

increase of pressure at the condenser (cut in at appr. 15 bar):

- it stops the compressor, de-energizing the electromagnetic joint. If the pressure reaches very high, thus dangerous, values (above appr. 28 bar), or very low values to ensure correct operating conditions (below appr. 2.45 bar):

minimum pressure switch (defroster) - Boxer and T.SPARK versions only - : this disconnects the compressor when the pressure is too low (<1.7 bar) to prevent the danger of the evaporator "frosting". It also protects the compressor from sharp pressure falls, caused for example by leaks in the circuit.

compressor cutoff thermal contact: - TD version only - : this cuts off the compressor if the engine temperature reaches dangerously high levels (it is a contact to be found on the thermostatic cup, which cuts in opening the circuit above 111°C).

full load switch - TD version only - : this is a mechanical microswitch on the injection pump which, through the special compressor cutout control unit, cuts in to shut off the compressor temporarily when the accelerator pedal is completely depressed (full load).

compressor cutout control unit - TD version only - : this momentarily cuts out the cooling system under particular circumstances in which the engine needs to be able to deliver the maximum power to the wheels, eliminating the absorption of power by the compressor (for example when overtaking, rapid accelerations, uphill driving, etc.).

The control unit activates the following **operating logic**, or rather two different logics at low and high rpms: below 2000 rpm as soon as the full load switch closes, the compressor electromagnetic joint is de-energised, and vice versa it is engaged as soon as the switch opens again; above 2000 rpm the supply is cut off only for 8 seconds, then it is restored.

Engine fan control

When the car is travelling at low speed the cooling action of the dynamic air on the condenser is reduced and it is necessary to turn on the two fans which cool the engine radiator and the actual condenser. This is done by the trinary pressure switch which cuts in preventing an increase of the pressure at the condenser (over 15.2 bar).

The engine fans are firstly turned on at first speed, then through a timer - not fitted on the T.SPARK version - they gradually pass to second speed avoiding sudden actuations and overloads at the relay contacts.

The delay device works according to the following logic:

- The first speed is turned on with a signal from the pressure switch on the cooling fluid circuit: after appr. 8-12 seconds, if this signal persists, the delaying device operates the second speed.
- When the signal from the pressure switch ceases, the second speed is turned off immediately and the delaying device operates the first speed for appr. 0.5 second more.

Fuses and relays:

There is a box (**Q41**) in the engine compartment which contains the relays and fuses associated with the air conditioning system:

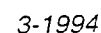
- cooling fan delaying device (**Q42**);
- compressor electromagnetic joint relay (**Q22**);
- additional compressor relay (**Q32**); - Boxer versions only
- 1st fan speed relay (**I99b**);
- 2nd fan speed relay (**I100**); - Boxer versions only
- 7.5A wander fuse (**Q65**);
- 3A wander fuse (**Q66**) - Boxer versions only

There is also the relay unit supply wander fuse and the 30A conditioning fuses (**Q39**), located next to the branch terminal box (Boxer versions only).

N.B.: For T.SPARK and boxer versions from chassis no. 4065018, and from chassis no. ... for the TD version, box **Q41** is no longer present, and the fuses and relays are located on the bracket next to the fusebox

For further details concerning this system, refer to Group 50 "CLIMATE CONTROL".

Wiring diagram



Functional description

Fan:

The heater and ventilation fan **Q1** is supplied with battery voltage through the key-operated services relay **I35** - located in fusebox **G1** -; in addition to the supply line relay also through fuse **F13** of fusebox **G1**.

In the versions with fusebox "B" downstream of fuse **F13**, there is also a special relay **I78** which controls fan **Q1** with a supply protected by fuse **G255** (30A).

The motor of fan **Q1** is operated with an earth signal leading from the control knob **Q4**. This signal crosses the speed regulator **Q5**, which is formed of three resistances in series and which determine the four different speeds depending on the signal from knob **Q4**: from pin 2 of connector B (1st speed), from pin 1 of connector B (2nd speed), from pin C of connector A (3rd speed) and lastly from pin B of connector A (4th speed) with a direct signal that does not cross the regulator **Q5**.

NOTE : the regulator **Q5** has a built-in thermometric safety switch which de-activates the circuit if a temperature of $90\pm5^{\circ}\text{C}$ is exceeded due to excess voltage (it closes again when the temperature falls by appr. 10°C).

First fan speed with the compressor operating:

With control **Q4** in the "0" position the fan **Q1** is stopped but it is operated at first speed if the compressor is turned on: in this case a special relay

Q69 controls the fan supply at first speed. In fact, this switch is supplied from the ignition switch via fuse **F17** of **G1** - it is energized by the same earth signal that turns the compressor on (from switch **Q68** through pins 7 and 8 of connector B of knob **Q4**) and sends a signal to the regulator **Q5** in correspondence of the 1st speed.

Recirculation:

The recirculation function is achieved by actuating motor **Q27**, according to the following supply logic:

- pin 2 of **Q27** always earthed;
- 12 V at pin 3 of **Q27**: the motor turns operating recirculation;
- 12 V at pin 1 of **Q27**: the motor turns shutting off recirculation.

Turning on takes place through switch **Q68** but with switch **Q4** on "0", "1", etc....:

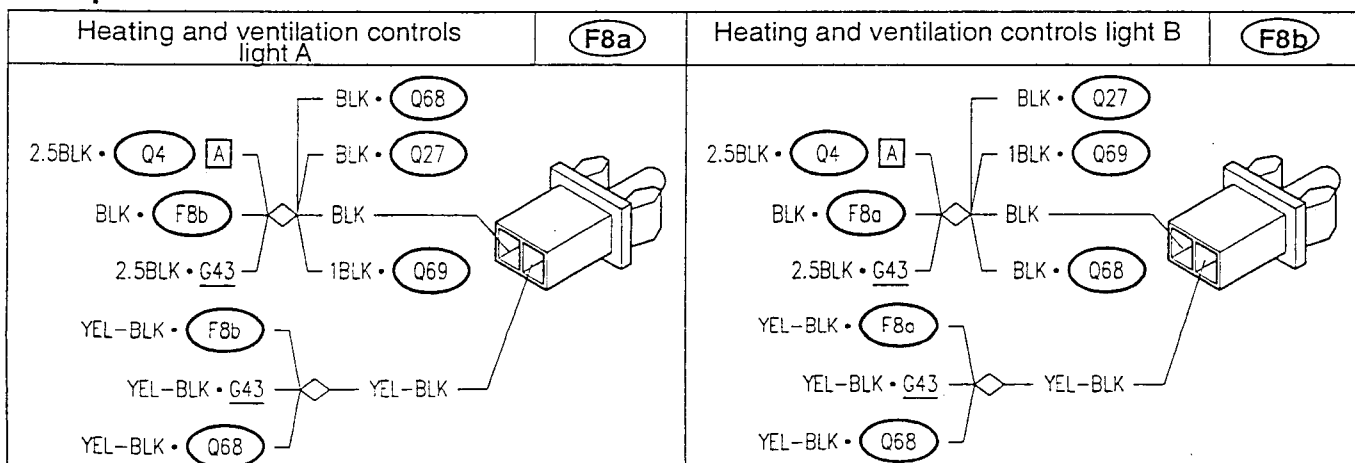
- switch **Q68** not pressed: recirculation not turned on;
- switch **Q68** pressed: recirculation turned on.

N.B.: With switch **Q4** at "OFF" recirculation is operational regardless of the position of switch **Q68**.

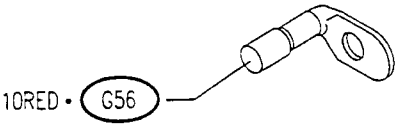
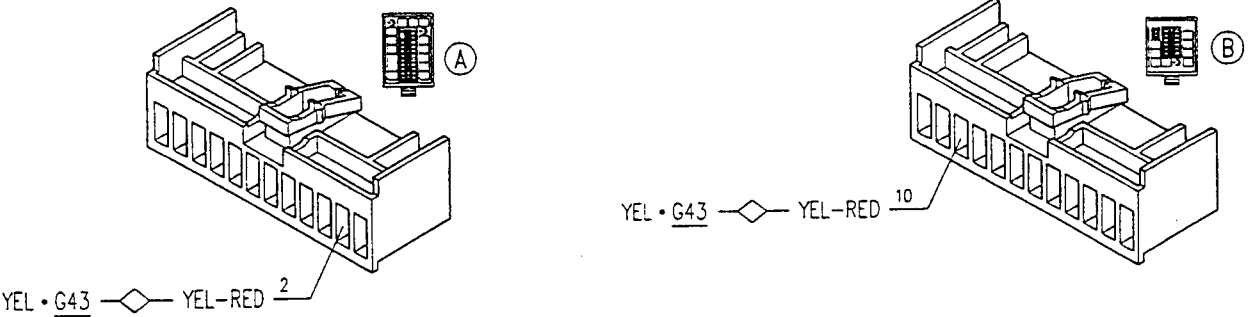
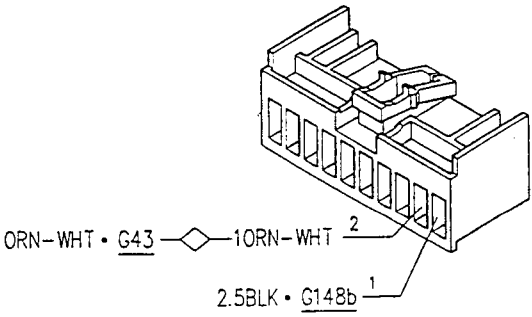
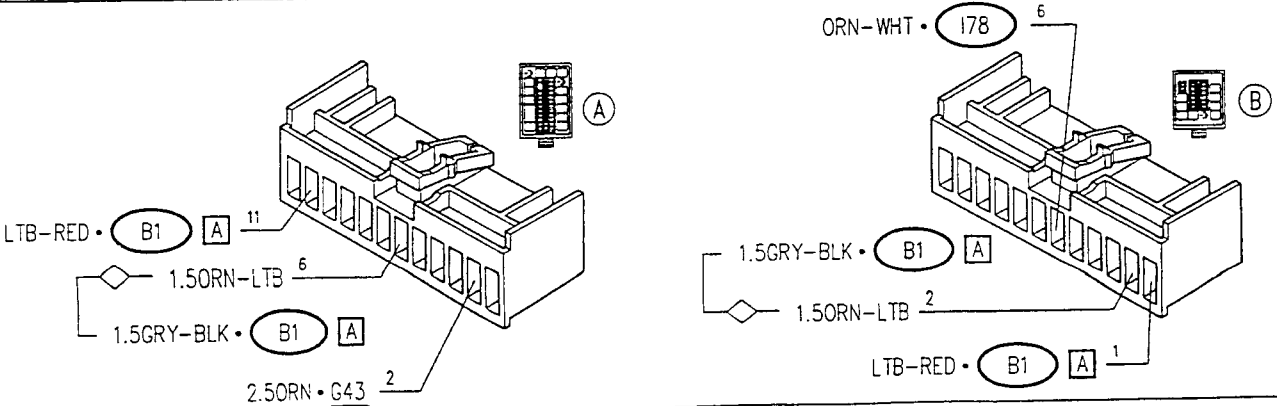
Controls lighting:

Lights **F8a** and **F8b**, located inside the control panel, together with the led next to switch **Q68** are supplied by the side lights circuit - connector D of fusebox **G1**.

Components and connectors



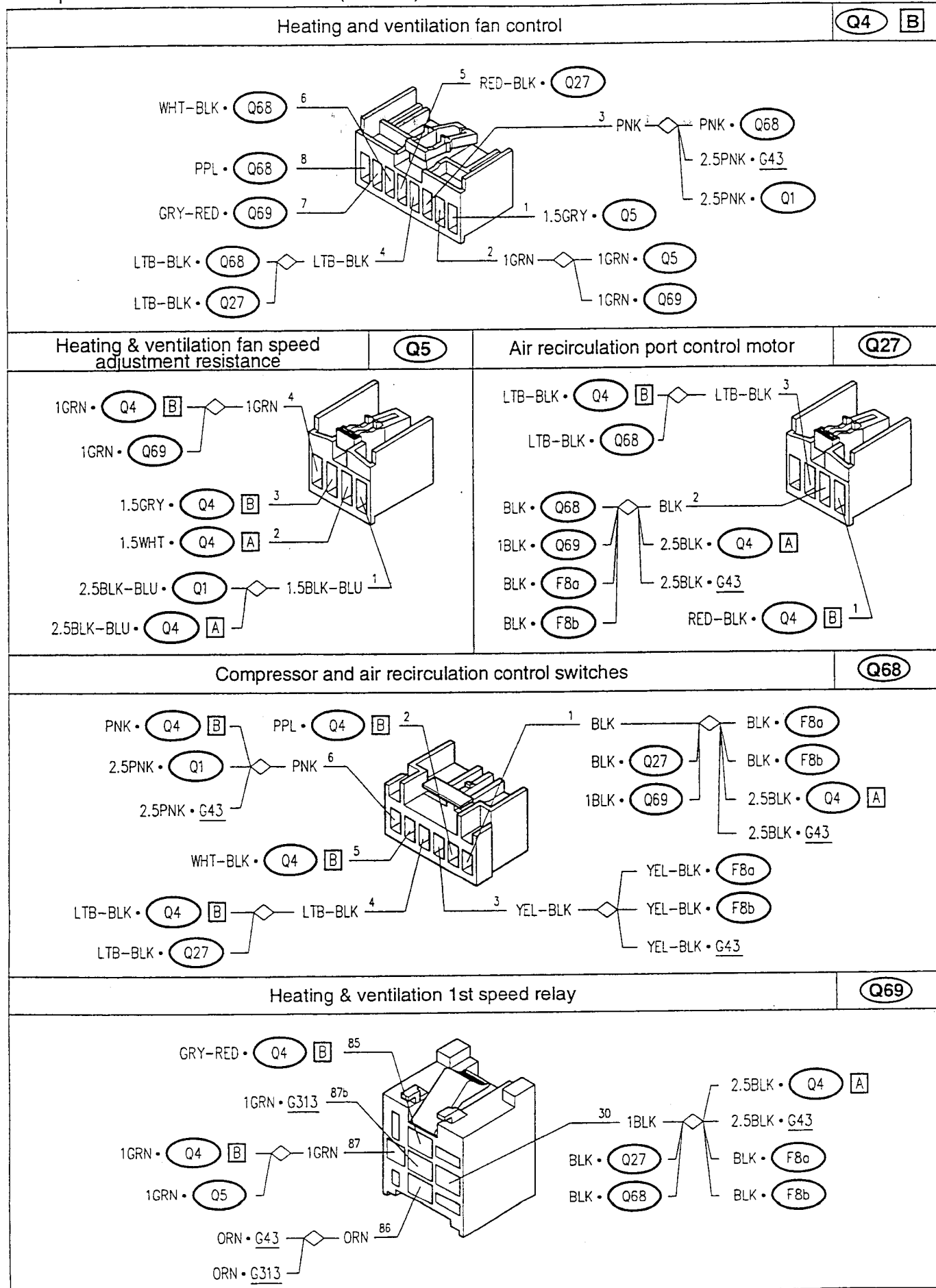
Components and connectors (cont.d)

<p>Fusebox</p>  <p>10RED • G56</p>	<p>G1</p>
<p>Fusebox</p>  <p>YEL • G43 — YEL-RED 2</p> <p>YEL • G43 — YEL-RED 10</p>	<p>G1 D</p>
<p>Fusebox</p>  <p>ORN-WHT • G43 — 1ORN-WHT 2</p> <p>2.5BLK • G148b 1</p>	<p>G1 G</p>
<p>Fusebox</p>  <p>LTB-RED • B1 11</p> <p>1.5ORN-LTB 6</p> <p>1.5GRY-BLK • B1 2</p> <p>2.5ORN • G43 2</p> <p>ORN-WHT • 178 6</p> <p>1.5GRY-BLK • B1 2</p> <p>LTB-RED • B1 1</p>	<p>G1 H</p>

Components and connectors (cont.d)

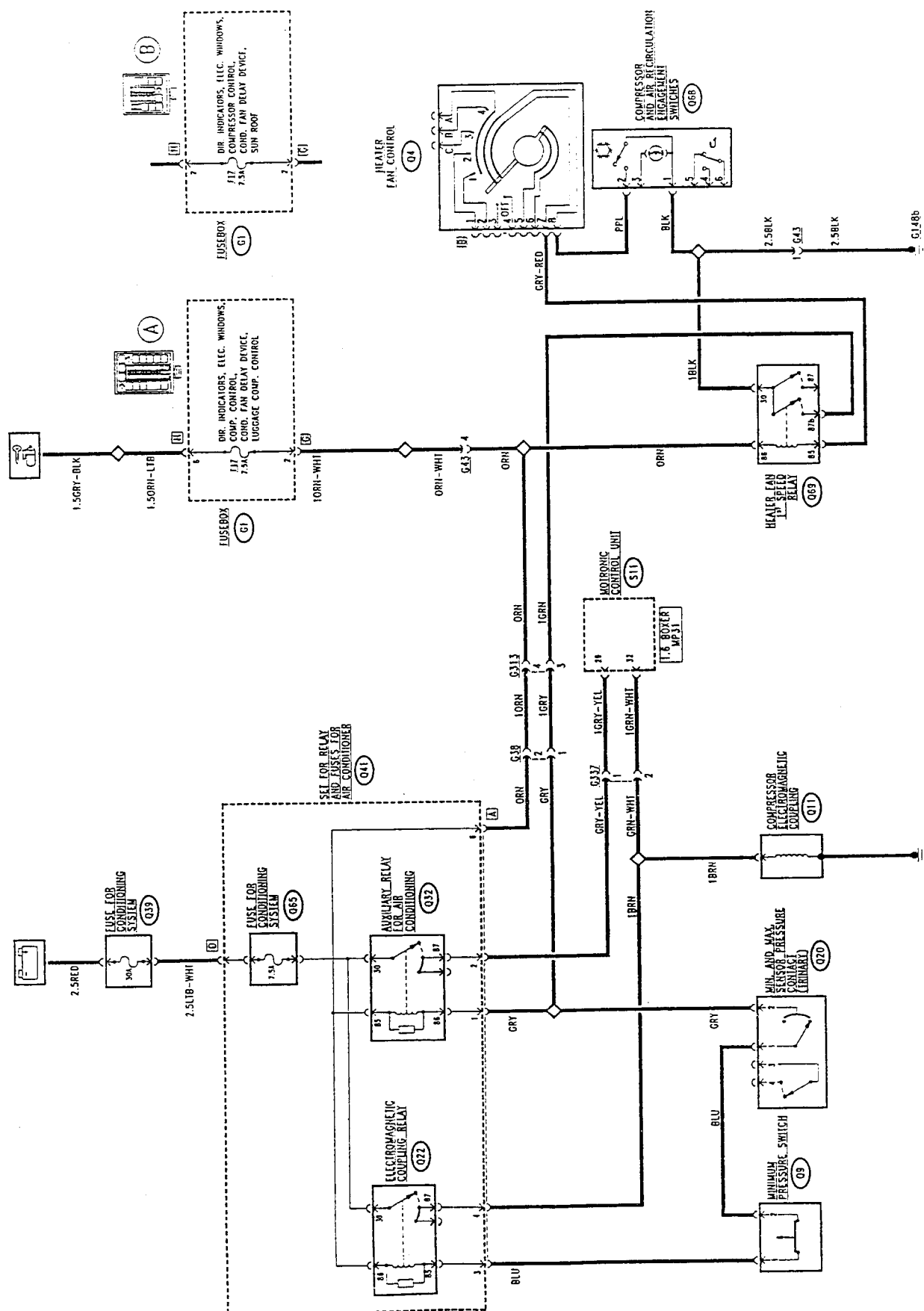
Heating & ventilation control wiring connector		G43	
<p>1 ORN-WHT • G1 [G] 4 ORN-WHT ③ 2.5ORN • G1 [H] ④ 2.5ORN • I78 YEL-RED • G1 [D] YEL 2 2.5BLK • G148b 1 BLK • Q68 BLK • F8b BLK • F8a BLK • Q27 2.5BLK 1 1BLK • Q69 2.5BLK • Q4 [A] 3 2.5PNK 2.5PNK • Q1 4 ORN 2 YEL-BLK PNK • Q68 PNK • Q4 [B] ORN • G313 ORN • Q69 YEL-BLK • F8a YEL-BLK • F8b YEL-BLK • Q68</p>			
Earth under LH dashboard.	G148b	Heating and ventilation fan fuse	G255
<p>③ BLK • I78 1.5BLK 2.5BLK • G1 [G] 2.5BLK • G43</p>		<p>2.5RED • I78 4RED • G56 2.5RED</p>	
Heating & ventilation fan relay	I78	Heating & ventilation fan	Q1
<p>1.5BLK • G148b BLK 85 2.5ORN • G43 87 ORN-WHT • G1 [H] 86 2.5RED • G255 30</p>		<p>2.5BLK-BLU • Q4 [A] 2.5BLK-BLU 1 1.5BLK-BLU • Q5 PNK • Q4 [B] PNK • Q68 2.5PNK • G43 2.5PNK 2</p>	
Heating and ventilation fan control			Q4 [A]
<p>2.5BLK • G43 BLK • Q27 BLK • Q68 1BLK • Q69 BLK • F8a BLK • F8b 2.5BLK A</p>			

Components and connectors (cont.d)



COMPRESSOR CONNECTION

Wiring Diagram (Boxer version 1.6- MOTRONIC MP3.1)



Functional Description

- up to chassis no. 4065017

The electromagnetic joint which operates the compressor **Q11** is controlled by relays **Q22** and **Q32**, to be found in the set of relays and fuses **Q41**.

