Operations index

Op.	*Symbol*	*Description*	*Validity*
E5010		**IGNITION AND RECHARGING**	
			10/00 ▶
E5020		**ENGINE COOLING**	
			03/99 ▶
			03/99 ▶
			10/00 ▶
E5030		**PETROL ENGINES ELECTRONIC CONTROL**	
			ACS
			10/00 ▶
			10/00 ▶

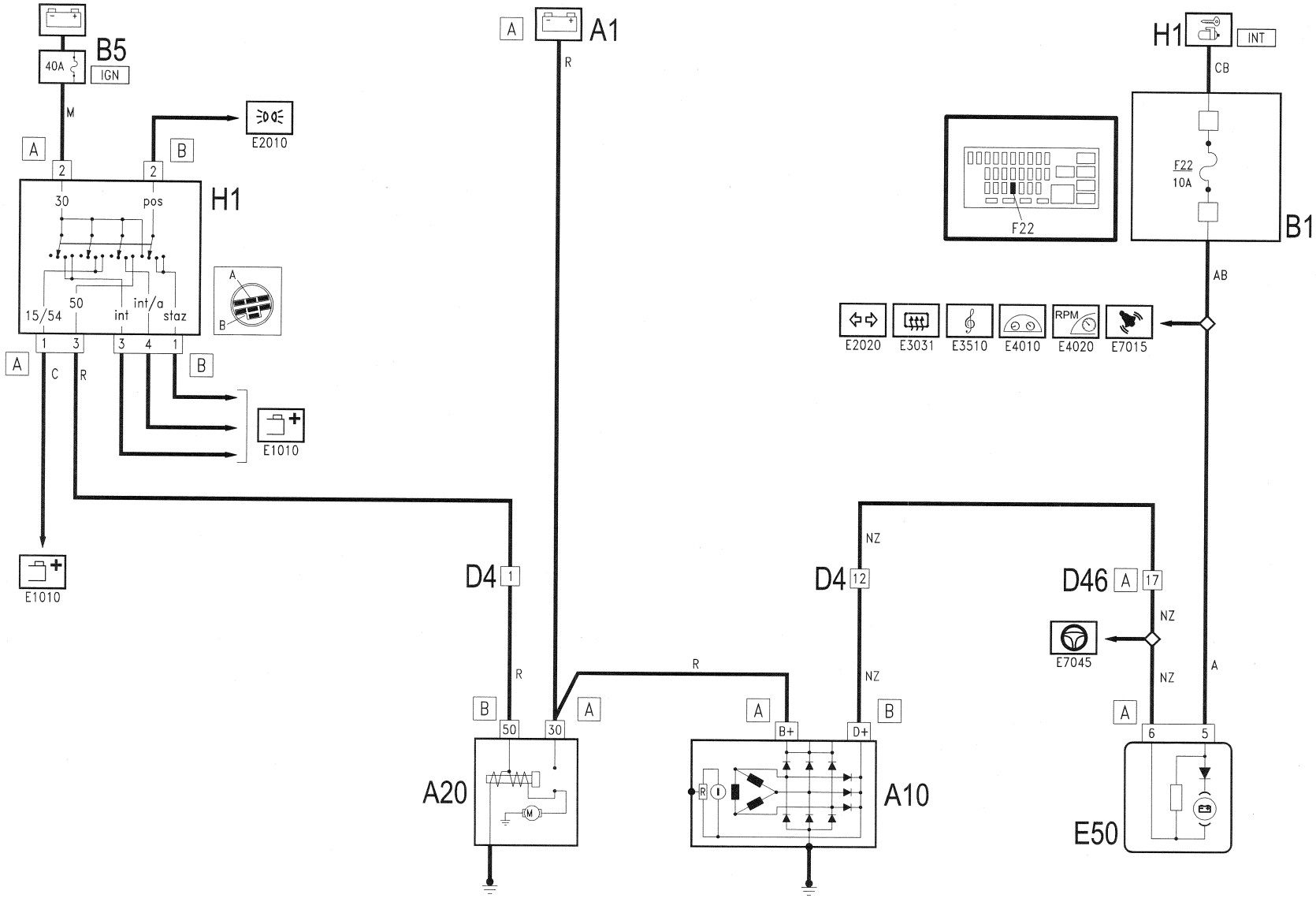
List of functions

DESCRIPTION

The starting and recharging circuit consists of the battery, the starter motor and the alternator.
The battery (12V) is lead type, which requires very little servicing.
The starter motor consists of a d.c. motor fed by the battery and an energising electromagnet.
Turning the ignition key to the end position (IGN) the motor windings are supplied, generating the electromagnetic forces that turn the pinion of the motor.
At the same time the electromagnet is energised to activate the pinion meshing in the flywheel crown ring thus starting the crankshaft rotation.

The alternator recharges the battery during the normal engine rotation.
The crankshaft starts the alternator shaft (rotor) rotation through a belt. Supplied with the energising current, the rotor generates a magnetic field that induces an alternating current on the fixed winding (stator).
A rectifier diode bridge on the rear of the alternator transforms the alternating current to direct current, that is sent to recharge the battery.
A voltage regulator, also incorporated in the alternator, holds the current delivery at a steady voltage(approx. 14 V) for all the load variation ranges and engine speeds.

WIRING DIAGRAM



List of functions

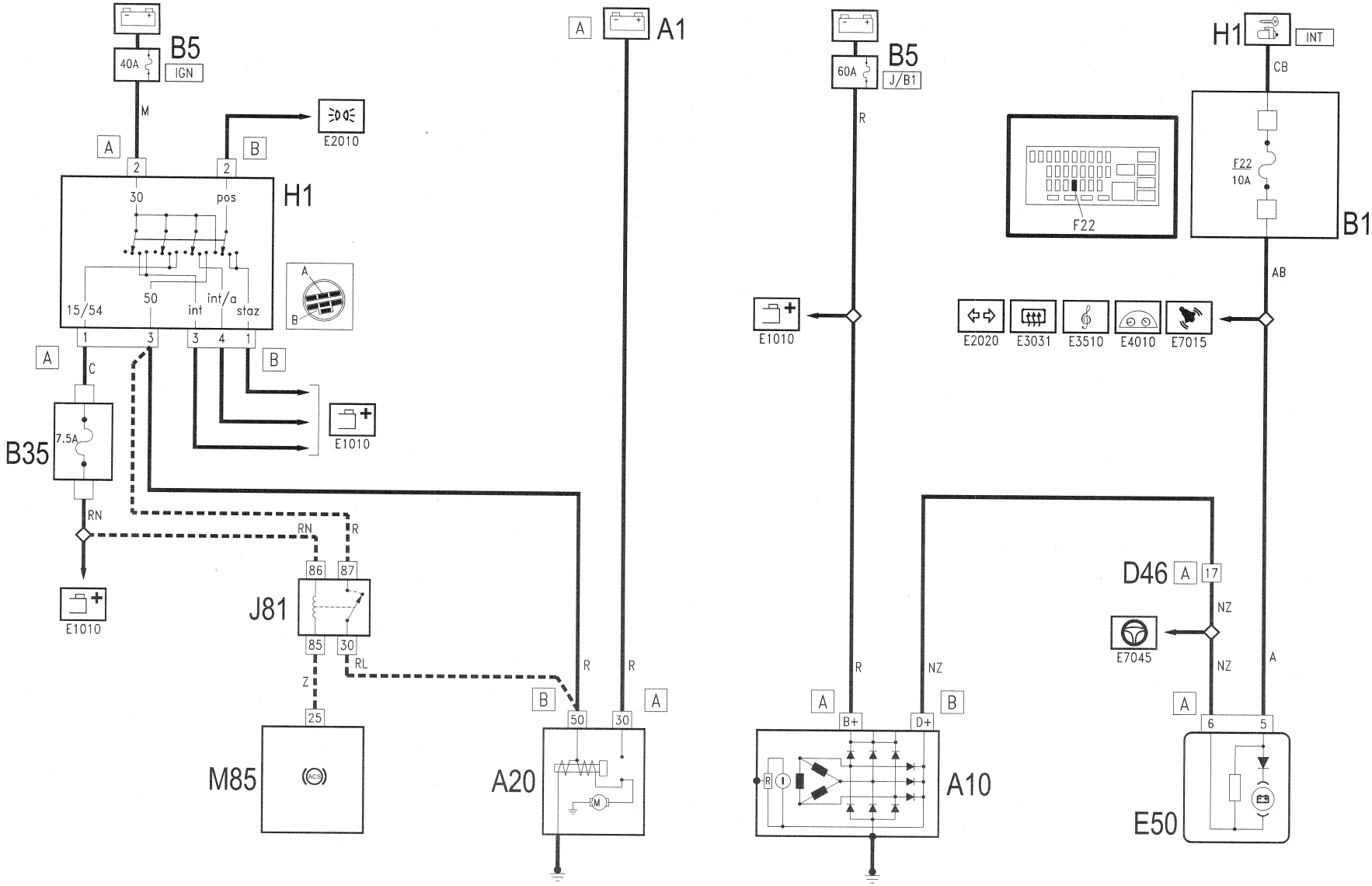
- DESCRIPTION
- WIRING DIAGRAM
- DESCRIPTION OF OPERATION
- COMPONENTS
- COMPONENT LAYOUT

DESCRIPTION

The starter and recharging circuit consists of the battery, the starter motor and the alternator.
The battery(12V)is lead type that requires very little servicing .
IThe starter motor has a d.c. motor supplied by the battery and an energising electromagnet.
Turning the ignition key to the end position (IGN) the motor windings are powered, generating the electromagnetic forces that rotate the pinion of the motors. At the same time the electromagnet is energised that activates the pinion meshing in the flywheel crown ring, rotating the crankshaft.
The alternator recharges the battery during notmal engine rotation.

The alternator shaft (rotor) is rotated by the crankshaft by a belt. Powered by an energising current, the rotor generates a magnetic field that induces an alternating current on the fixed winding (stator.
A rectifier diode bridge on the rear of the alternator transforms the alternating current to direct current sent to recharge the battery.
A bvoltage regulator also incorporated in the alternator, keeps the voltage delivery steady (approx. 14 V) for all load variation ranges and engine speeds .
In the automatic clutch version , this system actuates a safety logic that inhibits the vehicle start up if any gear is inserted : the signal to the starter motor passes through a relay energised by the automatic clutch control unit that supplies the consent.

WIRING DIAGRAM



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- - - - - - - - - for ACS only

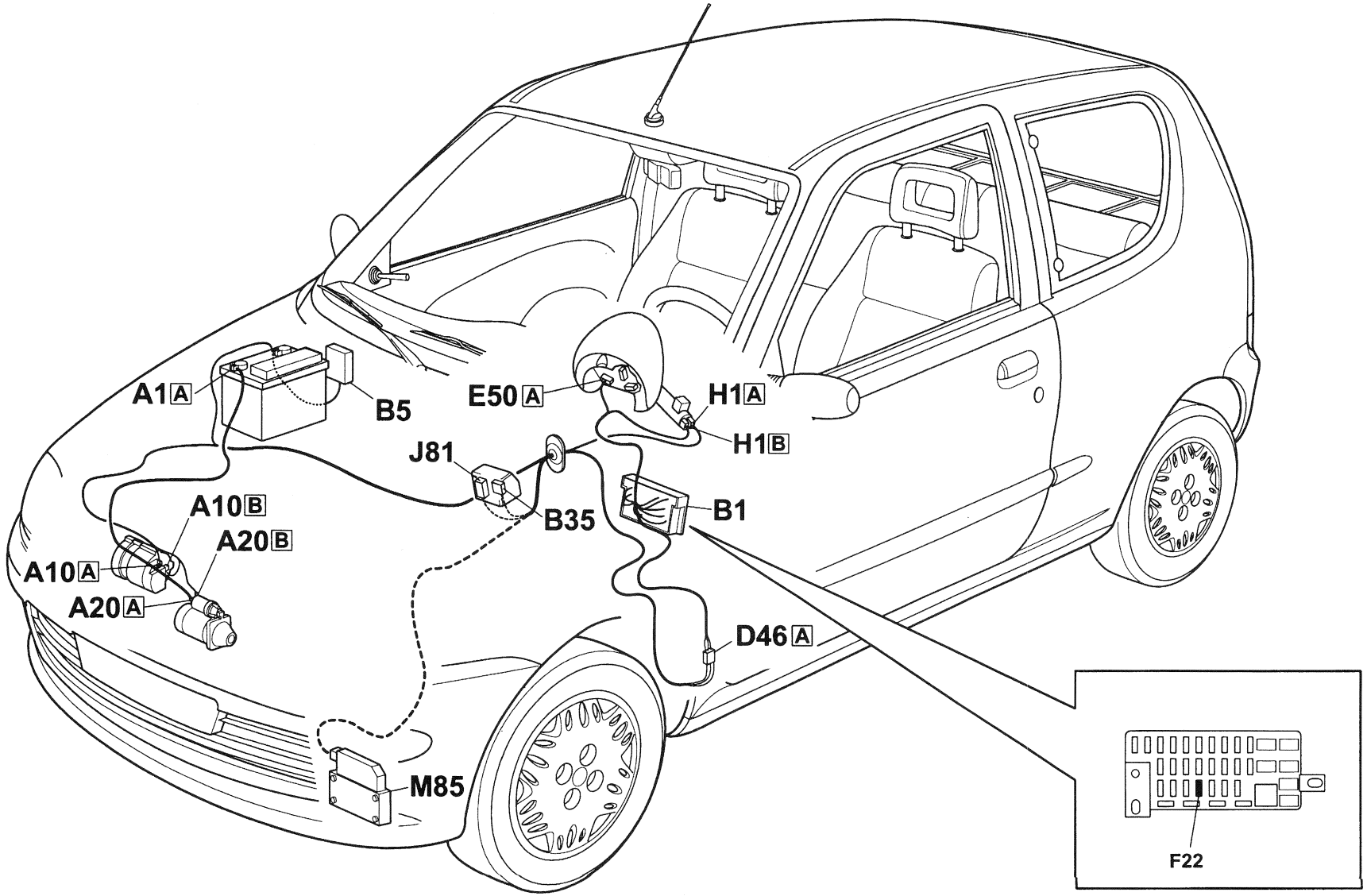
DESCRIPTION OF OPERATION

Turning the ignition key of switch **H1** to the end position (IGN) the electromagnet winding is energised (pin 50)by starter motor **A20**.This supply comes from the battery through the line of maxifuse IGN of **B5**
In the automatic clutch version, this signal passes through the startup inhibition relay **J81** : this is energised by the automatic clutch control unit **M85** that supplies the consent signal from pin 25.
Pin 30 of **A20**,the actual motor, is powered with the voltage coming directly from battery A1.
The direct current generatedby the alternator **A10** (pin B+) is sent to the battery **A1**, passing through maxifuse of **B5**.
When the alternator isnot in rotation, and does not recharge the battery, an earth signal is sentfrom pin D+ to cluster **E50**, pin 6 of connector A.
Cluster **E50** receives ignition switch power supply (INT)to pin 5 of connector A of the line protected by fuse **F22** of junction unit **B1**: when this signal arrives, the generator warning light switches on. With the engine running this signal becomes 12 V and the warning light switches off

COMPONENTS

Code component	*Description*	*Unit reference*
A1	Battery	5530B
A10	Alternator	5530A
A20	Starter motor	5520B
B1	Fuse carrier	5505A
B5	MAXI FUSE box	-
B35	CODE and injection memories fuse	-
D4	Front/engine connection	-
D46	Front/dashboard - rear connection	-
E50	Cluster	5560B
H1	Ignition switch	5520A
J81	Start up inhibition relay	1820E
M85	Automatic clutch control unit	1820E

COMPONENT LAYOUT



- - - - - - - - - variant for ACS

187E150100100001E1CEU

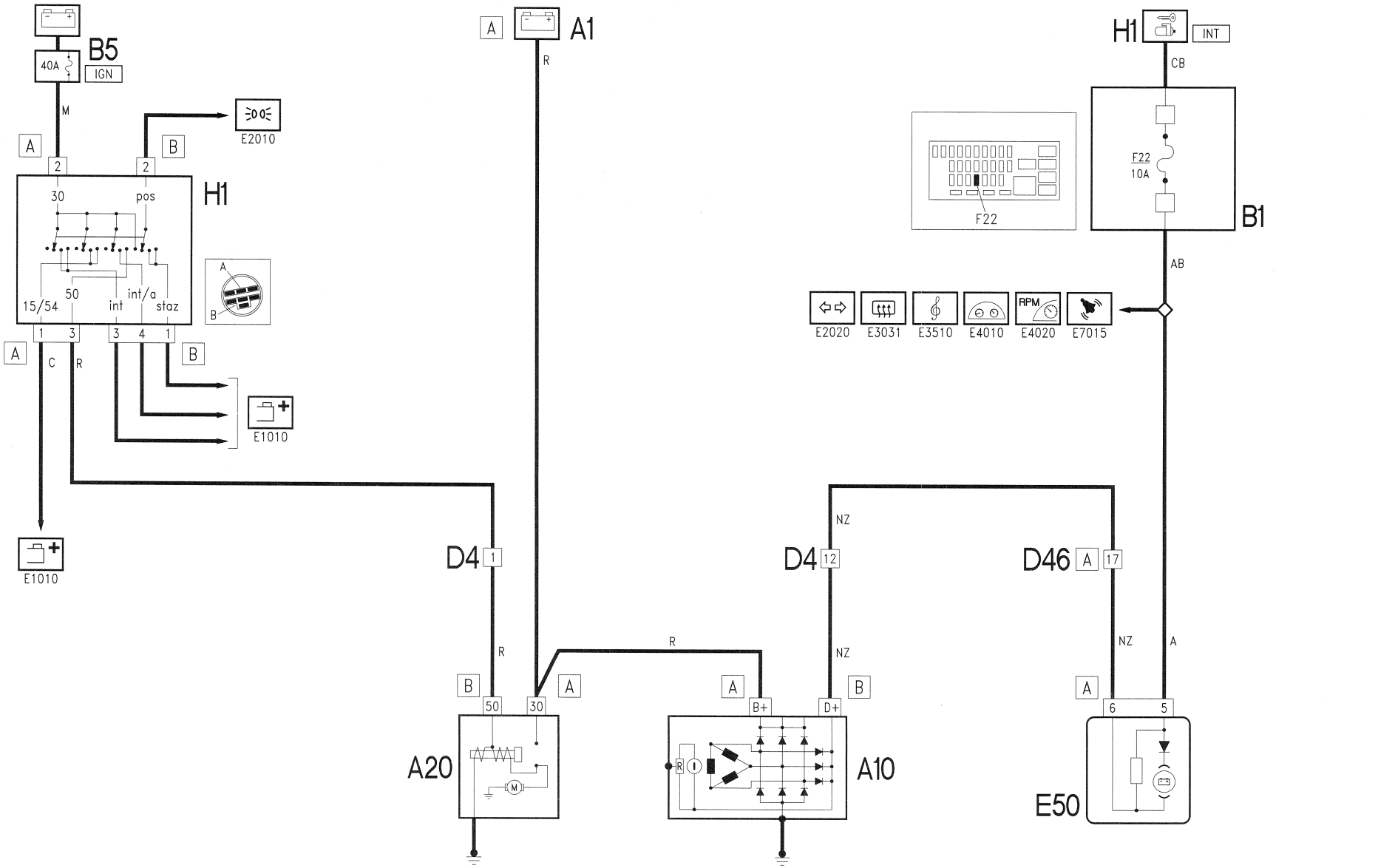
List of functions

DESCRIPTION

The starting and recharging circuit consists of the battery, the starter motor and the alternator.
The battery (12V) is lead type, which requires very little servicing.
The starter motor consists of a d.c. motor fed by the battery and an energising electromagnet.
Turning the ignition key to the end position (IGN) the motor windings are supplied, generating the electromagnetic forces that turn the pinion of the motor.
At the same time the electromagnet is energised to activate the pinion meshing in the flywheel crown ring thus starting the crankshaft rotation.

