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AUTOMATIC TRANSMISSION

156

AUTOMATIC TRANSMISSION - Description

A control system called SELESPEED supervises and governs the operation of the manual gearbox via an electrohydraulic device.

An electronic control unit manages a complex operating logic which enables the gearbox to be used in both 'semi-automatic' conditions, in which the driver manages the engagement of the gears using the lever or the two steering wheel buttons, and automatic 'CITY' mode which delegates gear change management to the electronic system.

The electronic control unit dialogues with the engine management control unit via two dedicated lines (CAN), and receives the rpm, engine torque and engine temperature signals.

The control unit drives, by means of a complex operating logic, an electrohydraulic unit located on the gearbox, via a specific electric pump.

For more details, 2127 ELECTRO-HYDRAULIC SELECTION. GEARBOX EXTERNAL. CONTROLS .

The system is also controlled by means of two relays located in the engine compartment near the battery.

The supply lines to the control unit and the various system components (sensors and actuators) are protected by two specific maxifuses and other jumper fuses, located next to the junction unit.

AUTOMATIC TRANSMISSION - Functional description

The SELESPEED control unit M54 monitors and controls the entire gearbox management system.

The control unit is supplied directly by the battery, via the line of the maxifuse O/A located on the battery (connector B99 D), at pin 27 of connector A of M54 .

The supply controlled by the ignition (15/54) reaches pin 28 of connector A of M54 , via the line protected by fuse F4 of supplementary fuse box B98 A.

Pins 1 and 2 of connector A of M54 are earthed.

A set of sensors and potentiometers on the gearbox informs the gearbox as to which gear is engaged:

the potentiometers are supplied from pin 73 of the connector B; the gear selection potentiometer K68 returns a signal to pin 51 of connector A; the gear engagement potentiometer K69 returns a signal to pin 39 of connector A; the hydraulic unit oil pressure sensor K96 returns a signal to pin 40 of connector A.

The clutch position potentiometer K95 is supplied from pin 79 of connector B and returns a signal to pin 52 of connector A.

Pins 38 and 50 of connector A M54 are connected to the car speed sensor (gearbox output) K77 .

Pin 36 of connector A is connected to instrument E10 from which it receives the speedometer signal (car speed).

Pin 48 of connector A is connected to instrument E15 from which it receives the engine rpm signal.

The gear control unit H37 is connected to the control unit M54 to signal the request to engage a gear: these signals are sent to pins 67, 74, 68 of connector B of M54 ; and to pin 26 of connector A to signal the request for gears 1, 2, 3 and D respectively.

The selector H39 allows the CITY mode to be selected; it is connected to the M54 control unit at pin 77 of connector B; (the display is also lit up with the side lights on (line coming from steering column switch unit H5).

The steering wheel controls H38 send signals to pin 75 of connector B of M54 .

Pin 69 of connector B of M10 receives the signal coming from the brake lights switch I30 , with the supply controlled by the ignition (INT) from fuse F1 of the junction unit B1E2021 BRAKE LIGHTS .

In accordance with the operating logic, the control unit controls the electrohydraulic unit located on the gearbox which effects the gear change: the electric pump N48 , which keeps the oil in the hydraulic unit under pressure, is controlled from pin 31 of connector A.

The pump N48 is controlled by a specific relay J86 (supplied by the line of the specific maxifuse F/P located on the battery (connector B99 D).

The control unit then controls the opening of the hydraulic unit solenoids:

- the two gear engagement solenoids L51 and L52 are controlled from pins 32 and 44 of connector A of M54 ;
- the two gear selection solenoids L53 and L54 are controlled from pins 29 and 3 of connector A of M54 ;
- the clutch control solenoid L56 is controlled from pin 43 3 of connector A of M54 .

A safety signal comes from pin 42 of connector A of M54 for the starting enablement relay J05 which gives starting enablement, pin 50 of the starter motor A20 ; the signal requesting starting reaches pin 76 of connector B E5010 STARTING AND RECHARING .