Relays **Q22** and **Q32**, have the coil supplied from the ignition switch (line protected by fuse **F17** of **G1**); their power line is supplied by battery voltage through fuse **Q65** (7.5A), also located in group **Q41**, as well as through floating fuse **Q39** (30A) which protects the entire system.

Relay **Q22** is energized and consequently supplies 12V to the electromagnetic joint **Q11**, according to the following logic:

BOXER Version 1.6 (MOTRONIC MP3.1) :

- Relay **Q32** is energized by a signal leading from **Q69**, which is in turn energized with a signal leading from the compressor operating switch **Q68**; this signal crosses the control knob **Q4** which interrupts it when the knob itself is in the "OFF" position. In this condition, the compressor cannot be turned on. It should be remembered that the same signal controls the first speed of the fan contemporaneously ("Fan and Recirculation Control").
- the same control signal is also sent to the other relay **Q22**: this signal crosses the minimum pressure switch (antifrost) **Q9** and the minimum and maximum pressure switch (trinary) **Q20** which intervene if the pressure in the cooling system is too high or too low: in this case the control signal does not reach **Q22** which operates the compressor.
- relay **Q32** sends a signal to the Motronic control unit MP3.1 (pin 29) which informs this system about the "request" to turn on the compressor.
- the other signal sent to the control unit (pin 32 of the Motronic MP3.1 control unit) is the one which supplies joint **Q11**, and thereby informs that the compressor has actually been turned on.

BOXER Version 1.7 16v:

- relay **Q32** is energized by a signal leading from relay **Q69**, which is in turn energized with a signal leading from the compressor switch **Q68**; This signal crosses the control knob **Q4** which interrupts it when the knob itself is in the "OFF" position. In fact in this condition, the compressor cannot be turned on. It

should be remembered that the same signal controls the first speed of the fan contemporaneously ("Fan and Recirculation Control").

- relay **Q32** consequently sends two signals to the Motronic M2.10 control unit **S11**; a direct "request" signal to turn the compressor on to pin 41, and a second signal which crosses the minimum pressure switch (antifrost) **Q9** and the minimum and maximum pressure switch (trinary) **Q20** which intervene if the pressure in the cooling system is too high or too low: in this case the signal does not reach the control unit at pin 40, and the control unit does not command the turning on of the compressor
- the control unit "refers" the command signal - pin 32 of **S11** - to relay **Q22** which is energized and supplies joint **Q11** which turns on the compressor, but only when the internal logic has ascertained determinate conditions (for example the compressor does not turn on in the event of the engine requiring full power, etc...)

BOXER Version 1.3 and BOXER 1.6 (ROCHESTER):

- relay **Q32** is energized by a signal leading from relay **Q69**, which is in turn energized with a signal from the compressor operating switch **Q68**; this signal crosses the control knob **Q4** which interrupts it when the knob is at the "OFF" position: indeed in this condition the compressor cannot be turned on. It should be remembered that the same signal controls the first speed of the fan contemporaneously ("Fan and Recirculation Control").
- relay **Q32** consequently sends a signal to the IAW control unit **S40**, to pin 8 (IAW) or pin A8 (Rochester), which crosses the minimum pressure switch (antifrost) **Q9** and the minimum and maximum pressure switch (trinary) **Q20** which intervene if the pressure in the cooling system is too high or too low: in this case the signal does not reach the control unit **S40** which does not command the turning on of the compressor
- the control unit "refers" the command signal - pin 24 (IAW) or pin A15 (Rochester) of **S40** - to relay **Q22** which is energized and supplies joint **Q11** which turns on the compressor, but only when the internal logic has ascertained determinate conditions (for example the compressor does not turn on in the event of the engine requiring full power, etc...)

Functional description

- from chassis no. 4065018

The electromagnetic joint which operates the compressor **Q11** is controlled by relays **Q22** and **Q32**, located on the auxiliary bracket for relays and fuses.

Relays **Q22** and **Q32**, have the coil supplied from the ignition switch (line protected by fuse **F17** of **G1**); conversely the power line is supplied by battery voltage via fuse **Q65** (7.5A).

The relay **Q22** is energised, and thus supplies 12 V current to the electromagnetic joint **Q11**, according to the following logic:

BOXER 1.7 16v version:

- the relay **Q32** is energised by a signal leading from relay **Q69**, which is in turn energised with a signal leading from the compressor engagement switch **Q68**; this signal crosses the control knob **Q4** which cuts it off when the knob is at "OFF": in this condition, in fact, the compressor can not be engaged. You are reminded that the same signal simultaneously controls engagement of the fan at first speed ("Fan and Recirculation control")
- the relay **Q32** consequently sends two signals to the Motronic M2.10 control unit **S11**,: a direct signal to "request compressor engagement" at pin 41, and a second signal which crosses the minimum pressure switch (antifrost) **Q9** and the minimum and maximum pressure switch (trinary) **Q20** which cut in in the event of high or low pressure in the cooling system: in this case the signal does not reach the control unit at pin 40, and this does not command engagement of the compressor

- the control unit "relays" the command signal - pin 32 of **S11** - to relay **Q22** which is energised and supplies the joint **Q11** which thereby engages the compressor, but only when the internal logic has checked determinate conditions (e.g. the compressor does not engage in the case of the need for full power at the engine, etc..)

BOXER 1.3 and BOXER 1.6 (ROCHESTER) version

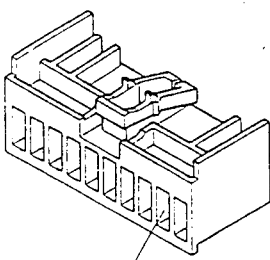
- the relay **Q32** is energised by a signal leading from relay **Q69**, which is in turn energised with a signal leading from the compressor engagement switch **Q68**; this signal crosses the control knob **Q4** which cuts it off when the knob is at "OFF": in this condition, in fact, the compressor can not be engaged. You are reminded that this signal simultaneously controls engagement of the fan at 1st speed ("Fan and Recirculation control")
- the relay **Q32** consequently sends a signal to the control unit **S40**, at pin 8 (IAW) or pin A8 (Rochester), which crosses the minimum pressure switch (antifrost) **Q9** and the minimum and maximum pressure switch (trinary) **Q20** which cut in if the event of high or low pressure in the cooling system: in this case the signal does not reach the control unit **S40** and this does not engage the compressor
- the control unit "relays" the command signal - pin 24 (IAW) or pin A15 (Rochester) di **S40** - to relay **Q22** which is energised and supplies the joint **Q11** which thereby engages the compressor, but only when the internal logic has checked determinate conditions (e.g. the compressor is not engaged if the engine needs full power, etc..)

Components and Connectors

Fusebox

G1

G

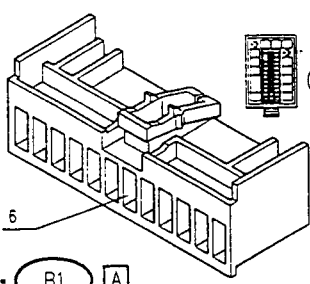


ORN-WHT • G43 1ORN-WHT 2

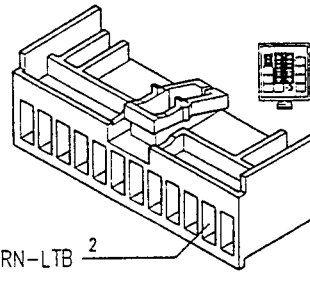
Fusebox

G1

H



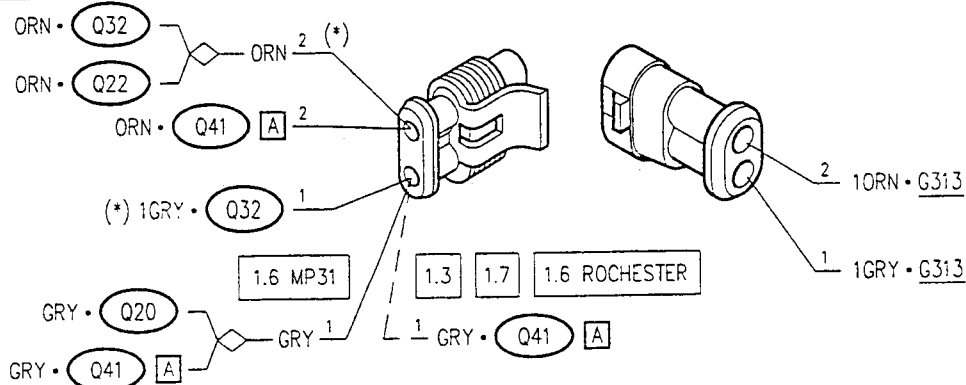
1.5ORN-LTB 6
1.5GRY-BLK • B1 A



1.5ORN-LTB 2
1.5GRY-BLK • B1 A

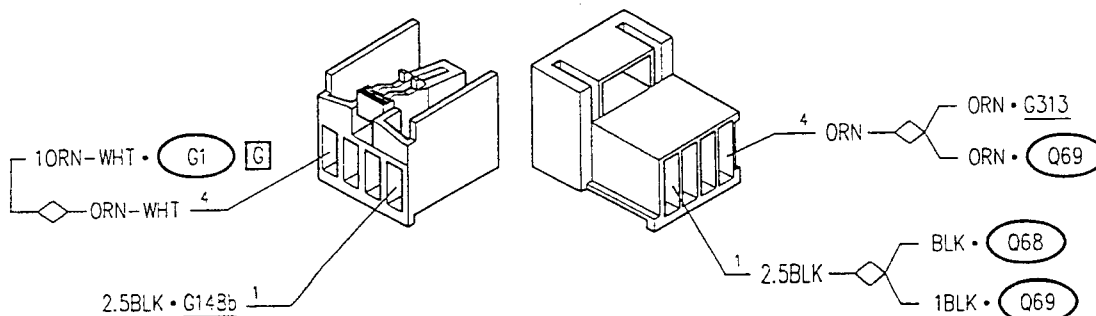
Air conditioner wiring connector

G38

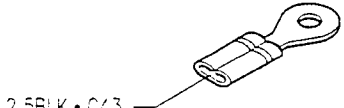
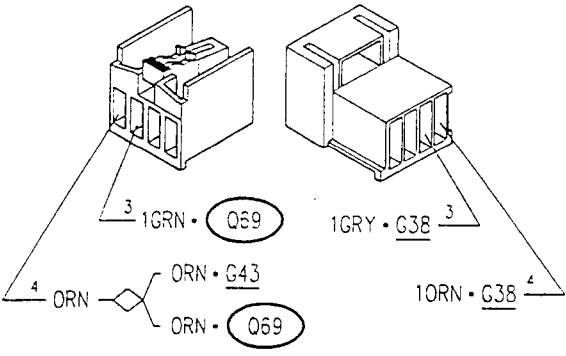
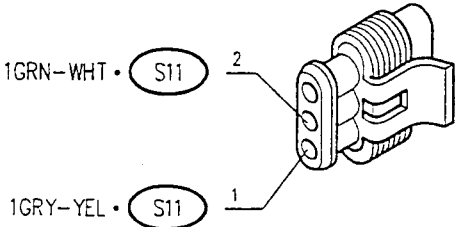
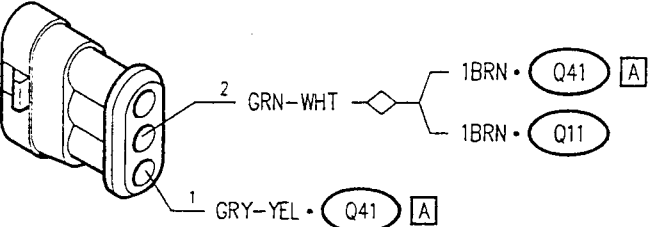
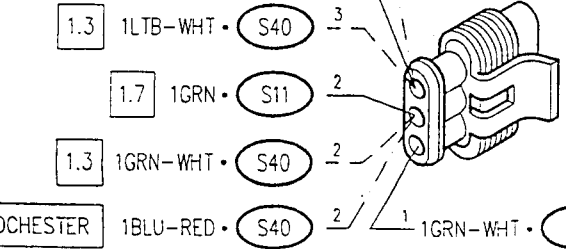
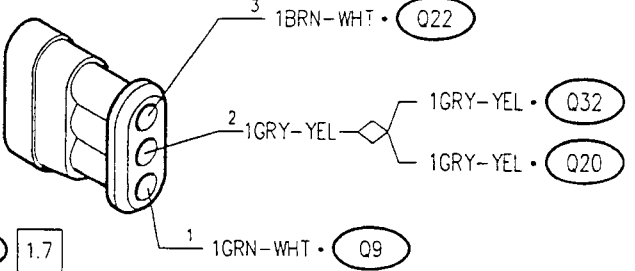


Heating & ventilation wiring connector

G43



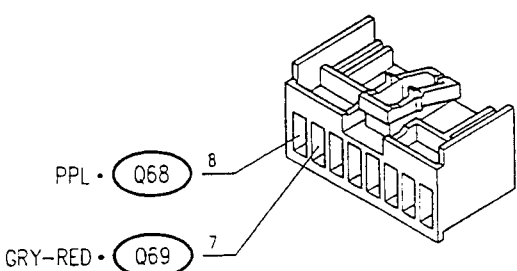
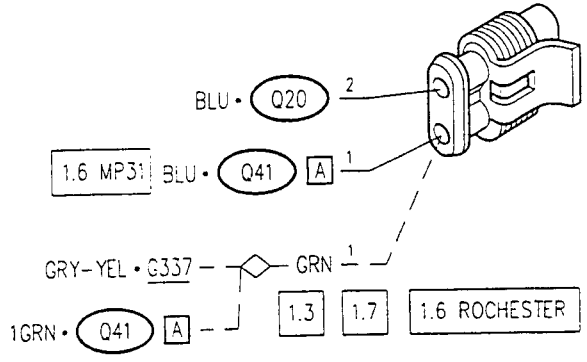
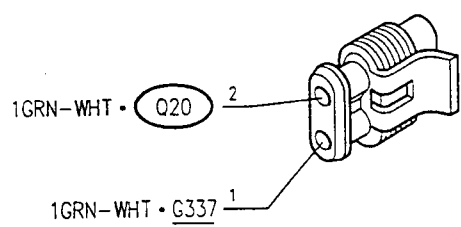
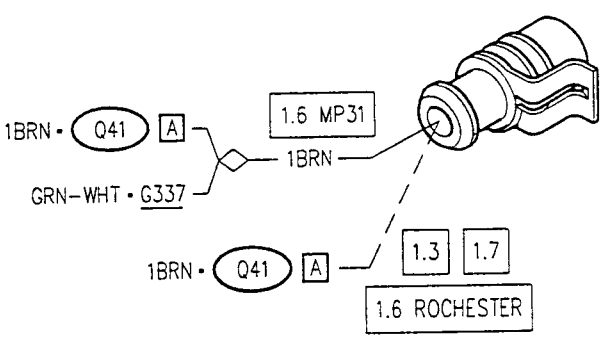
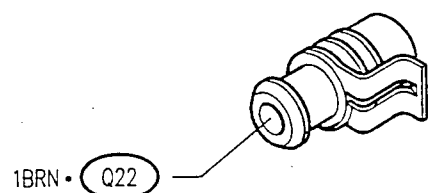
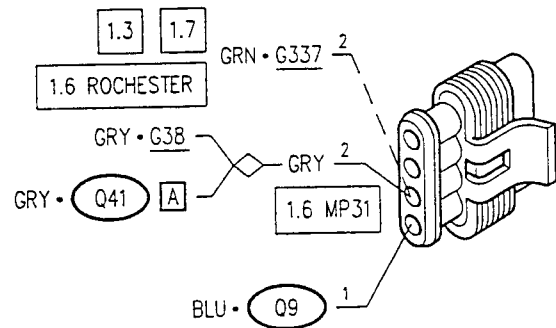
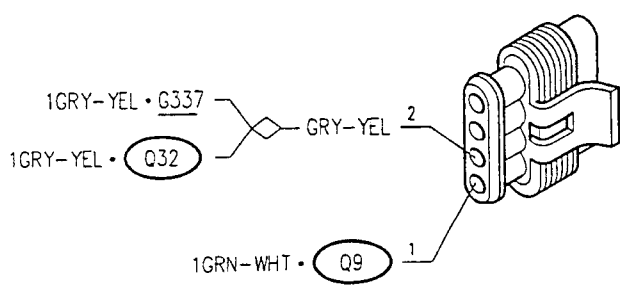
Components and connectors (cont.d)

Earth under LH dashboard.	G148b	Additional conditioner wiring connector	G313
 <p>2.5BLK • G43</p>			
Conditioner system/injection system connector			G337
 <p>1.6 MP31</p> <p>1GRN-WHT • S11</p> <p>1GRY-YEL • S11</p> <p>1.6 ROCHESTER 1BLU • S40</p> <p>1.7 1BLU • S11</p> <p>1.3 1LTB-WHT • S40</p> <p>1.7 1GRN • S11</p> <p>1.3 1GRN-WHT • S40</p> <p>1.6 ROCHESTER 1BLU-RED • S40</p>			 <p>1.6 ROCHESTER</p> <p>1.3 1.7</p> <p>1.6 ROCHESTER</p> <p>1GRN-WHT • S11</p> <p>GRN-WHT</p> <p>LTB-WHT • Q41</p> <p>1BRN • Q41</p> <p>1BRN • Q11</p> <p>GRY-YEL • Q41</p> <p>GRN • Q20</p> <p>1GRN • Q41</p> <p>GRN • Q9</p>
Conditioner system/injection system connector			G337
 <p>1.6 ROCHESTER</p> <p>1.3 1.7</p> <p>1.6 ROCHESTER</p> <p>1BLU • S40</p> <p>1.7 1BLU • S11</p> <p>1.3 1LTB-WHT • S40</p> <p>1.7 1GRN • S11</p> <p>1.3 1GRN-WHT • S40</p> <p>1.6 ROCHESTER 1BLU-RED • S40</p>			 <p>1.6 ROCHESTER</p> <p>1.3 1.7</p> <p>1.6 ROCHESTER</p> <p>1BLU • S40</p> <p>1.7 1BLU • S11</p> <p>1.3 1LTB-WHT • S40</p> <p>1.7 1GRN • S11</p> <p>1.3 1GRN-WHT • S40</p> <p>1.6 ROCHESTER 1BLU-RED • S40</p> <p>1GRN-WHT • S11</p> <p>1BRN-WHT • Q22</p> <p>1GRY-YEL • Q32</p> <p>1GRY-YEL • Q20</p> <p>1GRN-WHT • Q9</p>

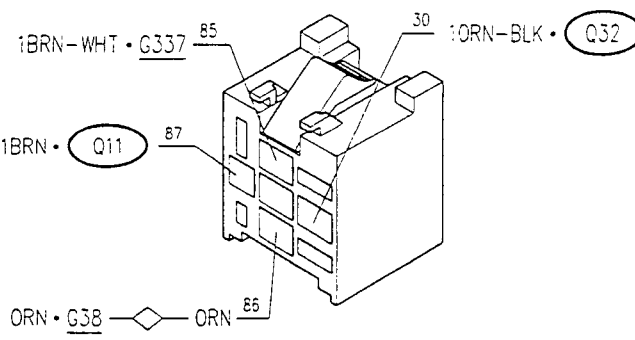
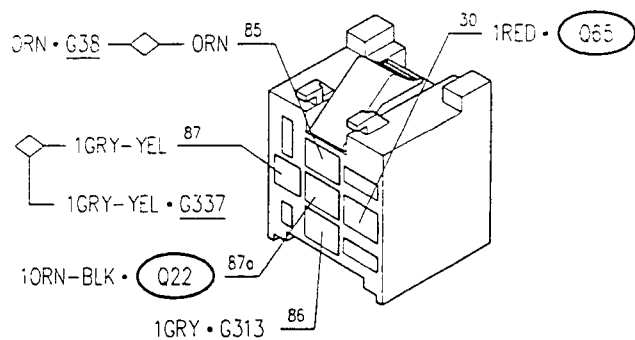
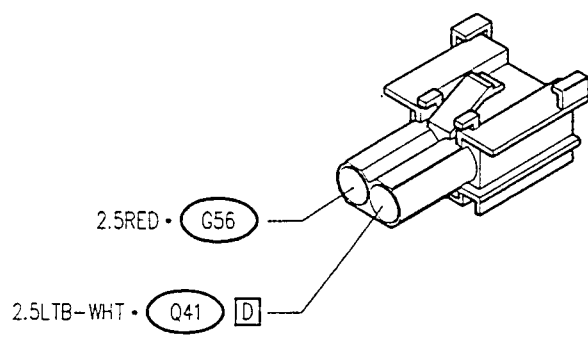
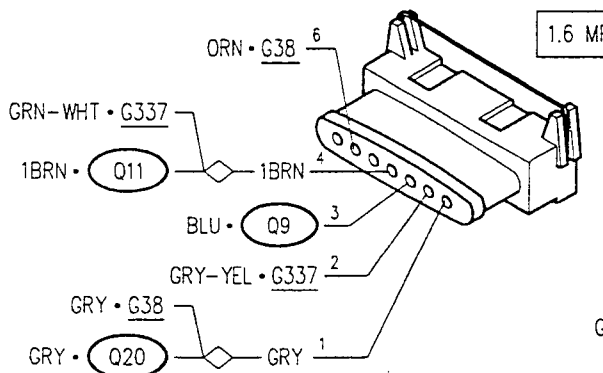
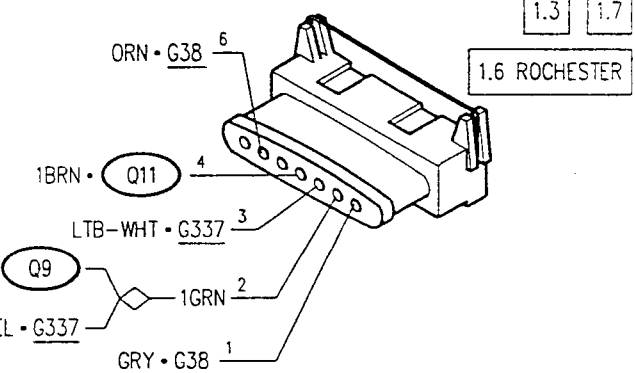
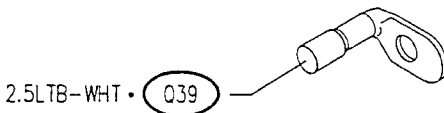
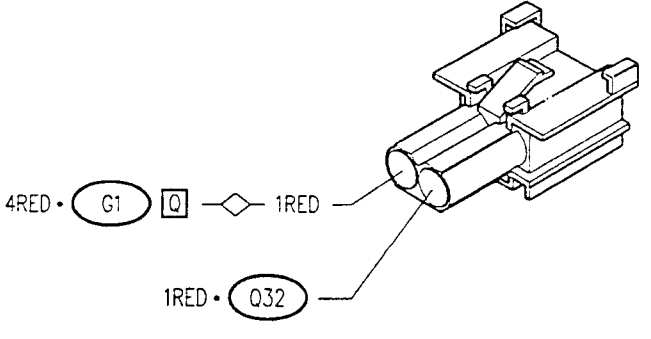
(*) from chassis no. 4065018