The alternator recharges the battery during the normal engine rotation.
The crankshaft starts the alternator shaft (rotor) rotation through a belt. Supplied with the energising current, the rotor generates a magnetic field that induces an alternating current on the fixed winding (stator).
A rectifier diode bridge on the rear of the alternator transforms the alternating current to direct current, that is sent to recharge the battery.
A voltage regulator, also incorporated in the alternator, holds the current delivery at a steady voltage(approx. 14 V) for all the load variation ranges and engine speeds.

WIRING DIAGRAM



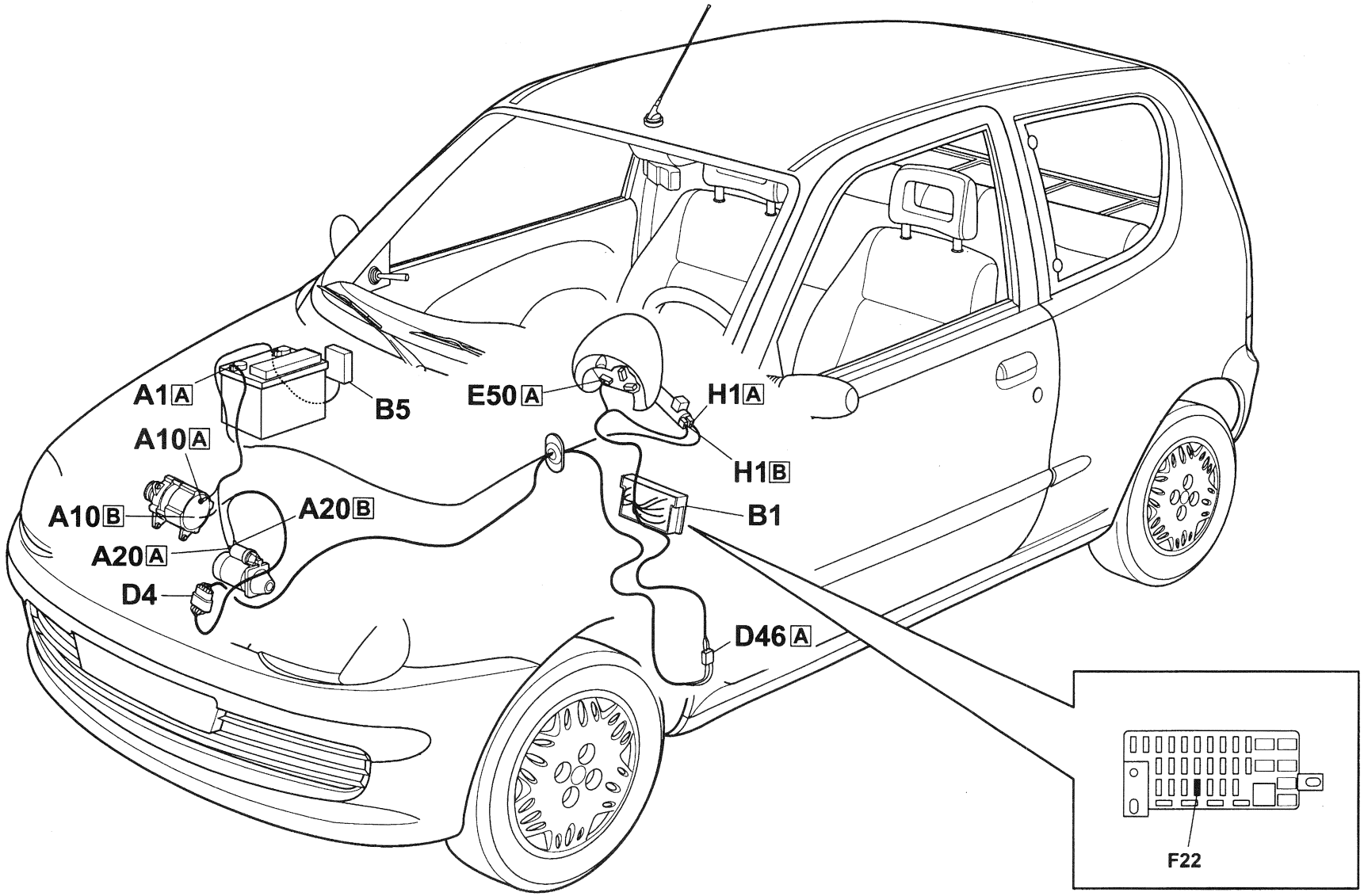
DESCRIPTION OF OPERATION

Turning the key of ignition switch **H1** to the end position (IGN) the electromagnetic windings(pin 50) of starter motor **A20** are powered.
This supply comes from the battery through the maxifuse IGN line of **B5**.
Furthermore, pin 30 of **A20**, the actual motor, is supplied with a voltage coming directly from the battery **A1**.
The direct current generated by alternator **A10** (pin B+) is sent to the battery**A1**, passing through starter motor **A20**. When the alternator does not rotate, and therefore does not recharge the battery, an earth signal is sent by pin D+ to cluster **E50**, pin 6 of connector A.
Cluster E50 is powered from ignition switch (INT) to pin 5 of connector A by the line protected by fuse **F22** of junction unit **B1**: when this signal arrives,the "generator"warning light switches on. With the engine running this signal becomes 12 V and the warning light switches off.

COMPONENTS

Code component	*Description*	*Unit reference*
A1	Battery	5530B
A10	Alternator	5530A
A20	Starter motor	5520B
B1	Fuse carrier	5505A
B5	MAXI FUSE box	-
D4	Front/engine connection	-
D46	Front/dashboard - rear connection	-
E50	Cluster	5560B
H1	Ignition switch	5520A

COMPONENT LAYOUT



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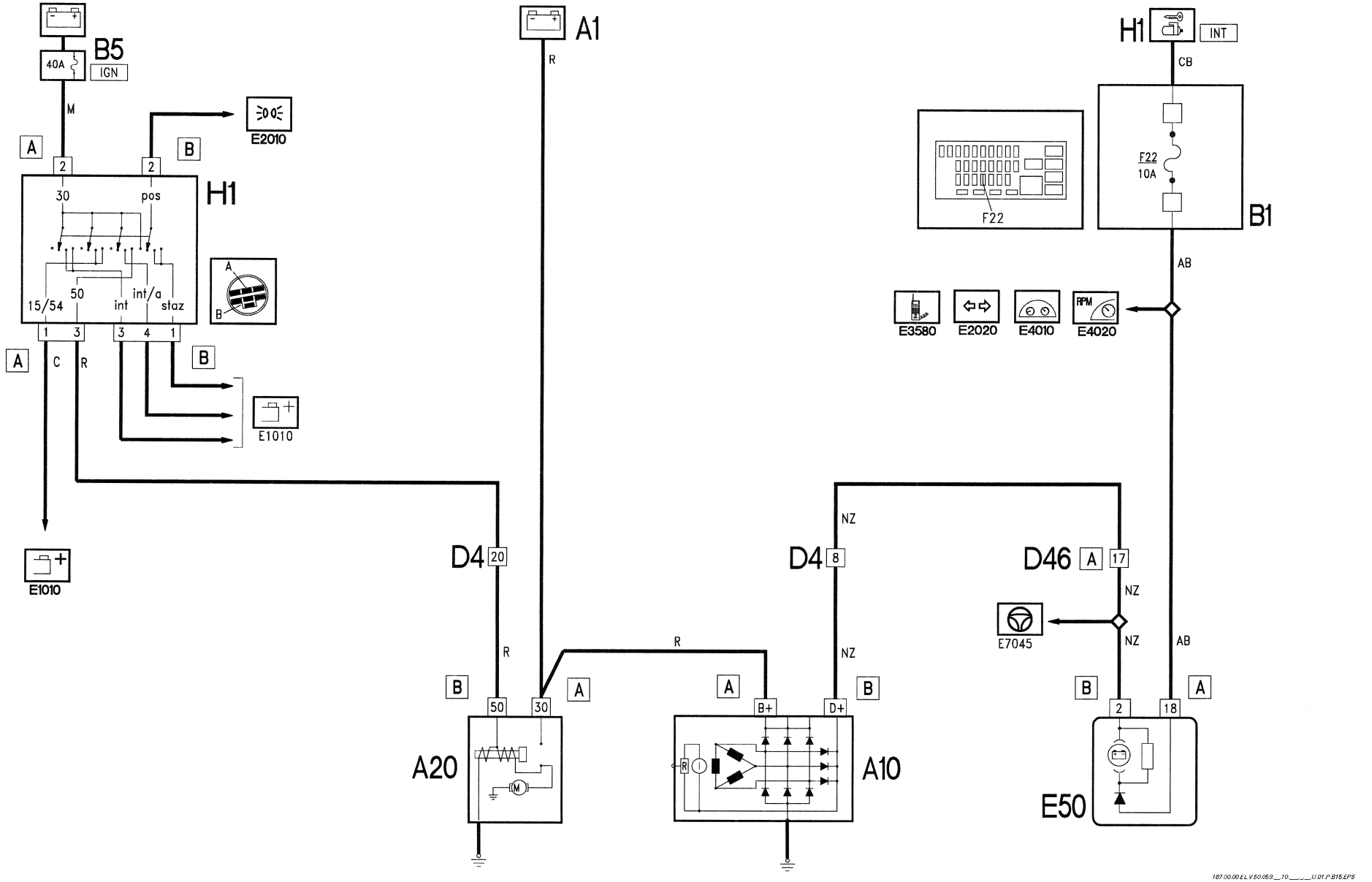
Operation index

DESCRIPTION

10/00 ▶

The ignition and recharging circuit comprises a battery, starter motor and alternator.
The battery (12V) is low maintenance lead type.
The starter motor consists of a direct current motor supplied by the battery and an excitation solenoid.
When the ignition key is turned to the extreme position (AVV), the starter motor windings are supplied, producing electro-magnetic forces which rotate the motor pinion. At the same time, the solenoid is energized and operates the mechanism for engaging the pinion in the flywheel ring gear, thus turning over the engine.
The alternator recharges the battery during normal engine rotation.
The alternator shaft (rotor) is turned by the crankshaft by means of a belt. When supplied with an excitation current, the rotor generates a magnetic field that induces an alternating current in the fixed winding (stator).
A diode rectifying bridge located on the back of the alternator transforms the alternating current into a direct current, which is sent to recharge the battery.
A voltage regulator, also built into the alternator, maintains a constant voltage supply (about 14V) throughout the load and engine speed ranges.
Version with automatic clutch, this system has a safety logic which prevents the vehicle from being started if a gear is engaged: the control signal for the starter motor passes through a special relay energized by the automatic clutch control unit which provides the necessary go ahead.

WIRING DIAGRAM



DESCRIPTION OF OPERATION

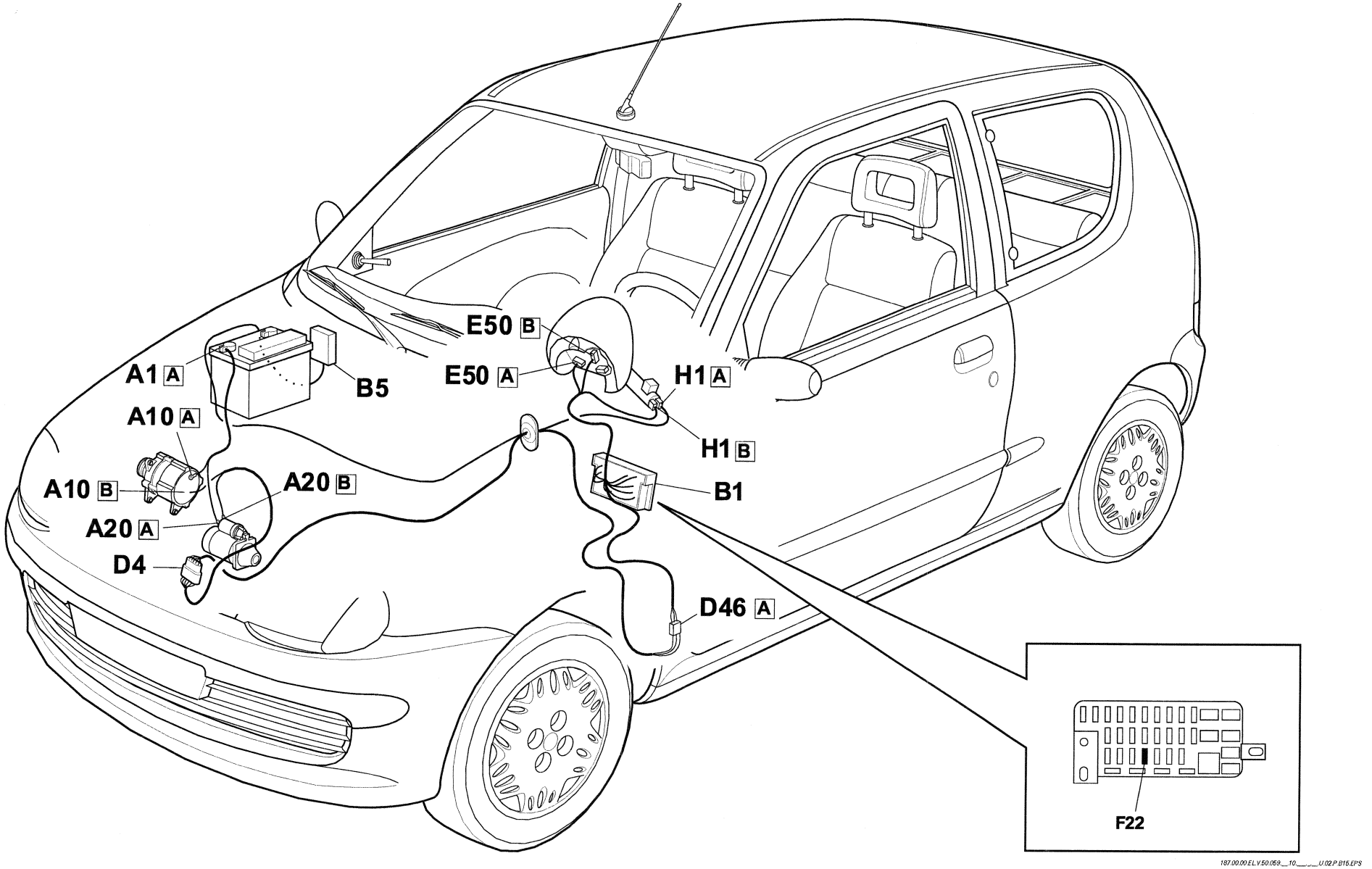
10/00

When the ignition key for the switch **H1** is turned to the extreme position (AVV), the solenoid winding (pin 50) of the starter motor **A20** is supplied. This supply comes from the battery via the line of 40A maxifuse IGN of **B5**.
Pin 30 of **A20**, the actual starter motor, receives the voltage coming directly from the battery **A1**.
The direct current generated by the alternator **A10** (pin B+) is sent to the battery **A1** through motor **A20**.
When the alternator is not turning, i.e. not charging the battery, an earth signal is sent from pin D+ to instrument panel **E50** - pin 2 of connector B.
The instrument **E50** is supplied with the ignition switched on (INT) at pin 18 of connector A from the line protected by fuse **F22** of the junction unit **B1**.
When the instrument panel is on, the 'recharging' warning light is lit up because the signal available from pin D+ of the alternator is an earth. When the vehicle has been started up, when the alternator is recharging the battery correctly, the 'recharging' warning light goes out because the voltage at pin D+ of the alternator **A10** is +12V; in effect, as there is no variation in voltage between pin 2 of connector B and pin 18 of connector A the internal diode does not allow the current to pass.

COMPONENTS

Component code	*Description*	*Assembly drawing reference*
A01		5530B
A10	Alternator	5530A
A20	Starter' motor	5520B
B01	Junction unit	-
B05	MAXI FUSE box	-
B35	Injection memory and CODE fuse	-
D04	Front / engine coupling	-
D46	Rear dashboard./ front- coupling	-
E50	Instrument panel	5560B
H01	Ignition switch	5520A
J81	Starter inhibitor relay	-
M85	Automatic clutch control unit	1820E

COMPONENTS LAYOUT



List of functions

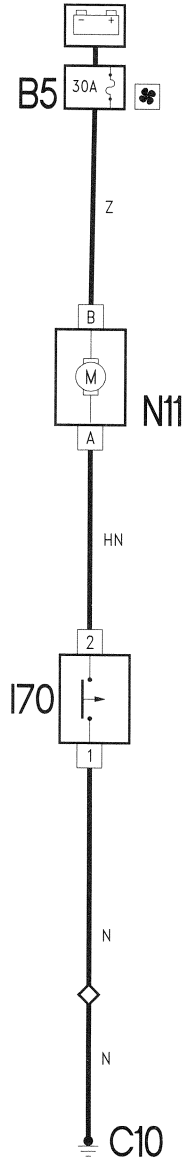
- **DESCRIPTION**
- **WIRING DIAGRAM**
- **DESCRIPTION OF OPERATION**
- **COMPONENTS**
- **COMPONENT LAYOUT**

DESCRIPTION

The engine raditor cooling system consists of an electric fan that is activated when the engine coolant reaches a high temperature.
The fan activation is through a thermometric switch on the radiator.

