

Do It Yourself 4x4 switch for Alfa Romeo 33 16v Permanent 4

ver. 1.03

I suggest you to read all from page one to end so you could know better what and why are you doing on car and what will it affect but if you are to jumpy please read at least pages 1 and 2 before jumping to 26 and higher.

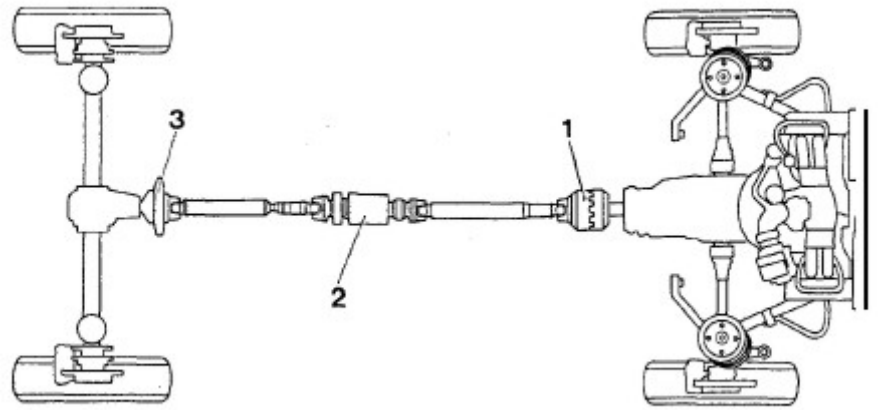
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I wish specially to thank Keith Walker for supplying me with all needed data for making this manual because without his help, knowledge, patience and readiness to share information I wouldn't be able to learn and make this manual and also to James Barrett, Dave Peto, Lucas Lardinois and all other people who answered to my questions when I asked them.

How Permanent 4 system works

On vehicles with permanent four-wheel drive new technical solutions have been adopted characterized by a series of devices able to guarantee optimal traction even under critical road holding conditions. These results have been obtained thanks to the adoption of a central “viscous coupling” able to transfer part of the deflecting torque from one drive shaft to another whenever there is wheel slip due to bad road conditions. Under good road holding conditions the vehicle behaves like a front wheel drive vehicle but has the advantage that the rear axle permanently contributes to the thrust with a small torque (about 5%) transferred by the viscous coupling which, like a differential device, allows small differences in the speed of the front and rear wheels. Drive is transmitted to the viscous coupling (2) from the electromagnetic coupling (1) which is controlled by an electronic control unit which automatically engages/disengages it in accordance with evaluation parameters set by the control unit itself and measures by the relevant sensors and components. The rotating mass (3) located at the end of the drive shaft enables the vibrations generated by the imbalance of the system to be absorbed.



PG 0320

1 - Electromagnet coupling

2 - Viscous coupling

3 - Rotating mass

4. Body

5. Shaft

A. Integral disc with coupling body 4

B. Integral disc with shaft 5

Electromagnetic coupling (1)

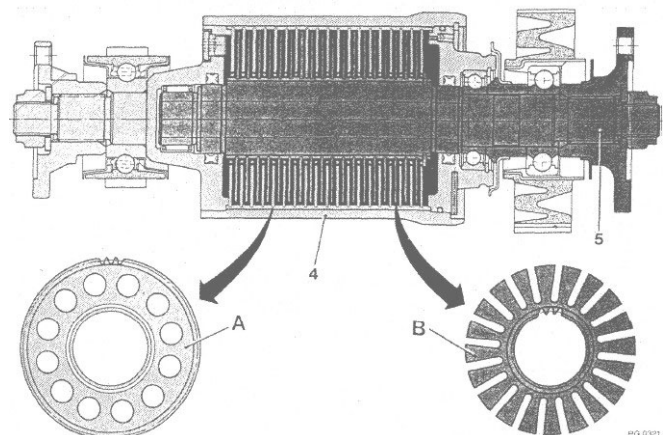
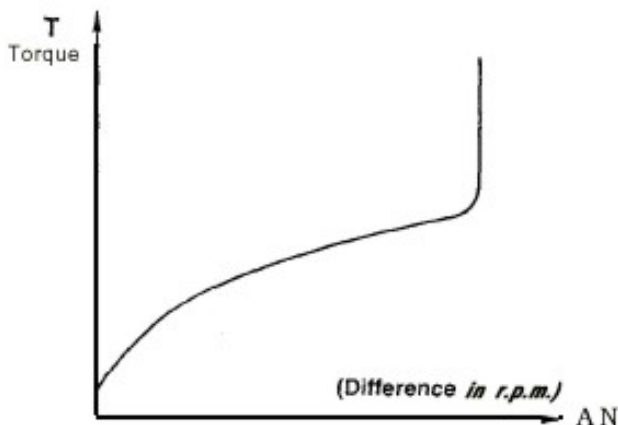
The electromagnetic coupling forms part of a sophisticated system of control managed by a specific control unit which, from the processing of the data measured by a series of sensors, manages the traction on the basis of the best road holding conditions obtained through the disengagement of the four-wheel drive which is the normal operational state.

The functions of the system are basically as follows:

- Engagement/disengagement of the coupling
- Anti-disengaging function
- Self diagnose.

Viscous coupling (2)

As shown in the following page the connection between the two drive shafts (front and rear) is formed by a special silicone fluid in which discs “A” and “B” are immersed. These discs are integral with body 4 and with the shaft 5 (through a grooved coupling). Under normal conditions, as already described, with a minimum difference in the speed of the two discs, a minimum torque is transferred as the traction is almost entirely on the front axle. When one of the drive shafts is slipping resulting in a great difference in speed between the two disks, (e.g. front wheels on ice and rear wheels **on** dry road) there is an increase in temperature resulting in a compression of the disks and relative blocking of the coupling itself.



PG 0321

FOUR-WHEEL DRIVE

33 16V



Permanent 4

Description

The "33 Permanent 4" is a vehicle with **Permanent four-wheel drive** on which advanced technical solutions have been adopted characterized by a series of devices able to permit optimal traction even under critical road-holding conditions.

These results have been obtained by the addition of a "**central viscous coupling**" permitting part of the deflecting torque of a drive shaft to be transferred to the other whenever slipping conditions are encountered due to insufficient road holding by the tyres.

Under good road holding conditions though, the vehicle responds like a front-wheel drive with the advantage that the rear wheels participate permanently in the drive force through a small couple (approx. 5%) transferred to it by the viscous coupling that, like a differential device, permits small differences in speed between the front and rear wheels.

Drive is transmitted to the viscous coupling by the **electromagnetic coupling** (M22) and is managed by the **electronic control unit** (N50) which engages/disengages drive under conditions defined by the evaluation parameters of the control unit through the use of special sensors.

Introduction of the viscous coupling also facilitates reengagement of traction when the necessity to disengage it has been detected (managed by the control unit only) following particular conditions:

- The electromagnetic coupling is continuously engaged but the system has a **safety braking characteristic** which, after

having obtained the consensus of the two **stop switches** (H3 - H49), automatically disengages four-wheel drive 0.001 seconds after release of the switches if a deceleration of 0.2 g is exceeded. Deceleration is not controlled at speeds lower than 50 km/hr; four obvious reasons of co-existence between this type of four-wheel drive and the ABS system.

The system is fitted with an **anti-disengagement characteristic** based on the monitoring of magnetic disturbance which results when the teeth of the coupling do not engage.

The sensor is a **coil** (L42) situated near the coupling.

This safety characteristic functions on guided engagement after the brake pedal has been released following intervention of the deceleration protection. If after 0.1 seconds from the engagement signal the difference in angular velocity between the two gears exceeds the angle corresponding to 8 teeth, the control unit prevents engagement.

Coupling is then repeated every 0.3 seconds up to 32 times.

If after this, the coupling is still not engaged, the system enters in failure signalling the anomalous condition on the instrument panel. The next attempt to engage the coupling will be possible only when the system has been re-set.

Anti-disengagement control is carried out at speeds between 50 and 150 km/hr. After this limit the difference in angular velocity is outside the limits of danger

and in any event, the viscous coupling is able to absorb the differences in speed of the drive shafts.

- If the **supply voltage is less than 10V** when the coupling is engaged, the electronic control interrupts the command to the coupling without the failure warning light (D32) being illuminated, permitting automatic re-engagement as soon as the voltage exceeds 10V.

A **system failure warning lamp** (D32) is situated on the instrument panel.

This warning lamp is illuminated for 1.5 seconds after rotation of the ignition key to the "MARCIA" position.

The system is equipped with an **autodiagnosis** characteristic and diagnostic data is transmitted through the **Alfa Tester** which is able to signal (together with the system failure warning lamp) the following anomalies:

- **Absence of speedometer signal.**

In order to ensure operating conditions with the ABS system, if the control unit does not receive the speedometer signal for a period of over 120 seconds, four-wheel drive is disengaged by depression of the brake pedal regardless of the force of the deceleration.

After approximately 0.4 seconds from release of the brake pedal, four-wheel drive is re-engaged. With the vehicle stopped, after 120 seconds, at each activation of the brake pedal the drive is disengaged and re-engaged with the successive release of the pedal.

Absence of the speedometer signal does not cause illumination of the system failure warning light.

- **Absence of stop signal.**

The control unit is pre-set to receive the signals from two switches acting contemporaneously and connected to the brake pedal. In case of malfunction of either (or their fuses), the system failure warning light is illuminated.

The control of the stop switches is carried out when the vehicle is in movement.

From the moment that a discrepancy between the two stop signals is detected, a four-second timer is activated.

After the four seconds have elapsed, if the two stop signals are not equal, only the first braking anomaly is counted. This procedure is repeated eight times (in the event of signal dissymmetry). At the 9th braking anomaly ($T > 36$ sec.) the system enters in failure and the relative warning lights are illuminated and the coupling is disengaged. If on the other hand during the diagnostic phase the symmetry between the two stop signals is restored, the count of the braking anomalies is set to zero and the system is re-set for a new control.

The presence of the second stop switch is an additional safety device necessary when considering the danger caused by the traction failing to disengage as a result of malfunction of the fuse or normal stop switch.

As a rule it is the first of the two switches that closes and gives the consensus for the calculation

of deceleration. For re-engagement of the traction both switches must be released (which must be mechanically separated but synchronized in their actioning).

- **Interruption of anti-disengagement sensor.**

The control unit sends a signal to the sensor so that a return signal is obtained verifying the continuity of the connection even when disengagement is not detected.

If it is interrupted, the system failure warning light is illuminated and the supply to the part concerning power supply and consequently the coupling is interrupted.

Short circuiting of the coil is not checked.

- **Short circuit or interruption of the 4x4 coupling coil.**

Also in this case the coil is continuously monitored by the control unit and in both cases (short-circuit or interruption), the system failure warning light is illuminated and the supply to the part concerning power supply is interrupted.

The four-wheel drive is obviously disengaged.

- **Anomaly in the part concerning power supply.**

Regarding the internal parts of the control unit.

In the event that an anomaly in one of these is detected, the control unit illuminates the system failure warning light and interrupts supply to the part concerning power supply.

- **Missing or burnt out system failure warning lamp.**

This anomaly can be detected when the ignition key is rotated from "GARAGE" to "MARCIA" as

the lamp should come on for 1.5 seconds.

With the system failure warning lamp burnt out or missing four-wheel drive is disengaged.

- **Short circuit or interruption of safety relay.**

The faults are detected on the relay coil and not on its contact. Faulty contact is detected as a fault on the 4x4 coupling (and cannot be distinguished from it).

In the event of one of the two faults being detected, four-wheel drive is disengaged and the system failure warning light is illuminated.

In the event that it becomes necessary to carry out the following operations:

- Dynamic balancing with wheels on vehicle
 - Towing
 - Power testing on a roller bench.
- the electromagnetic coupling must be disconnected as there must be no transmission between the front and rear shafts.

This result can be obtained by turning the ignition key to "GARAGE" or withdrawing from the supply relay, the fuse (30A) protecting the coupling supply circuit, situated in the service compartment.

KEY

KEY

A: STARTING - RECHARGING

A1	Battery
A2	Alternator
A3	Alternator with integral electronic voltage regulator
A4	Voltage regulator
A5	Ignition distributor
A5a	Ignition distributor A
A5b	Ignition distributor B
A6	Impulse generator
A7	Rotor
A8	Ignition coil
A8a	Ignition coil A
A8b	Ignition coil B
A9	Coil resistance
A10	2-way connector for coil
A11	Starter motor
A12	Spark plugs
A13	Pre-heating glow plugs
A14	Alternator cable terminal board

B: MANUAL ELECTRIC CONTROLS

B1	Ignition switch
B2	Windscreen wiper control
B3	Windscreen and/or headlight washer pump control
B4	Control for side lights, flashing, low/high beam headlights
B5	Horn control switch
B6	Direction indicator light control
B7	Low beam flashing control switch
B8	High beam flashing control switch
B9	Heated rear window control switch
B10	Fog light control switch
B11	Rear fog light control switch
B12	Road hazard lights control switch
B13	Passenger compartment front roof lamp control switch
B14	Passenger compartment rear roof lamp control switch
B15	Passenger compartment roof lamp control switch
B16	Cluster lighting dimmer rheostat
B17	Gearbox oil level warning light switch
B18	Front right door-locking control switch
B19	Front left door-locking control switch
B20	Interior door-locking switch
B21	Front right power window control switch
B22	Front left power window control switch
B23	Rear right power window control switch
B24	Rear left power window control switch
B25	Rear power window inhibitor switch
B26	Rear power window and rear cigar lighter inhibitor switch
B27	Front seat height adjustment control switch
B28	Front left backrest adjustment control switch
B29	Front right backrest adjustment control switch
B30	Door electric rear view mirror control switch
B31	Electric aerial control switch
B32	Windscreen washer pump control
B33	Front spot light switch
B34	Rear left spot light switch
B35	Rear right spot light switch
B36	Right door rear view mirror double control switch
B37	Parking light control switch
B38	Rear window wiper control switch
B39	Trip odometer recall microswitch
B40	Trip odometer reset microswitch
B41	VF electronic rheostat
B42	Lamp dimmer rheostat
B43	Internal control switch for door unlock
B44	Rear spot light control switch
B45	Recognition light control switch