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Components and connectors (cont.d)

Heating and ventilation fan control	Q4 B	Minimum pressure switch	Q9
			
Minimum pressure switch (*)	Q9	Compressor electromagnetic joint	Q11
			
Compressor electromagnetic joint (*)	Q11	Min. & max. sensor pressure contact (Trinary)	Q20
			
Min. & max. sensor pressure contact (Trinary) (*)			Q20
			

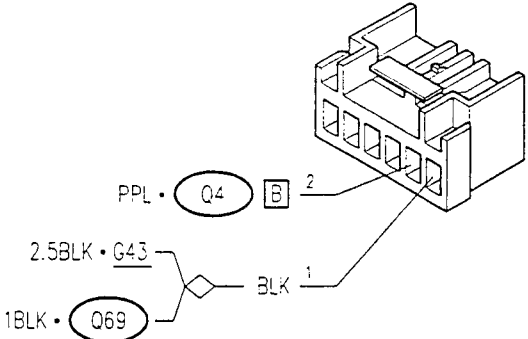
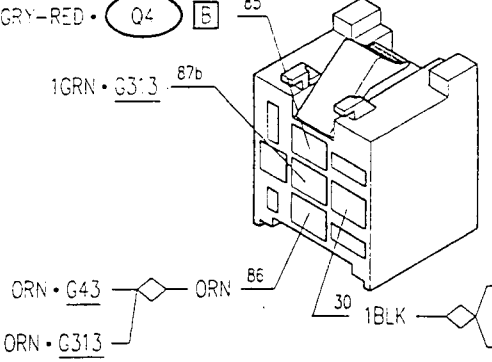
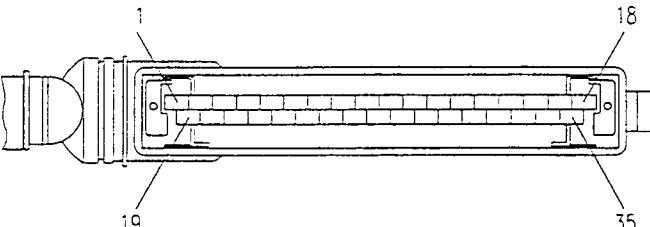
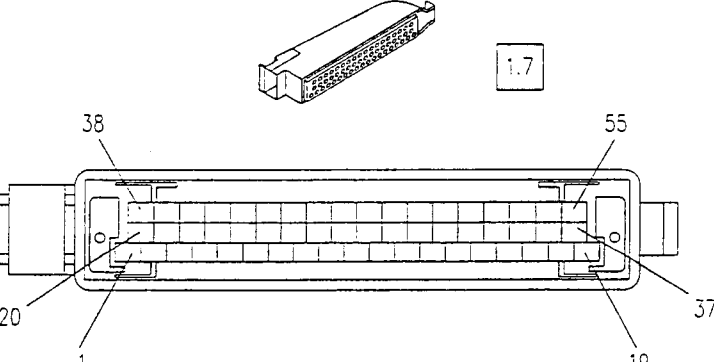
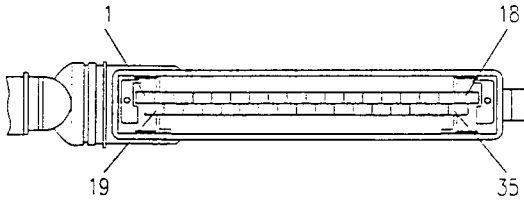
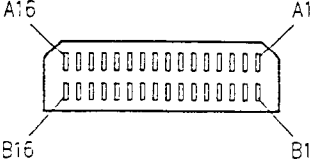
Components and connectors (cont.d)

<p>Electromagnetic coupling relay Q22</p> 	<p>Auxiliary relay for heating and ventilation Q32</p> 
<p>Conditioner system floating fuse-30A (•) Q39</p> 	
<p>Set of conditioner relays and fuses (•) Q41 A</p> <div style="display: flex; justify-content: space-around;"> <div data-bbox="159 1247 766 1621"> <p>1.6 MP31</p>  </div> <div data-bbox="829 1247 1468 1621"> <p>1.3 1.7 1.6 ROCHESTER</p>  </div> </div>	
<p>Set of conditioner relays and fuses (•) Q41 D</p> 	<p>Fuse for conditioning system-7.5 A Q65</p> 

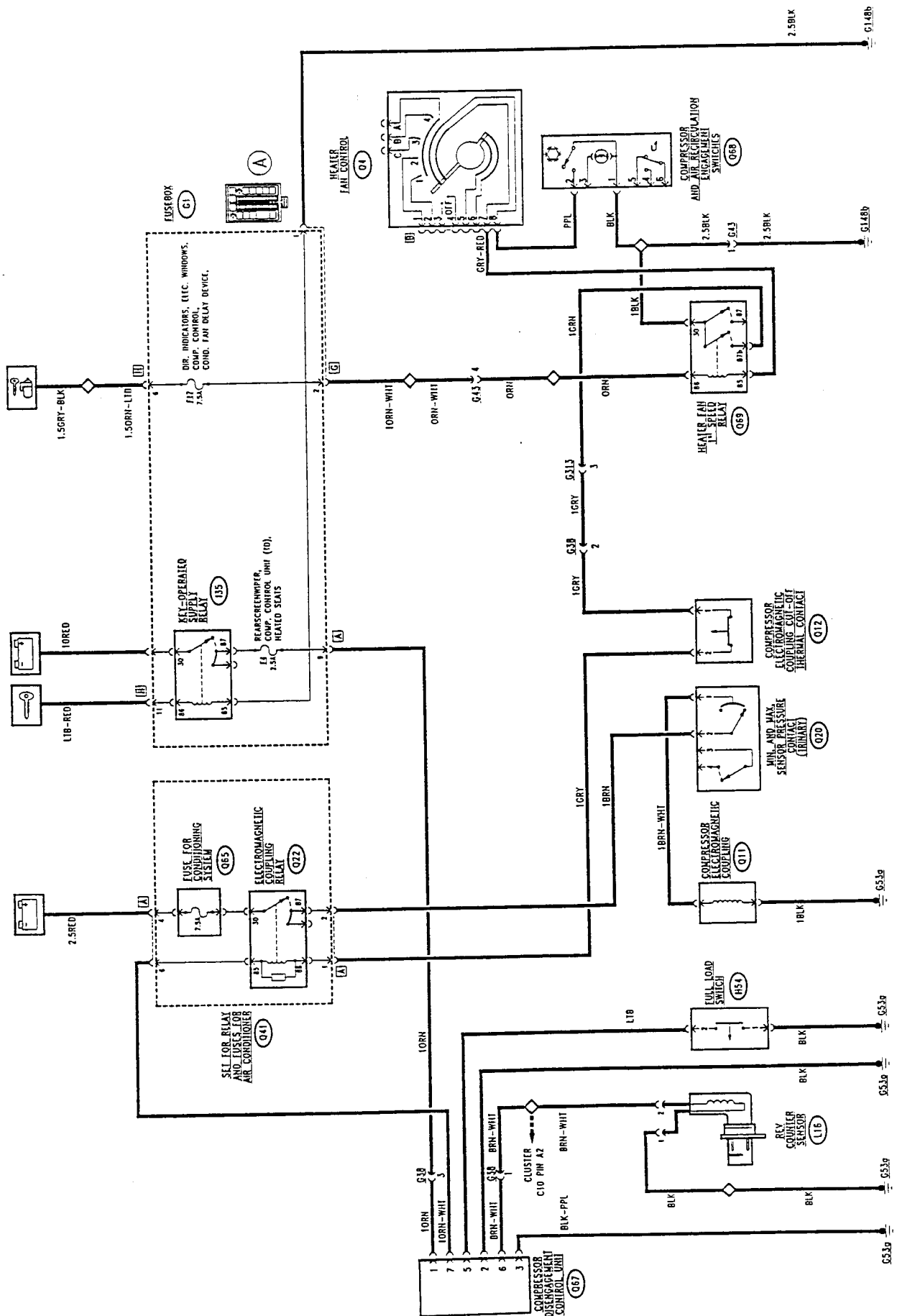
(•) only up to chassis no. 4065017

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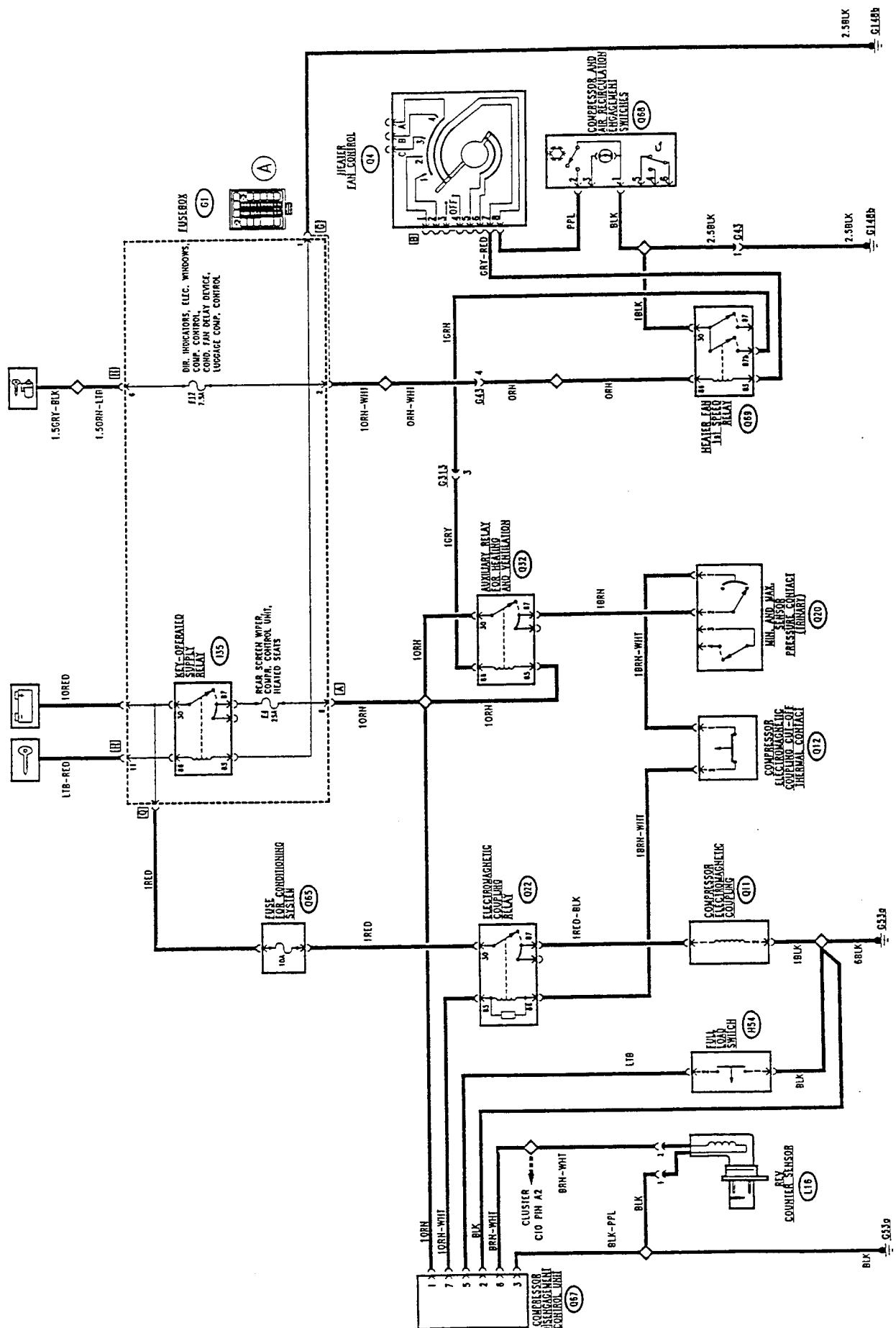
Components and connectors (cont.d)

Compressor and air recirculation switches	Q68	Heater fan 1st speed relay	Q69
 <p> PPL • Q4 [B] 2 2.5BLK • G43 1BLK • Q69 BLK 1 </p>		 <p> GRY-RED • Q4 [B] 85 1GRN • G313 87b ORN • G43 86 ORN • G313 2.5BLK • G43 1BLK BLK • Q68 </p>	
Motronic control unit			S11
<p> <u>29</u> 1GRY-YEL • G337 <u>32</u> 1GRN-WHT • G337 </p>  <p> <u>32</u> 1BLU • G337 <u>40</u> 1GRN • G337 <u>41</u> 1GRN-WHT • G337 </p> 			
Injection/ignition control unit			S40
<p> <u>8</u> 1GRN-WHT • G337 <u>32</u> 1LTB-WHT • G337 </p>  <p> <u>A8</u> 1BLU-RED • G337 <u>A15</u> 1BLU • G337 </p> 		<p> 1.3 1.6 ROCHESTER </p>	

Wiring Diagram (TD version - up to chassis no.)



Wiring Diagram (TD version - from chassis no.)



Functional Description

The electromagnetic joint which operates the compressor **Q11** is operated by the corresponding relay **Q22**.

Relay **Q22** is supplied directly by the battery, via fuse **Q65**.

The two energising signals (12 V and earth) reach the relay **Q22** from the compressor cutout control unit **Q67**, and from the control switch **Q68**:

- the earth signal leads from relay **Q69**, which is energised with a signal leading from the compressor cutout switch **Q68**; this signal crosses the control knob **Q4** which cuts it off when the actual knob is in the "OFF" position: in this condition, in fact, the compressor cannot be engaged. In addition, before reaching relay **Q22** crosses the compressor cutout thermal contact **Q12** - which disengages the compressor if the engine is very hot, and - from chassis no. - pressure switch **Q20**. In this version there is also an auxiliary relay **Q32** which is energised by the earth signal leading from relay **Q69** and controls relay **Q21**.
- the signal from the control unit **Q67** is either 12 V or 0 V (earth), according to the following logic, in relation to engine rpm (information picked up directly from the rev counter sensor **L16**):
 - up to 2000 rpm: when the full load switch **H54** closes, an earth signal leaves the control unit - pin

7- therefore the compressor electromagnetic joint is not energised; vice versa as soon as the switch opens again, the signal from pin 7 becomes 12 V, energising the joint;

- above 2000 rpm: the earth signal is timed and lasts only for 8 seconds, then it becomes 12 V, therefore the joint is energised and engages the compressor, provided that the pushbutton **Q68** has been pressed.

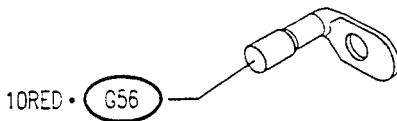
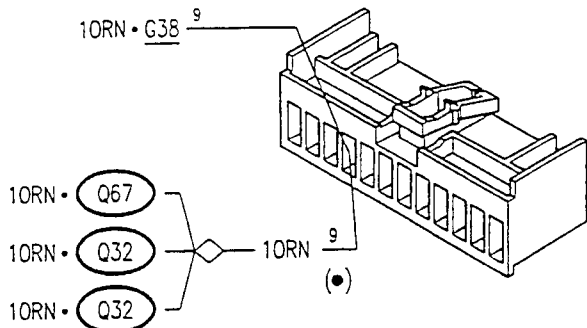
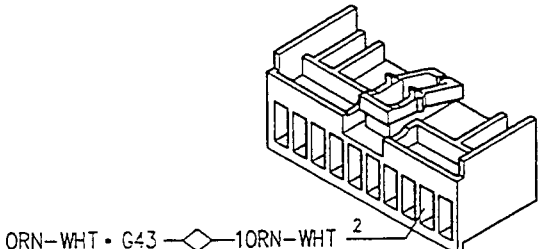
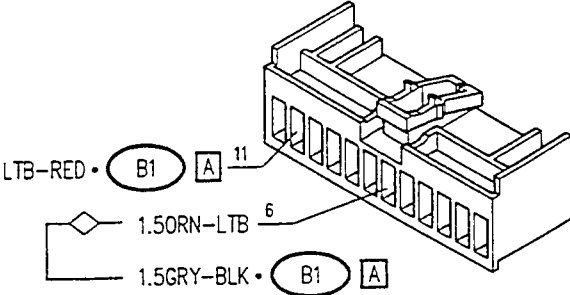
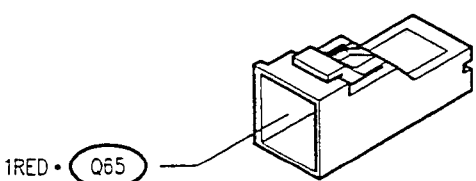
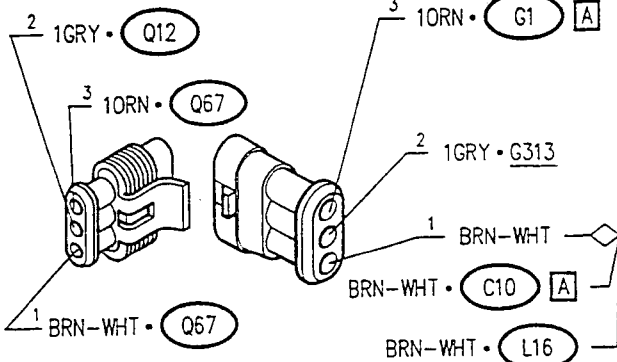
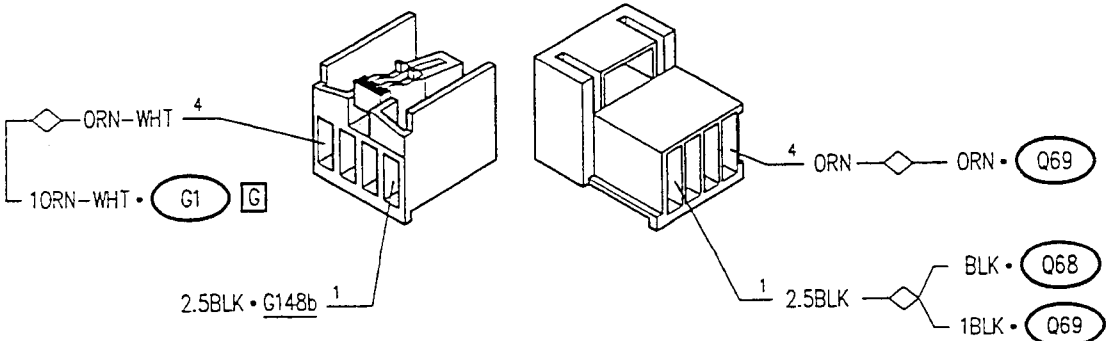
The control unit **Q67** is connected, as mentioned previously, to the rev counter sensor **L16** at pins 3 and 6, to switch **H54** at pin 5; pin 2 is earthed, while pin 1 receives the "key- operated" supply via relay **I35** and fuse **F4** of the fusebox **G1**: the signal for engaging the compressor leaves pin 7 as described above.

When it is energised, relay **Q22** operates the compressor electromagnetic joint **Q11** which engages the compressor.

This control signal - up to chassis no. - must not however be cut off by the minimum and maximum pressure switch (trinary) **Q20** - located between relay **Q22** and the compressor joint **Q11** - which cuts in if the pressure of the cooling system is too high or too low.

Relay **Q22** and fuse **Q65** are to be found - up to chassis no. - in the set of fuses and relays **Q41**.

Components and Connectors

Fusebox		G1	Fusebox		G1	A	
							
Fusebox		G1	G	Fusebox		G1	H
							
Fusebox (•)		G1	Q	Conditioner wiring connector		G38	
							
Climate control wiring connector						G43	
							

(•) Variant from chassis no....