The fan power supply line is protected by a maxifuse.
The fan can switch on under any conditions, even with the key on STOP or removed.

WIRING DIAGRAM



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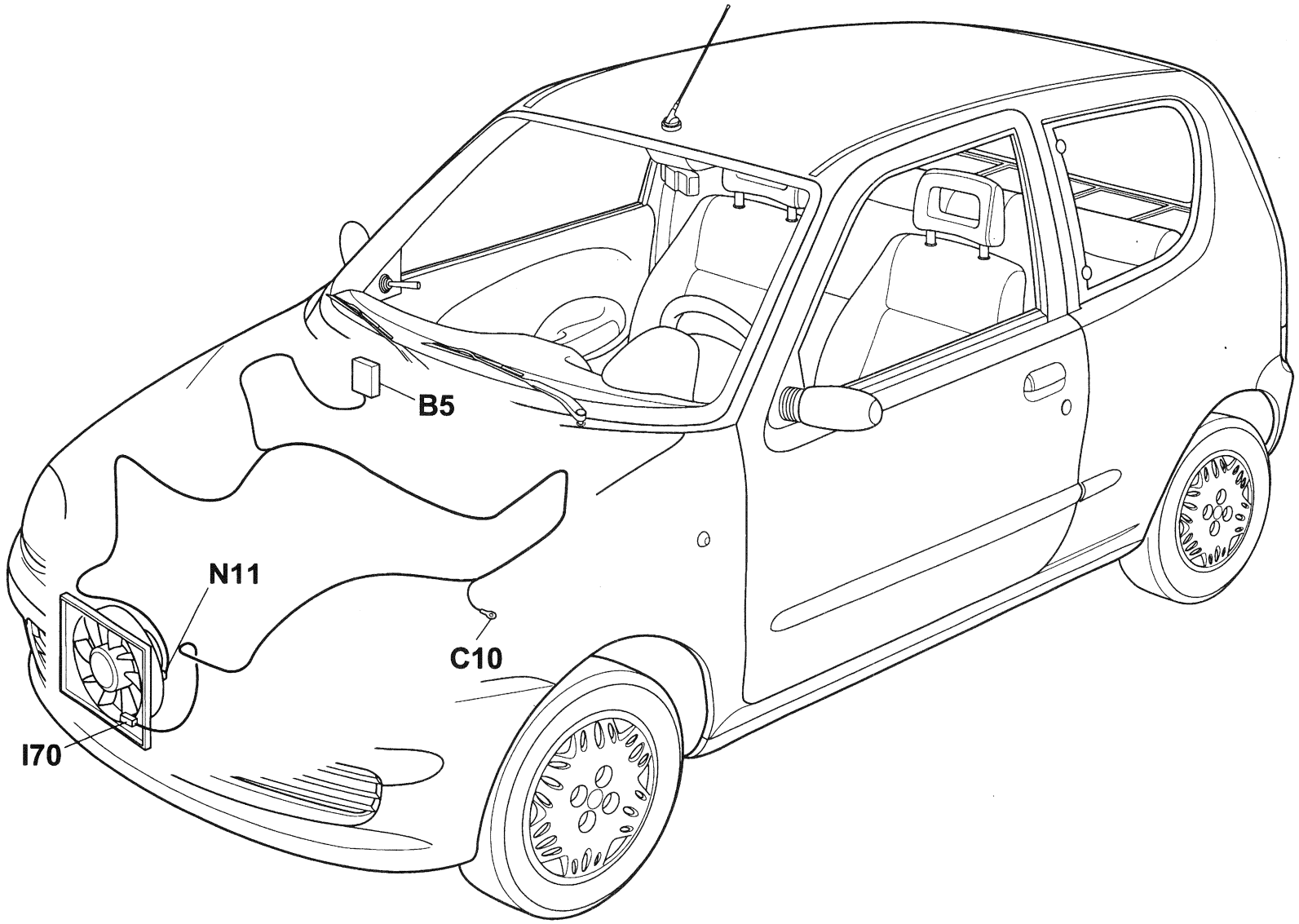
DESCRIPTION OF OPERATION

The power supply for engine fan motor **N11** arrives directly from the battery from the maxifuse FAN line of di **B5**: therefore the fan operates when it receives a control earth.
If the engine coolant temperature rises, thermometric switch **I70** closes, sending the earth to activate the engine fan motor **N11**.

COMPONENTS

Code component	*Description*	*Unit reference*
B5	MAXI FUSE box	-
C10	Front left earth	-
I70	Thermometric switch on radiator	1088E
N11	Engine fan motor	1088E

COMPONENT LAYOUT



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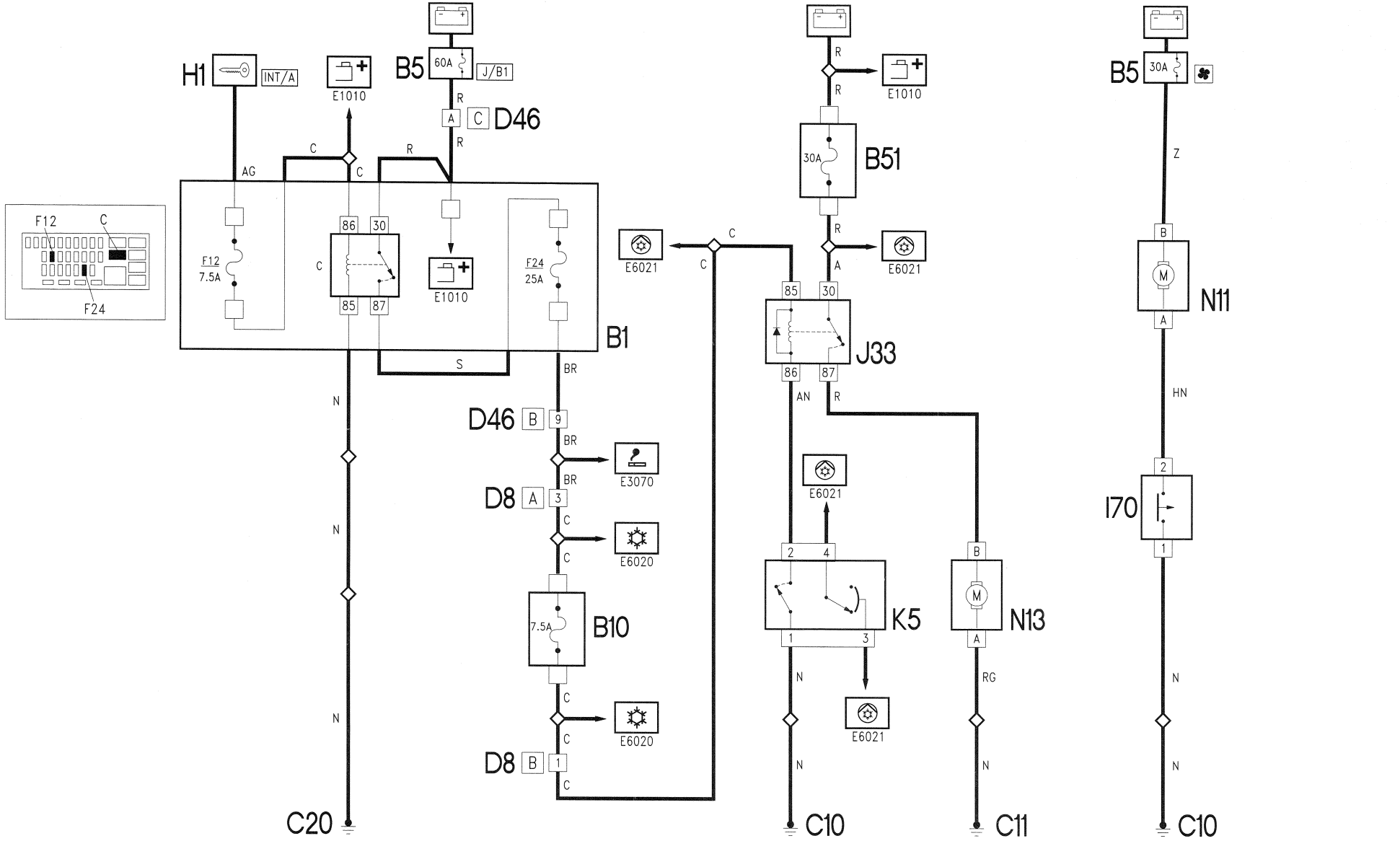
List of functions

DESCRIPTION

The cooling system of the engine radiator and air conditioner condenser consists of two distinct electric fans: the first fan is activated when the temperature of the engine coolant rises considerably, the second fan is activated in relation to a certain pressure of the air conditioner coolant .
The activation of theengine cooling fan is by means of a thermometric switch on the radiator.
The electric fan power supply line is protected by a maxifuse.

The engine cooling fan can switch on under any condition, even with the key on STOP or removed.
the air conditioner condenser fan is activated by a relay in the engine compartment (right side) and is controlled by a three-level pressure switch of the air conditioner circuit.
The power supply line for this fan is protected by the power supply fuse in the engine compartment next to the MAXI FUSES, whereas the relay energising circuit is protected by the air conditioner power supply fuse, under the dashboard on the air conditioner group.
YThe condenser cooling fan only switches on with the key on RUN.

WIRING DIAGRAM



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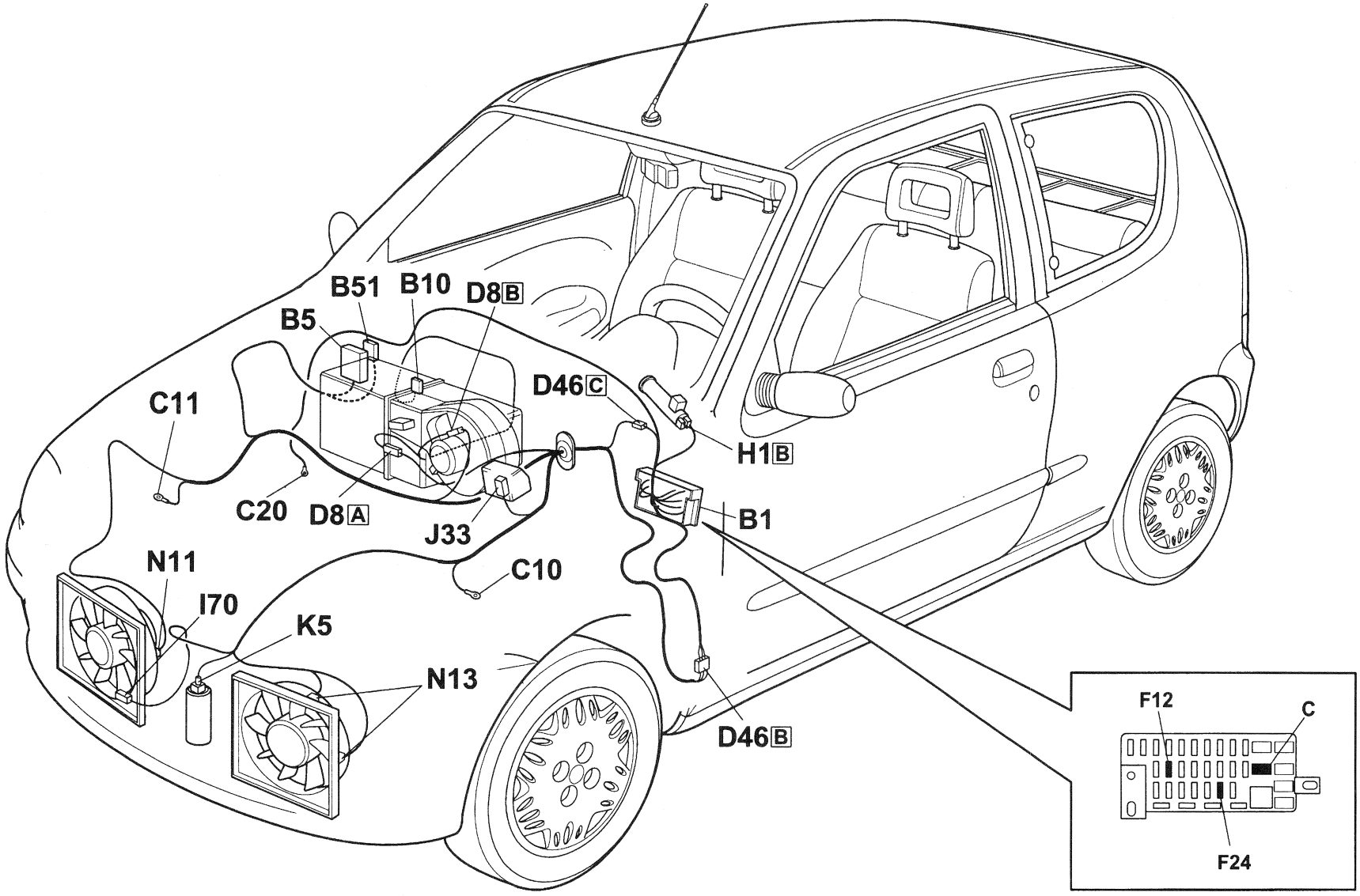
DESCRIPTION OF OPERATION

The power supply of the engine fan motor **N11** arrives directly from the battery from the maxifuse FAN line of **B5**: therefore the fan operates when it receives a control earth. .
If the engine coolant reaches a high temperature, thermometric switch **I70** closes, sending the earth to activate the engine fan motor **N11**.
The condenser cooling fan motor**N13** is connected to earth and therefore operates when it is fed by air conditioner fan relay **J33**.
The relay is supplied directly from the battery through the line of air conditioner/automatic clutch fuse **B51**.
The coil of relay **J33** is fed by ignition switch power supply line (INT/A) of fuse **B10**: this line is controlled by power supply cut-out relay (connector C) and protected by fuse **F24**, both on junction unit **B1**.
The coil of realy **J33** is energised by an earth signal coming from 3-level pressure switch **K5** (pin 2) that signals that a certain pressure level has been reached in the conditioner circuit: pressure switch **J33** then sends power to the condenser cooling fan motor **N13**.

COMPONENTS

Code component	*Description*	*Unit reference*
B1	Fuse carrier	5505A
B5	MAXI FUSE box	-
B10	Ignition switch power supply fuse	-
B51	Air conditioner/automatic clutch fuse	-
C10	Front left earth	-
C11	Front right earth	-
C20	Right dashboard earth	5505A
D8	Front /air conditioner - heater connection	-
D46	Front/dashboard - rear connection	-
H1	Ignition switch	5520A
I70	Thermometric switch on radiator	-
J33	Air conditioner fan relay	-
K5	3-level pressure switch	5040B
N11	Engine fan motor	1088E
N13	Condenser cooling fan motor	5040A

COMPONENT LAYOUT



187E150201000002E1CEU

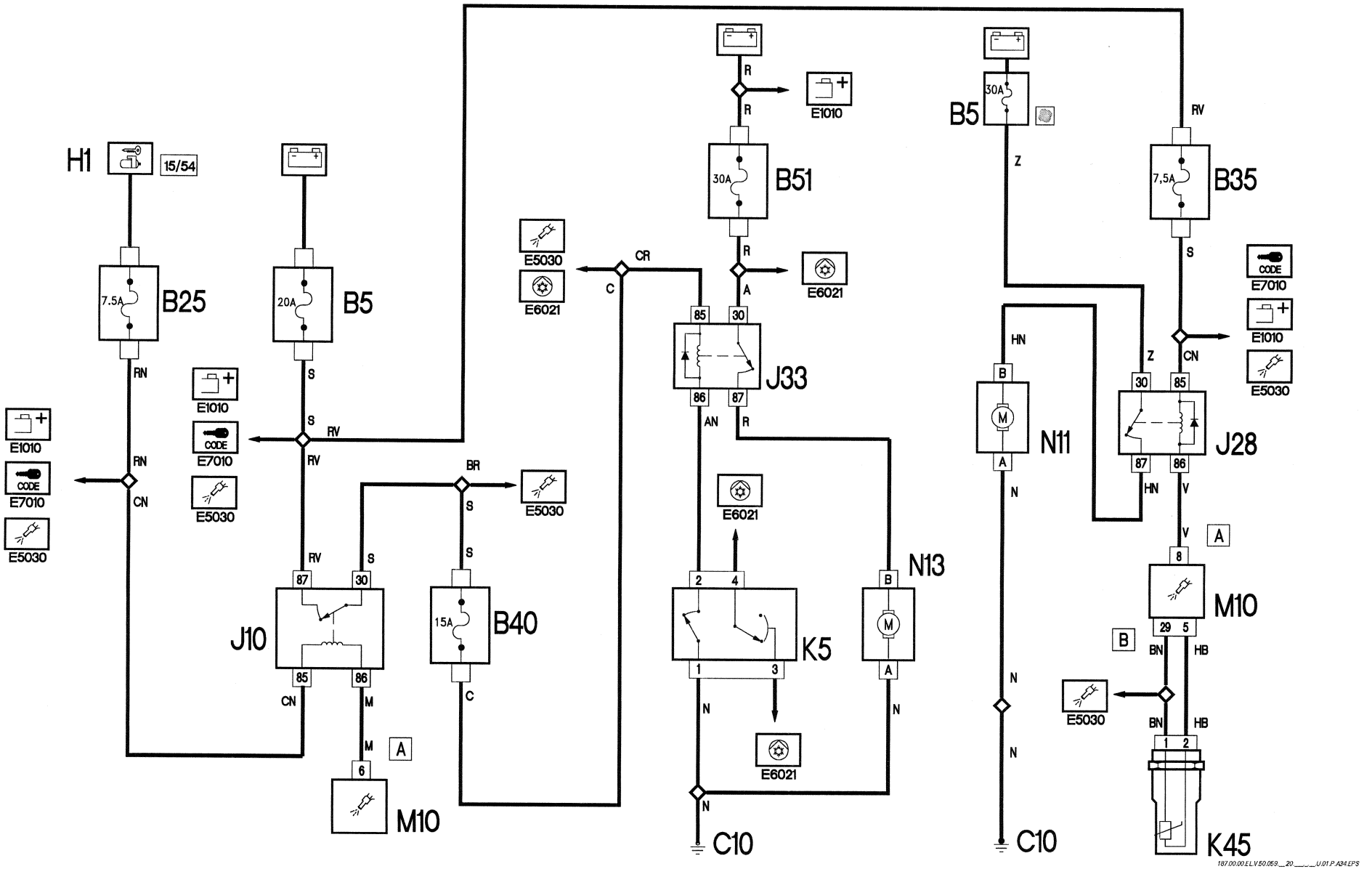
Operation index

DESCRIPTION

10/00

The engine radiator and condenser cooling system consists of two fans: the first fan is operated when the engine coolant temperature is high, the second fan is operated when the air conditioning coolant fluid reaches a certain pressure.
The operation of the engine cooling fan is achieved by means of a special thermal switched located on the radiator.
The fan supply line is protected by a special maxifuse.
The engine cooling fan comes on in all conditions, even with the ignition key switched OFF or removed.
The operation of the air conditioning condenser cooling fan is achieved by means of a special relay located in the engine compartment (right hand side) and is operated by a three stage pressure switch in the air conditioning circuit.
The supply line for this fan is protected by a special shunt fuse, located in the engine compartment next to the MAXIFUSES, whilst the relay energizing circuit is protected by the shunt fuse for the climate control system, located under the dashboard on the actual climate control system assembly.
The condenser cooling fan only comes on when the ignition is ON.

