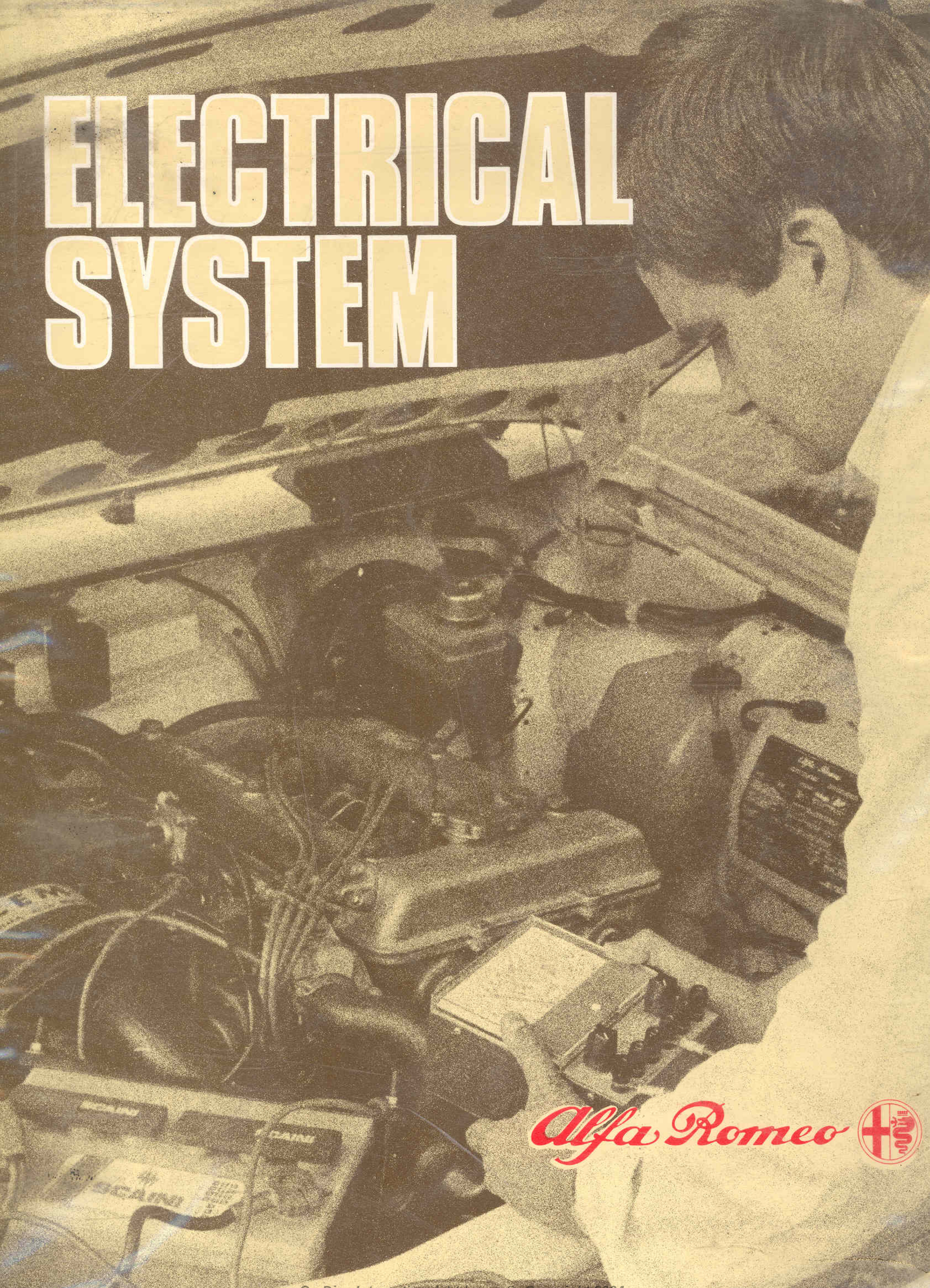
ELECTRICAL SYSTEM



Alfa Romeo

ELECTRICAL SYSTEM

Alfa Romeo

Alfa Romeo Auto S.p.A.

DIREZIONE ASSISTENZA
Centro Direzionale
20020 ARESE (Milano)

Pubblic. N. PA 341000000000 - 10/83 - 8000

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SCHEDA AGGIORNAMENTO / FICHE DE MISE A' JOUR

UPDATING SHEETS / UBERARBEITER SCHALTPLAN

Aggiornamento Mise à jour Update Letzter Stand N.	Schema / Schéma Wiring diagram / Schaltplan		Data Date Date Datum
	Sostituito / Remplacé Superseded / Ersetzt	Aggiunto / Ajouté Added / Ergänzt	
2	Tipes/models (1)		3/86
2	Tipes/models (2)		3/86
2		A7	3/86
2		B43	3/86
2		C45	3/86
2		E72	3/86
2		E73	3/86

SCHEDA AGGIORNAMENTO / FICHE DE MISE A' JOUR
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1	Tipes/models (1)		3/84	1	E11		3/84
1	Tipes/models (2)		3/84	1	E44		3/84
1	Tipes/models (3)		3/84	1	E48		3/84
1	Tipes/models (4)		3/84	1		E51	3/84
1	Tipes/models (5)		3/84	1		E52	3/84
1	Tipes/models (6)		3/84	1		E53	3/84
1		Tipes/models (7)	3/84	1		E54	3/84
				1		E55	3/84
1	A4		3/84	1		E56	3/84
1		A5	3/84	1		E57	3/84
1		A6	3/84	1		E58	3/84
				1		E59	3/84
1	B11		3/84	1		E60	3/84
1		B33	3/84	1		E61	3/84
1		B34	3/84	1		E62	3/84
1		B35	3/84	1		E63	3/84
1		B36	3/84	1		E64	3/84
1		B37	3/84	1		E65	3/84
1		B38	3/84	1		E66	3/84
1		B39	3/84	1		E67	3/84
1		B40	3/84	1		E68	3/84
1		B41	3/84	1		E69	3/84
1		B42	3/84	1		E70	3/84
				1		E71	3/84
1		C33	3/84				
1		C34	3/84	1		F17	3/84
1		C35	3/84	1		F18	3/84
1		C36	3/84	1		F19	3/84
1		C37	3/84	1		F20	3/84
1		C38	3/84	1		F21	3/84
1		C39	3/84				
1		C40	3/84				
1		C41	3/84				
1		C42	3/84				
1		C43	3/84				
1		C44	3/84				

Le seguenti voci vanno riportate sulla legenda schemi elettrici in ordine di lettera e numero

D20 Lampadina spia segnalazione innesto trazione posteriore
H29 Interruttore spia innesto trazione posteriore
N20 Centralina per variazione anticipo
N21 Modulo di potenza
S16 Correttore di quota

Les titres suivants devront être indiqués dans la Légende des schémas électriques par ordre de lettre et de numéro

D20 Témoin d'introduction de la traction arrière
H29 Interrupteur d'introduction de la traction arrière
N20 Centrale pour variation d'avance
N21 Module de puissance
S16 Correcteur de niveau

The following electrical components should be entered in proper order of letter and number in the key wiring diagrams list

D20 Rear-wheel-drive engaged, warning light
H29 Rear-wheel-drive warning light switch
N20 Ignition advance ECU
N21 Power module
S16 Automatic altitude compensation device

Die folgenden Stickwörter werden in alphabetischer oder numerischer Reihenfolge in die "Erläuterung für die Schaltpläne" auf genommen

D20 Kontrolleuchte für eingeschalteten Hinterradantrieb
H29 Schalter für die Kontrolleuchte bei eingeschaltetem Hinterradantrieb
N20 Steuergerät für die Anderung der Zündvorverstellung
N21 Druckkraftmodul
S16 Luftdichterregler

P R E M E S S A

— La presente pubblicazione ha lo scopo di fornire, in un'unica raccolta, gran parte degli schemi elettrici, relativi ai modelli Alfetta, Alfasud, Giulietta ed Alfa 6 fino ad ora prodotti.
La raccolta sarà costantemente aggiornata, in corrispondenza della "uscita" di ulteriori nuove versioni o modelli.

— Gli schemi elettrici sono rappresentati in "planimetrici" e suddivisi per tipo di contenuto; la scomposizione, tuttavia, non è identica per tutti gli schemi; per facilitare, quindi, la scelta dello schema elettrico che vorrete consultare, abbiamo idealmente suddiviso il contenuto degli schemi in 7 tipologie, rappresentate ognuna da un ideogramma.

— Partendo dal riconoscimento del tipo e modello di vettura ed individuata la tipologia di appartenenza della parte di impianto in oggetto od interessata da un guasto, è facilmente riconoscibile il numero progressivo del foglio sul quale è rappresentato lo schema necessario.

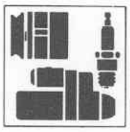
— Per individuare con precisione il numero progressivo di foglio, può essere necessario, in alcuni casi, dopo avere individuato tipo, modello e impianto, distinguere ulteriormente per mercato di appartenenza e numero di telaio.

— La lettera e il numero posti vicino ai cavi contrassegnati da una freccia indicano con quale particolare viene effettuato il collegamento elettrico.

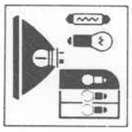
IDEOGRAMMI E SIMBOLI

TIPO DI IMPIANTO

ALIMENTAZIONE – INIEZIONE ELETTRONICA



ACCENSIONE – AVVIAMENTO – RICARICA
Motorino d'avviamento, alternatore, modulo elettronico, bobina, ecc.



ILLUMINAZIONE INTERNA ED ESTERNA
Lampade, interruttori di comando, lampadine spia, ecc.

UTILIZZATORI
Motorini, avvisatori acustici, trasmettitori, lampadine spia, tergicristalli, accendisigari, lunotto termico, ecc.

ACCESSORI
Specchio retrovisore esterno, alzacristalli, sensori per check control, trip computer, bloccaporte, dispositivi elettronici, autoradio, orologio, ecc. Negli schemi elettrici sono rappresentati anche gli accessori non montati di serie

CONDIZIONAMENTO (CD)

TERGIFARO

VARIANTI

Per vetture con accensione elettronica (AE)

Per vetture con cambio automatico (CA)

ALLESTIMENTI SPECIALI

CH	SVIZZERA
USA	STATI UNITI
SWE	SVEZIA
AUS	AUSTRALIA
F	FRANCIA
B	BELGIO
EUROPE	EUROPA

VALIDITA' DI N. TELAIO

00000000 Indica la validità **dal** numero di telaio indicato

00000000 Indica la validità **fino** al numero di telaio indicato

SIMBOLI

* Indica che il particolare od il collegamento vale solo per il tipo di vettura o di numero indicato

▲ Indica che il particolare od il collegamento elettrico non deve ritenersi valido per il tipo di vettura o di mercato indicato

INTRODUCTION

– Cette pubblication a été réalisée dans le but de fournir, réunis en un seul recueil, la majeure partie des schémas électriques concernant les modèles Alfetta, Alfasud, Giulietta et Alfa 6. La mise à jour se fera au fur et à mesure qu'un nouveau modèle ou une nouvelle version sera lancé sur le marché.

– Les schémas dont la représentation est planimétrique sont subdivisés suivant leur contenu, mais n'ayant pas tous la même composition, nous les avons idéalement regroupés, pour faciliter la recherche du schéma à consulter, sous 7 affectations principales, caractérisées chacune par un idéogramme.

– A partir du type, du modèle de voiture et de l'affectation de la partie du circuit en cause, on trouvera facilement le numéro d'ordre progressif de la page sur laquelle est représenté le schéma désiré.

– Dans certains cas, pour repérer avec exactitude le numéro de la page, il peut être nécessaire, après avoir identifié type, modèle et circuit de considérer en plus le marché de destination et le numéro de châssis.

– Le sigle (lettre + numéro) désigné par la flèche repérant un fil indique l'organe auquel est relié ce fil.

EQUIPEMENTS SPECIAUX

CH	SUISSE
USA	ETAS-UNIS
SWE	SUEDE
AUS	AUSTRALIE
F	FRANCE
B	BELGIQUE
EUROPE	EUROPE

VALIDITE N. DE CHASSIS

00000000 ↓ Valable à partir du numéro de châssis indiqué

↓ 00000000 Valable jusqu'au numéro de châssis indiqué

SYMBOLES

✳ Indique que l'élément ou la connexion n'est valable que pour le type de voiture ou de numéro indiqué.

▲ Indique que l'élément ou la connexion n'est pas valable pour le type de voiture ou de marché indiqué.

F O R E W O R D

- Purpose of this manual is to provide, in a single publication, the complete set of wiring diagrams for the Alfetta, Alfasud, Giulietta and Alfa 6 models.
  On introduction of new models this manual will be updated accordingly.

- The wiring diagrams have been so arranged as to deal with homogeneous electrical equipment and facilities; in other words, to facilitate finding components, the wiring diagrams have been divided into 7 functional groups each one identified by a symbol drawing to aid in interpretation.

- Knowing the model of the car and the symbol drawing of the equipments or facilities the component is part of, makes it very easy to find the number of the wiring diagram sought for.

- Sometimes after having found the car model and the wiring diagram, it may also be necessary to distinguish further among market areas and chassis numbers.

- Letter and number placed next to lead marked with arrow indicate the component to which electrical connection is made.

SPECIAL EQUIPMENT FOR EXPORT TO:

CH	SWITZERLAND
USA	UNITED STATES
SWE	SWEDEN
AUS	AUSTRALIA
F	FRANCE
B	BELGIUM
EUROPE	EUROPE

APPLICABILITY TO CHASSIS NOS.

00000000 ⬇ Applicable from chassis number shown **onwards**

⬇ 00000000 Applicable **up to** chassis number shown

SYMBOLS

* Means that the component, or the relevant electrical connection, applies only to the car model or chassis no. shown.

▲ Means that the component, or the relevant electrical connection, does not apply to the car model or market area shown.

V O R W O R T

– Das Ziel vorliegender Veröffentlichung besteht darin, in einer einzigen Dokumentation einen grossen Teil der elektrischen Schaltpläne für die Modelle Alfetta, Alfasud, Giulietta und Alfa 6, bisheriger Herstellung zusammenzufassen. Beim Erscheinen weiterer Ausführungen oder Modelle wird die Dokumentation immer auf den jüngsten Stand gebracht werden.

– Die elektrischen Schaltpläne sind in sogenannten "Lageplänen" dargestellt und je nach Inhalt unterteilt; die Art der vorgenommenen Aufteilung stimmt jedoch nicht bei allen Schaltplänen überein. Um nun die Auswahl des von Ihnen gewünschten Schaltplanes zu erleichtern, haben wir die Schaltpläne nach 7 Typologien unterschieden, wobei jede dieser Typologien durch ein eigenes Symbol dargestellt ist.

– Ausgegangen wird vom Typ und Modell des Wagens, dann ist die Typologie jenes Anlage-Teiles herauszufinden, der Sie besonders interessiert oder defekt ist; auf diese Weise können Sie leicht die fortlaufende Nummer des Blattes erkennen, auf dem der erforderliche Schalt-plän wiedergegeben ist.

– Um die fortlaufende Nummer des Blattes genau herauszufinden, kann es sich in einigen Fällen als notwendig erweisen, nach der Bestimmung von Typ, Modell und Anlage weiterhin nach Verkaufsmarkt und Fahrgestellnummer zu unterscheiden.

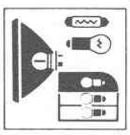
– Der Buchstabe und die Zahl, die sich neben mit einem Pfeil gekennzeichneten Kabeln befin-den, zeigen an, mit welchem Teil die elektrische Verbindung hergestellt wird.

SYMBOL UND ZEICHEN

ART DER ANLAGE

KRAFTSTOFF-ZUFUHR – ELEKTRONISCHE INJEKTION

ZUENDANLAGE – ANLASSER – STROMVERSORGUNG
Anlasser, Drehstromgenerator, elektronisches Modul, Spule, usw.

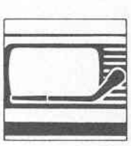


INNEN- UND AUSSENBELEUCHTUNG
Lampen, Schalter, Kontroll-Leuchten, usw.

SONSTIGE VERBRAUCHER
kl. Motoren, akustische Warnanlagen, Übermittler, Kontroll-Leuchten, Scheibenwischer, Zigarettenanzünder, heizbare Heckscheibe, usw.

ZUBEHÖR
Aussenrückspiegel, Scheibenheber, Sensoren zur Check-Kontrolle, Reise-Computer, Türverriegelung, elektronische Vorrichtungen, Autoradio, Uhr usw. In den elektrischen Schaltplänen sind auch die nicht serienmässig eingebauten Zubehörteile wiedergegeben.

KLIMAANLAGE (CD)



SCHEINWERFER-REINIGUNGSANLAGE

VARIANTEN

Für Wagen mit elektronischer Zündung (AE)

Für Wagen mit Automatic-Getriebe (CA)

BESONDERE AUSFÜHRUNGEN

CH	SCHWEIZ
USA	VEREINIGTE STAATEN
SWE	SCHWEDEN
AUS	AUSTRALIEN
F	FRANKREICH
B	BELGIEN
EUROPE	EUROPA

GÜLTIGKEIT DER FAHRGESTELLNUMMER

00000000 ▼ Die Gültigkeit ist ab der angegebenen Fahrgestellnr. zu verstehen.

▼ 00000000 Die Gültigkeit ist bis zur angegebenen Fahrgestellnr. zu verstehen.

ZEICHEN:

* Das Teil bzw. die Verbindung gilt nur für den angegebenen Wagentyp oder Nummer.

▲ Das Teil bzw. die elektrische Verbindung ist nicht für den angegebenen Wagentyp oder Markt gültig.

TYPES/MODELS (1)

113.05	Alfetta 2.0			B8	C4	E6	E6	F14	F6
113.05	Alfetta 2.0 – SWE –			B8	C4	E71	E71		E71
113.06	Alfetta 2.0			B8	C5	E7	E7	F13	E7
113.07	Alfetta 2.0 Turbo Diesel			B5	C8	E13	E13	F10	
113.10	GTV - 2.5		A6	B42	C44	E70	E70	E70	
113.11	Alfetta 1.6			B8	C4	E6	E6	F14	E9
113.12	Alfetta 1.8			B8	C4	E6	E6	F14	E9
113.15	GTV 6 - 2.5		A3	B16	C22	E33	E33		E33
113.15	GTV 6 - 2.5	00020011 ↓	A7	B43	C45	E72	E72		E72
113.15	GTV 6 - 2.5 – CD –		A3	B16	C22	E34	E34	E34	E34
113.15	GTV 6 - 2.5 – CD –	00020011 ↓	A7	B43	C45	E73	E73	E73	E73
113.17	GTV 2.0			B26	C23	E35	E35		
113.17	GTV 2.0 – CD –			B26	C23	E36	E36	E36	
113.30	Alfetta 2.0 "Quadrifoglio" – Iniezione –			B7	C7	E10	E10	F11	
113.32	Alfetta 2.0 "Quadrifoglio"			B6	C7	E11	E11	F11	
113.43	Alfetta 2.0			B8	C6	E8	E8	F12	
113.48	Giulietta 1.6			B34	C34	E52	E54	F17	E52
113.49	Giulietta 1.6			B37	C37	E58	E60	F18	E58
113.50	Giulietta 1.8			B34	C34	E52	E54	F17	F52
113.50	Giulietta 1.8 – CH –			B35	C35	E53	E54	F17	E53
113.51	Giulietta 1.8			B37	C37	E58	E60	F18	E58

TYPES/MODELS (2)

113.52	Giulietta 2.0 – Turbo Diesel		B33	C33	E51	E54		
113.56	Giulietta 2.0		B34	C34	E52	E54	F17	E52
113.56	Giulietta 2.0 – CH –		B35	C35	E53	E54	F17	E53
113.56	Giulietta 2.0 – SWE –		B35	C34	E53	E55		E53
113.57	Giulietta 2.0		B37	C37	E58	E60	F18	E58
113.57	Giulietta 2.0 – AUS –		B38	C38	E59	E60	F18	E59
113.60	Giulietta 2.0 – Turbodelta		B36	C36	E56	E57		

TYPES/MODELS (3)

116 A	Giulietta 1.8	00022550		B17	C19	E22	E22	F3	
116 A	Giulietta 1.8	00022551		B4	C20	E17	E17	F2	
116 A	Giulietta 1.8 – SWE –			B17	C21	E20	E20		E20
116.00	Alfetta 1.6			B13	D2	D2	D2	F1	
116.04	Alfetta GTV 1.6			B14	D1	D1	D1		
116.36	Alfetta GTV 2.0			B15	C14	E31	E31	F6	
116.38	Giulietta 2.0			B4	C20	E17	E17	F2	
116.42	Alfetta 1.8			B13	D2	D2	D2	F1	
116.44	Giulietta 1.3	00042710		B17	C19	E22	E22	F3	
116.44	Giulietta 1.3	00042711		B4	C20	E17	E17	F2	
116.46	Alfetta GTV 6 - 2.5		A2	B1	C9	E14	E14		E14
116.46	Alfetta GTV 6 - 2.5 – CD –		A2	B1	C9	E15	E15	E15	E15
116.50	Giulietta 1.6	00088430		B17	C19	E22	E22	F3	
116.50	Giulietta 1.6	00088431		B4	C20	E17	E17	F2	
116.55	Alfetta 2.0 L			B21	C13	E32	E32	F6	
116.55	Alfetta 2.0 L – CA –			B21	C15	E30	E30	F6	
116.55	Alfetta 2.0 L – SWE –			B21	C13	E32	E32		E29
116.58	Alfetta 2.0 – USA –			B19	C16	E28	E28	F15	
116.58	Alfetta 2.0 "America LI"	00004000		B19	C1	E27	E27	F5	
116.58	Alfetta 2.0 "America LI"	00004001		B9	C1	E3	E3		
116.59	Alfetta GTV 2.0			B11	C2	E2	E2		

TYPES/MODELS (4)

116.59	Alfetta GTV 2.0 – CD –		B11	C2	E1	E1	E1	
116.59	Alfetta GTV 2.0 – AE –		B10	C3	E4	E4		
116.59	Alfetta GTV 2.0 – AE – CD –		B10	C3	E5	E5	E5	
116.61	Giulietta Turbo Diesel		B27	C24	E12	E12		
116.69	GTV 6 - 2.5	A1	B2	C10	E16	E16	E16	
116.71	Giulietta 2.0 TI - Super		B22	C12	E21	E21	F8	E21
116.76	Alfetta 2.0 Turbo Diesel		B20	C17	E26	E26	F4	
116.91	Giulietta 1.3		B3	C11	E18	E18	F9	E18
116.91	Giulietta 1.3 – AE –		B22	C12	E19	E19	F8	E19
116.93	Giulietta 1.6		B3	C11	E18	E18	F9	E18
116.93	Giulietta 1.6 – AE –		B22	C12	E19	E19	F8	E19
116.95	Giulietta 1.8		B3	C11	E18	E18	F9	E18
116.95	Giulietta 1.8 – AE –		B22	C12	E19	E19	F8	E19
116.97	Giulietta 2.0		B3	C11	E18	E18	F9	E18
116.97	Giulietta 2.0 – AE –		B22	C12	E19	E19	F8	E19

TYPES/MODELS (5)

117.01	Alfetta 2.0		B29	C28	E42	E41	F16	E42
117.01	Alfetta 2.0 – SWE –		B30	C28	E45	E46		E45
117.01	Alfetta 2.0 – CH –		B30	C25	E43	E41	F16	E43
117.02	Alfetta 2.4 Turbo Diesel		B31	C32	E39	E37		
117.06	Alfetta 2.0 Turbo Diesel		B31	C43	E68	E69	F21	
117.10	Alfetta 2.0		B12	C31	E50	E49	F7	
117.13	Alfetta 2.0 "Quadrifoglio"	A4	B28	C29	E44	E38	F16	
117.13	Alfetta 2.0 "Quadrifoglio" – CH –	A4	B28	C26	E44	E38	F16	
117.14	Alfetta 2.0 "Quadrifoglio"	A4	B32	C30	E48	E47	F7	
117.17	Alfetta 1.8		B29	C27	E42	E40	F16	E42
117.18	Alfetta 1.6		B29	C27	E42	E40	F16	E42

TYPES/MODELS (6)

119 A	Alfa 6		B18	C18	E25	E23	E23	E25
119 A1	Alfa 6		B18	C18	E24	E23	E23	E24
119.20	Alfa 6 - Turbo Diesel 5		B40	C41	E64	E65	F20	E64
119.28	Alfa 6 - 2.5 "Quadrifoglio"	A5	B39	C39	E61	E63	F19	E61
119.30	Alfa 6 - 2.5 CA "Quadrofoglio"	A5	B41	C39	E61	E63	F19	E61
119.31	Alfa 6 - 2.5 CA "Quadrifoglio"	A5	B41	C42	E66	E67	F19	E66
119.32	Alfa 6 - 2.0		B39	C40	E62	E63	F19	E62

TYPES/MODELS (7)

901 ..... – 902	Alfasud AE Marelli		B24/1					
901 ..... – 902	Alfasud AE Bosch		B24/2					
901.08	Alfasud N		B23	D4	D4	D4		
901.70	Alfasud 1.2		B23	D4	D4	D4		
901.72	Alfasud 1.3		B23	D4	D4	D4		
901.74	Alfasud 1.5		B23	D4	D4	D4		
901.80	Alfasud 1.3		B23	D3	D3	D3		
901.82	Alfasud 1.5		B23	D3	D3	D3		
902.12	Alfasud Sprint 1.3		D5	D5	D5	D5		D5
902.14	Alfasud Sprint 1.5		D5	D5	D5	D5		D5
902.14	Alfasud Sprint 1.5 – CH – SWE –		B25	D5	D5	D5		D5
902.15	Alfasud Sprint 1.5		D5	D5	D5	D5		D5
902.15	Alfasud Sprint 1.5 – AUS –		B25	D6/D5	D5	D5		D5

LEGGENDA SCHEMI ELETTRICI

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COLORAZIONE CAVI

B	Bianco	C	Arancio	VN	Verde-Nero	AR	Azzurro-Rosso
N	Nero	Z	Viola	RN	Rosso-Nero	HG	Grigio-Giallo
A	Azzurro	SN	Rosa-Nero	CN	Arancio-Nero	SB	Rosa-Bianco
M	Marrone	HN	Grigio-Nero	AB	Azzurro-Bianco	GR	Giallo-Rosso
G	Giallo	BN	Bianco-Nero	HR	Grigio-Rosso	AG	Azzurro-Giallo
R	Rosso	AN	Azzurro-Nero	HV	Grigio-Verde	VB	Verde-Bianco
V	Verde	GN	Giallo-Nero	GV	Giallo-Verde	MB	Marrone-Bianco
H	Grigio	No	Nocciola	CB	Arancio-Bianco	ZN	Viola-Nero
S	Rosa	BL	Blu	BR	Bianco-Rosso	Br	Bruno

La sezione dei cavi non indicata è di 0,5 mm^2.