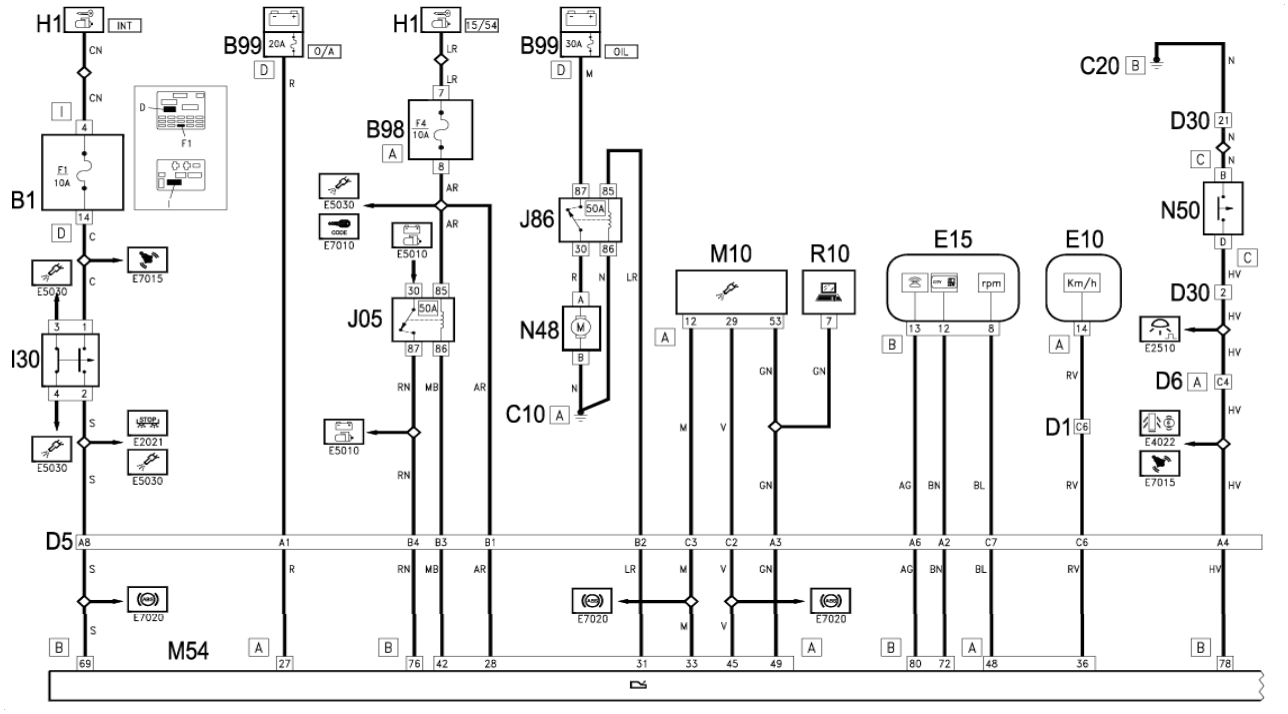
The control unit M54 also manages the door open buzzer: the driver's door open signal - catch N50 - reaches pin 78 of connector B of M54 ; the control for the buzzer, located in instrument E15 departs from pin 80 of connector B.