B46	Two-tone horn control switch
B47	Sunroof motor control switch
B48	Interphone system control switch
B49	Talk/listen switch
B50	Siren control switch
B51	Driver's seat heater control switch
B52	Front right seat longitudinal adjusting switch
B53	Front power window full acting switch
B54	Front left seat longitudinal adjusting switch
B55	Luggage compartment opening control switch
B56	Rear right seat adjusting device switch
B57	Rear right seat heating device switch
B58	Rear left seat adjusting device switch
B59	Rear left seat heating device switch
B60	Cluster warning light operation check push-button
B61	Fuel filler cap opening switch
B62	Front right seat heating device switch
B63	Front right seat height adjusting switch
B64	Cruise control "OFF", "RESUME" switch
B65	Cruise control "SET ACC.", "SET DEC." switch
B66	Position/Hazard/Fuel flap light control push-button panel
B67	Controlled damping suspension shock-absorber control board
B68	Combination switch unit
B69	Headlight aiming control device
B70	Rear windscreen washer-headlight washer windscreen washer pump control
B71	Front electric window double control switch (LH and RH)
B72	Four-wheel drive control switch
B73	Vehicle lift switch
B74	Vehicle lower switch
B75	Driver's seat memory panel
B76	Front right-hand seat lumbar support regulation switch
B77	Front left-hand seat lumbar support regulation switch
B78	Front right-hand seat rear tilt regulation switch
B79	Front left-hand seat rear tilt regulation switch
B80	Front right-hand seat vertical - longitudinal regulation switch
B81	Front left-hand seat vertical - longitudinal regulation switch
B82	Front right-hand seat front tilt regulation switch
B83	Front left-hand seat front tilt regulation switch
B84	Front right-hand rear tilt, front tilt, longitudinal and vertical regulation switch unit
B85	Front left-hand rear tilt, front tilt, longitudinal and vertical regulation switch unit
B86	Front left-hand seat heating switch
B87	Boot release switch with glovebox light
B88	Light dimmer rheostat (DIM-DIP)

C: INSTRUMENTS

C1	Electronic rev-counter
C2	Electronic speedometer
C3	Voltmeter
C4	Fuel level gauge
C5	Oil pressure gauge
C6	Coolant temperature gauge
C7	Clock
C8	Space free for instrument
C9	Turbo charger air pressure gauge
C10	Cluster (*)
C11	ALFA ROMEO Control display
C12	Performance gauge display
C13	Optoelectronic cluster
C14	Warning lamp panel
C15	Door lock actuated LED
C16	Display check with clock
C17	Odometer module on instrument panel

KEY

G: FUSEBOX - CONNECTIONS - GROUNDS (Continued)

G10	Connection between front right door wiring and door mirror switch	G60	Injection wiring ground
G11	Connection between board wiring and rear wiring	G61	Connection for ignition coil
G12	Connection between board wiring and mirror switch	G62	Clutch switch connection
G13	Connection between board wiring and console wiring	G63	Rear ground
G14	3-way connection between board wiring and door wiring	G63a	Rear right ground
G15	2-way connection between board wiring and door wiring	G63b	Rear left ground
G16	6-way connection between board wiring and door wiring	G64	Connection for Trip Computer - clock
G17	Connection between board wiring and front right door wiring	G65	Coaxial cable
G18	Connection between board wiring and front left door wiring	G66	Motronic wiring ground
G19	Connection between board wiring and passenger compartment roof lamp	G67	Motronic connection
G20	Connection for front right door-locking motor	G68	Connection A with board wiring
G21a	Connection for front right door-wiring	G69	Connection B with board wiring
G21b	Connection for front right door-wiring	G70	Connection C with board wiring
G22	Connection for front left door-locking motor	G71	Connection for warning lamp on instruments
G23a	Connection for front left door wiring	G72	Connection for seat back adjustment wiring
G23b	Connection for front left door wiring	G73	Connection for rear services
G24	Connection for rear right door-locking motor	G73a	Connection for rear right accessories
G25	Connection for rear right door wiring	G73b	Connection for rear left accessories
G26	Connection for rear left door-locking motor	G73c	Rear services connection (4-way)
G27	Connection for rear left door wiring	G73d	Rear services connection (4-way for Alfa Control)
G28	Connection between front right door wiring and power window switch	G74	Connection ALFA ROMEO Control Televel rear wiring
G28a	Connection between rear right door wiring and power window switch	G75	Connection between right and left roof panel services
G29	Connection between door-locking wiring and rear power windows	G76	Connection for roof panel - services - right side
G30	Connection for power windows and door lock	G77	Connection for roof panel services - left side
G31	Connection between front left door wiring and power window switch	G78	Connection for front door services wiring
G32	Connection between console wiring and rear right door wiring	G79	Connection for rear door services wiring
G33	Connection between console wiring and rear left door wiring	G80	Connection for board wiring
G34	Connection for power window supply cable	G81	Connection for front left seat back adjustment
G35	Connection between rear wiring and rear right side light wiring	G82	Connection for front right seat back adjustment
G36	Connection for power window switch cables	G83	Rear connector for fast idle device
G37	Connection for multiswitch, on steering column	G84	Console cable connector
G38	Connection for air conditioner wiring	G84a	Central panel 15-way cable connection
G39	Connection for clock wiring	G84b	Central panel 12-way cable connection
G40	Connection for door-locking control unit	G85	Front accessories connector
G41	Speedometer-rev counter sensor device connection	G86	Connection for passenger compartment roof lamp
G42	Connection between alternator and min engine oil pressure switch	G87	Connection for rear door-locking motors
G43	Connection for heater/ventilation control cables	G88	Connection for rear lights
G44	Connection for rear fog lamp	G89	Intermediate connection A
G45	Connection for headlight wash-wipe cables	G90	Intermediate connection B
G46	Connection for headlights	G91	Rear door sensors ground
G47	Connection for right-side repeater cables	G92	Luggage compartment ground
G48	Connection between electric door mirror and left-side repeater cables	G93	Windscreen frame upper cross member ground
G49	Connection available	G94	Engine compartment connector
G50	Presetting for loud speaker cables	G94a	10-way connection for engine compartment
G51	Presetting for car radio cables	G94b	8-way connection for engine compartment
G52	Fuse box ground	G94c	Engine compartment connection - right side
G53	Engine compartment ground	G94d	Engine compartment connection - left side
G53a	Engine compartment ground - right side	G95	Centralized fuse box
G53b	Engine compartment ground - left side	G95A	Connection for switches
G54	Passenger compartment ground	G95B	Connection for switches
G54a	Passenger compartment ground - right side	G95C	Connection for cluster warning lamps
G54b	Passenger compartment ground - left side	G95D	Connection for ALFA ROMEO Control
G55	Hood ledge panel ground	G95E	Connection for console
G56	Branch terminal board	G95F	Connection for fog light - rear fog light
G57	Presetting for fuel cut-off solenoid valve	G95G	Connection for combination switch
G58	Connection for cigar lighter	G95H	Connection for LH interface
G59	Connection for electric rear-view door mirror	G95I	Connection for RH interface
		G95L	Connection for clock - rheostats
		G95M	Connection for sunroof
		G95N	Connection for battery
		G95O	Connection for ignition switch
		G95P	Connection for door services
		G95Q	Connection for performance gauge
		G95R	Connection for heated rear window
		G95S	Connection for cluster
		G95V	Fuses
		G96	Single connector for ALFA ROMEO Control - cluster
		G97	Connection for left doors services
		G98	Connection for right doors services
		G99a	Connection for engine dashboard A
		G99b	Connection for engine dashboard B

KEY

G: FUSEBOX - CONNECTIONS - GROUNDS (Continued)

G99c	Connection for engine dashboard C	G156	Front-right door wiring - front-right door sensor connection
G99d	Connection for engine dashboard D	G157	Front-left door wiring - front-left door sensor connection
G99e	Connection for engine dashboard E	G158	Rear-right door wiring - rear-right door sensor connection
G100	Connection for console - doors wiring	G159	Rear-left door wiring - rear-left door sensor connection
G101	Trip Computer connection	G160	Front-right door wiring - ground lighting lamp connection
G102	Optoelectronic cluster connector	G161	Front-left door wiring - ground lighting lamp connection
G103	Connection for grounds to brake fluid tank	G162	Rear-right door wiring - ground lighting lamp connection
G104	Connection for roof panel left upright	G163	Rear-left door wiring - ground lighting lamp connection
G105	Connection for ashtray lamp	G164	Board wiring - conditioning unit wiring connection
G106	Seat grounds	G165	Door service wiring - conditioning unit wiring connection
G107	Connection for fuel pump	G166	Front door wiring - front right door wiring connection
G108	CEM wiring ground	G167	Front door wiring - rear right wiring connection
G109	Injection wiring connection	G168	Front door wiring - front right door wiring connection
G110	Thermostat wiring ground	G168a	Front door wiring and rear left door wiring one-way connection
G111	Connection for dashboard instruments wiring	G169	Front door wiring - rear left wiring connection
G112a	Connection A for roof wiring	G170	Board wiring - rear right wiring connection
G112b	Connection B for roof wiring	G171	Board wiring - rear left wiring connection
G112c	Connection C for roof wiring	G172	Door wiring - sunroof connection
G112d	Connection D for roof wiring	G173	Console wiring - front door wiring connection
G112e	Connection E for roof wiring	G174	Steering column support ground
G113	Connection for front left fender	G175	Board wiring - fog light wiring connection
G114	Connection for outside temperature sensor	G176	Roof panel ground
G115	Connection for tow bar vehicle socket	G177	Door service wiring - board wiring connection
G116	Connection for tow bar trailer plug	G178	Preset connection for seat height adjustment switch
G117	Connection for engine compartment lamp	G179	Rear left wiring - roof lamp wiring connection
G118	Connection for luggage compartment lamp	G180	Rear left wiring - front door wiring connection
G119	Courtesy mirror light connection	G181	Rear left wiring - rear console wiring connection
G120	Map light connection	G182	Console area ground
G121	Car electric system connection	G183	Rear console wiring - front right seat connection
G122	Ignition wiring connection	G184	Rear console wiring - front left seat connection
G123	Pedal-board ground	G185	Luggage compartment left-side ground
G124	ABS system connection	G186	Luggage compartment right-side ground
G125	ABS system fuse box	G187	Single connection in rear left wiring
G126	ABS system electromagnetic switch protection fuse	G188	Single connection in rear right wiring
G127	Recognition light fuse box	G189	Rear seat wiring - rear console wiring connection
G128	Transceiver fuse box	G190	Rear seat wiring connection
G129	Two-tone horn left-side engine compartment connection	G191	Rear left wiring - rear left door wiring connection
G130	Switch connection	G192	Preset connection for trailer stop signal
G131	Ground on upper cover	G193	Preset connection radio aerial
G132	Ground on manifold	G194	Rear left wiring - central side light wiring connection
G133a	Electronic ignition-injection connection wiring A	G195	Preset connection for rear left loud-speaker
G133b	Electronic ignition-injection connection wiring B	G196	Preset connection for rear right loud-speaker
G134	Front left upright connection	G197	Rear right wiring - rear right door wiring connection
G135	Rear window back-shelf wiring connection	G198	Rear right wiring - boot lid lock wiring connection
G136	Front side-marker intermediate connection	G199	Rear right door wiring connection
G137	Injection supply wiring connection	G200	Preset connection for radio headphones control unit
G138	Combination switch headlight unit connection	G201	Heated rear window fuse (30A)
G139	Interphone system control unit connection	G202	ABS System ground
G140	Fuel pump intermediate connection to service panel	G203	Rear right wiring - front door wiring connection
G141	Rear side-marker intermediate connection	G204	Front right sensor connection - ABS
G142	Engine service connections	G205	Front left sensor connection - ABS
G143	Service central compartment ground	G206	Rear right sensor connection - ABS
G144	Boot lid wiring connection	G207	Rear left sensor connection - ABS
G145	Intermediate connection for injection switch cables	G208	Front left power window connection
G146	Tachymeter connection	G209	Rear right wiring - rear console wiring connection
G147	Rev-counter sensor connection	G210	Door wiring - rear console wiring connection
G148	Under-dash-board ground	G211	Cluster intermediate connection for gearbox oil level signal
G149	Board wiring with engine compartment right-side wiring connection	G212	Cluster internal connection for ABS warning light signals and seat belts
G150	Board wiring with engine compartment left-side wiring connection	G213	Cluster internal connection for ABS warning light, seat belts and gearbox oil level
G150a	Additional wiring connection header with left-hand engine compartment wiring	G214	Instrument connection for ABS warning light signals and seat belts (CA)
G151	Board wiring with engine service compartment wiring connection	G215	Instrument internal connection for ABS warning light signals and seat belts
G152	Glow plug pre-heating timing fuse (50a)	G216	Preset connection for power window control unit
G153	Ground under diesel filter	G217	Preset connection for front left loud-speaker
G154	Engine wiring - board wiring connection	G218	Preset connection for front right loud-speaker
G155a	Right seat adjustment wiring connection	G219	Sunroof connection
G155b	Left seat adjustment wiring connection		

KEY

G: FUSEBOX - CONNECTIONS - GROUNDS (Continued)