A : AVVIAMENTO - RICARICA

A1 Batteria
A2 Alternatore
A3 Alternatore con regolatore elettronico incorporato
A4 Regolatore di tensione
A5 Distributore accensione
A6 Impulsore
A7 Rotore
A8 Bobina d'accensione
A9 Resistenza per bobina
A10 Connettore a due vie per bobina
A11 Motorino d'avviamento
A12 Candele
A13 Candelette
A14 Morsettiera cavi alternatore

B : COMANDI ELETTRICI MANUALI

B1 Commutatore d'accensione
B2 Comando tergicristallo
B3 Comando pompa lavaparabrezza e/o lavatergifaro
B4 Comando luce di posizione, lampeggio, anabbagliante e abbagliante
B5 Interruttore di comando avvisatori acustici
B6 Comando indicatore luci di direzione
B7 Interruttore di comando lampeggio luce anabbagliante
B8 Interruttore di comando lampeggio luce abbagliante
B9 Interruttore di comando lunotto termico
B10 Interruttore di comando luce fendinebbia
B11 Interruttore di comando luce retronebbia
B12 Interruttore di comando luci simultanee d'emergenza
B13 Interruttore di comando plafoniera anteriore abitacolo
B14 Interruttore di comando plafoniera posteriore abitacolo
B15 Interruttore di comando plafoniera abitacolo
B16 Reostato per attenuazione illuminazione quadro
B17 Interruttore spia, per controllo livello olio cambio
B18 Interruttore di comando bloccaporte su porta anteriore destra
B19 Interruttore di comando bloccaporte su porta anteriore sinistra
B20 Interruttore interno di comando bloccaporte
B21 Interruttore di comando alzacristallo elettrico anteriore destro
B22 Interruttore di comando alzacristallo elettrico anteriore sinistro
B23 Interruttore di comando alzacristallo elettrico posteriore destro
B24 Interruttore di comando alzacristallo elettrico posteriore sinistro
B25 Interruttore per consenso alzacristalli elettrici posteriori
B26 Interruttore per consenso alzacristalli elettrici posteriori e accendisigari posteriore
B27 Interruttore di comando regolazione altezza sedile anteriore
B28 Interruttore di comando regolazione schienale anteriore sinistro
B29 Interruttore di comando regolazione schienale anteriore destro
B30 Interruttore di comando specchio retrovisore esterno elettrico
B31 Interruttore di comando antenna elettrica
B32 Comando pompa lavaparabrezza
B33 Interruttore spot anteriore
B34 Interruttore spot posteriore sinistro
B35 Interruttore spot posteriore destro
B36 Doppio interruttore di comando specchio retrovisore esterno elettrico
B37 Interruttore di comando luci di stazionamento
B38 Interruttore di comando tergilunotto

C : STRUMENTI DI BORDO

C1 Contagiri elettronico
C2 Tachimetro elettronico
C3 Voltmetro
C4 Indicatore di livello carburante
C5 Indicatore pressione olio
C6 Indicatore temperatura acqua
C7 Orologio
C8 Strumento disponibile
C9 Indicatore pressione aria turbo

D : LAMPADINE SPIA

D1 Lampadina spia carica alternatore
D2 Lampadina spia luce di direzione
D3 Lampadina spia luce di posizione
D4 Lampadina spia luce abbagliante
D5 Lampadina spia livello liquido freni
D6 Lampadina spia climatizzatore
D7 Lampadina spia freno a mano
D8 Lampadina spia riserva carburante
D9 Lampadina spia starter
D10 Lampadina spia livello liquido freni-freno a mano
D11 Lampadina spia minima pressione olio motore
D12 Lampadina spia preriscaldo candelette
D13 Lampadina spia massima temperatura acqua motore
D14 Lampadina spia massima pressione aria
D15 Lampadina spia minima pressione benzina
D16 Lampadina spia disponibile
D17 Lampadina spia segnalazione posizione cambio
D18 Lampadina spia anticipo manuale iniezione
D19 Lampadina spia usura pastiglie freni

E : LUCI ESTERNE

E1 Lampada luce indicatore direzione anteriore
E2 Lampada luce di posizione anteriore
E3 Lampada luce di direzione e di posizione anteriore
E4 Lampada luce side marker anteriore
E5 Lampada luce anabbagliante
E6 Lampada luce anabbagliante con luce di posizione incorporata
E7 Lampada luce abbagliante
E8 Lampada luce anabbagliante e abbagliante
E9 Lampada luce laterale di direzione
E10 Lampada luce fendinebbia
E11 Lampada luce di direzione posteriore
E12 Lampada luce side marker posteriore
E13 Lampada luce di posizione posteriore
E14 Lampada luce retromarcia
E15 Lampada luce d'arresto
E16 Lampada luce retronebbia
E17 Lampada luce targa
E18 Lampada luce di arresto e di posizione posteriore

F : LUCI INTERNE

F1 Plafoniera anteriore abitacolo
F2 Plafoniera posteriore abitacolo
F3 Plafoniera abitacolo
F4 Plafoniera vano motore
F5 Plafoniera bagagliera
F6 Luce apertura porta
F7 Lampada luce fusibili
F8 Lampada illuminazione comandi climatizzatore
F9 Plafoniera cassetto portaoggetti
F10 Lampada illuminazione portacenere
F11 Leggimappa
F12 Lampadina illuminazione quadro
F13 Spot anteriore
F14 Spot posteriore destro
F15 Spot posteriore sinistro
F16 Lampada illuminazione commutatore d'accensione
F17 Lampada illuminazione interruttori

G : PORTAFUSIBILI – GIUNZIONI – MASSE

G1 Scatola portafusibili
G2 Scatola portafusibili supplementare
G3 Morsetto nella scatola portafusibili
G4 Portafusibile volante
G5 Giunzione multipla
G6 Giunzione multipla B quadro di bordo
G7 Giunzione multipla R quadro di bordo
G8 Giunzione semplice
G9 Giunzione di collegamento cablaggio porta anteriore sinistra con interruttore specchio
G10 Giunzione di collegamento cablaggio porta anteriore destra con interruttore specchio
G11 Giunzione di collegamento cablaggio basetta con cablaggio posteriore
G12 Giunzione di collegamento cablaggio basetta con interruttore specchio

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G14 Giunzione di collegamento, a tre vie, cablaggio basetta con cablaggio porte
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G16 Giunzione di collegamento, a sei vie, cablaggio basetta con cablaggio porte
G17 Giunzione di collegamento cablaggio basetta con cablaggio porta anteriore destra
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G25 Giunzione cablaggio porta posteriore destra
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G27 Giunzione cablaggio porta posteriore sinistra
G28 Giunzione di collegamento cablaggio porta anteriore destra con interruttore alzacristallo
G29 Giunzione cablaggio bloccaporte e alzacristalli posteriori
G30 Giunzione per alzacristalli e bloccaporte
G31 Giunzione di collegamento cablaggio porta anteriore sinistra con interruttore alzacristallo
G32 Giunzione cablaggio mobiletto e cablaggio porta posteriore destra
G33 Giunzione cablaggio mobiletto e cablaggio porta posteriore sinistra
G34 Giunzione cavo alimentazione alzacristalli elettrici
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G38 Giunzione cablaggio condizionatore
G39 Giunzione di collegamento per orologio
G40 Giunzione di collegamento centralina bloccaporte
G41 Giunzione interruttore tachimetrico - impulsore contagiri
G42 Giunzione di collegamento alternatore - manocontatto minima pressione olio motore
G43 Giunzione cavi comando climatizzatore
G44 Giunzione fanalino retronebbia
G45 Giunzione cavi tergi-lavafari
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G47 Giunzione cavi ripetitore laterale destro
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G52 Massa nella scatola portafusibili
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G54 Massa abitacolo
G55 Massa fianchetto
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G90 Giunzione intermedia "B"
G91 Massa sensori porte posteriori
G92 Massa vano baule
G93 Massa traversa superiore vano parabrezza
G94 Giunzione vano motore

H : INTERRUTTORI

H1 Interruttore freno a mano
H2 Interruttore luce retromarcia
H3 Interruttore luce di arresto
H4 Interruttore sul montante plafoniera abitacolo
H5 Interruttore segnalatore porta anteriore sinistra aperta
H6 Interruttore segnalatore porta anteriore destra aperta
H7 Interruttore segnalatore porta posteriore sinistra aperta
H8 Interruttore segnalatore porta posteriore destra aperta
H9 Interruttore pastiglia freno anteriore destra
H10 Interruttore pastiglia freno anteriore sinistra
H11 Interruttore pastiglia freno posteriore destra
H12 Interruttore pastiglia freno posteriore sinistra
H13 Interruttore starter
H14 Interruttore anticipo iniezione
H15 Interruttore nel cambio per rilevamento livello minimo olio (ampolla magnetica)
H16 Interruttore consenso avviamento e retromarcia
H17 Interruttore controllo minimo livello liquido freni
H18 Interruttore nel cambio per minimo accelerato
H19 Interruttore minima pressione benzina
H20 Interruttore inerziale
H21 Interruttore sul pedale frizione per minimo accelerato
H22 Microinterruttore commutatore d'accensione
H23 Interruttore plafoniera vano motore
H24 Interruttore plafoniera bagagliera
H25 Interruttore lampada illuminazione cassetto portaoggetti
H26 Interruttore-contatto sulla porta posteriore per tergilunotto
H27 Interruttore-contatto sulla porta posteriore per lunotto termico
H28 Interruttore-contatti sul carburatore

I : TELERUTTORI

I1 Teleruttore elettroventilatore raffreddamento motore
I2 Teleruttore lunotto termico
I3 Teleruttore avvisatori acustici
I4 Teleruttore tergifaro
I5 Teleruttore ausiliario per temporizzatore tergifari
I6 Teleruttore minimo accelerato
I7 Teleruttore chiusura condotti benzina
I8 Teleruttore esclusione martelletto ritardato
I9 Teleruttore per candelette
I10 Teleruttore consenso avviamento
I11 Teleruttori alzacristalli elettrici anteriori-alzasedile
I12 Teleruttore alzacristalli elettrici anteriori
I13 Teleruttori alzacristalli elettrici posteriori
I14 Teleruttore per controllo automatico spia liquido freni
I15 Teleruttore spia minima pressione benzina
I16 Teleruttore fari
I17 Teleruttore fendinebbia
I18 Teleruttore a doppio contatto
I19 Teleruttore elettropompa lavafari
I20 Teleruttore di commutazione
I21 Teleruttore esclusione abbaglianti
I22 Teleruttore esclusione anabbaglianti
I23 Teleruttore eletroventilatore supplementare raffreddamento motore

L : TRASMETTITORI

L1 Manocontatto minime pressione benzina
L2 Manocontatto minima pressione olio motore
L3 Manocontatto massima pressione aria
L4 Termocontatto per giunto elettromagnetico raffreddamento motore
L5 Termocontatto spia massima temperatura acqua motore
L6 Termocontatto per elettroventilatore raffreddamento motore
L7 Trasmettitore per indicatore temperatura acqua
L8 Trasmettitore per indicatore pressione olio
L9 Trasmettitore indicatore livello carburante
L10 Trasmettitore indicatore temperatura acqua e contatto spia massima temperatura
L11 Pressostato esclusione martelletto ritardato
L12 Sensore livello olio motore
L13 Sensore livello liquido lavaparabrezza
L14 Sensore livello liquido raffreddamento motore
L15 Sensore flusso benzina
L16 Impulsore contagiri
L17 Impulsore contachilometri

M : ELETTROMAGNETI – ELETTROVALVOLE

M1 Elettrovalvola tagliaminimo
M2 Elettrovalvola pompa iniezione
M3 Elettromagnete con microinterruttore esclusione pompa iniezione
M4 Elettromagnete minimo accelerato
M5 Elettromagnete stop motore
M6 Elettromagnete chiusura condotti benzina
M7 Elettromagnete apertura - chiusura porte
M8 Elettrovalvola supplemento aria (inserimento compressore)

N : DISPOSITIVI ELETTRONICI - INTERMITTENZA TEMPORIZZATORI

N1 Modulo per accensione elettronica
N2 Connettore per modulo Marelli
N3 Condensatore per accensione elettronica
N4 Connettore per modulo Bosch
N5 Dispositivo interruttore tachimetrico
N6 Temporizzatore preriscaldo candelette
N7 Trip computer
N8 Check Control
N9 Centralina usura pastiglie freni
N10 Temporizzatore plafoniera
N11 Centralina bloccaporte
N12 Temporizzatore per tergifari
N13 Intermittenza luci simultanee e di direzione
N14 Intermittenza elettronica tergicristallo
N15 Intermittenza elettronica tergicristallo e controllo spie
N16 Centralina tachimetrica
N17 Centralina trip per flusso benzina
N18 Dispositivo elettronico commutazione fari e lampeggio
N19 Efficentometro

O : UTILIZZATORI

O1 Lunotto termico
O2 Avvisatore acustico
O3 Antenna elettrica
O4 Autoradio
O5 Altoparlante
O6 Accendisigari
O7 Accendisigari posteriore

P : MOTORINI ELETTRICI

P1 Motorino tergicristallo
P2 Elettroventilatore raffreddamento motore
P3 Giunto elettromagnetico raffreddamento motore
P4 Motorino tergifaro
P5 Motorino regolazione sedile anteriore sinistro
P6 Motorino regolazione schienale anteriore destro
P7 Motorino regolazione schienale anteriore sinistro
P8 Motorino specchio retrovisore esterno elettrico lato sinistro
P9 Motorino specchio retrovisore esterno elettrico lato destro
P10 Motorino bloccaporte anteriore destro
P11 Motorino bloccaporte anteriore sinistro
P12 Motorino bloccaporte posteriore destro
P13 Motorino bloccaporte posteriore sinistro
P14 Motorino alzacristallo elettrico anteriore destro
P15 Motorino alzacristallo elettrico anteriore sinistro
P16 Motorino alzacristallo elettrico posteriore destro
P17 Motorino alzacristallo elettrico posteriore sinistro
P18 Elettropompa benzina
P19 Elettropompa lavaparabrezza
P20 Elettropompa lavafaro
P21 Motorino tergilunotto
P22 Elettropompa tergilunotto
P23 Elettroventilatore supplementare raffreddamento motore

Q : CLIMATIZZAZIONE – CONDIZIONAMENTO

Q1 Elettroventilatore di climatizzazione
Q2 Comando pneumatico a pulsante per condizionatore
Q3 Comando pneumatico a pulsante per climatizzatore
Q4 Comando elettroventilatore di climatizzazione
Q5 Resistenza regolazione velocità elettroventilatore di climatizzatore
Q6 Pulsante sulla portella per inserimento elettroventilatore di climatizzazione
Q7 Termostato a fluido
Q8 Pressostato giunto elettromagnetico
Q9 Pressostato di minima
Q10 Pressostato di massima
Q11 Giunto elettromagnetico compressore
Q12 Termocontatto per esclusione giunto elettromagnetico compressore
Q13 Elettroventilatore supplementare condizionatore
Q14 Teleruttore elettroventilatore supplementare condizionatore e giunto elettromagnetico compressore
Q15 Teleruttore elettroventilatore di climatizzazione
Q16 Teleruttore comando simultaneo elettroventilatore raffreddamento motore ed elettroventilatore supplementare
Q17 Teleruttore comando simultaneo giunto elettromagnetico raffreddamento motore ed elettroventilatore supplementare

R : DISPOSITIVI DI SICUREZZA

R1 Dispositivo cinture di sicurezza
R2 Dispositivo segnalazione temperatura marmitta catalitica
R3 Termocoppia per rilevamento temperatura marmitta catalitica
R4 Cicalino segnalazione cintura di sicurezza slacciata
R5 Cicalino segnalazione porta aperta
R6 Dispositivo contamiglia
R7 Lampadina spia cinture di sicurezza
R8 Lampadina spia segnalazione trentamila miglia
R9 Interruttore a pulsante sulle cinture
R10 Lampadina spia segnalazione massima temperatura marmitta catalitica

S : INIEZIONE ELETTRONICA

S1 Centralina di comando iniezione
S2 Teleruttore combinato
S3 Elettroiniettore
S4 Elettroiniettore avviamento a freddo
S5 Misuratore portata aria
S6 Interruttore corpo farfalla acceleratore
S7 Sensore temperatura acqua motore
S8 Termointerruttore a tempo
S9 Valvola supplemento aria
S10 Sonda λ
S11 Centralina Motronic
S12 Teleruttore Motronic
S13 Sensore di fase
S14 Sensore numero di giri
S15 Variatore di fase

LEGENDE DES SCHEMAS ELECTRIQUES

A : DEMARRAGE – RECHARGE
B : COMMANDES MANUELLES DES DISPOSITIFS ELECTRIQUES
C : INSTRUMENTATION DE BORD
D : LAMPES-TEMOINS
E : ECLAIRAGE EXTERIEUR
F : ECLAIRAGE INTERIEUR
G : PORTE-FUSIBLES – BLOCS-RACCORDS – MASSES
H : INTERRUPTEURS
I : RELAIS
L : TRANSMETTEURS
M : ELECTRO-AIMANTS – ELECTRO-VALVES
N : DISPOSITIFS ELECTRONIQUES – TEMPORISATEURS
O : UTILISATEURS
P : MOTEURS ELECTRIQUES
Q : CONDITIONNEMENT – CLIMATISATION
R : DISPOSITIFS DE SECURITE
S : INJECTION ELECTRONIQUE

COULEUR DES FILS

B	Blanc	C	Orange	VN	Vert-Noir	AR	Bleu-Rouge
N	Noir	Z	Violet	RN	Rouge-Noir	HG	Gris-Jaune
A	Bleu-ciel	SN	Rose-Noir	CN	Orange-Noir	SB	Rose-Blanc
M	Marron	HN	Gris-Noir	AB	Bleu-Blanc	GR	Jaune-Rouge
G	Jaune	BN	Blanc-Noir	HR	Gris-Rouge	AG	Bleu-Jaune
R	Rouge	AN	Bleu-Noir	HV	Gris-Vert	VB	Vert-Blanc
V	Vert	GN	Jaune-Noir	GV	Jaune-Vert	MB	Marron-Blanc
H	Gris	No	Noisette	CB	Orange-Blanc	ZN	Violet-Noir
S	Rose	BL	Bleu	BR	Blanc-Rouge	Br	Brun

Pour les fils dont la section n'est pas indiquée $S = 0{,}5\ mm^2$

A DEMARRAGE – RECHARGE

A1 Batterie
A2 Alternateur
A3 Alternateur avec régulateur électronique incorporé
A4 Régulateur de tension
A5 Distributeur d'allumage
A6 Générateur d'impulsions
A7 Rotor
A8 Bobine d'allumage
A9 Résistance pour bobine
A10 Connecteur à deux voies pour bobine
A11 Démarreur
A12 Bougies
A13 Bougies de préchauffage
A14 Platine de raccordement câblage alternateur

B COMMANDES MANUELLES DES DISPOSITIFS ELECTRIQUES

B1 Commutateur d'allumage
B2 Commande d'essuie-glace
B3 Commande de lave-glace et/ou de lave-phares
B4 Commandes des feux de position, avertisseur lumineux, feux de route/croisement
B5 Contacteur d'avertisseur sonore
B6 Commande des indicateurs de direction
B7 Commande d'avertisseur lumineux sur feux de croisement
B8 Commande d'avertisseur lumineux sur feux de route
B9 Contacteur de lunette chauffante
B10 Contacteur de projecteur anti-brouillard
B11 Contacteur de feu de brouillard AR
B12 Contacteur de feux de détresse
B13 Contacteur de plafonnier AV
B14 Contacteur de plafonnier AR
B15 Contacteur de plafonnier
B16 Rhéostat d'éclairage tableau de bord
B17 Contacteur-témoin de contrôle niveau de BV
B18 Contacteur de verrouillage portes sur porte AV droite
B19 Contacteur de verrouillage portes sur porte AV gauche
B20 Contacteur intérieur de condamnation portes
B21 Contacteur de lève-vitre AV droit
B22 Contacteur de lève-vitre AV gauche
B23 Contacteur de lève-vitre AR droit
B24 Contacteur de lève-vitre AR gauche
B25 Contacteur d'interdiction lève-vitres AR
B26 Contacteur d'interdiction lève-vitres et allume-cigares AR
B27 Interrupteur de réglage hauteur du siège AV
B28 Contacteur de réglage dossier AV gauche
B29 Contacteur de réglage dossier AV droit
B30 Contacteur de réglage rétroviseur extérieur
B31 Contacteur d'antenne électrique
B32 Commande de lave-glace
B33 Contacteur spot AV
B34 Contacteur spot AR gauche
B35 Contacteur spot AR droit
B36 Contacteur double de réglage rétroviseur extérieur
B37 Contacteur des feux de stationnement
B38 Contacteur d'essuie-lunette

C INSTRUMENTATION DE BORD

C1 Compte-tours électronique
C2 Tachymètre électronique
C3 Voltmètre
C4 Jauge à carburant
C5 Manomètre d'huile
C6 Thermomètre d'eau
C7 Montre
C8 Instrument libre
C9 Manomètre d'air du turbocompresseur

D LAMPES-TEMOINS

D1 Témoin de charge alternateur
D2 Témoin d'indicateurs de direction
D3 Témoin des feux de position
D4 Témoin des feux de route
D5 Témoin de niveau liquide de freins
D6 Témoin de climatiseur
D7 Témoin de frein à main serré
D8 Témoin de réserve carburant
D9 Témoin de starter
D10 Témoin de niveau liquide de freins - frein à main serré
D11 Témoin de pression d'huile moteur min.
D12 Témoin de préchauffage bougies
D13 Témoin de température max. d'eau moteur
D14 Témoin de pression d'air max.
D15 Témoin de pression carburant min.
D16 Témoin libre
D17 Témoin de position BV
D18 Témoin d'avance manuelle injection
D19 Témoin d'usure plaquettes de freins

E ECLAIRAGE EXTERIEUR

E1 Lampe d'indicateur de direction AV
E2 Lampe de feu de position AV
E3 Lampe d'indicateur de direction AV et de feu de position AV
E4 Lampe de feu side marker AV
E5 Lampe de feu de croisement
E6 Lampe de feu de croisement avec feu de position incorporé
E7 Lampe de feu de route
E8 Lampe de feu de croisement/route
E9 Lampe de répétiteur latéral de direction
E10 Lampe de projecteur anti-brouillard
E11 Lampe d'indicateur de direction AR
E12 Lampe de feu side marker AR
E13 Lampe de feu de position AR
E14 Lampe de feu de recul
E15 Lampe de feu de stop
E16 Lampe de feu de brouillard AR
E17 Lampe d'éclaireur de plaque de police
E18 Lampe de feu de stop et de position AR

F ECLAIRAGE INTERIEUR

F1 Plafonnier AV
F2 Plafonnier AR
F3 Plafonnier
F4 Eclaireur de compartiment moteur
F5 Eclaireur de coffre à bagages
F6 Signal lumineux de porte ouverte
F7 Eclaireur de boîte à fusibles
F8 Eclaireur des commandes de climatisation
F9 Eclaireur de boîte à gants
F10 Eclaireur de cendrier
F11 Lecteur de cartes
F12 Eclaireur de tableau de bord
F13 Spot AV
F14 Spot AR droit
F15 Spot AR gauche
F16 Eclaireur de commutateur d'allumage
F17 Eclaireur des interrupteurs

G PORTE-FUSIBLES – BLOCS-RACCORDS-MASSES

G1 Boîte à fusibles
G2 Boîte à fusibles supplémentaire
G3 Borne dans boîte à fusibles
G4 Porte-fusible volant
G5 Bloc-raccord
G6 Bloc-raccord B de tableau de bord
G7 Bloc-raccord R de tableau de bord
G8 Connecteur simple
G9 Bloc-raccord câblage porte AV gauche/interrupteur de rétroviseur
G10 Bloc-raccord câblage porte AV droite/interrupteur de rétroviseur
G11 Bloc-raccord câblage central/câblage AR
G12 Bloc-raccord câblage central/interrupteur de rétroviseur
G13 Bloc-raccord câblage central/câblage console
G14 Bloc-raccord, à trois voies, câblage central/câblage portes
G15 Bloc-raccord, à deux voies, câblage central/câblage portes
G16 Bloc-raccord, à six voies, câblage central/câblage portes

G17 Bloc-raccord câblage central/câblage porte AV droite
G18 Bloc-raccord câblage central/câblage porte AV gauche
G19 Bloc-raccord câblage central/plafonnier
G20 Bloc-raccord pour moteur de verrouillage porte AV droite
G21 Bloc-raccord de câblage porte AV droite
G22 Bloc-raccord pour moteur de verrouillage porte AV gauche
G23 Bloc-raccord de câblage porte AV gauche
G24 Bloc-raccord pour moteur de verrouillage porte AR droite
G25 Bloc-raccord de câblage porte AR droite
G26 Bloc-raccord pour moteur de verrouillage porte AR gauche
G27 Bloc-raccord de câblage porte AR gauche
G28 Bloc-raccord câblage porte AV droite/interrupteur de lève-vitre
G29 Bloc-raccord câblage verrouillage des portes/lève-vitres AR
G30 Bloc-raccord pour lève-vitres et verrouillage des portes
G31 Bloc-raccord câblage porte AV gauche/interrupteur de lève-vitres
G32 Bloc-raccord câblage console/câblage porte AR droite
G33 Bloc-raccord câblage console/câblage porte AR gauche
G34 Connecteur fil d'alimentation de lève-vitres
G35 Bloc-raccord câblage AR/câblage feu AR droit
G36 Bloc-raccord de câblage interrupteurs de lève-vitres
G37 Bloc-raccord combiné lumières-essuie-glace
G38 Bloc-raccord de câblage conditionnement
G39 Bloc-raccord pour montre
G40 Bloc-raccord de câblage centrale de verrouillage portes
G41 Bloc-raccord interrupteur tachymétrique/générateur d'impulsions de compte-tours
G42 Bloc-raccord alternateur/manocontact de pression d'huile min.
G43 Bloc-raccord câblage de commande climatisation
G44 Bloc-raccord de feu de brouillard AR
G45 Bloc-raccord d'essuie-lave-phares
G46 Bloc-raccord des projecteurs
G47 Bloc-raccord de câblage répétiteur latéral droit
G48 Bloc-raccord câblage rétroviseur/répétiteur latéral gauche
G49 Bloc-raccord pour pré-équipement
G50 Pré-équipement câblage haut-parleur
G51 Pré-équipement câblage auto-radio
G52 Masse boîte à fusibles
G53 Masse compartiment moteur
G54 Masse habitacle
G55 Masse doublure d'aile
G56 Platine de dérivation
G57 Pré-équipement -électrovanne étouffoir de ralenti
G58 Bloc-raccord d'allume-cigares
G59 Bloc-raccord de rétroviseur extérieur
G60 Masse câblage injection
G61 Bloc-raccord pour bobine d'allumage
G62 Bloc-raccord pour interrupteur embrayage
G63 Masse AR
G64 Bloc-raccord Trip Computer - Montre
G65 Fil coaxial
G66 Masse câblage Motronic
G67 Bloc-raccord Motronic
G68 Bloc-raccord "A" avec câblage central
G69 Bloc-raccord "B" avec câblage central
G70 Bloc-raccord "C" avec câblage central
G71 Bloc-raccord pour lampe-témoin sur instruments de bord
G72 Bloc-raccord de câblage réglage de dossiers de sièges
G73 Bloc-raccords des servitudes AR
G74 Bloc-raccord de câblage AR Televel-check
G75 Bloc-raccord des servitudes pavillon, côté droit et gauche
G76 Bloc-raccord des servitudes pavillon, côté droit
G77 Bloc-raccord des servitudes pavillon, côté gauche
G78 Bloc-raccord de câblage servitudes portes AV
G79 Bloc-raccord de câblage servitudes portes AR
G80 Bloc-raccord de câblage central
G81 Bloc-raccord de réglage dossier de siège AV gauche
G82 Bloc-raccord de réglage dossier de siège AV droit
G83 Bloc-raccord AR pour ralenti accéléré
G84 Bloc-raccord de câblage console
G85 Bloc-raccord des servitudes AV
G86 Bloc-raccord plafonnier
G87 Bloc-raccords moteurs de verrouillage porte AR
G88 Bloc-raccord feux AR
G89 Bloc-raccord intermédiaire "A"
G90 Bloc-raccord intermédiaire "B"
G91 Masse capteur de portes AR
G92 Masse coffre à bagages
G93 Masse traverse supérieure de baie de pare-brise
G94 Bloc-raccord compartiment moteur

H INTERRUPTEURS

H1 Interrupteur de frein à main
H2 Interrupteur de feu de recul
H3 Interrupteur de feu de stop
H4 Interrupteur de plafonnier sur montant de porte
H5 Interrupteur de signal de porte AV gauche ouverte
H6 Interrupteur de signal de porte AV droite ouverte
H7 Interrupteur de signal de porte AR gauche ouverte
H8 Interrupteur de signal de porte AR droite ouverte
H9 Interrupteur de plaquette de frein AV droite
H10 Interrupteur de plaquette de frein AV gauche
H11 Interrupteur de plaquette de frein AR droite
H12 Interrupteur de plaquette de frein AR gauche
H13 Interrupteur de starter
H14 Interrupteur d'avance injection
H15 Interrupteur sur BV capteur de niveau d'huile min, (bulbe magnétique)
H16 Interrupteur de consentement démarrage et marche AR
H17 Interrupteur de niveau liquide de frein min.
H18 Interrupteur dans BV pour ralenti accéléré
H19 Interrupteur de pression carburant min.
H20 Interrupteur à inertie
H21 Interrupteur sur pédale d'embrayage pour ralenti accéléré
H22 Micro-interrupteur de commutateur d'allumage
H23 Interrupteur d'éclaireur compartiment moteur
H24 Interrupteur d'éclaireur coffre à bagages
H25 Interrupteur d'éclaireur boîte à gants
H26 Interrupteur sur porte de hayon pour essuie-lunette
H27 Interrupteur sur porte de hayon pour lunette chauffante
H28 Interrupteur - contacts sur carburateur

I RELAIS

I1 Relais motoventilateur de refroidissement moteur
I2 Relais de lunette chauffante
I3 Relais d'avertisseur sonore
I4 Relais d'essuie-phares
I5 Relais auxiliarie pour temporisateur d'essuie-phares
I6 Relais de ralenti accéléré
I7 Relais de coupure alimentation carburant
I8 Relais d'exclusion contact retardé sur distributeur d'allumage
I9 Relais de bougies de préchauffage
I10 Relais de consentement démarrage
I11 Relais de lève-vitres AV-lève-siège
I12 Relais de lève-vitres AV
I13 Relais de lève-vitres AR
I14 Relais de contrôle automatique témoin liquide de freins.
I15 Relais de témoin pression de carburant min.
I16 Relais des phares
I17 Relais des projecteurs anti-brouillard
I18 Relais à double contact
I19 Relais de motopompe lave-phares
I20 Relais de commutation
I21 Relais d'exclusion feux de route
I22 Relais d'exclusion feux de croisement
I23 Relais de motoventilateur supplémentaire de refroidissement moteur

L TRANSMETTEURS

L1 Manocontact de pression carburant min.
L2 Manocontact de pression huile moteur min.
L3 Manocontact de pression d'air max.
L4 Thermocontact d'embrayage électromagnétique de refroidissement moteur
L5 Thermocontact de témoin de température d'eau max.
L6 Thermocontact de motoventilateur de refroidissement moteur
L7 Transmetteur pour thermomètre d'eau
L8 Transmetteur pour manomètre d'huile

L9 Transmetteur pour jauge à carburant
L10 Transmetteur pour thermomètre d'eau et contact température max.
L11 Pressostat d'exclusion contact retardé sur distributeur d'allumage
L12 Capteur de niveau huile moteur
L13 Capteur de niveau liquide de lave-glace
L14 Capteur de niveau d'eau
L15 Capteur de débit carburant
L16 Capteur de compte-tours
L17 Capteur de compteur kilométrique

M ELECTRO-AIMANTS – ELECTRO-VALVES

M1 Electrovalve étouffoir de ralenti
M2 Electrovalve de pompe d'injection
M3 Electroaimant avec micro-interrupteur d'exclusion pompe d'injection
M4 Electroaimant de ralenti accéléré
M5 Emectroaimant de stop moteur
M6 Electroaimant de coupure alimentation carburant
M7 Electroaimant d'ouverture/fermeture des portes
M8 Electrovalve d'air supplémentaire (voiture avec conditionneur)