WIRING DIAGRAM



DESCRIPTION OF OPERATION

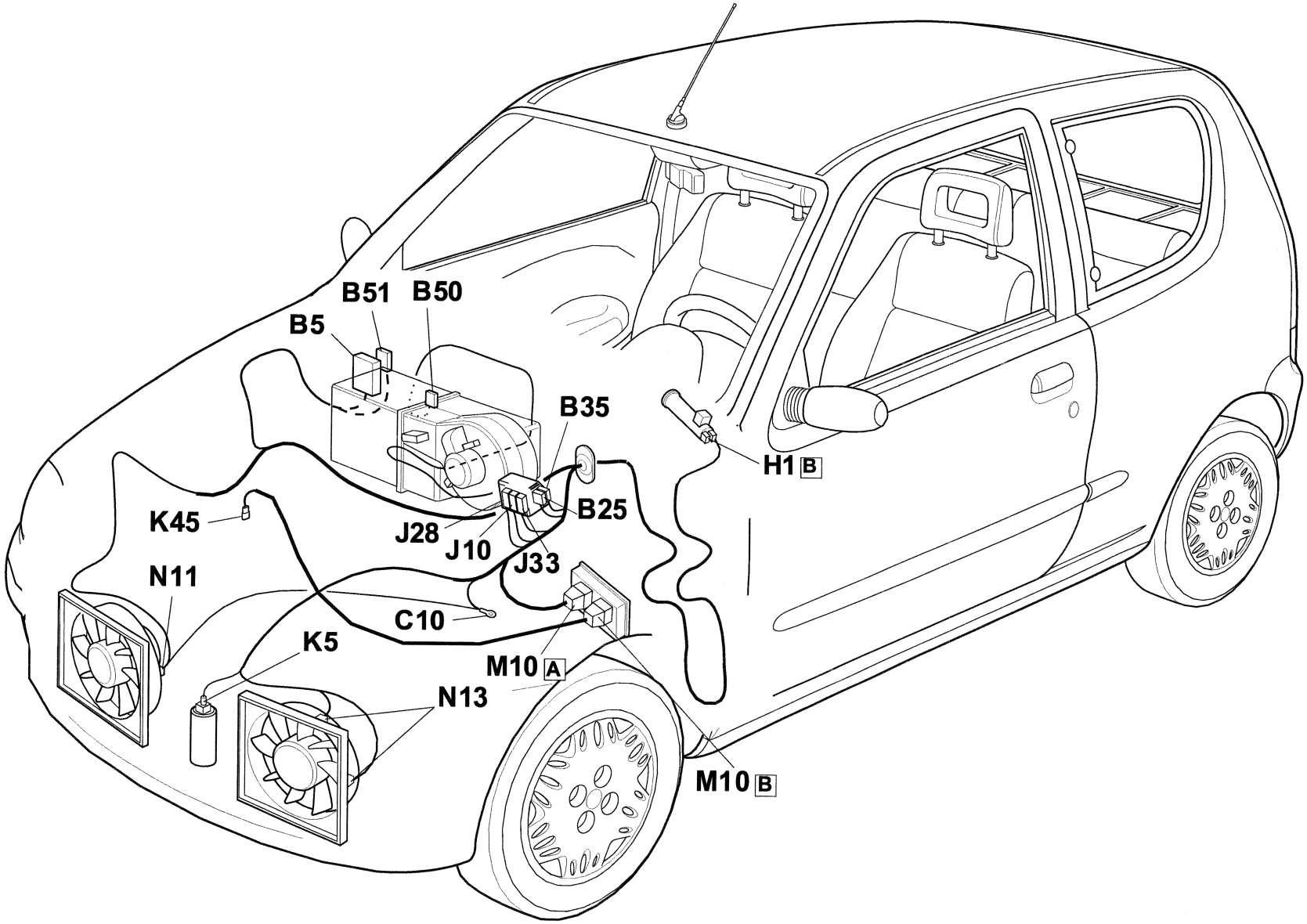
10/00

The fan **N11** is supplied by the battery via the contact for relay **J28** and is protected by the 30A fuse in unit **B5**. The fan starts working when the coil for relay **J28** is energized and the contact closes.
The relay coil is energized through the engine management control unit **M10** and by the temperature sensor **K45**. The control unit **M10** receives a signal from the sensor **K45** at pins 1 and 2 of connector B and when it feels it is appropriate (coolant overheating) it energizes the coil for relay **J28** sending an earth signal to pin 86. The other pole of the coil, pin 85, is supplied directly at the battery via the 7.5A fuse for **B35** and the 20A fuse for **B5**.
The condenser **N13** fan motor is supplied via the contact for relay **J33**, from the 30A fuse **B51**. Fuse **B51** is supplied directly by the battery.
The engagement of the fan **N13** motor is established by the 3 stage pressure switch **K5** which energizes the coil for relay **J33** providing an earth at pin 86. The other end of the coil is connected to the 15A fuse **B40** which is supplied via the contact for relay J10 by the 20A fuse for **B5**. Fuse **B5** is connected directly to the battery.
The energizing of the relay **J10** and the consequent supply of the line protected by the 15A fuse **B50** is determined by the ignition switch being turned to the ON position and the go ahead from the engine management control unit **M10**. The igniton key in the ON position allows the coil for relay **J10** to be supplied whilst the control unit **M10** energizes the coil for **J10** via pin 6, connector A. When the line protected by **B10** is supplied, the coil for relay J33 can be energized by the pressure switch **K5** with the consequent supply of motor **N13**.

COMPONENTS

Component code	*Description*	*Assembly drawing reference*
B01	Junction unit	-
B05	MAXI FUSE box	-
B10	Fuse controlled by ignition	-
B25	Fuse. for services controlled by ignition 15/ 54	-
B51	Automatic clutch / air conditioning fuse	-
C10	Left front. earth	-
C11	Right front. earth	-
C20	Radio phone earth	-
C20	Right dashboard earth	-
D08	Front./ air conditioning-heater coupling	-
D46	Rear dashboard./ front- coupling	-
H01	Ignition switch	5520A
I70	Thermal switch on radiator	1088E
J33	Air conditioning fan relay	-
K05	3 stage pressure switch	5040B
M10	Engine management ECU	-
N11	Engine fan motor -1	1088E
N13	Condenser cooling fan motor	5040A

COMPONENTS LAYOUT



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List of functions

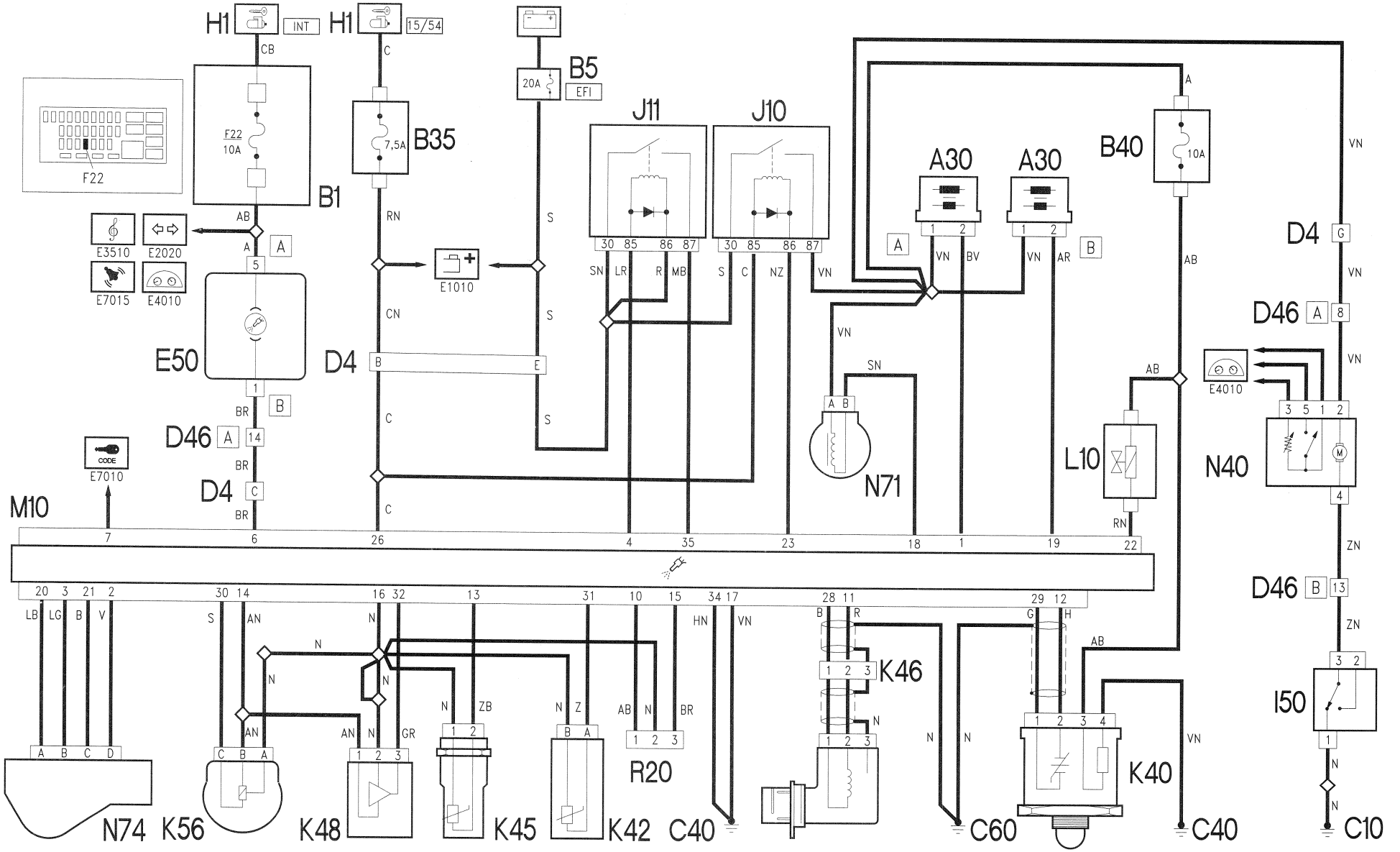
- DESCRIPTION
- WIRING DIAGRAM
- DESCRIPTION OF OPERATION
- COMPONENTS
- COMPONENT LAYOUT

DESCRIPTION

An electronic control system supervises and adjusts all the engine parameters, optimising performance and consumption through a real-time response to the various operating conditions.
The system is managed by a single control unit that handles both ignition and injection.
The control unit controls the actuators connected to it according to the signals received from the various sensors, thus handling the following systems:
- fuel supply;
- air supply;
- exhaust with catalytic exhaust pipe;
- fuel vapours recirculation.

For further details, see **DESCRIPTION AND OPERATION 1056**
The system is also controlled by two relays located in the engine compartment near the control unit. The supply lines of the control unit and the various system components (sensors and actuators) are protected by a special maxifuse and another two free fuses, also located near the control unit.

WIRING DIAGRAM



DESCRIPTION OF OPERATION

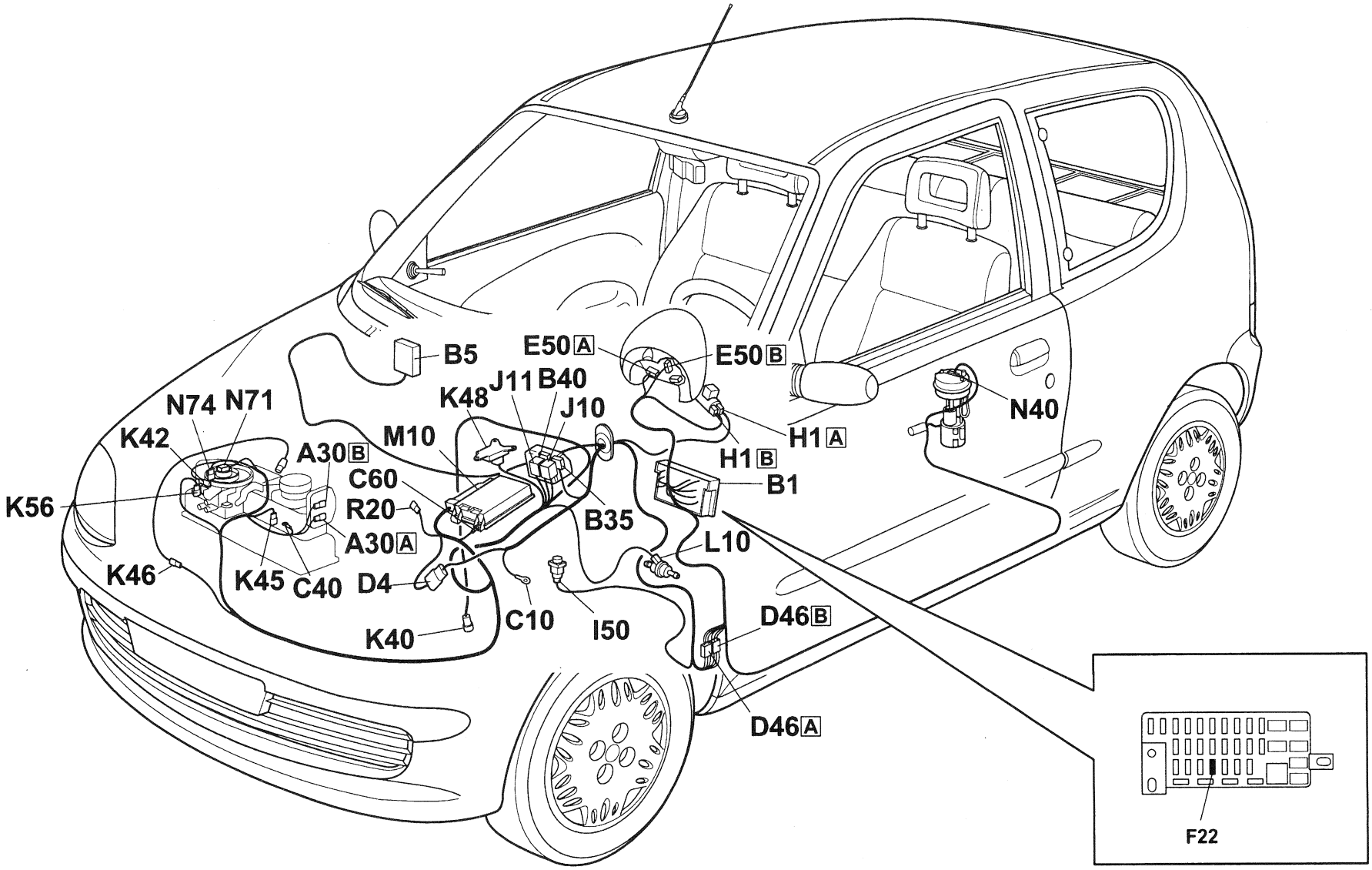
The engine control unit **M10** controls and adjusts the entire electronic ignition and injection.
The ignition switch power (15/54) reaches pin 26 from the line protected by free fuse **B35**.
Pins 17 and 34 on control unit **M10** are earthed.
Control unit relay **J11** is powered directly by the battery from the **B5** EFI maxi-fuse line: this relay is energised by a command signal (earth) coming from pin 4 on control unit **M10** and consequently sends power to pin 35 of **M10** which enables all the control unit functions.
Main relay **J10** is also powered directly by the battery from the **B5** EFI maxi-fuse line, whereas the coil is supplied from ignition switch (15/54) through the line protected by free fuse **B35**; this relay is energised by a command signal (earth) coming from pin 23 on control unit **M10** (safety signal that enables the fuel pump) and as a consequence sends power :
- to the electroinjector **N71**;
- to the coils **A30**;
- to the Lambda sensor heater, through the line protected by fuse **B40**;
- to the fuel vapours recovery solenoid valve **L10**, through the line protected by fuse **B40**;
- to the electric fuel pump **N40**;

The electric fuel pump **N40** is earthed through the inertia switch **I50**, which cuts off the circuit in the event of a crash to stop fuel being delivered in dangerous circumstances.
Engine control unit **M10** receives the signals from the various sensors, thus keeping all the engine functioning parameters under control.
Rev sensor **K46** sends information relating to engine speed to pins 11 and 28 on control unit **M10** via a frequency signal: these two signals have very low intensity ad are therefore suitably shielded.
Absolute pressure sensor **K48** receives its 5 V from pin 14 on the control unit and a reference earth from pin 16; it sends a frequency signal to pin 32 of the control unit, according to the pressure found.
Throttle position sensor **K56** receives its 5V from pin 14 and a reference earth from pin 16; it sends a signal to pin 30 on control unit **M10**, proportional to the degree of throttle opening, through a potentiometer.
Engine temperature sensor **K45**, receives a reference earth from pin 16 on control unit **M10**, and sends a signal that is proportional to the engine coolant temperature to pin 13 on the control unit.
Intake air temperature sensor **K42**, receives a reference earth from pin 16 on control unit **M10**, and sends a signal that is proportional to the incoming air temperature to pin 31 on the control unit.
Heated Lambda sensor **K40** sends control unit **M10** information regarding the correct air-fuel mixture: the signal is sent to pin 29 on the control unit, while pin 12 sends the reference earth: these two signals have very low intensity and are therefore suitably shielded. Sensor **K40** is heated with a resistor to ensure correct operation even when cold; the resistor is powered by the main injection relay **J10**.
Control unit **M10** controls the opening of electroinjector **N71** through a special signal sent by pin 18. Injector **N71** receives consent when the main relay **J10** opens.
Control unit **M10** also controls coils **A30** through the command signals (earth) for the coil primary windings, whereas the secondary sends the pulse to the spark plugs: from pin 1 for the cylinder pair 1-4 and from pin 19 for cylinders 2-3.
Coil **A30** primary windings receive consent when main relay **J10** opens.
Idle actuator **N74** regulates the throttle by-pass line.
This has a stepper motor that controls the opening of the by-pass clearance: it is controlled by control unit **M10** by means of the signals from pins 2, 3, 20 and 21 that control the various motor phases.
Fuel vapours recovery solenoid valve **L10** allows the fuel vapours to pass to the engine intake, where they are added to the mixture coming into the combustion chamber. Valve **L10**, supplied by main relay **J10**, is opened by the control unit when the engine is under load, through a signal from pin 22 on **M10**.
Control unit **M10** is connected to CODE control unit **M20** via serial line by pin 7 (see E7010 - ALFA ROMEO CODE).
The control unit has a self-diagnostics system that can be used by connecting the relevant connector, **R20**: signals reach this through pins 10 (line L) and 15 (line K) from control unit **M10**; the self-diagnostics system also generates the signal coming from pin 6 on **M10** for the "injection fault" warning light on the **E50** cluster.
Cluster **E50** is supplied by ignition switch (INT) from the line protected by fuse **F22** on the fuse carrier **B1**: when this earth signal arrives, the "injection fault" warning light comes on.