- G220 Coil power module connection for rev-counter
- G221 Jumper connection for power window wiring
- G222 Cruise Control Actuator - Cruise Control CU connection
- G223 Preset connection for Cruise Control clutch push-button
- G224a Right passive seat belt wiring connection
- G224b Left passive seat belt wiring connection
- G225a Right passive seat belt control unit switch wiring connection
- G225b Left passive seat belt control unit switch wiring connection
- G226a Right passive seat belt wiring ground connection
- G226b Left passive seat belt wiring ground connection
- G227b Under-fender services wiring connection
- G228 Board wiring - cooling electric fan motor wiring connection
- G229 Starting signal and "Over-boost" warning light wiring connection
- G230 Ground on starting distributor bracket
- G231 Board wiring - automatic transmission wiring connection
- G232 Jumper connection preset for Motronic control unit (manual/automatic transmission versions)
- G233 Board wiring - automatic transmission gear-lever wiring connection
- G234 Interphone control unit connection A
- G235 Interphone control unit connection B
- G236 Interphone circuit panel connection A
- G237 Interphone circuit panel connection B
- G238 Board wiring - day-light lamps
- G239 Car radio/car telephone CU relay - 15A
- G240 Front seats relay - 20A
- G241 Board wiring - anti-theft wiring connection
- G242 Board wiring Cruise Control wiring connection
- G243 Board wiring - rear cabinet wiring single connection
- G244 Board wiring - rear cabinet wiring connection
- G245 Rear - right anti-theft wiring connection
- G246 Rear seat adjustment fuse 20A
- G247 Rear electric window fuse 30A
- G248 Anti-theft wiring - rear right wiring connection
- G249 Anti-theft wiring - cabinet wiring connection
- G250 Board wiring - C.A. right side engine wiring connections
- G251 Shock absorber connection clinching
- G252a Board wiring - rear right wiring for shock-absorber system connection
- G252b Board wiring - rear right wiring for shock-absorber system connection
- G252c Board wiring - rear right wiring for shock-absorber system connection
- G252d Board wiring - rear right wiring for shock-absorber system connection
- G253 Rear wiring - left wiring - climatization wiring connection
- G254 Engine electric fan fuse 40A
- G255 Climatization electric fan fuse 40A
- G256 Rear left wiring - anti-theft connection
- G257 Interlock SHIFT CU fuse 10A
- G258 Anti-theft fuse 15A
- G259a Automatic transmission clinching
- G259b Automatic transmission clinching
- G260 Front cabinet wiring - rear cabinet wiring connection
- G261 Sunroof fuses
- G262 Door locking - electric window clinching
- G263 Front electric windows clinching
- G264 Rear electric window enabling and closing crimping connection
- G265 Left-hand front under-mudguard wiring connection
- G265a Front right-hand wiring connector under wheel housing (3-way)
- G265b Front right-hand wiring connector under wheel housing (2-way)
- G266 Boot hatch ground
- G267 Engine block ground
- G268 Heated seats and handbrake switch-door locks wiring connection
- G269 Glovebox compartment light connection
- G270a Dashboard wiring - four-wheel drive wiring (four-way) connection
- G270b Dashboard wiring - four-wheel drive wiring (six-way) connection
- G271 Electric fan operation check connection
- G272 ABS hydraulic group connection
- G273 ABS control unit connection
- G275 ABS hydraulic group ground connection
- G276 Four-wheel drive intermediate wiring connection
- G277 Intermediate Alfa Romeo Control unit - instrument connector
- G278 Brake pad wear sensor connector
- G279 Brake fluid reservoir switch connector
- G280 Radio intermediate wiring connector
- G281 Free connector for luggage compartment light
- G282 Earth on front tunnel
- G283 Earth on left service compartment
- G284A Rear right passenger compartment panneling earth
- G284B Rear left passenger compartment panneling earth
- G285 Provision for anti-theft system connector
- G286 Dash wiring - door wiring four-way connection
- G287 Injection wiring - engine coolant temperature sensor wiring connection
- G288 Injection wiring evaporation solenoid valve wiring connection
- G289 Connection for front right-hand speaker - high tones
- G290 Connection for front right-hand speaker - low tones
- G291 Connection for front left-hand speaker - high tones
- G292 Connection for front left-hand speaker - low tones
- G293 Connection between engine services wiring - engine compartment wiring - left-hand side
- G294 Earth on intake manifold
- G295 Rear console wiring - driver's side seat memory wiring connection
- G296 Memory wiring - driver's side longitudinal seat regulation motor wiring connection
- G297a Memory wiring - driver's side seat control panel wiring connection
- G297b Memory wiring - driver's seat control panel wiring connection
- G297c Memory wiring - driver's seat control panel wiring connection
- G298 Memory wiring - driver's seat lumbar and back regulation wiring connection
- G299a Front left-hand seat control pad relay unit - control pad wiring connection
- G299b Front right-hand seat control pad relay unit - control pad wiring connection
- G300 Front left-hand seat warming pad clinching
- G301 Front right-hand seat warming pad clinching
- G302 Driver's seat earth cable clinching
- G303 Control pad wiring - driver's seat lumbar support and back regulation wiring connection
- G304 Injection wiring intermediate clinching
- G305 Electric seats and rear power window connection
- G306 Right-hand engine wiring/engine wiring connection
- G307 Luggage compartment/rear wiring connection
- G308 Connector for engine sensors
- G309a Controlled damping suspension system A
- G309b Controlled damping suspension system A
- G310 Front right-hand power window fuse
- G311 Front left-hand power window fuse
- G312 Fuse for headlight washers
- G313 Air conditioner supplementary wiring connection
- G314a Engine wiring/air conditioner A wiring connection
- G314b Engine wiring/air conditioner B wiring connection
- G315a Left-hand seat regulation motor connection
- G315b Right-hand seat regulation motor connection
- G316 Engine r.p.m. and timing sensor sheath earth
- G317 Engine - injection wiring rev counter connection
- G318 Earth on gearbox
- G319 Engine oil level wiring - engine services wiring connection
- G320 Rear speaker cable connection

KEY

G: FUSEBOX - CONNECTIONS - GROUNDS (Continued)

G321a	Air conditioner control wiring - microswitch wiring connection (6-way)
G321b	Air conditioner control wiring - microswitch wiring connection (3-way)
G322	Air conditioner control wiring - dashboard wiring connection
G323	Air conditioner control wiring - electric fan wiring for condensers connection
G324	Left-hand seat warming pad spiral cable - heated seats ns door locks wiring connection
G325	Right-hand seat warming pad spiral cable - heated seats ns door locks wiring connection
G326	Dashboard wiring - front foglight/headlight washer wiring connection
G327	Speedometer sensor connection
G328	Dashboard wiring - rooflight wiring connection
G329	Dashboard wiring - injection wiring connection
G330	Injection wiring - electric fan wiring for condensers connection
G331	Ultrasound soldering connection
G332	Alternator connection for recharging signal
G333	DIM-DIP fuse
G334	Fuel level sender connection
G335	Engine services with E.G.R. valve power supply clinching

H: SWITCHES

H1	Handbrake switch
H2	Reversing light switch
H3	Stop light switch
H4	Courtesy light switch on passenger compartment upright
H5	Front left door open indicator switch
H6	Front right door open indicator switch
H7	Rear left door open indicator switch
H8	Rear right door open indicator switch
H9	Front right brake pad switch
H10	Front left brake pad switch
H11	Rear right brake pad switch
H12	Rear left brake pad switch
H13	Choke switch
H14	Injection advance switch
H15	Gearbox oil low level switch (magnetic bulb)
H16	Starting and reverse inhibitor switch
H17	Brake fluid minimum level check switch
H18	Fast-idle switch in gearbox
H19	Low fuel pressure switch
H20	Inertia switch
H21	Clutch pedal fast-idle switch
H22	Ignition microswitch
H23	Engine compartment lamp switch
H24	Luggage compartment lamp switch
H25	Glovebox light switch
H26	Contact/switch on rear door for rear window wiper
H27	Contact/switch on rear door for heated rear window
H28	Carburetor contact/switch
H29	Switch for rear drive engagement warning lamp
H30	Load switch
H31	Switch for idle r.p.m. adjusting screw on carburetor
H32	Microswitch on carburetor for inserting timing variator
H33	Number plate contact/switch
H34	ABS System brake fluid tank switch
H35	Fuel pre-heating filter thermal switch
H36	Diesel post-heating microswitch
H37	Clutch pedal switch
H38	Rear right seat microswitch
H39	Rear left seat microswitch
H40	Rear right door inhibitor switch for rear seats
H41	Rear left door inhibitor switch for rear seats
H42	Accelerator throttle valve maximum opening switch
H43	Door-locking engaged signalling microswitch

H44	Engine hood antitheft device switch
H45	Cruise Control clutch and brake switch
H46	Gearbox switch for controlled damping suspension shock-absorber
H47	Engine throttle microswitch for controlled damping suspension shock-absorber
H48	Lefthand door switch for electric windows - sunroof automatic closing
H49	Auxiliary stop lights switch
H50	Seat end-run switch
H51	Sunroof stop limit switch

I: RELAYS

I1	Engine cooling electric fan relay
I2	Heated rear window relay
I3	Horn relay
I4	Headlight wiper relay
I5	Auxiliary relay for headlight wiper timer
I6	Fast-idle relay
I7	Fuel hose closing relay
I8	Relay excluding retarded rotor arm
I9	Glow plug relay
I10	Choke inhibitor relay
I11	Front power window and seat raising relay
I12	Front power window relay
I13	Rear power window relay
I14	Brake fluid automatic warning light control relay
I15	Low fuel pressure warning light relay
I16	Headlight relay
I17	Fog light relay
I18	Double contact relay
I19	Headlight washer pump relay
I20	Beam change over relay
I21	Full beam exclusion relay
I22	Low beam exclusion relay
I23	Supplementary engine cooling electric fan relay
I24	Direction and hazard lights relay
I25	Rear fog light relay
I26	Roof lamp relay
I27	Seat height adjustment relay
I28	Hazard lights relay
I29	Fuel pump relay
I30	Relay with CEM diode
I31	Front power window/climatisation relay
I32	Advance variation control unit relay
I33	Carburetor microswitch relay
I34	Rear fog light exclusion relay
I35	Key-operated supply relay
I36	Relay for brake wear and fluid level
I37	ABS System control unit relay
I38	ABS System auxiliary relay
I39	Brake fluid level warning light relay
I40	ABS System brake fluid electric pump relay
I41	Two-tone hooter, horn relay
I42	Two-tone hooter relay
I43	Inspection light relay
I44	Fuel pre-heating device relay
I45	Outer mirror defrosting relay
I46	Siren relay
I47	Engine oil cooler electric fan relay
I48	Instrument and AR control ignition key-controlled relay
I49	Low-beam light relay
I50	High-beam light relay
I51	Electronic control unit power supply relay
I52	Boot lid opening relay
I53	Fuel filter cap opening relay
I54	Rear right seat relay

KEY

I: RELAYS (Continued)

I55	Rear left seat relay
I56	Rear seat inhibitor relay
I57	ABS System electronic relay
I58	Sunroof - seat relay
I59	"OFF", "RESUME" Cruise Control switch auxiliary relay
I60	Outer mirror defrosting relay
I61	Petrol vapour motor pump relay
I62	Gear engaged signal relay (automatic transmission) for MOTRONIC control unit
I63	Oil radiator electric fan - automatic transmission relay
I64	Position light relay
I65	Foglight inhibitor relay
I66	Day-light insertion relay
I67	Day-light exclusion relay
I68	Water cooling auxiliary electric fan relay
I69	Stop switch relay
I70	Radio relay
I71	20 relay for shock-absorber
I72	Brake fluid tank relay
I73	Front electric window - door-locking relay
I74	Rear electric window - sunroof relay
I75	Electric window - sunroof closing relay
I76	Four-wheel drive supply relay
I77	Series/parallel relay (for cooling electric fans)
I78	Relay for heater blower 50A
I79	Supplementary relay for fog lamps
I80	Seat longitudinal end-run locking relay
I81	Brake pad wear relay
I82	Headlight flashing relay
I83	Relay for electric aerial
I84	Automatic closure relay
I85	Driver's seat memory relay
I86	Relay for driver's seat memory recall stop
I87	Front left-hand seat warming pad relay
I88	Front right-hand seat warming pad relay
I89	Rear foglight permit and front foglight exclusion relay
I90	DIM-DIP exclusion relay
I91	DIM-DIP cut-in relay
I92	K.S.B. relay

L: SENSORS

L1	Low fuel pressure switch
L2	Low oil pressure switch
L3	Max air pressure switch
L4	Thermal switch for engine cooling electromagnetic coupling
L5	Thermal switch for engine coolant max temperature
L6	Thermal switch for engine cooling electric fan
L7	Engine coolant temperature gauge sender
L8	Oil pressure gauge sender
L9	Fuel level gauge sender
L10	Sender for engine coolant temperature gauge and max temperature warning lamp contact
L11	Retarded rotor arm cut-out pressure switch
L12	Engine oil level sensor
L13	Windscreen washing liquid level sensor
L14	Engine coolant level sensor
L15	Fuel flow sensor
L16	Rev-counter pulse generator
L17	Speedometer pulse generator
L18	Load sender
L19	External temperature sensor
L20	Photoelectric cell
L21	Pierburg solenoid valve regulating the supercharging pressure

L22	Knocking sensor
L23	Potentiometer
L24	Engine coolant temperature sensor for ignition advance adjustment
L25	Thermal switch for engine coolant temperature
L26	Vacuum sensor
L27	Temperature sensor
L28	Front right brake sensor
L29	Front left brake sensor
L30	Rear right brake sensor
L31	Rear left brake sensor
L32	Turbo supercharger air pressure sensor sender
L33	Two-stage thermal contact
L34	Boot lid opened contact
L35	Thermometric switch
L36	Turbo supercharger maximum pressure safety sensor
L37	T.D.C. sensor
L38	Thermal switch for oil radiator electric fan - automatic transmission
L39	Automatic transmission oil maximum temperature sensor
L40	Steering angle sensor
L41	Oil pressure switch for controlled damping suspension shock-absorber
L42	Tooth mesh control sensor
L43	Oil pressure switch for vehicle lift warning light
L44	Engine oil temperature sender
L45	K.S.B. water temperature sender
L46	E.G.R. control solenoid valve
L47	E.G.R. valve potentiometer

M: SOLENOIDS - SOLENOID VALVES

M1	Fuel cut-off solenoid valve
M2	Injection pump solenoid valve
M3	Solenoid with injection pump fuel cut-off microswitch
M4	Fast-idle solenoid
M5	Engine stop solenoid
M6	Fuel pipe closing electromagnet
M7	Door opening/closing electromagnet
M8	Auxiliary air solenoid valve compressor actuation
M9	Pierburg solenoid valve (for idle r.p.m.)
M10	Brake fluid adjusting valve
M11	ABS System main valve
M12	Boot lid opening solenoid
M13	Fuel filter cap opening solenoid
M14	Cruise Control actuator
M15	Emission control solenoid valve
M16	Over-boost solenoid valve
M17	Front right shock-absorber solenoid valve
M18	Front left shock-absorber solenoid valve
M19	Rear right shock-absorber solenoid valve
M20	Rear left shock-absorber solenoid valve
M21	Automatic transmission unit solenoid
M22	Four-wheel drive electromagnetic coupling

N: ELECTRONIC DEVICES - INTERMITTENCES - TIMERS

N1	Electronic ignition module
N1a	Electronic ignition module A
N1b	Electronic ignition module B
N2	Connector for Marelli module
N3	Capacitor for electronic ignition
N4	Connector for Bosch module
N5	Tachymetric switch device
N6	Pre-heating glow plug timer
N7	Trip Computer
N8	ALFA ROMEO Control
N9	Brake pad wear control unit

KEY

N: ELECTRONIC DEVICES - INTERMITTENCES - TIMERS (Continued)

N10	Roof lamp timer
N11	Door-locking control unit
N12	Headlight wiper timer
N13	Road hazard and direction indicators intermittence
N14	Electronic windscreen wiper intermittence
N15	Electronic windscreen wiper intermittence and warning light control
N16	Tachymetric control unit
N17	Trip control unit for fuel flow
N18	Electronic device for headlights flashing
N19	Performance gauge control unit
N20	Advance variation control unit
N21	Power module
N22	ALFA ROMEO Control control unit
N23	Ignition control unit
N24	Pulse converter
N25	Rear fog-light device
N26	Brake pad wear warning light intermittence device
N27	ABS System control unit
N28	ABS System brake fluid electric pump device
N29	Diode holder connection
N29a	A diode connection
N29b	B diode holder connection
N30	Two-tone hooter control unit
N31	Fuel pre-heating device
N32	Head-phone connection control unit
N33	Differentiated rear window defrosting control unit
N34	Control unit for pulse generator
N35	Coding control unit
N36	Interphone system control unit
N37	Petrol vapour intake pump timer
N38	Power window control unit
N39	Cruise Control unit
N40	DIM DIP electronic device
N41	Lights on signalling control unit
N42	Dimmer for door-locking actuated signalling LED
N43	Automatic transmission locking/unlocking control unit
N44	Rear lights control unit
N45	Antitheft control unit
N46	Shock-absorber electronic control unit
N47	Accelerometer
N48	Radiotelephone control unit
N49	Aerial - Heated rear window control unit
N50	Four-wheel drive control unit
N51	Hydraulic group with ABS control unit
N52	CROSS-OVER control unit (radio system)
N53	Antijamming condenser radio boot panel 4.7 μ F
N54	Right radio loudspeaker antijamming condenser 4.7 μ F
N55	Left radio loudspeaker antijamming condenser 4.7 μ F
N56	Supplementary fusebox radio antijamming condenser 22 μ F
N57	Radio relay protection diode
N58	Driver's seat memory control unit
N59	Control unit
N60	Sunroof control unit
N61	Shock absorber control unit condenser
N62	ABS system - longitudinal accelerometer
N63	ABS system - transversal accelerometer
N64	Instrument panel warning light timer
N65	E.G.R. control unit
N66	Brake light radio anti-interference condenser
N67	Door lock remote control signal receiver