N DISPOSITIFS ELECTRONIQUES – TEMPORISATEURS

N1 Module d'allumage électronique
N2 Connecteur pour module Marelli
N3 Condensateur pour allumage électronique
N4 Connecteur pour module Bosch
N5 Dispositif d'interrupteur tachymétrique
N6 Temporisateur de préchauffage bougies
N7 Trip computer
N8 Check control
N9 Centrale d'usure plaquettes de freins
N10 Temporisateur de plafonnier
N11 Centrale de condamnation des portes
N12 Temporisateur d'essuie-phares
N13 Centrale clignotante
N14 Temporisateur d'essuie-glaces
N15 Temporisateur d'essuie-glace et contrôle témoins
N16 Centrale tachymétrique
N17 Centrale Trip pour débit carburant
N18 Dispositif électronique de commutation phares et avertisseur lumineux
N19 Moniteur de conduite

O ACCESSOIRES

O1 Lunette chauffante
O2 Avertisseur sonore
O3 Antenne électrique
O4 Autoradio
O5 Haut-parleur
O6 Allume-cigares
O7 Allume-cigares AR

P MOTEURS ELECTRIQUES

P1 Moteur d'essuie-glace
P2 Motoventilateur de refroidissement moteur
P3 Embrayage électromagnétique de refroidissement moteur
P4 Moteur d'essuie-phares
P5 Moteur de réglage siège AV gauche
P6 Moteur de réglage dossier de siège AV droit
P7 Moteur de réglage dossier de siège AV gauche
P8 Moteur de réglage rétroviseur extérieur gauche
P9 Moteur de réglage rétroviseur extérieur droit
P10 Moteur de condamnation porte AV droite
P11 Moteur de condamnation porte AV gauche
P12 Moteur de condamnation porte AR droite
P13 Moteur de condamnation porte AR gauche
P14 Moteur de lève-vitre AV droite
P15 Moteur de lève-vitre AV gauche
P16 Moteur de lève-vitre AR droit
P17 Moteur de lève-vitre AR gauche
P18 Motopompe à carburant
P19 Motopompe de lave-glace
P20 Motopompe de lave-phares
P21 Moteur d'essuie-lunette
P22 Motopompe de lave-lunette
P23 Motoventilateur supplémentaire de refroidissement moteur

Q CLIMATISATION – CONDITIONNEMENT

Q1 Motoventilateur de climatisation
Q2 Commande pneumatique à touche de conditionnement
Q3 Commande pneumatique à touche de climatisation
Q4 Commande motoventilateur de climatisation
Q5 Résistance de réglage vitesse de motoventilateur de climatisation
Q6 Contact sur volet d'air pour branchement motoventilateur de climatisation
Q7 Thermostat à fluide
Q8 Pressostat d'embrayage électromagnétique
Q9 Pressostat de minima
Q10 Pressostat de maxima
Q11 Embrayage électromagnétique de compresseur
Q12 Thermocontact d'exclusion embrayage électromagnétique de compresseur
Q13 Motoventilateur supplémentaire de conditionnement
Q14 Relais de motoventilateur supplémentaire de conditionnement et embrayage électromagnétique de compresseur
Q15 Relais de motoventilateur de climatisation
Q16 Relais de branchement simultané motoventilateur de refroidissement moteur et motoventilateur supplémentaire
Q17 Relais de branchement simultané embrayage électromagnétique de refroidissement moteur et motoventilateur supplémentaire

R DISPOSITIFS DE SECURITE

R1 Dispositif ceintures de sécurité
R2 Dispositif indicateur de température de pot d'échappement catalyptique
R3 Thermocouple capteur de température de pot d'échappement catalyptique
R4 Alarme acoustique ceinture de sécurité détachée
R5 Alarme acoustique de porte ouverte
R6 Dispositif compteur de milles
R7 Lampe-témoin des ceintures de sécurité
R8 Lampe-témoin signal des 30.000 milles
R9 Interrupteur à touche sur ceintures de sécurité
R10 Lampe-témoin d'alarme surchauffe de pot d'échappement catalyptique

S INJECTION ELECTRONIQUE

S1 Centrale d'injection
S2 Relais combiné
S3 Electro-injecteur
S4 Electro-injecteur de départ à froid
S5 Débitmètre d'air
S6 Interrupteur sur papillon
S7 Capteur de température d'eau moteur
S8 Thermo-interrupteur temporisé
S9 Dispositif d'air additionnel
S10 Sonde lambda
S11 Centrale Motronic
S12 Relais Motronic
S13 Capteur de calage
S14 Capteur de régime de rotation
S15 Correcteur d'avance

ERLÄUTERUNG FÜR DIE SCHALTPLÄNEN

VERZEICHNIS

A : ANLASSEN – AUFLADEN
B : ELEKTRISCHE BEDIENUNGSSCHALTER
C : BORDINSTRUMENTE
D : KONTROLLEUCHTEN – WARNLEUCHTEN
E : AUSSENBELEUCHTUNG
F : INNENBELEUCHTUNG
G : SICHERUNGSKASTEN – KABELVERBINDUNG – MASSEANSCHLÜSSE
H : SCHALTER
I : RELAIS
L : GEBER
M : ELEKTROMAGNETE – ELEKTROVENTILE
N : ELEKTRONISCHE VORRICHTUNGEN – INTERVALLSCHALTER – ZEIT-SCHALTER
O : VERBRAUCHER
P : ELEKTROMATOREN
Q : BELÜFTUNGSANLAGE – KLIMAANLAGE
R : SICHERHEITSVORRICHTUNGEN
S : ELEKTRONISCHE EINSPRITZUNG

KABELFARBEN

B	Weiß	C	Orange	VN	Grün-Schwarz	AR	Blau-Rot
N	Schwarz	Z	Violett	RN	Rot-Schwarz	HG	Grau-Gelb
A	Hell-Blau	SN	Rosa-Schwarz	CN	Orange-Schwarz	SB	Rosa-Weiß
M	Braun	HN	Grau-Schwarz	AB	Blau-Weiß	GR	Gelb-Rot
G	Gelb	BN	Weiß-Schwarz	HR	Grau-Rot	AG	Blau-Gelb
R	Rot	AN	Blau-Schwarz	HV	Grau-Grün	VB	Grün-Weiß
V	Grün	GN	Gelb-Schwarz	GV	Gelb-Grün	MB	Braun-Weiß
H	Grau	No	Hell braun	CB	Orange-Weiß	ZN	Violet-Schwarz
S	Rosa	BL	Blau	BR	Weiß-Rot	Br	Dunkel braun

Anmerkung: Wenn nicht anders angegeben, Kabelquerschnitt 0,5 mm².

A ANLASSEN – AUFLADEN

A1 Batterie
A2 Alternator
A3 Alternator mit eingebautem elektronischem Spannungsregler
A4 Spannungsregler
A5 Zündverteiler
A6 Impulsgeber
A7 Rotor
A8 Zündspule
A9 Widerstand für die Zündspule
A10 Zweifachverbindung für die Zündspule
A11 Anlasser
A12 Zündkerzen
A13 Glühkerzen
A14 Klemmenbrett für die Alternatorkabel

B ELEKTRISCHE BEDIENUNGSSCHALTER

B1 Zündanlasschalter
B2 Schalter für den Scheibenwischer
B3 Schalter für die Pumpe der Scheiben - und/oder Scheinwerferreinigungsanlage
B4 Schalter für Standlicht, Lichthupe, Abblendlicht und Fernlicht
B5 Bedienungsschalter für die Signalhörner
B6 Schalter für die Fahrtrichtungsanzeiger
B7 Schalter zur Bedienung der Lichthupe mittels Abblendlicht
B8 Schalter zur Bedienung der Lichthupe mittels Fernlicht
B9 Bedienungsschalter für die Heckscheibenheizung
B10 Bedienungsschalter für die Nebelscheinwerfer
B11 Bedienungsschalter für die Nebelschlussleuchte
B12 Bedienungsschalter für die Warnblinkanlage
B13 Bedienungsschalter für die Innenraumleuchte vorne
B14 Bedienungsschalter für die Innenraumleuchte hinten
B15 Bedienungsschalter für die Innenraumleuchte
B16 Helligkeitsregler für die Instrumentenbeleuchtung
B17 Schalter für die Getriebeölstand-Kontrolleuchte
B18 Türverriegelungsschalter vorne rechts
B19 Türverriegelungsschalter vorne links
B20 Türverriegelungsschalter, innen
B21 Bedienungsschalter für den elektrischen Fensterheber vorne rechts
B22 Bedienungsschalter für den elektrischen Fensterheber vorne links
B23 Bedienungsschalter für den elektrischen Fensterheber hinten rechts
B24 Bedienungsschalter für den elektrischen Fensterheber hinten links
B25 Sperrschalter für die elektrischen Fensterheber hinten
B26 Sperrschalter für die elektrischen Fensterheber hinten und den Zigarettenanzünder hinten
B27 Bedienungsschalter zur Höhenverstellung des Vordersitzes
B28 Bedienungsschalter zur Einstellung der Sitzlehne vorne links
B29 Bedienungsschalter zur Einstellung der Sitzlehne vorne rechts
B30 Bedienungsschalter für den elektrischen Aussenrückspiegel
B31 Bedienungsschalter für die elektrische Antenne
B32 Schalter für die Scheibenwaschpumpe
B33 Schalter für Leseleuchte vorne
B34 Schalter für Leseleuchte hinten links
B35 Schalter für Leseleuchte hinten rechts
B36 Doppelschalter zur Bedienung der elektrischen Aussenrückspiegel
B37 Bedienungsschalter für das Standlicht
B38 Bedienungsschalter für den Heckscheibenwischer

C BORDINSTRUMENTE

C1 Elektronischer Drehzahlmesser
C2 Elektronischer Tachometer
C3 Voltmeter
C4 Kraftstoffstandanzeige
C5 Öldruckmesser
C6 Kühlwassertemperaturanzeiger
C7 Uhr
C8 Raum für den einbau eines zusätzlichen instruments
C9 Turbolader-luftdruckanzeiger

D KONTROLLEUCHTEN – WARNLEUCHTEN

D1 Alternator-Warnleuchte
D2 Kontrolleuchte für den Fahrtrichtungsanzeiger
D3 Kontrolleuchte für das Standlicht
D4 Kontrolleuchte für das Fernlicht
D5 Kontrolleuchte für den Bremsflüssigkeitsstand
D6 Kontrolleuchte für das Belüftungsgeblase
D7 Kontrolleuchte für die Handbremse
D8 Kontrolleuchte für die Kraftstoffreserve
D9 Starter-kontrolleuchte (choke)
D10 Warnleuchte für Bremsflüssigkeitsstand und angezogene Handbremse
D11 Öldruck-Warnleuchte
D12 Kontrolleuchte für die Glühkerzen-Vorwärmung
D13 Kühlwassertemperatur-Warnleuchte
D14 Luftdruck-Warnleuchte
D15 Benzindruck-Warnleuchte
D16 Freie Kontrolleuchte
D17 Kontrolleuchte für die Gangschalthebelstellung
D18 Kontrolleuchte für die Einspritz-Vorverstellung
D19 Kontrolleuchte für den Bremsbelagverschleiss

E AUSSENBELEUCHTUNG

E1 Lampe für den Fahrtrichtungsanzeiger vorne
E2 Lampe für das Standlicht vorne
E3 Lampe für den Fahrtrichtungsanzeiger und das Standlicht vorne
E4 Lampe für side-marker vorne
E5 Lampe für das Abblendlicht
E6 Lampe für das Abblendlicht mit eingebautem Standlicht
E7 Lampe für das Fernlicht
E8 Lampe für das Abblendlicht und Fernlicht
E9 Lampe für den seitlichen Blinkgeber
E10 Lampe für den Nebelscheinwerfer
E11 Lampe für den Fahrtrichtungsanzeiger hinten
E12 Lampe für side-marker hinten
E13 Lampe für das Standlicht hinten
E14 Lampe für den Rückfahrscheinwerfer
E15 Lampe für das Bremslicht
E16 Lampe für die Nebelschlussleuchte
E17 Lampe für die Kennzeichenleuchte
E18 Lampe für das Bremslicht und das Standlicht hinten

F INNENBELEUCHTUNG

F1 Innenraumleuchte vorne
F2 Innenraumleuchte hinten
F3 Innenraumleuchte
F4 Motorraumleuchte
F5 Kofferraumleuchte
F6 Türöffnungsleuchte
F7 Lampe für Sicherungskastenbeleuchtung
F8 Beleuchtung für die Bedienungschalter der Belüftungs-oder Klimaanlage
F9 Innenraumleuchte-Handschuhfachbeleuchtung
F10 Lampe für die Aschenbecherbeleuchtung
F11 Leselampe
F12 Lampe für die Instrumentenbrettbeleuchtung
F13 Leseleuchte vorne
F14 Leseleuchte hinten rechts
F15 Leseleuchte hinten links
F16 Lampe für die Zündschlossbeleuchtung
F17 Lampe für die Schalterbeleuchtung

G SICHERUNGSKASTEN -KABELVERBINDUNGEN MASSEANSCHLÜSSE

G1 Sicherungskasten
G2 Zusätzlicher Sicherungskasten
G3 Klemme im Sicherungskasten
G4 Fliegende Sicherung
G5 Mehrfachverbindung
G6 Mehrfachverbindung B Instrumentenbrett
G7 Mehrfachverbindung R Instrumentenbrett
G8 Einfachverbindung
G9 Kabelverbindung vom Kabelbaum der linken Vordertür zum spiegelschalter
G10 Kabelverbindung vom Kabelbaum der rechten Vordertür zum Spiegelschalter
G11 Kabelverbindung vom Zentralkabelbaum zur hinteren Verkabelung

G12 Kabelverbindung vom Zentralkabelbaum zum Spiegelschalter
G13 Kabelverbindung vom Zentralkabelbaum zur Verkabelung
G14 Dreiweg-Verbindung vom Zentralkabelbaum zur Türen-Verkabelung
G15 Zweiweg-Verbindung vom Zentralkabelbaum zur Türen-Verkabelung
G16 Sechsweg-Verbindung vom Zentralkabelbaum zur Türen-Verkabelung
G17 Kabelverbindung vom Zentralverkabelung zur Verkabelung der rechten Vordertür
G18 Kabelverbindung vom Zentralverkabelung zur Verkabelung der linken Vordertür
G19 Kabelverbindung vom Zentralkabelbaum zur Innenraumleuchte
G20 Kabelverbindung zum Elektromotor der Türverriegelung vorne rechts
G21 Kabelverbindung zur Verkabelung der rechten Vordertür
G22 Kabelverbindung zum Elektromotor der Türverriegelung vorne links
G23 Kabelverbindung zur Verkabelung der linken Vordertür
G24 Kabelverbindung zum Elektromotor der Türverriegelung hinten rechts
G25 Kabelverbindung zur Verkabelung der rechten Hintertür
G26 Kabelverbindung zum Elektromotor der Türverriegelung hinten links
G27 Kabelverbindung zur Verkabelung der linken Hintertür
G28 Kabelverbindung von der Verkabelung der rechten Vordertür zum Fensterheberschalter
G29 Kabelverbindung, Verkabelung der Türverriegelungen und der Fensterheber hinten
G30 Kabelverbindung zu den Fensterhebern und Türverriegelungen
G31 Kabelverbindung von der Verkabelung der linken Vordertür zum Fensterheberschalter
G32 Kabelverbindung Verkabelung der Konsole und Verkabelung der rechten Hintertür
G33 Kabelverbindung Verkabelung der Konsole und Verkabelung der linken Hintertür
G34 Kabelverbindung zu den elektrischen Fensterhebern
G35 Kabelverbindung hintere Verkabelung zur Verkabelung der Heckleuchte hinten rechts
G36 Kabelverbindung zu den Fensterheberschalter
G37 Kabelverbindung zum Scheibenwischer-Kombischalter
G38 Kabelverbindung zur Verkabelung der Klimaanlage
G39 Kabelverbindung zur Uhr
G40 Kabelverbindung zur Zentraltürverriegelung
G41 Kabelverbindung zum Tachoschalter-Impulsgeber des Drehzahlmessers
G42 Kabelverbindung zum Alternator-Mindestöldruckschalter
G43 Kabelverbindung zu der Belüftungsbedienung
G44 Kabelverbindung zur Nebelschlussleuchte
G45 Kabelverbindung zur Scheinwerferreinigungsanlage
G46 Kabelverbindung zu den Scheinwerfern
G47 Kabelverbindung zum seitlichen blinker rechts
G48 Kabelverbindung zum elektrischen Spiegel-Seitl. blinker links
G49 Verfügbare Kabelverbindung
G50 Lautsprecherverkabelung
G51 Verkabelung für den radioanschluss
G52 Masseanschluss im Sicherungskasten
G53 Masseanschluss im Motorraum
G54 Masseanschluss im Innenraum
G55 Seitliche Masseanschluss
G56 Klemmenbrett für Kabelabzweigungen
G57 Verkabelung für Leerlaufabschaltung-Elektroventil
G58 Kabelverbindung zum Zigarettenanzünder
G59 Kabelverbindung zum elektrischen Aussenrückspiegel
G60 Masseanschluss für die Verkabelung der Einspritzanlage
G61 Kabelverbindung zur Zündspule
G62 Kabelverbindung zum Kupplungsschalter
G63 Masseanschluss hinten
G64 Kabelverbindung zum Bordcomputer-Uhr
G65 Abschirmkabel
G66 Masseanschluss für die Verkabelung des Motronik-Systems
G67 Kabelverbindung zum Motronik-System
G68 Kabelverbindung 'A zum Zentralkabelbaum
G69 Kabelverbindung 'B zum Zentralkabelbaum
G70 Kabelverbindung 'C zum Zentralkabelbaum
G71 Kabelverbindung zur Kontrolleuchte auf den Bordinstrumenten
G72 Kabelverbindung zur Verkabelung des Sitzlehnen-Einstellmechanismus
G73 Kabelverbindung zu den Verbraucher hinten
G74 Kabelverbindung zur hinteren Verkabelung des Televel-Check
G75 Kabelverbindung zu den Verbraucher am Wagendach rechts und links
G76 Kabelverbindung zu den Verbrauchern an den Wagendecke rechts
G77 Kabelverbindung zu den Verbraucher an den Wagendecke links
G78 Kabelverbindung Verkabelung der Verbraucher der Vordertüren
G79 Kabelverbindung Verkabelung der Verbraucher der Hintertüren
G80 Kabelverbindung Zentralkabelbaum
G81 Kabelverbindung zum Einstellmechanismus der Sitzlehne vorne links
G82 Kabelverbindung zum Einstellmechanismus der Sitzlehne vorne rechts
G83 Hintere Kabelverbindung für Schnelleerlauf
G84 Kabelverbindung zur Konsole
G85 Kabekverbindung der Verbraucher, vorne
G86 Kabelverbindung zur Verkabelung der Innenbeleuchtung
G87 Kabelverbindung zu E-Motoren der Türverriegelungen, hinten
G88 Kabelverbindung zur Heckbeleuchtung
G89 Zwischenkabelverbindung "A"
G90 Zwischenkabelverbindung "B"
G91 Masseanschluss der Geber, Türen hinten
G92 Masseanschluss, Kofferraum
G93 Masseanschluss, obere Querträger der Frontscheibe
G94 Kabelverbindung Motorraum

H SCHALTER

H1 Schalter für die Handbremse
H2 Schalter für den Rückfahrscheinwerfer
H3 Schalter für das Bremslicht
H4 Schalter auf der Türpfosten für die Innenraumleuchte
H5 Schalter für die Kontrolleuchte bei offener Vordertür links
H6 Schalter für die Kontrolleuchte bei offener Vordertür rechts
H7 Schalter für die Kontrolleuchte bei offener Hintertür links
H8 Schalter für die Kontrolleuchte bei offener Hintertür rechts
H9 Schalter für den Bremsbelag Verschleiss vorne rechts
H10 Schalter für den Bremsbelag Verschleiss vorne links
H11 Schalter für den Bremsbelag Verschleiss hinten rechts
H12 Schalter für den Bremsbelag Verschleiss hinten links
H13 Schalter für den Starter (Choke)
H14 Schalter für die Einspritzvorverstellung
H15 Schalter im Getriebe für die Ölmindeststandanzeige (Magn. Kolben)
H16 Zustimmungsschalter für den Anlassvorgang und die Schalter für die Rückfahrscheinwerfer
H17 Schalter für die Warnleuchte des Bremsflüssigkeitsmindeststandes
H18 Schalter im Getriebe für Schnelleerlauf
H19 Schalter für den Benzinmindestdruck
H20 Inertialschalter
H21 Schalter für den Schnelleerlauf auf dem Kupplungspedal
H22 Mikroschalter am Zündschloss
H23 Schalter für die Motorraumbeleuchtung
H24 Schalter für die Kofferraumbeleuchtung
H25 Schalter für die Handschuhfachbeleuchtung
H26 Kontaktschalter auf der Hecklappe für den Heckscheibenwischer
H27 Kontaktschalter an der Heckklappe für die Heckscheibenheizung
H28 Schalter-Kontakte auf dem Vergaser

I RELAIS

I1 Relais für den Kühlerventilator
I2 Relais für die Heckscheibenheizung
I3 Relais für die Signalhörner
I4 Relais für die Scheinwerferreinigungsanlage

I5 Zuzatzrelais für den Zeitgeber der Scheinwerfer-reinigungsanlage
I6 Relais für den Schnelleerlauf
I7 Relais für das Kraftstoff-Sperrventil
I8 Relais zum Abschalten der Spät zündkontakt
I9 Relais für die Glühkerzen
I10 Sperrelais für den Anlassvorgang
I11 Relais für die elektrischen Fensterheber vorne-Sitz-höhenverstellung
I12 Relais für die elektrischen Fensterheber vorne
I13 Relais für die elektrischen Fensterheber hinten
I14 Relais für die automatische Kontrolle der Brems-flüssigkeit
I15 Relais für die Benzinmindestdruck-Warnleuchte
I16 Relais für die Scheinwerfer
I17 Relais für die Nebelscheinwerfer
I18 Relais mit Zweifachkontakt
I19 Relais für die Elektropumpe der Scheinwerferreinungs-anlage
I20 Schaltrelais
I21 Relais zum Ausschalten des Fernlichts
I22 Relais zum Ausschalten des Abblendlichts
I23 Relais für das Zusätzliche Gebläse des Kühlerventi-lators

L GEBER

L1 Druckschalter für den Benzinmindestdruck
L2 Druckschalter für den Motorölmindestdruck
L3 Druckschalter für den Maximalen Luftdruck
L4 Thermoschalter für die elektromagnetische Kupplung des Kühlventilators
L5 Thermoschalter für Kühlflüssigkeits temperature-Warn-leuchte
L6 Thermoshalter für den Kühlerventilator
L7 Geber für die Kühlflüssigkeitstemperatur
L8 Geber für die Öldruckanzeige
L9 Geber für die Kraftstoffstand-Anzeige
L10 Geber für die Kühlflüssigkeitstemperatur-Anzeige und Kontakt für die Kühlflüssigkeitstemperatur-Warnleuchte
L11 Druckschalter zum Abschalten des Spätzündkontakt
L12 Fühler für den Motorölstand
L13 Fühler für den Flüssigkeitsstand in der Scheiben-waschanlage
L14 Fühler für den Kühlflüssigkeitsstand
L15 Fühler für die Benzinzufuhr
L16 Impulsgeber für den Drehzahlmesser
L17 Impulsgeber für den Kilometerzähler

M ELEKTROMAGNETE-ELEKTROVENTILE

M1 Elektroventil für Leerlaufabschaltung
M2 Elektroventil für die Einspritzpumpe
M3 Elektromagnet mit Mikroschalter zum Ausschalten der Einspritzpumpe
M4 Elektromagnet für Schnelleerlauf
M5 Elektromagnet zum Abschalten des motors
M6 Elektromagnet zum Abschalten der Kraftstoff-Zufuhr
M7 Elektromagnet für die Ent-und Verriegelung der Türen
M8 Zusatzluftventil (Fahrzeuge mit Klimaanlage)

N ELEKTRONISCHE VORRICHTUNGEN INTERVALLSCHALTER – ZEITSCHALTER

N1 Steuergerät für die elektronische Zündung
N2 Kabelverbindung für Steuergerät (Marelli)
N3 Kondensator für die elektronische Zündung
N4 Kabelverbindung für Steuergerät (Bosch)
N5 Schaltvorrichtung für den Tachometer
N6 Zeitschalter für die Vorwärmung der Glühkerzen
N7 Bordcomputer
N8 Check-Control
N9 Schaltgerät für den Verschleiss der Bremsbeläge
N10 Zeitschalter für die Innenraumbeleuchtung
N11 Zentraltürverriegelung
N12 Zeitschalter für die Scheinwerferwischer
N13 Blinkgeber für die Warnblinkanlage und die Fahrt-richtungsanzeiger
N14 Elektronische Intervallschaltung für den Scheiben-wischer
N15 Elektronische Intervallschaltung für den Scheiben-wischer und die Warnleuchten
N16 Tachometer Steuergerät
N17 Steuergerät des Bordcomputers für den Kraftstoff-verbrauch
N18 Elektronische Umschaltvorrichtung der Scheinwerfer und Lichthupe
N19 Fahrüberwachungsvorrichtung

O VERBRAUCHER

O1 Geheizte Hecksheibe
O2 Signalhorn
O3 Elektrische Antenne
O4 Autoradio
O5 Lautsprecher
O6 Zigarettenanzünder
O7 Zigarettenanzünder hinten

P ELEKTROMOTOREN

P1 E-Motor für den Scheibenwischer
P2 Kühlerventilator
P3 Elektromagnetische Kupplung für das Kühlventilator
P4 E-Motor für die Scheinwerferwischer
P5 E-Motor für die Sitzhöhenverstellung, vorne, links
P6 E-Motor für die Sitzehnenverstellung, vorne, rechts
P7 E-Motor für die Sitzehnenverstellung, vorne, links
P8 E-Motor für den Aussenrückspiegel links
P9 E-Motor für den Aussenrückspiegel rechts
P10 E-Motor für den Türverriegelungsmechanismus vorne rechts
P11 E-Motor für den Türverriegelungsmechanismus vorne links
P12 E-Motor für den Türverriegelungsmechanismus hinten rechts
P13 E-Motor für den Türverriegelungsmechanismus hinten links
P14 E-Motor für den Fensterheber vorne rechts
P15 E-Motor für den Fensterheber vorne links
P16 E-Motor für den Fensterheber hinten rechts
P17 E-Motor für den Fensterheber hinten links
P18 Elektrische Kraftstoffpumpe
P19 Elektrische Scheibenwaschpumpe
P20 Elektrische Waschpumpe für die Scheinwerferreini-gungsanlage
P21 E-Motor für den Heckscheibenwischer
P22 Elektrische Scheibenwaschpumpe hinten
P23 Zusätzlicher Kühlerventilator

Q KLIMAANLAGE – BELÜFTUNGSANLAGE

Q1 Elektroventilator für die Klimaanlage
Q2 Schaltknopf für die Pneumatische Betätigung der Klimaanlage
Q3 Schaltknopf für die Pneumatische Betätigung der Belüftungsanlage
Q4 Betätigungsschalter für den Elektroventilator der Belüftungsanlage
Q5 Widerstand für die Stufenregelung des Elektroventi-lators der Belüftungsanlage
Q6 Schaltknopf auf der Klappe zum Einschalten des Elektroventilators der Belüftungsanlage
Q7 Flüssigkeitsthermostat
Q8 Druckschalter für die Elektromagnetische Kupplung
Q9 Unterdruckschalter
Q10 Überdruckschalter
Q11 Elektromagnetische Kupplung des Kompressors
Q12 Thermokontakt zum Ausschalten der Elektromagne-tischen Kupplung des Kompressors
Q13 Zusätzlicher Elektroventilator für die Klimaanlage
Q14 Relais für den Zusätzlichen Elektroventilator der Klimaanlage und die elektromagnetische Kupplung des Kompressors
Q15 Relais für den elektroventilator der Belüftungsanlage
Q16 Relais zur gleichzeitigen Betätigung des Kühler-ventilators und des Zusätzlichen Elektroventilators
Q17 Relais für die Gleichzeitige Betätigung der Elektro-magnetischen Kupplung des Kühlsystems und des Zusätzlichen Elektroventilators

R SICHERHEITSVORRICHTUNGEN

R1 Sicherheitsgurtenvorrichtung
R2 Vorrichtung zur Anzeige der Temperatur des Kata-lysators

R3 Thermoelement für die Messung der Temperatur des Katalysators
R4 Summtongeber bei nicht umgelegten Sicherheitsgurten
R5 Summtongeber bei offener Tür
R6 Meilenzähler
R7 Kontrolleuchte bei nicht umgelegten Sicherheitsgurten
R8 30.000-meilen-Kontrolleuchte
R9 Schalter an den Sicherheitsgurtenschlösser
R10 Warnleuchte für die Höchsttemperatur des Katalysators

S ELEKTRONISCHE EINSPRITZUNG

S1 Steuergerät für die Einspritzanlage
S2 Kombi Relais
S3 Elektronisches Einspritzventil
S4 Elektronisches Kaltstartventil
S5 Luftmengenmesser
S6 Drosselklappenschalter
S7 Kühlflüssigkeitstemperatur-Fühler
S8 Thermozeitschalter
S9 Zusatzluftscheiber
S10 λ Sonde
S11 Steuergerät für das Motronik-System
S12 Relais für das Motronik-System
S13 Fühler für die Zündeinstellung
S14 Drehzahlfühler
S15 Zündversteller