COMPONENTS

Code component	Description	Unit reference
A30	Ignition coil	5510C
B1	Fuse carrier	5505A
B5	MAXI FUSE box	-
B35	CODE and injection memories fuse	-
B40	Injection services power supply fuse	-
C10	Front left earth	-
C40	Earth on engine	-
C60	Injection control unit earth	-
D4	Front/engine connection	-
D46	Front/dashboard - rear connection	-
E50	Cluster	5560B
H1	Ignition switch	5520A
I50	Inertia switch	1040A
J10	Main injection relay	-
J11	Injection control unit relay	-
K40	Lambda sensor	1080B
K42	Air temperature sensor	1056B
K45	Engine temperature sensor	1056B
K46	Rev sensor	5510C
K48	Absolute pressure sensor	1056A
K56	Throttle position sensor	1056B
L10	Fuel vapours recovery solenoid valve	1080E
M10	Engine control unit	1056B
N40	Electric fuel pump and fuel level gauge	1040A
N71	Single injector (SPI)	1056A
N74	Idle actuator	1056B
R20	Diagnostic socket for e.i.	-

COMPONENT LAYOUT



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List of functions

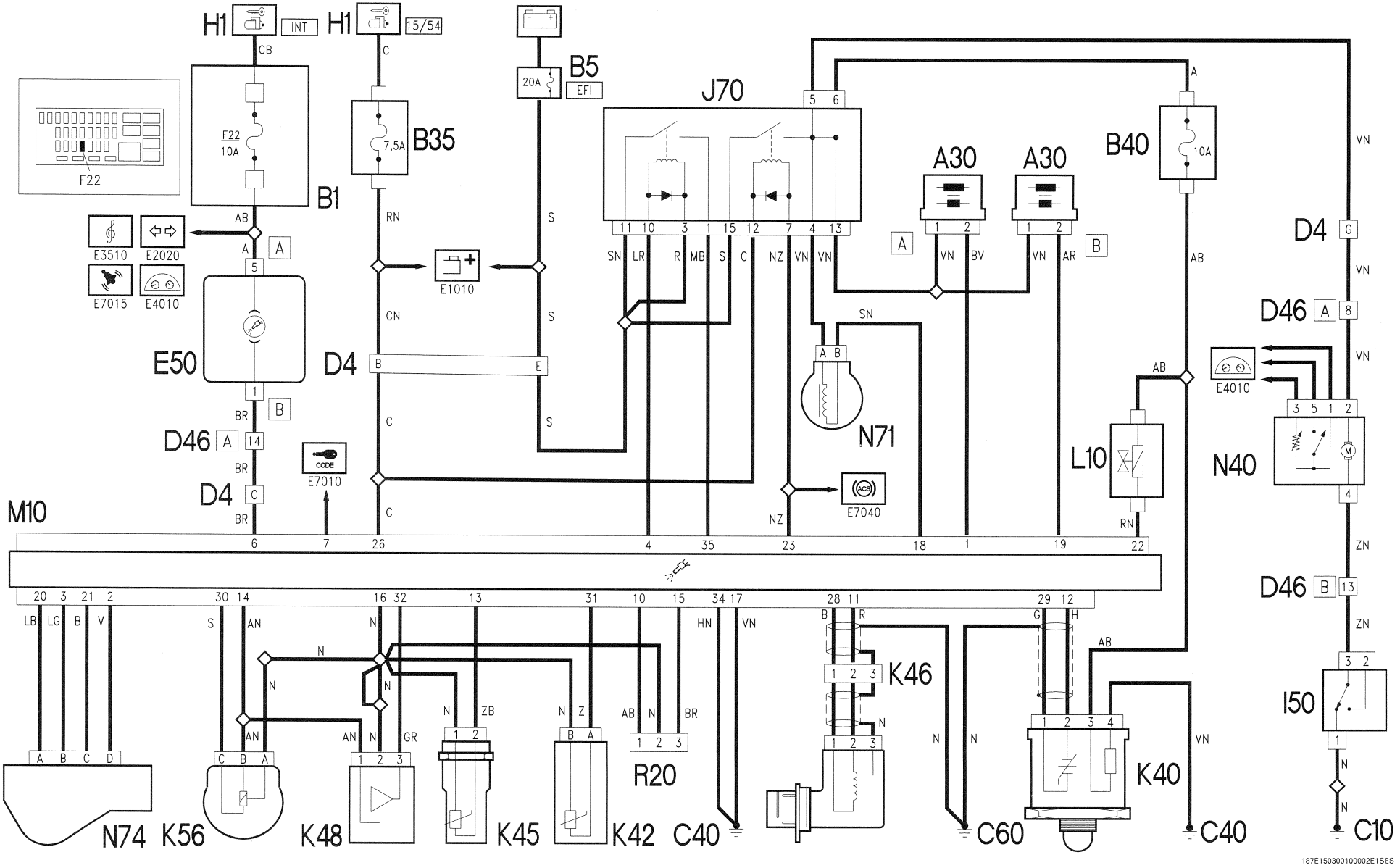
- DESCRIPTION
- WIRING DIAGRAM
- DESCRIPTION OF OPERATION
- COMPONENTS
- COMPONENT LAYOUT

DESCRIPTION

An electronic control system supervises and adjusts all the engine parameters, optimising performance and consumption through a real-time response to the various operating conditions.
The system is managed by a single control unit that handles both ignition and injection.
The control unit controls the actuators connected to it according to the signals received from the various sensors, thus handling the following systems:
- fuel supply;
- air supply;
- exhaust with catalytic exhaust pipe;
- fuel vapours recirculation.

For further details, see **DESCRIPTION AND OPERATION 1056**
The system is also controlled by ignition multiple relay, located in the engine compartment near the control unit. The supply lines of the control unit and the various system components (sensors and actuators) are protected by a special maxifuse and another two free fuses, also located near the control unit.

WIRING DIAGRAM



187E150300100002E1SES

DESCRIPTION OF OPERATION

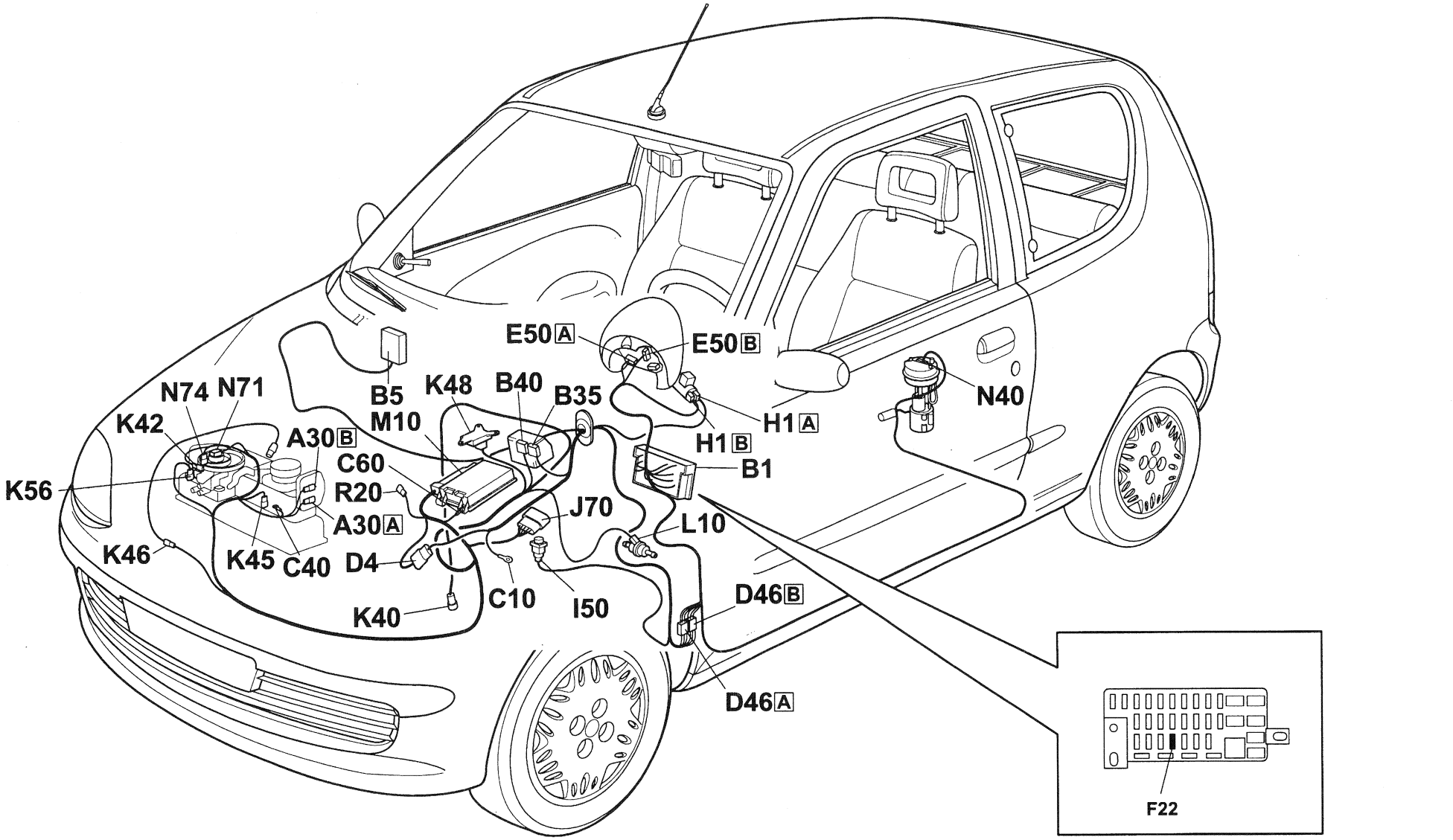
The engine control unit **M10**controls and adjusts the entire electronic ignition and injection.
The ignition switch power (15/54) reaches pin 26 from the line protected by free fuse **B35**.
Pins 17 and 34 on control unit **M10** are earthed.
Multiple relay **J70** is powered directly by the battery from the **B5** EFI maxifuse line: first contact is energised by a command signal (earth) coming from pin 4 on control unit **M10** and consequently sends power to pin 35 of **M10** which enables all the control unit functions.
The second contact is also powered directly by the battery from the **B5** EFI maxifuse line, whereas the coil is supplied from ignition switch (15/54) through the line protected by free fuse **B35**; this contact is energised by a command signal (earth) coming from pin 23 on control unit **M10** (safety signal that enables the fuel pump) and as a consequence sends power :
- to the electroinjector **N71**;
- to the coils **A30**;
- to the Lambda sensor heater, through the line protected by fuse **B40**;
- to the fuel vapours recovery solenoid valve **L10**, through the line protected by fuse **B40**;
- to the electric fuel pump **N40**;

The electric fuel pump **N40** is earthed through the inertia switch **I50**, which cuts off the circuit in the event of a crash to stop fuel being delivered in dangerous circumstances.
Engine control unit **M10** receives the signals from the various sensors, thus keeping all the engine functioning parameters under control.
Rev sensor **K46** sends information relating to engine speed to pins 11 and 28 on control unit **M10** via a frequency signal: these two signals have very low intensity ad are therefore suitably shielded.
Absolute pressure sensor **K48** receives its 5 V from pin 14 on the control unit and a reference earth from pin 16; it sends a frequency signal to pin 32 of the control unit, according to the pressure found.
Throttle position sensor **K56** receives its 5V from pin 14 and a reference earth from pin 16; it sends a signal to pin 30 on control unit **M10**, proportional to the degree of throttle opening, through a potentiometer.
Engine temperature sensor **K45**, receives a reference earth from pin 16 on control unit **M10**, and sends a signal that is proportional to the engine coolant temperature to pin 13 on the control unit.
Intake air temperature sensor **K42**, receives a reference earth from pin 16 on control unit **M10**, and sends a signal that is proportional to the incoming air temperature to pin 31 on the control unit.
Heated Lambda sensor **K40** sends control unit **M10** information regarding the correct air-fuel mixture: the signal is sent to pin 29 on the control unit, while pin 12 sends the reference earth: these two signals have very low intensity and are therefore suitably shielded. Sensor **K40** is heated with a resistor to ensure correct operation even when cold; the resistor is powered by the relay **J70**.
Control unit **M10** controls the opening of electroinjector **N71** through a special signal sent by pin 18. Injector **N71** receives consent when the relay **J70** opens.
Control unit **M10** also controls coils **A30**through the command signals (earth) for the coil primary windings, whereas the secondary sends the pulse to the spark plugs: from pin 1 for the cylinder pair 1-4 and from pin 19 for cylinders 2-3.
Coil **A30** primary windings receive consent whenrelay **J70** opens.
Idle actuator **N74** regulates the throttle by-pass line.
This has a stepper motor that controls the opening of the by-pass clearance: it is controlled by control unit **M10** by means of the signals from pins 2, 3, 20 and 21 that control the various motor phases.
Fuel vapours recovery solenoid valve **L10** allows the fuel vapours to pass to the engine intake, where they are added to the mixture coming into the combustion chamber. Valve **L10**, supplied by relay **J70**, is opened by the control unit when the engine is under load, through a signal from pin 22 on **M10**.
Control unit **M10** is connected to CODE control unit M20 via serial line by pin 7 (see E7010 - ALFA ROMEO CODE).
The control unit has a self-diagnostics system that can be used by connecting the relevant connector, **R20**: signals reach this through pins 10 (line L) and 15 (line K) from control unit **M10**; the self-diagnostics system also generates the signal coming from pin 6 on **M10** for the "injection fault" warning light on the **E50** cluster.
Cluster **E50** is supplied by ignition switch (INT) from the line protected by fuse **F22**on the fuse carrier **B1**: when this earth signal arrives, the "injection fault" warning light comes on.
Control unit **M10** sends a signal from pin 23 of automatic clutch control unit (see E7040: AUTOMATIC CLUTCH); this signal is proportional to the engine revs; it is also safety signal for fuel pump.

COMPONENTS

Code component	Description	Unit reference
A30	Ignition coil	5510C
B1	Fuse carrier	5505A
B5	MAXI FUSE box	-
B35	CODE and injection memories fuse	-
B40	Injection services power supply fuse	-
C10	Front left earth	-
C40	Earth on engine	-
C60	Injection control unit earth	-
D4	Front/engine connection	-
D46	Front/dashboard - rear connection	-
E50	Cluster	5560B
H1	Ignition switch	5520A
I50	Inertia switch	1040A
J70	Ignition multiple relay	-
K40	Lambda sensor	1080B
K42	Air temperature sensor	1056B
K45	Engine temperature sensor	1056B
K46	Rev sensor	5510C
K48	Absolute pressure sensor	1056A
K56	Throttle position sensor	1056B
L10	Fuel vapours recovery solenoid valve	1080E
M10	Engine control unit	1056B
N40	Electric fuel pump and fuel level gauge	1040A
N71	Single injector (SPI)	1056A
N74	Idle actuator	1056B
R20	Diagnostic socket for e.i.	-

COMPONENT LAYOUT



187E150300100002E1CEU

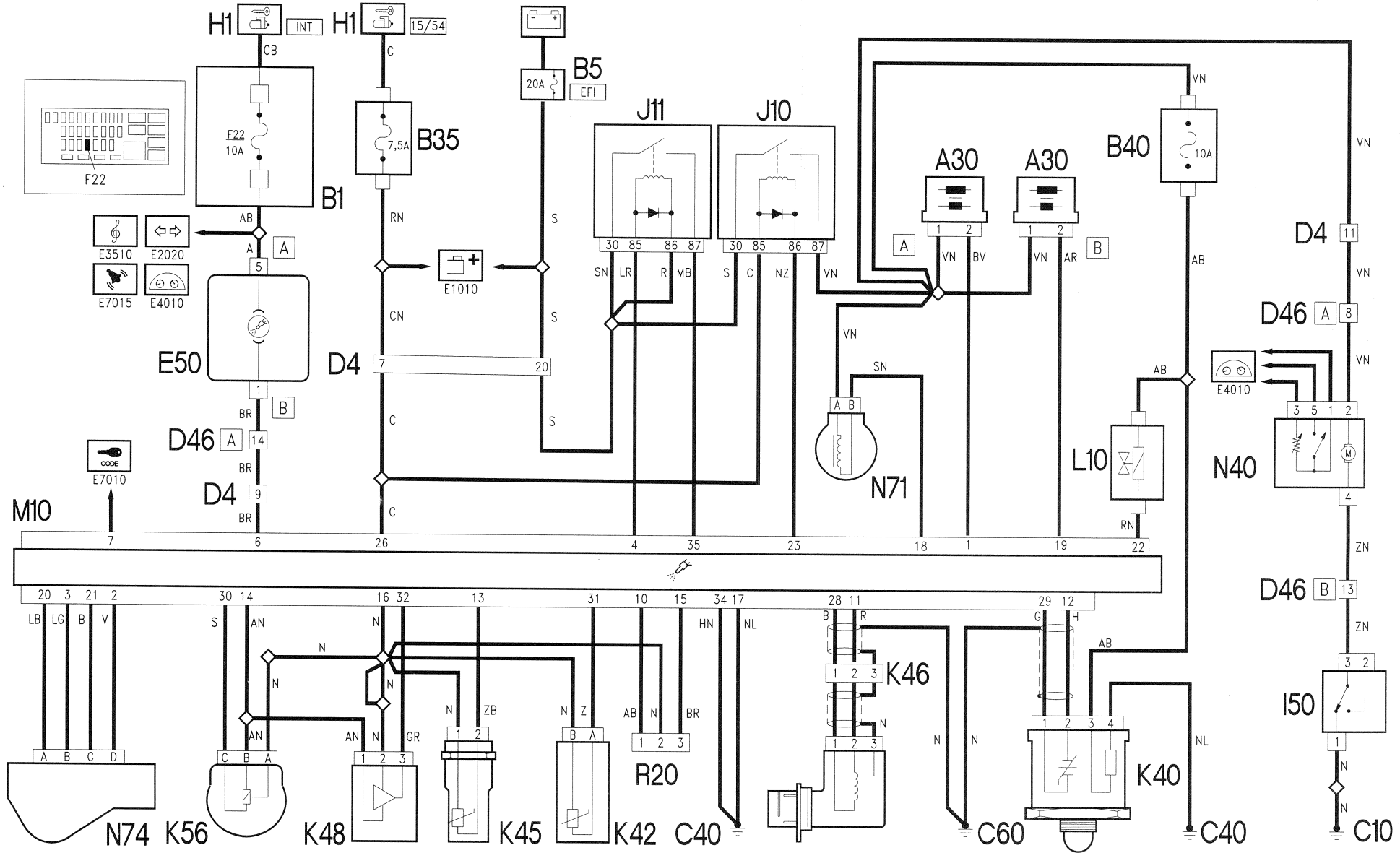
List of functions

DESCRIPTION

An electronic control system supervises and adjusts all the engine parameters, optimising performance and consumption through a real-time response to the various operating conditions.
The system is managed by a single control unit that handles both ignition and injection.
The control unit controls the actuators connected to it according to the signals received from the various sensors, thus handling the following systems:
- fuel supply;
- air supply;
- exhaust with catalytic exhaust pipe;
- fuel vapours recirculation.