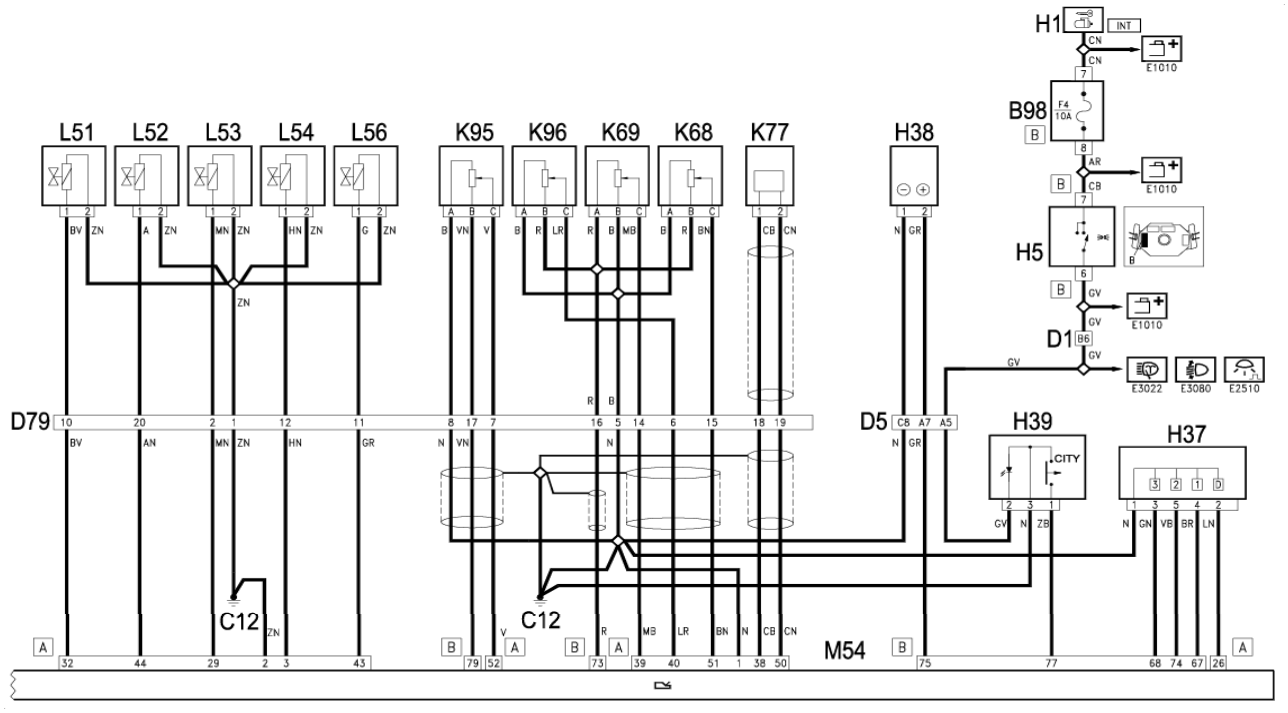
The control unit M54 has a self-test system, which can be used by connecting the unit to the connector R10 : this receives signals from pin 49 of connector A of M54 ;the serial line is shared with the engine control unit M10 .

The same self-test also sends signals for the 'automatic gearbox fault' warning light. located in the instrument E15 , via the same line - coming out of pin 72 of connector B - it is used for the gear indication display on the instrument itself.

Control unit M54 is connected to the engine management control unit M10 and the ABS control unit M50 ; this connection is via the CAN line from pins 33 and 45 of connector B of M54 and is connected to pins 12 and 29 of connector A of M10 .