O: ANCILLARY EQUIPMENT

O1	Heated rear window
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O2	Horn
O3	Electrically-operated aerial
O4	Car radio
O5	Speaker
O6	Cigar lighter
O7	Rear cigar lighter
O8	Two-tone hooter
O9	Transceiver
O10	Rear headphone
O11	Siren
O12	External loudspeaker-microphone
O13	Internal loudspeaker-microphone
O14	Driver's seat warming pad
O15	Rear right seat warming pad
O16	Rear left seat warming pad
O17	Front right seat warming pad
O18	Right door rear-view mirror defroster
O19	Left door rear-view mirror defroster
O20	External right microphone
O21	External left microphone
O22	Engine electric fan supplementary resistance
O23	Antitheft siren
O24	Radiotelephone
O25	Windscreen defroster
O26	Front left-hand seat warming pad
O27	K.S.B. device
O28	DIM-DIP resistance

P: ELECTRIC MOTORS

P1	Windscreen wiper motor
P2	Engine cooling electric fan motor
P3	Engine cooling electric fan electromagnetic drive
P4	Headlight wiper motor
P5	Front left seat adjustment motor
P6	Front right backrest adjustment motor
P7	Front left backrest adjustment motor
P8	Motor for electric door rear-view mirror - left-side
P9	Motor for electric door rear-view mirror - right-side
P10	Front right door locking motor
P11	Front left door locking motor
P12	Rear right door locking motor
P13	Rear left door locking motor
P14	Front right power window motor
P15	Front left power window motor
P16	Rear right power window motor
P17	Rear left power window motor
P18a	Main fuel electric pump
P18b	Auxiliary fuel electric pump
P19	Windscreen washer pump
P20	Headlight washer pump
P21	Rear window wiper motor
P22	Rear window washer electric pump motor
P23	Supplementary engine cooling electric fan motor
P24	Sunroof motor
P25	Engine oil radiator electric fan
P26	Petrol vapour intake electric pump motor
P27	Windscreen wiper motor with control unit
P28	Front right seat longitudinal adjusting motor
P29	Front left seat longitudinal adjusting motor
P30	Front right seat adjusting motor
P32	Rear right seat motor
P33	Rear left seat motor
P34	Oil radiator electric fan - automatic transmission
P35a	Right-hand headlight adjustment motor
P35b	Left-hand headlight adjustment motor
P36	Vehicle lift pump motor
P37	Right-hand front seat rear tilt regulation motor
P38	Left-hand front seat rear tilt regulation motor
P39	Right-hand front seat front tilt regulation motor
P40	Left-hand front seat front tilt regulation motor

KEY

P: ELECTRIC MOTORS (Continued)

- P41 Front right-hand seat lumbar support regulation
P42 Front left-hand seat lumbar support regulation

Q: HEAT/VENT - AIR CONDITIONING SYSTEM

- Q1 Heater/ventilation electric fan
Q2 Pneumatic push-button control for air conditioning
Q3 Pneumatic push-button control for climatization
Q4 Heater/ventilation electric fan control
Q5 Heater blower fan speed adjustment resistance
Q6 Switch on flap for heater blower fan
Q7 Fluid thermostat
Q8 Electromagnetic coupling pressure switch
Q9 Minimum pressure switch
Q10 Maximum pressure switch
Q11 Compressor electromagnetic coupling
Q12 Thermostat exclusion of compressor electromagnetic coupling
Q13 Supplementary conditioner fan
Q14 Relay for supplementary conditioner fan and electromagnetic compressor coupling
Q15 Heater/ventilation electric fan relay
Q16 Relay for simultaneous control of engine cooling electric fan and supplementary electric fan
Q17 Relay for simultaneous coupling and supplementary electric fan
Q18 Heater
Q19 Conditioner
Q20 Min and max pressure switch (Trinary)
Q21A Automatic control check unit
Q21B Manual control check unit
Q22 Electromagnetic coupling control relay
Q23 Internal temperature sensor for climatization
Q24 External temperature sensor for climatization
Q25 Mixed air temperature sensor for climatization
Q26 Defrosting thermostat
Q27 Air recirculation vent control motor
Q28 Ventilation motor for internal temperature sensor
Q29 Climatization system branch point
Q30 Air mixture and vent controls
Q30A Air distribution motor to vents
Q30B Cold/hot mixing motor
Q31 Climatization unit fan speed adjuster
Q32 Climatization auxiliary relay
Q33 Passenger compartment internal temperature motor with sensor
Q34 Conditioner temperature control potentiometer
Q35 Free fuse for conditioning system
Q36 Conditioning system earth
Q37 Passenger compartment supplementary air conditioning fan
Q38 Passenger compartment supplementary fan control for heating
Q39 Air conditioning system wander fuse - 30A
Q40 Air conditioning system wander fuse - 15A
Q41 Air conditioning system relay and fuse unit
Q42 Air conditioning fan delay device
Q43 Air conditioning system wander fuse - 50A
Q44 Water by-pass electronic actuator
Q45 Electric by-pass cock control microswitches
Q46 External/recirculation air intake electric actuator
Q47 Dynamic air intake actuator control microswitches
Q48 Air-to-floor electric actuator
Q49 Air-to-floor electric actuator control microswitches
Q50 Recirculation and 1st speed of electric fan microswitches
Q51 Control potentiometer with switch
Q52 Fan for right-hand condenser
Q53 Fan for left-hand condenser
Q54 Fan control relay for right-hand condenser

- Q55 Electric fan and compressor electromagnetic coupling simultaneous control relay for left-hand condenser
Q56 Relay for heater/air conditioner
Q57 Electric fan speed selector relay
Q58 Electronic thermostat control unit
Q59 Electronic thermostat temperature sensor

R: SAFETY DEVICES

- R1 Seat belt device
R2 Catalytic converter temperature indicator
R3 Thermocouple for catalytic converter temperature detection
R4 Unfastened seat belt buzzer
R5 Open door buzzer
R6 Mileometer
R7 Seat belt warning lamp
R8 30,000 mile warning lamp
R9 Push-button switch on seat belts
R10 Catalytic converter maximum temperature warning light
R11 Front left door switch for seat belt device
R12a Right-side passive seat belt control unit
R12b Left-side passive seat belt control unit
R13a Right-side passive seat belt motor
R13b Left-side passive seat belt motor
R14a Right-side seat belt winder locking mechanism
R14b Left-side seat belt winder locking mechanism
R15 Passive seat belt-unfastened buzzer
R16a Right-side passive seat belt warning light
R16b Left-side passive seat belt warning light
R17a Right-side passive seat belt-unfastened switch
R17b Left-side passive seat belt-unfastened switch
R18a Right-side passive seat belt switch set to position "A"
R18b Left-side passive seat belt switch set to position "A"
R19a Right-side passive seat belt switch set to position "B"
R19b Left-side passive seat belt switch set to position "B"
R20 AIR-BAG front - right sensor
R21 AIR-BAG front - left sensor
R22 AIR-BAG control unit
R23 Steering wheel inflation module for AIR-BAG
R24 Key-inserted and unfastened safety belt signalling buzzer
R25 Safety belt inserted hook sensor

S: ELECTRONIC FUEL INJECTION

- S1 Injection control unit
S2 Double relay
S3 Electroinjectors
S4 Cold start electroinjector
S5 Air flow meter
S6 Accelerator throttle body switch
S7 Engine coolant temperature sensor
S8 Thermo-time switch
S9 Auxiliary air valve
S10 Lambda probe
S11 Motronic control unit
S12 Motronic relay
S12a Petrol pump Motronic relay
S12b Motronic relay with diode
S12c Timing variator Motronic relay
S12d Auxiliary Motronic relay
S13 Timing sensor
S14 Rev sensor
S15 Timing variator
S16 Altitude air regulator
S17 CEM control unit
S17a CEM control unit white connector
S17b CEM control unit black connector
S18 Throttle angle sensor
S19 Hall sensor

KEY

S: ELECTRONIC FUEL INJECTION (Continued)

S20	Deton sensor
S21	Throttle actuator
S22	Electroinjector terminal
S23	Electroinjector resistance
S24	Electroinjector terminal board
S25	Automatic transmission/manual transmission switch connector
S26	Injector system
S27	Lambda probe resistance
S28	Injection control relay
S29	Idle adjusting actuator
S30	Motronic control unit switch connector
S31	Rev and timing sensor
S32	Lambda probe coding connector
S33	Full load enrichment device
S34	Available
S35	Heated Lambda probe
S36	Free fuse for Auxiliary Motronic relay
S37	4x2 - 4x4 switching connector
S38	Sensor on throttle body with potentiometer
S39	Cylinder No. 1 recognition sensor
S40	Ignition/injection control unit
S41	Main relay
S42	Secondary relay
S43	Absolute pressure sensor
S44	Throttle angle potentiometer
S45	Lambda probe wander fuse
S46	Motronic power supply wander fuse
S47	Fuel pump wander fuse
S48	"CO" regulation potentiometer
S49	MP3.1 control unit switch connector for 1.5 IE and 1.7 IE engines

T: DIAGNOSIS

T1	Alfa Tester connector
T2	"Flashing code" diagnosis connector
T3	AIR-BAG diagnosis connector
T4	Diagnosis indicator light push-button
T5	Controlled damping suspension electric system diagnosis coupling

INTRODUCTION

IDENTIFICATION OF COMPONENTS

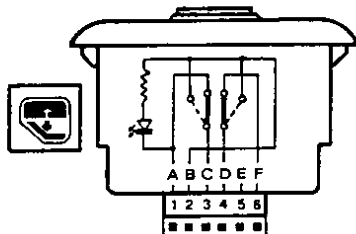
The aim of this manual is to facilitate the search for the required components and their relative connections in order to be able to identify any faults.

For clarity each electrical subsystem, as for example the starting system, heated rear window, main beam lights etc., are described separately following 3 distinct paragraphs:

- **Wiring diagram** arranged in order to facilitate component identification and the relative connections.

The components (shown following a lay-out that mirrors the real-life situation) are aligned on the outside edge of the diagram and sometimes a symbol place next to the component identifies its function.

Example:

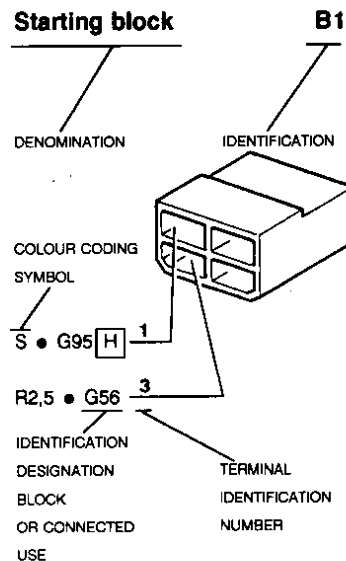


B21

Front right power window control switch.

- **Wiring**, illustrates the arrangement of the wires and connectors on the car and also the position of the various electrical components shown with the use of lenses.
- **Connectors**, shown in charts that give information as to the nature and destination of wires connected to them according

to the following example:



Each component is identified by a reference designation composed of a letter and a number (e.g.: B1). The letter identifies component type according to the following symbols:

- A Starting - Recharging
- B Manual electric controls
- C Instruments
- D Warning lamps
- E External lights
- F Interior lights
- G Fuseboxes - connectors - earths
- H Switches
- I Relays
- L Senders
- M Solenoids - solenoid valves
- N Electronic devices - intermittences - timers
- O Ancillary equipment
- P Electric motors
- Q Heater/ventilation - air conditioning system
- R Safety devices
- S Electronic fuel injection
- T Diagnosis

The key for all the components is given under the specific group.

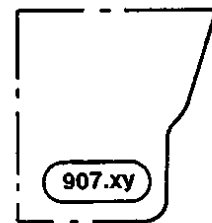
Variations

Each wiring diagram may be applicable to more than one model in the 33 range.

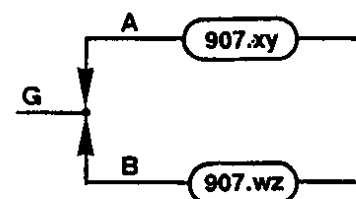
In cases where the different versions require variations in the electrical system, the wiring diagram shows each variation and where necessary duplicates the part of the circuit affected.

Any variations present between models is given in accordance with the following symbols:

- The dashed line and circled point on the diagrams, the areas containing the specific variations for the vehicle indicated with "907.xy".



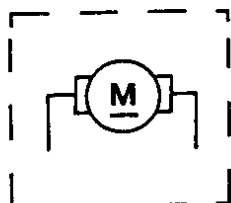
- The connection identifies two wiring variations, given as an alternative and connected in the same fashion. The variations refer to the models indicated with "907.xy" and "907.wz" respectively.



ELECTRICAL SYSTEM

Components fitted upon request

In the wiring diagrams a dashed line encloses the components that can be fitted upon request.



IDENTIFICATION OF MODELS

The models in the 33 range dealt with in this group can be identified by way of the following tables:

MODEL 33

907.A1	33 1.7 IE
907.A1A Δ	33 1.7 IE
907.A1D	33 1.7 IE 4x4
907.A1E Δ	33 1.7 IE 4x4
907.A1B	33 Boxer 16V
907.A1C Δ	33 Boxer 16V

SPORT WAGON MODELS

907.B1	SPORT WAGON 1.7 IE
907.B1A Δ	SPORT WAGON 1.7 IE
907.B1D	SPORT WAGON 1.7 IE 4x4
907.B1E Δ	SPORT WAGON 1.7 IE 4x4

Δ Vehicles with catalytic converter.

The wiring diagrams for the **Sport Wagon** are identical to those of the 33 models of equal motorization.

For this reason, apart from specific indications they will be identified using a single system of symbols following the 33 model which is:

907.A1 for the 33 1.7 IE - SPORT WAGON 1.7 IE versions;

907.A1D for the 33 1.7 IE 4x4 - SPORT WAGON 1.7 IE 4x4 versions.

CABLE IDENTIFICATION

A code composed of one or more letters and a number (e.g.: BN!) is marked on the end of each cable.

The letters identify the colour of the cable and the numbers indicate its thickness (**N.B. The cable section not indicated is 0.5 mm²**).

For convenience the names of the colours have been abbreviated.