KEY TO WIRING DIAGRAMS

A. STARTING – CHARGING
B. MANUAL ELECTRICAL CONTROLS
C. INSTRUMENTS
D. WARNING LAMPS
E. EXTERNAL LIGHTS
F. INTERIOR LIGHTS
G. FUSE HOLDERS – EARTH CONNECTIONS – CONNECTORS
H. SWITCHES
I. RELAYS
L. SENDERS
M. ELECTROMAGNETS – SOLENOID VALVES
N. ELECTRONIC DEVICES – INTERMITTENCE – TIMERS
O. ANCILLARY EQUIPMENT
P. ELECTRIC MOTORS
Q. HEATING/VENTILATION – AIR CONDITIONING SYSTEM
R. SAFETY DEVICES
S. ELECTRONIC FUEL INJECTION

CABLE COLOUR CODE

B	White	C	Orange	VN	Green-Black	AR	Sky blue-Red
N	Black	Z	Violet	RN	Red-Black	HG	Grey-Yellow
A	Sky blue	SN	Pink-Black	CN	Orange-Black	SB	Pink-White
M	Brown	HN	Grey-Black	AB	Sky blue-White	GR	Yellow-Red
G	Yellow	BN	White-Black	HR	Grey-Red	AG	Sky blue-Yellow
R	Red	AN	Sky blue-Black	HV	Grey-Green	VB	Green-White
V	Green	GN	Yellow-Black	GV	Yellow-Green	MB	Brown-White
H	Grey	No	Hazel brown	CB	Orange-White	ZN	Violet-Black
S	Pink	BL	Blue	BR	White-Red	Br	Dark brown

Note: Cross sectional area of leads is 0.5 mm unless otherwise indicated

A STARTING – CHARGING

- A1 Battery
- A2 Alternator
- A3 Alternator with integral electronic voltage regulator
- A4 Voltage regulator
- A5 Ignition distributor
- A6 Impulse generator
- A7 Rotor
- A8 Ignition coil
- A9 Coil resistor
- A10 2-way connector for coil
- A11 Starter motor
- A12 Spark plugs
- A13 Glow plugs
- A14 Alternator cable terminal board

B MANUAL ELECTRICAL CONTROLS

- B1 Ignition switch
- B2 Windscreen wiper control
- B3 Windscreen and/or headlamp washer pump control
- B4 Control for side lights, flashing, low full beam headlamps
- B5 Horn control switch
- B6 Direction indicators control
- B7 Low beam flashing control switch
- B8 Full beam flashing control switch
- B9 Heated rear screen control switch
- B10 Fog lamp control switch
- B11 Rear fog lamp control switch
- B12 Road hazard lights control switch
- B13 Front courtesy light control switch
- B14 Rear courtesy light control switch
- B15 Courtesy light control switch
- B16 Panel lighting dimmer rheostat
- B17 Gearbox oil level warning lamp switch
- B18 Front right door locking switch
- B19 Front left door locking 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 control switch
- B28 Front left backrest control switch
- B29 Front right backrest control switch
- B30 Door mirror control switch
- B31 Antenna control switch
- B32 Windscreen washer pump control
- B33 Front spot switch
- B34 Rear left spot switch
- B35 Rear right spot switch
- B36 Door mirror double control switch
- B37 Side light control switch
- B38 Rear screen wiper control switch

C INSTRUMENTS

- C1 Electronic rev-counter
- C2 Electronic speedometer
- C3 Voltmeter
- C4 Fuel level gauge
- C5 Oil pressure gauge
- C6 Water temperature gauge
- C7 Clock
- C8 Space free for instrument
- C9 Turbocharger air pressure gauge

D WARNING LAMPS

- D1 Alternator warning lamp
- D2 Direction indicator warning lamp
- D3 Side light warning lamp
- D4 Full beam warning lamp
- D5 Brake fluid low level warning lamp
- D6 Heater fan warning lamp
- D7 Handbrake warning lamp
- D8 Fuel reserve warning lamp
- D9 Choke warning lamp
- D10 Handbrake fluid level warning lamp
- D11 Engine oil minimum pressure warning lamp
- D12 Pre-heating glow plug warning lamp
- D13 Engine water high temperature warning lamp
- D14 Maximum air pressure warning lamp
- D15 Minimum fuel pressure warning lamp
- D16 Warning lamp free
- D17 Gear position warning lamp
- D18 Manual injection advance warning lamp
- D19 Brake pad wear warning lamp

E EXTERNAL LIGHTS

- E1 Front direction indicator light
- E2 Front side light
- E3 Front direction indicator and side light
- E4 Front side marker light
- E5 Low beam light
- E6 Low beam light with incorporated side light
- E7 Full beam light
- E8 Low and full beam light
- E9 Side repeater
- E10 Fog light
- E11 Rear direction indicator
- E12 Rear side marker light
- E13 Rear side light
- E14 Reversing light
- E15 Stop light
- E16 Rear fog lamp
- E17 Numberplate light
- E18 Stop and rear side light

F INTERIOR LIGHTS

- F1 Front courtesy light
- F2 Rear courtesy light
- F3 Courtesy light
- F4 Bonnet light
- F5 Boot light
- F6 Open-door signalling light
- F7 Fuse light
- F8 Heater controls light
- F9 Glovebox light
- F10 Ashtray light
- F11 Map light
- F12 Panel light
- F13 Front spot
- F14 Rear right spot
- F15 Rear left spot
- F16 Ignition switch light
- F17 Switch illumination light

G FUSE HOLDERS – CONNECTORS EARTH CONNECTIONS

- G1 Fusebox
- G2 Auxiliary fuse box
- G3 Fuse box terminal
- G4 In-line fuse holder
- G5 Multiple connector
- G6 Multiple connector B panel
- G7 Multiple connector R panel
- G8 Single connector
- G9 Connector between front left door loom and mirror switch
- G10 Connector between front right door loom and mirror switch
- G11 Connector between main harness and rear loom
- G12 Connector between main harness and mirror switch
- G13 Connector between main harness and console wiring loom

G14 3-way connector between main harness and door loom
G15 2-way connector between main harness and door loom
G16 6-way connector between main harness and door loom
G17 Connector between main harness and front right door loom
G18 Connector between main harness and front left door loom
G19 Connector between main harness and courtesy light
G20 Connector for front right door locking motor
G21 Connector for front right door loom
G22 Connector for front left door locking motor
G23 Connector for front left door loom
G24 Connector for rear right door locking motor
G25 Connector for rear right door loom
G26 Connector for rear left door locking motor
G27 Connector for rear left door loom
G28 Connector between front right door loom and window switch
G29 Connector between central door locking loom and rear window lift loom
G30 Connector for window lifts and central door locking system looms
G31 Connector between front left door loom and window switch
G32 Connector for console loom and rear right door loom
G33 Connector for console loom and rear left door loom
G34 Connector for power window supply wire
G35 Connector for rear loom and rear right light loom
G36 Connector for power window switch cables
G37 Connector for multiswitch on steering column
G38 Connector for conditioner loom
G39 Connector for clock
G40 Connector for central door locking system
G41 Connector for tachymetric inhibitor switch - rev counter impulse generator
G42 Connector for alternator-engine oil minimum pressure switch
G43 Connector for heater control cables
G44 Connector for rear fog light
G45 Connector for headlight wiper/washer cables
G46 Connector for headlights
G47 Connector for right side repeater cables
G48 Connector for remote control mirror-left side repeater cables
G49 Provision for connection
G50 Provision for speaker
G51 Provision for radio
G52 Fusebox earth
G53 Engine compartment earth
G54 Passenger compartment earth
G55 Inner wing panel earth
G56 Branch terminal board
G57 Provision for idle petrol supply cutoff solenoid valve
G58 Cigar lighter connector
G59 Door mirror connector
G60 Injection loom earth
G61 Ignition coil connector
G62 Clutch switch connector
G63 Rear earth
G64 Clock-trip computer connector
G65 Coaxial cable
G66 Motronic loom earth
G67 Motronic connector
G68 Connection "A" with cabling loom
G69 Connection "B" with cabling loom
G70 Connection "C" with cabling loom
G71 Connector for warning lamp on instruments
G72 Connector for backrest adjustment device loom
G73 Connector for rear ancillary services loom
G74 Connector for fuel level sender - check control rear loom
G75 Connector for right and left roof panel ancillary services
G76 Connector for right roof panel ancillary services
G77 Connector for left roof panel ancillary services
G78 Connector for front door ancillary services loom
G79 Connector for rear door ancillary services loom
G80 Main cabling loom connector
G81 Connector for front left backrest adjustment device loom
G82 Connector for front right backrest adjustment device loom
G83 Rear connector for fast-idle device
G84 Connector for console loom
G85 Connector for front ancillary services
G86 Connector for courtesy light
G87 Connector rear door locking motor
G88 Connector for tail lights
G89 Intermediate connection "A"
G90 Intermediate connection "B"
G91 Earth connection for rear door sensors
G92 Luggage compartment earth
G93 Windscreen bow earth
G94 Engine compartment connection

H SWITCHES

H1 Handbrake switch
H2 Reversing light switch
H3 Stop light switch
H4 Courtesy light switch on pillar
H5 Left front door open indicator switch
H6 Right front door open indicator switch
H7 Left rear door open indicator switch
H8 Right rear door open indicator switch
H9 Right front brake pad switch
H10 Left front brake pad switch
H11 Right rear brake pad switch
H12 Left rear 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 Bonnet light switch
H24 Boot light switch
H25 Glovebox light switch
H26 Switch on rear door for rear screen wiper
H27 Switch on rear door for heated rear screen
H28 Carburettor contact/switch

I RELAYS

I1 Engine cooling fan relay
I2 Heated rear screen relay
I3 Horn relay
I4 Headlight wiper relay
I5 Auxiliary relay for headlight wiper timer
I6 Fast idle relay
I7 Fuel pipe closing relay
I8 Relay excluding retarded rotor arm
I9 Glow plug relay
I10 Starter 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 lamp 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 fan relay

L SENDERS

L1 Low fuel pressure switch
L2 Low oil pressure switch
L3 High air pressure pressure-switch
L4 Thermoswitch for engine cooling fan electromagnetic drive

L5 Thermoswitch for engine water high temperature warning lamp
L6 Thermoswitch for engine cooling fan
L7 Water temperature gauge sender
L8 Oil pressure gauge sender
L9 Fuel level gauge sender
L10 Water temperature gauge sender and temperature warning light switch
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 impulse generator
L17 Speedometer impulse generator

M SOLENOIDS – SOLENOID VALVES

M1 Idle petrol supply cutout solenoid valve
M2 Injection pump solenoid valve
M3 Solenoid with injection pump fuel cutoff microswitch
M4 Fast idle solenoid
M5 Engine stop solenoid
M6 Fuel pipe closing electromagnet
M7 Door opening/closing electromagnet
M8 Supplementary air valve (for A/C equipped car)

N ELECTRONIC DEVICES – INTERMITTENCE – TIMERS

N1 Electronic ignition module
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 Check control
N9 Brake pad wear unit
N10 Courtesy light timer
N11 Central door locking 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 Tachometric unit
N17 Trip unit for fuel flow
N18 Electronic device for headlamps and flashing
N19 Performance gauge

O ANCILLARY EQUIPMENT

O1 Heated rear screen
O2 Horn
O3 Electrically-operated antenna
O4 Radio
O5 Speaker
O6 Cigar lighter
O7 Rear cigar lighter

P ELECTRIC MOTORS

P1 Windscreen wiper motor
P2 Engine cooling fan motor
P3 Engine cooling 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 Left remote control rearview mirror motor
P9 Right remote control rearview mirror motor
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
P18 Fuel pump motor
P19 Windscreen washer pump
P20 Headlight washer pump
P21 Rear screen wiper motor
P22 Rear screen washer pump motor
P23 Supplementary engine cooling fan motor

Q HEAT/VENT – AIR CONDITIONING SYSTEM

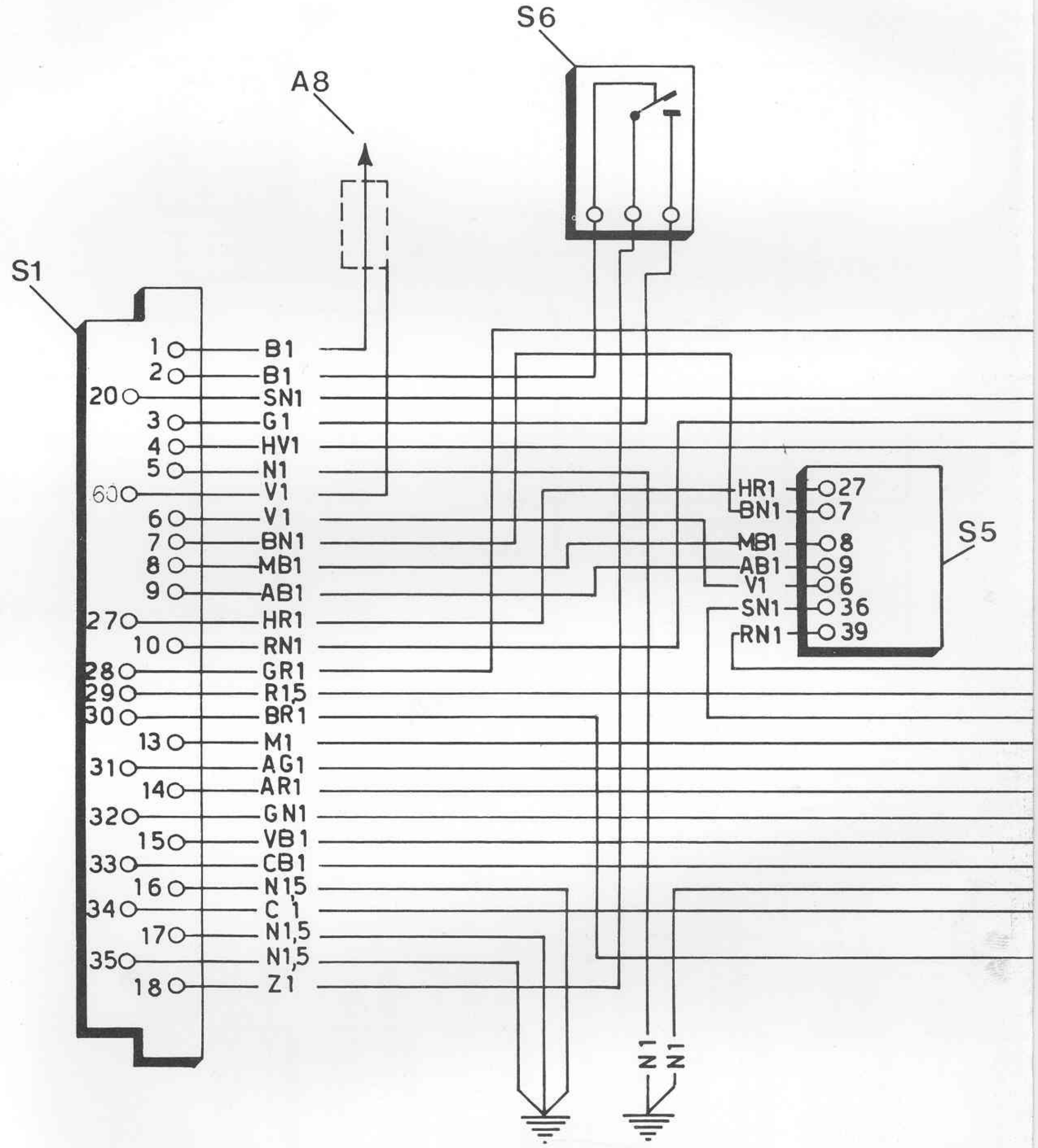
Q1 Heater blower fan
Q2 Pneumatic pushbutton control for air conditioning
Q3 Pneumatic pushbutton control for ventilation
Q4 Heater blower fan control
Q5 Heater blower fan speed adjustment resistance
Q6 Switch on flap for heater blower fan
Q7 Fluid thermostat
Q8 Electromagnetic coupling pressure switch
Q9 Minimum pressure switch
Q10 Maximum pressure switch
Q11 Compressor electromagnetic coupling
Q12 Thermoswitch for exclusion of compressor electromagnetic coupling
Q13 Supplementary conditioner fan
Q14 Relay for supplementary conditioner fan and electromagnetic compressor coupling
Q15 Heater blower fan relay
Q16 Relay for simultaneous control of engine cooling fan and supplementary fan
Q17 Relay for simultaneous control of engine cooling electromagnetic coupling and supplementary fan

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 Switch on seat belts
R10 Catalytic converter maximum temperature warning light

S ELECTRONIC FUEL INJECTION

S1 Injection control unit
S2 Relay set
S3 Electronic injector
S4 Cold starting injector
S5 Air flow sensor
S6 Throttle switch
S7 Engine water temperature sensor
S8 Thermo-time switch
S9 Supplementary air valve
S10 CO_2 sensor (λ)
S11 Motronic unit
S12 Motronic relay
S13 Timing sensor
S14 Rev sensor
S15 Timing variator device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S5
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3 G1
4 HV1
5 N1
60 V1
6 V1
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8 MB1
9 AB1
27 HR1
10 RN1
28 GR1
29 R1,5
30 BR1
13 M1
31 AG1
14 AR1
32 GN1
15 VB1
33 CB1
16 N1,5
34 C 1
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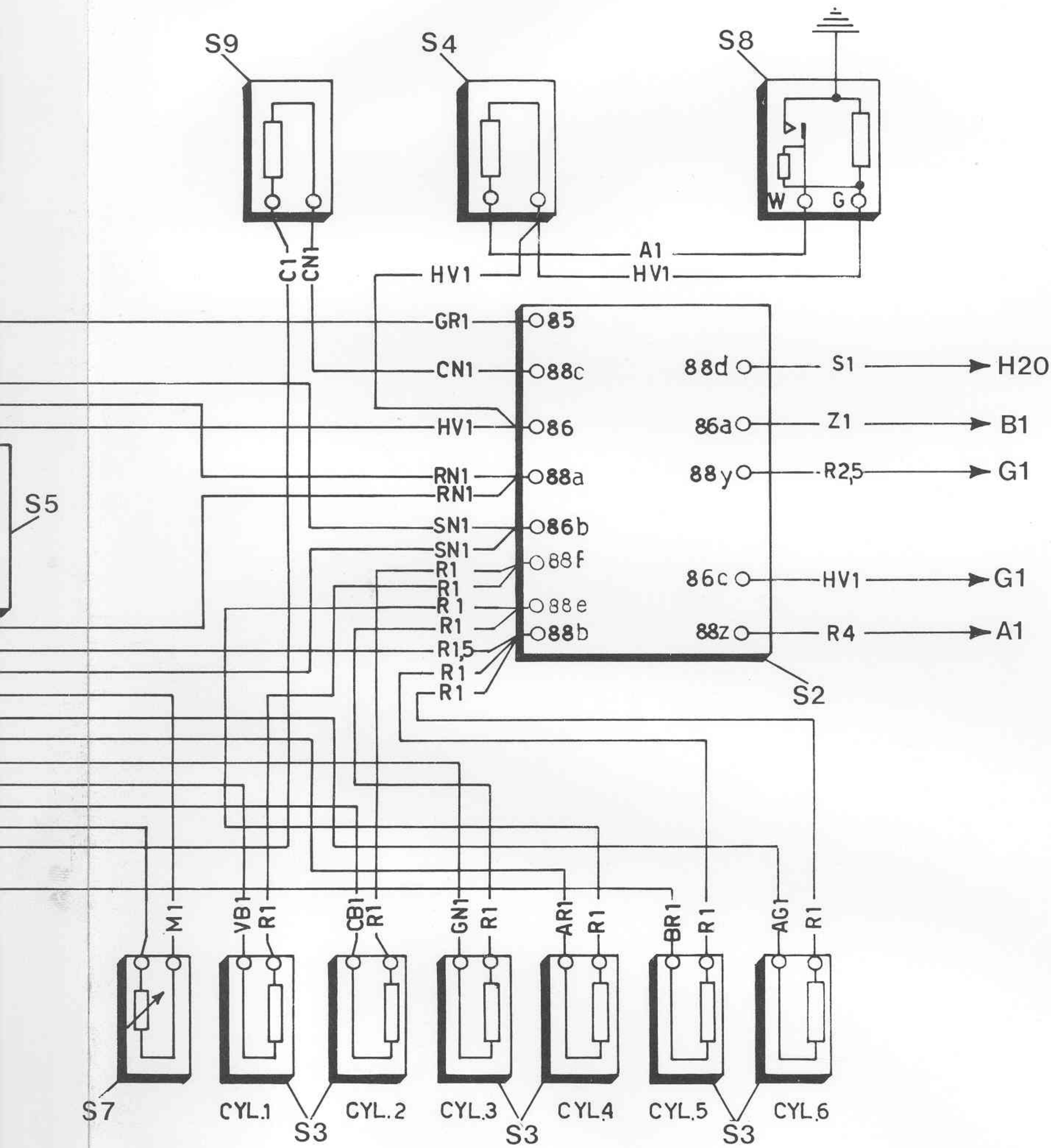
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G
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HV1
HV1
GR1
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CN1
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H20
HV1
86
86a
Z1
B1
RN1
88a
RN1
88y
R2,5
G1
S5
SN1
86b
SN1
88F
R1
R1
86c
HV1
G1
R1
88e
R1
88b
88z
R4
A1
R1,5
R1
R1
S2
M1
VB1
R1
CB1
R1
GN1
R1
AR1
R1
BR1
R1
AG1
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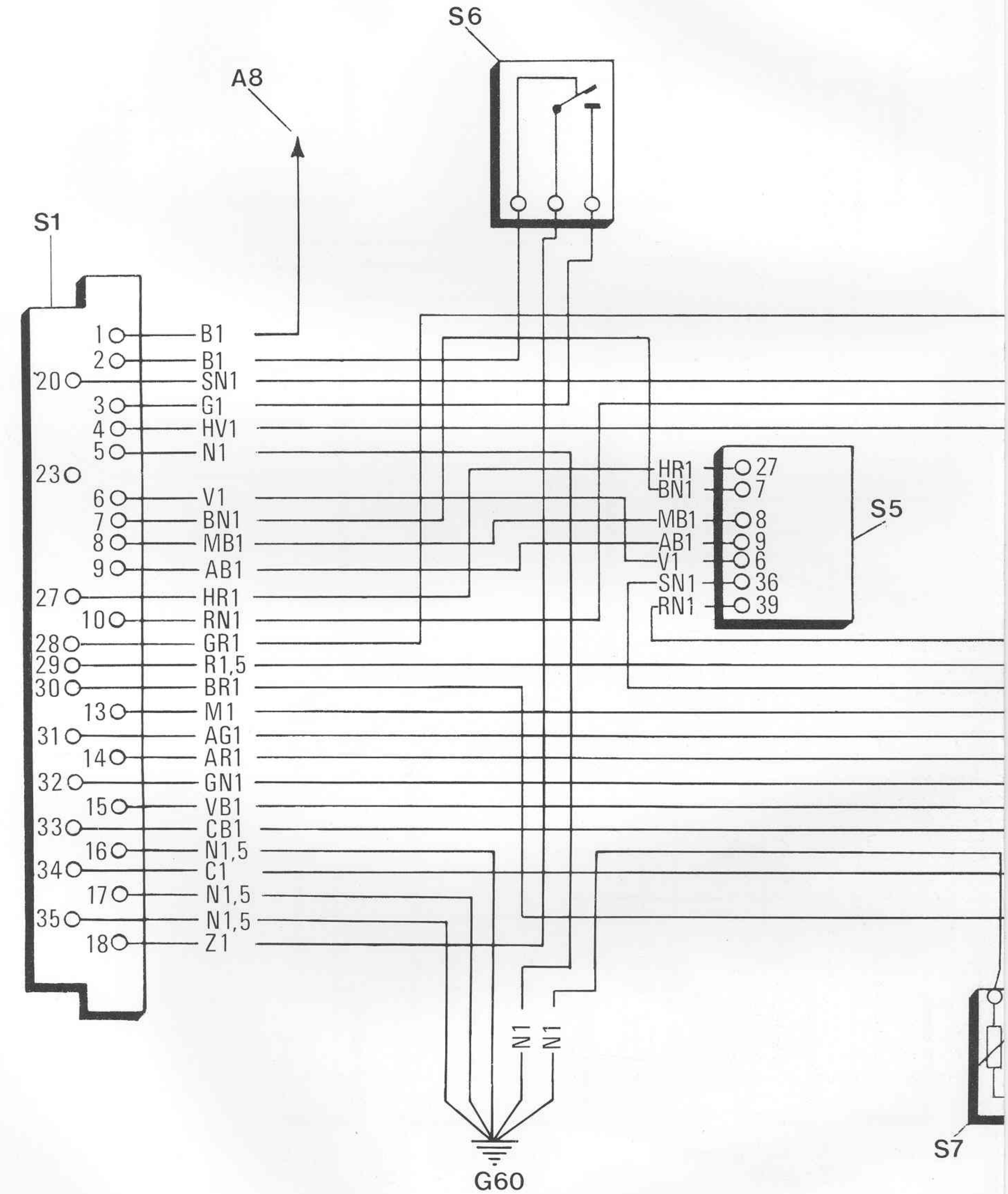
CYL.3
CYL.4
CYL.5
CYL.6
S3
S3
S3

A 2



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27 HR1
10 RN1
28 GR1
29 R1,5
30 BR1
13 M1
31 AG1
14 AR1
32 GN1
15 VB1
33 CB1
16 N1,5
34 C1
17 N1,5
35 N1,5
18 Z1
HR1 27
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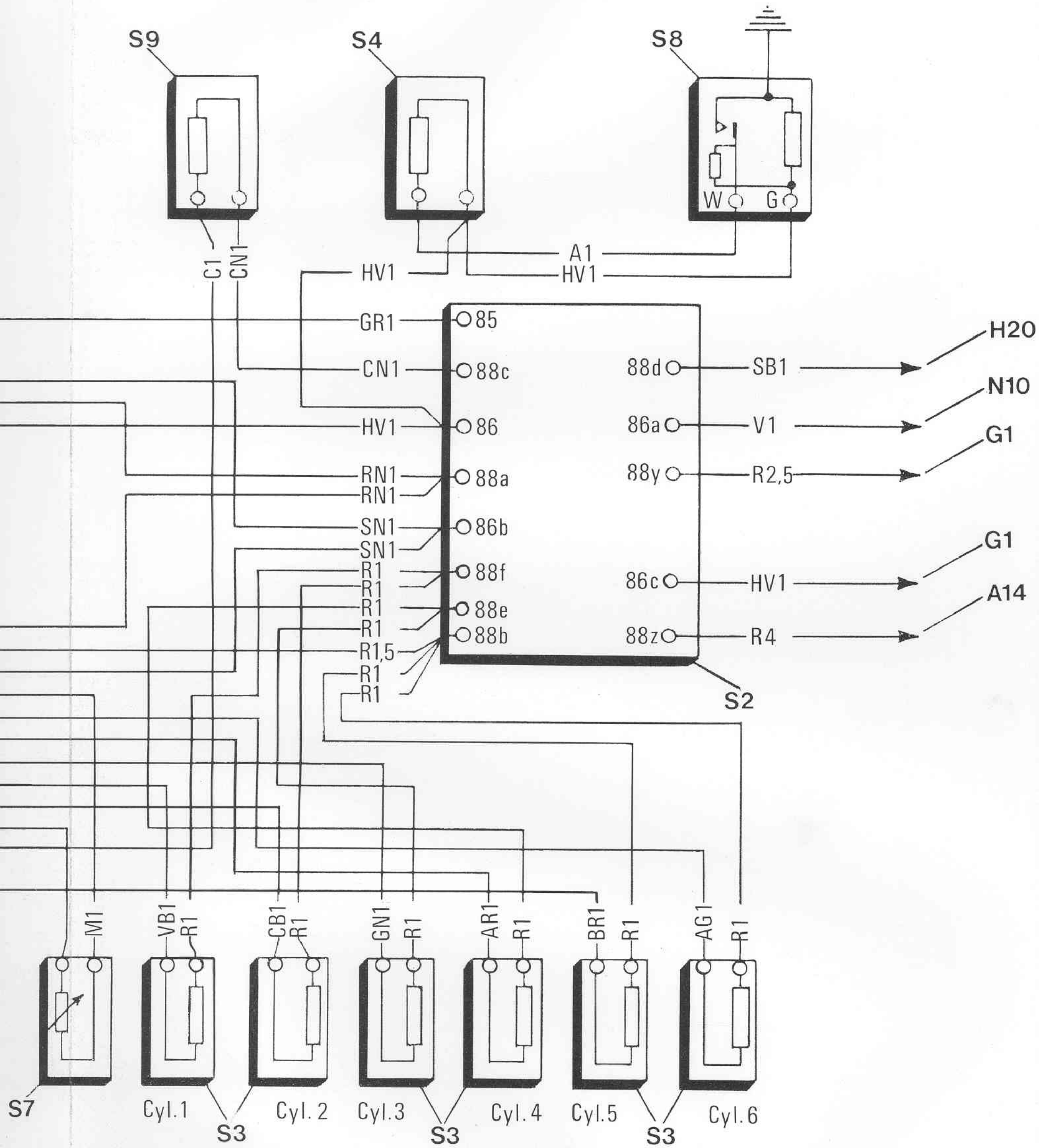
MB1 8
AB1 9
V1 6
SN1 36
RN1 39
S5
N1
N1
G60
S7

