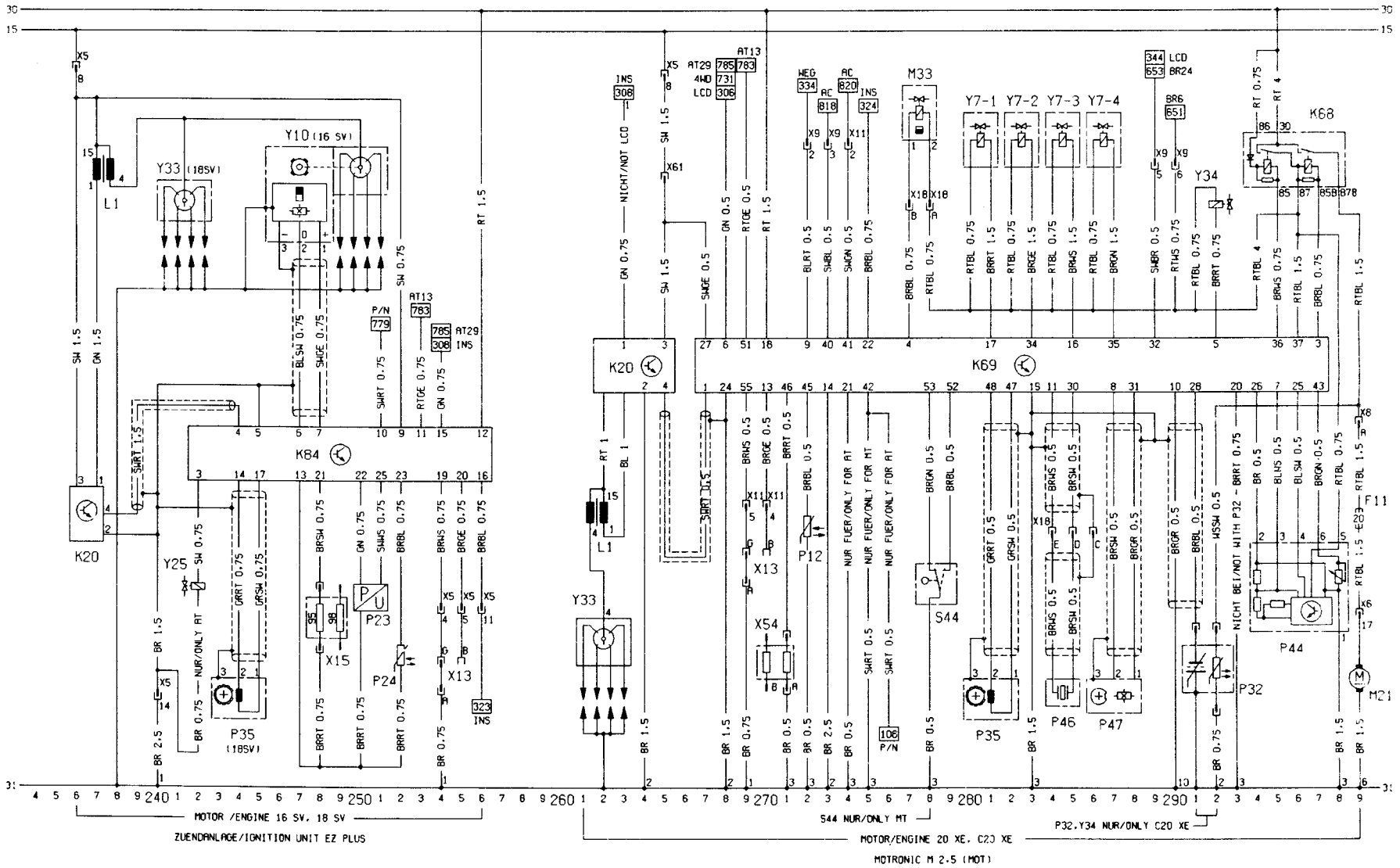
No	Description	Track
S1.2	Key contact switch	586
S2.1	Lighting switch	404 to 407
S2.2	Courtesy lamp switch	487
S2.3	Instrument illumination lamp dimmer	328
S3	Heater blower switch	853 to 860
S4	Heated rear window and mirror switch	554 to 556
S5.2	Dipped beam switch	438 to 439
S5.3	Direction indicator switch	480 to 482
S5.4	Sidelamp switch	401 to 402
S7	Reversing lamp switch	497
S8	Brake lamp switch	462
S9.2	Windscreen wiper interval switch	501 to 504
S9.5	Rear window washer/wiper switch	514 to 516
S10	Automatic transmission starter inhibitor switch	773 to 779
S11	Brake fluid level warning sensor	31
S13	Handbrake-on warning switch	315
S14	Oil pressure switch	310
S15	Luggage compartment lamp switch	485
S17	Passenger door courtesy lamp switch	490
S21	Front fog lamp switch	450 to 452
S22	Rear foglamp switch	455 to 457
S24	Air conditioning blower motor switch	804 to 811
S27	Air conditioning compressor low-pressure switch	821
S28	Air conditioning compressor high-pressure switch	821
S29	Cooling fan switch	113
S30	Driver's seat heater switch	560 to 562
S31	Rear door courtesy lamp switch - left	491
S32	Rear door courtesy lamp switch - right	491
S37	Driver's door electric window switch assembly	668 to 694
S37.1	Electric window switch - front left	668 to 670
S37.2	Electric window switch - front right	686 to 688
S37.3	Electric window switch - rear left	674 to 676
S37.4	Electric window switch - rear right	692 to 694
S37.5	Electric window safety cut-out switch	672 to 673
S37.6	Electric window anti-jam switch	690
S37.7	Electric window automatic control	677 to 682
S39	Electric window switch - rear left door	678 to 680
S40	Electric window switch - rear right door	696 to 698
S41	Central locking switch - driver's door	601 to 603
S42	Central locking switch - passenger door	605
S44	Throttle position sensor	278 to 279
S47	Driver's door courtesy lamp switch	493 to 494
S52	Hazard warning flasher switch	469 to 474
S55	Passenger seat heater switch	564 to 566
S57	Sunroof switch	864 to 869, 872 to 877
S63.1	Trip computer function reset switch	656
S63.2	Trip computer clock hours adjustment switch	657
S63.3	Trip computer function select switch	658
S63.5	Trip computer clock minutes adjustment switch	659
S64	Horn switch	592, 595
S68.1	Door mirror adjustment switch	538 to 540, 945 to 950
S68.3	Door mirror left/right selector switch	537 to 541, 946 to 950
S68.4	Door mirror parking position switch	952
S76	Air conditioning compressor switch - high-pressure fan	827
S82	Washer pump switch	347, 392
S88	Cooling fan switch	115 to 116, 935 to 936
S93	Coolant level sensor	348, 393
S95	Oil level sensor	349, 394
S98	Headlamp aim adjustment switch	758 to 760
S99	Electric window switch - driver's door	685
S100	Electric window switch - passenger door	683
S101	Air conditioning compressor switch	822 to 824
S102	Air conditioning circulation switch	816 to 818
S104	Automatic transmission kickdown switch	794
S105	Automatic transmission "Winter" mode button	796 to 798
S106	Automatic transmission "Economy/Sport" mode button	793
S109	Air conditioning compressor switch	818
S115	Automatic transmission coolant temperature switch	788 to 789
S116	Brake lamp switch	464 to 465
S117	Four-wheel-drive hydraulic pressure switch	729
S119	Air conditioning refrigerant temperature switch	829, 843
S120	Anti-theft alarm bonnet switch	635
S127	Central locking switch - tailgate (Calibra models)	630
S128	Air conditioning refrigerant temperature cooling switch	825 to 826
S131	Air conditioning defroster lever limit switch	815
U2	Trip computer	651 to 662
U4	ABS hydraulic modulator assembly	705 to 718, 738 to 751
U4.1	ABS hydraulic pump relay	706 to 709, 739 to 742
U4.2	ABS solenoid valves relay	715 to 718, 747 to 751
U4.3	ABS hydraulic pump	705, 738
U4.4	ABS diode	717
U4.5	ABS solenoid valve - front left	710, 743
U4.6	ABS solenoid valve - front right	711, 744
U4.7	ABS solenoid valve - rear left	712, 745
U4.8	ABS solenoid valve - rear right	713
U5	Check control display	347 to 355
U5.1	Check control washer fluid level warning lamp	352
U5.2	Check control oil level warning lamp	351
U5.3	Check control coolant level warning lamp	350
U5.4	Check control tail lamp and dipped beam bulb failure warning lamp	349
U5.5	Check control brake lamp bulb failure warning lamp	348
U5.6	Check control brake wear warning lamp	347
U6	LCD instruments	
U6.1	Check control washer fluid level warning lamp	392
U6.2	Check control oil level warning lamp	394
U6.3	Check control coolant level warning lamp	393
U6.4	Check control tail lamp and dipped beam bulb failure warning lamp	391
U6.5	Check control brake lamp bulb failure warning lamp	395
U6.6	Check control brake pad wear warning lamp	396
U12.1	Temperature switch (Diesel models)	898, 931
U12.2	Fuel filter heater (Diesel models)	899, 932
U13	AF 14/20 automatic transmission	782 to 786
U13.1	Solenoid - 1/2 and 3/4 shift up	782
U13.2	Solenoid - 2/3 shift up	783
U13.3	Solenoid - converter lock-up control	784
U13.4	Solenoid - main fluid pressure control	785
V1	Brake fluid level warning lamp test diode	312
V8	Air conditioning compressor diode	820
Y1	Air conditioning compressor clutch	821
Y4	Headlamp washer solenoid valve	520
Y5	Fuel solenoid valve (Diesel models)	893, 928
Y7	Fuel injectors	187 to 194, 280 to 287
Y10	Distributor (Hall-effect)	246 to 251
Y23	Distributor (inductive discharge)	123 to 127
Y24	Distributor (inductive discharge)	129 to 136
Y25	Idle-up solenoid valve (automatic transmission)	242
Y30	Cold start valve (Diesel models)	896
Y32	Fuel injector	140, 979
Y33	Distributor	170, 262, 972 to 974
Y34	Fuel tank vent valve	193, 292
Y35	Air conditioning circulation solenoid valve	816
Y44	Four-wheel-drive solenoid valve	731
Y47	Parking brake lock lifting magnet (automatic transmission)	769
X13	Diagnostic equipment connector	149, 170 to 171, 254 to 255, 269 to 270, 325, 339 to 340, 752 to 753, 774 to 775, 992 to 993
X15	Octane coding plug	160, 184 to 185, 248 to 249, 990 to 991
X54	Ignition coding plug	270 to 271
X1 on	Wiring connectors	Various



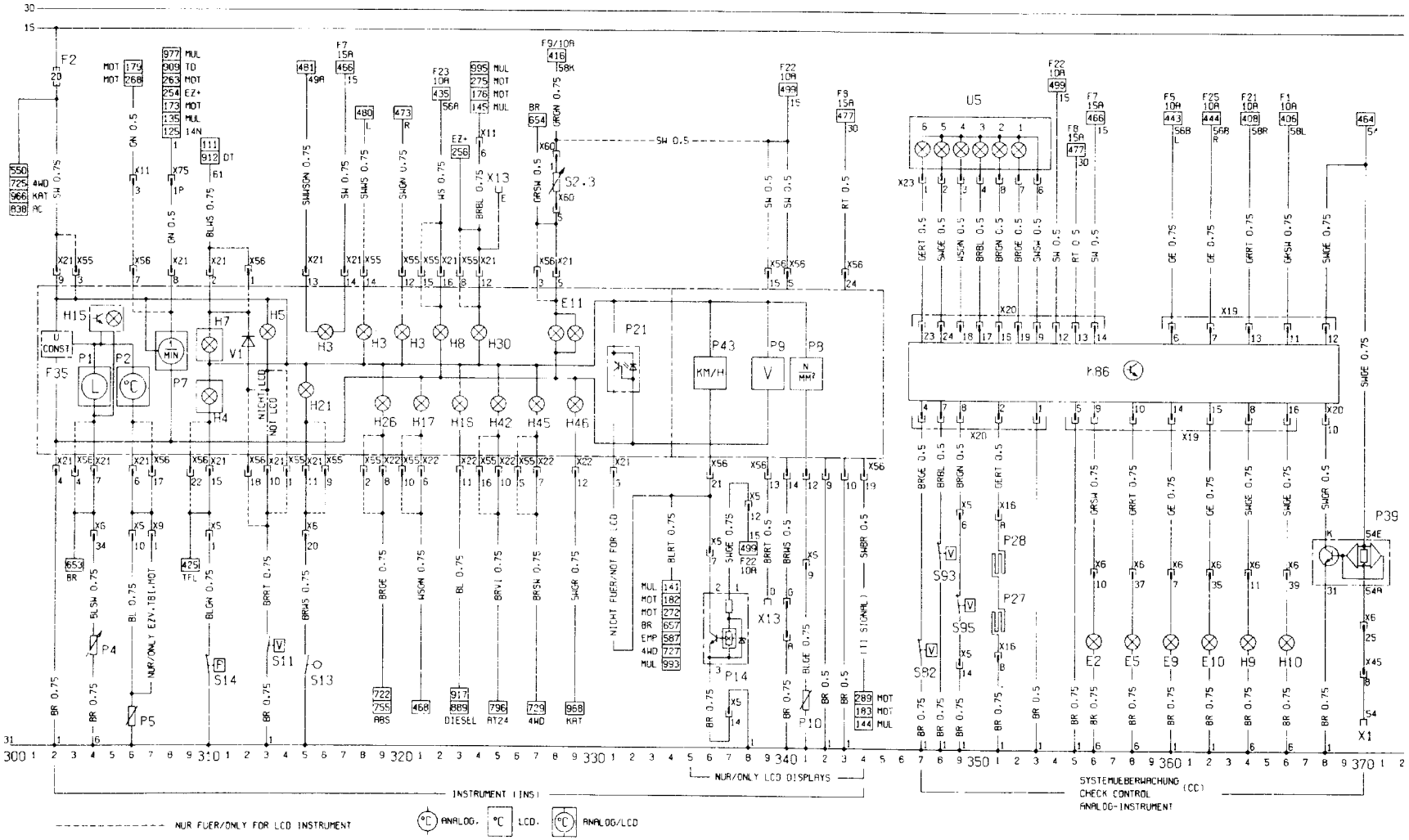
Wiring diagram for 1991 models



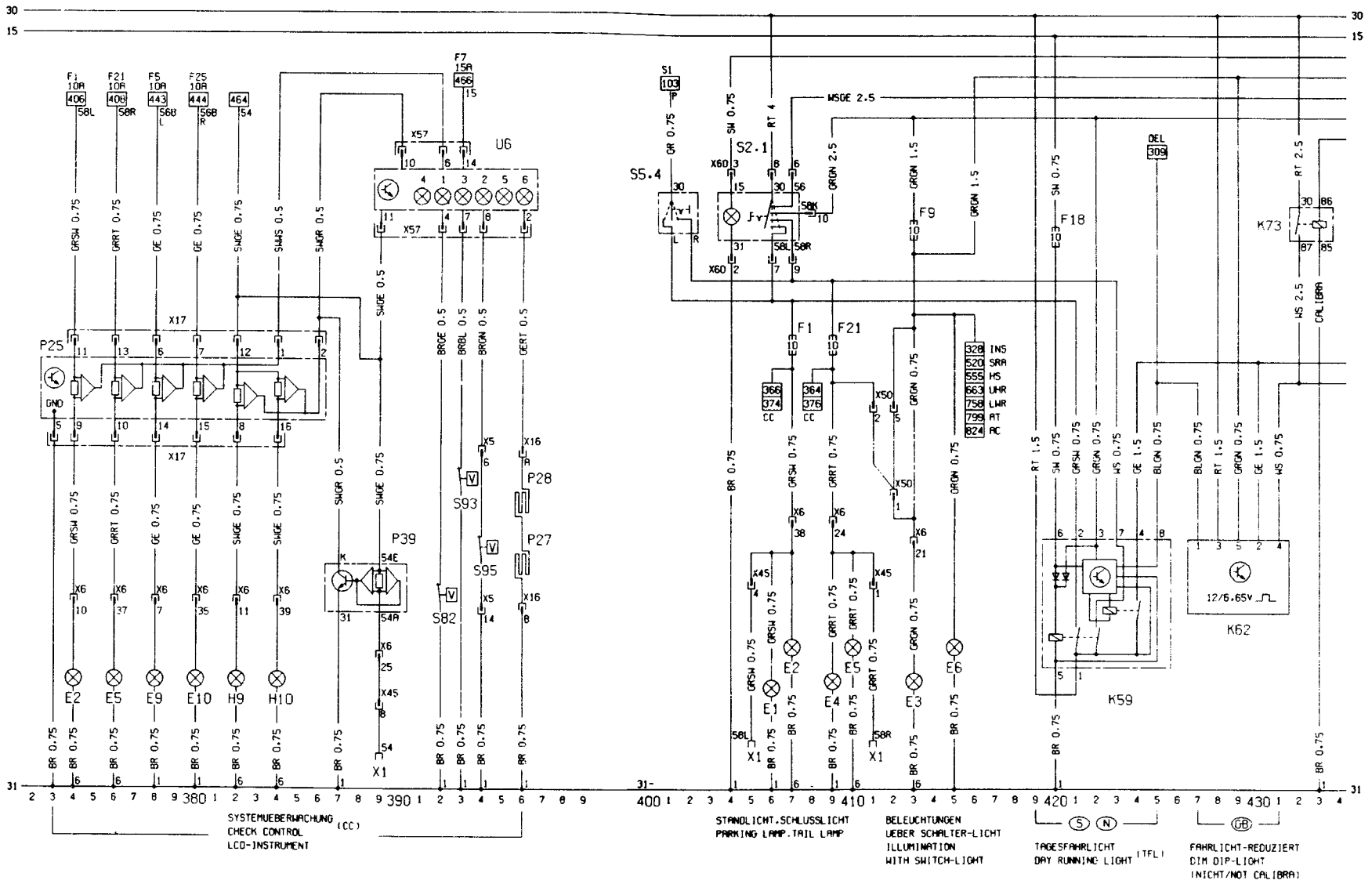
Wiring diagram for 1991 models (continued)