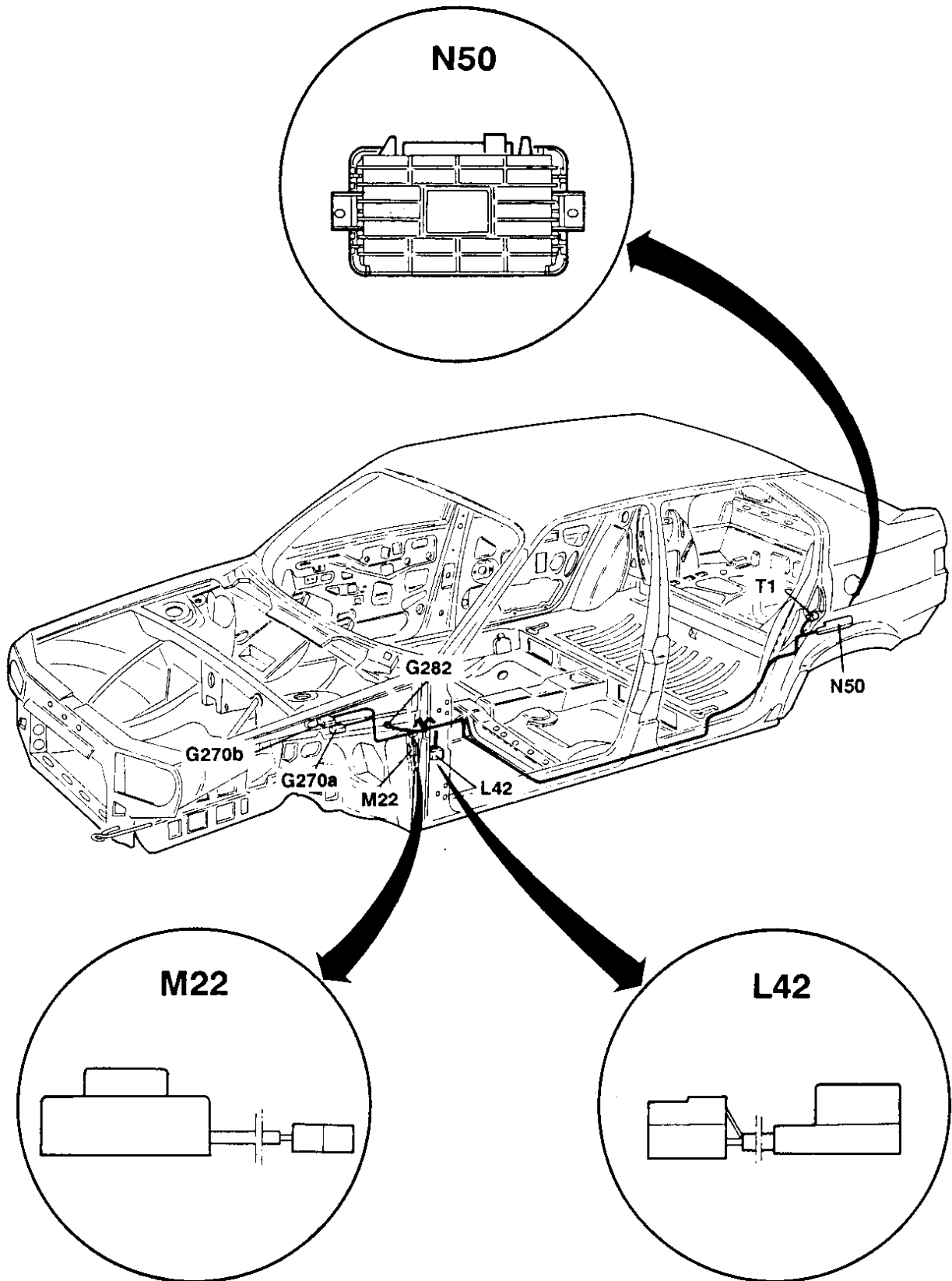
The list of these abbreviations is given below:

A	Light-blue
AB	Light-blue white
AG	Light-blue yellow
AN	Light-blue black
AR	Light-blue red
B	White
BN	White black
BR	White red
BL	Blue

BLN	Blue black
BLR	Blue red
Br	Dark brown
C	Amber
CB	Amber white
CN	Amber black
G	Yellow
GB	Yellow white
GN	Yellow black
GR	Yellow red
GV	Yellow green
H	Grey
HG	Grey yellow
HN	Grey black
HR	Grey red
HV	Grey green
M	Brown
MB	Brown white
MG	Brown yellow
N	Black
No	Hazel brown
R	Red
RN	Red black
S	Pink
SB	Pink white
SN	Pink black
V	Green
VB	Green white
VN	Green black
Z	Purple
ZB	Purple white
ZN	Purple black

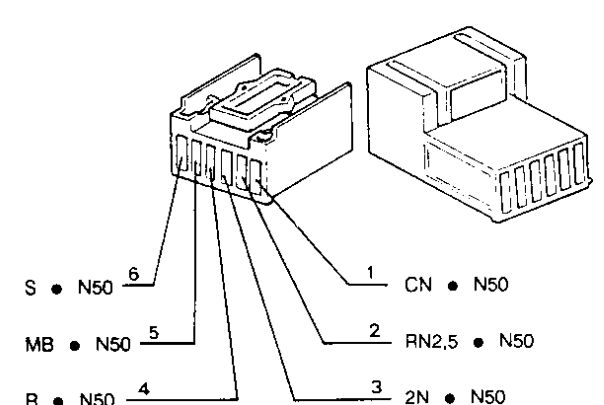
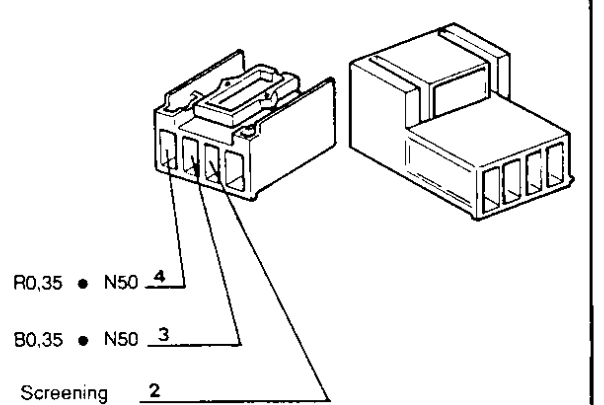
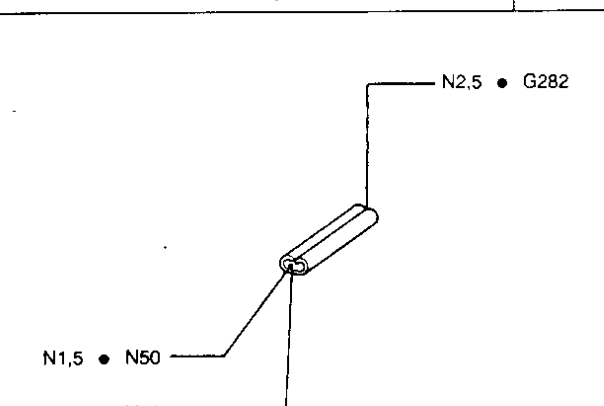
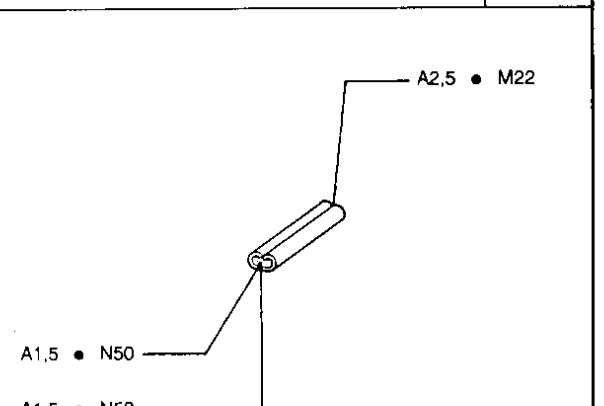
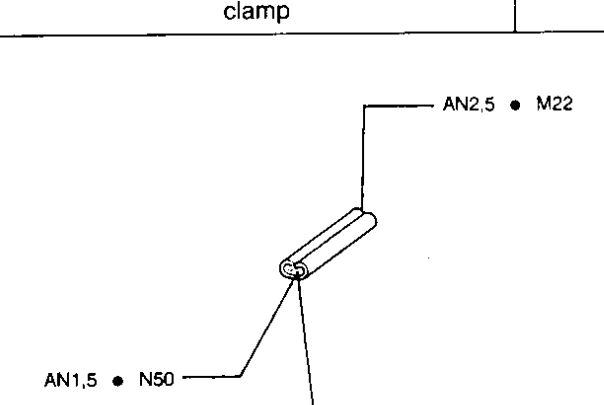
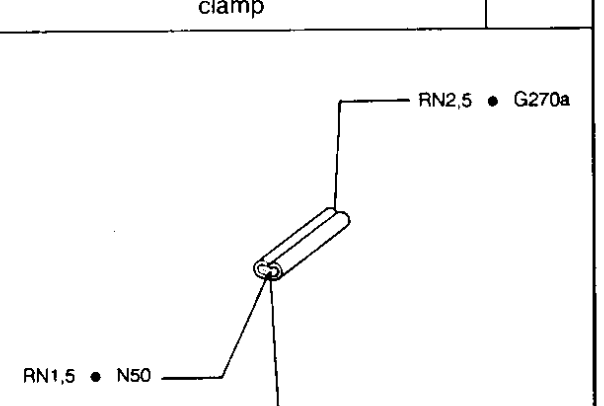
ELECTRICAL SYSTEM

Wiring (Diagram A)

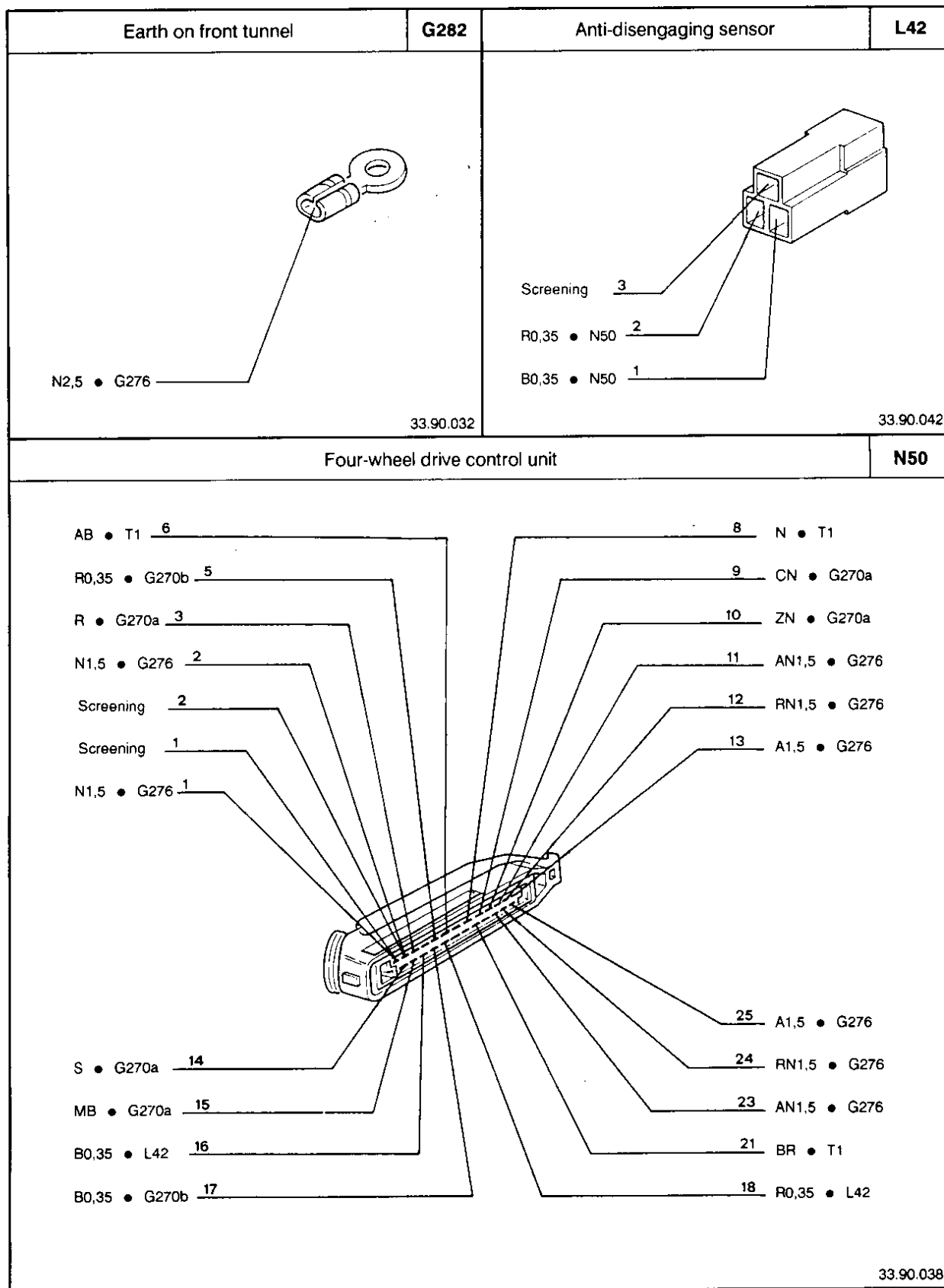


ELECTRICAL SYSTEM

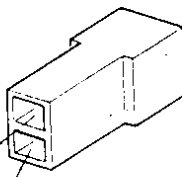
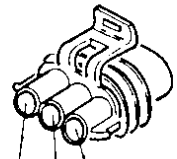
Connectors (Diagram A)

<p>Dashboard wiring - four-wheel drive wiring connection (6 way)</p> <p>G270a</p>  <p>S • N50 6 MB • N50 5 R • N50 4 CN • N50 1 RN2,5 • N50 2 2N • N50 3</p> <p>33.90.036</p>	<p>Dashboard wiring - four-wheel drive wiring connection (4 way)</p> <p>G270b</p>  <p>R0,35 • N50 4 B0,35 • N50 3 Screening 2</p> <p>33.90.018</p>
<p>Four-wheel drive intermediate wiring clamp</p> <p>G276</p>  <p>N2,5 • G282 N1,5 • N50 N1,5 • N50</p> <p>33.90.044</p>	<p>Four-wheel drive intermediate wiring clamp</p> <p>G276</p>  <p>A2,5 • M22 A1,5 • N50 A1,5 • N50</p> <p>33.90.044</p>
<p>Four-wheel drive intermediate wiring clamp</p> <p>G276</p>  <p>AN2,5 • M22 AN1,5 • N50 AN1,5 • N50</p> <p>33.90.044</p>	<p>Four-wheel drive intermediate wiring clamp</p> <p>G276</p>  <p>RN2,5 • G270a RN1,5 • N50 RN1,5 • N50</p> <p>33.90.044</p>