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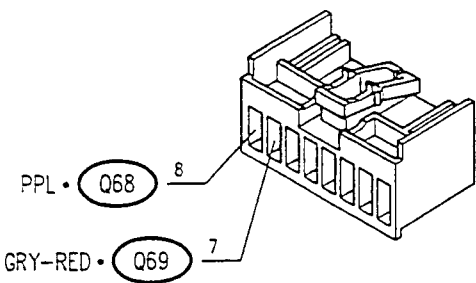
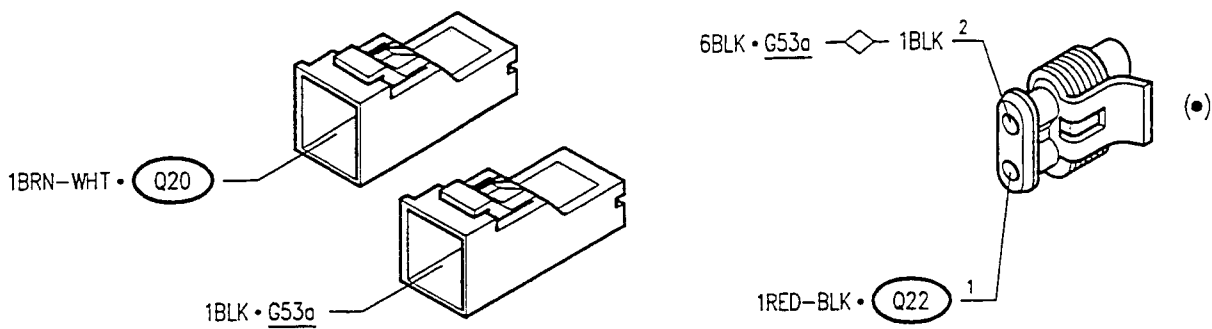
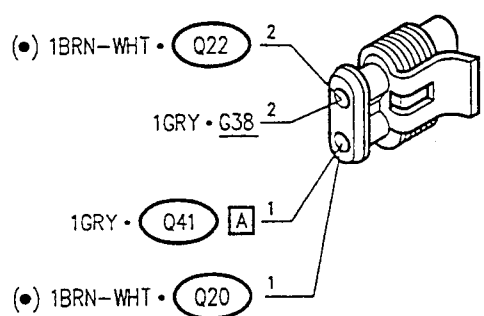
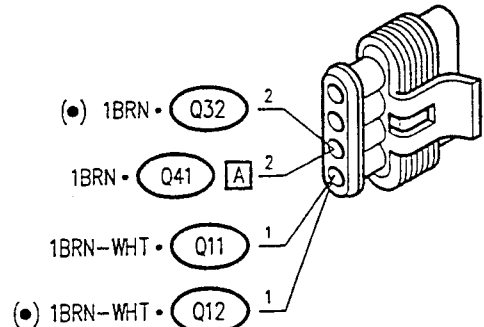
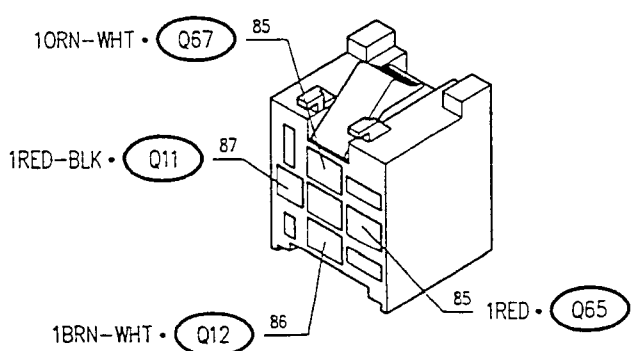
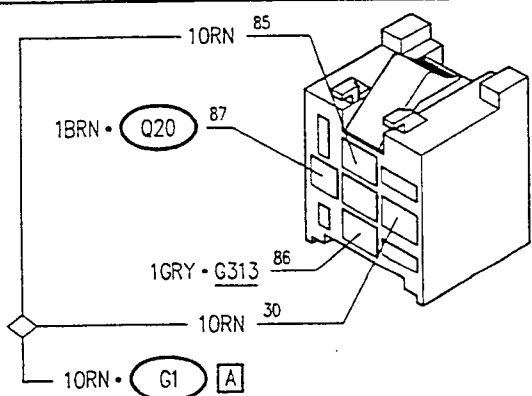
Components and Connectors (contd.)

RH engine compt. earth		G53a
LH earth under dashboard		G148b
Additional conditioner wiring connector		G313
Full load switch	H54	Rev counter sensor

(•) Variant from chassis no....

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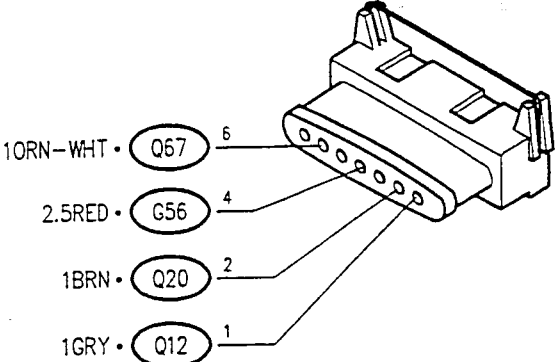
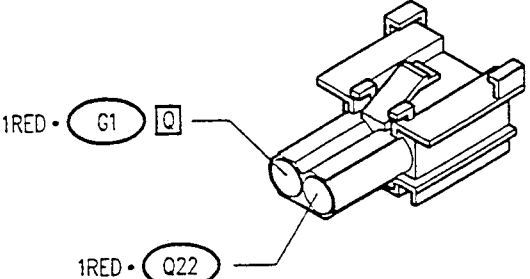
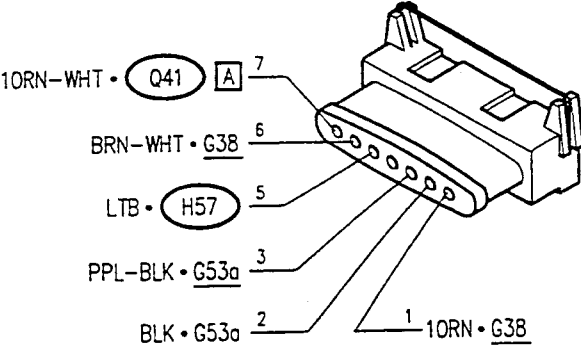
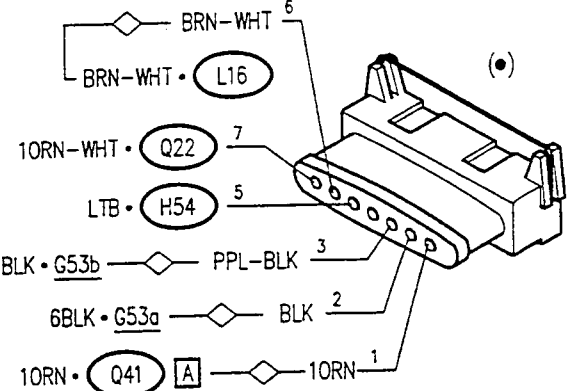
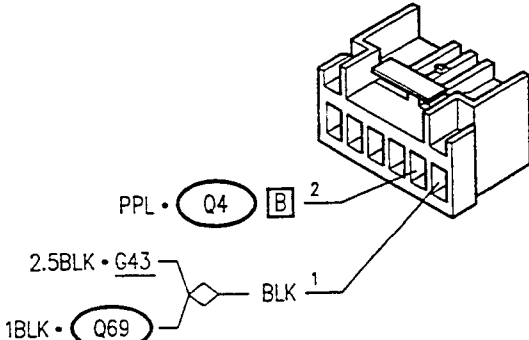
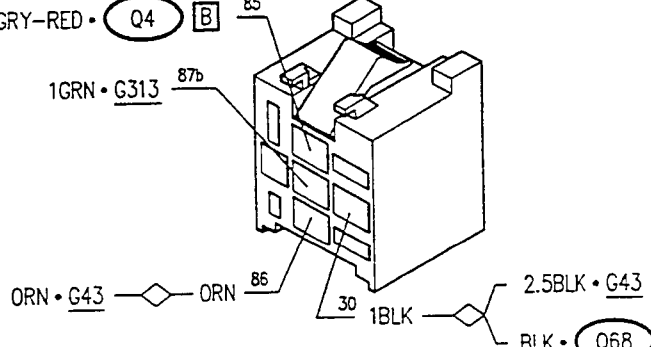
Components and Connectors (contd.)

Climate control fan command		Q4	B
			
Compressor electromagnetic joint		Q11	
			
Compressor electromagnetic joint connector	Q12	Min. and max. sensor pressure contact (Trinary)	Q20
			
Electromagnetic joint control relay (•)	Q22	Auxiliary climate control relay(•)	Q32
			

(•) Variant from chassis no....

PA493000000004

Components and Connectors (contd.)

Set of conditioner relays and fuses	Q41 A	Conditioning system wanderfuse (•)	Q65
 <p>10RN-WHT • Q67 6</p> <p>2.5RED • G56 4</p> <p>1BRN • Q20 2</p> <p>1GRY • Q12 1</p>		 <p>1RED • G1 1</p> <p>1RED • Q22 2</p>	
Compressor cutout control unit			Q67
 <p>10RN-WHT • Q41 A 7</p> <p>BRN-WHT • G38 6</p> <p>LTB • H57 5</p> <p>PPL-BLK • G53a 3</p> <p>BLK • G53a 2</p> <p>10RN • G38 1</p>		 <p>BRN-WHT • L16 6</p> <p>10RN-WHT • Q22 7</p> <p>LTB • H54 5</p> <p>BLK • G53b 3</p> <p>6BLK • G53a 2</p> <p>10RN • Q41 A 1</p>	
Compressor engagement and air recirculation switches	Q68	Climate control fan 1st speed relay	Q69
 <p>PPL • Q4 B 2</p> <p>1BLK • Q69 1</p>		 <p>GRY-RED • Q4 B 85</p> <p>1GRN • G313 87b</p> <p>ORN • G43 86</p> <p>1BLK • Q68 30</p> <p>2.5BLK • G43 1</p>	

(•) Variant from chassis no....

Wiring Diagram (T.SPARK)

Functional Description

The electromagnetic joint which operates the compressor **Q11** is controlled by relays **Q22** e **Q32**.

Relays **Q22** and **Q32**, have the coil supplied by the "key- operated" line (protected by fuse **F17** of **G1**); the power line is supplied by battery voltage via fuse **Q65** (10A) and the general fuse **G384** (50A).

Relay **Q22** is energised, therefore it supplies the 12 V signal to the electromagnetic joint **Q11**, according to the following logic:

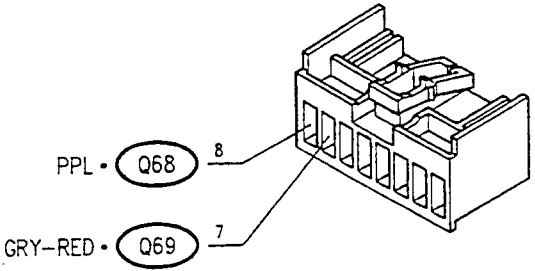
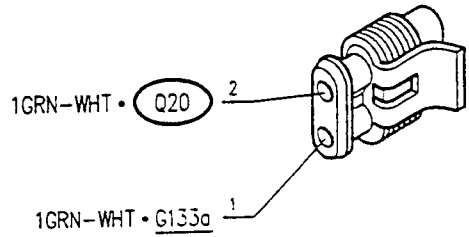
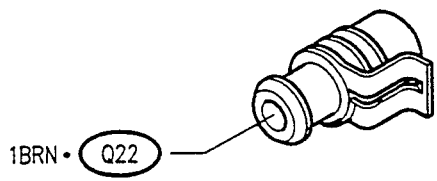
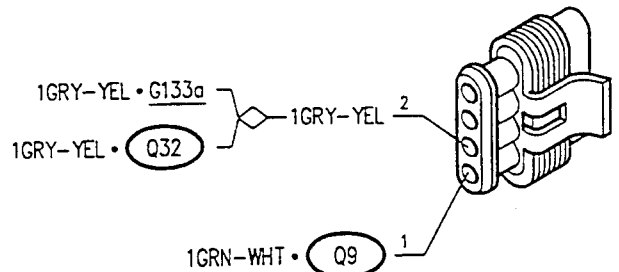
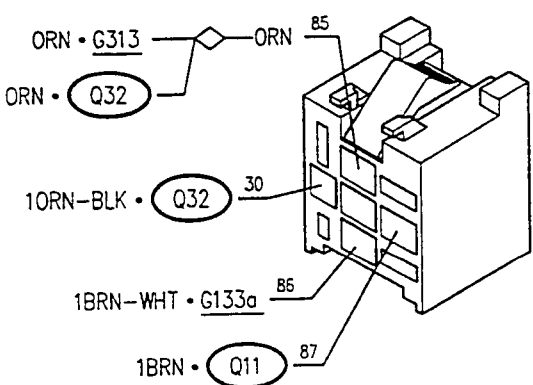
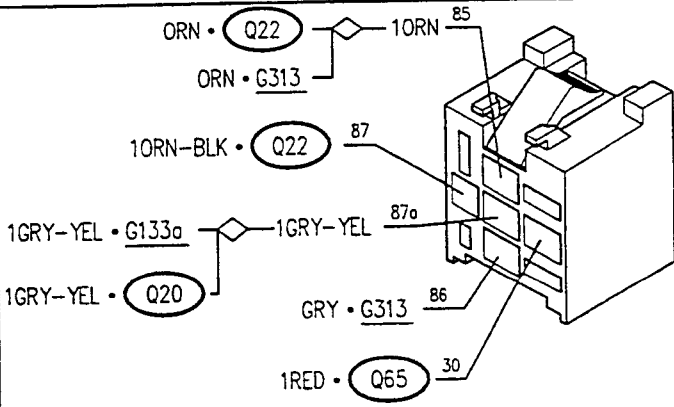
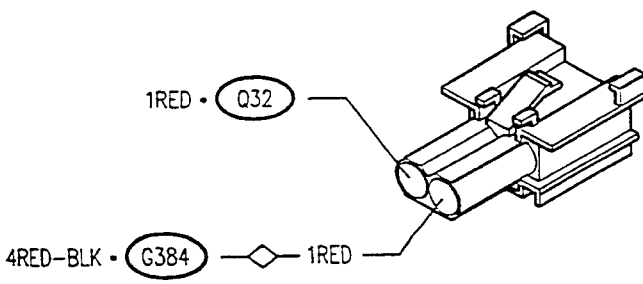
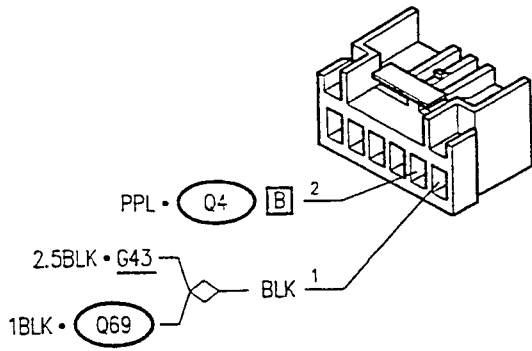
- relay **Q32** is energised by a signal leading from relay **Q69**, which in turn energised with a signal leading from the compressor engagement switch **Q68**; this signal crosses the control knob **Q4** which cuts it off when the knob itself is at "OFF": in fact, in this condition, the compressor cannot be engaged. You are reminded that the same signal simultaneously controls the engagement of the fan at first speed ("Fan and Recirculation Control")

- relay **Q32** consequently sends two signals to the Motronic control unit **S11**,: a direct signal to "request engagement of the compressor" to pin 41, and a second signal which crosses the minimum pressure switch (antifrost) **Q9** and the minimum and maximum pressure switch (trinary) **Q20** which cut in if the pressure in the cooling system is too high or too low: in this case the signal does not reach the control unit at pin 40, and the compressor is not engaged
- the control unit "relays" the control signal - pin 32 of **S11** - to relay **Q22** which is energised and supplies connector **Q11** which engages the compressor, but only when the internal logic has checked determinate conditions (e.g. the compressor is not engaged in the event of the need for full power at the engine, etc..)

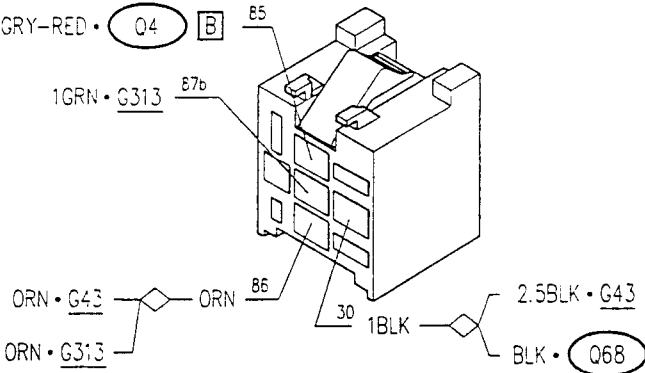
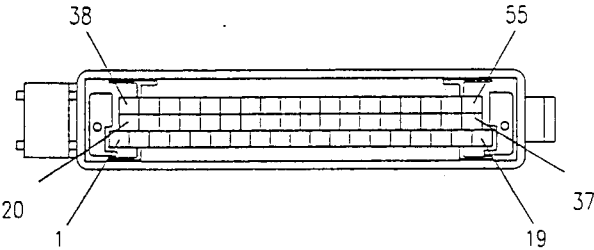
Components and Connectors

<p>Fusebox</p> <p>G1 G</p> <p>ORN-WHT • <u>G43</u> — 10RN-WHT 2</p>	<p>Fusebox</p> <p>G1 H</p> <p>1.50RN-LTB 6 — 1.5GRY-BLK • B1 A</p>
<p>Climate control wiring connector</p> <p>G43</p> <p>10RN-WHT • G1 G — ORN-WHT 4</p> <p>2.5BLK • <u>G148b</u> 1</p>	
<p>Connector for electronic injection wiring A</p> <p>G133a</p> <p>1BRN-WHT • Q22 6 — 1GRN-WHT • Q9 5 — 1GRY-YEL • Q20 4</p> <p>1GRY-YEL • Q32</p> <p>1BRN-BLK • S11 6 — 1GRN-WHT • S11 5 — 1GRY-YEL • S11 4</p>	
<p>Earth under dashboard LH</p> <p>G148b</p> <p>2.5BLK • <u>G43</u></p>	<p>Connector for conditioner syst./injection syst.</p> <p>G313</p> <p>1GRN • Q69 3 — ORN • <u>G43</u> 4 — ORN • Q69</p> <p>GRY • Q32 3 — ORN • Q32 — ORN • Q22 4</p>

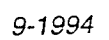
Components and Connectors (contd.)

Climate control fan comand	Q4 B	Minimum pressure switch	Q9
			
Compressor electromagnetic joint	Q11	Min. and max. sensor pressure contact (Trinary)	Q20
			
Electromagnetic joint control relay	Q22	Climate control auxiliary relay	Q32
			
Conditioning system wander fuse	Q65	Compressor and air recirculation engagement switches	G68
			

Components and Connectors (contd.)

Climate control fan 1st speed relay	Q69
 <p> GRY-RED • Q4 1GRN • G313 ORN • G43 ORN • G313 1BLK 2.5BLK • G43 BLK • Q68 </p>	
Motronic control unit	S11
 <p> 1BRN-BLK • G133a 1GRN-WHT • G133a 1GRY-YEL • G133a </p>	

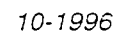
SECRET



中華民國二十九年
 五月二十日



A schematic diagram of a 16-bit parallel adder. It consists of a central block with 16 horizontal input lines on the left and 16 horizontal output lines on the right. A single input line at the bottom left is labeled 'A'. The output lines are labeled with hexadecimal digits from 0 to F on the right side.



[illegible]

Functional Description

- up to chassis no. 406517

Two fans **P2a** and **P2b** warrant the necessary ventilation of the cooling air for the engine and air conditioning system condenser radiator.

N.B.: the two fans are set in parallel and they are always operated together, following the same logic.

The two fans are always supplied by battery voltage: the first one (**P2a**) has the line protected by fuse **F14** of fusebox **G1**; the second one (**P2b**) is protected by floating fuse **Q39** (30A) which protects the whole system; they are therefore operated by an earth signal: this signal arrives directly (2nd speed) or through the additional resistance **O22** (1st speed) fitted with a thermal safety fuse.

The delaying device **Q42**, in group **Q41**, controls the gradual turning on of the fans which are operated at two different speeds also via two relay **I99b** and **I100**, also part of group **Q41**.

The delaying device works according to the following logic:

The "key-operated" voltage (line protected by fuse **F17** of **G1**) supplies the coil and electronic devices of the delaying device **Q42** -pin 85, and relay **I99b**, while relay **I100** is supplied by the battery voltage through floating fuse **Q39** (30 A) and fuse **Q66** (3 A) in group **Q41**. The coil of delaying device **Q42** is energized by an earth signal -pin P- which leads from the trinary pressure switch **Q20**: this causes an earth signal to be sent immediately - pin 30 - to energize relay **I99b** which sends the earth to the two engine cooling fans **P2a** e **P2b** through the additional resistance **O22**: 1st speed)

After appr. 8-12 seconds, if the signal from the trinary persists, the delaying device operates the second speed with an earth signal from: pin 86, which energises relay **I100** which sends the earth command directly to the two engine cooling fans **P2a** e **P2b**: 2nd speed.

When the signal from the pressure switch ceases the fan turns off immediately.

The two fans are operated at the two different speeds also by the two-level thermal contact **L33** which controls the temperature of the coolant in the engine radiator: when a first level is reached, relay **I99a** is energized, which is located inside fusebox **G1** in version "A" and outside it in version "B" - which sends the earth signal to the two engine cooling fans **P2a** and **P2b** through resistance **O22**: 1st speed.

If the second temperature level is reached, relay **I100**, is energized, which is located in group **Q41**, and this sends the earth signal directly to the two engine cooling fans **P2a** and **P2b**: 2nd speed.

Functional Description

- from chassis no. 406518

Two fans **P2a** and **P2b** ensure the necessary ventilation of the air for cooling the engine radiator and the conditioner system condenser.