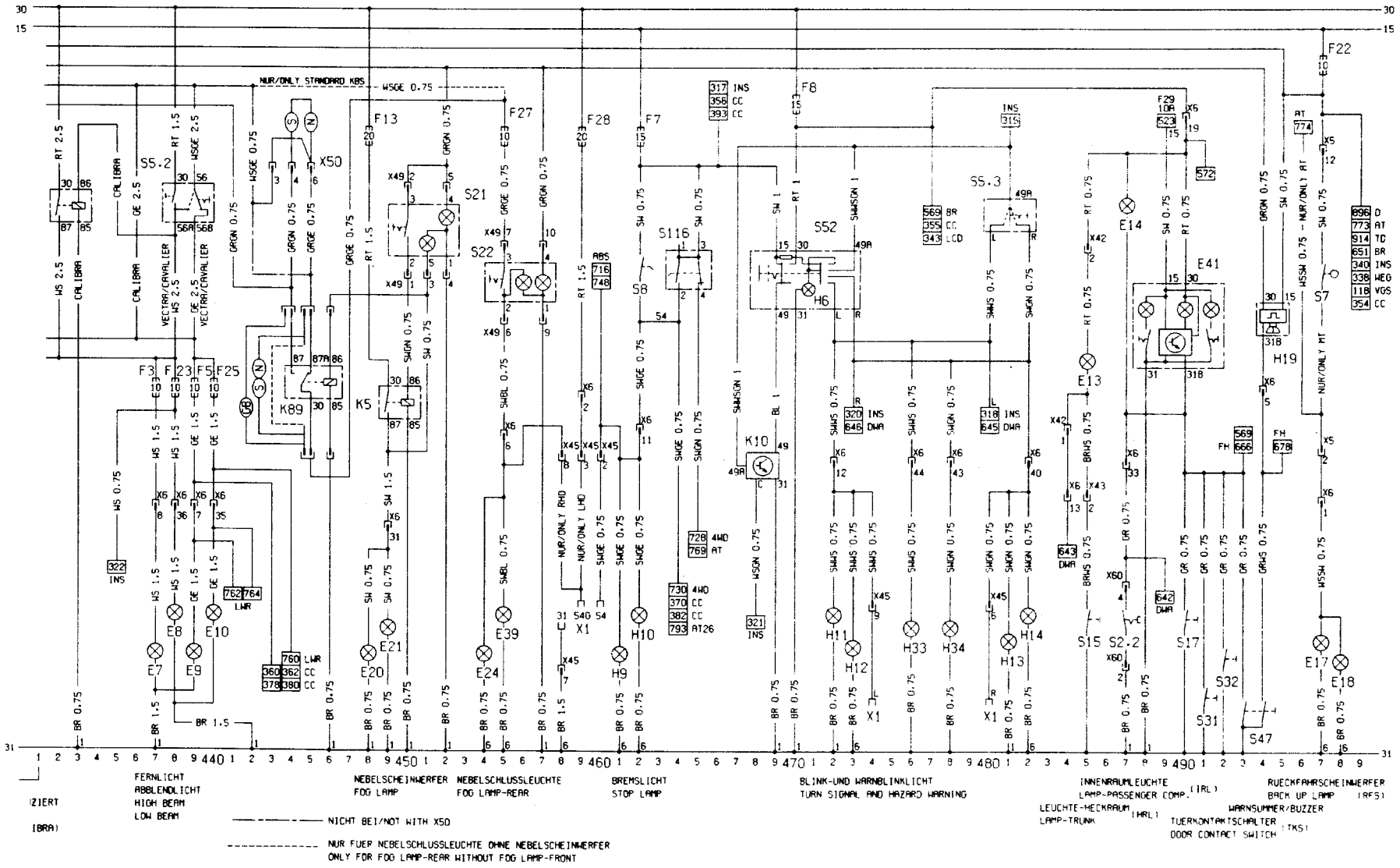
Wiring diagram for 1991 models (continued)



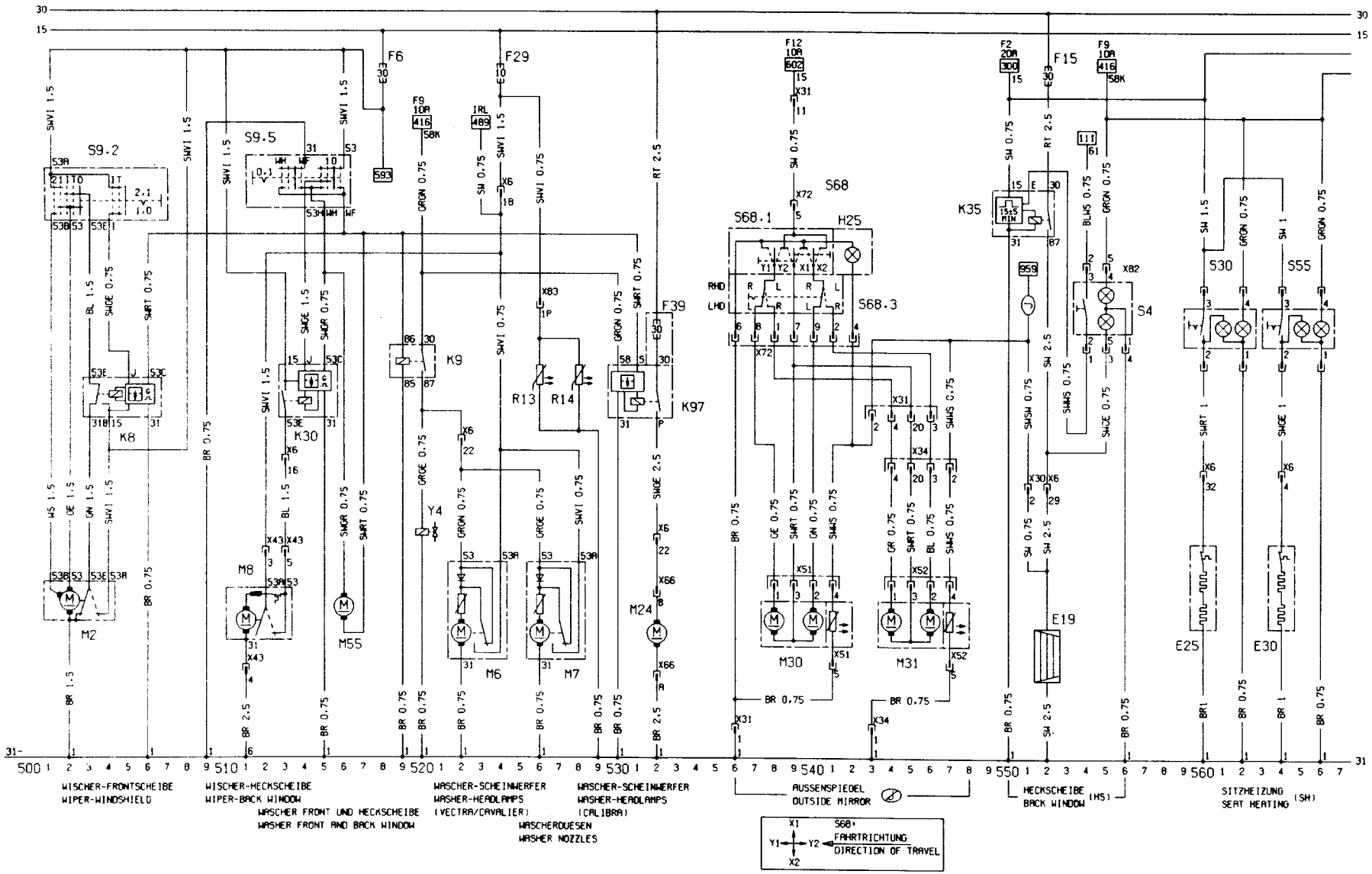
Wiring diagram for 1991 models (continued)



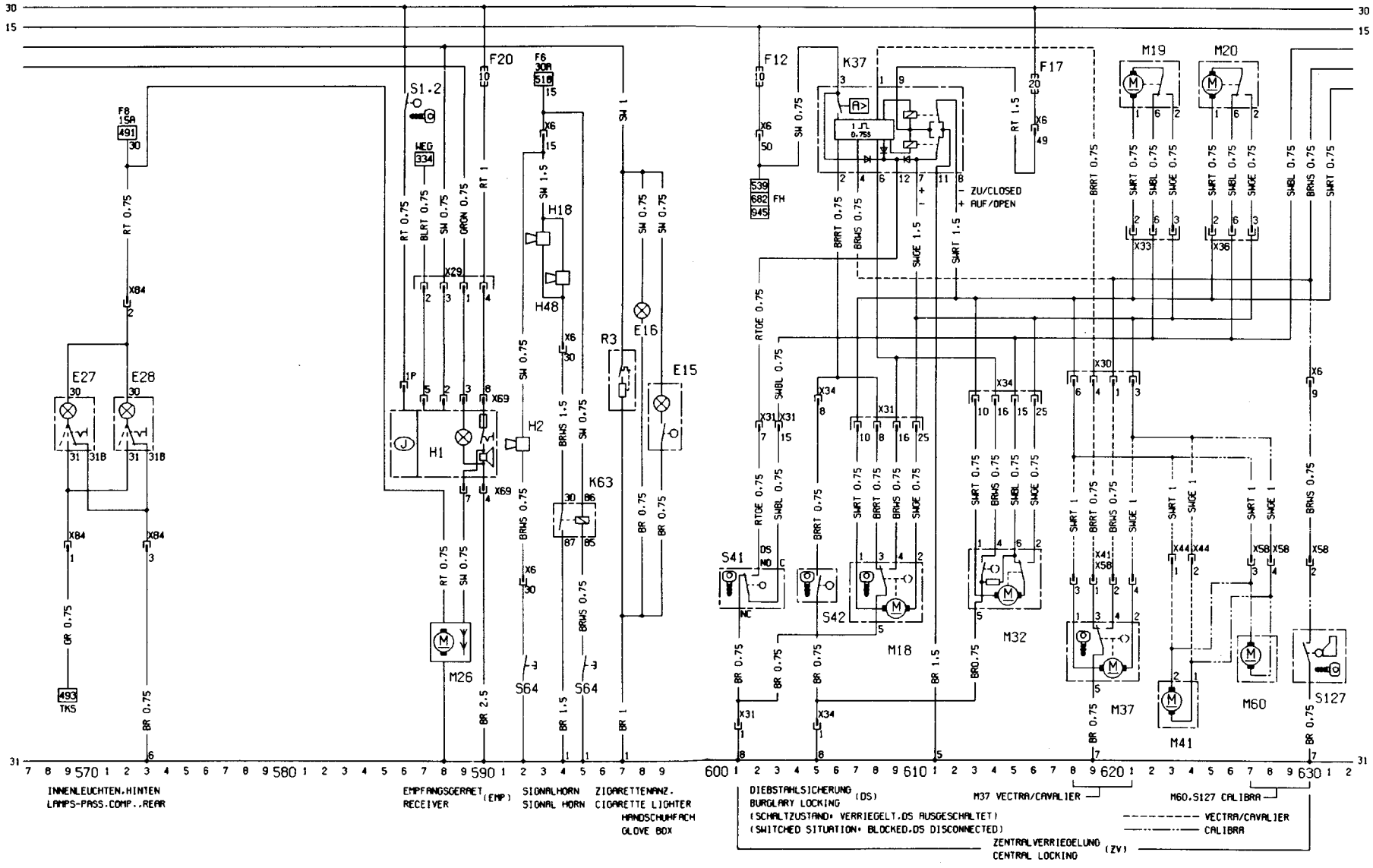
Wiring diagram for 1991 models (continued)



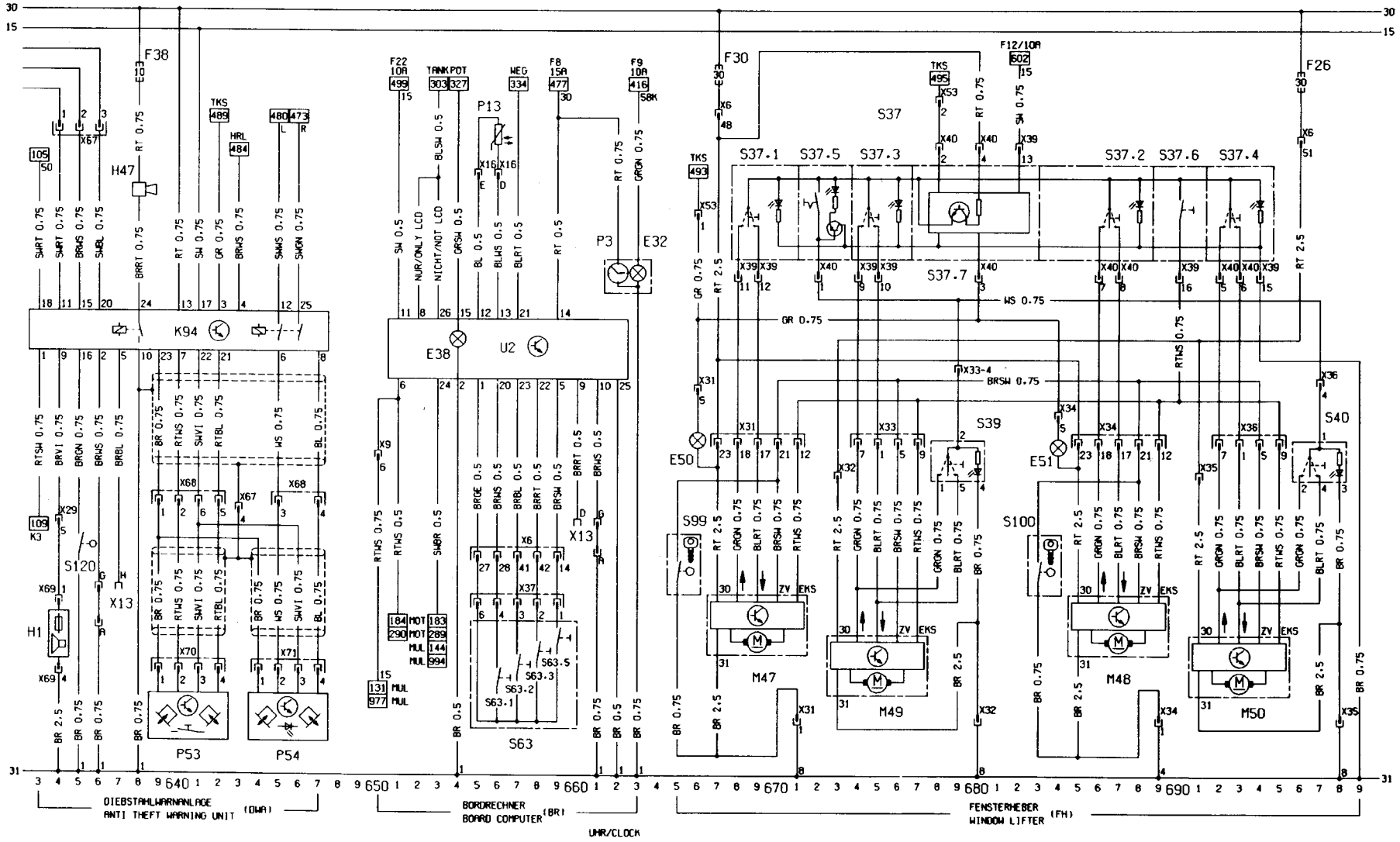
Wiring diagram for 1991 models (continued)