ELECTRICAL SYSTEM

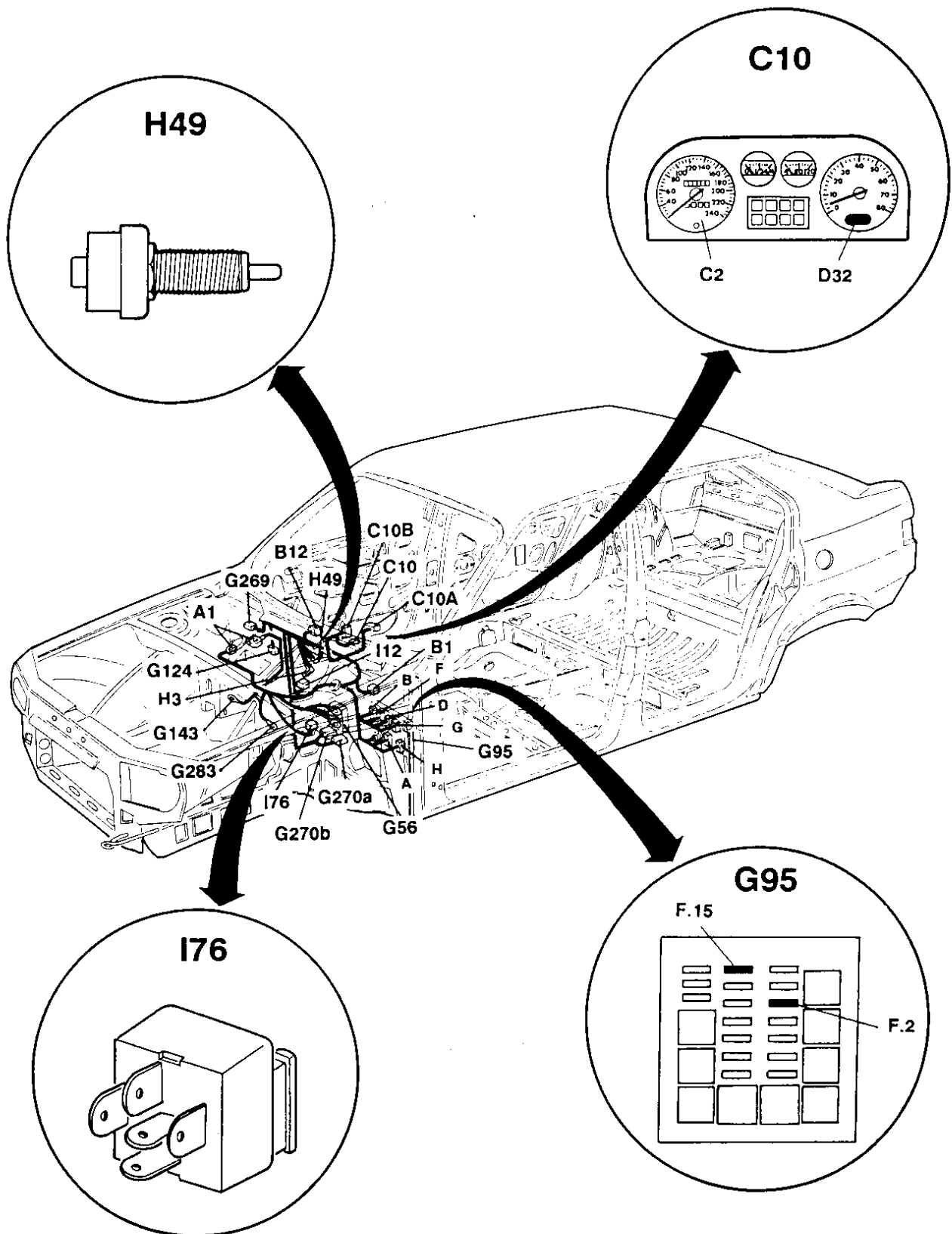


ELECTRICAL SYSTEM

Electromagnetic coupling four-wheel drive	M22	Connector for Alfa Tester	T1
 <p>AN2,5 • G276 2</p> <p>A2,5 • G276 1</p>		 <p>BR • N50 C</p> <p>N • N50 B</p> <p>AB • N50 A</p>	
33.90.043		33.90.029 - 33.90.040	


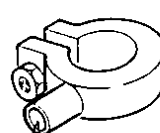
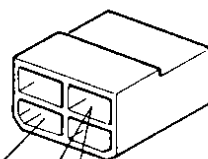
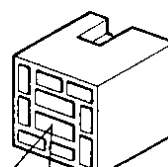
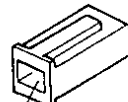
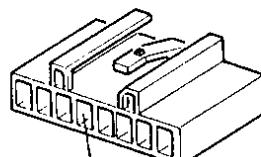


Wiring (Diagram B)

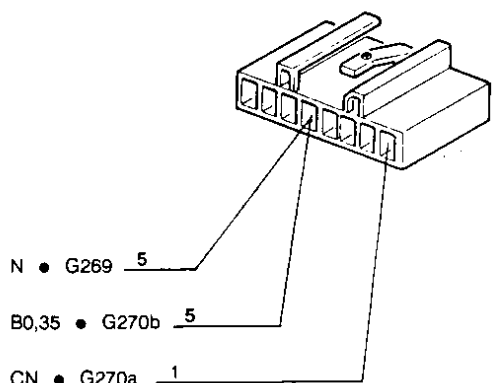
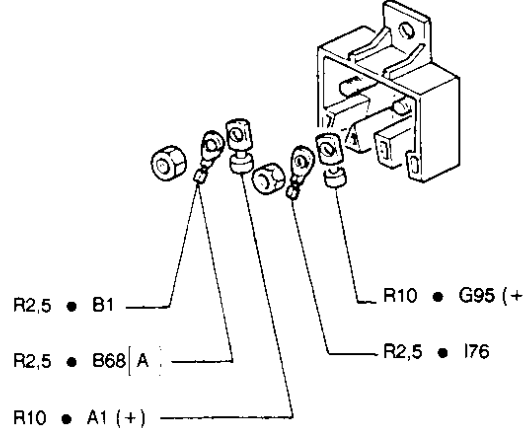
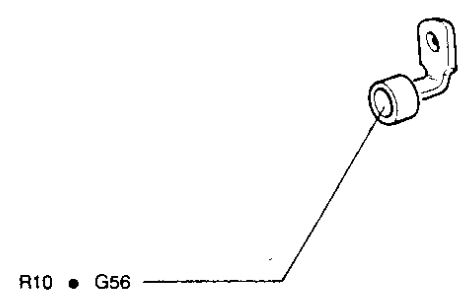
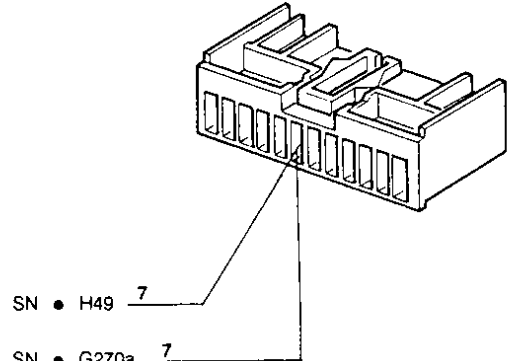
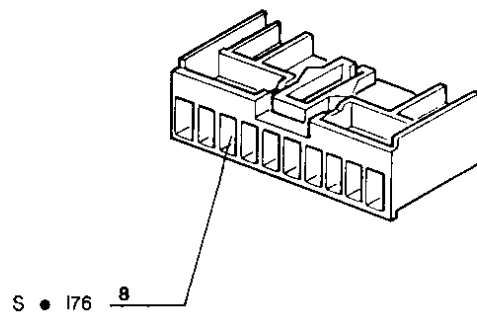
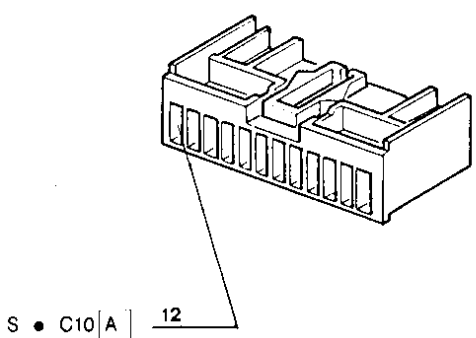


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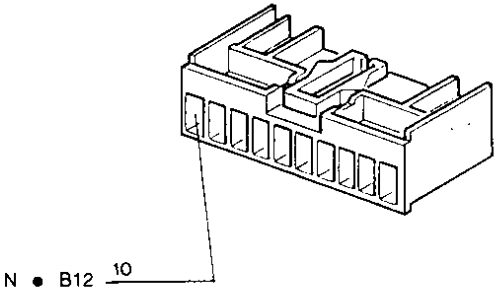
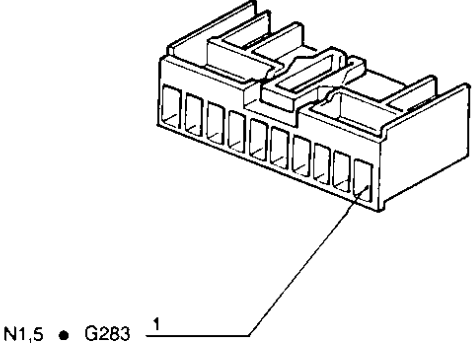
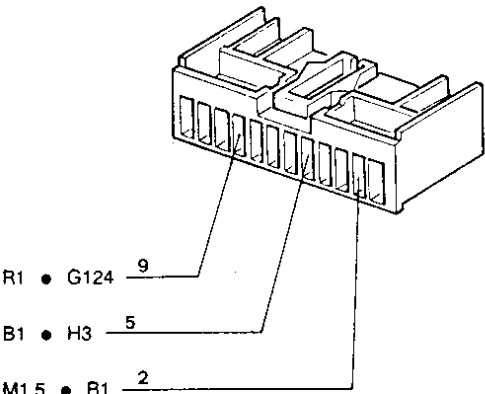
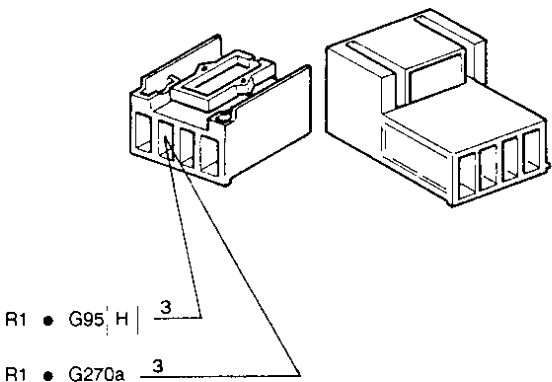
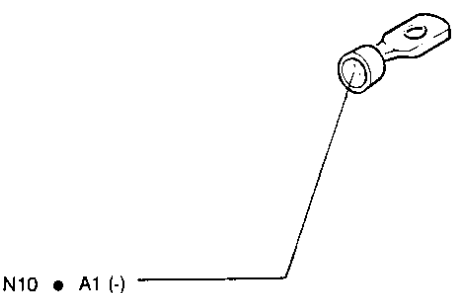
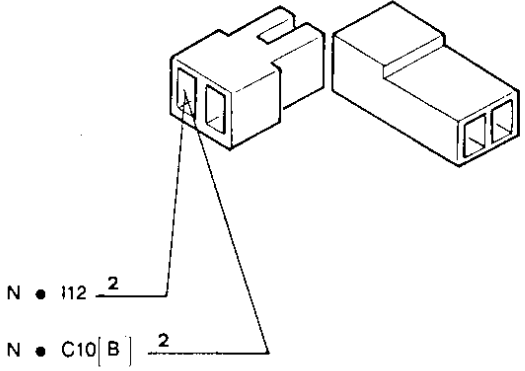
Connectors (Diagram B)

Battery (+)	A1	Battery (-)	A1
 <p>R10 • G56</p>	33.90.001	 <p>N10 • G143</p> <p>N20 • To engine</p>	33.90.002
Ignition switch	B1	Hazard control lights control switch	B12
 <p>R2,5 • G56 3</p> <p>VN2,5 • G99a 2</p> <p>M1,5 • G95 [H] 2</p>	33.90.028	 <p>N • I12 9</p> <p>N • G95 [F] 9</p>	33.90.008
Instrument panel	C10	Instrument panel	C10 A
 <p>R0,35 • G270b</p>	33.90.078	 <p>S • G95 [D] 5</p>	33.90.024

ELECTRICAL SYSTEM

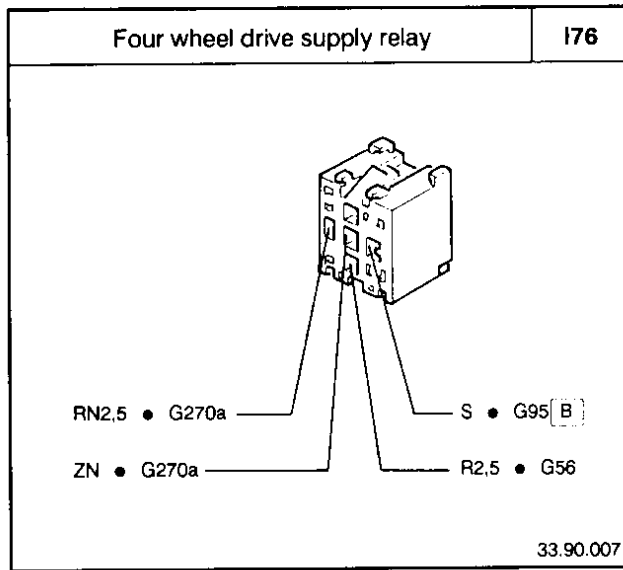
Instrument panel	C10 B	Branch terminal board	G56
 <p>N • G269 5</p> <p>B0,35 • G270b 5</p> <p>CN • G270a 1</p> <p>33.90.024</p>	 <p>R2,5 • B1</p> <p>R2,5 • B68 A</p> <p>R10 • G95 (+)</p> <p>R2,5 • I76</p> <p>33.90.010</p>		
Central fusebox (+)	G95	Central fusebox	G95 A
 <p>R10 • G56</p> <p>33.90.006</p>	 <p>SN • H49 7</p> <p>SN • G270a 7</p> <p>33.90.004</p>		
Central fusebox	G95 B	Central fusebox	G95 D
 <p>S • I76 8</p> <p>33.90.005</p>	 <p>S • C10 A 12</p> <p>33.90.004</p>		

ELECTRICAL SYSTEM

Central fusebox	G95 F	Central fusebox	G95 G
 <p>N • B12 10</p>	33.90.005	 <p>N1,5 • G283 1</p>	33.90.005
Central fusebox	G95 H	ABS system connector	G124
 <p>R1 • G124 9 B1 • H3 5 M1,5 • B1 2</p>	33.90.004	 <p>R1 • G95 H 3 R1 • G270a 3</p>	33.90.018
Central service compartment earth	G143	Glove compartment lamp connection	G269
 <p>N10 • A1 (-)</p>	33.90.001	 <p>N • I12 2 N • C10 B 2</p>	33.90.013

ELECTRICAL SYSTEM

<p>Dashboard wiring - four-wheel drive wiring connection (6 way)</p> <p>G270a</p> <p>SN • G95 [A] 6</p> <p>MB • H49 5</p> <p>R1 • H3 4</p> <p>R1 • G124 4</p> <p>CN • C10 [B] 1</p> <p>RN2,5 • I76 2</p> <p>ZN • I76 3</p> <p>33.90.036</p>	<p>Dashboard wiring - four-wheel drive wiring connection (4 way)</p> <p>G270b</p> <p>Screening 2</p> <p>R0,35 • C10 4</p> <p>B0,35 • C10 [B] 3</p> <p>33.90.018</p>
<p>Earth on left service compartment</p> <p>G283</p> <p>N1,5 • G95 [G]</p> <p>N1 • O4</p> <p>N1,5 • Q18</p> <p>N1,5 • G23</p> <p>33.90.001</p>	<p>Stop light switch</p> <p>H3</p> <p>R1 • G270a</p> <p>B1 • G95 [H]</p> <p>33.90.037</p>
<p>Supplementary stop light switch</p> <p>H49</p> <p>MB • G270a</p> <p>SN • G95 [A]</p> <p>33.90.037</p>	<p>Front power window relay</p> <p>I12</p> <p>N • G269 86</p> <p>N • B12 85</p> <p>33.90.007</p>



For what is P2 better then P4?