For further details, see **DESCRIPTION AND OPERATION 1056**
The system is also controlled by two relays located in the engine compartment near the control unit. The supply lines of the control unit and the various system components (sensors and actuators) are protected by a special maxifuse and another two free fuses, also located near the control unit.

WIRING DIAGRAM



DESCRIPTION OF OPERATION

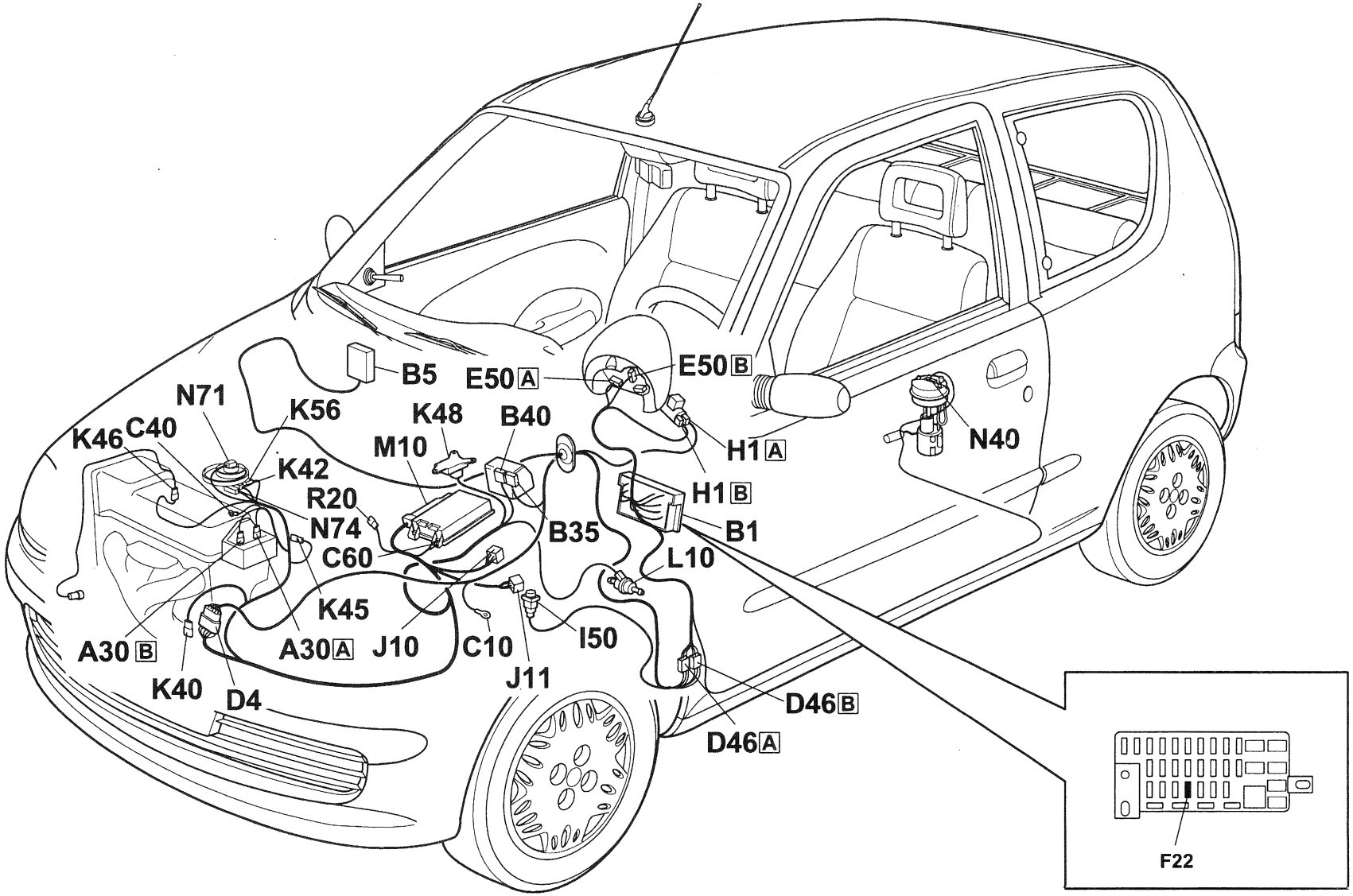
The engine control unit **M10**controls and adjusts the entire electronic ignition and injection.
The ignition switch power (15/54) reaches pin 26 from the line protected by free fuse **B35**.
Pins 17 and 34 on control unit **M10** are earthed.
Control unit relay **J11** is powered directly by the battery from the **B5** EFI maxi-fuse line: this relay is energised by a command signal (earth) coming from pin 4 on control unit **M10** and consequently sends power to pin 35 of **M10**which enables all the control unit functions.
Main relay **J10** is also powered directly by the battery from the **B5** EFI maxi-fuse line, whereas the coil is supplied from ignition switch (15/54) through the line protected by free fuse **B35**; this relay is energised by a command signal (earth) coming from pin 23 on control unit **M10** (safety signal that enables the fuel pump) and as a consequence sends power :
- to the electroinjector **N71**;
- to the coils **A30**;
- to the Lambda sensor heater, through the line protected by fuse **B40**;
- to the fuel vapours recovery solenoid valve **L10**, through the line protected by fuse **B40**;
- all'elettropompa combustibile **N40**;

The electric fuel pump **N40** is earthed through the inertia switch **I50**, which cuts off the circuit in the event of a crash to stop fuel being delivered in dangerous circumstances.
Engine control unit **M10** receives the signals from the various sensors, thus keeping all the engine functioning parameters under control.
Rev sensor **K46** sends information relating to engine speed to pins 11 and 28 on control unit **M10** via a frequency signal: these two signals have very low intensity ad are therefore suitably shielded.
Absolute pressure sensor **K48** receives its 5 V from pin 14 on the control unit and a reference earth from pin 16; it sends a frequency signal to pin 32 of the control unit, according to the pressure found.
Throttle position sensor **K56** receives its 5V from pin 14 and a reference earth from pin 16; it sends a signal to pin 30 on control unit **M10**, proportional to the degree of throttle opening, through a potentiometer.
Engine temperature sensor **K45**, receives a reference earth from pin 16 on control unit **M10**, and sends a signal that is proportional to the engine coolant temperature to pin 13 on the control unit.
Intake air temperature sensor **K42**, receives a reference earth from pin 16 on control unit **M10**, and sends a signal that is proportional to the incoming air temperature to pin 31 on the control unit.
Heated Lambda sensor **K40** sends control unit **M10** information regarding the correct air-fuel mixture: the signal is sent to pin 29 on the control unit, while pin 12 sends the reference earth: these two signals have very low intensity and are therefore suitably shielded. Sensor **K40** is heated with a resistor to ensure correct operation even when cold; the resistor is powered by the main injection relay **J10**.
Control unit **M10** controls the opening of electroinjector **N71** through a special signal sent by pin 18. Injector **N71** receives consent when the main relay **J10** opens.
Control unit **M10** also controls coils **A30**through the command signals (earth) for the coil primary windings, whereas the secondary sends the pulse to the spark plugs: from pin 1 for the cylinder pair 1-4 and from pin 19 for cylinders 2-3.
Coil **A30**primary windings receive consent when main relay **J10** opens.
Idle actuator **N74**regulates the throttle by-pass line.
This has a stepper motor that controls the opening of the by-pass clearance: it is controlled by control unit **M10** by means of the signals from pins 2, 3, 20 and 21 that control the various motor phases.
Fuel vapours recovery solenoid valve **L10** allows the fuel vapours to pass to the engine intake, where they are added to the mixture coming into the combustion chamber. Valve **L10**, supplied by main relay **J10**, is opened by the control unit when the engine is under load, through a signal from pin 22 on **M10**.
Control unit **M10** is connected to CODE control unit **M20** via serial line by pin 7 (see E7010 - ALFA ROMEO CODE).
The control unit has a self-diagnostics system that can be used by connecting the relevant connector, **R20**: signals reach this through pins 10 (line L) and 15 (line K) from control unit **M10**; the self-diagnostics system also generates the signal coming from pin 6 on **M10** for the "injection fault" warning light on the **E50** cluster.
Cluster **E50** is supplied by ignition switch (INT) from the line protected by fuse **F22**on the fuse carrier **B1**: when this earth signal arrives, the "injection fault" warning light comes on.

COMPONENTS

Code component	Description	Unit reference
A30	Ignition coil	5510C
B1	Fuse carrier	5505A
B5	MAXI FUSE box	-
B35	CODE and injection memories fuse	-
B40	Injection services power supply fuse	-
C10	Front left earth	-
C40	Earth on engine	-
C60	Injection control unit earth	-
D4	Front/engine connection	-
D46	Front/dashboard - rear connection	-
E50	Cluster	5560B
H1	Ignition switch	5520A
I50	Inertia switch	1040A
J10	Main injection relay	-
J11	Injection control unit relay	-
K40	Lambda sensor	1080B
K42	Air temperature sensor	1056B
K45	Engine temperature sensor	1056B
K46	Rev sensor	5510C
K48	Absolute pressure sensor	1056A
K56	Throttle position sensor	1056B
L10	Fuel vapours recovery solenoid valve	1080E
M10	Engine control unit	1056B
N40	Electric fuel pump and fuel level gauge	1040A
N71	Single injector (SPI)	1056A
N74	Idle actuator	1056B
R20	Diagnostic socket for e.i.	-

COMPONENT LAYOUT



187E150301000003E1CEU

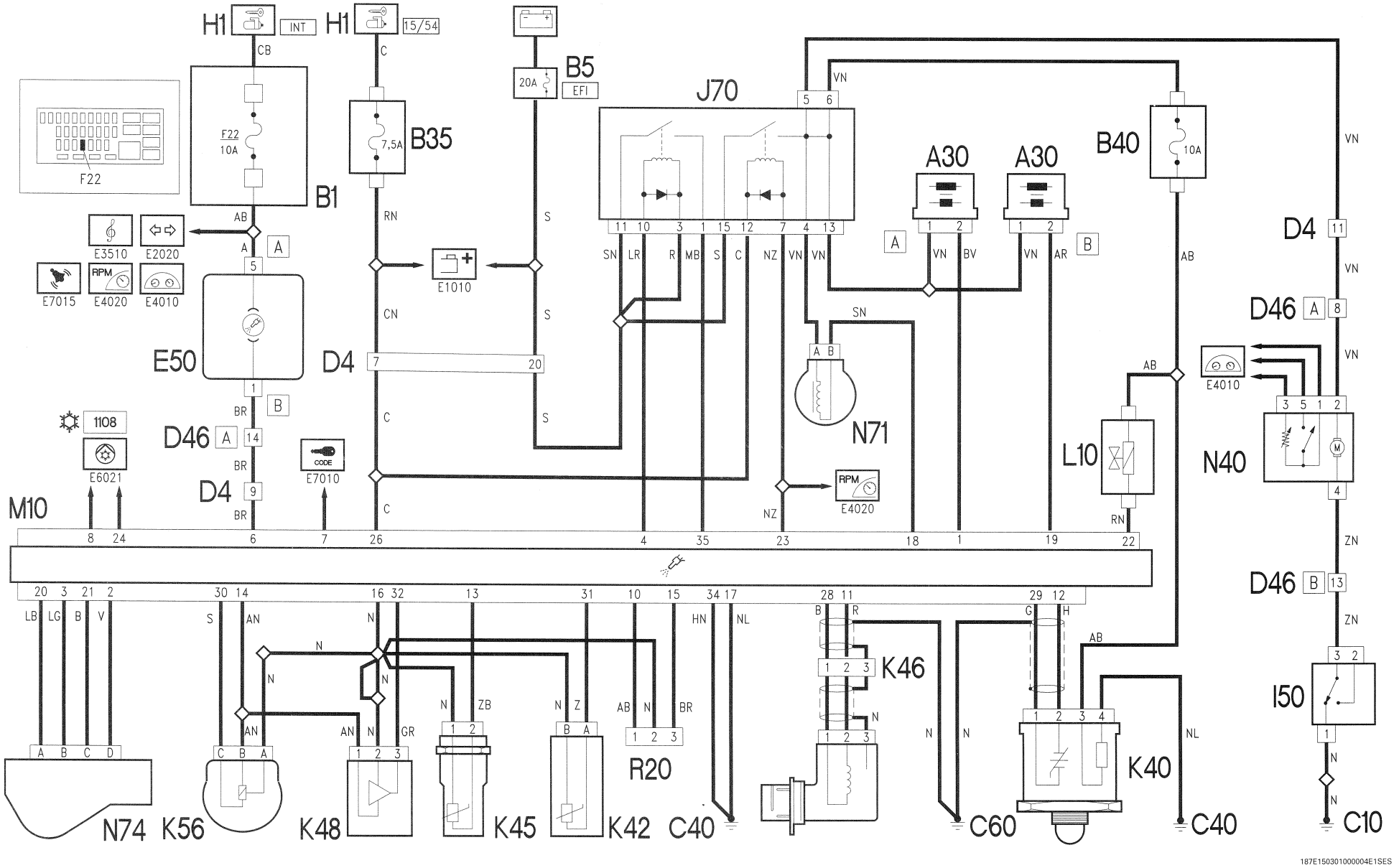
List of functions

DESCRIPTION

An electronic control system supervises and adjusts all the engine parameters, optimising performance and consumption through a real-time response to the various operating conditions.
The system is managed by a single control unit that handles both ignition and injection.
The control unit controls the actuators connected to it according to the signals received from the various sensors, thus handling the following systems:
- fuel supply;
- air supply;
- exhaust with catalytic exhaust pipe;
- fuel vapours recirculation.

For further details, see **DESCRIPTION AND OPERATION 1056**
The system is also controlled by ignition multiple relay, located in the engine compartment near the control unit. The supply lines of the control unit and the various system components (sensors and actuators) are protected by a special maxifuse and another two free fuses, also located near the control unit.

WIRING DIAGRAM



DESCRIPTION OF OPERATION

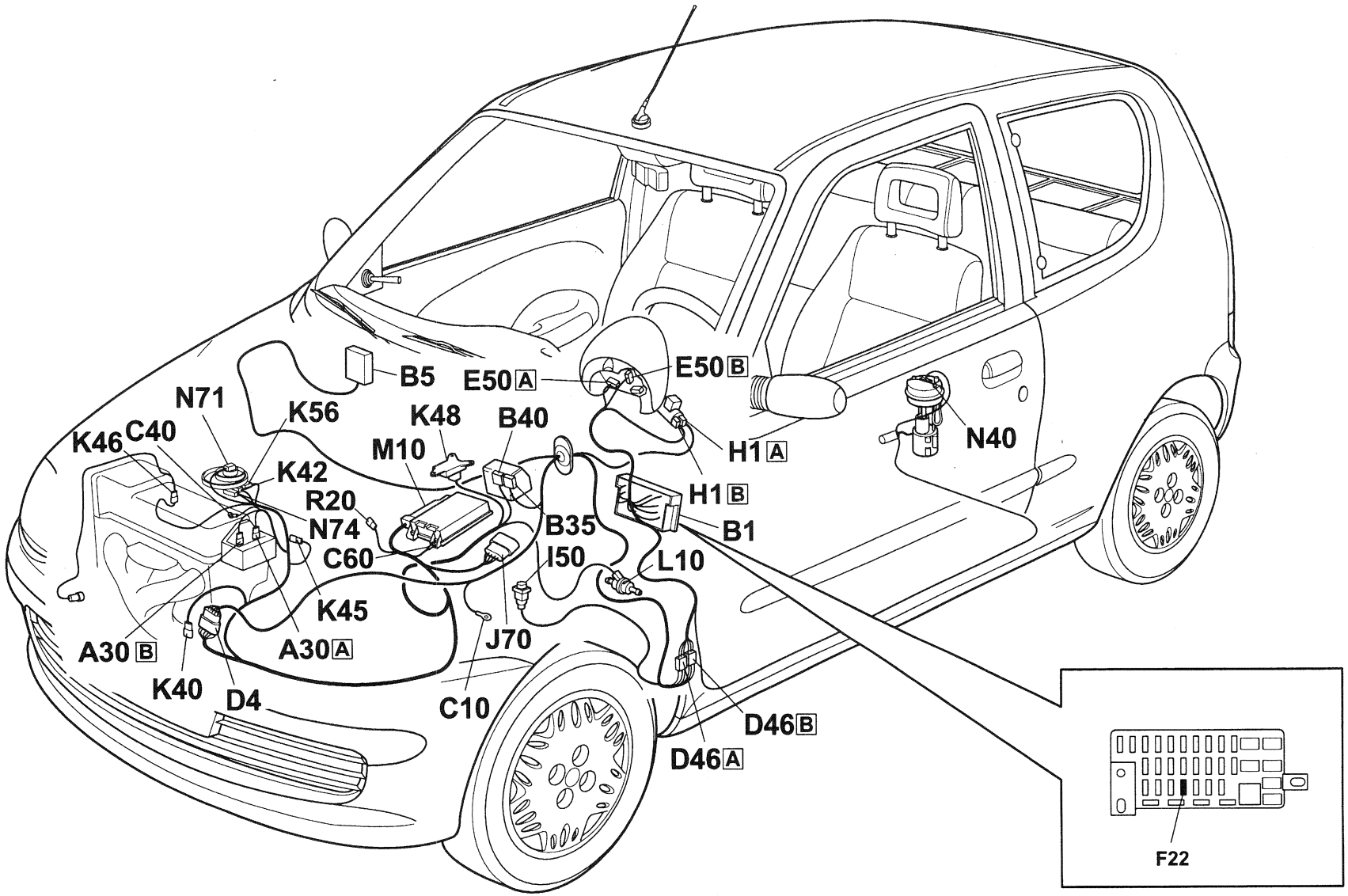
The engine control unit **M10** controls and adjusts the entire electronic ignition and injection.
The ignition switch power (15/54) reaches pin 26 from the line protected by free fuse **B35**.
Pins 17 and 34 on control unit **M10** are earthed.
Multiple relay **J70** is powered directly by the battery from the **B5** EFI maxifuse line: first contact is energised by a command signal (earth) coming from pin 4 on control unit **M10** and consequently sends power to pin 35 of **M10** which enables all the control unit functions.
The second contact is also powered directly by the battery from the **B5** EFI maxifuse line, whereas the coil is supplied from ignition switch (15/54) through the line protected by free fuse **B35**; this contact is energised by a command signal (earth) coming from pin 23 on control unit **M10** (safety signal that enables the fuel pump) and as a consequence sends power:
- to the electroinjector **N71**;
- to the coils **A30**;
- to the Lambda sensor heater, through the line protected by fuse **B40**;
- to the fuel vapours recovery solenoid valve **L10**, through the line protected by fuse **B40**;
- to the electric fuel pump **N40**;