N.B.: the two fans are in parallel, and are therefore operated together, always following the same logic.

The two fans are always supplied by battery voltage: the first (**P2a**) has the line protected by fuse **F14** of fusebox **G1**; the second (**P2b**) is protected by wander fuse **Q39** (30A) which protects the entire system; they are thus operated by an earth control signal: this signal arrives directly (2nd speed) or through the additional resistance **O22** (1st speed), fitted with a safety fuse.

Engagement of the fans, operated at two different speeds through two relays **I99** and **I100** takes place according to the following logic:

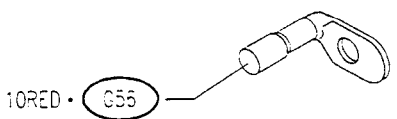
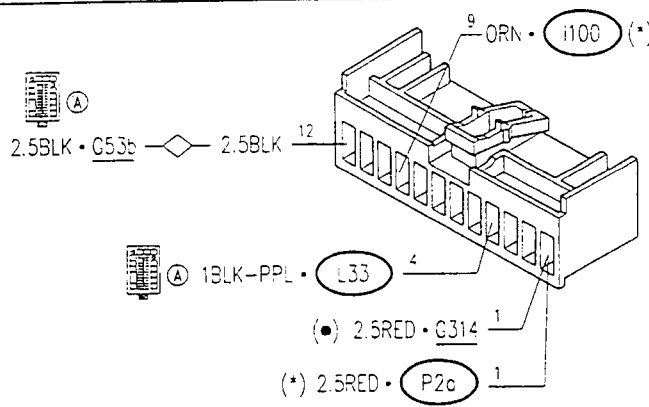
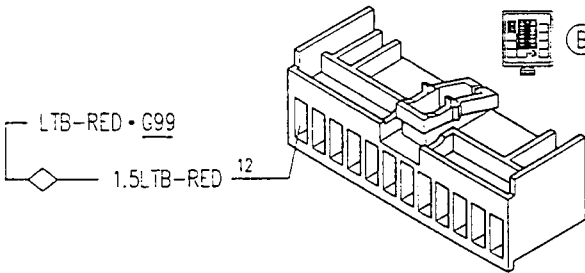
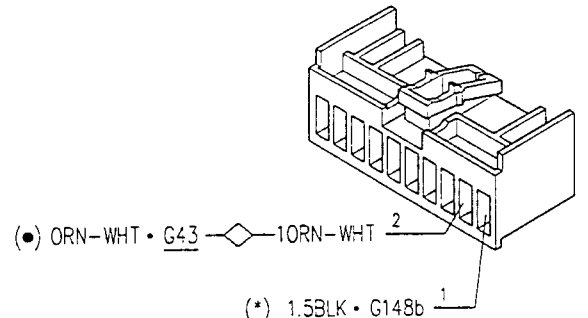
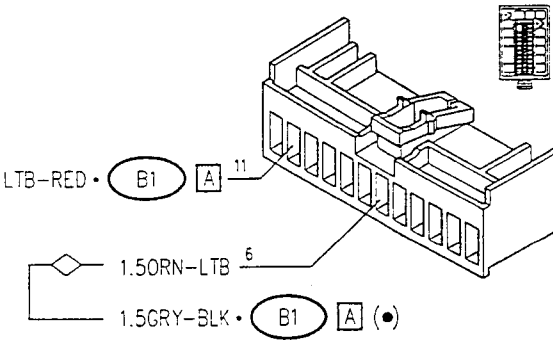
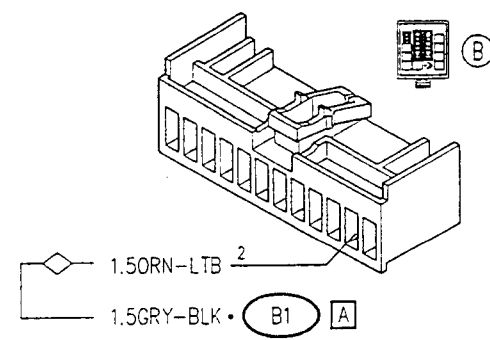
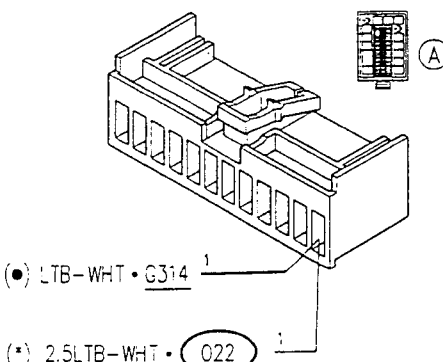
The fans **P2** are operated at two different speeds by the two-level thermal contact **L33** which controls the temperature of the coolant in the engine radiator: when a first level is reached relay **I99** is energised which sends the earth control signal to the fans **P2** via resistance **O22**: 1st speed

If the second temperature level is reached, relay **I100** is energised which sends the earth control signal directly to the fans **P2**: 2nd speed.

The two relays receive the key-operated supply; **I100** is supplied by the line of fuse **F4** of **G1** (fusebox A) or fuse **F15** (fusebox B).

Similarly the fans **P2** are controlled at first speed by an earth signal leading from the trinary pressure switch **Q20**.

Components and Connectors

Fusebox	G1	Fusebox	G1	A		
 <p>10RED • C55</p>		 <p>2.5BLK • G53b 2.5BLK 12</p> <p>9 ORN • i100 (*)</p> <p>1BLK-PPL • L33 4</p> <p>(•) 2.5RED • G314 1</p> <p>(*) 2.5RED • P2c 1</p>				
Fusebox	G1	D	Fusebox	G1	G	
 <p>LTB-RED • C99</p> <p>1.5LTB-RED 12</p>		 <p>(•) ORN-WHT • G43 10RN-WHT 2</p> <p>(*) 1.5BLK • G148b 1</p>				
Fusebox					G1	H
 <p>LTB-RED • B1 A 11</p> <p>1.5ORN-LTB 6</p> <p>1.5GRY-BLK • B1 A (•)</p>		 <p>1.5ORN-LTB 2</p> <p>1.5GRY-BLK • B1 A</p>				
Fusebox					G1	I
 <p>(•) LTB-WHT • G314 1</p> <p>(*) 2.5LTB-WHT • Q22 1</p>						

Components and connectors (cont.d)

Conditioner wiring connector		<u>G38</u>
Heating & ventilation control wiring connector		<u>G43</u>
RH engine compartment earth	<u>G53a</u>	LH engine compartment earth
Dashboard/engine wiring connector		<u>G99</u>

Components and connectors (cont.d)

Conditioner additional wiring connector (•)			G313
Engine/conditioner wiring connector (•)			G314
Engine cooling fan 1st speed relay (•)	199a	Engine cooling fan 1st speed relay (*)	199b
Engine cooling fan 2nd speed relay (*)			1100

(*) from no. 4065018
PA493000000006

(•) up to no. 4065017

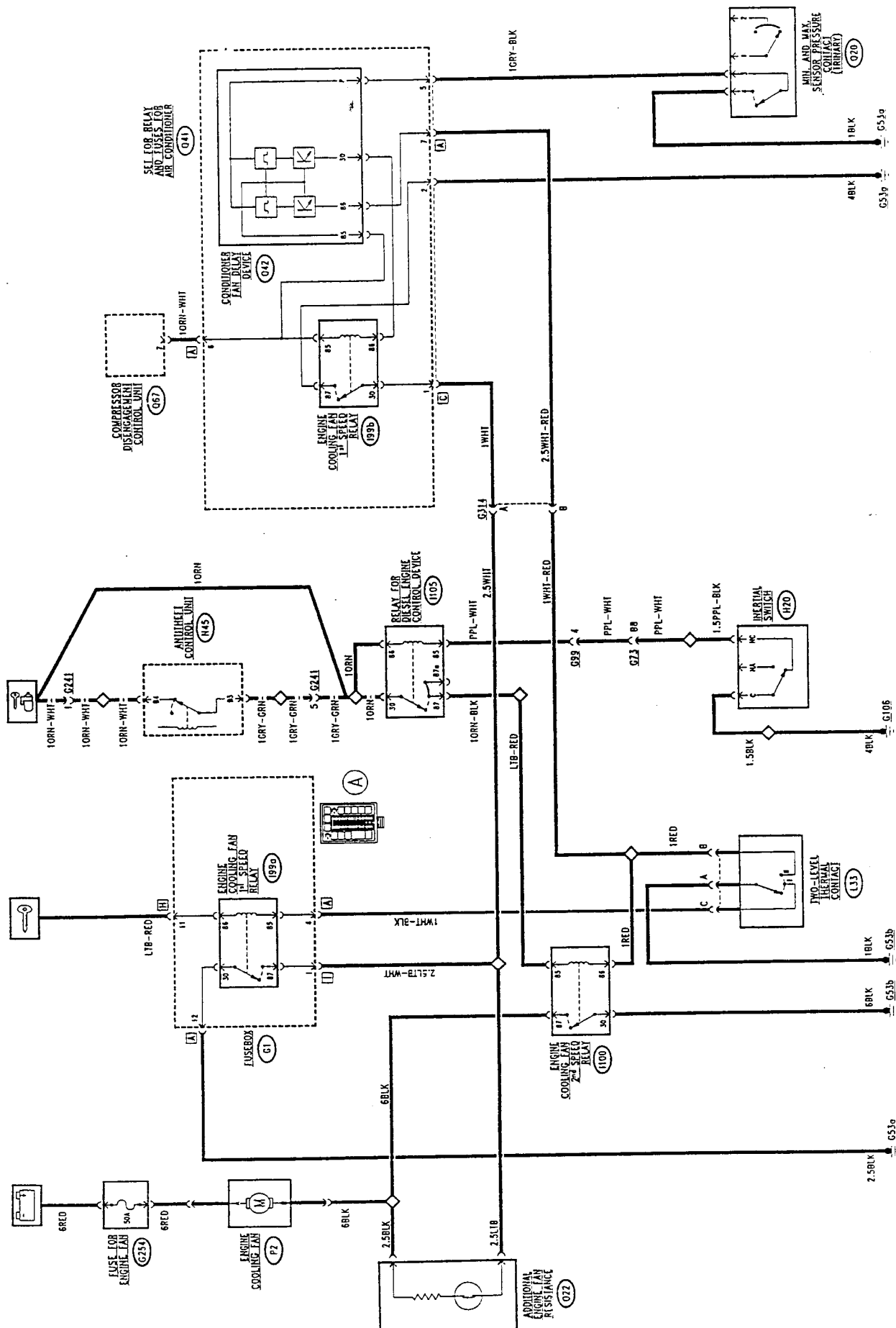
Components and connectors (cont.d)

Two-level thermal contact (•)	L33 A	Two-level thermal contact (•)	L33 B
<p>1BLK • G53b A</p> <p>1BLK-PPL • G1 A B</p> <p>1BLK-PPL • I99a B</p>		<p>1RED • Q41 A</p>	
Two-level thermal contact (*)	L33	Engine fan additional resistance (•)	Q22
<p>1PPL-BLK • I99 B</p> <p>1PPL-BLK • G1 A B</p> <p>1BLK • G53b A</p> <p>1GRN-BLK • I100</p> <p>1GRN-BLK • Q20</p> <p>1GRN-BLK C</p>		<p>2.5LTB-WHT • G314</p> <p>2.5LTB-WHT</p> <p>2.5LTB-WHT • Q41 C</p> <p>2.5GRY-BLK • Q41 B</p>	
Engine fan additional resistance (*)	Q22	Engine water cooling fan (•)	P2a
<p>4BLK • I100</p> <p>2.5LTB-WHT • P2b</p> <p>2.5LTB-WHT</p> <p>2.5LTB-WHT • P2c</p> <p>2.5LTB-WHT • G1 A</p> <p>2.5LTB-WHT • I99 B</p>		<p>1.5BLK • P2b</p> <p>2.5BLK B</p> <p>4BLK • Q41 B</p> <p>2.5RED • G314 A</p>	
Engine water cooling fan (*)	P2a	Engine water cooling fan (•)	P2b
<p>4BLK • I100</p> <p>2.5LTB-WHT B</p> <p>2.5RED • G1 A</p>		<p>4BLK • Q41 B</p> <p>2.5BLK • P2c</p> <p>2.5LTB-WHT • Q41 D</p> <p>1.5BLK A</p>	

Components and connectors (cont.d)

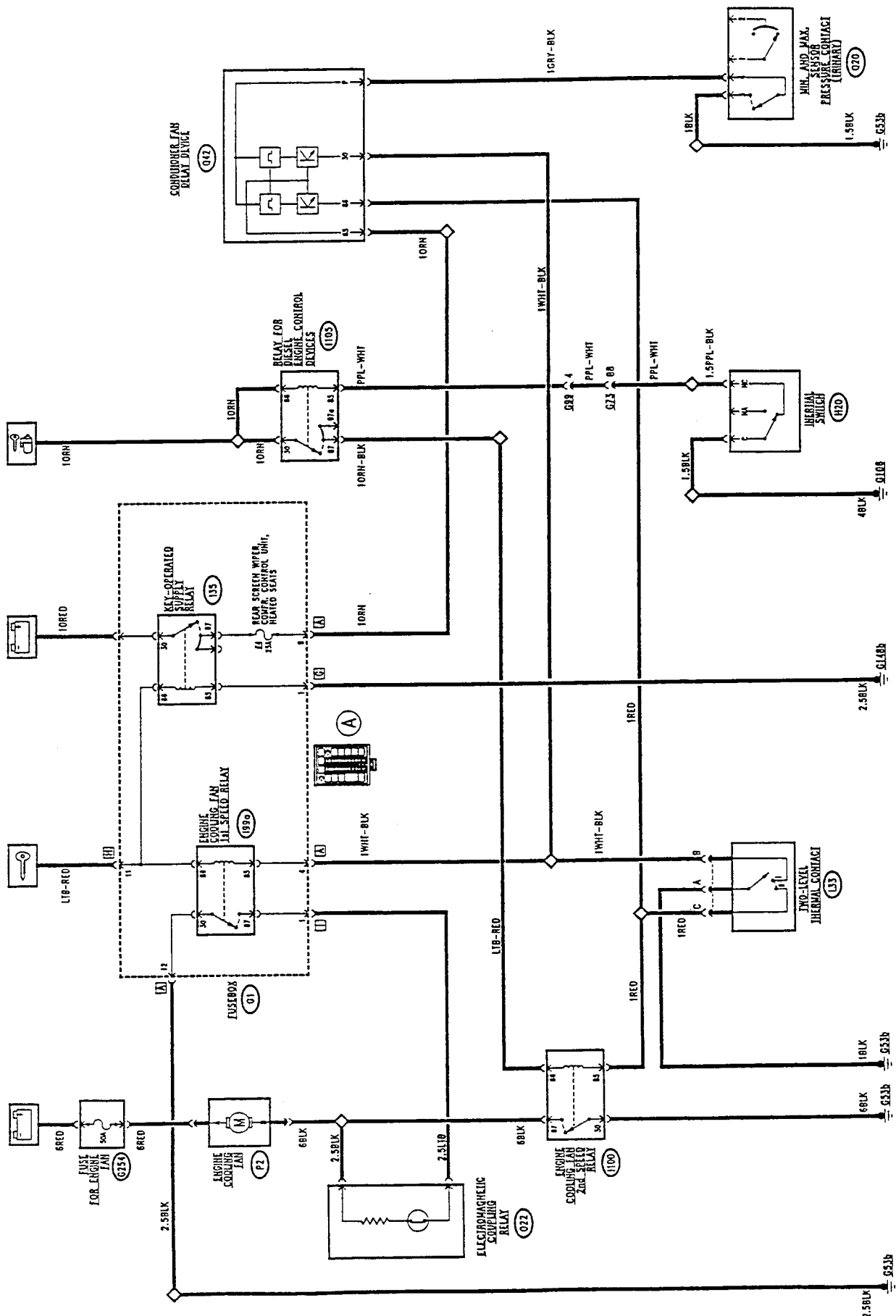
Engine water cooling fan (*)	P2b	Min. and max. sensor pressure contact (Trinary) (*)	Q20
Min. and max. sensor pressure contact (Trinary) (*)	Q20	Conditioner system floating fuse-30A	Q39
Set of conditioner relays and fuses (•)	Q41 A	Set of conditioner relays and fuses (•)	Q41 B
Set of conditioner relays and fuses (•)	Q41 C	Set of conditioner relays and fuses (•)	Q41 D

Wiring diagram (TD version - up to chassis no.....)



... versions without ALFA ROMEO CODE, but with theft alarm

Wiring diagram (TD version - from chassis no.....)



Functional Description

The fan **P2** provides the necessary ventilation of the cooling air for the radiator and engine and for the air conditioning system condenser.

This fan is always supplied by battery voltage through the line protected by the specific wander fuse **G254**, to be found next to the branch terminal box: it is therefore operated by an earth signal: this signal arrives directly (2nd speed) or through the additional resistance **O22** (1st speed), fitted with a thermal safety contact.

The delaying device **Q42**, together with relay **I99b** - present only up to chassis no..... - , controls the gradual engagement of the fan **P2**, operating according to the following logic:

The voltage leading - up to chassis no..... - from the compressor disengagement control unit **Q67** (12V with compressor engaged) and - from chassis no..... - directly from the ignition switch - supplies the coil and the electronic devices of the delaying device **Q42** -pin 85 and relay **I99b** - where fitted - ; the coil of **Q42** is energised by an earth signal -pin P- which leads from the trinary pressure switch **Q20**: this causes the immediate sending of a signal - pin 30- to energise relay

I99a or **I99b**, which sends the earth signal for the fan **P2** through the additional resistance **O22**: 1st speed.

After appr. 8-12 seconds, if the signal leading from the trinary persists, the delaying device operates the second speed with an earth signal from pin 86, which energises relay **I100** that sends the earth signal directly to the fan **P2**: 2nd speed.

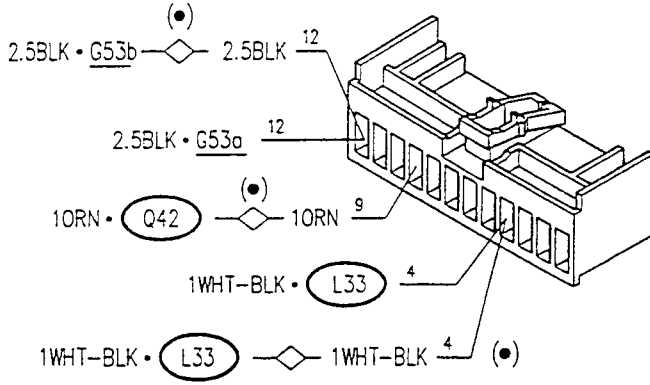
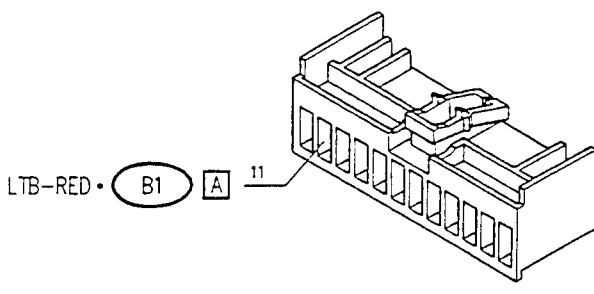
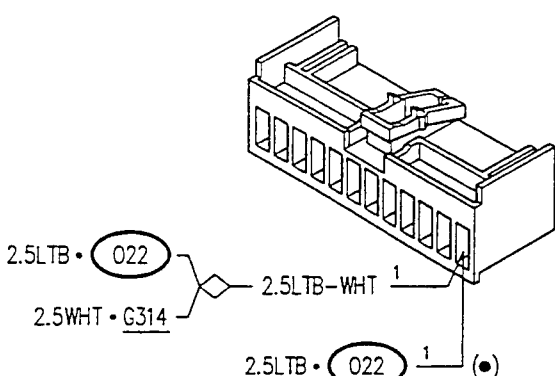
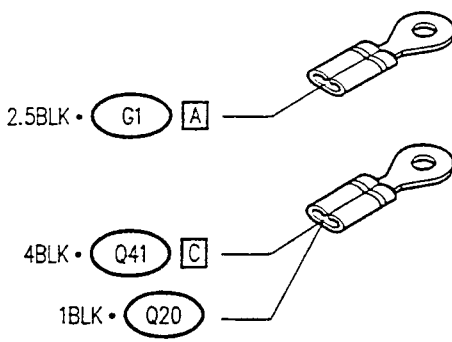
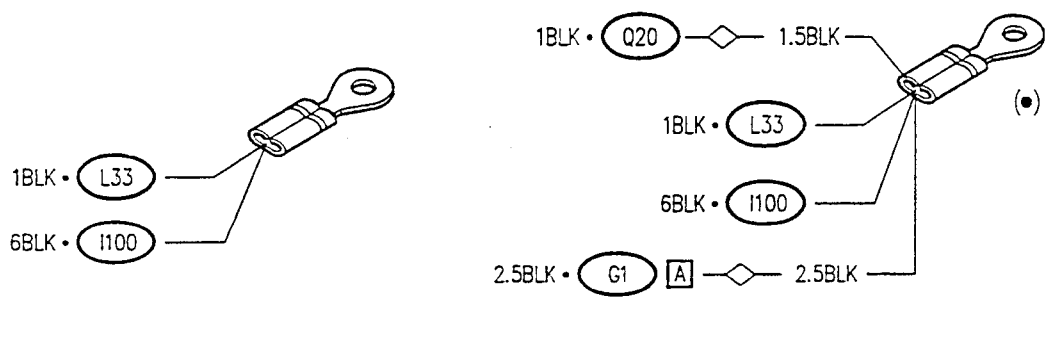
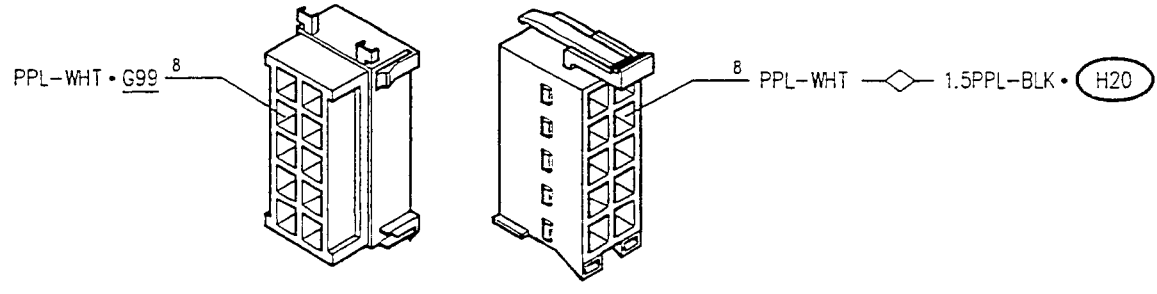
When the pressure switch signal ceases, the fan is immediately disengaged.