- + less jerking on low rpm
- + no jerking at all in corners yes especially in tight corners
- + you have lower consumption, especially “grandma” drivers
- + you have higher TOP SPEED
- + it's easier to drive it in city at cruising speed
- + especially on long distances you somehow have feeling that it glides in comparison to driving with 4x4 engaged
- + yes now you can pull up hand brake and it will block rear wheels, like normal FWD car do it's handy in some situations
- + you'll have a bit smaller turning radius, helps when parking
- + definitively your clutch has less stress
- + better acceleration above some 120km/h

For what is P2 worse then P4?

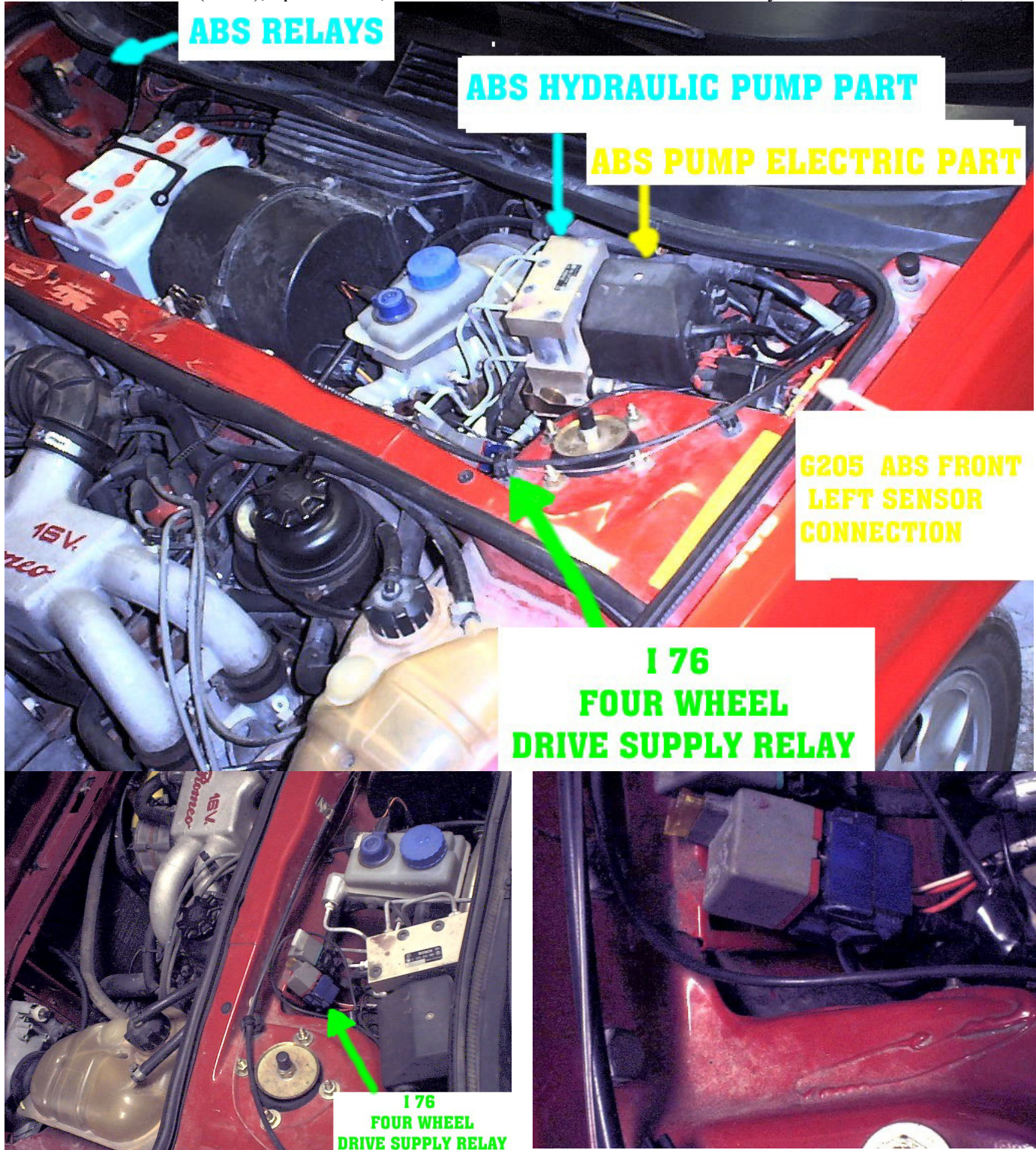
- first few days until you learn to drive it like FWD car, you won't be able to start without wheel spin
- you have slower accel. up to 120km/h because of wheel spin
- if you drive it hard you'll have wheel spin until you pass around 100Km/h, so you'll have to compensate with steering wheel just to stay on track which means no more one hand on wheel driving
- IT WILL HAVE EVEN LONGER BRAKING DISTANCE, because P4 is transferring some of braking force to back wheels with drive shaft until braking force exceed 0.2 G this is especially obvious if you have ABS
- you'll have trouble while climbing on sidewalk (normal way of parking car in my country) again you'll have wheel spin
- yours front tires will wear more then back tires
- you'll find out that car is no more neutral in high speeding corners (you'll have under steer), and you'll have feeling that yours car sways, you'll maybe want to put on front shocks sway bar because of it car somehow easier passes corner but you don't have that P4 feeling that it stays hard on ground with all four wheels (I missed it so much that I almost bought sway bar)
- also until you learn to drive it or ie computer learns first few day you won't see any difference in fuel consumption but after that passes, you'll be happy, if you drive like maniac all day long don't expect big fuel saving. With P4 and yellow fuel lamp turn on I could do 50Km normal city drive, now with P2 if I'm extra careful even 90Km, while on normal drive I have some 65-70Km, normal city consumption has on my car has fallen from 13lit/100km to some 11.5lit/100km on free way it isn't that large before on freeway I had 7.5lit/100km (in 5th on some 3-4000 rpm, around 120 km/h) now it's 6,5 lit/100km I don't think that it can go any lower than that without lowering to 2000-2200 rpm in 5th but many people know that 1900-2200 rpm is critical for Alfa boxer, because on that rpm engine wears much more so I don't like driving it lower then 2500 on long runs.

In case you didn't know DON'T EVER pull handbrake with engaged 4x4 you risk of swaying drive shaft, because we don't have central diff. we have el. clutch which acts like one, but only when you brake with foot brake.

Only reason for pulling it in drive with 4x4 is when you can't stop on time, and you risk damaging all of your car, it won't lock rear wheels but you'll have shorter braking distance and because it don't lock your rear wheels you won't spin your car, like on FWD you would.

How to TEST it without placing switch, to see if I like my P4 turned into P2?

How to turn P4 to P2 (FWD), open bonnet, and look on drivers side of car for two relays with fuses on them,



one that is closer to shock absorber should be el. clutch relay (with blue stand) come to relay red, red-black, purple-black, pink) so you can't miss it. Take fuse out or even whole relay, in any case with that el. clutch won't get electricity, also 4x4 warning lamp will ignite, which will tell you that computer found error and just disconnected further monitoring of all 4x4 system in car, which means that with it you disconnected all electric 4x4 systems in car, and you don't have to be afraid of damaging any, yours drive shaft will continue to turn but it will not transfer any Nm to rear wheels. Don't be afraid that 4x4 is ignited because it's good thing, because it means that all 4x4 electronic is shut down. Drive car and enjoy in P2.

After that to drive P4, turn off ignition, place back fuse (relay) and ignite car, and drive as again P4.

Do I need switches?

Well you don't if you don't look forward to those few gains mentioned from start or you tested it and didn't like it, or you like it but you think that opening bonnet every time you want to change from FWD to 4x4 or from 4x4 to FWD isn't hard.

I'm making this document to all those "lazy" people that like me think it's too much bother opening bonnet and getting out of seat, taking out fuse in let say brand new suit and dirtying yours hands and getting back to car.

What is purpose those of switches?

4x4 switch

+ you don't have to stop car, and open bonnet, and take fuse out or put it in, which can be interesting if it starts to rain and you want to transfer P2 to P4

4x4 reset switch

+ you don't need to turn off ignition and turn it back on, just to turn ON 4x4 computer and electronic, because once 4x4 yellow light ignite (error detected) 4x4 computer will disengage all 4x4 electronic and won't try to engage until you turn off/on car.

How do I operate those switches once I install them?

Best way to disengage 4x4:

1. is to stop car,
2. turn off car ignition
3. switch 4x4 to disengage
4. turn on car ignition

If you are in a hurry you can skip points 2. and 4.

Best way to engage 4x4:

1. is to stop car
2. turn off car ignition (if you have 4x4 reset switch you can leave car running)
3. switch 4x4 to engage
4. turn on car ignition (or just reset 4x4 system by 4x4 reset switch)

It is important that you stop car before engaging/disengaging 4x4 system, but if it is necessary you can engage/disengage 4x4 system at your own risk while car is moving at nearly constant velocity/speed but it is in neutral (none of gears) gearshift position.

NEVER:

- engage 4x4 when braking or accelerating fast
- disengage 4x4 when accelerating

Making switch

There are two switches, 4x4 electronic clutch power switch and 4x4 computer reset switch (as option you can make third switch which will turn on/off 4x4 orange warning light on instrument panel by cutting and inserting additional switch to amber-black wire which is first wire on G270a connector). There are two ways of doing 4x4 electronic switch one is to cut ZN (purple black) or S (pink) wire on I76 relay but since you need to open central console to make 4x4 computer reset switch I'll describe second way which include cutting (purple black) ZN wire which is #3 wire on G270a connector. Electronic scheme you can see page or two down, you'll need **2 switches** (20A or more preferred) one is for 4x4 switch and it is normal switch (if you can find original Alfa Romeo switch like for fog lights/all 4 direction lights/rear window defogger) other switch 4x4 reset switch should be momentary switch (like reset switch on computer) but normal will work also only you'll have step more to do, 6-7 meters/yards of 2,5mm² **car wire**, flat and cross **screwdrivers**, **scalper** or similar sharp object with which you'll cut wire and strip it (take off plastic/rubber electric insulation), **electric insulator tape** (or any electric insulator spray).

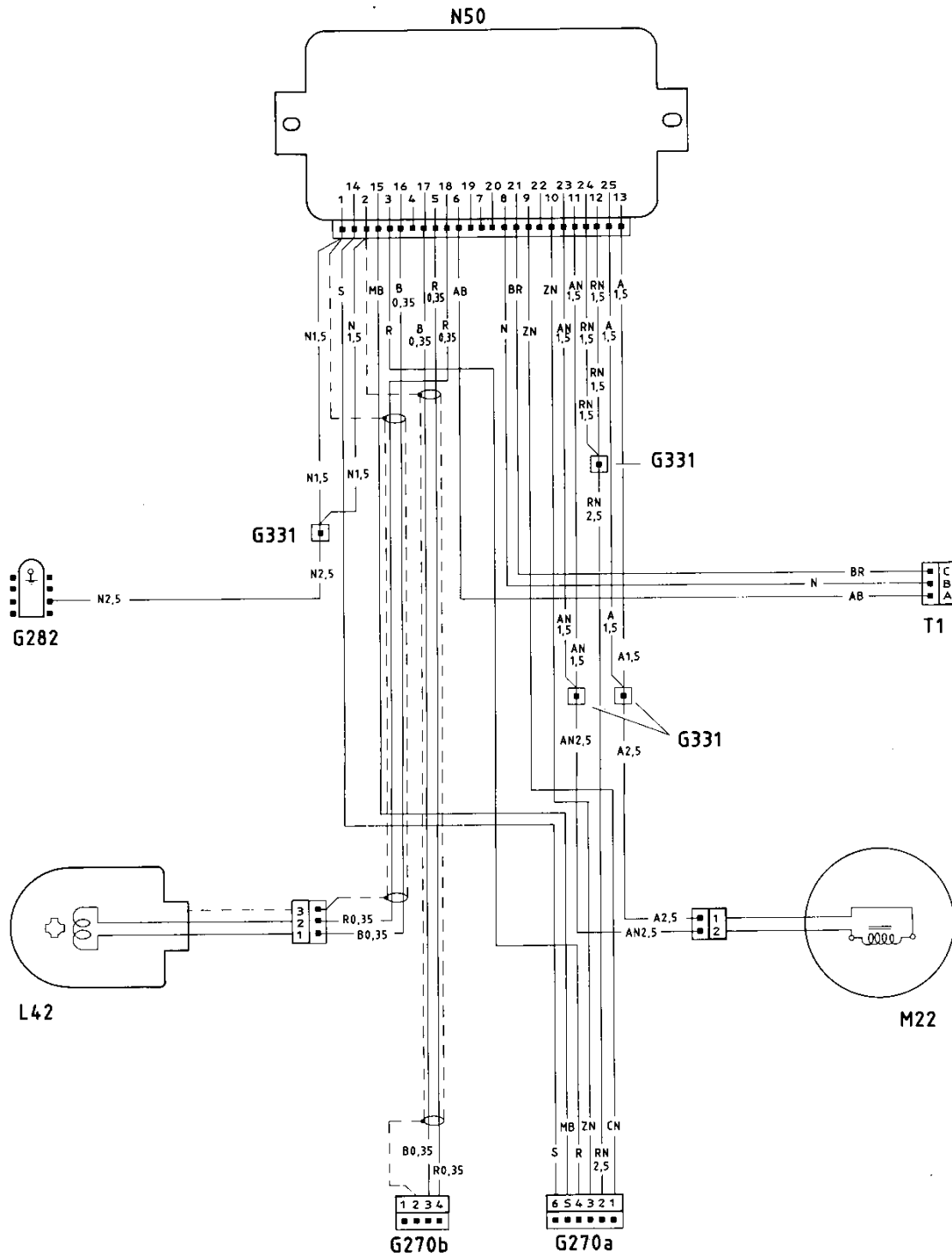
First you have to decide where in cabin would you like to have those switches, best place for them would be on lowest part of central console, between hand brake and ash tray since it's closest of connector and less wire we have, less resistance (ohms) we insert to 4x4 system, second best place for it would be on drivers shelf between steering wheel and central console, last place should be between steering wheel and driver door (this is not desirable location as you need long wires to reach that location but to me it is most ergonomic and esthetic place), so you need to sit little in drivers seat and move hands around and see which location suits you best I recommend first as it's closest to connector.