Alfa Romeo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CN1
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HV1
86
86a
V1
N10
RN1
RN1
88a
88y
R2,5
G1
SN1
SN1
86b
R1
R1
88f
R1
R1
88e
R1,5
88b
R1
R1
86c
HV1
G1
88z
R4
A14
S2
M1
VB1
R1
CB1
R1
GN1
R1
AR1
R1
BR1
R1
AG1
R1
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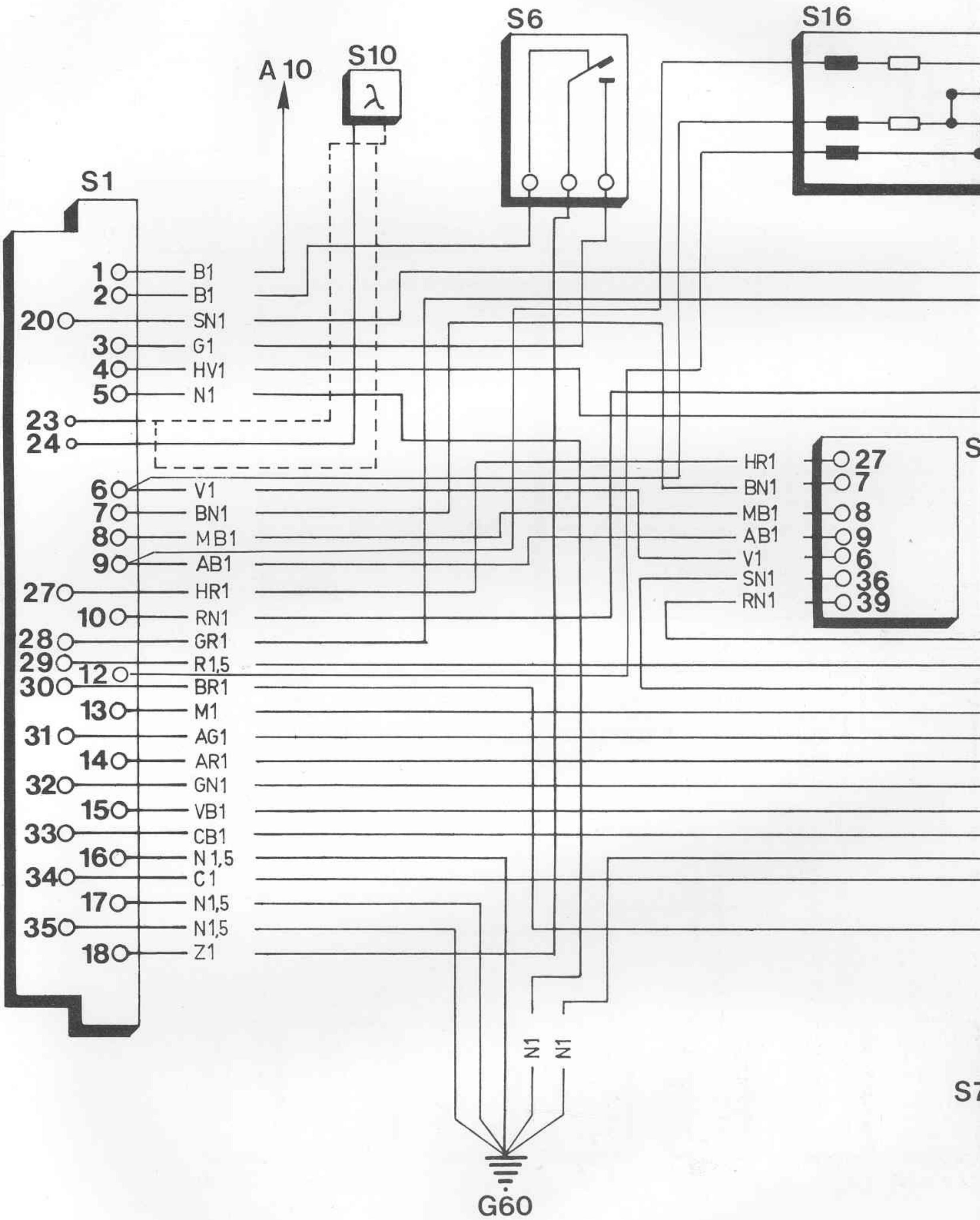
Cyl. 2
Cyl.3
Cyl. 4
Cyl.5
Cyl. 6
S3
S3
S3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S10
λ
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5 N1
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24
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7 BN1
8 MB1
9 AB1
27 HR1
10 RN1
28 GR1
29 R1,5
12
30 BR1
13 M1
31 AG1
14 AR1
32 GN1
15 VB1
33 CB1
16 N1,5
34 C1
17 N1,5
35 N1,5
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HR1 27
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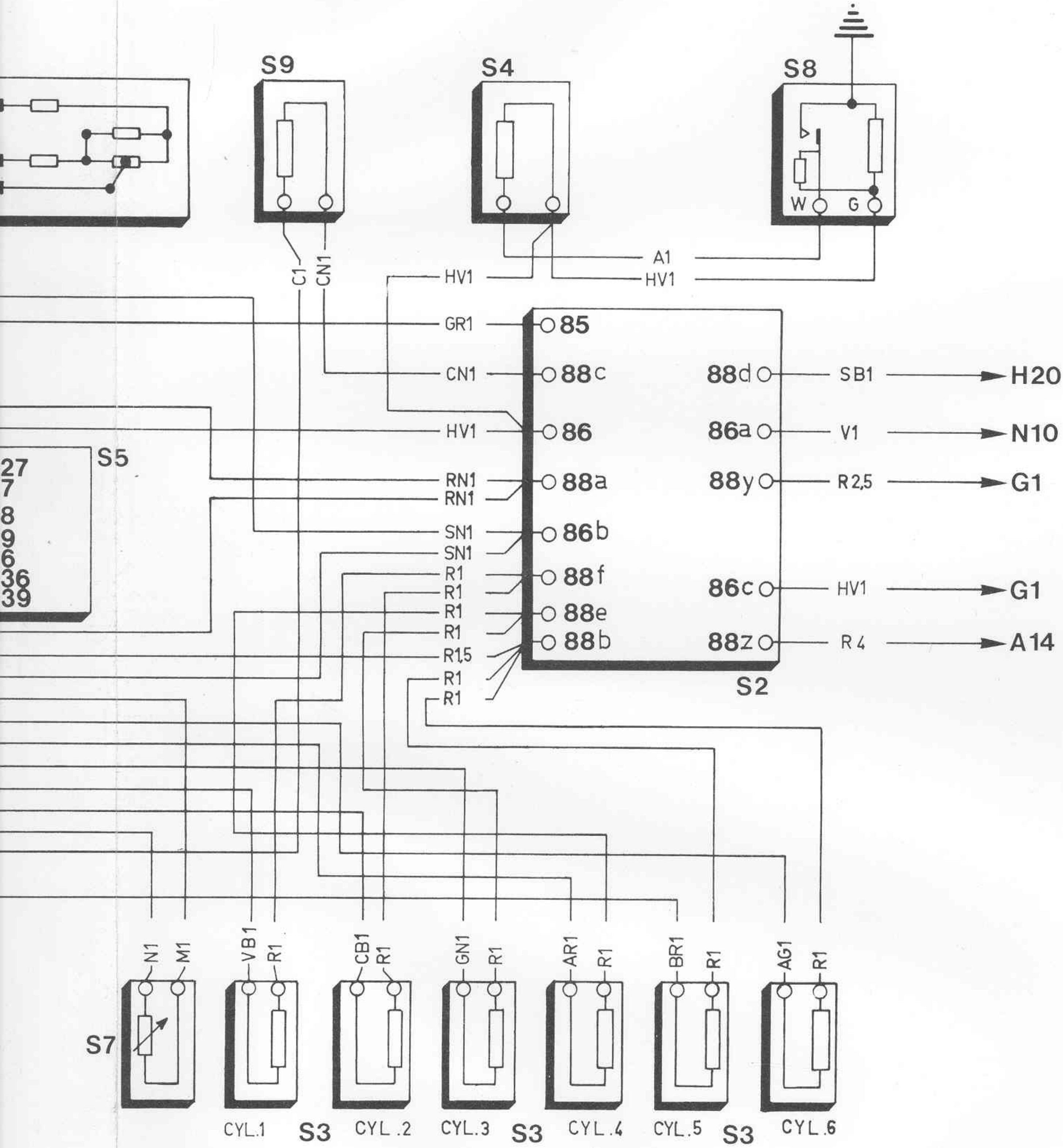
MB1 8
AB1 9
V1 6
SN1 36
RN1 39
S5
N1
N1
S7
G60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GR1
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HV1
RN1
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R1
R1
R1
R1,5
R1
R1
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88c
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88z
SB1
V1
R2,5
HV1
R4
H20
N10
G1
G1
A14
S2
S5
27
7
8
9
6
36
39
N1
M1
VB1
R1
CB1
R1
GN1
R1
AR1
R1
BR1
R1
AG1
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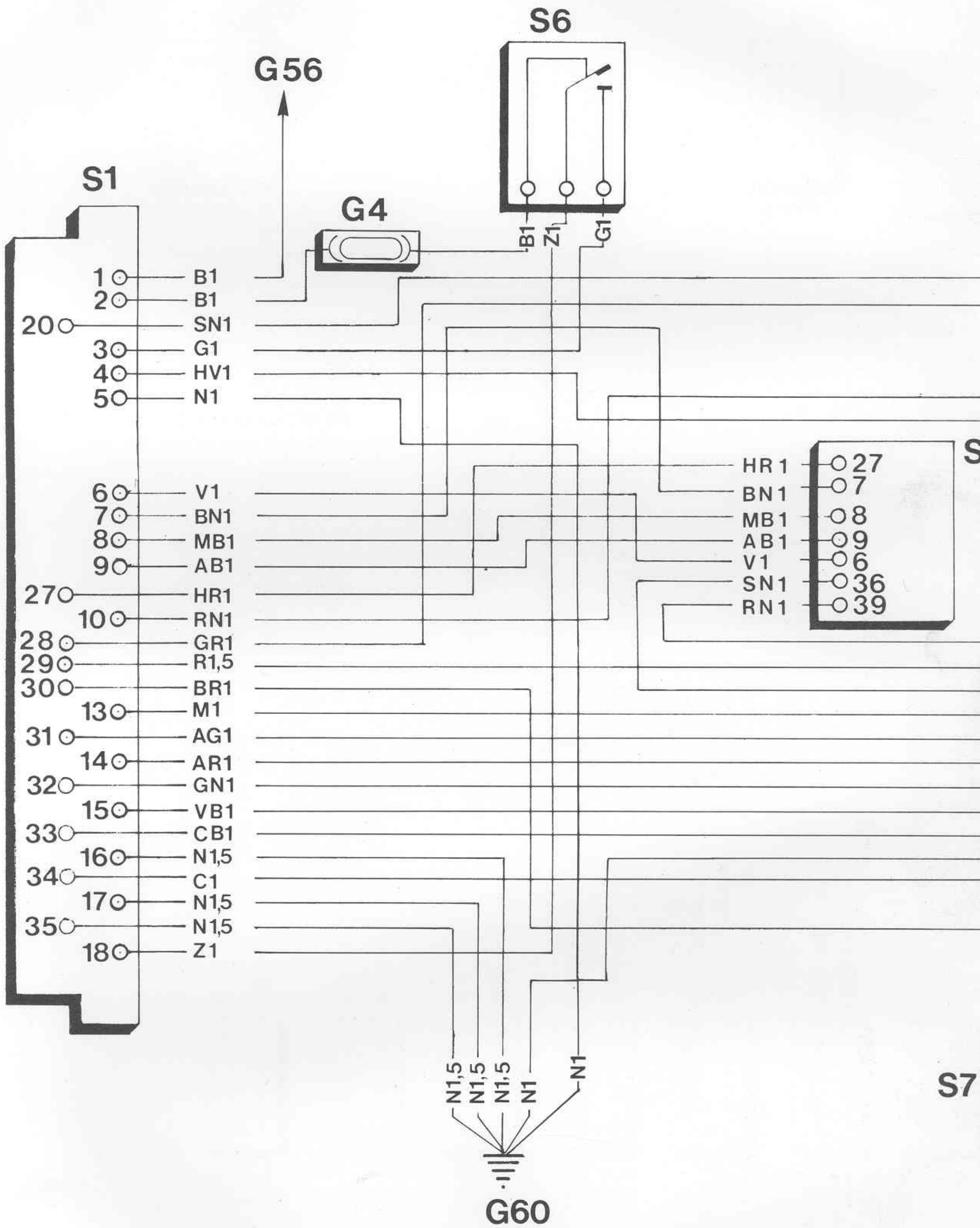
CYL .2
CYL.3
S3
CYL .4
CYL.5
S3
CYL.6



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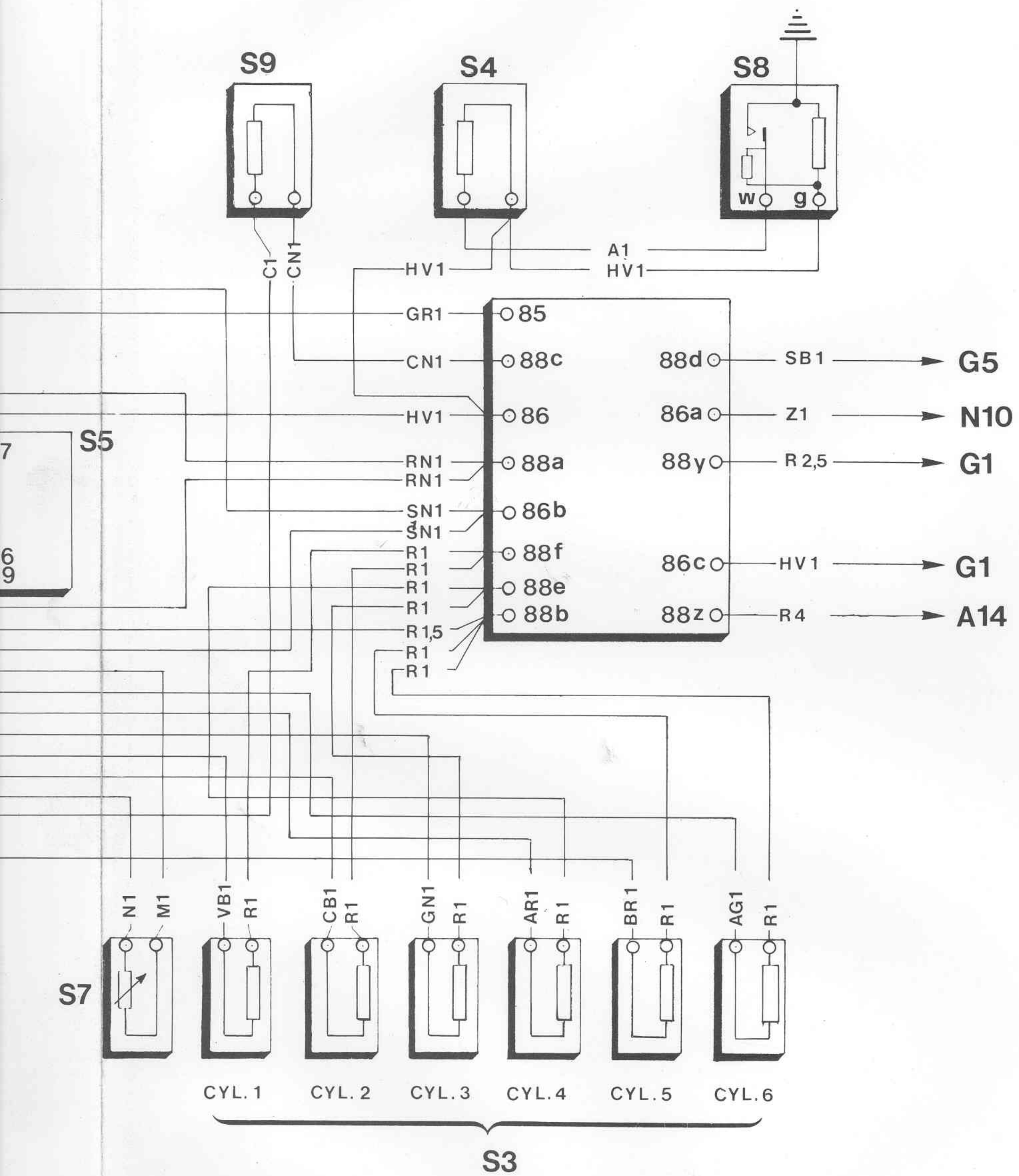
A 7


S9
S4
S8
w
g
C1
CN1
A1
HV1
HV1
GR1
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CN1
88c
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SB1
G5
HV1
86
86a
Z1
N10
S5
RN1
88a
88y
R 2,5
G1
RN1
SN1
86b
SN1
R1
88f
R1
R1
88e
86c
HV1
G1
R1
88b
88z
R4
A14
R 1,5
R1
R1
N1
M1
VB1
R1
CB1
R1
GN1
R1
AR1
R1
BR1
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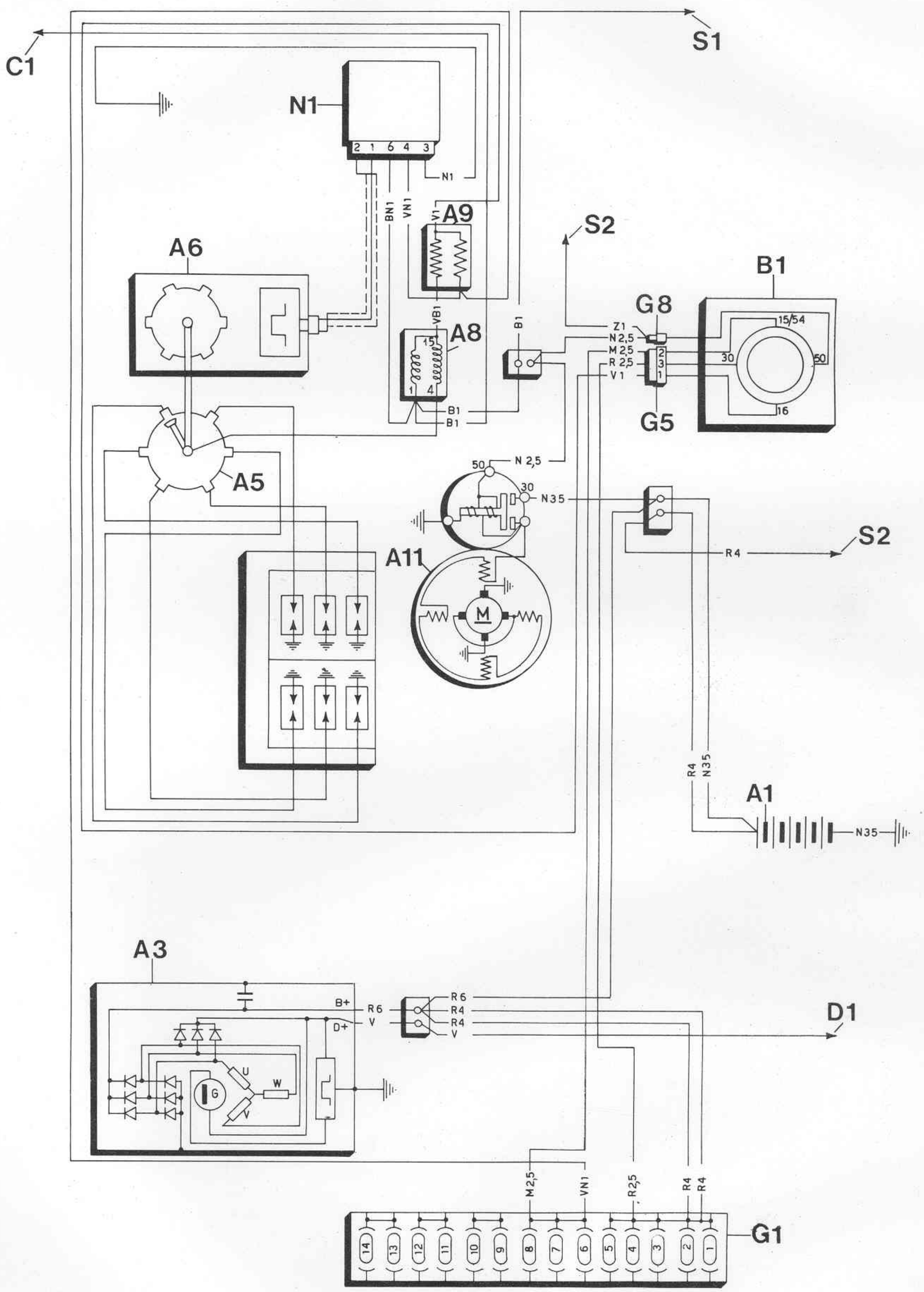
CYL. 1
CYL. 2
CYL. 3
CYL. 4
CYL. 5
CYL. 6
S3

A 7



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N1
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N1
BN1
VN1
V1
A9
A6
VB1
A8
15
1 4
B1
B1
B1
S2
G8
Z1
N 2,5
M 2,5
R 2,5
V 1
2
3
1
G5
B1
15/54
30
50
16
A5
50
N 2,5
30
N35
A11
M
R4
S2
R4
N35
A1
N35
A3
B+
D+
R6
V
R6
R4
R4
V
U
W
V
G
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R4
R4
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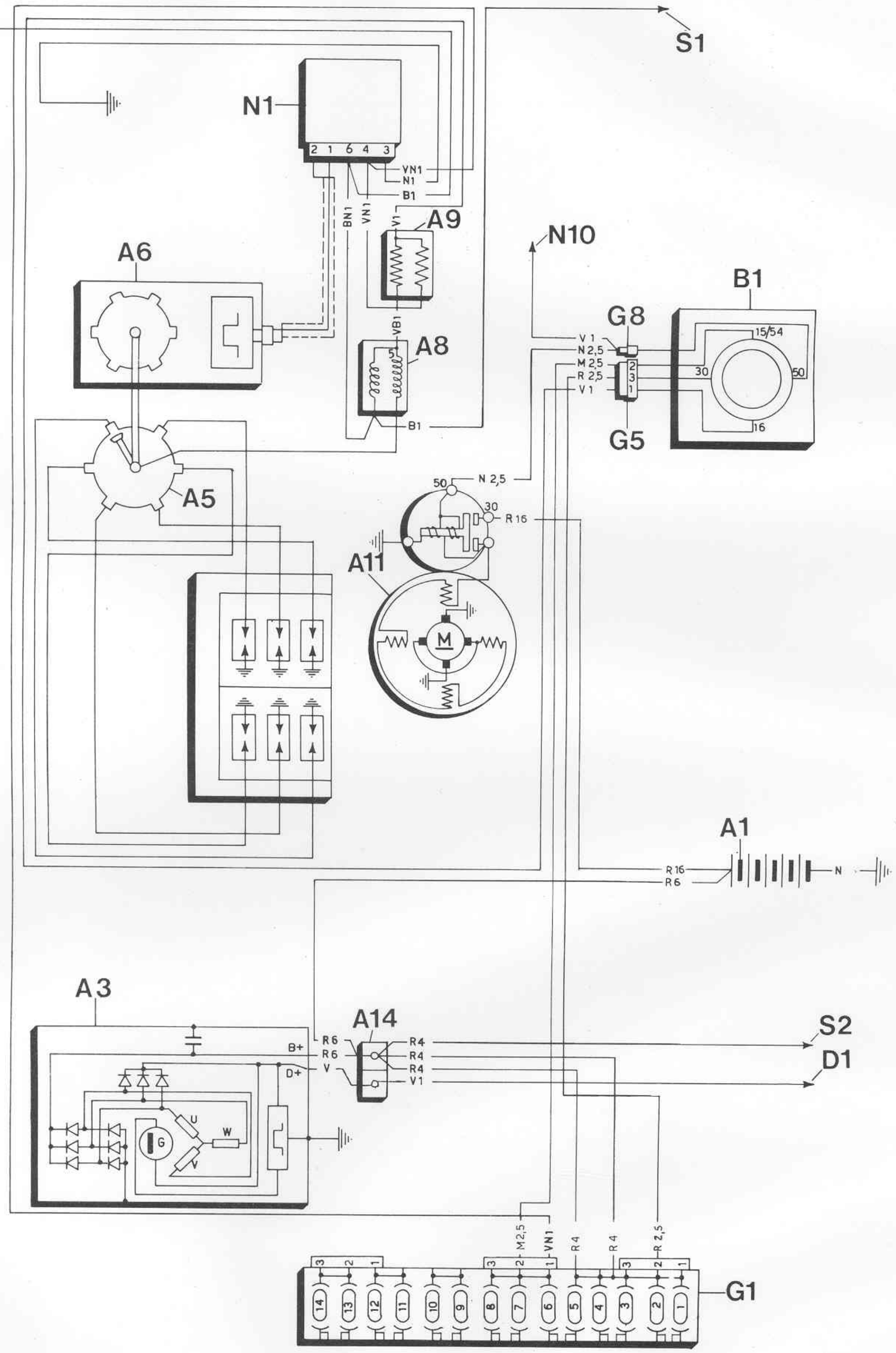
G1

Alfa Romeo


C1
S1
N1
2 1 6 4 3
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N1
B1
BN1
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V1
A9
A6
VB1
A8
B1
N10
B1
G8
V1
N2,5
M2,5
R2,5
V1
15/54
30
50
2
3
1
16
G5
A5
50
N 2,5
30
R 16
A11
M
A1
R 16
R 6
N
A3
A14
B+
R6
R6
D+
V
R4
R4
R4
V1
S2
D1
U
W
G
V
M2,5
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R 2,5
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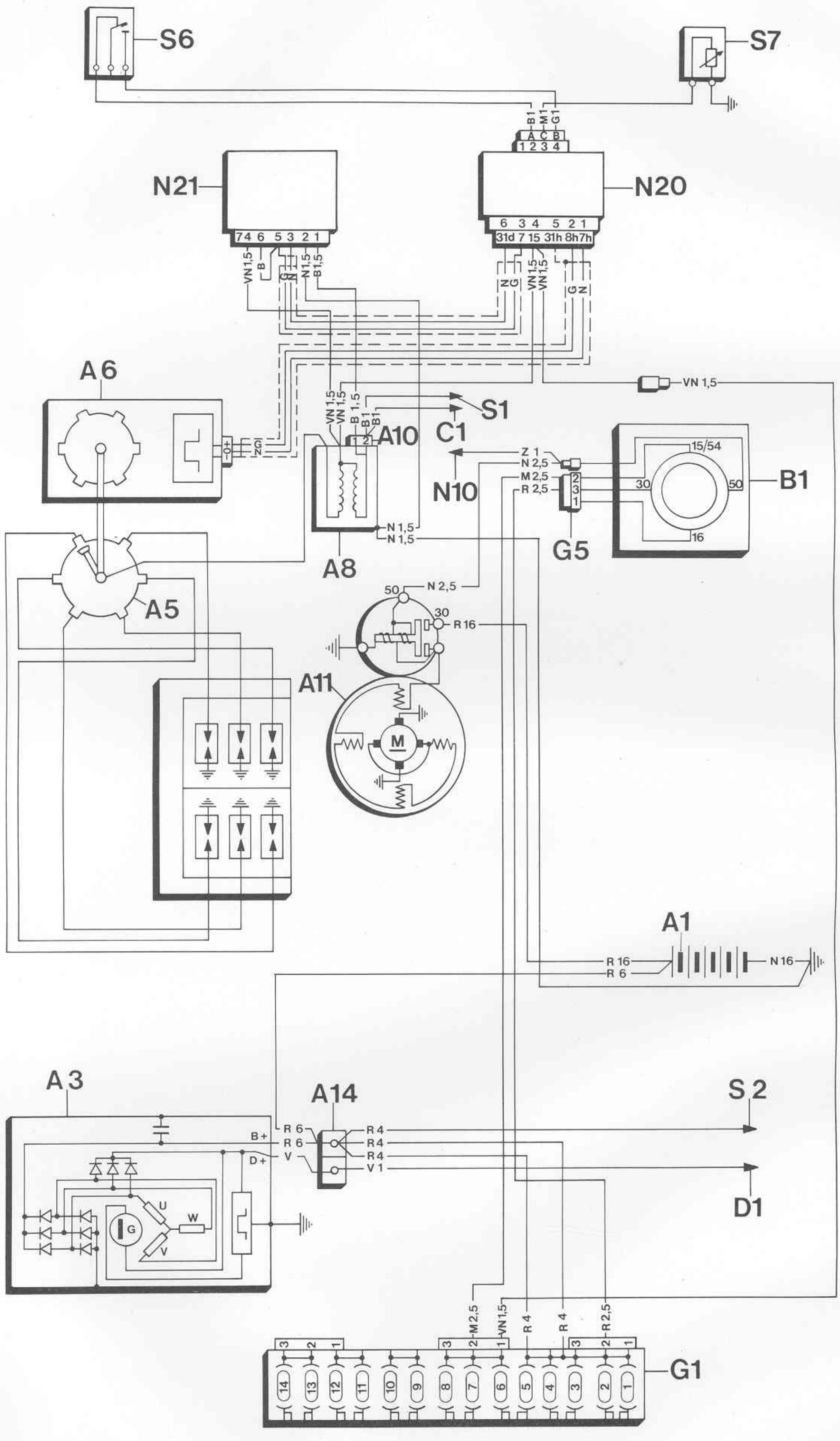
G1