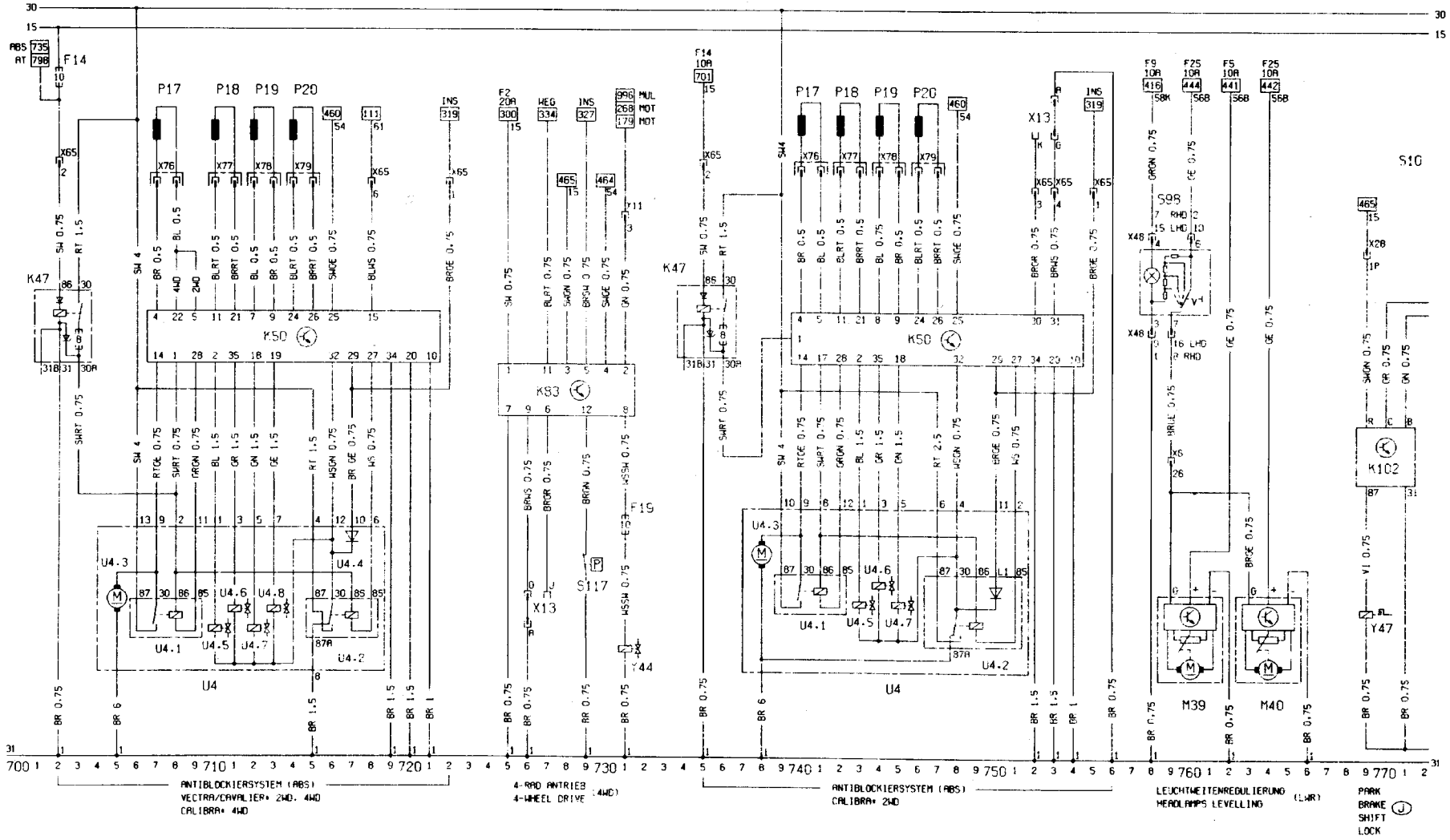
Wiring diagram for 1991 models (continued)



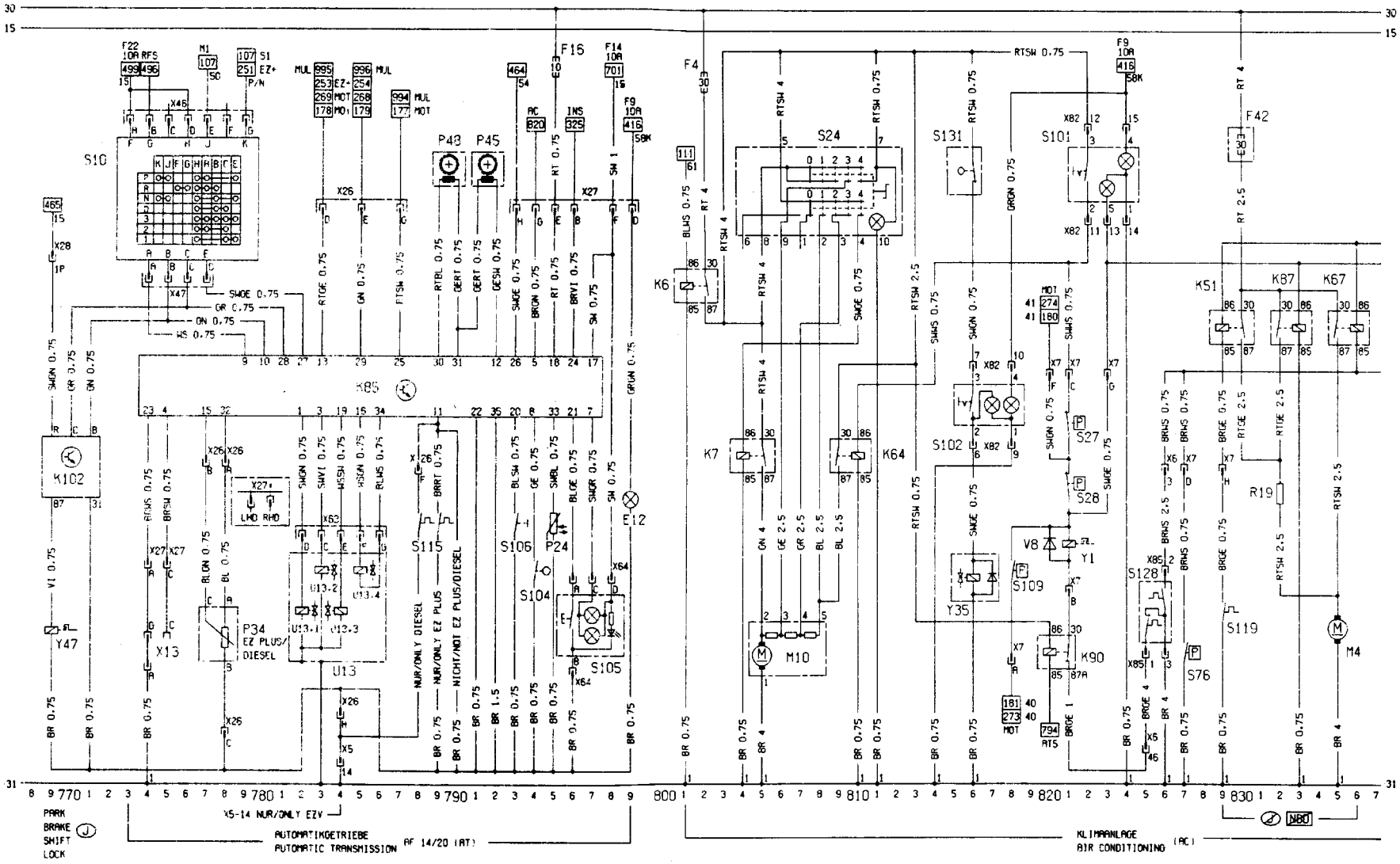
Wiring diagram for 1991 models (continued)



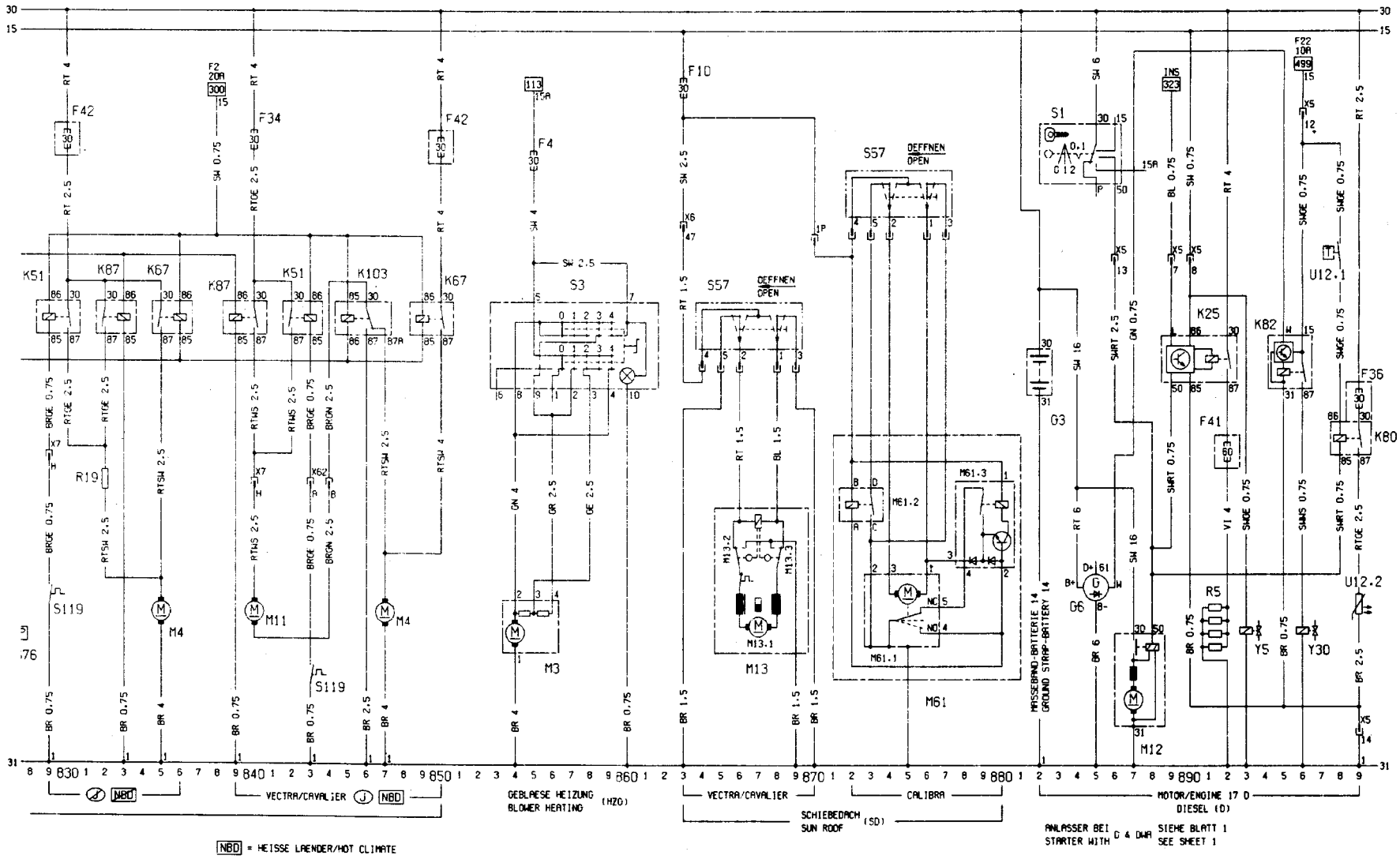
Wiring diagram for 1991 models (continued)



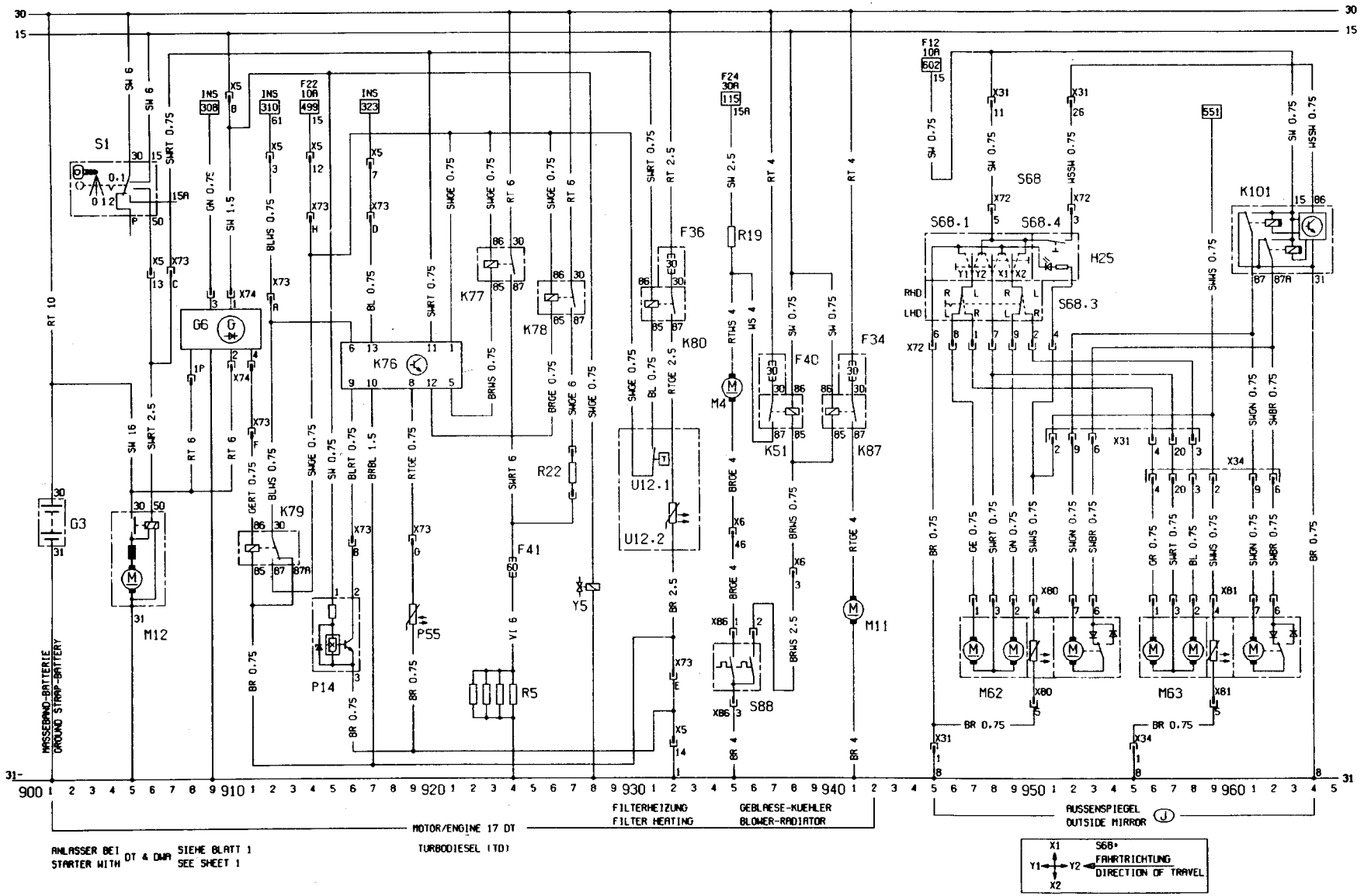
Wiring diagram for 1991 models (continued)