0. take screwdriver and unscrew drivers (4 upper, 2 lower screws) and co drivers shelves (2-3 upper, 2 lower screws)/ **if you can reach G270a connector behind ash tray and shelf above it by removing those two go to step 4. but I couldn't**
1. take flat screwdriver and take out air ventilation mask and all three ventilation tunnels behind it on central console, take it out
2. take flat screwdriver and open plastic cap to access cross screw on rear part of central plastic which protects handbrake it is just after rear ash tray at rear seats, take it out
3. take off leather/plastic thing around gearshift knob, unscrew two screws that are behind ventilation system at upper part of central console, also unscrew two screws holding it in middle, and at last unscrew last one near handbrake (maybe you'll need to loosen an bit plastic L pieces around central console, so you may need Super ATTAK or any other glue when putting it back on)
4. find G270a and G270b connectors and locate wire #6 SN (pink-black) or S (pink) depending which side of G270a connector you're looking at, strip wire and cut it after that connect both new ends of SN wire to 4x4 reset switch with 2.5mm² car wires, insulate with tape all connections
5. locate wire #3 ZN (purple-black) of G270a connector, strip wire and cut it after that connect both new ends of ZN wire to 4x4 switch with 2.5mm² car wires, insulate with tape all connections
6. make holes and install switches on central console or wherever you decided to put them
7. start car and test both switches, when you press 4x4 switch it should disengage el. Coupling which will result click noise followed by lighting up 4x4 warning light depress switch and you'll see that nothing happens, yellow light is still on because until you reset 4x4 computer it won't try to reengage coupling, after you press 4x4 reset switch, yellow lights will turn off you'll hear click noise which is el. Coupling engaging and if all is OK yellow light will stay off, now press foot brake pedal to see if system is OK if each time you press brake pedal hear clicking sound from el. Coupling then your system has too much wire and too high resistance is added to 4x4 system (**unless your car did that before you installed switch in which case you do not need to worry, my didn't**) and computer each time you press brake pedal calculates (what computer uses to calculate 0.2G I still don't know, I can only guess) that we have exceeded 0.2 G force limit in braking and it disengages drive shaft it isn't that bad if rear brake pressure valve is working OK but it would be better that we don't have this side effect. Take car for spin to see if it acts as before with 4x4 engaged.
8. If all is OK and yellow light don't come after some time of driving and braking, screw back all parts of console and shelves.
9. CONGRATULATIONS ON SUCCESSFULLY INSTALLING 4X4 SWITCH

On following page 30 (298 page of wiring diagram) you can see electric wiring scheme of both switches installed on one side of G270a connector of 4x4 system, but you can also install it on other side of that connector which leads to 4x4 computer at end of car N50 page 31 (seen on page 297 of wiring diagram).

[illegible]

PERMANENT FOUR-WHEEL DRIVE (Diagram A)



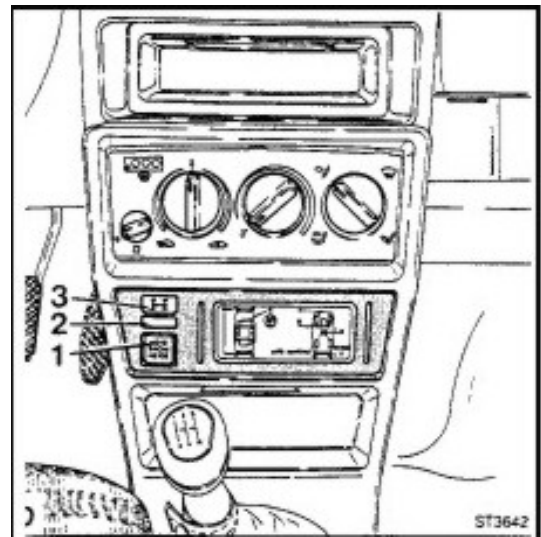
ORIGINAL 4x4 SWITCH IS PLACED NEAR FRONT ASH TRAY.

FOUR-WHEEL DRIVE 33 1.7 IE 4x4



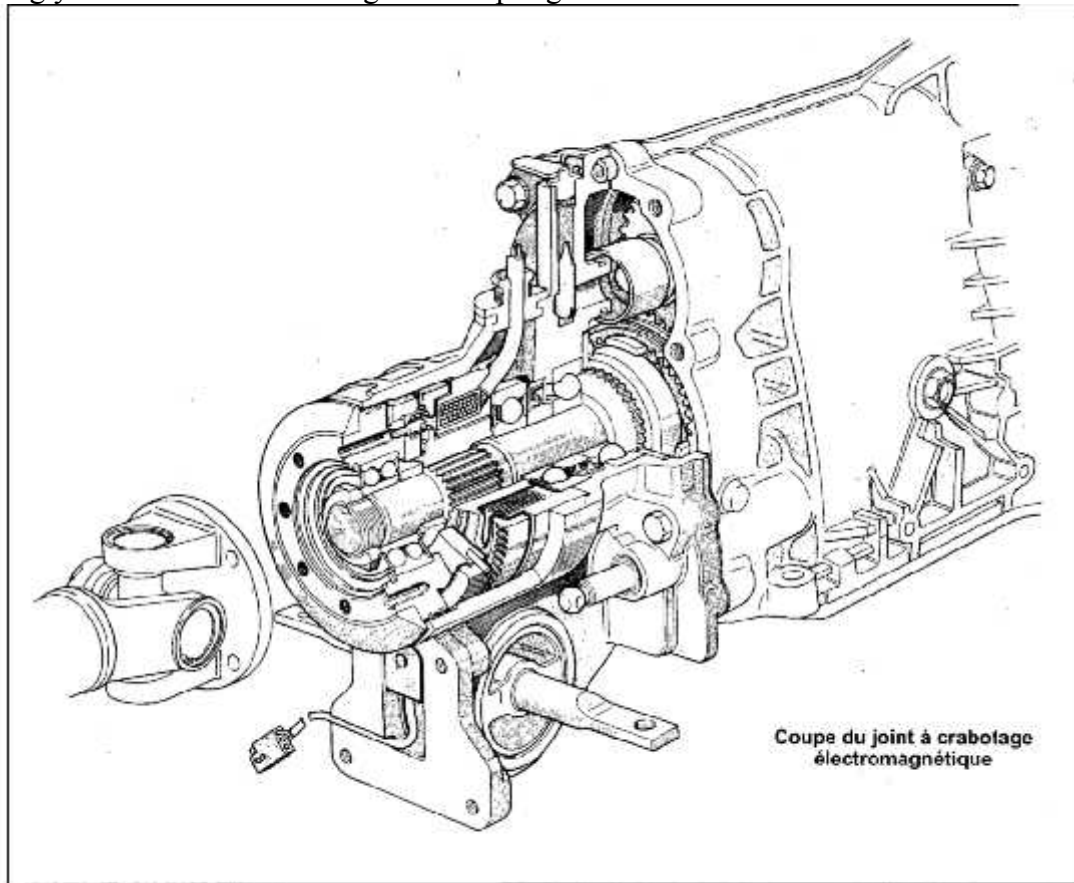


Switch inside my Permanent 4



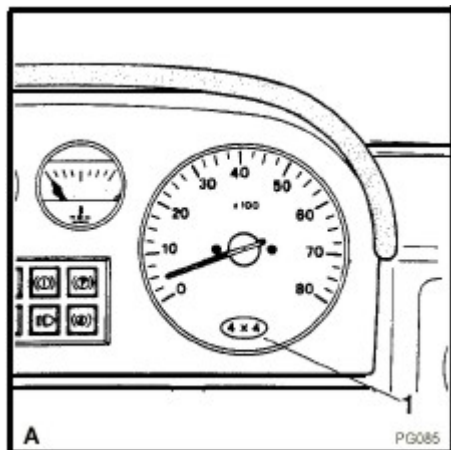
Original position of 4x4 switch on 4x4 Alfa, best position for installing both switches.

If you are asking yourself what electromagnetic coupling looks like



so now you know what expensive part you can damage if you play with 4x4 system and install/use 4x4 switch also you can see on it exactly electromagnetic coil and tooth mesh sensor if you look at it carefully.

WHAT YOU MUST KNOW WHEN DRIVING PERMANENT 4



1 - Permanent 4WD failure warning light. The system comprises an electromagnetic coupling controlled by an electronic control unit for engaging the drive. The system has a self-diagnosis unit and a special warning light (1) to alert the driver in the event of any system failures. Drive transmission also takes place through a viscous joint in an intermediate position from the propeller shaft.

Warning: The electromagnetic coupling is engaged by turning the ignition key to position 2 (key-controlled services ON). If the vehicle is to be towed, turn the ignition key to position 1 (key-controlled services OFF) **without removing the key so as to** disengage the electromagnetic coupling.

Warning

Avoid utilizing the vehicle in a manner different to that for which it was designed: it is therefore recommended not to use it as an “all terrain” vehicle. Furthermore follow the precautions listed hereunder:

- utilize tires of the same type and dimensions on all four wheels and ensure that inflation pressures are always those pre-scribed;
- always check brake efficiency after having crossed muddy, sandy or wet terrains;
- when the fitting of snow-chains is required, remember that these must be mounted onto the **front** wheels;
- **never tow the vehicle by raising the rear wheels only (front wheels in contact with the ground) to avoid serious damage to the mechanics. In the case of absolute necessity only, tow the vehicle in this way only after insertion of a rotating platform under the front wheels and with the ignition key in position 1 key controlled services OFF and electromagnetic coupling disengaged**
- **dynamic balancing, with wheels installed on the vehicle, must be carried out with the ignition key in position 1 (ignition controlled functions cut out) in order to disconnect the electromagnetic coupling;**
- **before carrying out power or brake testing with a roller test bench, remove the fuse protecting the electromagnetic coupling in order to disconnect it.**

An Authorized Alfa Romeo Service Station should carry out these operations.

Getting towed

When being towed, secure the towing link to the bracket shown in figure A. Turn the steering lock/ignition switch key to the position “1” (see page 34) and left **in** (key controlled services OFF and for Permanent 4 version electromagnetic coupling **disengaged**).

Warning

- When towing, care should be taken that any hauling local regulation is strictly adhered to.
- When the vehicle is being towed no power assistance is available to the brake system; a substantially greater pedal effort will therefore be needed to obtain effective braking.
- If the vehicle is equipped with power steering, the circuit is not active with the engine at rest and it is therefore necessary to exercise more force on the steering wheel.
- Never withdraw the key from the steering lock/ignition switch because it is possible for the steering lock to engage **accidentally**.
- Never tow the vehicle with only the rear wheels raised from the ground (front drive wheels on the road) to avoid serious mechanical damage. If it cannot be avoided use this system only after placing a rotating platform under the front wheels and turn the steering lock/ignition switch key to the position “1” (key controlled services OFF and for Permanent 4 version electromagnetic coupling disengaged).
- When getting towed, on 4WD version, **disengage** the four-wheel drive.

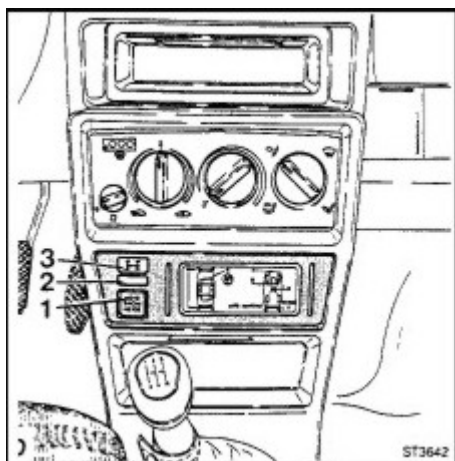
Towing

When taking another vehicle in tow, secure the towing link to the bracket on the underside of the boot as shown in figure 6 or C (4WD versions).

Note for 4WD versions

TO facilitate towing of another vehicle, it is advisable to engage the four-wheel drive.

WHAT YOU MUST KNOW WHEN DRIVING 4x4 WHEEL DRIVE



1 - Push-button to engage 4WD

2 - Self-diagnosis system warning light

3 - 4-wheel drive engagement warning light.

The system is composed of a rear differential coupled to the engine unit by a propeller shaft fitted with an electromagnetic coupling; this mechanical device is controlled by an electronic control unit. Engagement of 4WD is possible **at any vehicle speed** and is actuated by a push-button (1).

Avoid maneuvering on high-adhesion road surfaces with the wheels steered to locks and the **4WD engaged**. Under this condition, even though the reliability and strain resisting capabilities of the cars mechanical components are not impaired, the vehicle will result in a braking action.

The device is provided with a self-diagnosis system and a special warning

light (2) on the dashboard, signaling any possible faulty condition of the control unit, the electromagnetic coupling and the sensors. In such a case, 4WD is automatically disengaged thus preserving safety and reliability levels. 4WD engagement is signaled by warning light (3).

Note

Thanks to a series of sensors, the system optimizes functionality and reliability in any condition:

- inhibiting engagement in case of speed difference between front and rear wheels;
- disengaging 4WD in case of Sharp braking and automatically engaging it when the brake pedal is released.

The system is also fitted with a mesh-control safety device, the operation of which is based on the detection, performed by a coil installed near the coupling, of electromagnetic noises due to mesh failure. Said safety device operates upon engagement driven either by the push-button switch or by brake pedal release (after intervention of brake safety device).

How to chose which drive to utilize

Front-wheel drive only: this is most suitable on normal, dry roads, as it allows maximum savings in fuel consumption, a more comfort-able drive and lower wear of mechanical parts.

4WD: this must be utilized in all those circum-stances when the road presents low adhesion values, I.e. disconnected, wet, snowy or muddy roads and on sandy or muddy routes.

In general: it is recommended to utilize front wheel drive whenever road or atmospheric conditions do not expressly required the use of 4WD.

Warning

Avoid utilizing the vehicle in a manner different to that for which it was designed: it is therefore recommended not to use it as an “all terrain” vehicle. Furthermore follow the precautions listed hereunder:

- utilize tires of the same type and dimensions on all four wheels and ensure that inflation pressures are always those pre-scribed;
- always check brake efficiency after having crossed muddy, sandy or wet terrains;
- when the fitting of snow-chains is required, mounted on-to the front wheels without engaging 4WD.

DISCLAIMER

All written data here are obtained by TESTING with “pick and try” method (also known as right wire-wrong wire, good-bad wire..) on my P4 and from reading all other data you can find here in pictures. All data written here present my knowledge and my own belief so they can be wrong or insufficient. If you find any data that you think is incorrect or wish to change it, adopt it or fulfill manual please let me know by sending me e-mail to tvatavuk@usa.net .Nor me or any other person has any financial benefit from making/distributing this manual.

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