Alfa Romeo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A C B
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N21
N20
7 4 6 5 3 2 1
6 3 4 5 2 1
31d 7 15 31h 8h 7h
VN1,5 B G N N1,5 B1,5
N G VN1,5 VN1,5 G N
A6
VN 1,5
S1
C1
A10
N10
Z 1
N 2,5
M 2,5
R 2,5
15/54
30
50
16
B1
G5
A8
N 1,5
A5
50
N 2,5
30
R 16
A11
M
A1
R 16
R 6
N 16
A3
A14
B+
D+
R 6
V
R 4
V 1
S 2
D1
U
W
G
V
M2,5
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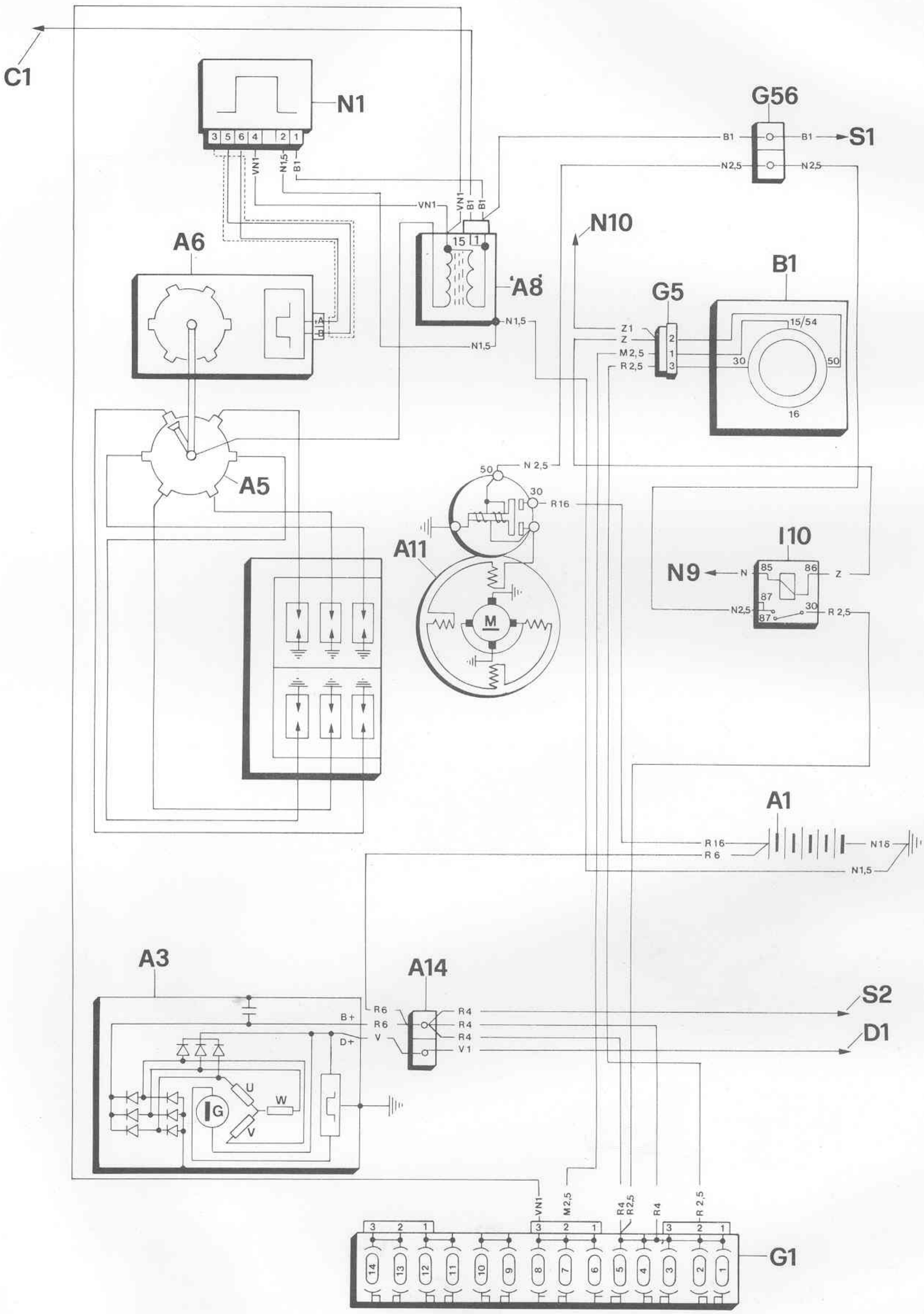
R 4
R2,5
G1

Alfa Romeo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B1
G5
Z1
Z
M 2,5
R 2,5
15/54
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50
16
A5
N 2,5
R 16
A11
M
I10
N9
85
86
87
30
R 2,5
A1
R 16
R 6
N16
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G
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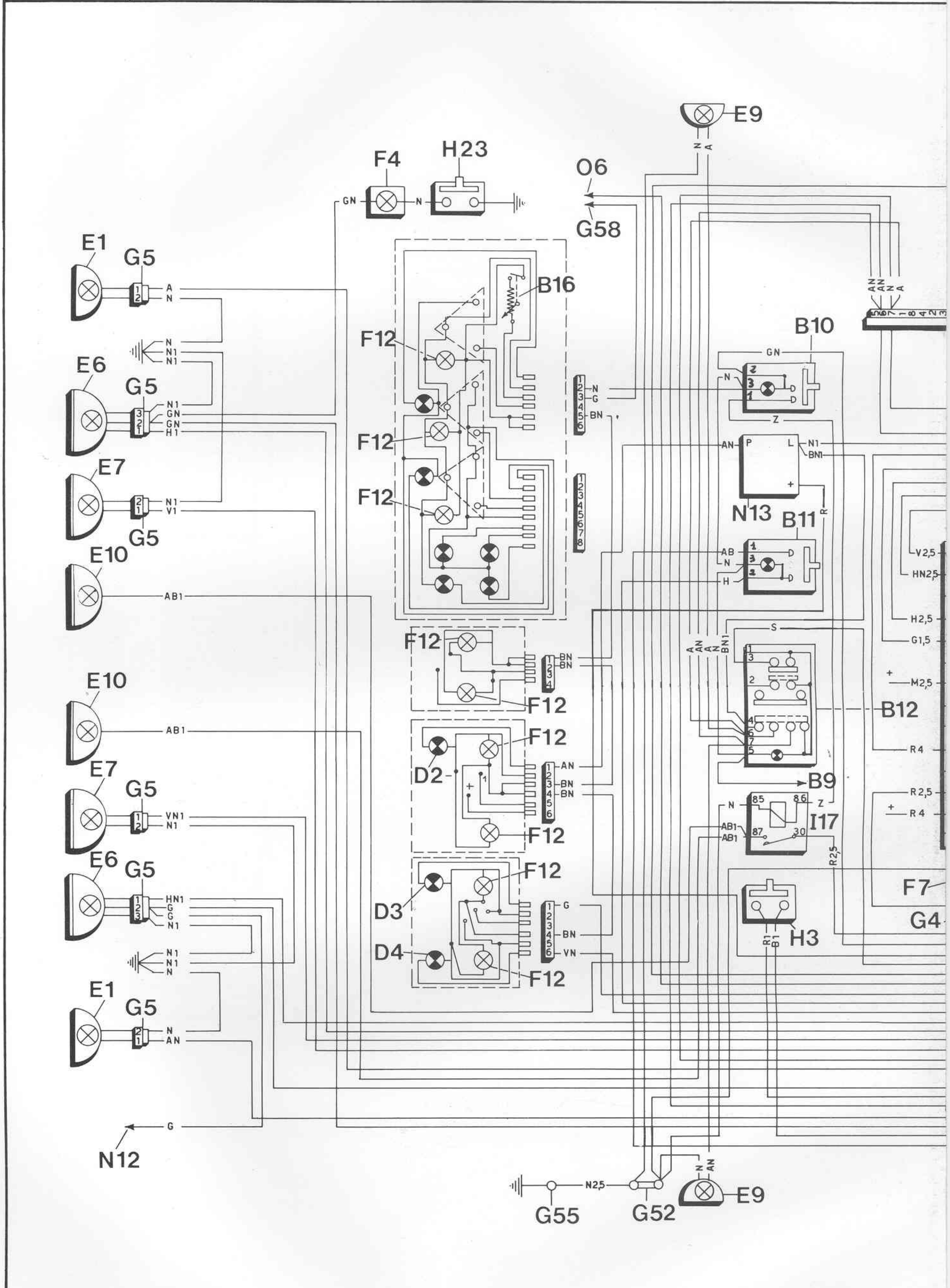
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E6
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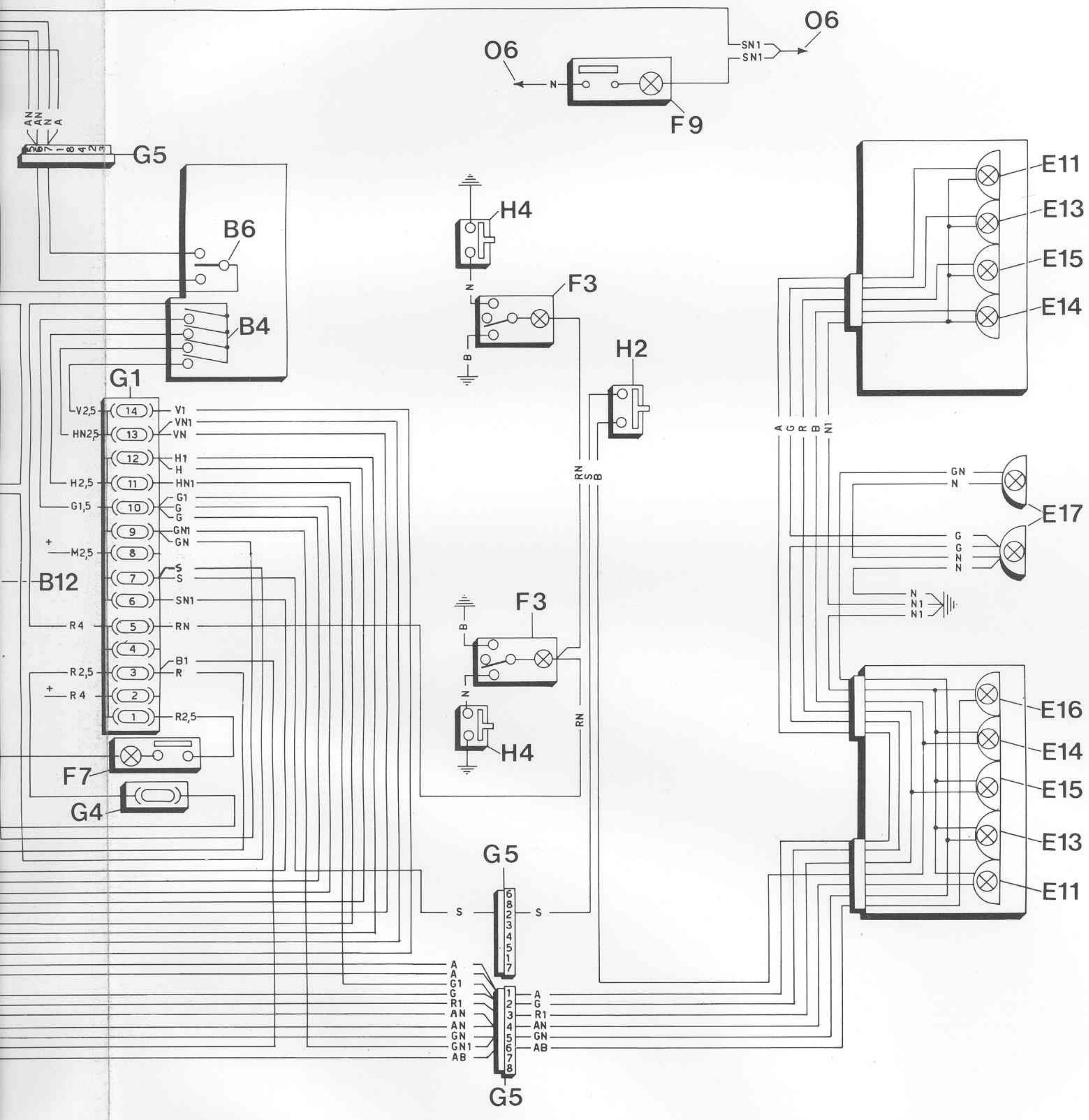
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SN1
SN1
N
G5
B6
B4
G1
H4
F3
H2
E11
E13
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E14
E15
E13
E11
G5
G5
V1
VN1
VN
H1
H
HN1
G1
G
G
GN1
GN
S
S
SN1
RN
B1
R
R2,5
V2,5
HN2,5
H2,5
G1,5
M2,5
R4
R2,5
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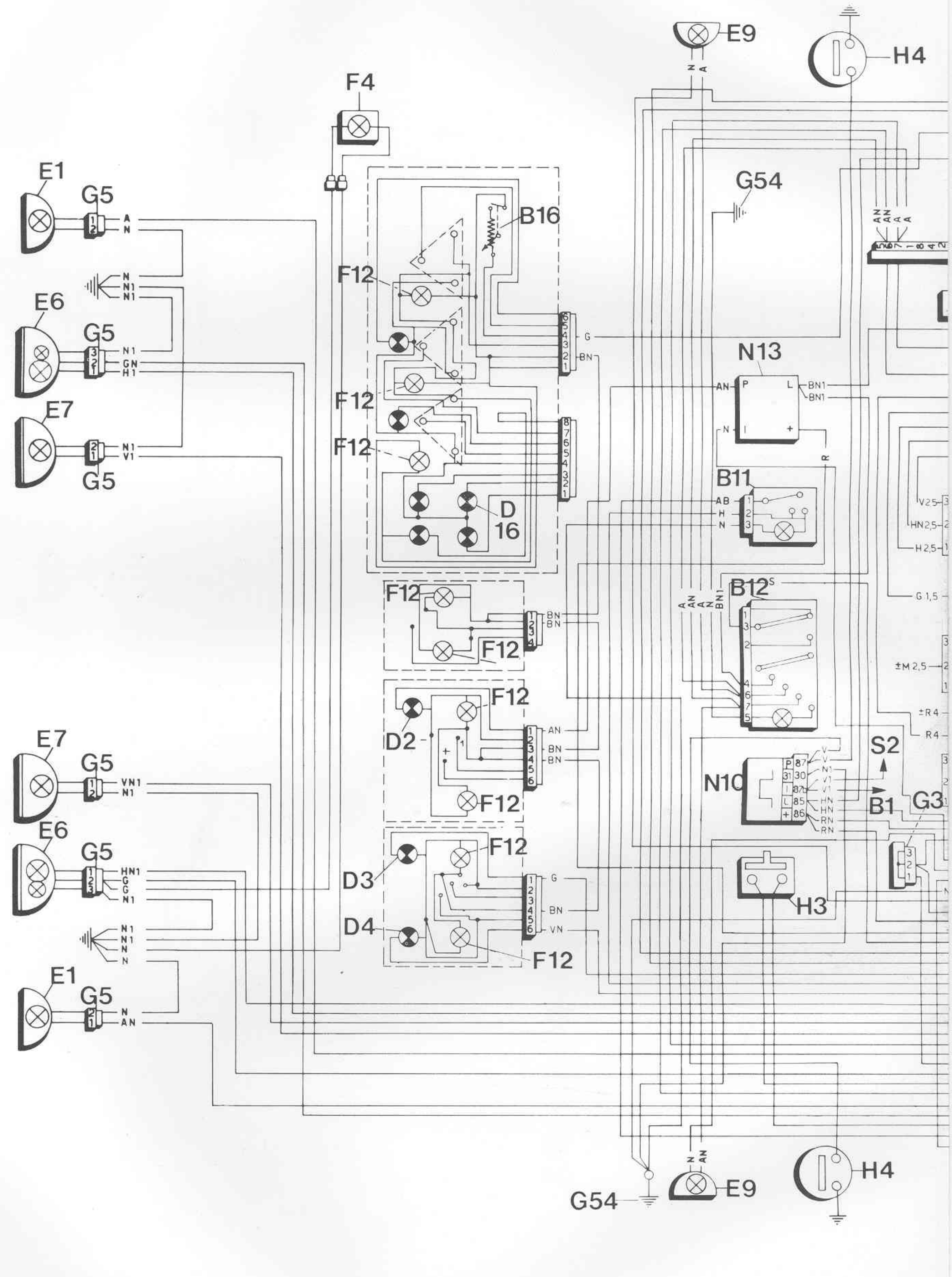
GN
AB

C 9


E1
G5
E6
E7
F4
B16
F12
D 16
D2
D3
D4
E9
H4
G54
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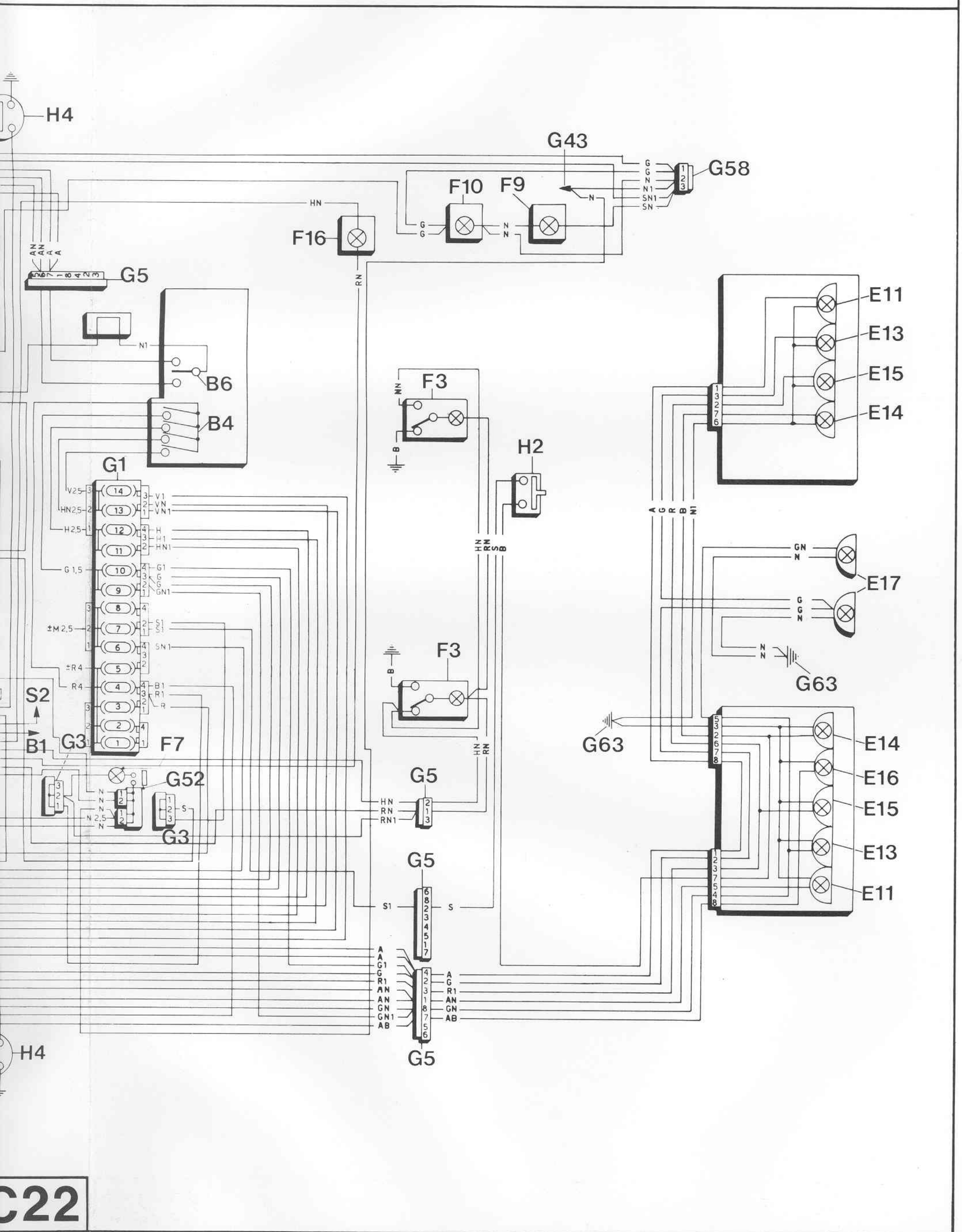
B11
B12
N10
S2
B1
G3
H3

Alfa Romeo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G1
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G3
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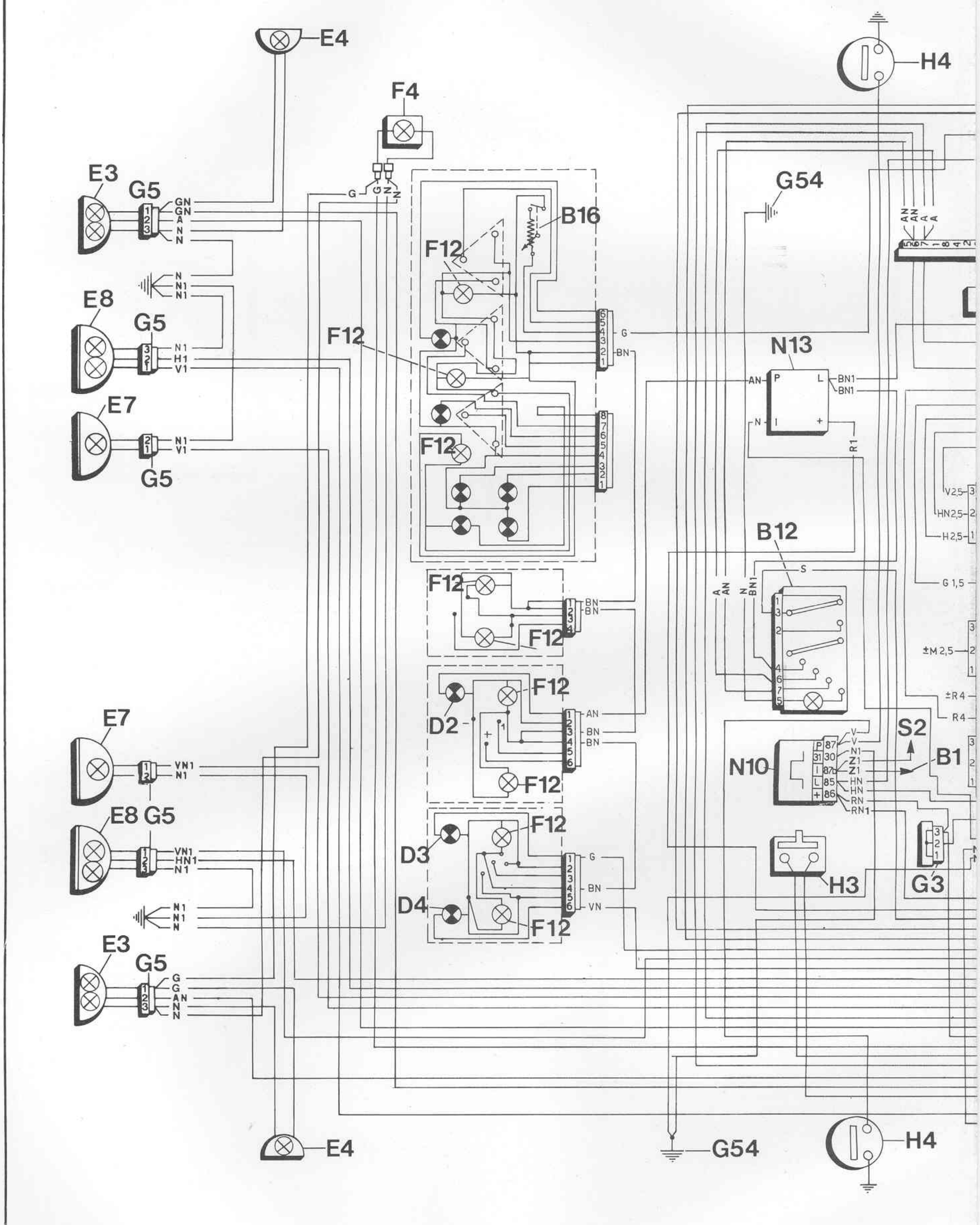
G52
C22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G54
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N13
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B1
D3
D4
H3
G3
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N
BN1
R1
G
BN
VN
V
N1
Z1
HN
RN
RN1
GN
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H1
V1
VN1
HN1
V2,5
HN2,5
H2,5
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±R4
R4
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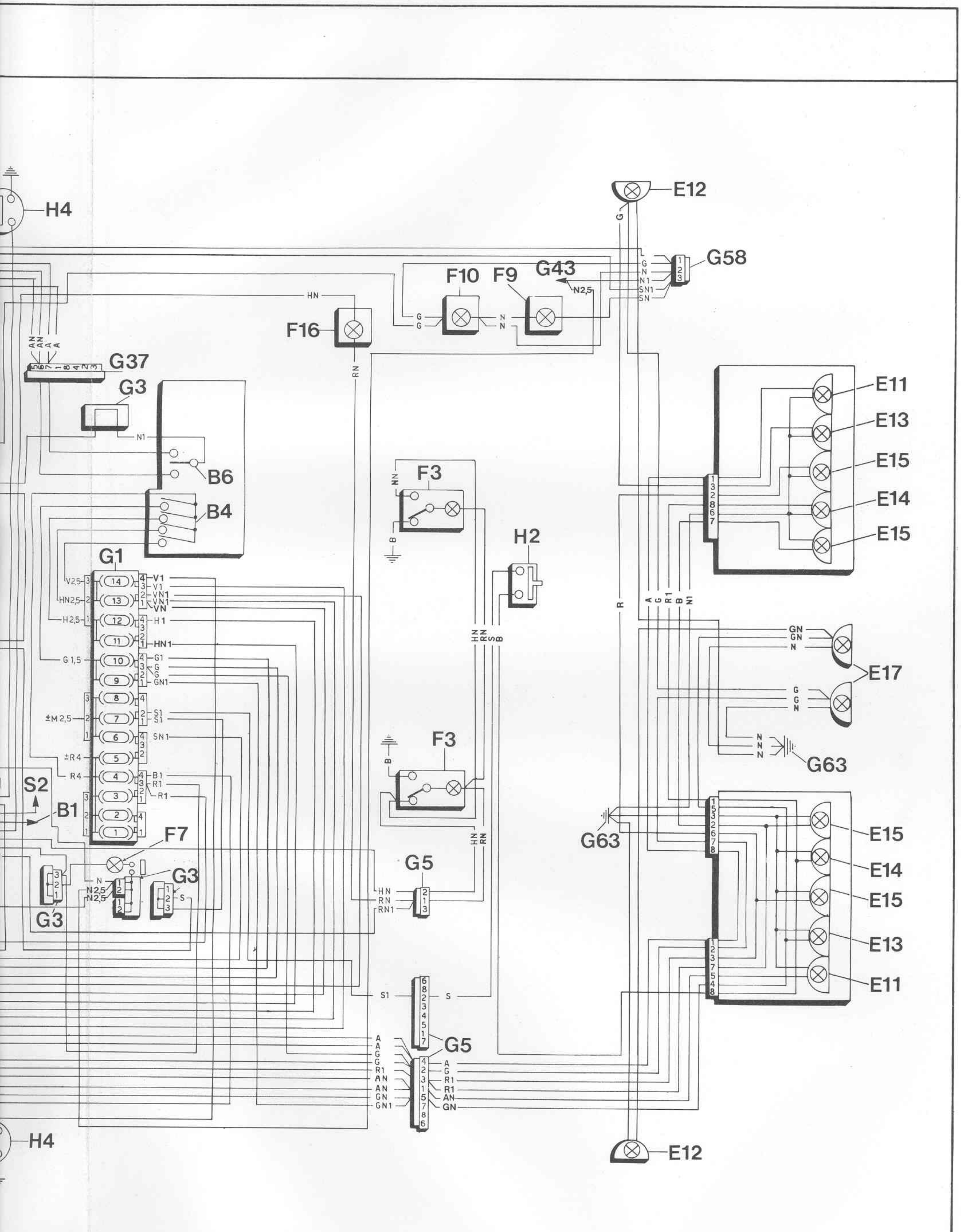
P
31
I
L
+
S