The fan is operated at the two different speeds also by the two- level thermal contact **L33** which controls the temperature of the coolant in the engine radiator: when a first level is reached, relay **I99a** is energised, located in the fusebox **G1**, which sends the earth signal to the fan **P2** through resistance **O22**: 1st speed.

If the second temperature level is reached, relay **I100** is energised, located on the fan duct, which sends the earth signal directly to the fan **P2**: 2nd speed.

The delaying device **Q42** and relay **I99b** are located - up to chassis no..... - in the set of relays and fuses **Q41**.

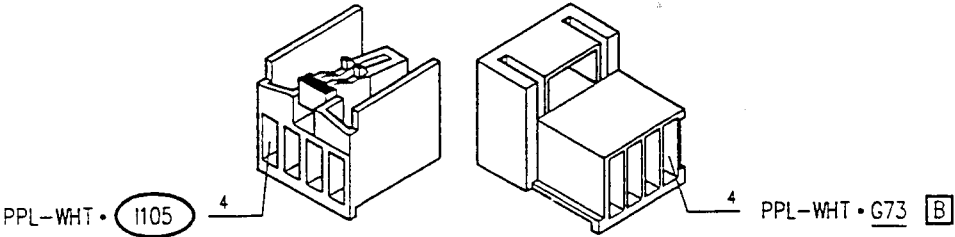
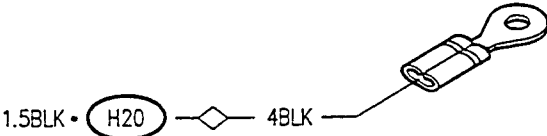
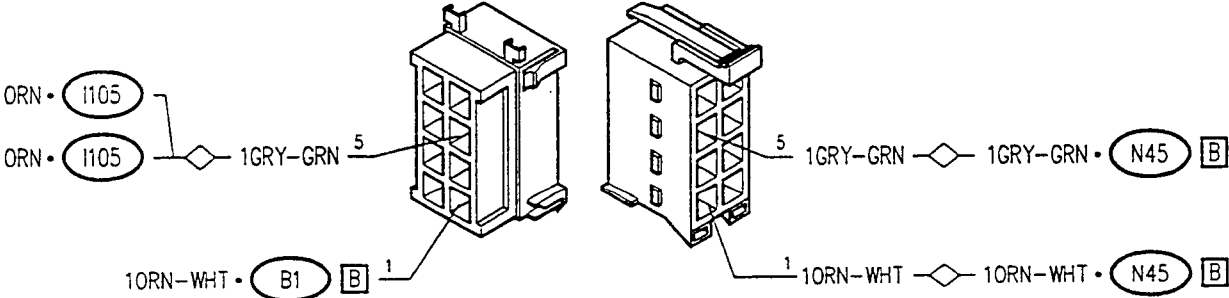
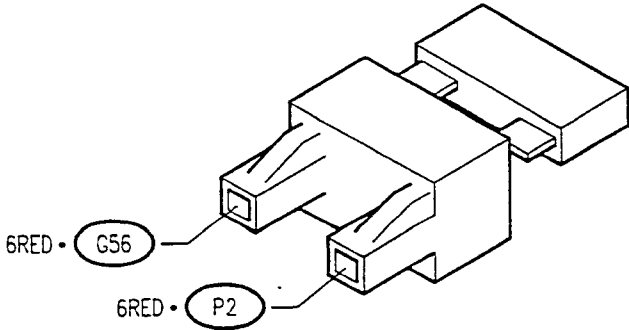
Components and Connectors

Fusebox		G1	A	Fusebox		G1	H	
								
Fusebox		G1	I	RH engine compartment earth		G53a		
								
LH engine compartment earth						G53b		
								
Rear services connector						G73		B
								

(•) Variant from chassis no....

PA493000000004

Components and Connectors (contd.)

Engine/dashboard wiring connectors	G99
	
Seat crossmember earth	G106
	
Alarm wiring connector (*)	G241
	
Engine fan fuse	G254
	

(*) Versions without ALFA ROMEO CODE, but with anti-theft system

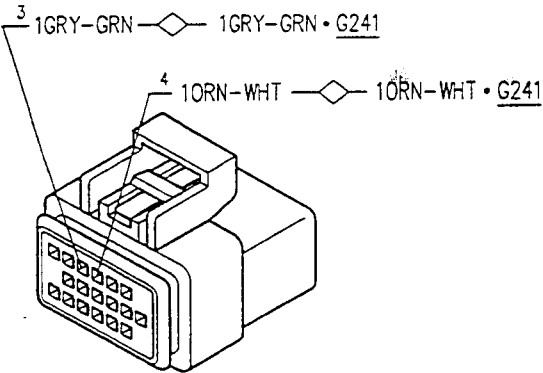
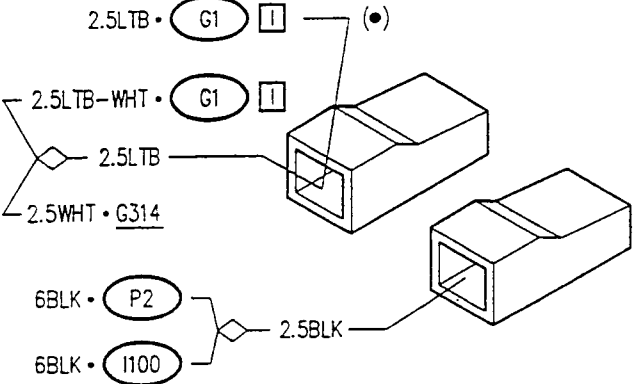
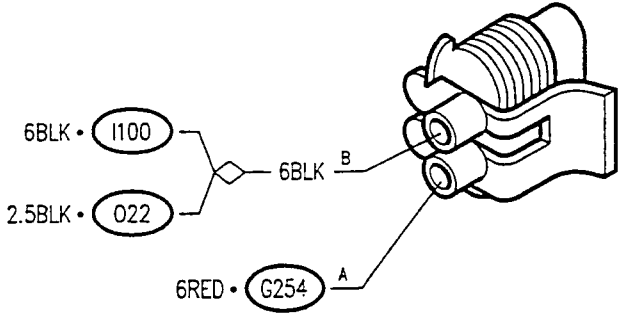
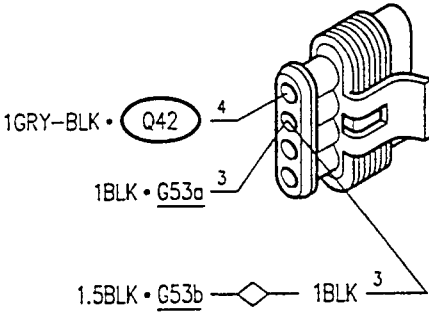
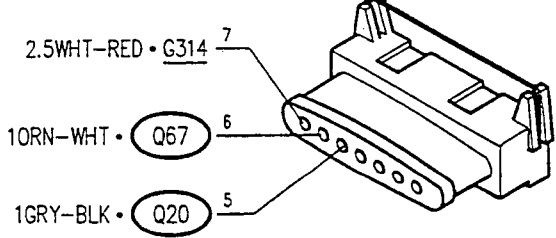
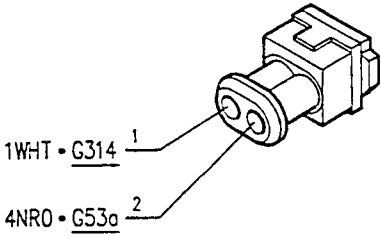
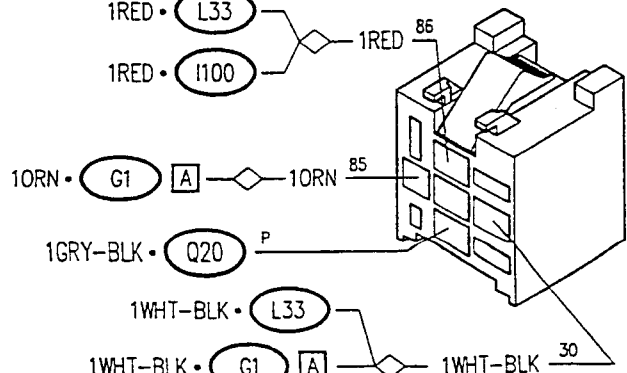
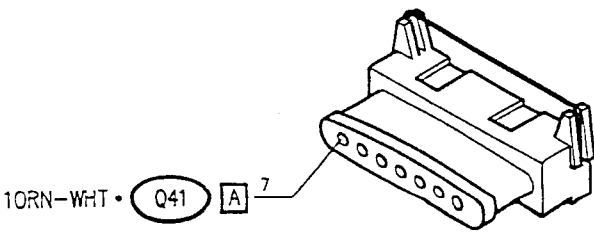
Components and Connectors (contd.)

Engine/conditioner wiring connector		G314
Inertial switch		H20
Engine cooling fan 2nd speed relay		I100
Diesel engine control devices relay	I105	Two-level thermal switch

(*) Versions without ALFA ROMEO CODE, but with anti-theft system

(*) Variant from chassis no....

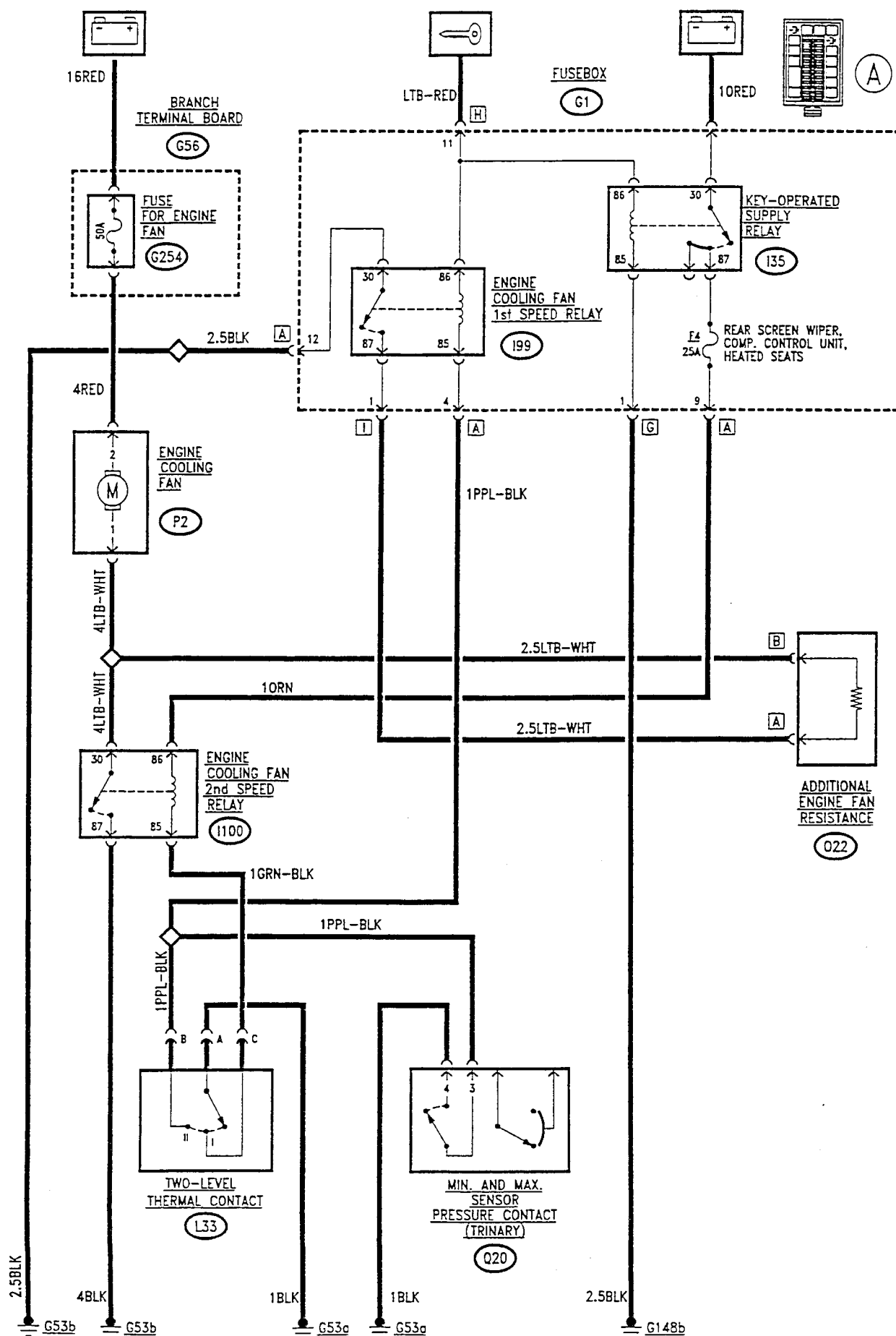
Components and Connectors (contd.)

Alarm control unit (*)	(N45) B	Engine fan additional resistance	(Q22)
 <p>3 1GRY-GRN —◇— 1GRY-GRN • G241 4 10RN-WHT —◇— 10RN-WHT • G241</p>	 <p>2.5LTB • G1 I 2.5LTB • WHT • G1 I 2.5WHT • G314 6BLK • P2 6BLK • I100 2.5BLK</p>		
Engine water cooling fan	(P2)	Min. and max. sensor pressure contact (Trinary)	(Q20)
 <p>6BLK • I100 2.5BLK • Q22 6BLK B 6RED • G254 A</p>	 <p>1GRY-BLK • Q42 1BLK • G53a 1.5BLK • G53b 1BLK 3 (•) 4</p>		
Set of conditioner relays and fuses	(Q41) A	Set of conditioner relays and fuses	(Q41) C
 <p>2.5WHT-RED • G314 7 10RN-WHT • Q67 6 1GRY-BLK • Q20 5</p>	 <p>1WHT • G314 1 4NR0 • G53a 2</p>		
Conditioner solenoid delaying device (•)	(Q42)	Compressor disengagement control unit	(Q67)
 <p>1RED • L33 1RED • I100 10RN • G1 A 10RN • L33 1GRY-BLK • Q20 P 1WHT-BLK • L33 1WHT-BLK • G1 A 1WHT-BLK 30 85 86</p>	 <p>10RN-WHT • Q41 A 7</p>		

(*) Versions without ALFA ROMEO CODE, but with anti-theft system

(•) Variant from chassis no....

Wiring diagram (T.SPARK version)



Functional Description

The fan **P2** provides the necessary ventilation of the cooling air for the radiator and engine and for the air conditioning system condenser.

This fan is always supplied by battery voltage through the line protected by the specific wander fuse **G254**, to be found next to the branch terminal box: it is therefore operated by an earth signal: this signal arrives directly (2nd speed) or through the additional resistance **O22** (1st speed).

The fan **P2** is operated at the two different speeds by the two-level thermal contact **L33** which controls the temperature of the coolant in the engine radiator: when a first level is reached, relay **I99a** is energised,

located in the fusebox **G1**, which sends the earth signal to the fan **P2** through resistance **O22**: 1st speed.

If the second temperature level is reached, relay **I100** is energised, located on the fan duct, which sends the earth signal directly to the fan **P2**: 2nd speed.

The two relays receive the key-operated supply; **I100** is supplied by the line of fuse **F4** of **G1**.

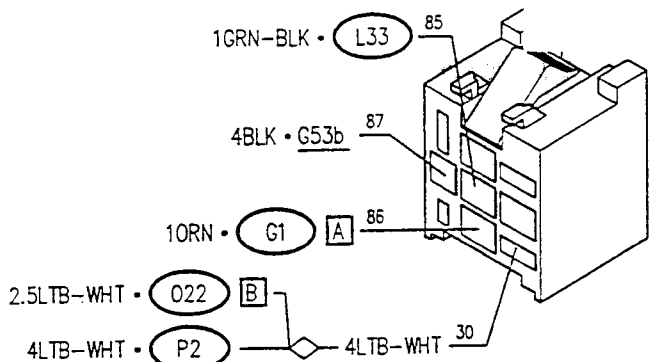
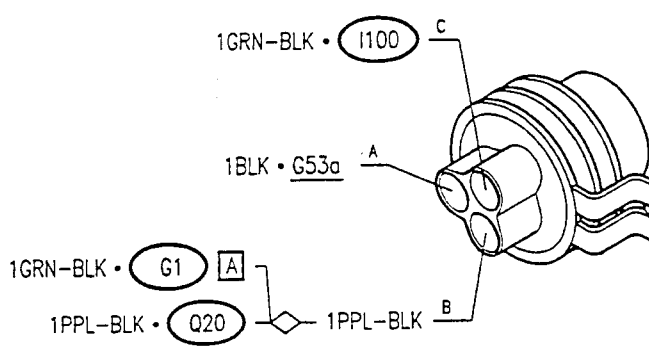
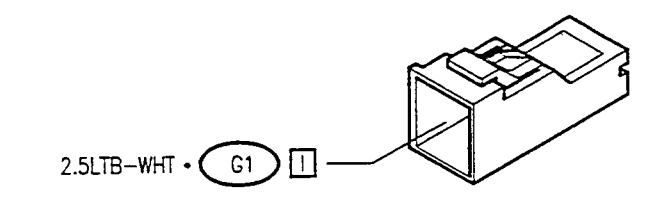
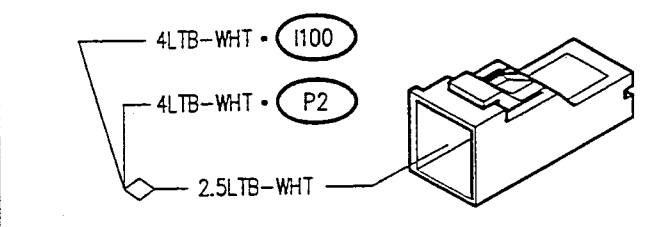
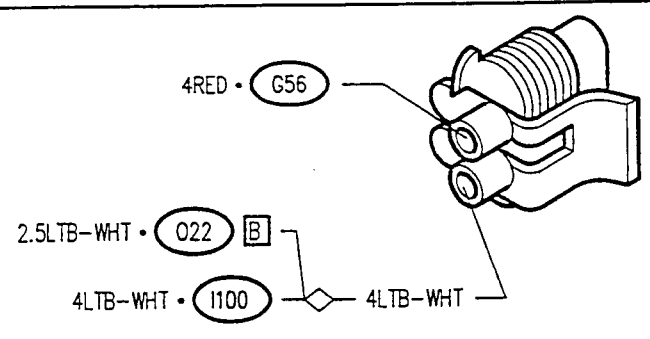
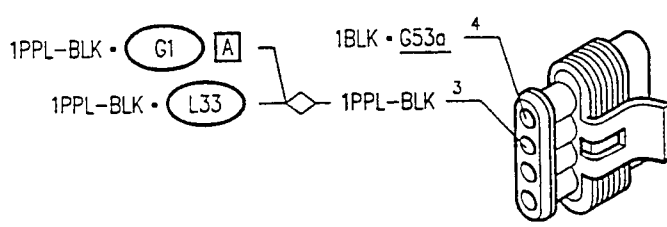
Similarly, the fan **P2** is controlled at the first speed by an earth signal leading from the trinary pressure switch **Q20**.

When the pressure switch signal ceases, the fan is immediately disengaged.