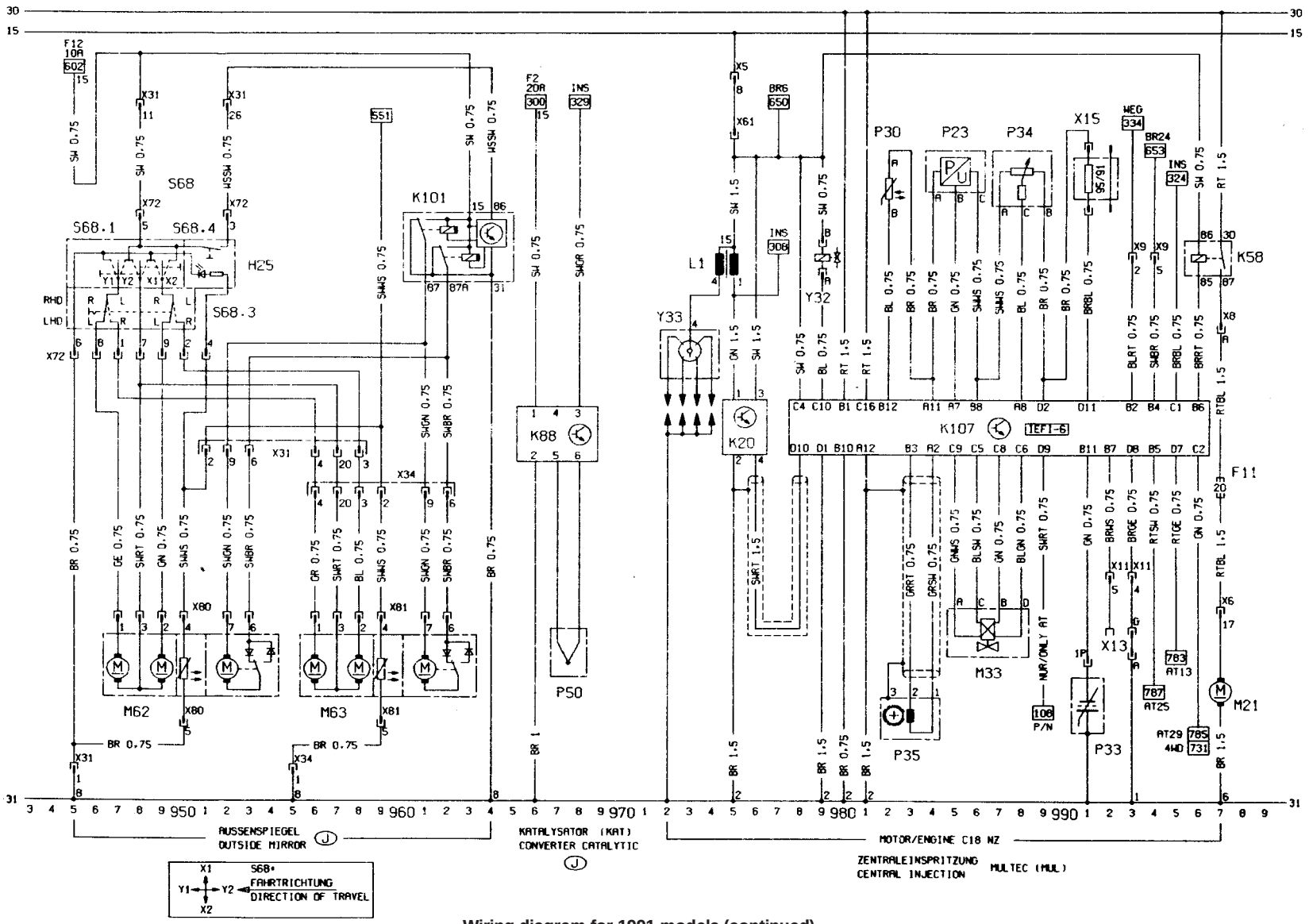
Wiring diagram for 1991 models (continued)



Wiring diagram for 1991 models (continued)



Wiring diagram for 1991 models (continued)



Wiring diagram for 1991 models (continued)

Key to wiring diagrams for 1992 and later models

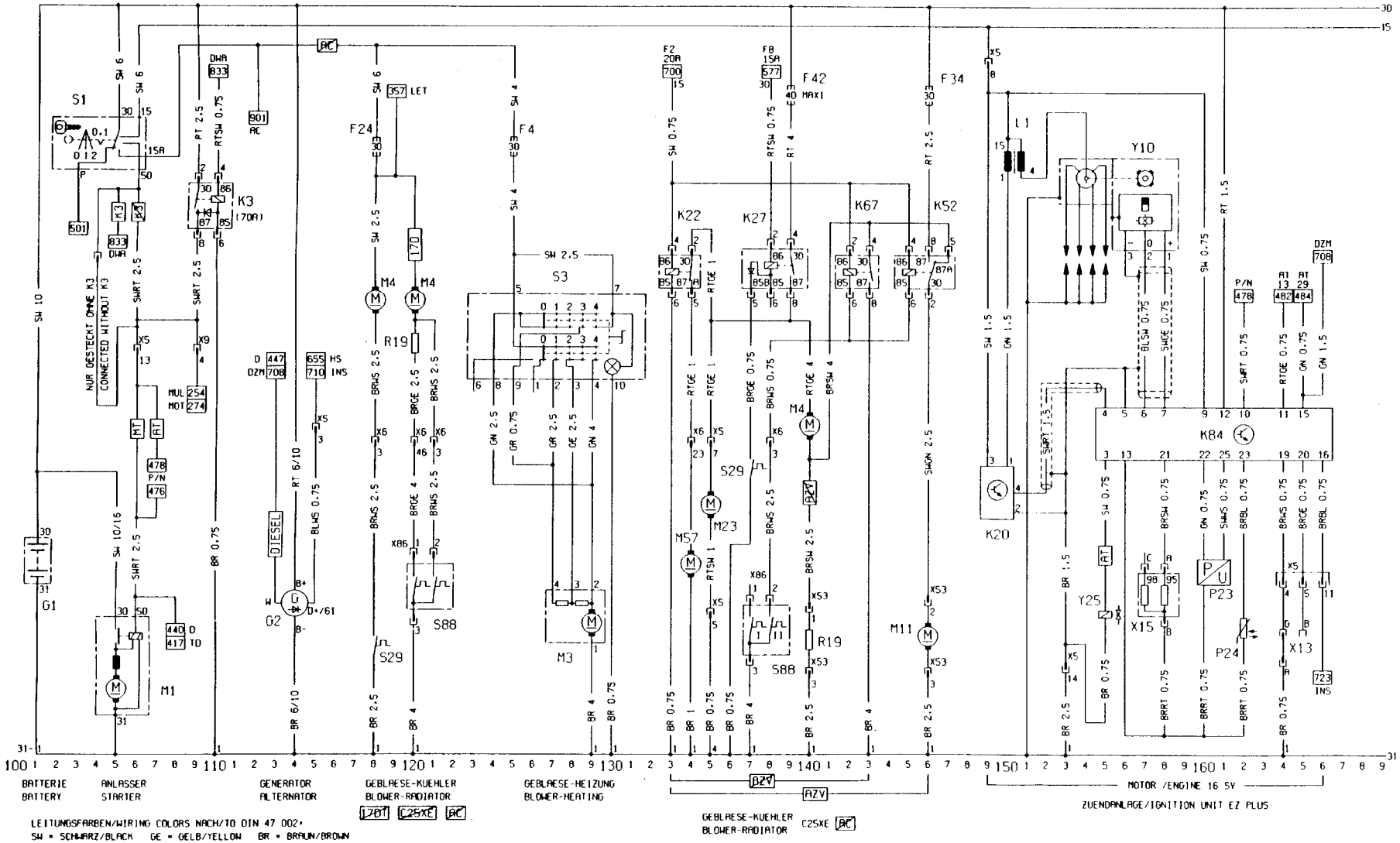
No	Description	Track
E1	Left parking lamp	506
E2	Left tail lamp	507, 745
E3	Licence plate lamp	513
E4	Right parking lamp	509
E5	Right tail lamp	510, 746
E6	Engine compartment lamp	515
E7	Left high beam	535
E8	Right high beam	536
E9	Left low beam	537, 747
E10	Right low beam	538, 748
E11	Instrument lights	728, 729
E12	Selector lever lamp	498, 499
E13	Boot lamp	585
E14	Passenger compartment lamp	587
E15	Glove box lamp	677
E16	Cigarette lighter lamp	676
E17	Left reversing lamp	597
E18	Right reversing lamp	598
E19	Heated back window	652
E20	Left fog lamp	553
E21	Right fog lamp	554
E24	Left rear fog lamp	548
E25	Left front heating mat	660
E27	Left rear reading lamp	680, 681
E28	Right rear reading lamp	683, 684
E30	Right front heating mat	664
E32	Clock lamp	863
E37	Left mirror make-up lamp	686
E38	Computer lamp	854
E39	Right rear foglamp	549
E40	Right mirror make-up lamp	688
E41	Passenger compartment delay lamp	588 to 590
E50	Driver door lamp	866
E51	Passenger door lamp	884
F1 on	Fuses	Various
F35	Voltage stabilizer	702
G1	Battery	101
G2	Alternator	114
G6	Diesel alternator	402 to 405
H1	Radio	784 to 798
H3	Turn signal lamp telltale	716, 718
H4	Oil pressure telltale	710
H5	Brake fluid telltale	712
H6	Telltale hazard warning system	570
H7	Charging indicator lamp	710
H8	High beam telltale	722
H9	Left stop lamp	561, 749
H10	Right stop lamp	562, 750
H11	Left front turn signal lamp	572
H12	Left rear turn signal lamp	573
H13	Right front turn signal lamp	581
H14	Right rear turn signal lamp	582
H15	Fuel telltale	705, 706
H16	Preheating time telltale	715
H17	Trailer turn signal lamp telltale	717
H18	Horn	670
H19	Headlamps on warning buzzer	594, 595
H21	Parking brake telltale	713
H23	Airbag telltale	719
H25	Heated back window & mirror telltale	642, 765
H26	ABS telltale	721
H27	Safety checking warning buzzer	996 to 998
H28	Seat belt warning telltale	723
H30	Engine telltale	724
H33	Left auxiliary turn signal lamp	576
H34	Right auxiliary turn signal lamp	578
H36	Additional stop lamp	563
H37	Left front loudspeaker	788 to 790
H38	Right front loudspeaker	794 to 796
H39	Left rear loudspeaker	788, 789
H40	Right rear loudspeaker	791, 792
H42	Automatic program power telltale	725
H45	Four wheel drive telltale	727
H46	Catalytic converter temperature telltale	729
H47	Anti-theft warning unit horn	838
H48	Horn	671
H51	Traction control telltale	720
H52	Left front tweeter	787 to 791
H53	Right front tweeter	793 to 797
K3	Starter relay anti-theft warning unit	109, 110
K5	Fog lamps relay	554 to 555
K6	Air conditioning relay	901, 902
K7	Four stage air conditioning blower relay	904, 905
K8	Windshield wiper interval relay	603 to 606
K9	Headlamps washer unit relay	619, 620
K10	Flasher unit	567 to 569
K20	Ignition coil module	149, 150, 171, 172, 241, 242, 302 to 305, 361 to 364, 1001 to 1005, 1055 to 1061
K22	Coolant pump relay	133, 134, 969, 970
K25	Glow time relay	440 to 443
K26	Radiator blower relays	972 to 974
K27	Radiator blower relay	137 to 139
K30	Back window wiper interval relay	613 to 615
K31	Airbag control unit	1191 to 1198
K34	Radiator blower time delay relay	356 to 358, 956 to 958
K35	Heated back window & mirror time delay relay	650 to 652
K37	Central locking control unit	805 to 812
K51	Radiator blower relay	430, 431, 942, 943, 956, 957
K52	Radiator blower relay	145 to 147, 433,435, 982 to 984, 960 to 962
K57	Multec unit control	211 to 230, 244 to 262
K58	Fuel pump relay	231, 232, 262, 263
K59	Running light relay	520 to 525
K60	Compressor relay	931,932
K61	Motronic control unit	270 to 294, 307 to 337, 366 to 396, 1007 to 1037, 1063 to 1096
K63	Horn relay	671, 672
K64	1 stage air conditioning blower relay	913, 914
K67	Radiator blower relay	142, 143, 436, 437, 948, 949, 964, 965, 986, 987
K68	Fuel injection unit relay	295 to 299, 393 to 397, 334 to 338, 1093 to 1097, 1034 to 1038
K73	High beam relay (Calibra)	530, 531
K76	Glow time control unit	413 to 417
K77	Glow plugs relay	419, 420
K78	Preresistor relay (70A)	422, 423
K79	Charge indicator relay	406 to 408
K80	Filter heating relay	426, 427, 452, 453
K82	Engine revolution relay	447, 448
K83	Four wheel drive unit control	342 to 349
K84	EZ Plus control unit	155 to 166, 177 to 191
K85	Automatic transmission control unit	473 to 496
K86	Check control unit	736 to 752
K87	Radiator blower relay	945, 946, 953, 954, 977, 978
K88	Catalytic converter temperature control unit	462 to 464
K89	Rear fog lamp relay	543 to 545
K90	Compressor relay (automatic transmission only)	930, 931
K94	Anti-theft warning unit control unit	833 to 847

Key to wiring diagrams for 1992 and later models (continued)