Alfa Romeo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G63
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S2
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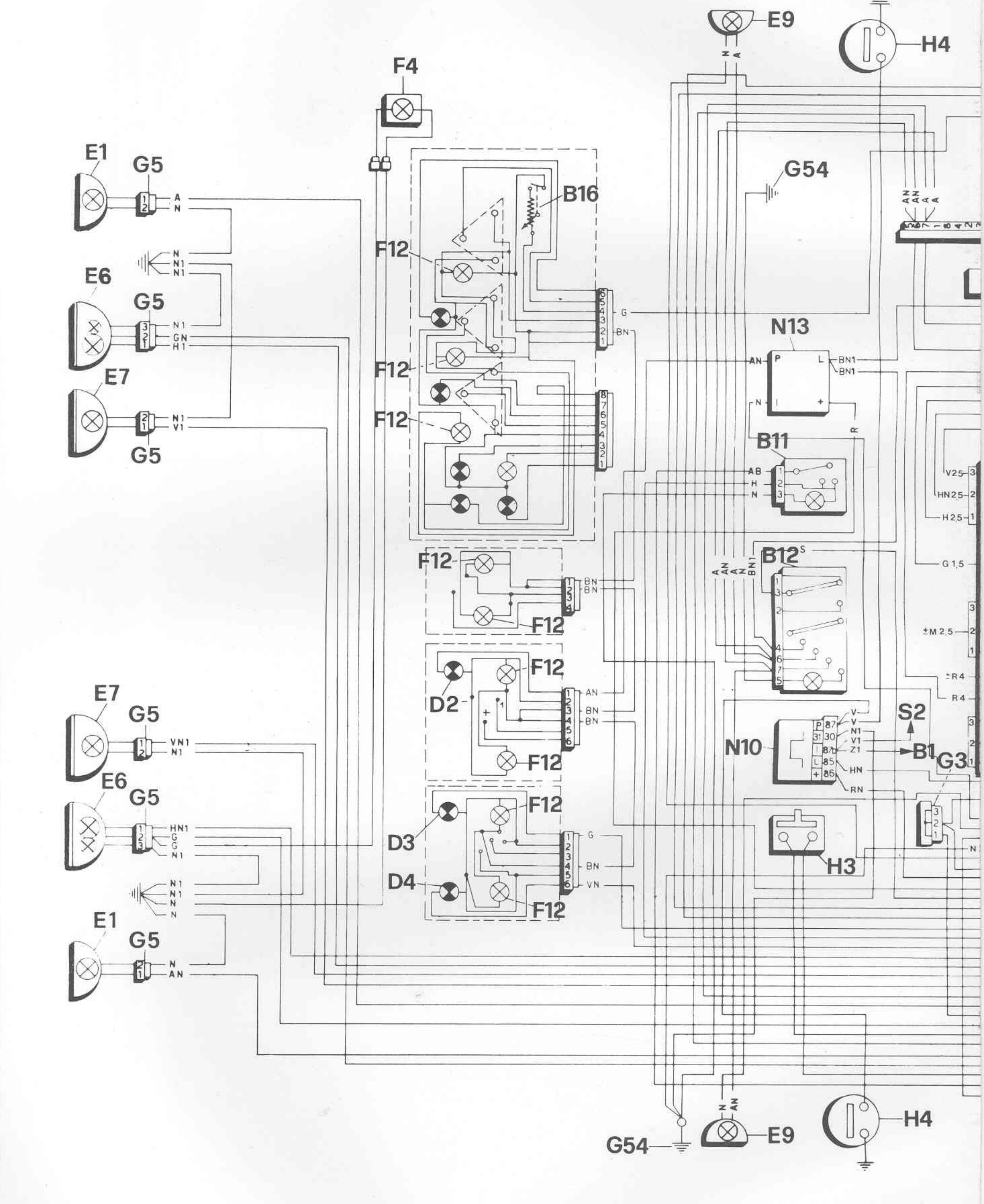
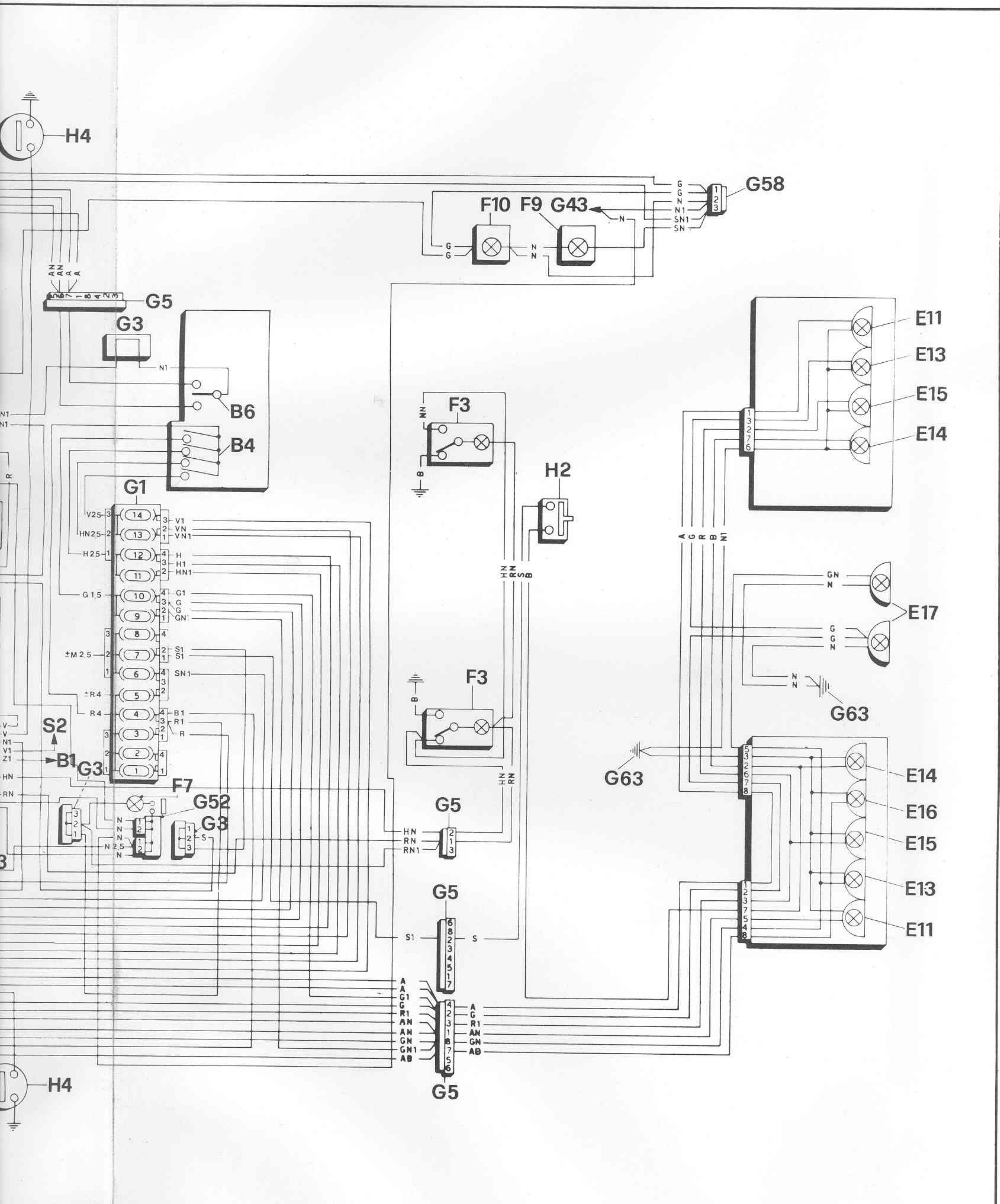
F7
G5



Alfa Romeo

C45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G1
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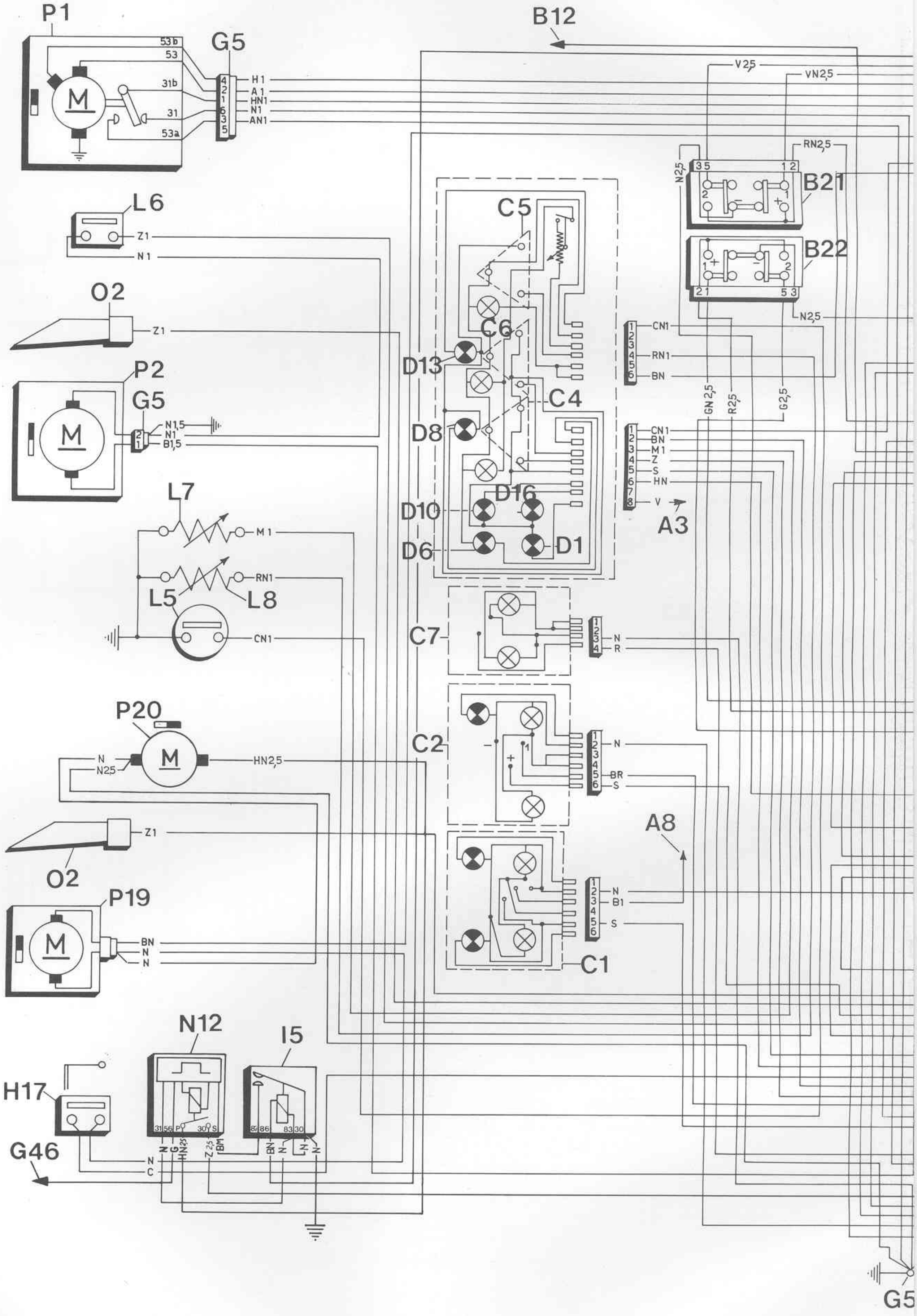
G63
S2
B1
F7
G52
E16

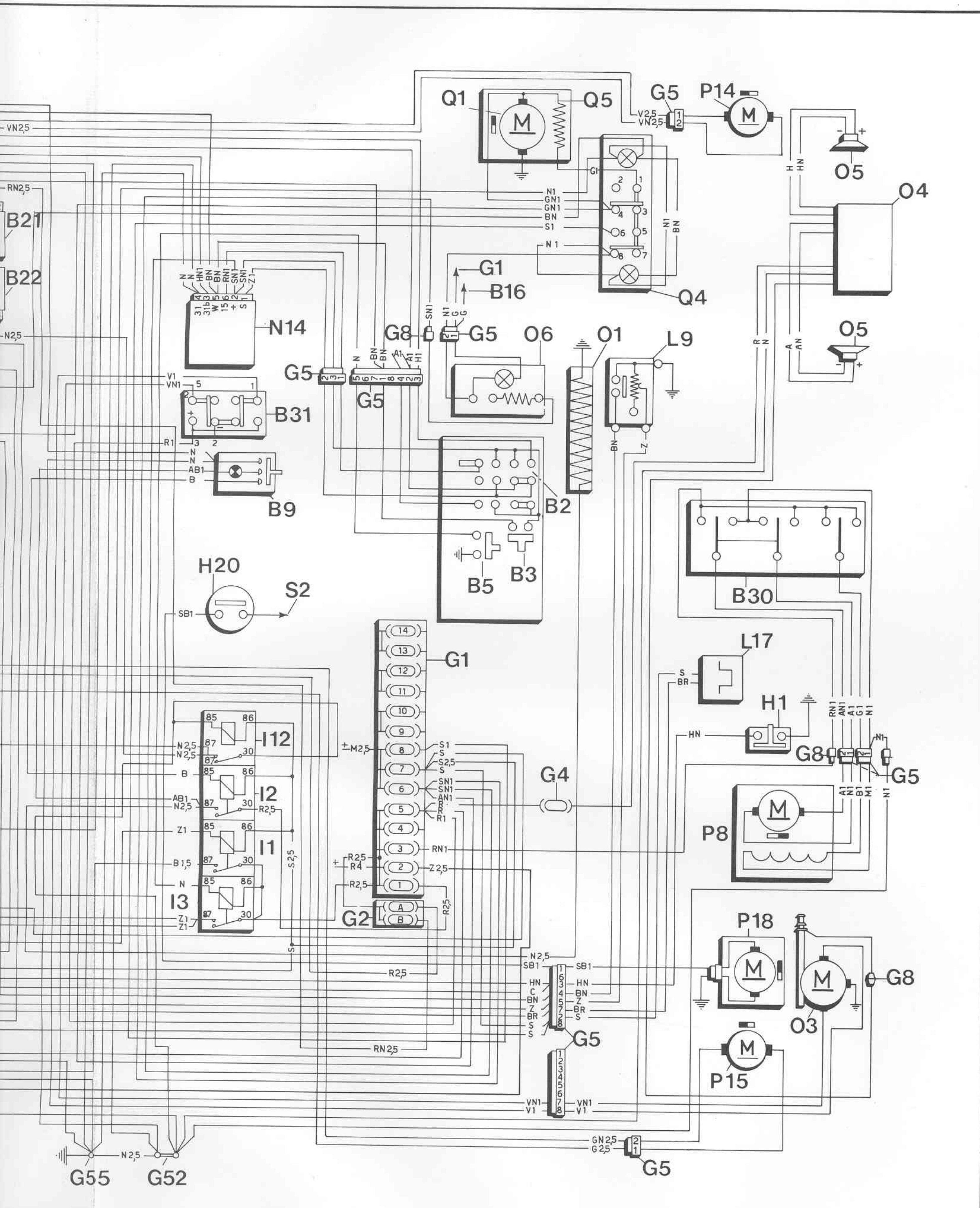
C45

3-86



Alfa Romeo

E 14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O4
Q4
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G8
O6
O1
L9
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B31
B9
B2
B5
B3
H20
S2
B30
L17
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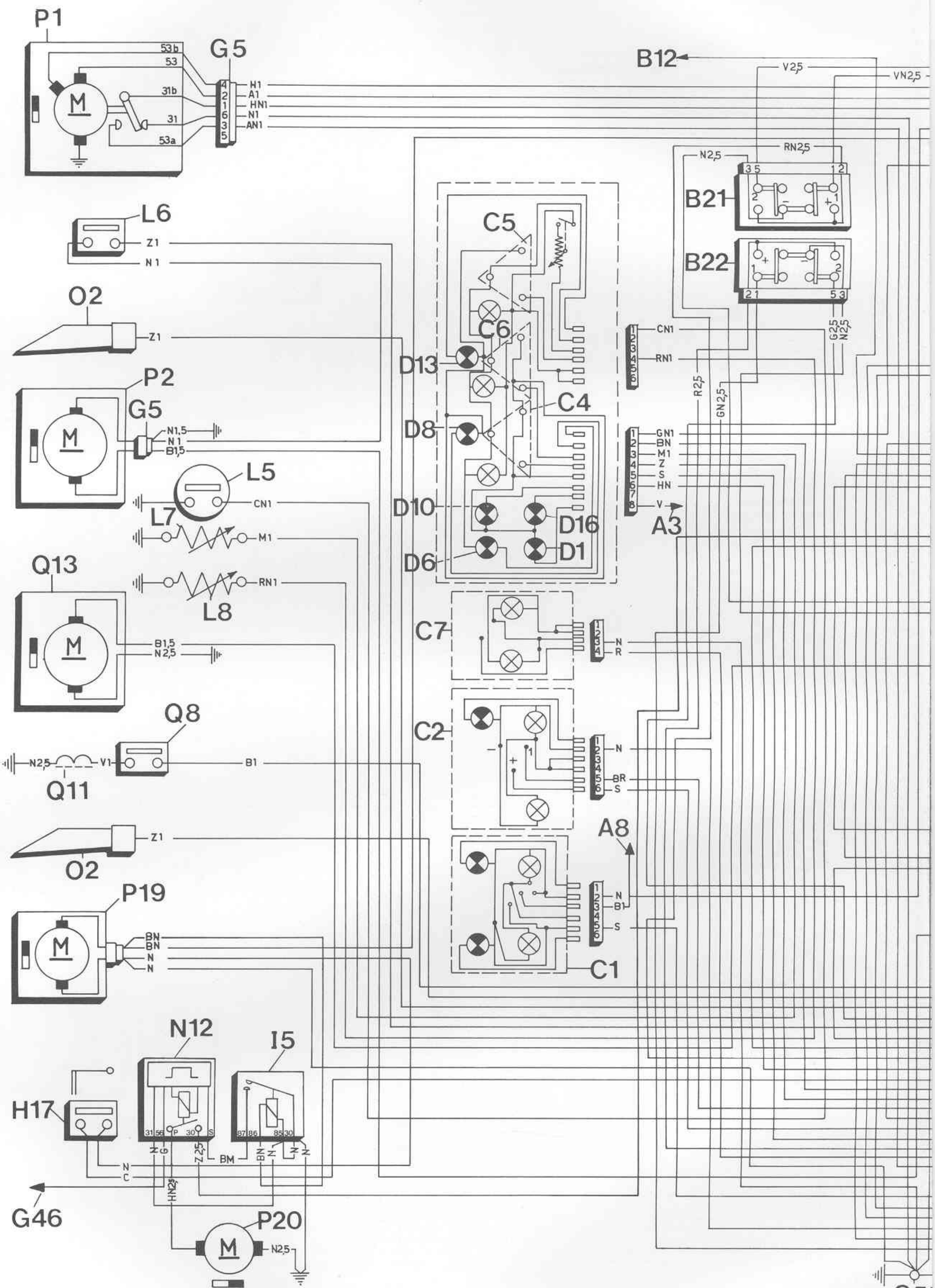
I12
I2
I1
I3
G2
P18
O3
P15
G55
G52

E 14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AN1
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N2,5
RN2,5
B21
B22
L6
Z1
N1
C5
O2
Z1
C6
D13
CN1
RN1
P2
G5
N1,5
N1
B1,5
D8
C4
R2,5
GN2,5
G2,5
N2,5
GN1
BN
M1
Z
S
HN
V
A3
L5
CN1
L7
M1
D10
D16
D1
D6
Q13
RN1
L8
B1,5
N2,5
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BR
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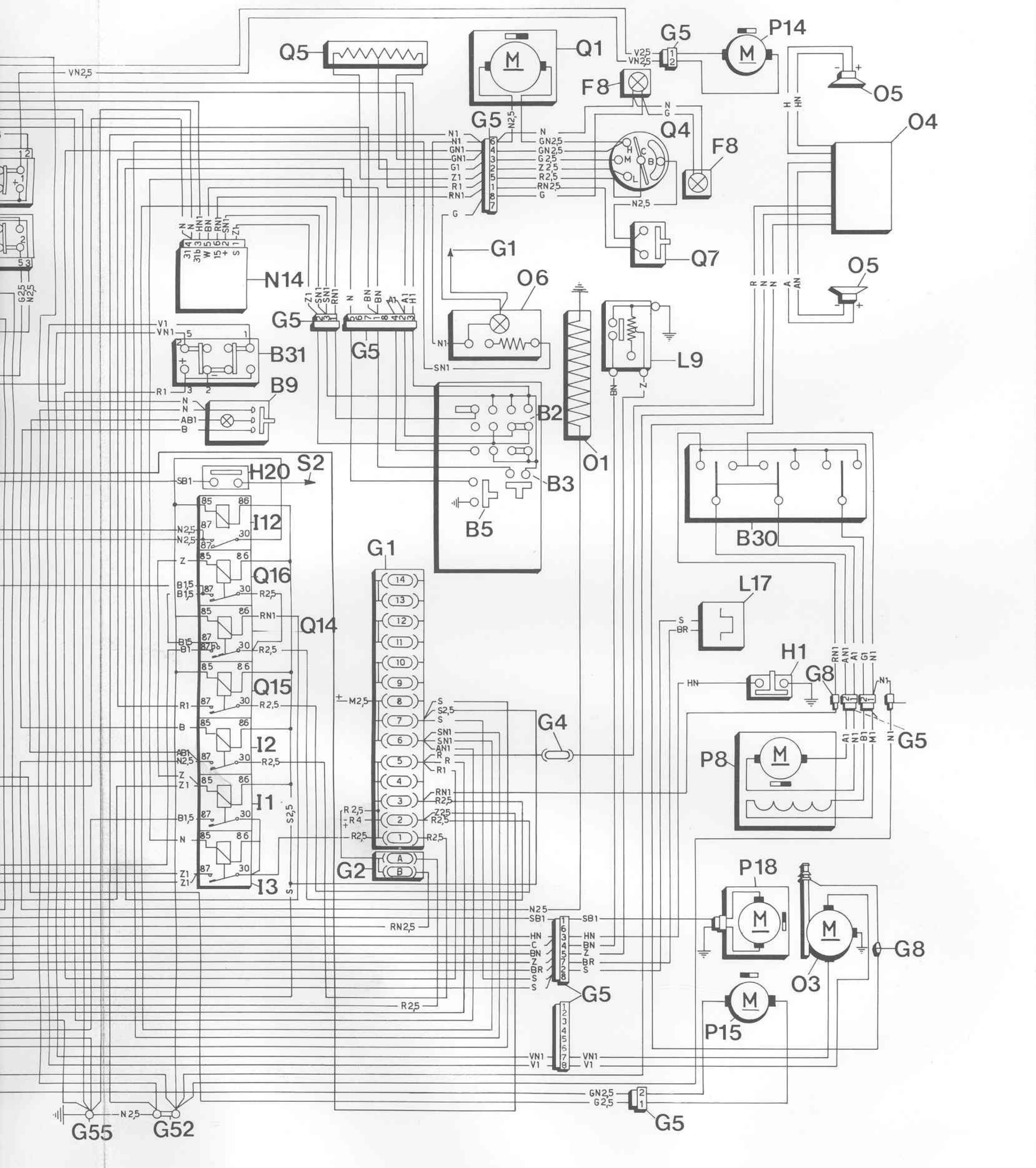
Q8
N2,5
V1
B1
Q11
O2
Z1
A8
N
B1
S
C1
P19
BN
BN
N
N
N12
I5
H17
N
C
BM
G46
HN2,5
P20
N2,5
G55