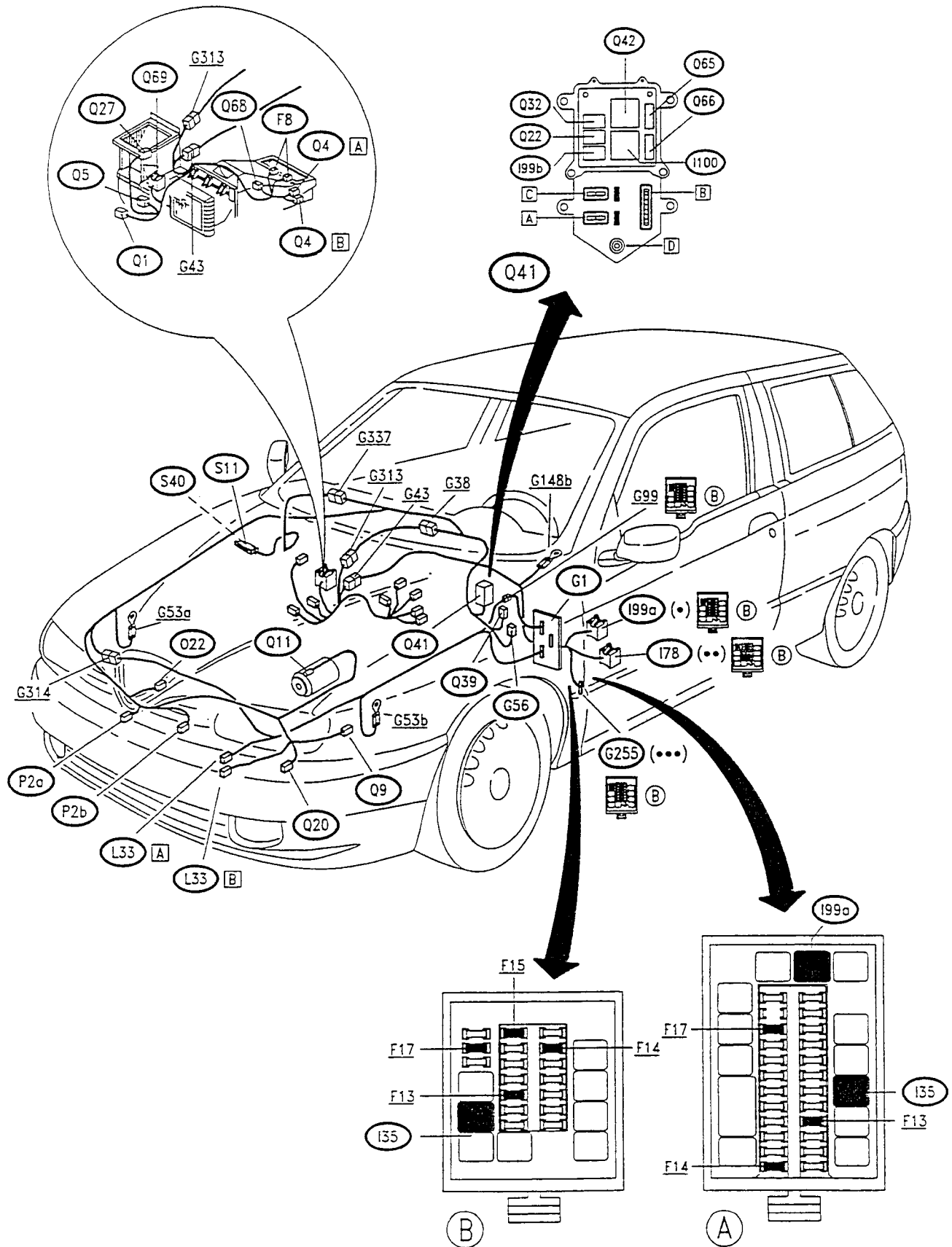
Components and Connectors

<p>Fusebox</p> <p>(G1) (A)</p> <p>2.5BLK • G53b</p> <p>2.5BLK 12</p> <p>10RN • I100 9</p> <p>1PPL-BLK • Q20</p> <p>1PPL-BLK • L33</p> <p>1PPL-BLK 4</p>	<p>Fusebox</p> <p>(G1) (H)</p> <p>LTB-RED • B1 11</p>
<p>Fusebox</p> <p>(G1) (I)</p> <p>2.5LTB-WHT • Q22 1</p>	<p>RH engine compartment earth</p> <p>(G53a)</p> <p>1BLK • L33</p> <p>1BLK • Q20</p>
<p>LH engine compartment earth</p> <p>(G53b)</p> <p>2.5BLK • G1 (A)</p> <p>4BLK • I100</p>	
<p>Branch terminal board</p> <p>(G56)</p> <p>G254</p> <p>16RED • A1</p> <p>4RED • P2</p>	

Components and Connectors (contd.)

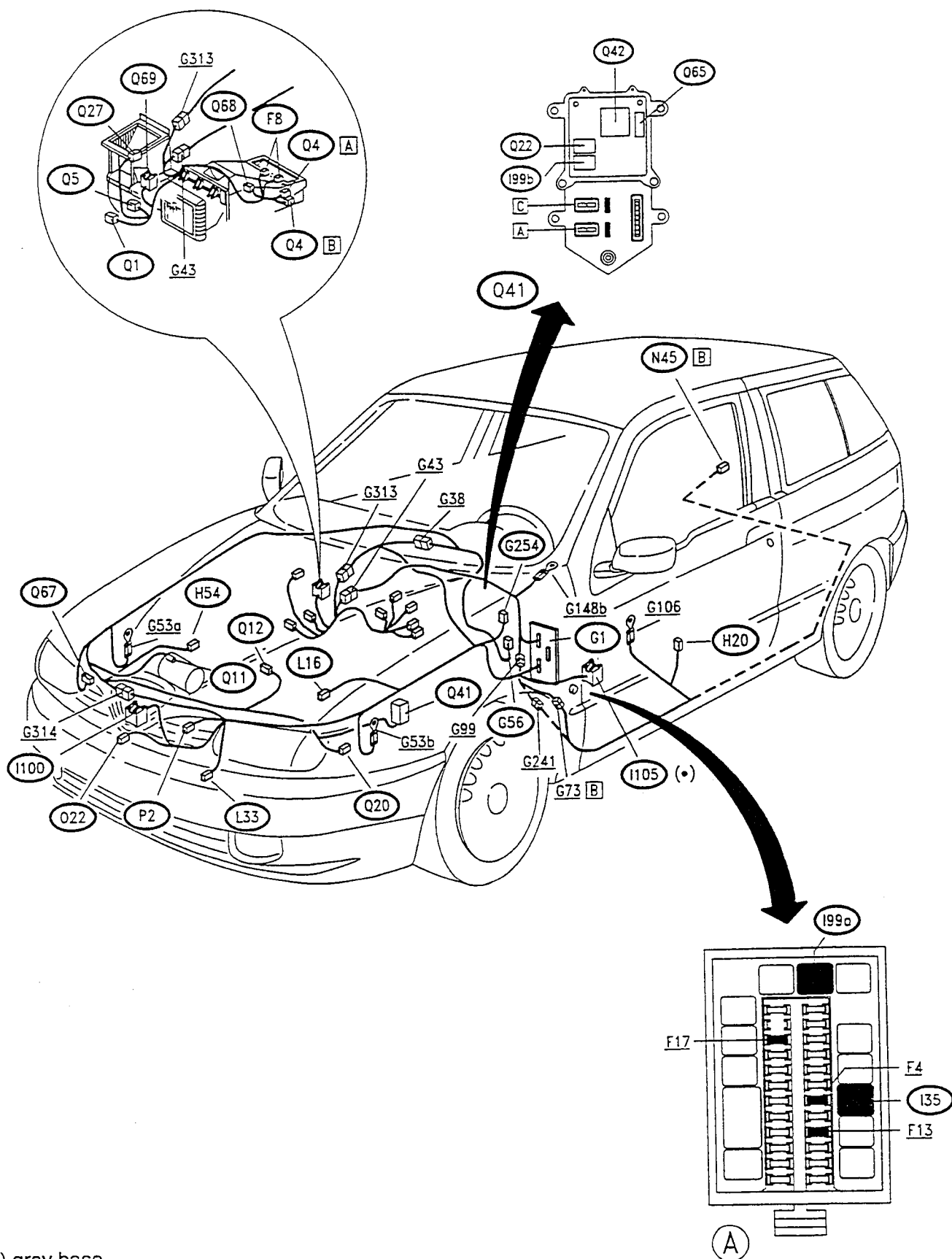
Engine cooling fan 2nd speed relay	(I100)	Two level thermal contact	(L33)
			
Engine fan additional resistance	(O22) [A]	Engine fan additional resistance	(O22) [B]
			
Engine water cooling fan			(P2)
			
Min. and max. sensor pressure contact			(Q20)
			

LOCATION OF COMPONENTS (Boxer Versions)

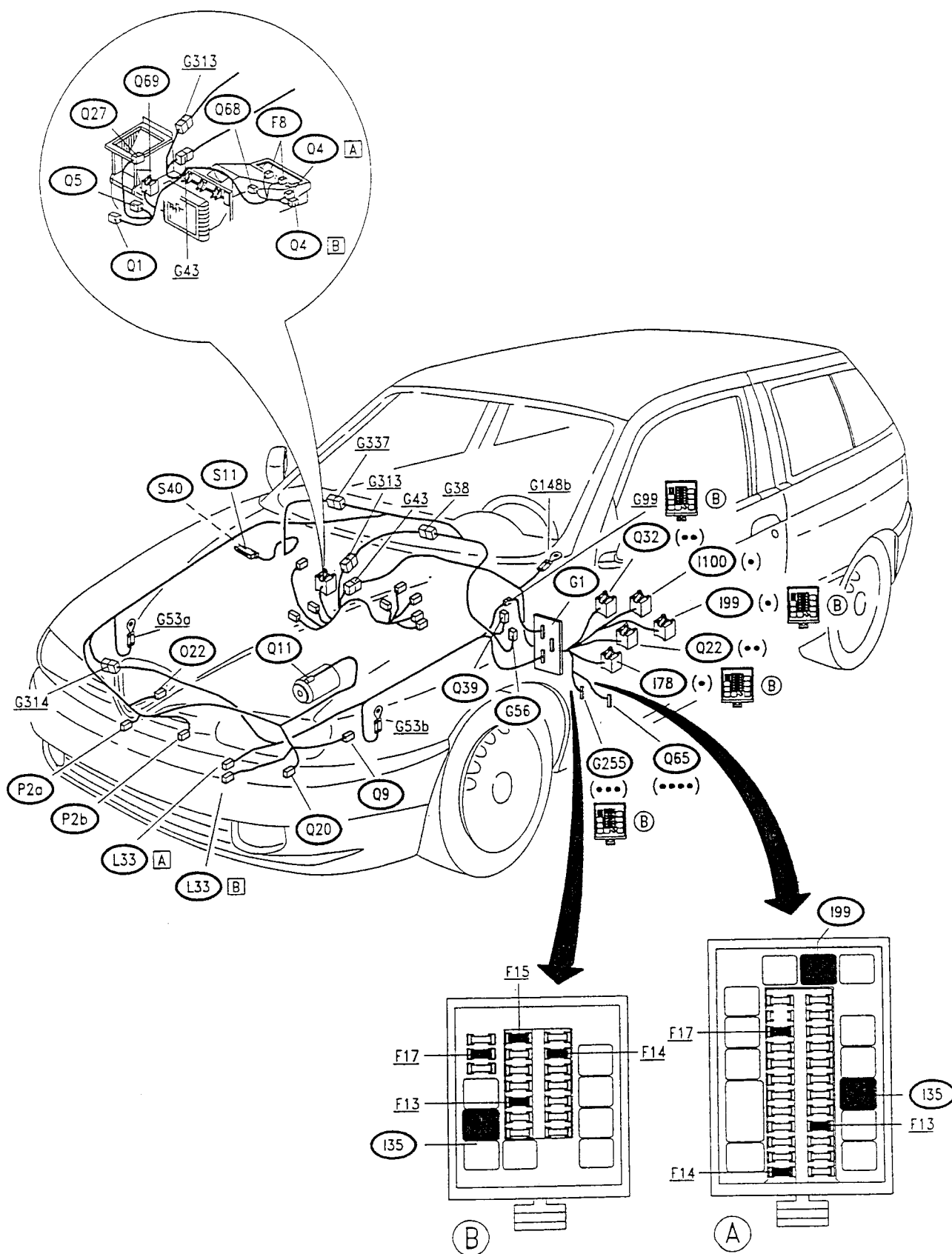


(•) yellow base
 (••) yellow base
 (•••) green fuseholder

LOCATION OF COMPONENTS (TD Version - up to chassis no.....)

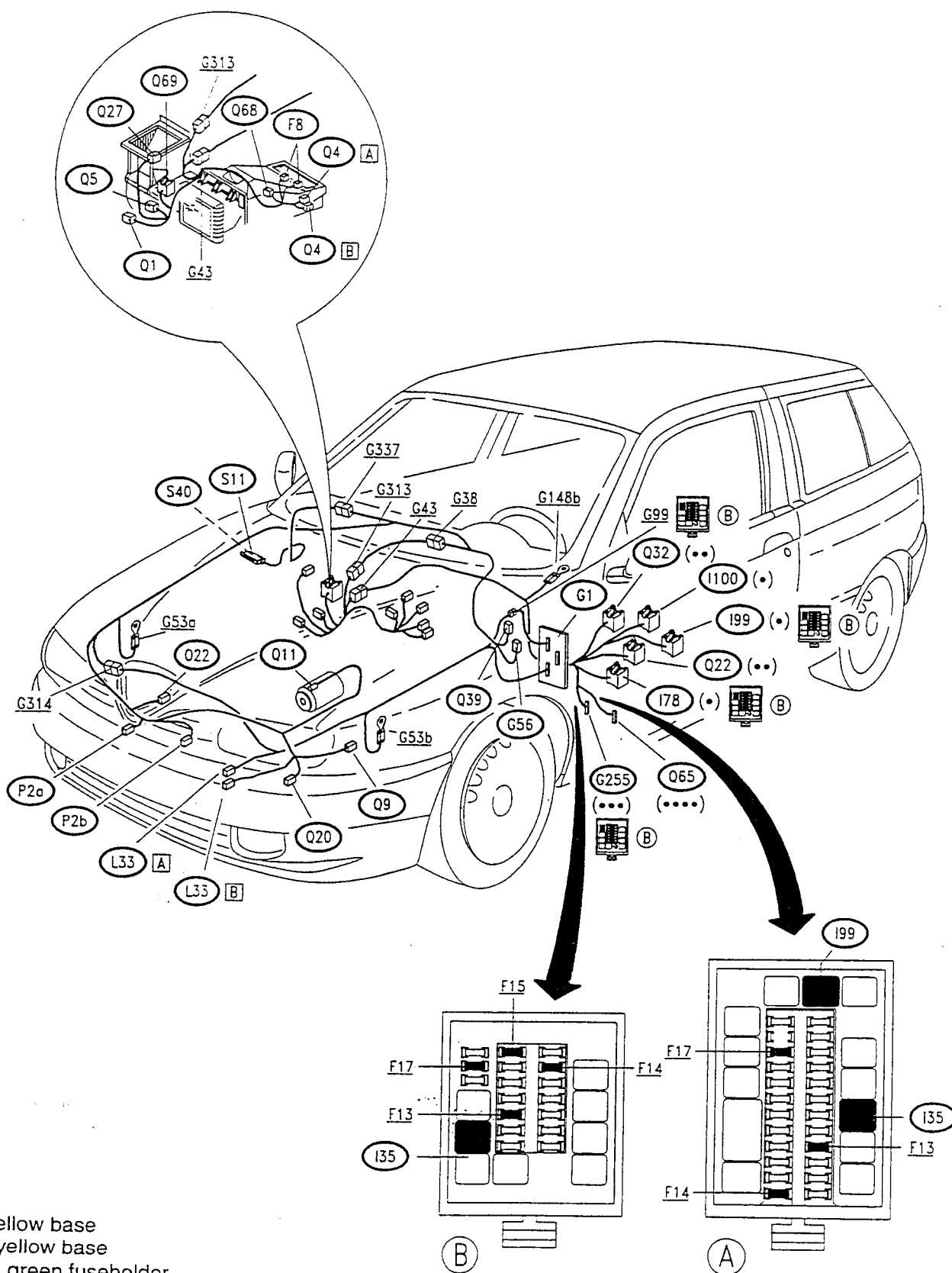


LOCATION OF COMPONENTS (Boxer Versions - up to chassis no. 4065017)

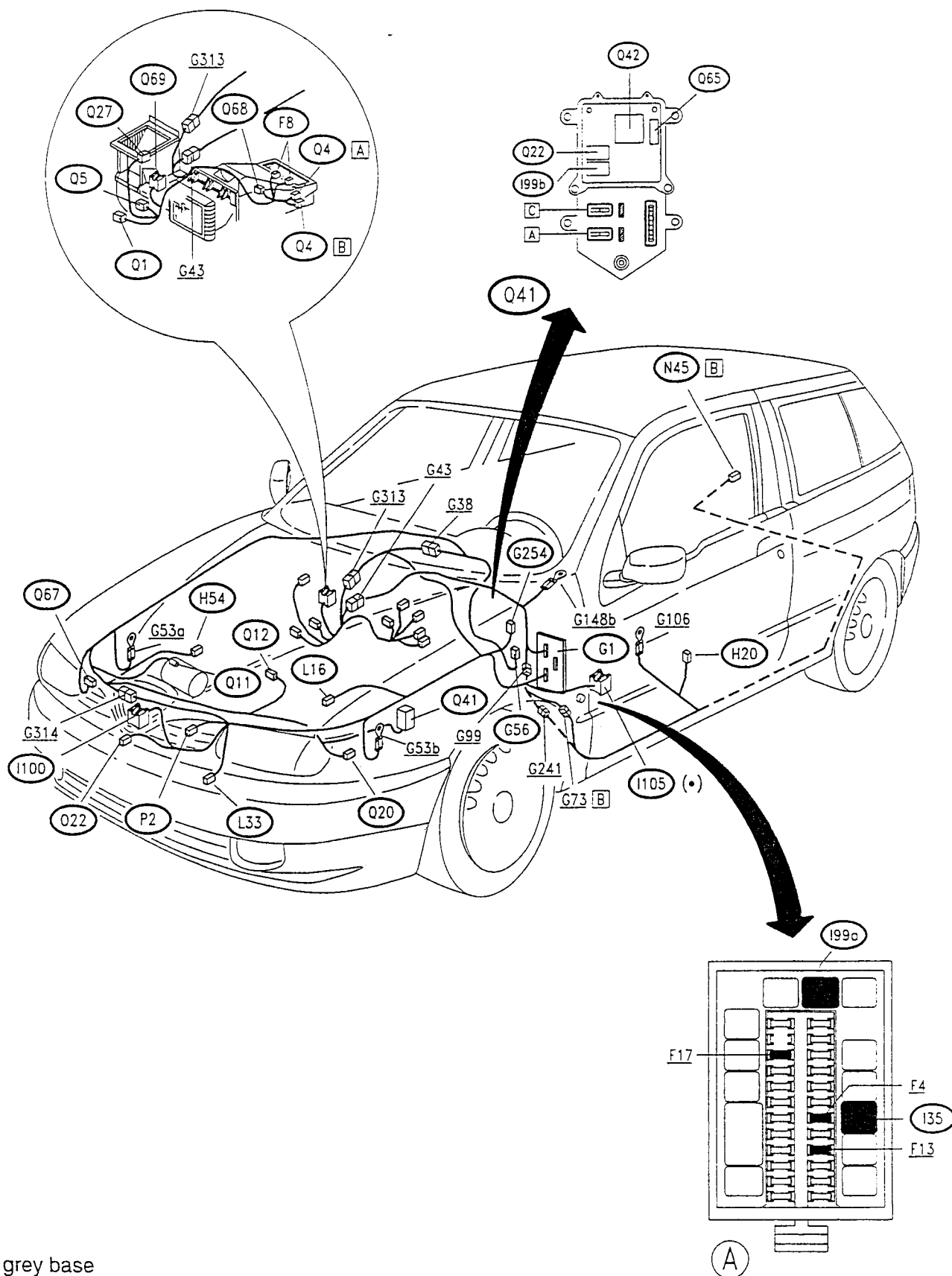


(•) yellow base
 (••) yellow base
 (•••) green fuseholder

LOCATION OF COMPONENTS (Boxer Versions - from chassis no. 4065018)



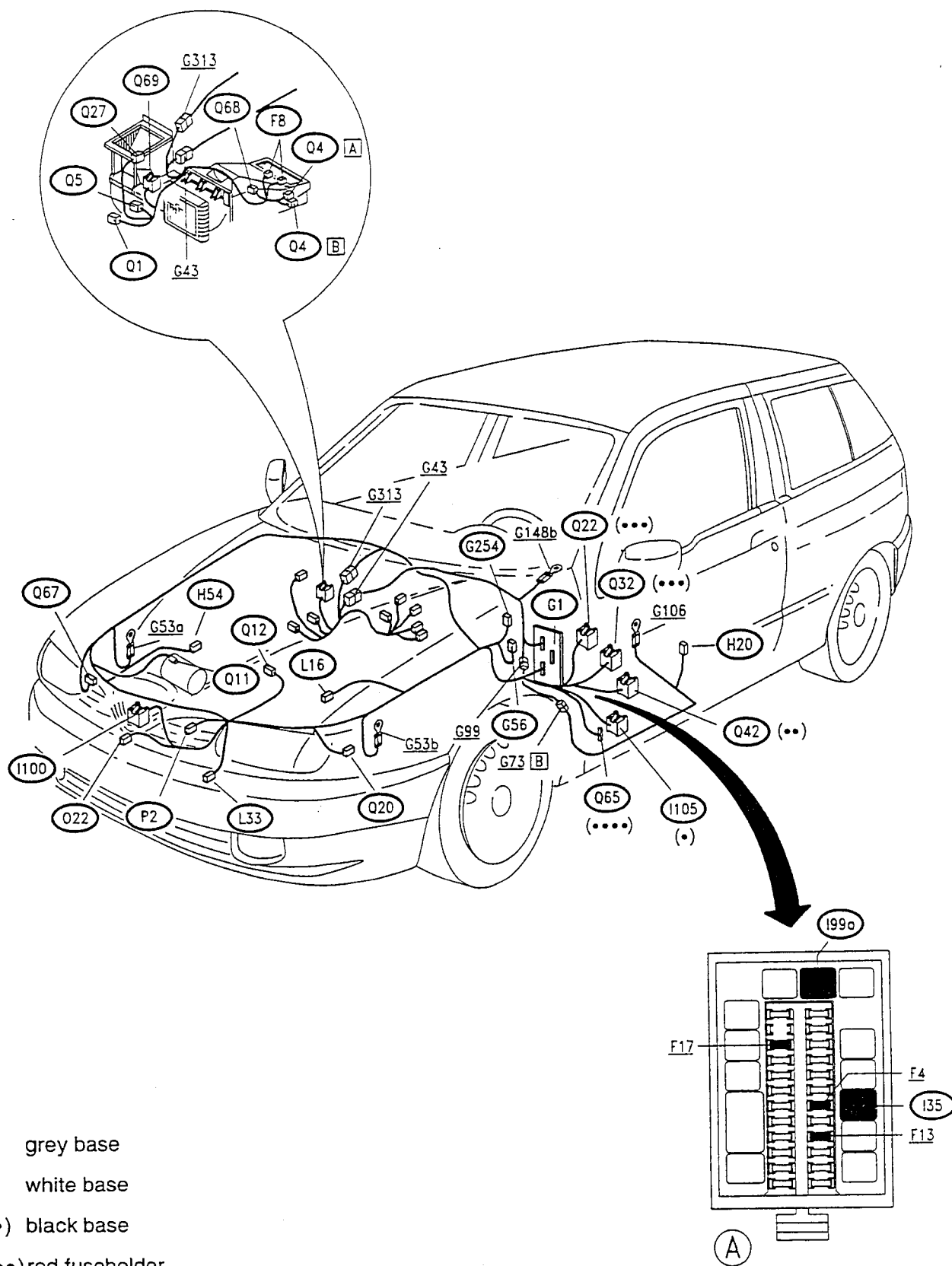
LOCATION OF COMPONENTS (TD Version - up to chassis no.....)