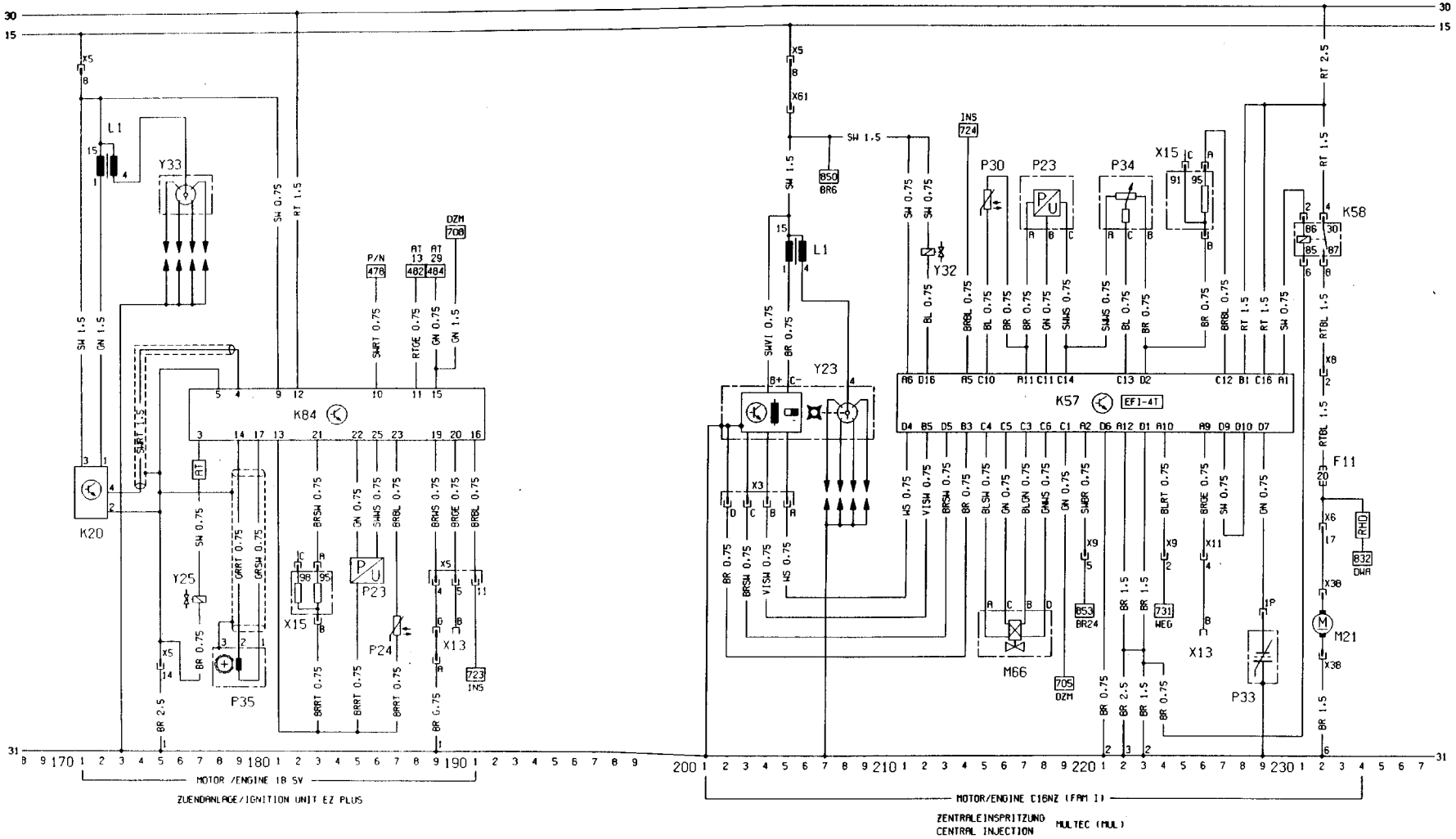
No	Description	Track
K95	Traction control control unit	1125 to 1140
K97	Headlamps washer pump time delay relay	630 to 632
K101	Parking position mirror relay	774 to 777
K102	Park brake shift lock control unit	469 to 471
L1	Ignition coil	150, 172, 205, 273, 241, 302, 361
L2	Ignition coil	1000 to 1004, 1054 to 1059
M1	Starter	105, 106
M2	Windshield wiper motor	601 to 604
M3	Heating blower motor	127 to 129
M4	Radiator blower motor	118, 120, 140, 356, 431, 948, 954, 980
M6	Left headlamp wiper motor	622 to 624
M7	Right headlamp wiper motor	626 to 628
M8	Back window wiper motor	611 to 613
M10	Air conditioning blower motor	905 to 908
M11	Radiator blower motor	136, 434, 962, 984
M13	Vectra/Cavalier sun roof motor	1172 to 1175
M13.1	Sun roof motor	1172, 1174
M13.2	Timing box microswitch	1172
M13.3	Timing box microswitch	1174
M18	Driver door central locking motor	807 to 810
M19	Left rear door central locking motor	821 to 823
M20	Right rear door central locking motor	825 to 827
M21	Fuel pump	232, 263, 297, 339, 399, 834, 1098, 1039
M23	Alternator blower motor	135, 974
M24	Headlamps washer pump	632
M26	Automatic antenna motor	798 to 799
M30	Driver side outside mirror	638 to 641
M31	Passenger side outside mirror	644 to 647
M32	Passenger door central locking motor	813 to 816
M33	Idle speed actuator	285, 286, 317, 318, 381, 382, 1019, 1020, 1075, 1076
M37	Tail gate/boot lid central locking motor	818 to 821
M39	Left headlamp levelling motor	692 to 695
M40	Right headlamp levelling motor	696 to 699
M41	Fuel filler door central locking motor	823, 824
M47	Driver door window lifter motor	867 to 871
M48	Passenger door window lifter motor	885 to 889
M49	Left rear window lifter motor	873 to 877
M50	Right rear window lifter motor	891 to 895
M55	Windshield and back window washer pump	617
M57	Coolant pump	134, 970
M60	Calibra tailgate central locking motor	827, 828
M61	Calibra sun roof motor	1178 to 1186
M61.1	Sun roof motor	1179 to 1182
M61.2	Relay 1	1178, 1179
M61.3	Relay 2	1184 to 1186
M62	Driver side outside mirror	760 to 767
M63	Passenger side outside mirror	769 to 776
M65	TC throttle valve actuator	1130 to 1134
M66	Idle air stepper motor	215 to 218, 250 to 253
P1	Fuel indicator	704
P2	Coolant temperature indicator	706
P3	Clock	862
P4	Fuel sensor	704
P5	Coolant temperature sensor	706
P7	Tachometer	708
P11	Airflow meter	285 to 289
P12	Coolant temperature sensor	282, 381
P13	Outside temperature sensor	856
P14	Distance sensor	412, 413
P17	Left front revolution sensor	1110, 1154
P18	Right front revolution sensor	1113, 1157
P19	Left rear revolution sensor	1116, 1160
P20	Right rear revolution sensor	1119, 1163
P21	Distance sensor	731
P23	Intake manifold absolute pressure sensor	160, 161, 185, 186, 217 to 219, 250 to 252
P24	Engine oil temperature sensor	162, 187
P27	Left front brake lining sensor	740
P28	Right front brake lining sensor	740
P29	Intake manifold temperature sensor	382, 1016, 1072
P30	Coolant temperature sensor	215, 248, 313, 1017, 1073
P32	Heated exhaust oxygen sensor	294, 295, 331, 332, 391, 392, 1034, 1035, 1093, 1094
P33	Exhaust oxygen sensor	229, 257
P34	Throttle valve potentiometer	221 to 223, 280, 281, 253 to 255, 383 to 385, 478, 479, 1018, 1019, 1074, 1075
P35	Crankshaft impulse sensor	178 to 180, 289 to 291, 248 to 250, 318 to 320, 373 to 375, 1025 to 1027, 1084 to 1086
P38	Transmission oil temperature sensor	494
P39	Trailer bulb test sensor	752 to 754
P43	Electronic speedometer	733
P44	Air mass meter	393 to 397, 334 to 338, 1037, 1038, 1096, 1097
P45	Transmission input revolution sensor	490, 491
P46	Knock control sensor	322, 323, 377, 378, 1022, 1023, 1078, 1079
P47	Cylinder identification hall sensor	325 to 327, 385 to 387, 1028 to 1030, 1087, 1089
P48	Automatic transmission distance sensor	488, 489
P50	Catalytic converter temperature sensor	463, 464
P53	Driver side anti-theft warning unit sensor	839 to 847
P54	Passenger side anti-theft warning unit sensor	839 to 847
P55	Engine coolant temperature sensor	415
P56	Knock control sensor II	1080, 1081
P57	Antenna	797
R3	Cigarette lighter	675
R5	Glow plugs	418 to 420, 441 to 443
R13	Left heated washer nozzle	626
R14	Right heated washer nozzle	628
R19	Radiator blower preresistor	120, 140, 945
R22	Glow plugs pre-resistor	423
R23	Driver airbag squib	1194
S1	Starter switch	103 to 106
S1.2	Key contact switch	783
S2	Light switch assy	
S2.1	Light switch	504 to 507
S2.2	Passenger compartment lamp switch	587
S2.3	Instrument lights dimmer	728
S3	Heating blower switch	123 to 130
S4	Heated back window & mirror switch	654 to 657
S5	Turn signal switch assy	
S5.2	Low beam switch	536, 537
S5.3	Turn signal switch	580 to 582
S5.4	Parking lamp switch	501, 502
S7	Back up lamp switch	597, 599
S8	Stop lamp switch	562
S9	Wiper unit switch	
S9.2	Interval windshield wiper switch	601 to 604
S9.5	Back window and washer unit wiper switch	614 to 616
S10	Automatic transmission switch	472 to 478
S11	Brake fluid control switch	712
S13	Parking brake switch	713
S14	Oil pressure switch	710
S15	Boot lamp switch	585
S17	Passenger door contact switch	590
S20	Pressure switch	
S20.1	Low pressure compressor switch	925

Key to wiring diagrams for 1992 and later models (continued)

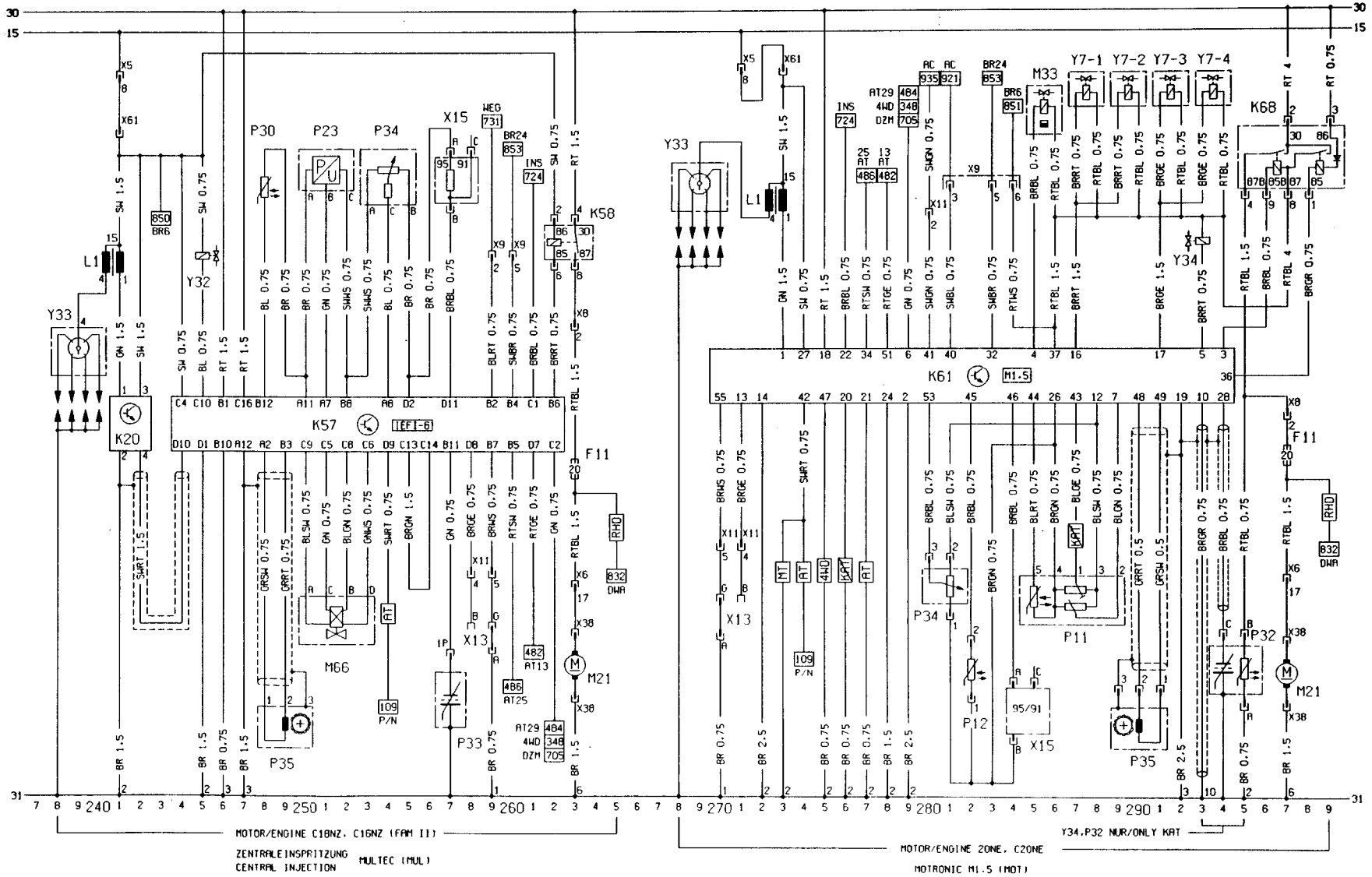
No	Description	Track
S20.2	High pressure compressor switch	925
S20.3	High pressure blower compressor switch	939
S21	Fog lamps switch	555 to 557
S22	Rear fog lamp switch	549 to 551
S24	Air conditioning blower switch	904 to 911
S29	Coolant temperature switch	118, 137, 357, 942, 957, 972
S30	Left front heating mat switch	660 to 662
S31	Rear left door contact switch	591
S32	Rear right door contact switch	592
S33	Traction control switch	1130, 1131
S37	Window lifter switch	868 to 894
S37.1	Left window lifter switch	868 to 870
S37.2	Right window lifter switch	886 to 888
S37.3	Left rear window lifter switch	874 to 876
S37.4	Right rear window lifter switch	892 to 894
S37.5	Safety switch	872, 873
S37.6	Window anti-jam off switch	890
S37.7	Automatic window lifter control	877 to 882
S39	Left rear door window lifter switch	878 to 880
S40	Right rear door window lifter switch	896 to 898
S41	Driver door burglary locking switch	800 to 802
S42	Passenger door central locking switch	805
S44	Throttle valve switch	316, 317
S47	Driver door contact switch	593, 594
S52	Hazard warning switch	569 to 573
S53	First gear identification switch	372
S55	Right front heating mat switch	664 to 666
S57	Sun roof switch	1170 to 1183
S63	Computer switch	
S63.1	Function reset switch	856
S63.2	Clock hours adjustment switch	857
S63.3	Function select switch	858
S63.4	Clock minute adjustment switch	859
S64	Horn switch	672
S68	Outside mirror switch assy	
S68.1	Outside mirror adjustment switch	638 to 640, 758 to 762
S68.3	Left/right outside mirror switch	637 to 641, 759 to 763
S68.4	Parking position switch	765
S82	Washer fluid minimum capacity control switch	736
S88	2 stage coolant temperature switch	120, 121, 137, 138, 430, 431
S89	Seat belt switch	998
S93	Coolant minimum capacity control switch	737
S95	Engine oil minuimum capacity control switch	738
S98	Headlamps levelling switch	691 to 693
S99	ZV driver door window lifter switch	865
S100	ZV passenger door window lifter switch	883
S101	Compressor switch	926 to 928
S102	Circulation switch	918 to 920
S103	Transmission temperature switch	350
S104	Kickdown switch	493
S105	Start-up assistance switch	495 to 497
S106	Economy power program switch	492
S109	Acceleration revolution pressure switch	921
S115	Coolant temperature switch	487, 488
S116	Stop lamp switch	564, 565
S117	Hydraulic pressure switch	346
S120	Engine compartment hood (anti-theft warning unit) switch	835
S127	Calibra tail gate central locking switch	831
S128	Coolant temperature switch	936,937
S131	Defroster lever limit switch	918
U2	Computer	851 to 862
U4	ABS hydroaggregate	1102 to 1122, 1146 to 1164
U4.1	Pump motor relay	1102, 1103, 1146, 1147
U4.2	Solenoid valves relay	1104, 1105, 1148, 1149
U4.3	Pump motor	1102,1146
U4.4	Diode	1105,1149
U4.5	Left front solenoid valve	1109,1153
U4.6	Right front solenoid valve	1111,1155
U4.7	Rear axle solenoid valve	1113,1157
U4.8	ABS control unit	1106 to 1122, 1150 to 1164
U4.9	Solenoid valves plug	1109 to 1113, 1153 to 1157
U5	Check control display	
U5.1	Washer fluid minimum capacity telltale	741
U5.2	Oil minimum capacity telltale	740
U5.3	Coolant minimum capacity telltale	739
U5.4	Tail light & low beam telltale	738
U5.5	Stop light failure telltale	737
U5.6	Front brake lining telltale	736
U12	Filter heater	
U12.1	Temperature switch	426, 452
U12.2	Filter heater	427, 453
U13	Automatic transmission	
U13.1	Solenoid valve (shift 1)	481
U13.2	Solenoid valve (shift 2)	482
U13.3	Solenoid valve (lock up control)	483
U13.4	Solenoid valve (pressure control)	484
U17	Roof antenna amplifier	795
V1	Brake fluid test bulb diode	712
V8	Air conditioning compressor diode	926
X1 on	Wiring connectors	Various
X10	Anti theft warning unit code	837
X13	Diagnostic link	164, 165, 189, 190, 226, 270, 271, 258, 259, 309, 310, 370, 371, 343, 344, 473, 474, 573, 725, 836, 837, 860, 861, 1012, 1013, 1069, 1070, 1118, 1119, 1136, 1162, 1163
X15	Octane number plug	157, 158, 182, 183, 225, 226, 257, 258, 284, 285
X54	Ignition coding plug	310, 311, 1014, 1070, 1071
Y1	Air conditioning compressor clutch	925
Y4	Headlamps washer solenoid valve	620
Y5	Fuel solenoid valve	410, 445
Y7	Fuel injection valves	287 to 294,320 to 327, 384 to 391,1025 to 1032,1078 to 1089
Y10	Hall sensor ignition distributor	153 to 158
Y11	Hot start solenoid valve	375, 376
Y12	Charging pressure control changeover valve	377, 378
Y18	Exhaust gas recirculation valve	1093
Y23	Inductive sensor distributor	201 to 208
Y24	Distributor (inductive discharge)	
Y25	Acceleration revolution solenoid valve	155, 177
Y30	Cold start acceleration solenoid valve	448
Y32	Fuel injection valve	212, 245
Y33	Ignition distributor	175 to 177, 268 to 270, 238 to 240, 301 to 303, 360 to 362
Y34	Tank ventilation valve	293, 331, 332, 379, 380, 1092, 1016, 1017,
Y35	Circulation solenoid valve	918
Y44	Four wheel drive solenoid valve	350
Y47	Park brake shift lock lifting magnet	469