The electric fuel pump **N40** is earthed through the inertia switch **I50**, which cuts off the circuit in the event of a crash to stop fuel being delivered in dangerous circumstances.
Engine control unit **M10** receives the signals from the various sensors, thus keeping all the engine functioning parameters under control.
Rev sensor **K46** sends information relating to engine speed to pins 11 and 28 on control unit **M10** via a frequency signal: these two signals have very low intensity ad are therefore suitably shielded.
Absolute pressure sensor **K48** receives its 5 V from pin 14 on the control unit and a reference earth from pin 16; it sends a frequency signal to pin 32 of the control unit, according to the pressure found.
Throttle position sensor **K56** receives its 5V from pin 14 and a reference earth from pin 16; it sends a signal to pin 30 on control unit **M10**, proportional to the degree of throttle opening, through a potentiometer.
Engine temperature sensor **K45**, receives a reference earth from pin 16 on control unit **M10**, and sends a signal that is proportional to the engine coolant temperature to pin 13 on the control unit.
Intake air temperature sensor **K42**, receives a reference earth from pin 16 on control unit **M10**, and sends a signal that is proportional to the incoming air temperature to pin 31 on the control unit.
Heated Lambda sensor **K40** sends control unit **M10** information regarding the correct air-fuel mixture: the signal is sent to pin 29 on the control unit, while pin 12 sends the reference earth: these two signals have very low intensity and are therefore suitably shielded. Sensor **K40** is heated with a resistor to ensure correct operation even when cold; the resistor is powered by the relay **J70**.
Control unit **M10** controls the opening of electroinjector **N71** through a special signal sent by pin 18. Injector **N71** receives consent when the relay **J70** opens.
Control unit **M10** also controls coils **A30**through the command signals (earth) for the coil primary windings, whereas the secondary sends the pulse to the spark plugs: from pin 1 for the cylinder pair 1-4 and from pin 19 for cylinders 2-3.
Coil **A30** primary windings receive consent whenrelay **J70** opens.
Idle actuator **N74** regulates the throttle by-pass line.
This has a stepper motor that controls the opening of the by-pass clearance: it is controlled by control unit **M10** by means of the signals from pins 2, 3, 20 and 21 that control the various motor phases.
Fuel vapours recovery solenoid valve **L10** allows the fuel vapours to pass to the engine intake, where they are added to the mixture coming into the combustion chamber. Valve **L10**, supplied by relay **J70**, is opened by the control unit when the engine is under load, through a signal from pin 22 on **M10**.
Control unit **M10** is connected to CODE control unit **M20** via serial line by pin 7 (see E7010 - ALFA ROMEO CODE).
The control unit has a self-diagnostics system that can be used by connecting the relevant connector, **R20**: signals reach this through pins 10 (line L) and 15 (line K) from control unit **M10**; the self-diagnostics system also generates the signal coming from pin 6 on **M10** for the "injection fault" warning light on the **E50** cluster.
Cluster **E50** is supplied by ignition switch (INT) from the line protected by fuse **F22**on the fuse carrier **B1**: when this earth signal arrives, the "injection fault" warning light comes on.
Control unit **M10** sends a signal from, pin 23 to the rev. counter (see E4020 REV. COUNTER).This signal is also safety signal for fuel pump.
Control unit **M10** is also connected with air conditioning system via pins 8 and 24.This allows the cut off of compressor for example with engine high temperature or high engine load (see E6021 COMPRESSOR ENABLING).

COMPONENTS

Code component	Description	Unit reference
A30	Ignition coil	5510C
B1	Fuse carrier	5505A
B5	MAXI FUSE box	-
B35	CODE and injection memories fuse	-
B40	Injection services power supply fuse	-
C10	Front left earth	-
C40	Earth on engine	-
C60	Injection control unit earth	-
D4	Front/engine connection	-
D46	Front/dashboard - rear connection	-
E50	Cluster	5560B
H1	Ignition switch	5520A
I50	Inertia switch	1040A
J70	Ignition multiple relay	-
K40	Lambda sensor	1080B
K42	Air temperature sensor	1056B
K45	Engine temperature sensor	1056B
K46	Rev sensor	5510C
K48	Absolute pressure sensor	1056A
K56	Throttle position sensor	1056B
L10	Fuel vapours recovery solenoid valve	1080E
M10	Engine control unit	1056B
N40	Electric fuel pump and fuel level gauge	1040A
N71	Single injector (SPI)	1056A
N74	Idle actuator	1056B
R20	Diagnostic socket for e.i.	-

COMPONENT LAYOUT



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Operation index

DESCRIPTION

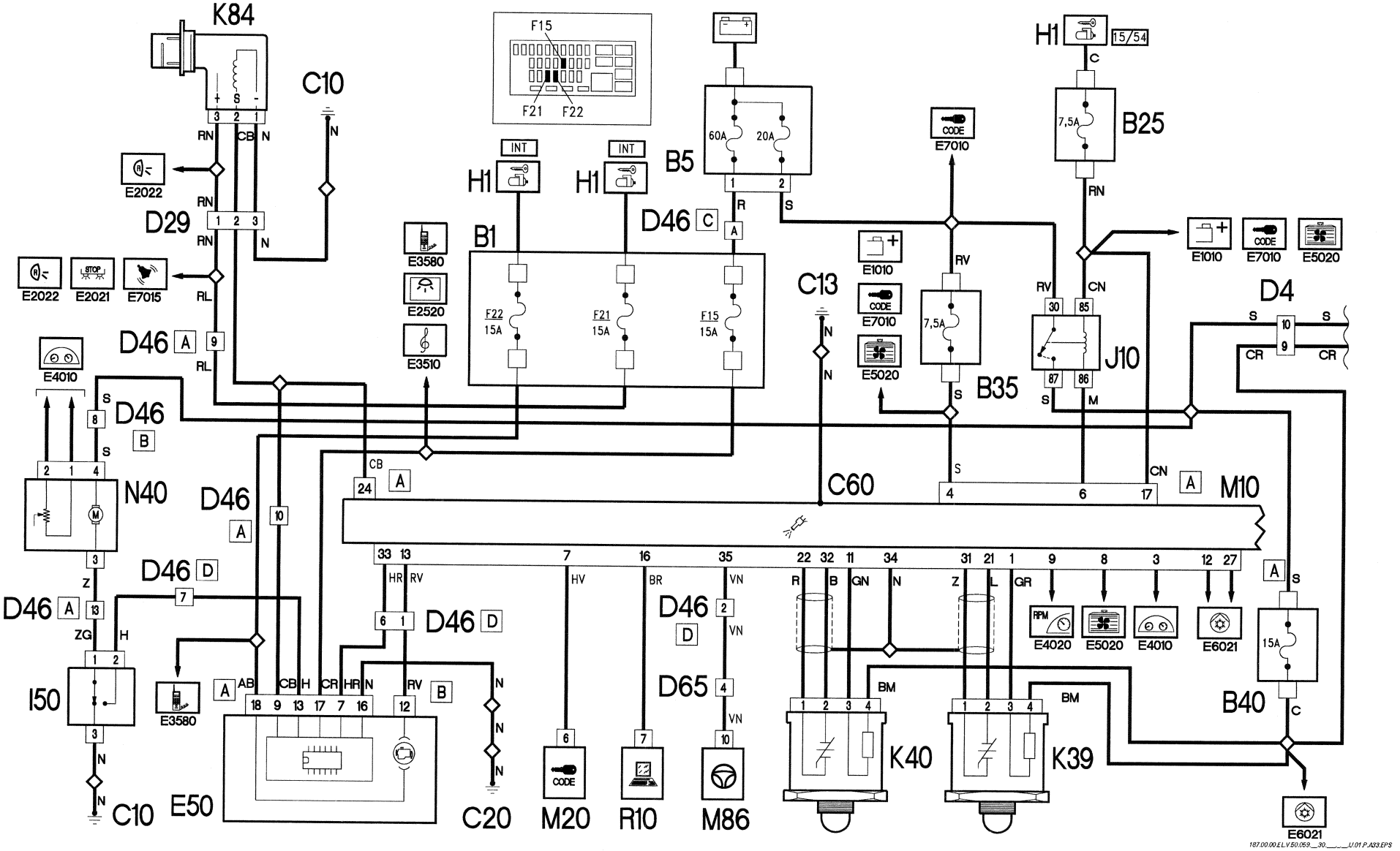
10/00

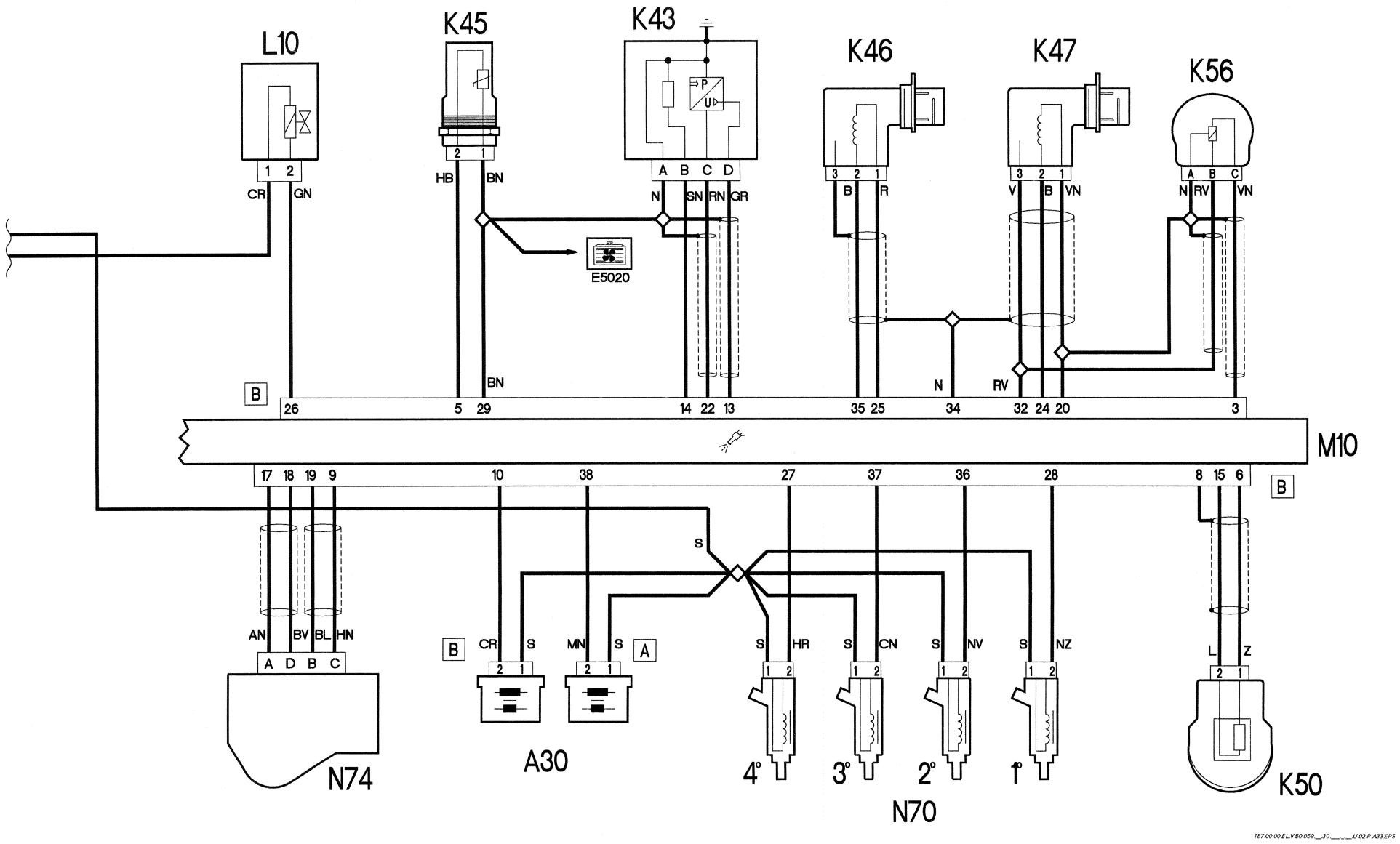
An electronic management system supervises and governs all engine parameters. It optimises performance and fuel consumption by responding in real time to different service conditions.
The system is managed by a single control unit which controls both the ignition and the injection.

The system uses signals received from numerous sensors to control actuators. It is connected to the following systems:
- fuel supply;
- air supply:
- exhaust with catalytic converter;
- fuel vapour recirculation.

For more details, **Characteristic of working principle 1056** Fuel injection system .
The system is also controlled by means of two relays located in the engine compartment near the control unit. The supply lines for the control unit and the various system components (sensors and actuators) are protected by a special maxifuse and two other fuses, also located in the engine compartment next to the control unit.

WIRING DIAGRAM




L10
K45
K43
K46
K47
K56
1 2
CR GN
2 1
HB BN
A B C D
N SN RN GR
3 2 1
B R
V B VN
A B C
N RV VN
E5020
B
BN
26 5 29 14 22 13 35 25 N 34 RV 32 24 20 3
M10
17 18 19 9 10 38 27 37 36 28 8 15 6
B
S
AN BV BL HN
A D B C
N74
B CR S MN S A
2 1
A30
S HR S CN S NV S NZ
1 2
4° 3° 2° 1°
N70
L Z
2 1
K50
187.00.00 E LV 50 059 __ 30 __ __ __ U 02 P A33 EPS

DESCRIPTION OF OPERATION

10/00

The engine management control unit **M10** monitors and controls the entire electronic ignition and injection system.
The control unit **M10** is supplied directly by the battery at pin 4 of connector A via the 20A fuse for **B5** and the 7.5A fuse for **B35**. It is also supplied through the ignition switch, contact 15/54 at pin 17 of connector A. Line 15/54 is protected by the 7.5A fuse of **B25**.
The control unit **M10** casing is connected to earth **C13**.
The general injection relay **J10** coil is operated by means of an earth signal from pin 6 of connector A of **M10**, whilst it is supplied b the 15/54 line of the ignition switch **H1** via the 7.5A fuse for **B25**.

When the control unit M10 operates the relay J10 the contact closes and the supply is distributed to the following components:
- Electric fuel pump **N40** pin 4
- Ignition coil **A30** pin 1
- Fuel injectors
- 15A fuse **B40**

Fuse B40, in turn, sends a supply to the following components:
- Lambda sensor **K40** pin 4
- Lambda sensor 2 **K39** pin 4
- Fuel vapour recovery solenoid valve **L10** pin 1

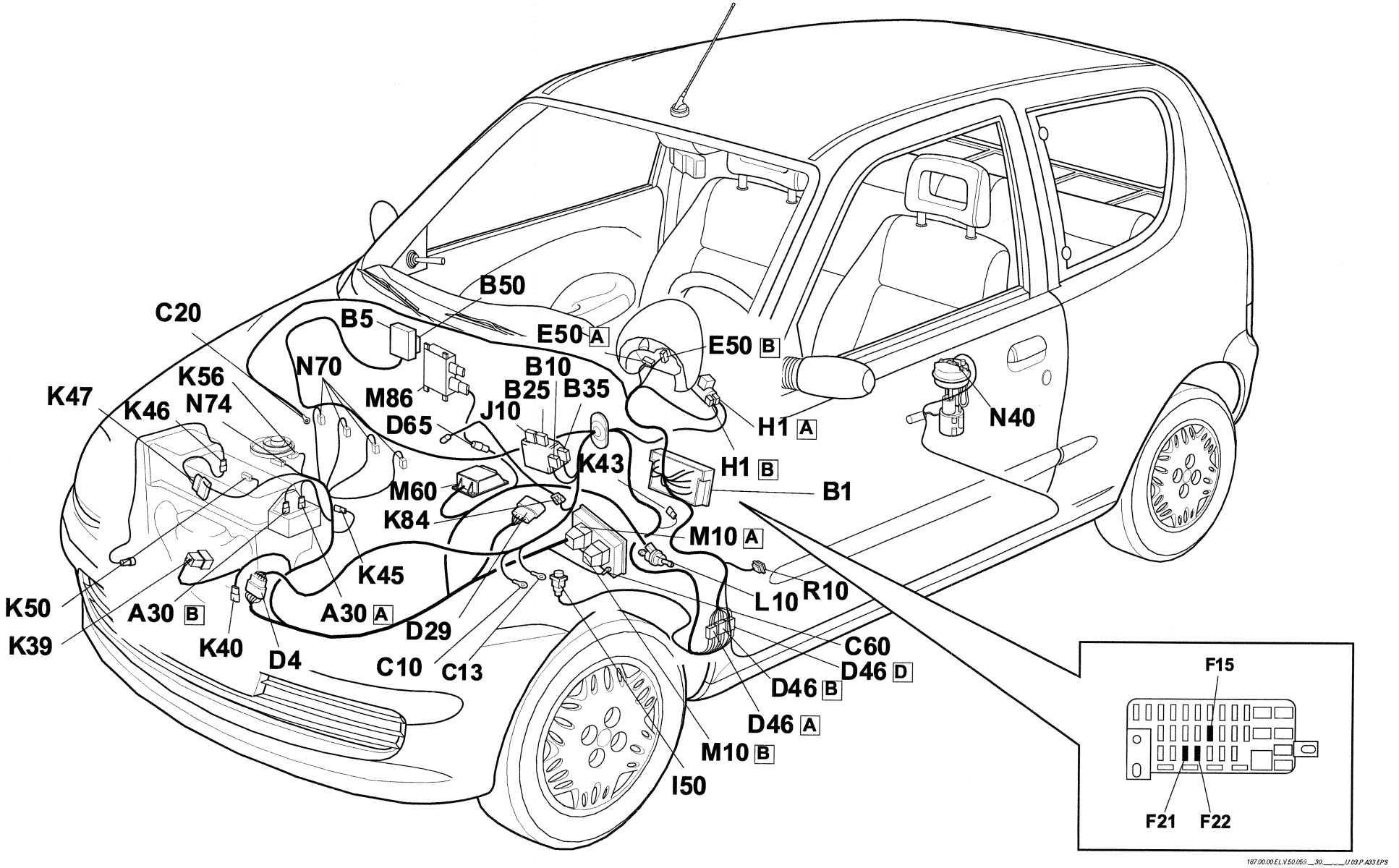
The contact for relay **J10** is supplied by the battery via the 20A fuse B5.
The instrument panel **E50** is supplied by the ignition switch **H1** line INT through the 10A fuse **F22**, pin 18 connector A and directly by the battery, pin 17, connector A via the 7.5A fuse B25 and the 15A fuse **F15** of **B1**.
The earth **C20** is sent to pin 16, connector A of the panel **E50**.
The speedometer sensor **K84** is supplied by the ignition switch **H1** line INT via the 10A fuse **F21** and is connected to earth **C10**. The sensor **K84** signal is sent to the control unit **M10** pin 24 connector A and to the instrument panel **E50** pin 9 connector A.
Pin 7, connector A of panel **E50** is connected directly to pin 33 connector A of the control unit **M10**.
Pin 13 of connector A of **M10** is connected to the 'OBD failure' warning light via pin 12 connector B of the instrument panel **E50**. When there is a failure, the control unit **M10** sends an earth signal, via pin 13, connector A, to light up the 'OBD failure' warning light.
The inertia switch **I50** is connected to the fuel pump **N40** and to the instrument panel **E50** pin 13, connector A; in the case of an impact, it interrupts the supply to the fuel pump **N40** and sends a signal to the instrument panel **E50** pin 13 connector A.