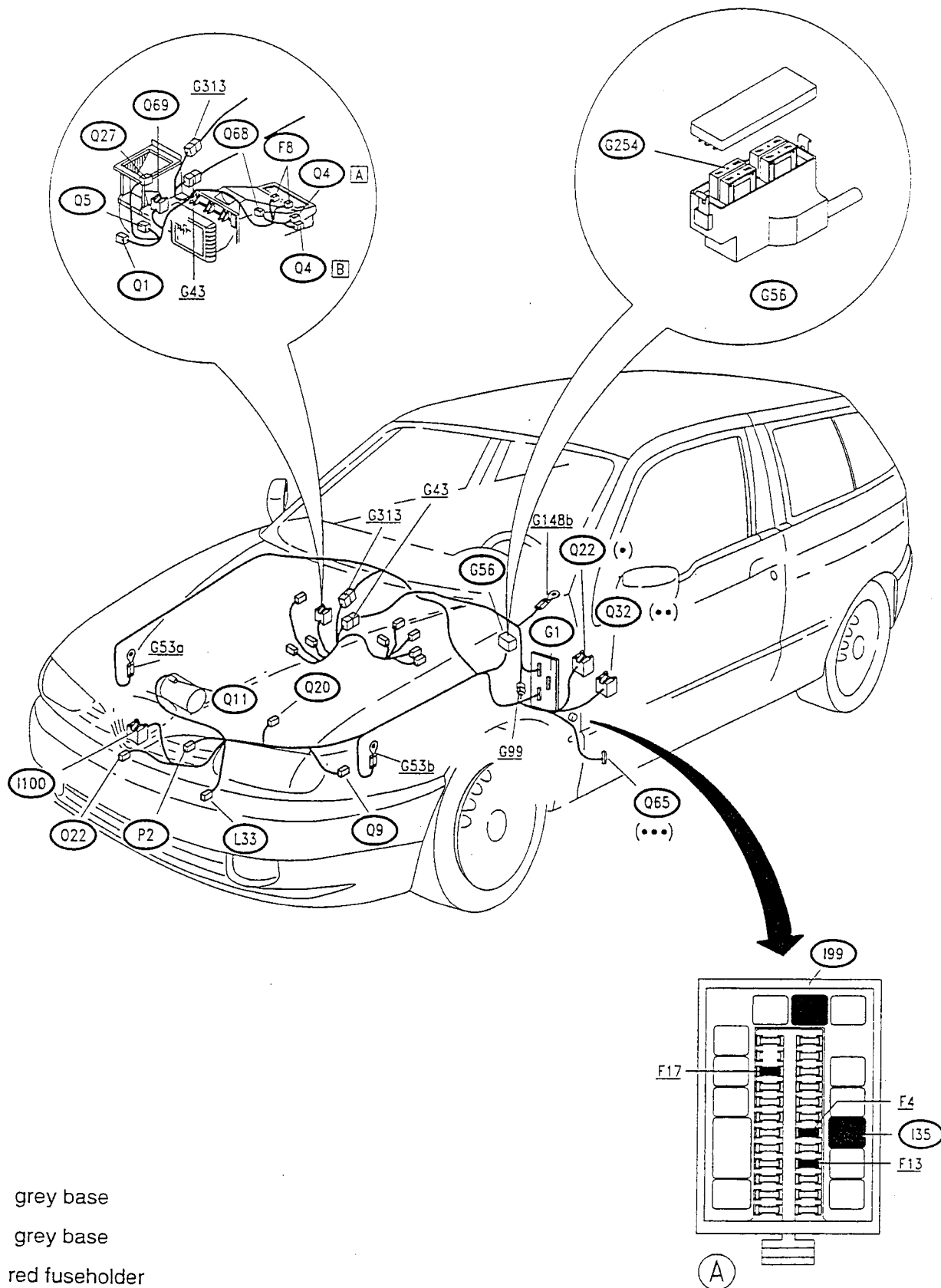
(•) grey base

— — — — only versions without ALFA ROMEO CODE, but with theft alarm

LOCATION OF COMPONENTS (TD version - from chassis no.....)



LOCATION OF COMPONENTS (T.SPARK version)



FAULT-FINDING TABLE

NOTE:

To make it easier to understand, the fault-finding table has been subdivided into three section which concern the three functions also described separately in the wiring diagrams:

Climate control fan and recirculation

Compressor control

Engine fan control

Climate control fan and recirculation

Fault	Component to be checked										
	F13	G255 (B)	Q1	I78 (B)	Q5	Q4	Q27	Q68	F8a (1)	F8b (1)	Q69
Fan engagement	•	•	•	•		•					
Fan engagement at the different speeds					•	•					
Fan engagement at 1st speed with compressor engaged						•					•
Recirculation function						•	•	•			
Climate control panel lighting									•	•	

(1) It is possible to replace the bulbs with their bulb holder

(B) Only for fusebox "B"

Compressor control

Fault		Component to be checked																
		Q39 (*)	Q65	F17	F4	Q11	Q20	Q9	Q12	H54	Q67	Q22	Q32	Q69	Q4	Q68	S11 (1)	S40 (2)
Compressor engagement (under all circumstances)	petrol	•	•	•		•						•	•	•	•	•		
	TD		•	•	•	•						•		•	•	•		
Compressor engagement (only under certain circumstances) (*)	petrol						•	•										•
	TD						•		•	•	•							

(•) only up to chassis no. 4065017

(1) Boxer 1.6 e 1.7 16 v, T.SPARK - (2) Boxer 1.3

(*) You are reminded that compressor operation is cut off by the system logic under the following conditions:

coolant fluid pressure > 28 bar appr.;

coolant fluid pressure < 2.5 bar appr. (circuit drained);

engine temperature > 111°C (only TD);

full load (temporary cutoff for appr. 8 sec. with engine rpm over 2000 rpm). (only TD).

This operation is also determined by the logic of the ignition/injection control unit (only petrol) (refer to the corresponding sections).

Engine fan control

Fault		Component to be checked																
		Q39	G254	Q66 (•)	F14	F4 (A) (*)	F15 (B)	F17 (•)	P2 P2a/b	O22	L33	Q20	Q42	Q67 (•)	I99a I99b (•)	I99 (*)	I100	I105
Fan engagement (underall circum- stances)	Boxer	•			•				•									
	TD		•						•									
	T.SPARK		•						•									
Fan engagement for high engine temperature (2nd speed)	Boxer			•		•	•	•		•	•				•	•	•	
	TD		•							•	•			•	•	•	•	•
	T.SPARK					•				•	•				•	•	•	
Fan engagement for highcoolant pressure	Boxer											•	•					
	TD											•	•					
	T.SPARK											•						

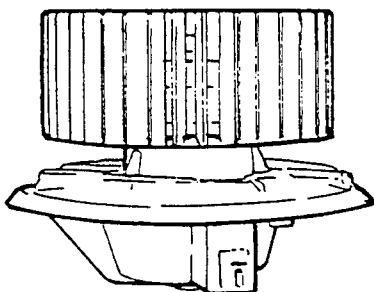
(B) Only for fusebox "B"

(•) only up to chassis no. 4065017

(*) from chassis no. 4065018

CHECKING COMPONENTS

Heating and ventilation fan (Q1)

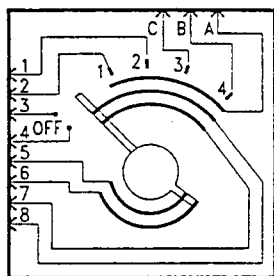


SPECIFICATIONS

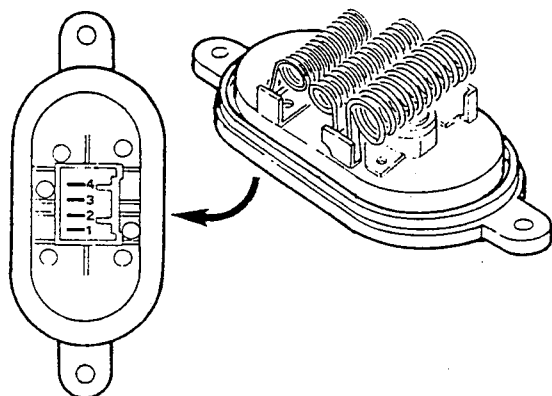
SPECIFICATIONS	
Nominal voltage	12V
Speed at 12V/25°C in free air with impeller and support	3700 ± 100 rpm
Direction of motor rotation	leftwards impeller side

Heating and ventilation fan control (Q4)

Check the contacts corresponding to the different positions of the knob.



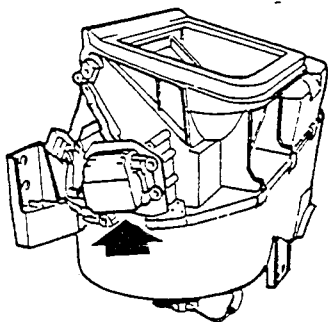
Heating & ventilation fan speed adjustment coil (Q5)



SPECIFICATIONS

SPECIFICATIONS		
Section crossed	Total resistance	fan speed
4-1	2.9 Ω	1st
3-1	0.8 Ω	2nd
2-1	0.3 Ω	3rd
none	-	4th
Thermal contact cut-in temperature		90 ± 5°C

Recirculation port control motor (Q27)



SPECIFICATIONS

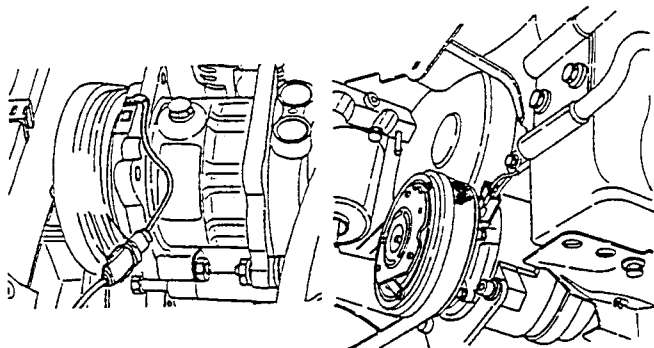
12 V at pin 1 and 0 V at pin 2 = output shaft **counter-clockwise** rotation

12 V at pin 3 and 0 V at pin 2 = output shaft **clockwise** rotation

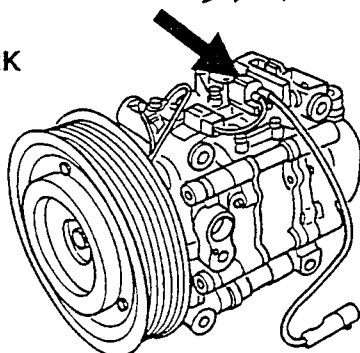
Compressor electromagnetic joint (Q11)

Boxer

TD



T.SPARK



SPECIFICATIONS

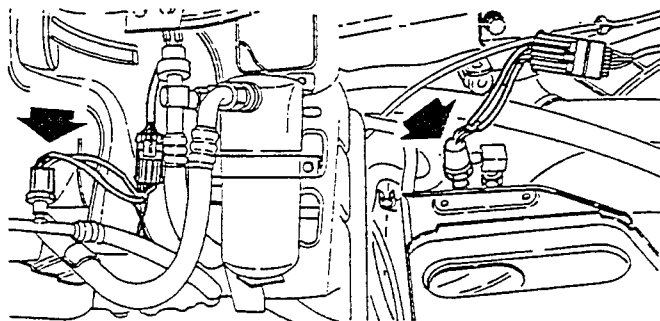
supply voltage	12 V
absorbed current	4 A (Boxer) 4.2 A (TD) 2.2 (T.SPARK)

Only T.SPARK:	Compressor disengagement thermal contact (T)	
	contact opens	>160 °C
	contact closes	<140 °C

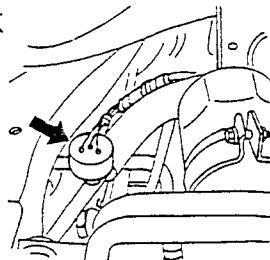
Minimum and maximum pressure switch (trinary) (Q20)

Boxer

TD



T.SPARK

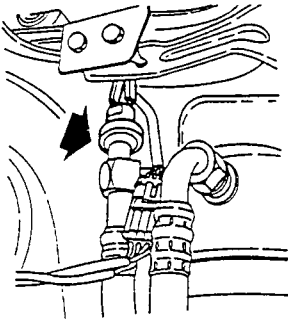


SPECIFICATIONS

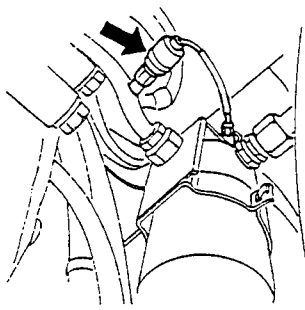
1st level: contact opens contact closes	2.45 ± 0.25 bar 2.85 ± 0.50 bar
2nd level: contact closes contact opens	15.2 ± 0.98 bar 11.28 ± 1.99 bar
3rd level: contact opens contact closes	28 $\pm \frac{2}{3}$ bar 22 $\pm \frac{4}{5}$ bar

Minimum pressure switch (antifros) (Q9)

Boxer

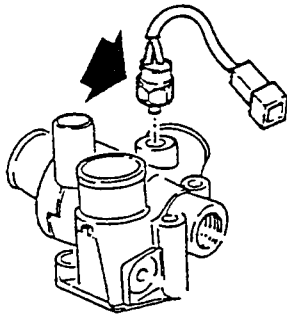


T.SPARK



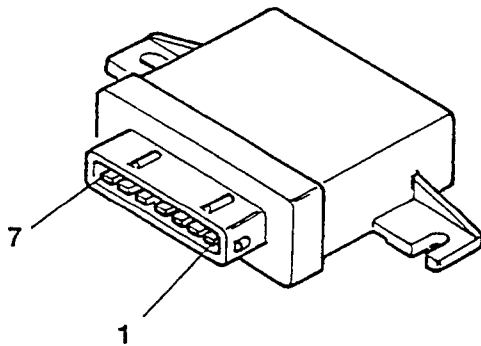
SPECIFICATIONS	
Contact opening pressure	1.7 ± 0.2 bar
Contact closing pressure	3.4 ± 0.65 bar

Compressor cutoff thermal contact (Q12) (for TD version only)



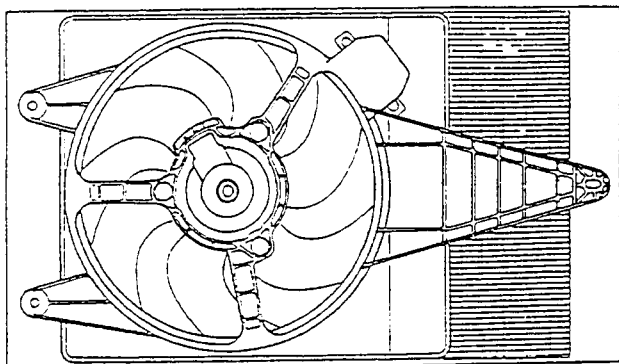
SPECIFICATIONS	
contact opens	111 ± 2 °C
contact closes	106 ± 2 °C

Compressor disengagement control unit (Q67) (for TD version only)



SPECIFICATIONS	
Operating diagram:	
Engine rpm (pin 6)	
Full load switch (pin 5)	
Output voltage (pin 7)	

Cooling fan (P2)

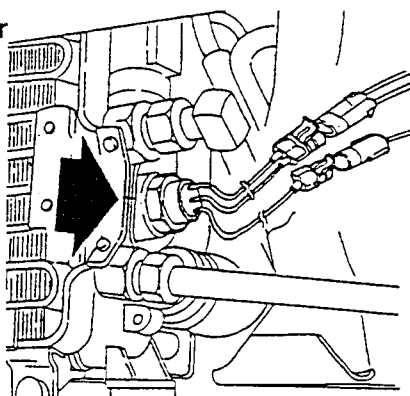


SPECIFICATIONS

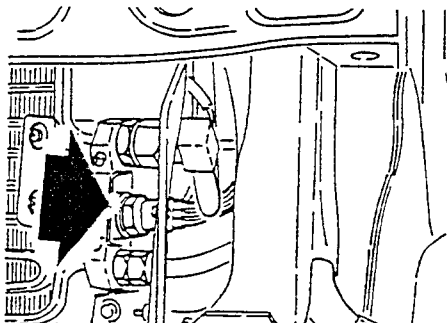
Nominal voltage	12V
Speed at 12V in free air in duct	2350 +150 rpm (minimum)
Motor direction of rotation (marked on duct)	right-hand (impeller side)

Fan two-level thermal contact (L33)

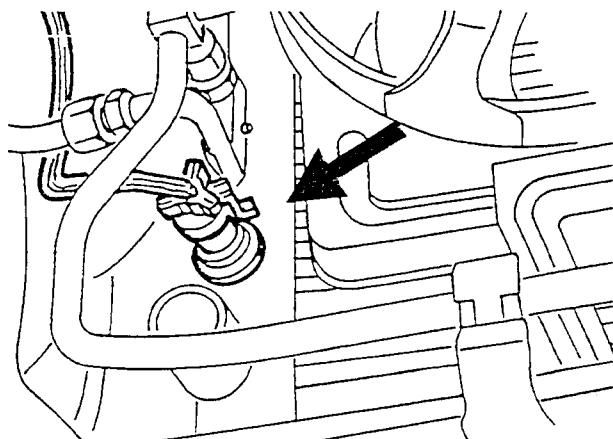
Boxer



TD



T.SPARK

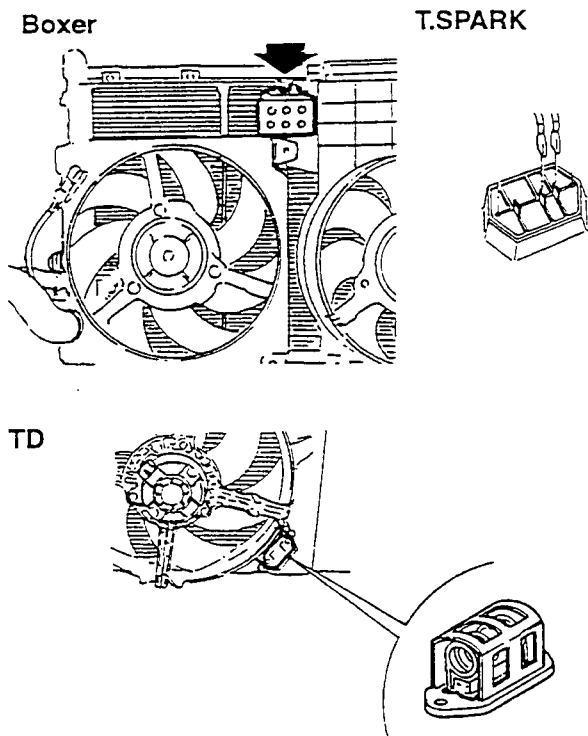


SPECIFICATIONS

Boxer and T.SPARK versions

1st level: contact closes contact opens	$92 \pm 2 \text{ }^{\circ}\text{C}$ $87 \pm 2 \text{ }^{\circ}\text{C}$
2nd level: contact closes contact opens	$97 \pm 2 \text{ }^{\circ}\text{C}$ $92 \pm 2 \text{ }^{\circ}\text{C}$
TD version	
1st level: contact closes contact opens	$88 \pm 2 \text{ }^{\circ}\text{C}$ $83 \pm 2 \text{ }^{\circ}\text{C}$
2nd level: contact closes contact opens	$92 \pm 2 \text{ }^{\circ}\text{C}$ $87 \pm 2 \text{ }^{\circ}\text{C}$

Fan resistance (O22)



SPECIFICATIONS	
Boxer versions	
resistance	$0.18 \pm 10\%$
thermal fuse cut in	216°C
TD versions	
resistance	$0.23 \pm 0.02\Omega$
thermal contact opening temperature	$130 \pm 10^{\circ}\text{C}$
thermal contact closing temperature	$60 \pm 10^{\circ}\text{C}$
T.SPARK version	
resistance	$0.18 \Omega \pm 10\%$
thermal fuse cut in	$< 100^{\circ}\text{C}$

Engine fan delaying device (Q42) (excluding T.SPARK)