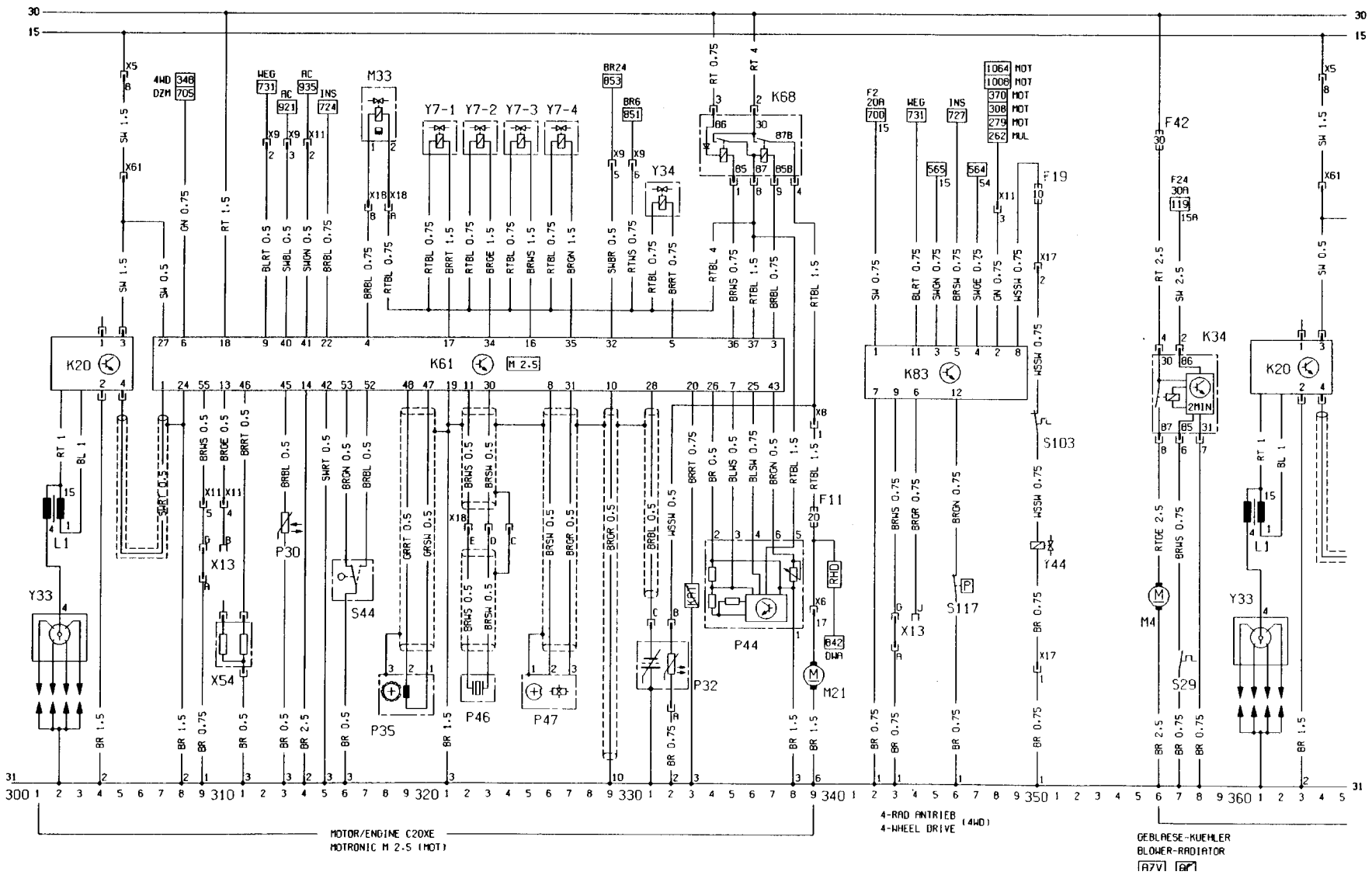
Wiring diagram for 1992-on models



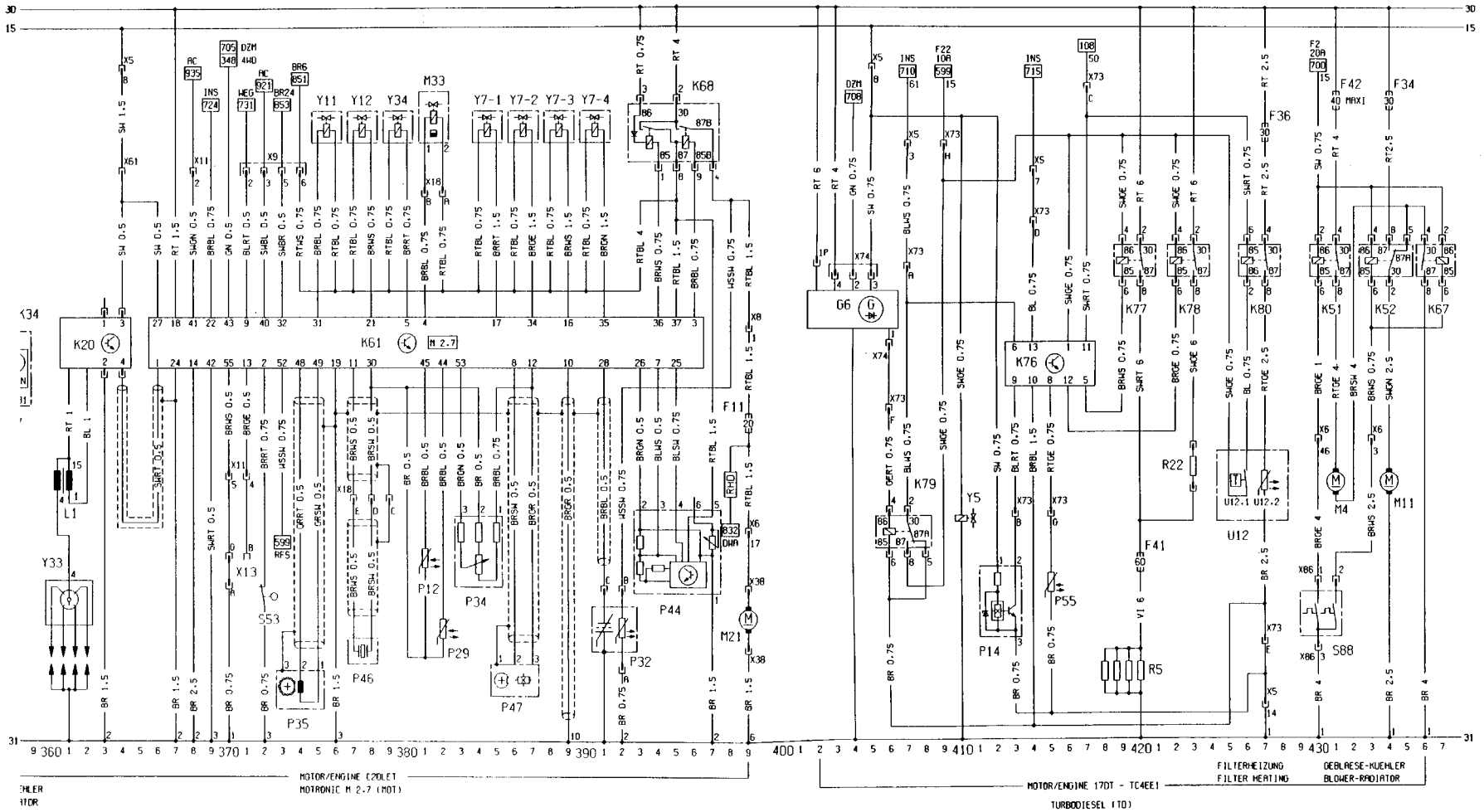
Wiring diagram for 1992-on models (continued)



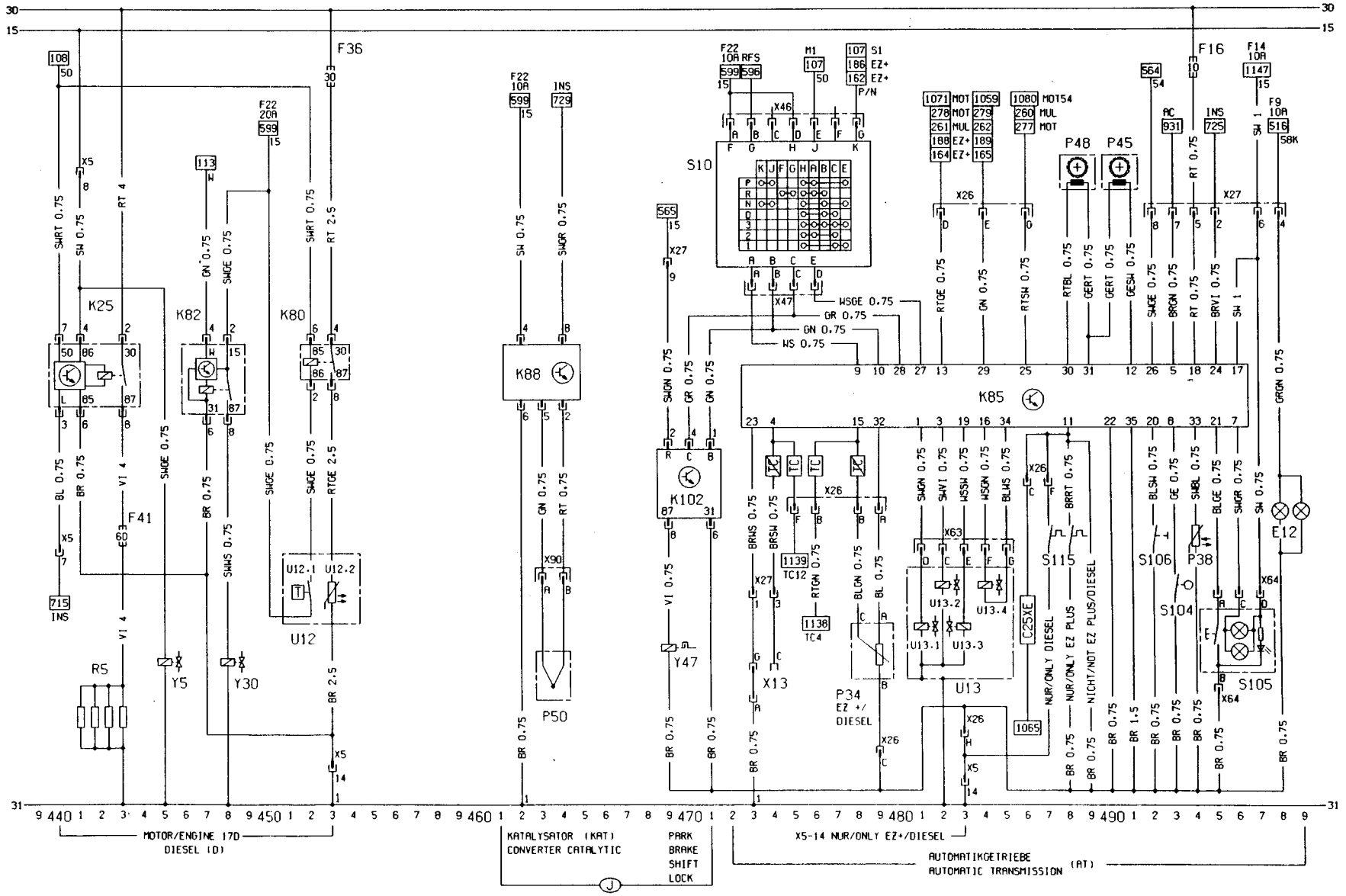
Wiring diagram for 1992-on models (continued)



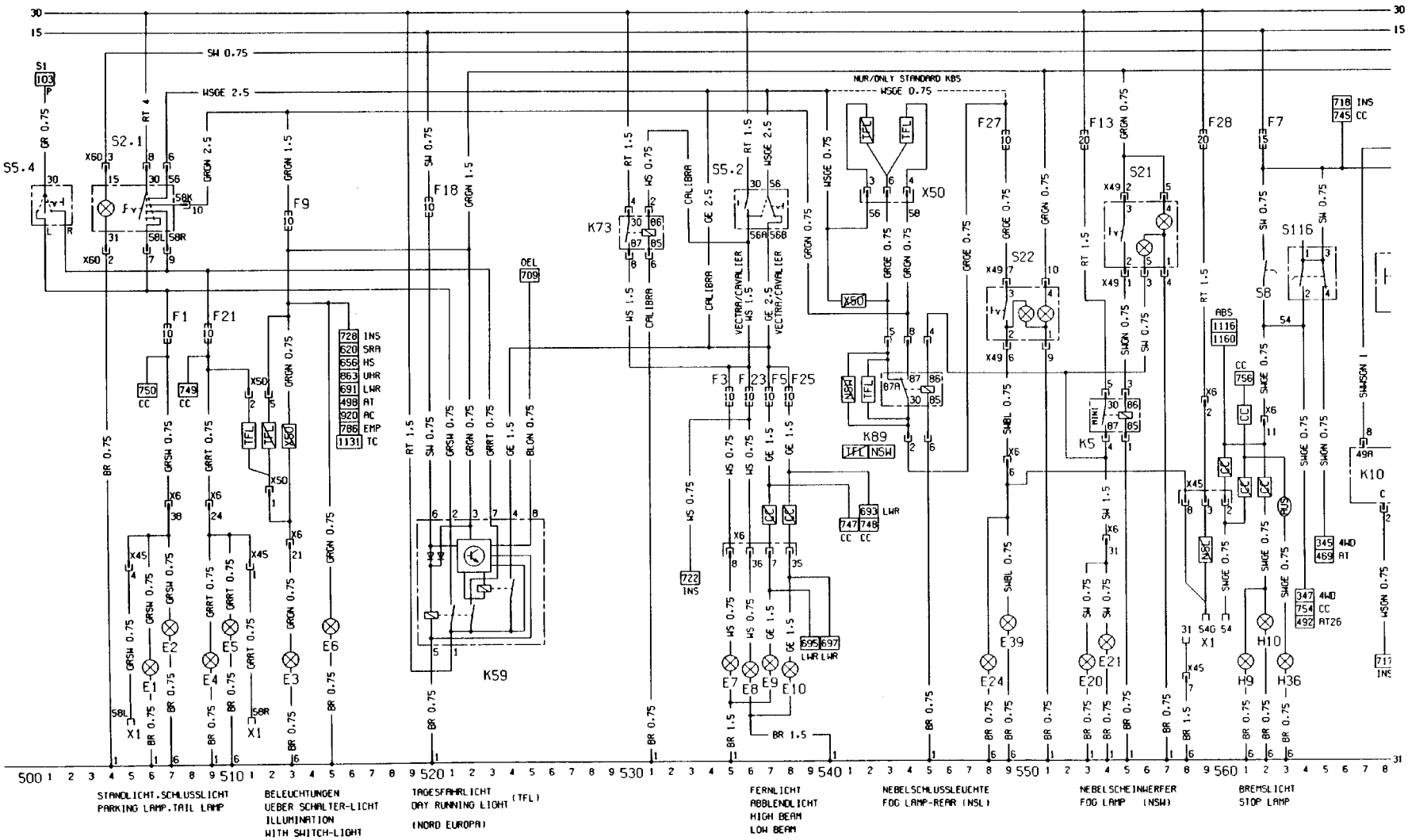
Wiring diagram for 1992-on models (continued)