The control unit M10 is connected to the following devices via the following pins:
- Pins 11, 22 and 32 connector A for supplying and receiving the signal from the Lambda sensor on the composition of the air/fuel mixture. The wiring is shielded.
- Pins 1, 21 and 31, connector A for supplying and receiving the signal from the Lambda sensor 2 **K39**; The wiring is shielded.
- Pin 7 connector A for receiving the signal from the Code control unit **M20** pin 6.
- Pin 16, connector A for carrying out the diagnosis through the multiple diagnostic coupling pin 7
- Pin 35, connector A for receiving the signal from the electric steering control unit **M86** pin 10
- Pin 26 connector B for supplying the fuel vapour recovery solenoid valve L10. It allows fuel vapours to pass through to the engine intake, where they join the mixture entering the combustion chamber. The valve L10 is opened by the control unit when the engine is loaded.
- Pins 13 and 22, connector B for receiving the signals from the integrated air temperature sensor **K43**; the sensor provides the control unit with a signal proportional to the tempreature of the air drawn in by the manifold. The wiring is shielded.
- Pin 29 of connector B carries the earth to sensors **K43** and **K45**.
- Pin 14 of connector B supplies sensor **K43**.
- Pin 5 of connector B receives the signal from the coolant temperature sensor **K45**; The sensor provides the control unit with a signal proportional to the temperature of the engine coolant.
- Pins 25 and 35 receive the signal from the rpm sensor **K46**. The wiring is shielded.
- Pins 20, 24 and 32 of connector B receive the signal from the timing sensor **K47**; The control unit uses the timing sensor to recognize the injector and the ignition coil to operate. The wiring is shielded.
- Pin 3 of connector B receives the signal from the throttle position sensor **K56**; The sensor uses a potentiometer to produce a signal proportional to the opening of the throttle.
- Pins 6 and 15 of connector B receive the signal from the detonation sensor **K50**.
- Pins 27, 28, 36 and 37 supply the injectors **N70** for the 4th, 1st, 2nd and 3rd cylinders, respectively.
- Pins 10 and 32 of connector B supply the ignition coils **A30**; The control unit controls the primary coil windings **A30** through the earth signals, whilst the secondary winding sends the impulse to the spark plugs.
- Pins 9, 17, 18 and 19 transmit the idle actuator **N74** signal; it consists of a stepping motor which controls the opening of the by-pass port.

COMPONENTS

Component code	*Description*	*Assembly drawing reference*
A30	Ignition coil	5510C
B01	Junction unit	-
B05	MAXI FUSE box	-
B25	Fuse. for services controlled by ignition 15/ 54	-
B35	Injection memory and CODE fuse	-
B40	Fuel injection services supply fuse	-
C10	Left front. earth	-
C13	Front earth on left side panel	-
C40	Earth on engine	-
C60	Injection ECU earth	-
D04	Front / engine coupling	-
D29	Engine /engine services cables coupling	-
D46	Rear dashboard./ front- coupling	-
E50	Instrument panel	5560B
H01	Ignition switch	5520A
I50	Inertial switch	1040A
J10	Fuel injection main relay	-
J11	Injection control unit relay	-
J70	Injection multiple relay	-
K39	Lambda sensor-2	-
K40	Lambda probe	1080B
K42	Air temperature sensor	1056A
K43	Integrated air temperature sensor	-
K45	Engine temperature sensor (for i.e.)	1056A
K46	RPM sensor	5510C
K47	Timing sensor	-
K48	Absolute pressure sensor	1056A
K50	Detonation sensor	-
K56	Throttle position sensor (i.e.)	1056A
L10	Fuel vapour recovery solenoid	1080E
M10	Engine management ECU	-
M10	Engine management ECU	1056A
N40	Fuel pump and sender unit	1040A
N70	Injector (SPI)	-
N71	Single injector (SPI)	1056A
N74	Idle actuator	1056A
R10	Multiple tester connection	-
R20	Diagnostic coupling for i.e.	-

COMPONENTS LAYOUT



Operation index

DESCRIPTION

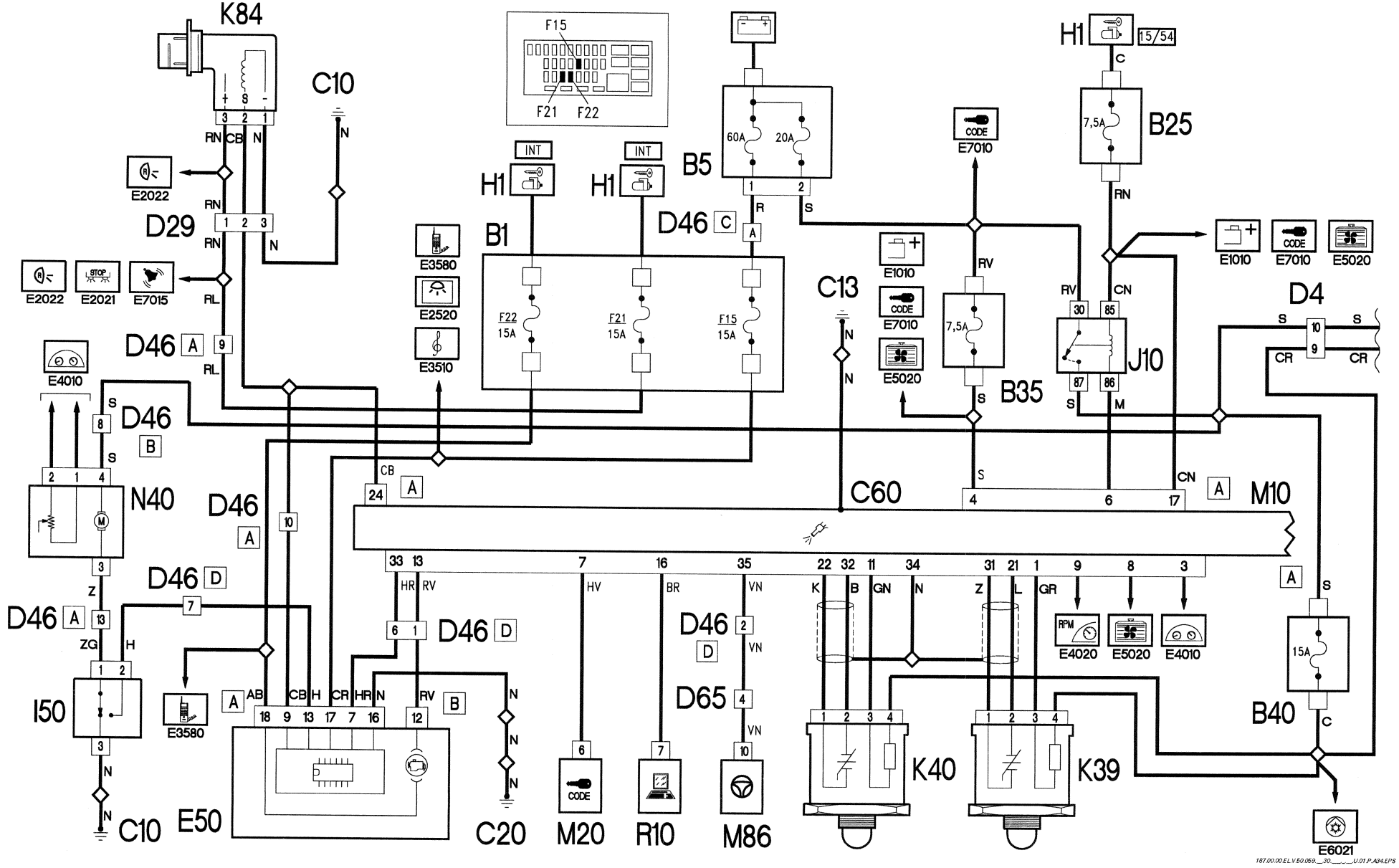
10/00

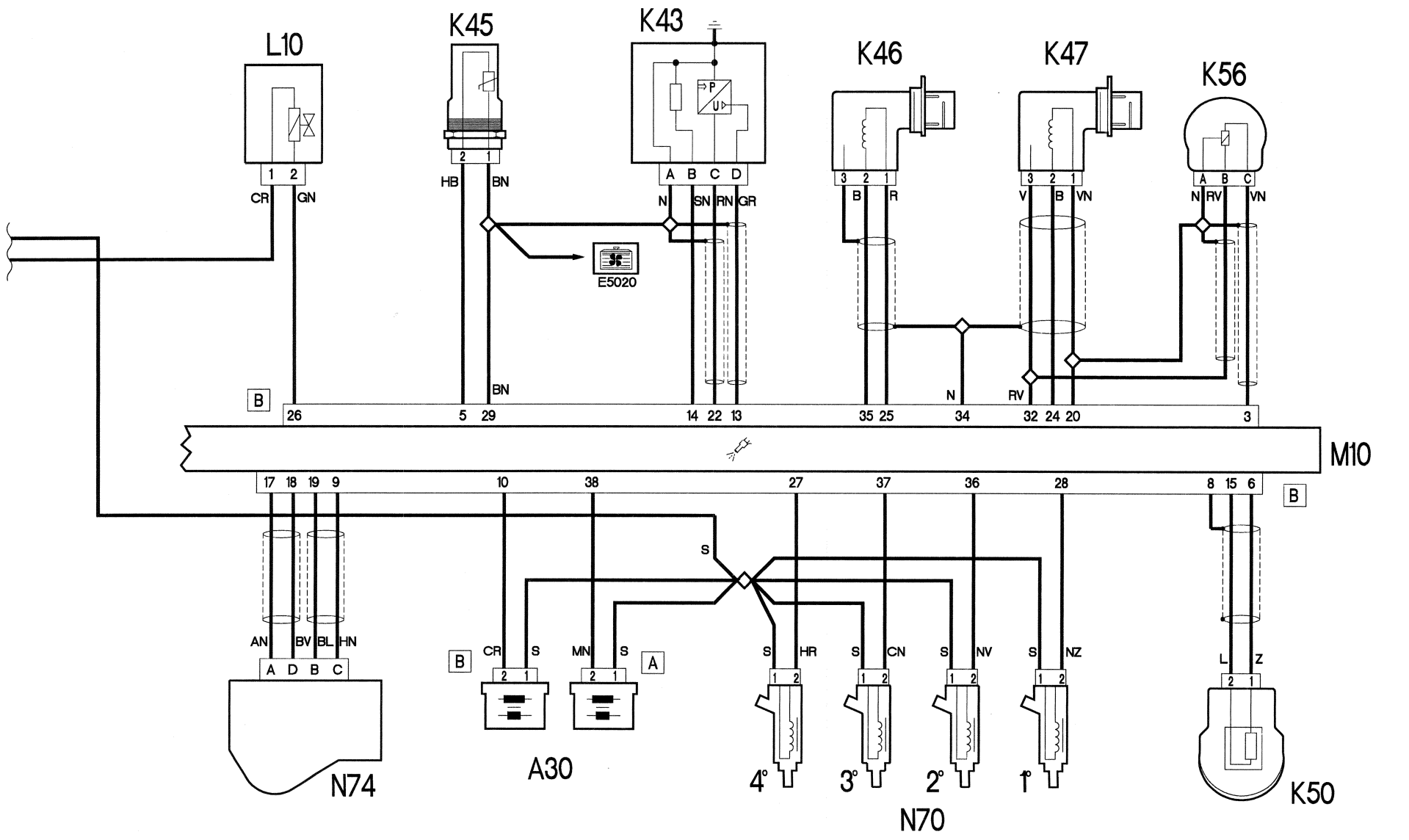
An electronic management system supervises and governs all engine parameters. It optimises performance and fuel consumption by responding in real time to different service conditions.
The system is managed by a single control unit which controls both the ignition and the injection.

The system uses signals received from numerous sensors to control actuators. It is connected to the following systems:
- fuel supply;
- air supply:
- exhaust with catalytic converter;
- fuel vapour recirculation.

For more details, **Characteristic of working principle 1056** Fuel injection system .
The system is also controlled by means of two relays located in the engine compartment near the control unit. The supply lines for the control unit and the various system components (sensors and actuators) are protected by a special maxifuse and two other fuses, also located in the engine compartment next to the control unit.

WIRING DIAGRAM




L10
K45
K43
K46
K47
K56
1 2
CR GN
2 1
HB BN
A B C D
N SN RN GR
3 2 1
B R
V B VN
A B C
N RV VN
E5020
B
BN
26
5 29
14 22 13
35 25
N
34
RV
32 24 20
3
M10
17 18 19 9
10
38
27
37
36
28
8 15 6
B
S
AN BV BL HN
A D B C
N74
B
CR S
MN S
A
2 1
A30
S HR
S CN
S NV
S NZ
1 2
4° 3° 2° 1°
N70
L Z
2 1
K50
187.00.00.E.L.V.50.059__30_____U.02.P.A34.EPS

DESCRIPTION OF OPERATION

10/00

The engine management control unit **M10** monitors and controls the entire electronic ignition and injection system.
The control unit **M10** is supplied directly by the battery at pin 4 of connector A via the 20A fuse for **B5** and the 7.5A fuse for **B35**. It is also supplied through the ignition switch, contact 15/54 at pin 17 of connector A. Line 15/54 is protected by the 7.5A fuse of **B25**.
The control unit **M10** casing is connected to earth **C13**.
The general injection relay **J10** coil is operated by means of an earth signal from pin 6 of connector A of **M10**, whilst it is supplied b the 15/54 line of the ignition switch **H1** via the 7.5A fuse for **B25**.

When the control unit M10 operates the relay J10 the contact closes and the supply is distributed to the following components:
- Electric fuel pump **N40** pin 4
- Ignition coil **A30** pin 1
- Fuel injectors
- 15A fuse **B40**

Fuse B40, in turn, sends a supply to the following components:
- Lambda sensor **K40** pin 4
- Lambda sensor 2 **K39** pin 4
- Fuel vapour recovery solenoid valve **L10** pin 1

The contact for relay **J10** is supplied by the battery via the 20A fuse B5.
The instrument panel **E50** is supplied by the ignition switch **H1** line INT through the 10A fuse **F22**, pin 18 connector A and directly by the battery, pin 17, connector A via the 7.5A fuse B25 and the 15A fuse **F15** of **B1**.
The earth **C20** is sent to pin 16, connector A of the panel **E50**.
The speedometer sensor **K84** is supplied by the ignition switch **H1** line INT via the 10A fuse **F21** and is connected to earth **C10**. The sensor **K84** signal is sent to the control unit **M10** pin 24 connector A and to the instrument panel **E50** pin 9 connector A.
Pin 7, connector A of panel **E50** is connected directly to pin 33 connector A of the control unit **M10**.
Pin 13 of connector A of **M10** is connected to the 'OBD failure' warning light via pin 12 connector B of the instrument panel **E50**. When there is a failure, the control unit **M10** sends an earth signal, via pin 13, connector A, to light up the 'OBD failure' warning light.
The inertia switch **I50** is connected to the fuel pump **N40** and to the instrument panel **E50** pin 13, connector A; in the case of an impact, it interrupts the supply to the fuel pump **N40** and sends a signal to the instrument panel **E50** pin 13 connector A.

The control unit M10 is connected to the following devices via the following pins:
- Pins 11, 22 and 32 connector A for supplying and receiving the signal from the Lambda sensor on the composition of the air/fuel mixture. The wiring is shielded.
- Pins 1, 21 and 31, connector A for supplying and receiving the signal from the Lambda sensor 2 **K39**; The wiring is shielded.
- Pin 7 connector A for receiving the signal from the Code control unit **M20** pin 6.
- Pin 16, connector A for carrying out the diagnosis through the multiple diagnostic coupling pin 7
- Pin 35, connector A for receiving the signal from the electric steering control unit **M86** pin 10
- Pin 26 connector B for supplying the fuel vapour recovery solenoid valve L10. It allows fuel vapours to pass through to the engine intake, where they join the mixture entering the combustion chamber. The valve **L10** is opened by the control unit when the engine is loaded.
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