AUTOMATIC TRANSMISSION - Wiring diagram

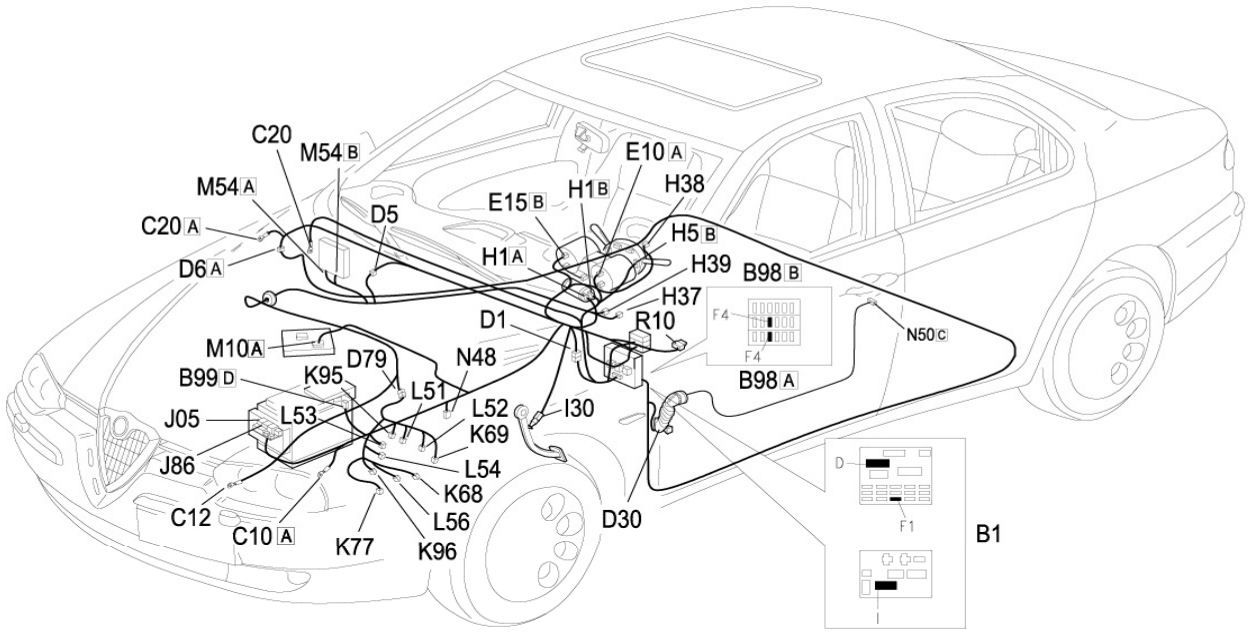




Component code	Name	Assembly reference
B1	Junction unit	5505A
B42	Automatic transmission supply fuse	-
B98	Supplementary fuse box	5505A
B99	Maxifuse box on battery	-
B99	Maxifuse box on battery	5530B
C10	Front left earth	5505A

C12	ABS front earth	5505A
C15	Facia earth, driver's side	5505A
C20	Passenger side dashboard earth	5505A
D1	Front / dashboard connection	-
D1	Front / dashboard coupling	-
D5	Front / ABS couping	-
D5	Front / ABS coupling	-
D6	Front / rear connection	-
D6	Front / rear coupling	-
D30	Rear / front door connection left	-
D30	Rear / front door coupling left	-
D79	Transmission sensor junction	-
D83	Gearbox i.e/ coupling	-
D83	I.e. / transmission connection	-
E10	Speedometer	5560B
E15	Rev counter	5560B
H1	Ignition switch	5520A
H5	Steering column switch unit	5550A
H37	Gear controls	2127A
H38	Gear controls on steering wheel	-
H49	Driving mode selection switch (A.T.)	-
I30	Brake pedal switch	5550D
J5	Starting enablement relay	-
J86	Automatic transmission relay	-
K58	Steering sensor	3350E
K68	Speed selection potentiometer	2127E
K69	Gear shift potentiometer	2127E
K77	Transmission output speed sensor	2127E
K77	Transmission output speed sensor	2127E
K78	Transmission input speed sensor	2127E
K95	Clutch position potentiometer	2127E
K96	Pressure sensor on transmission	2127E
L50	Automatic transmission solenoid unit	2127C
L51	Solenoid 1 (gear engagement)	2127E
L51	Solenoid 1 (gear shift)	2127E
L52	Solenoid 2 (gear engagement)	2127E
L52	Solenoid 2 (gear shift)	2127E
L53	Solenoid 3 (gear engagement)	2127E
L53	Solenoid 3 (gear selection)	2127E
L54	Solenoid 4 (gear engagement)	2127E
L54	Solenoid 4 (gear selection)	2127E
L55	Transmission release electromagnet	2127C
L56	Clutch control solenoid	2127E
M10	Engine management ECU	1056B
M10	Engine management control unit	1056B
M54	'Selespeed transmission control unit'	2127E
M55	Automatic transmission control unit	2135B
N48	Automatic transmission pump	2127C
N49	Automatic transmission fluid fan	2130A
N49	Automatic transmission fluid fan	7010N
N50	Front door lock gear motor left	7005N
N50	Right front door lock left	7005N
R10	Multiple tester connection	-

AUTOMATIC TRANSMISSION - Location of components



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L54	Solenoid 4 (gear engagement)	2127E
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