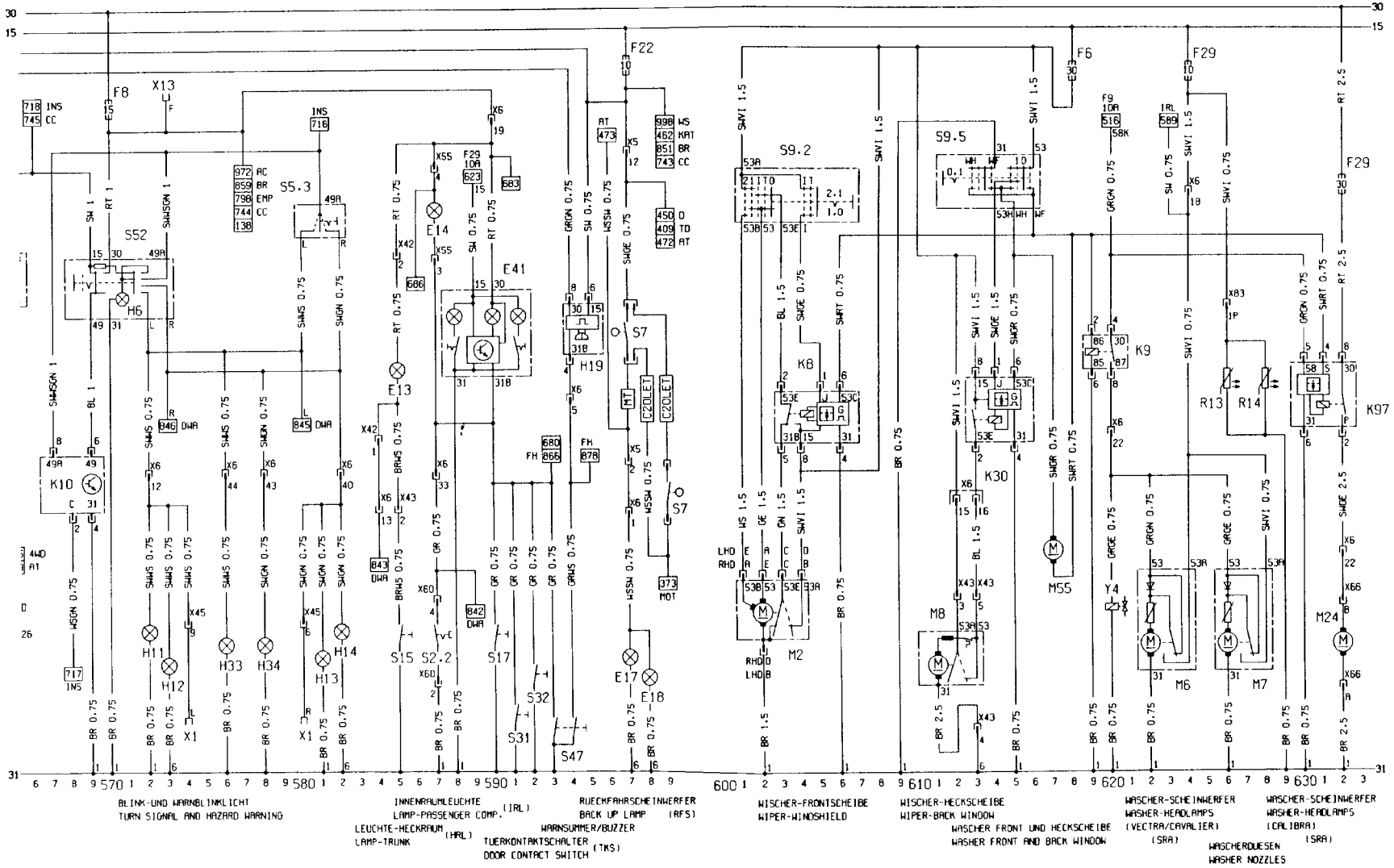
Wiring diagram for 1992-on models (continued)



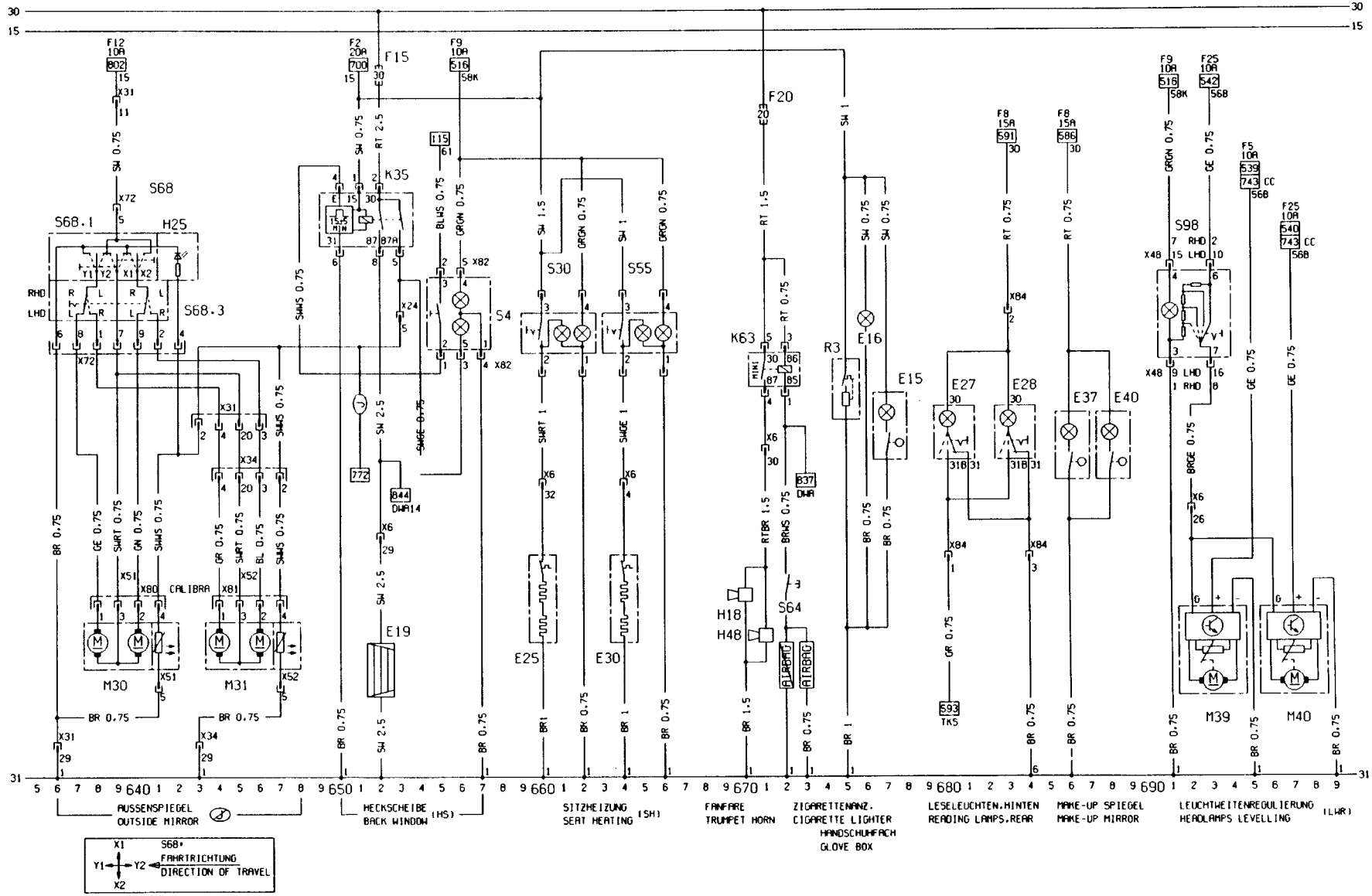
Wiring diagram for 1992-on models (continued)



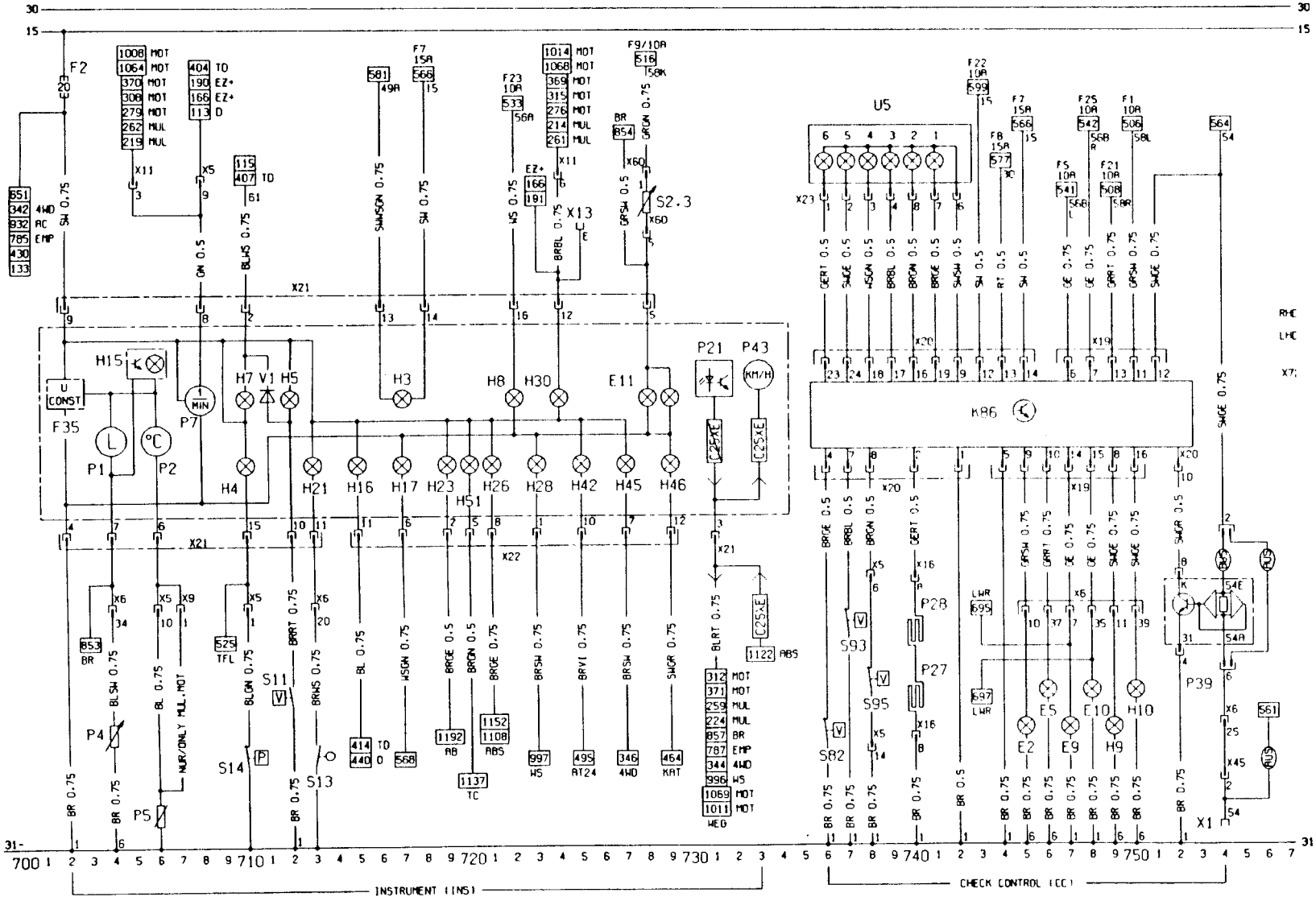
Wiring diagram for 1992-on models (continued)



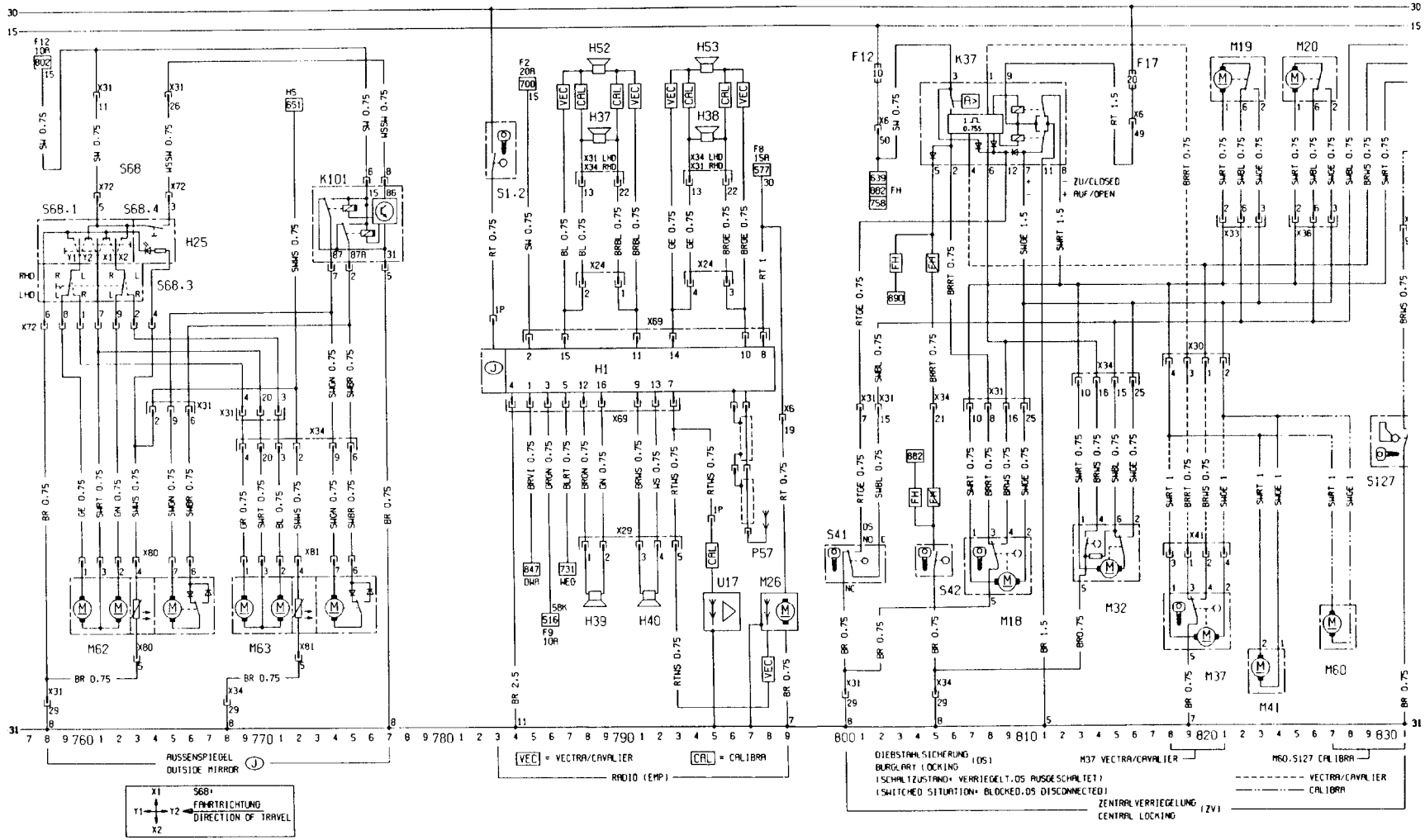
Wiring diagram for 1992-on models (continued)



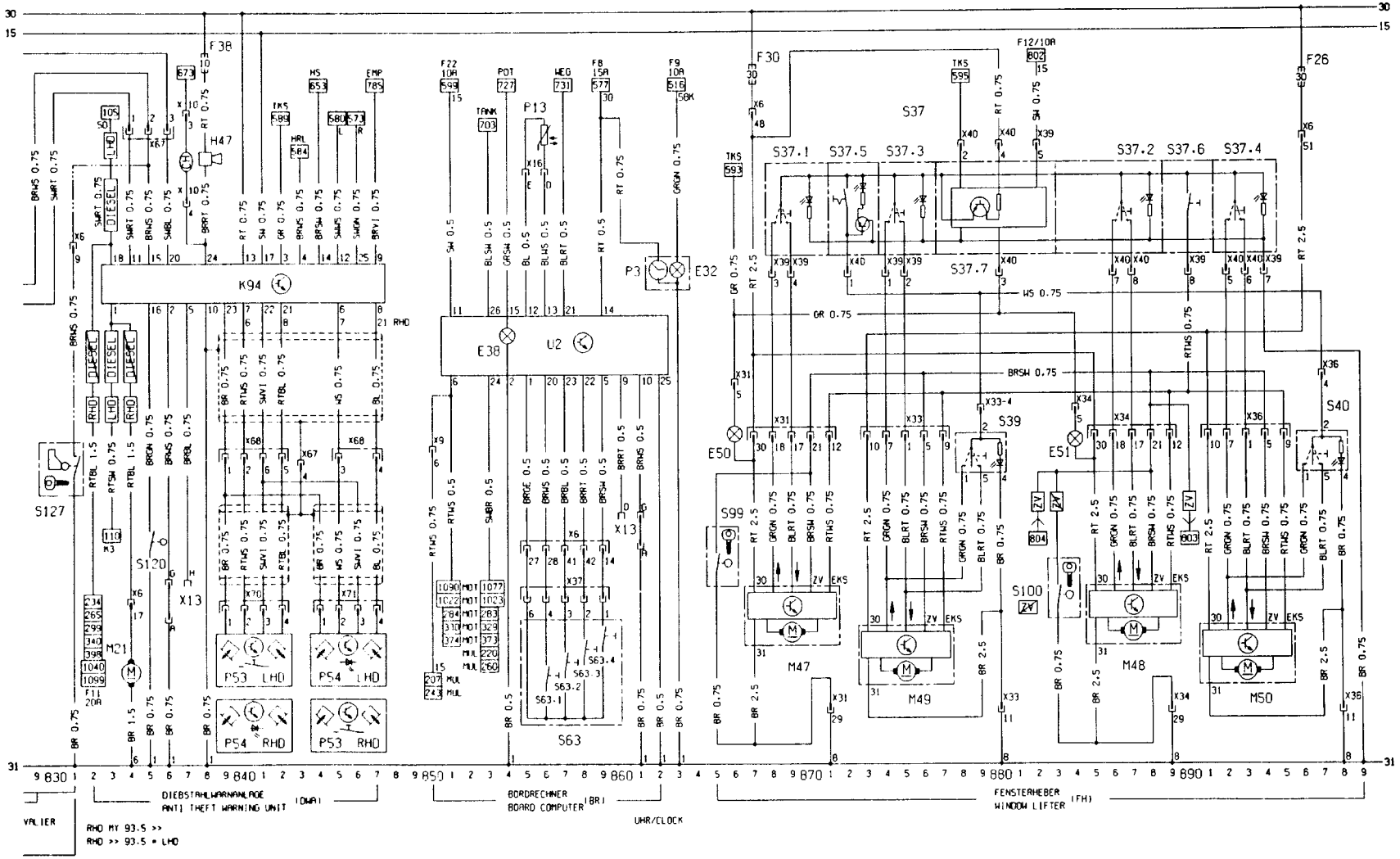
Wiring diagram for 1992-on models (continued)



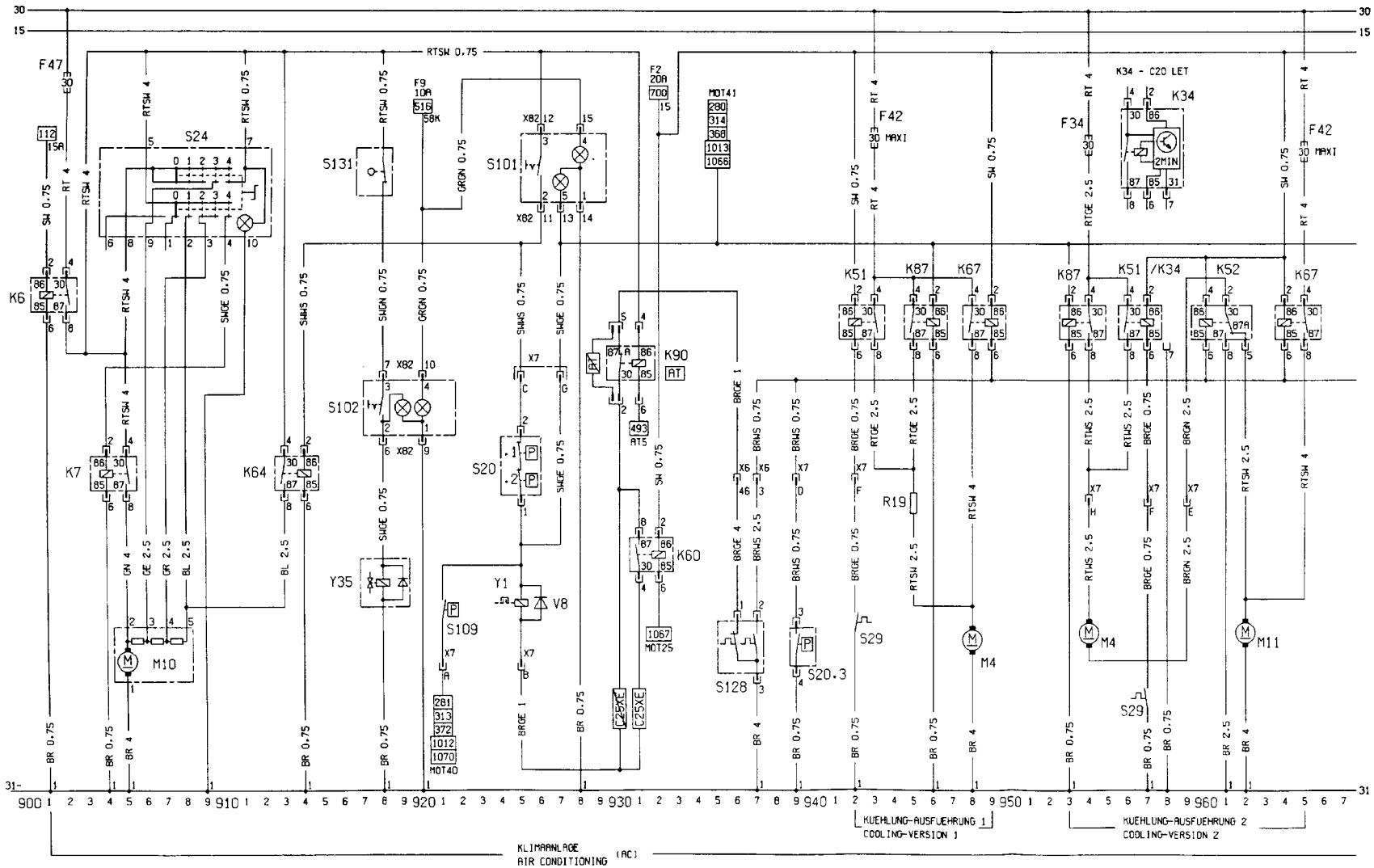
Wiring diagram for 1992-on models (continued)



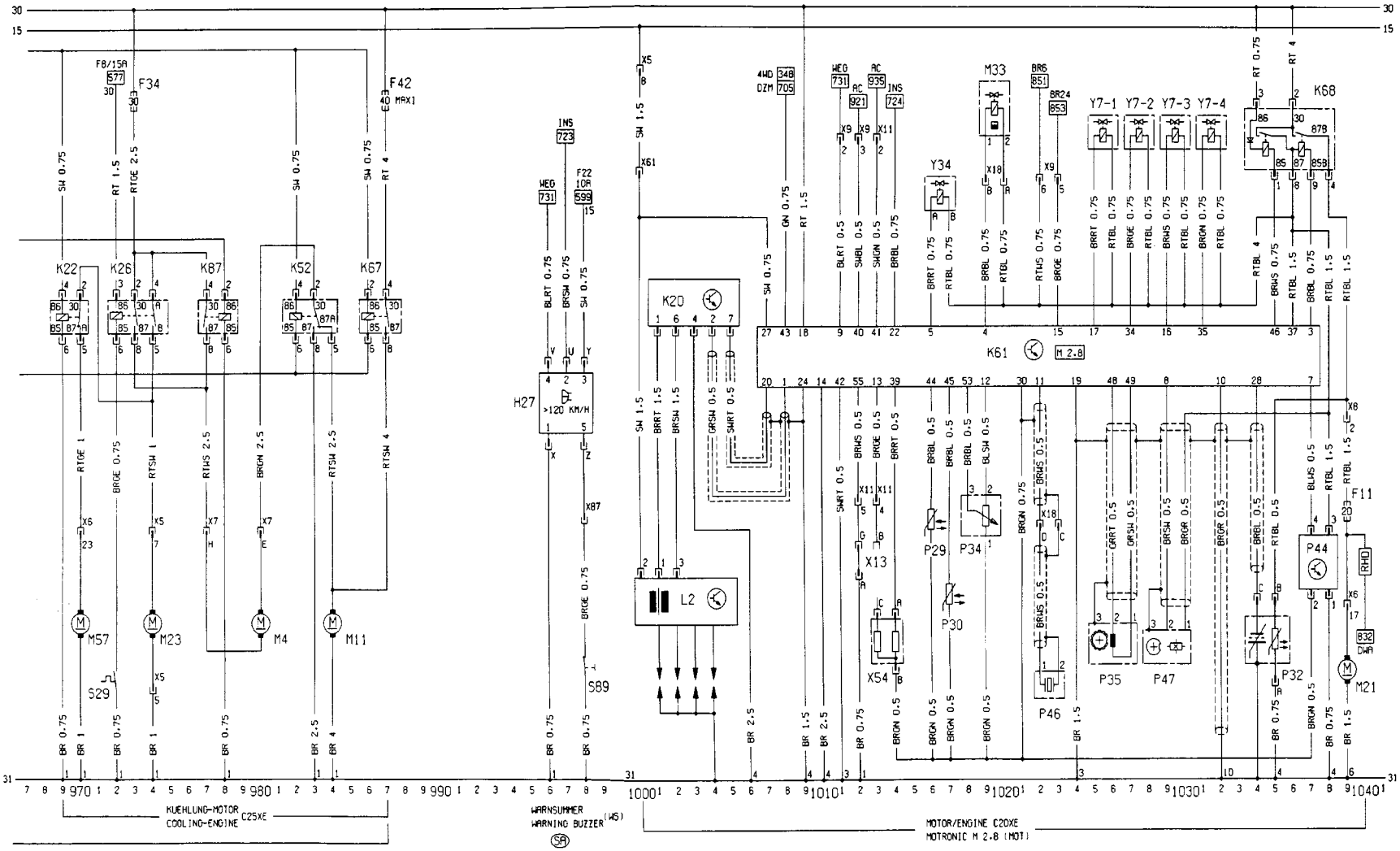
Wiring diagram for 1992-on models (continued)



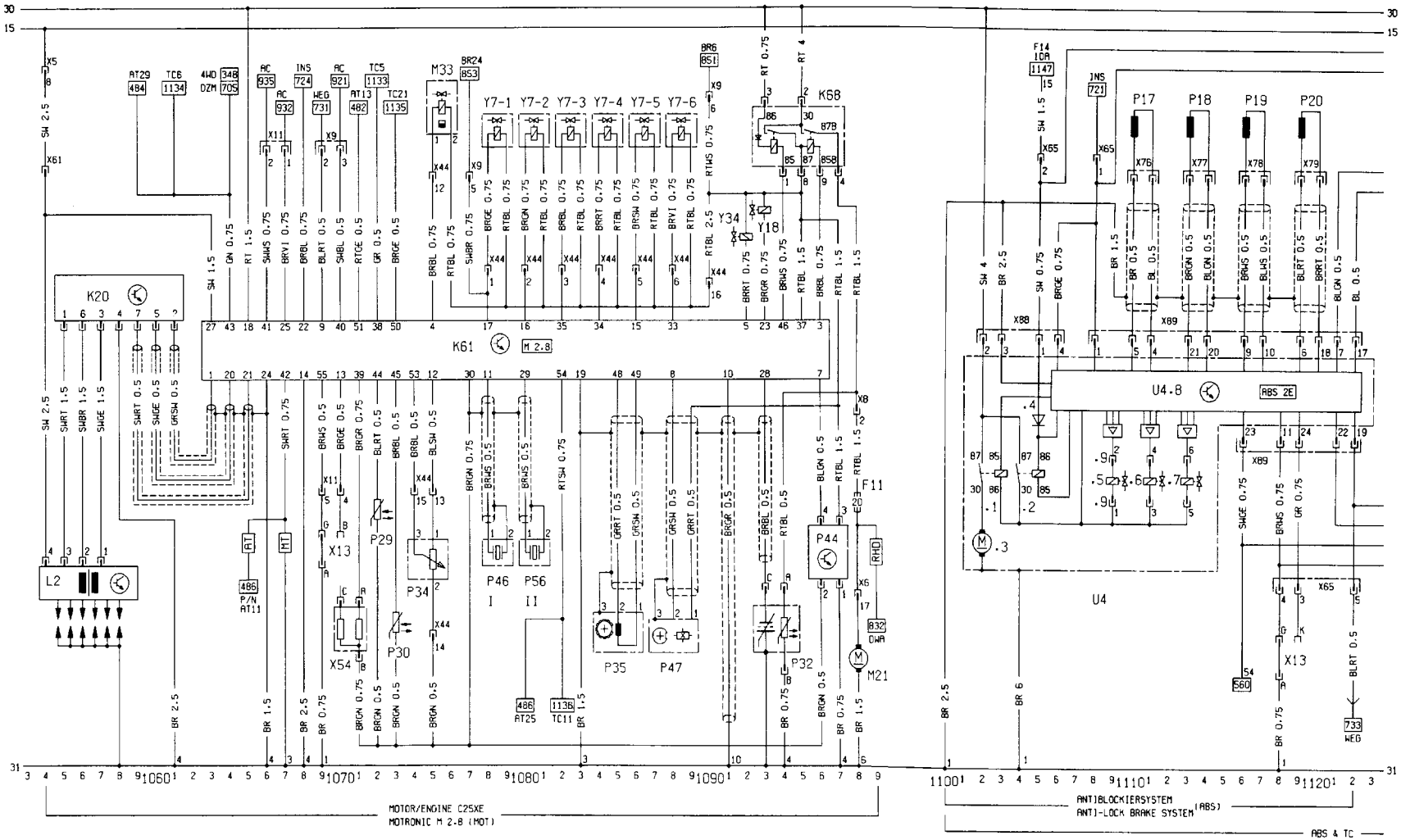
Wiring diagram for 1992-on models (continued)



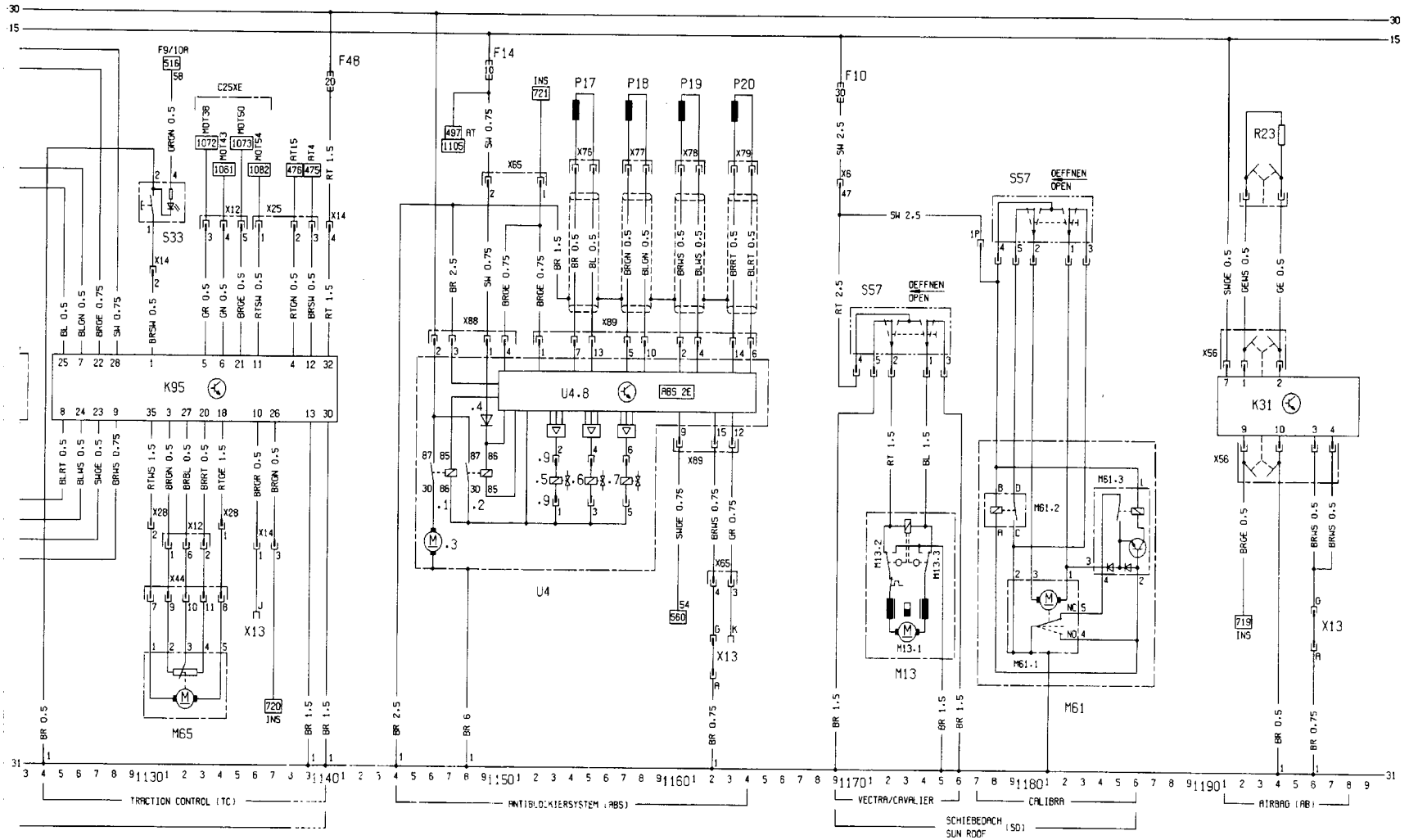
Wiring diagram for 1992-on models (continued)



Wiring diagram for 1992-on models (continued)



Wiring diagram for 1992-on models (continued)



Wiring diagram for 1992-on models (continued)