Alfa Romeo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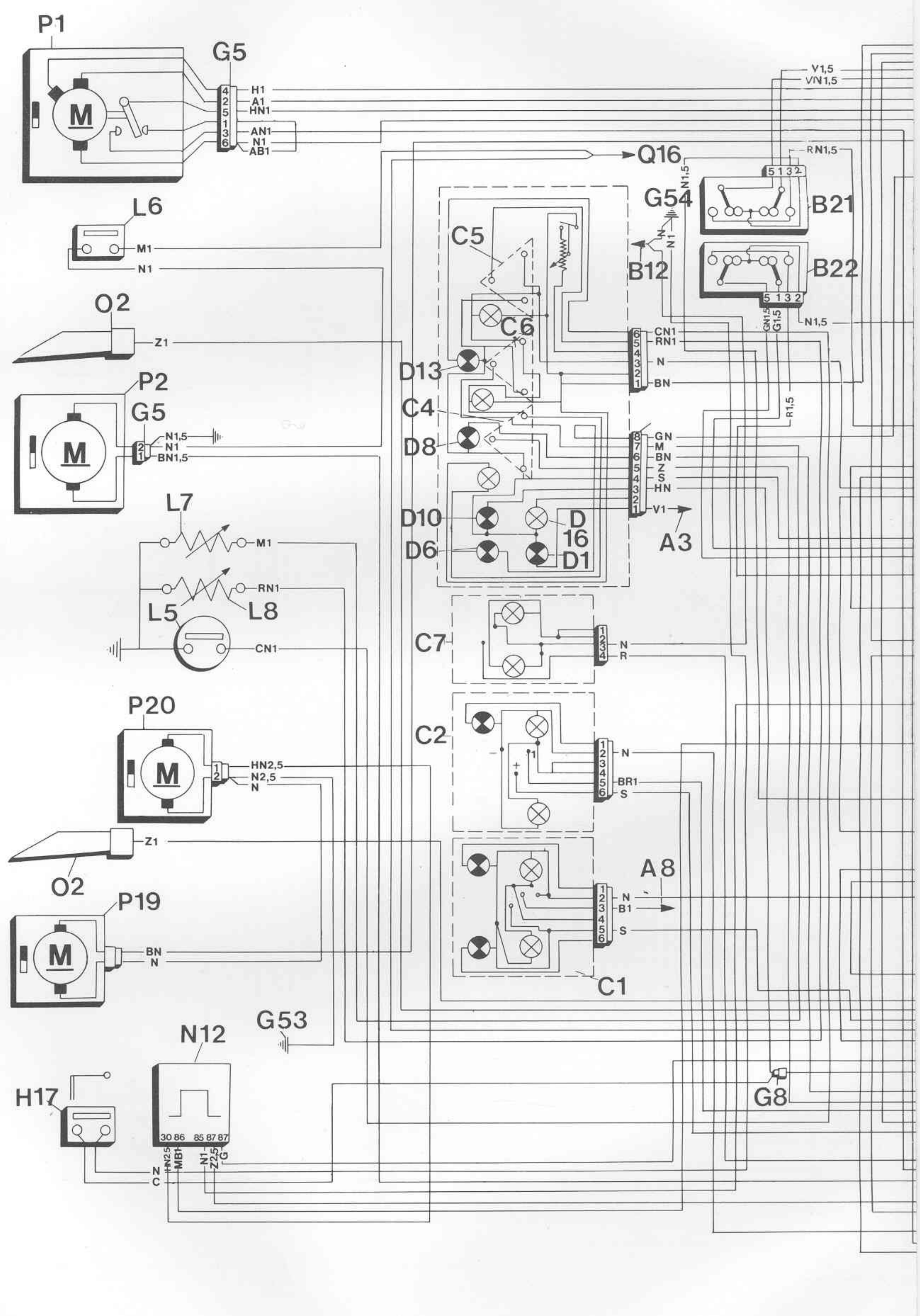
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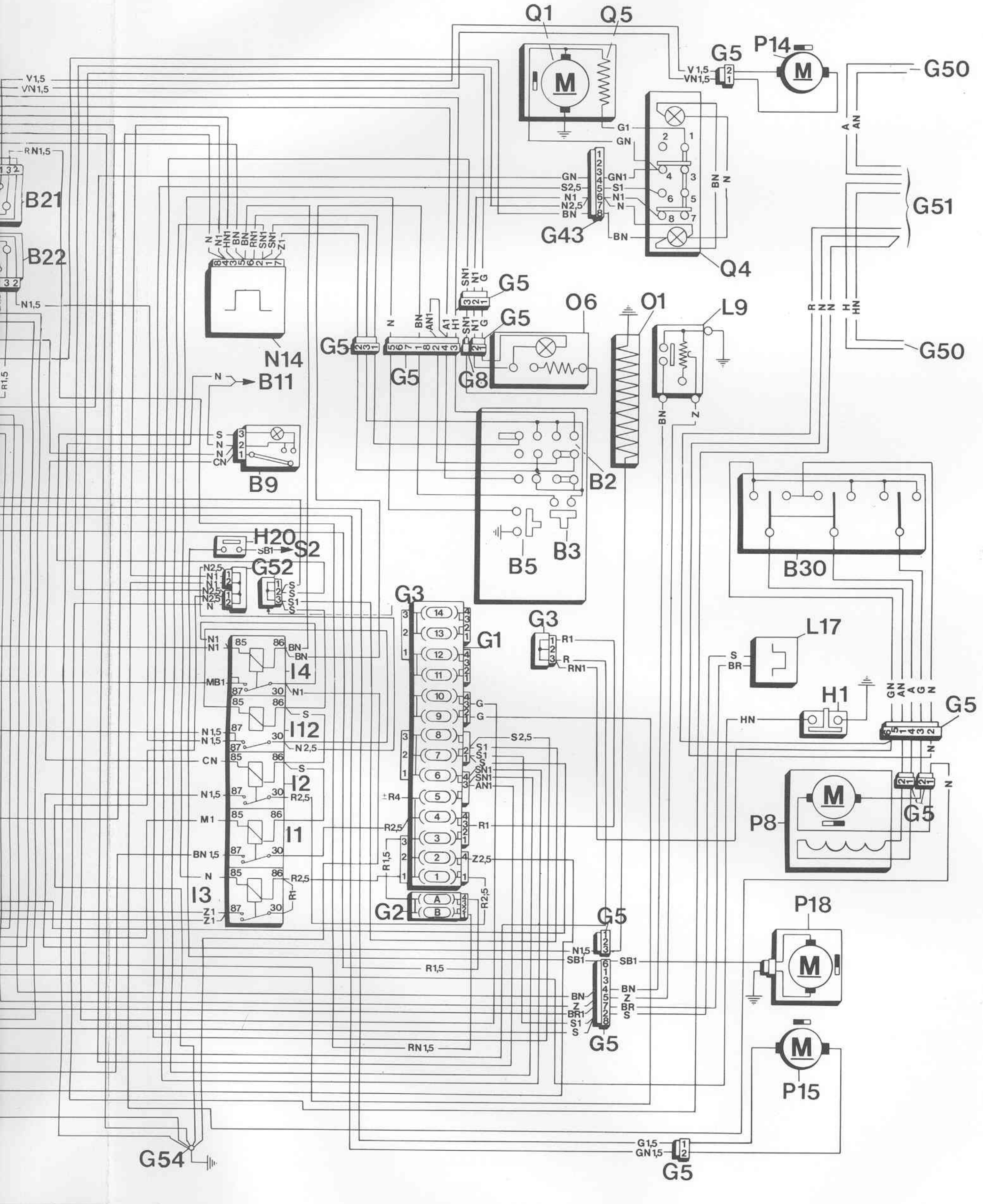
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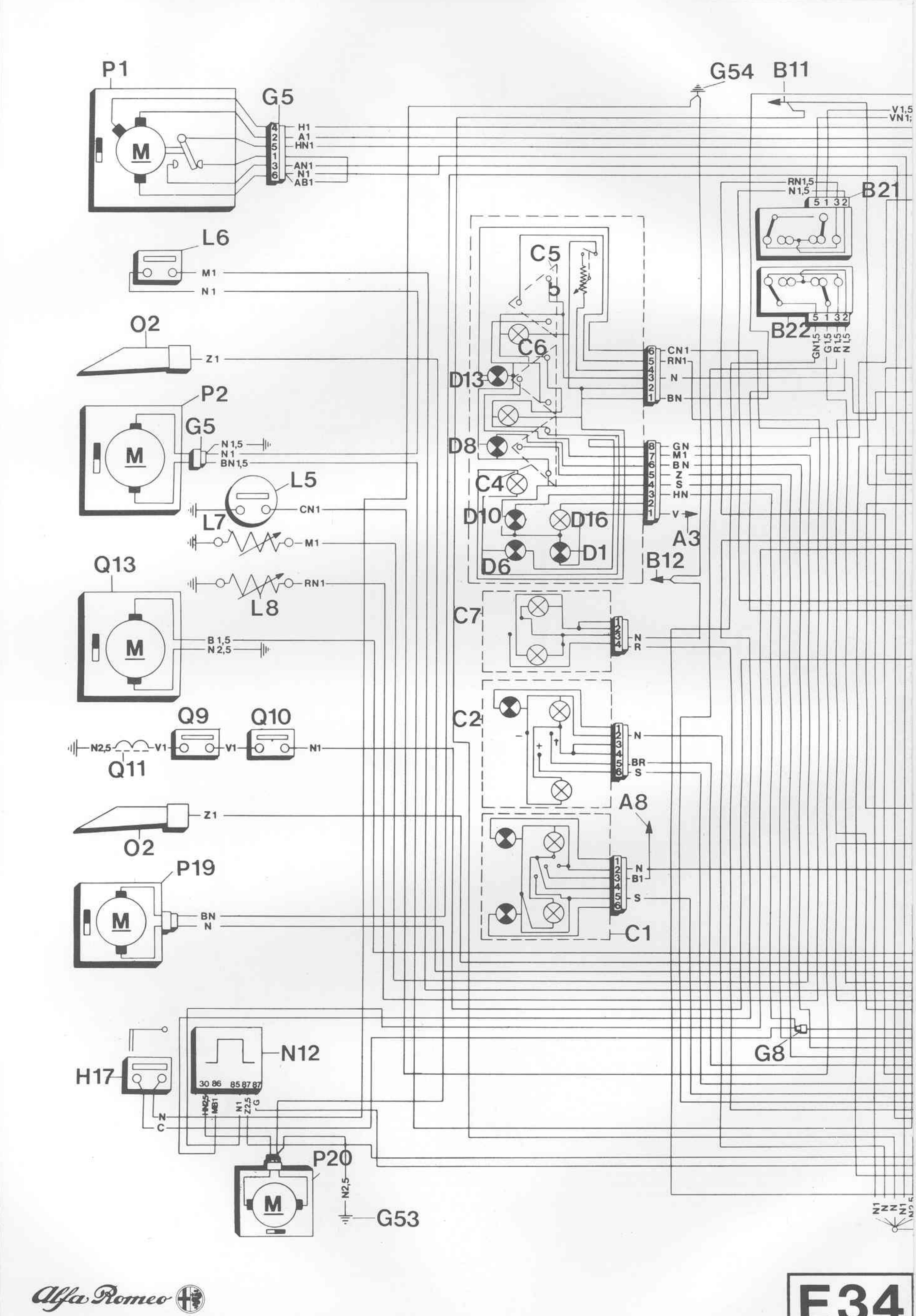
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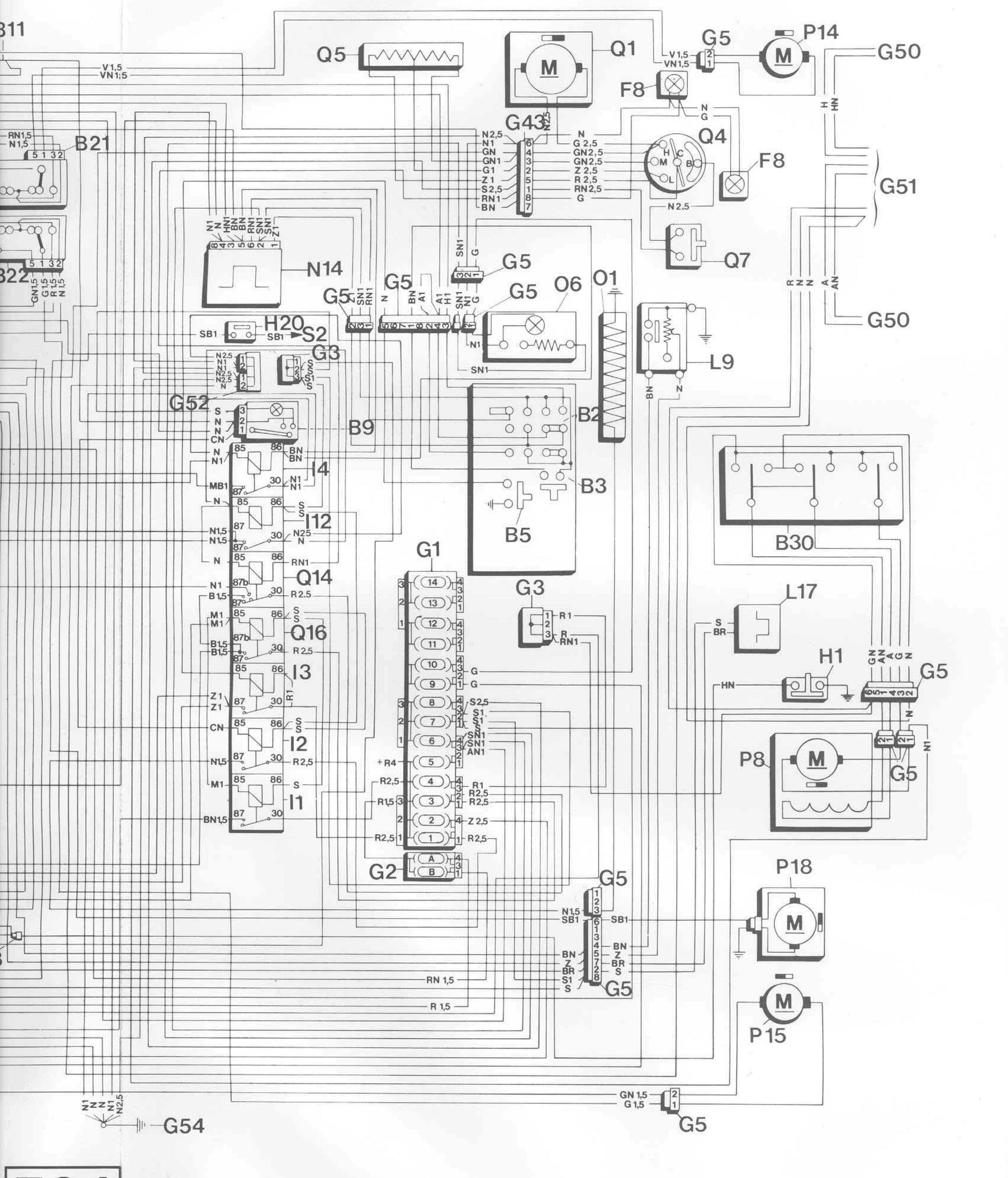
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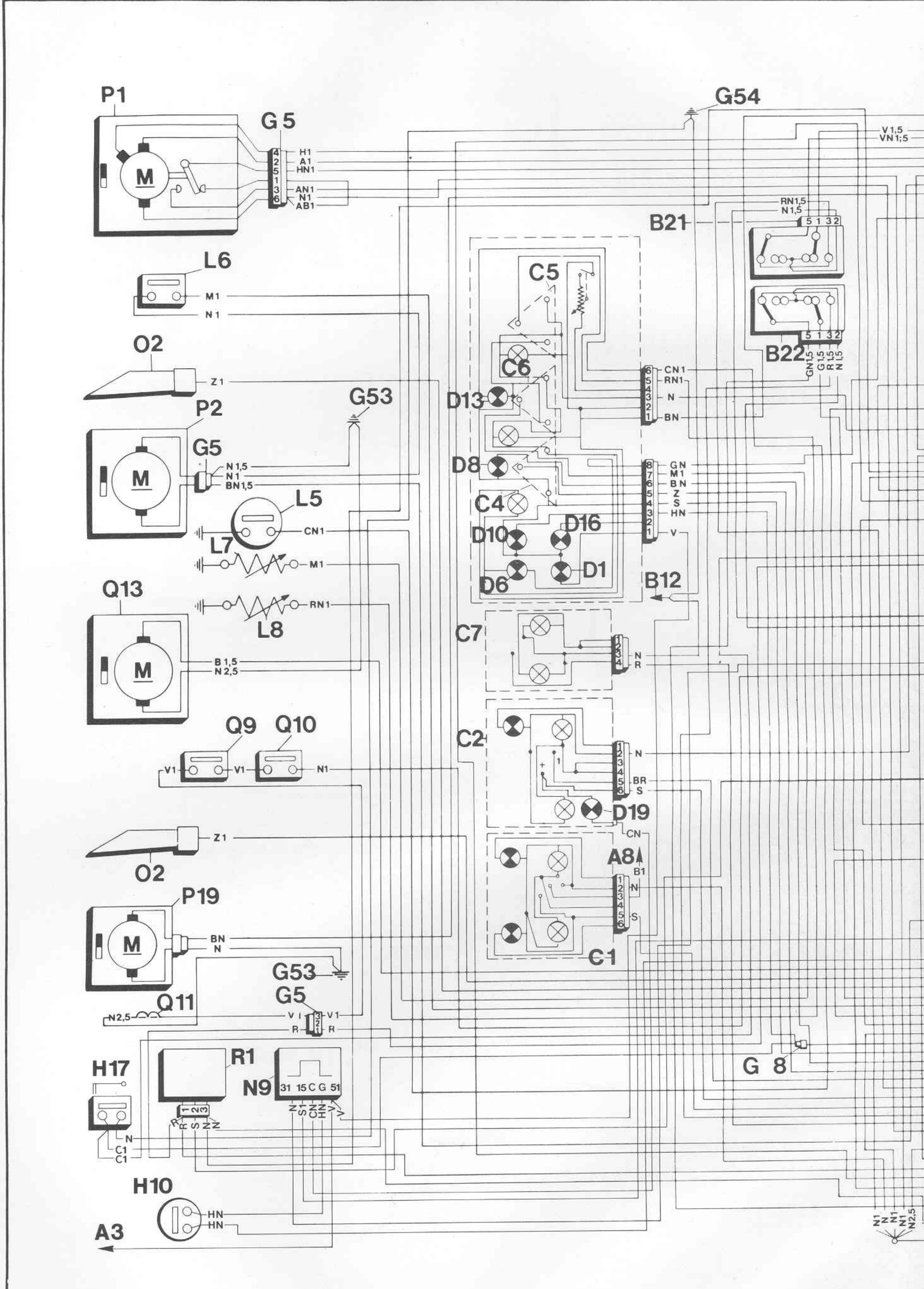
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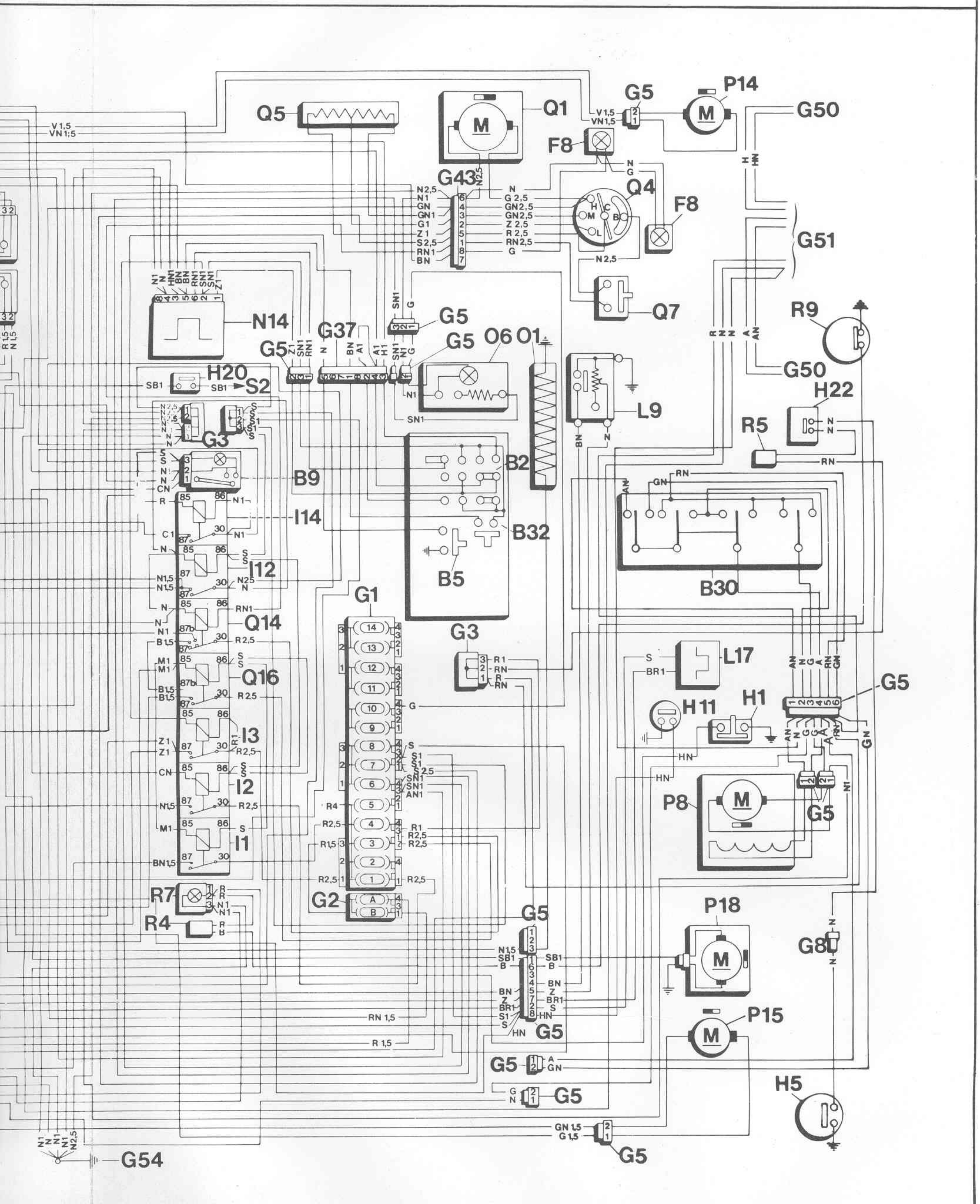

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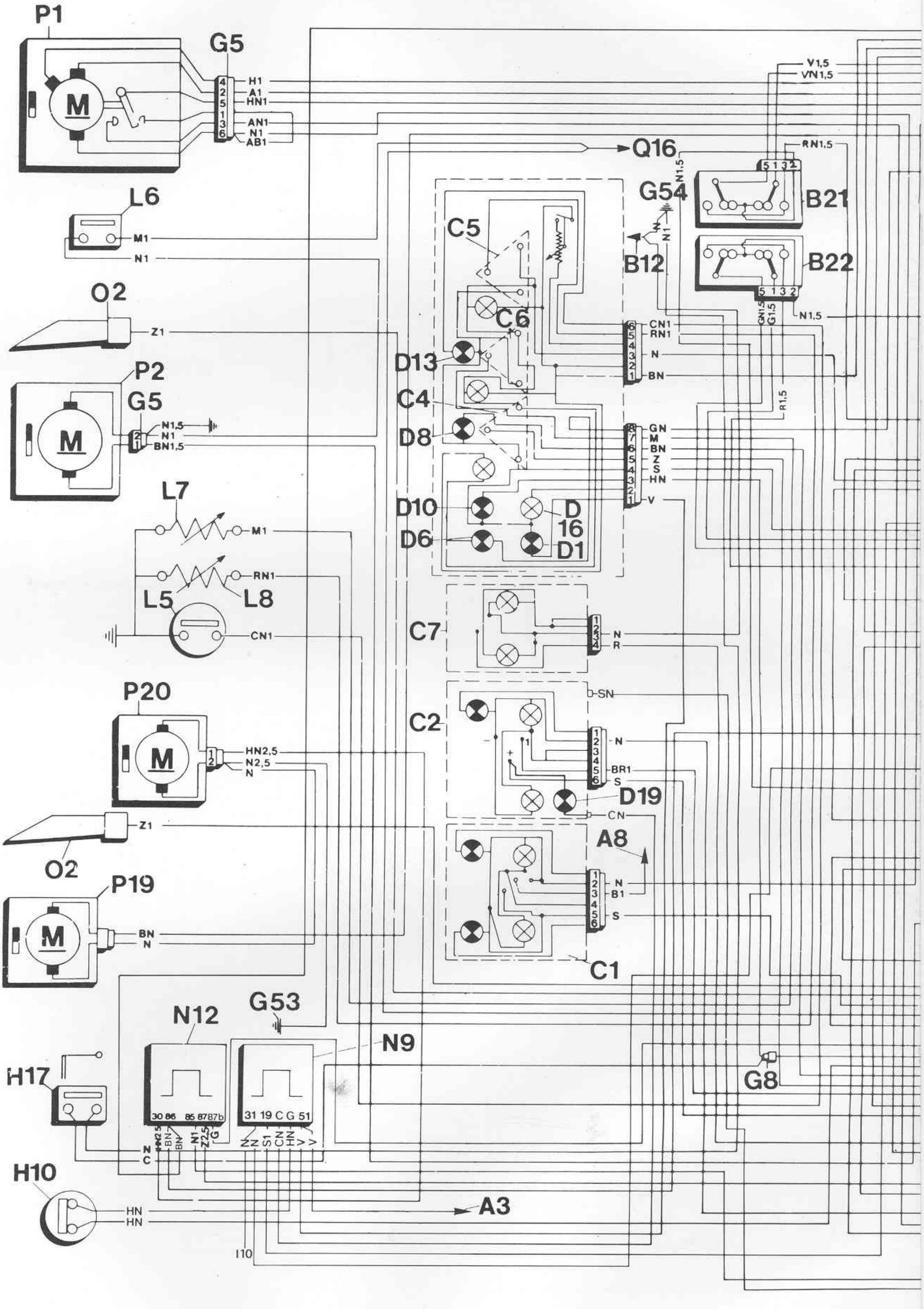
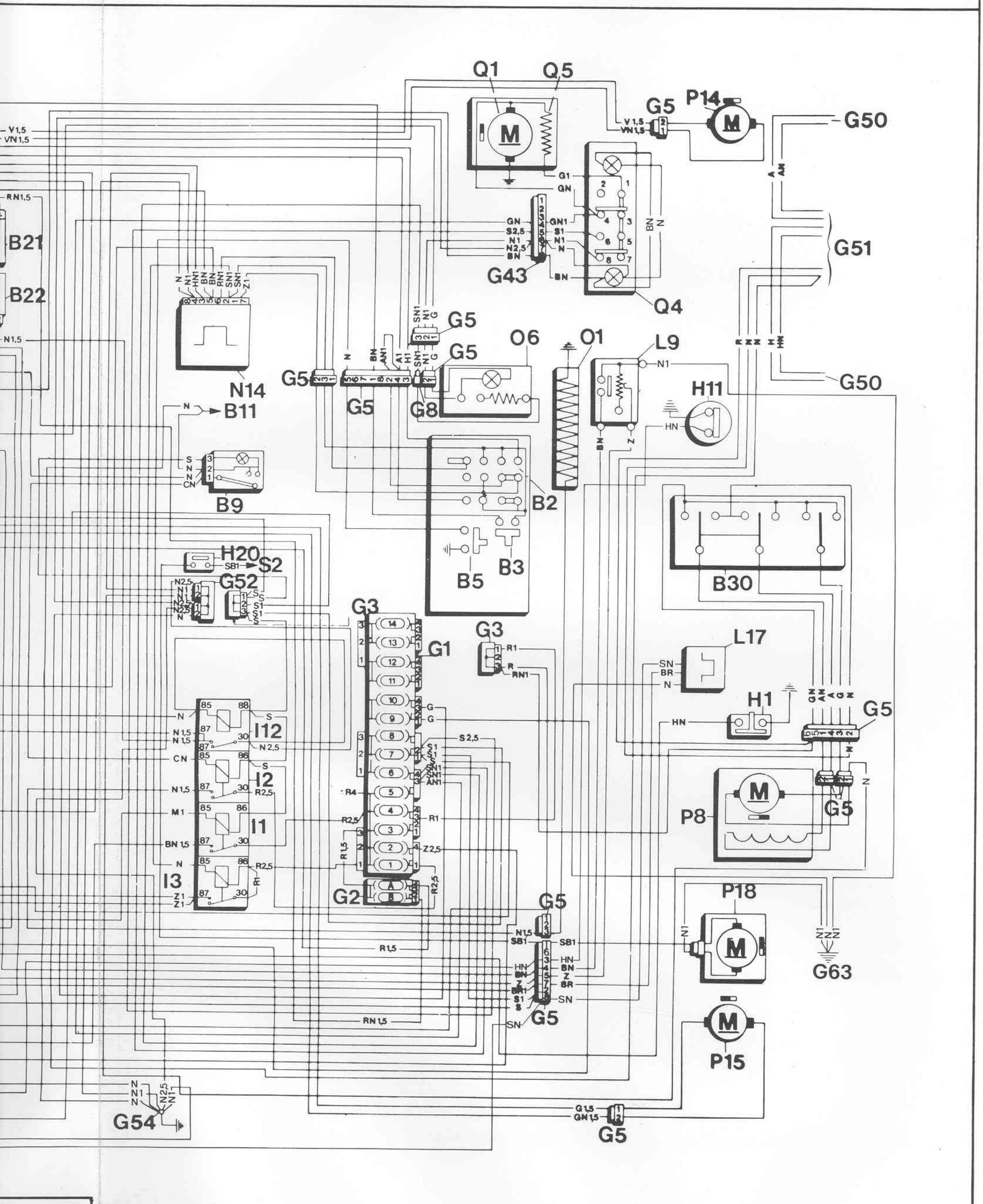


Alfa Romeo

E 72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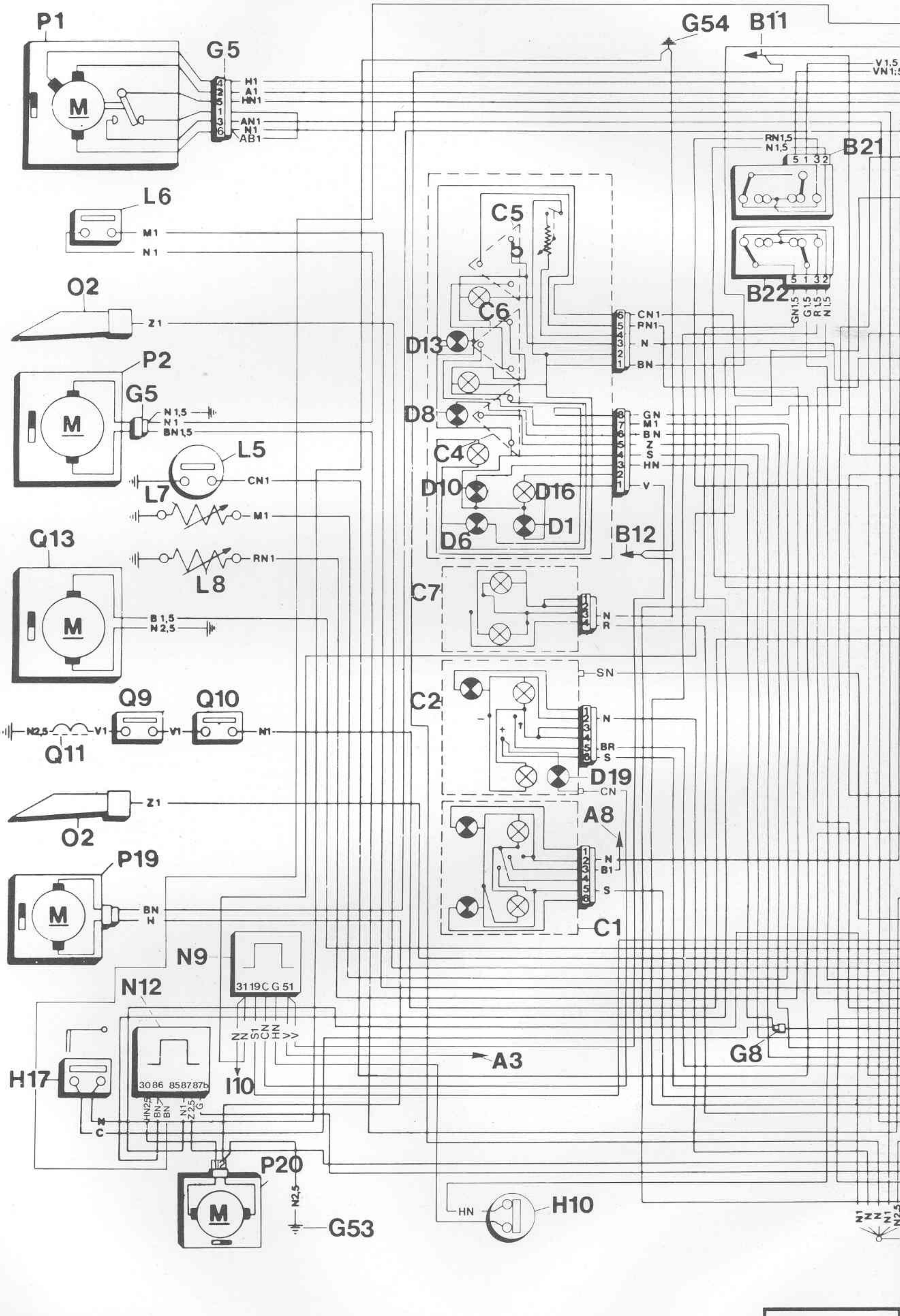
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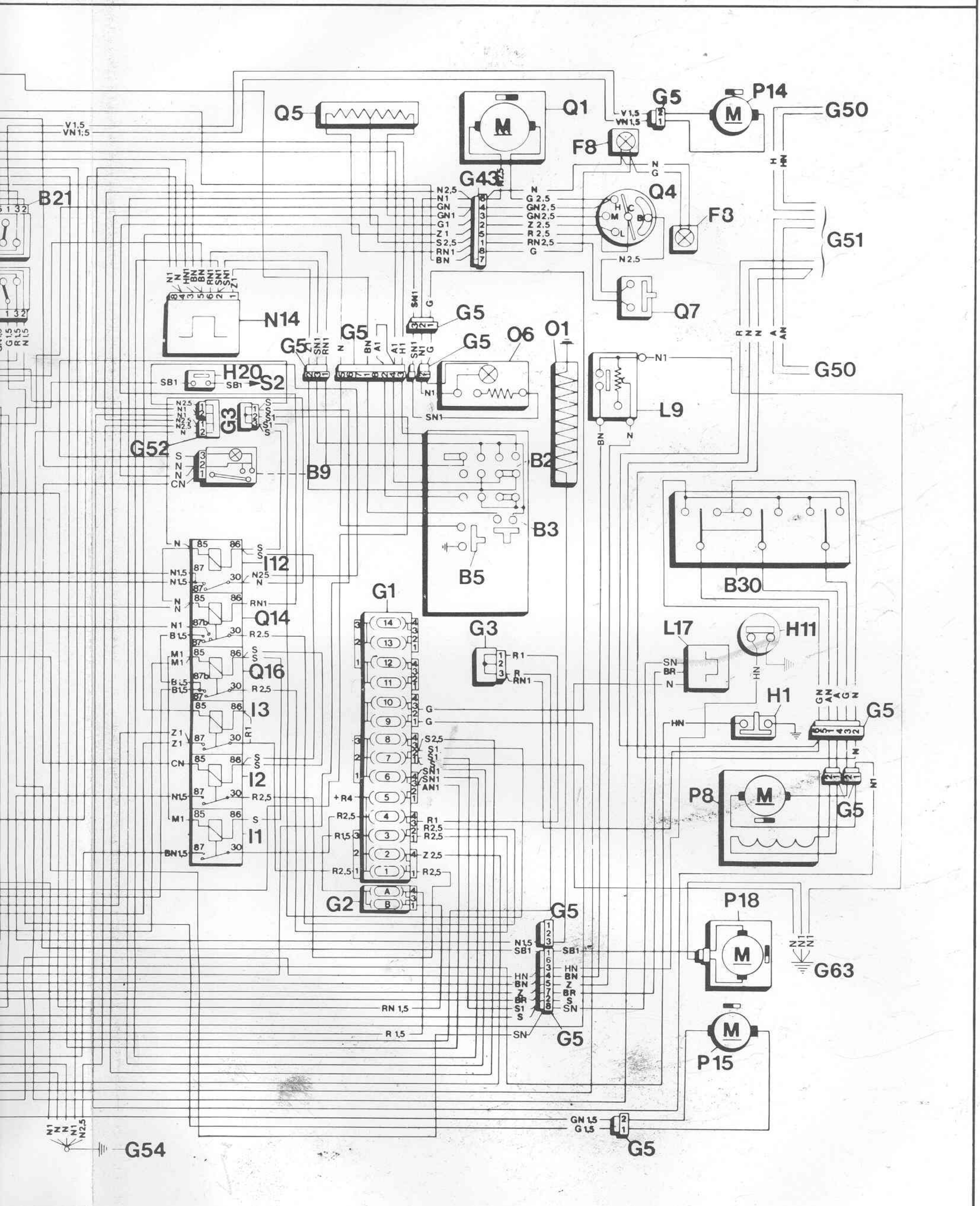
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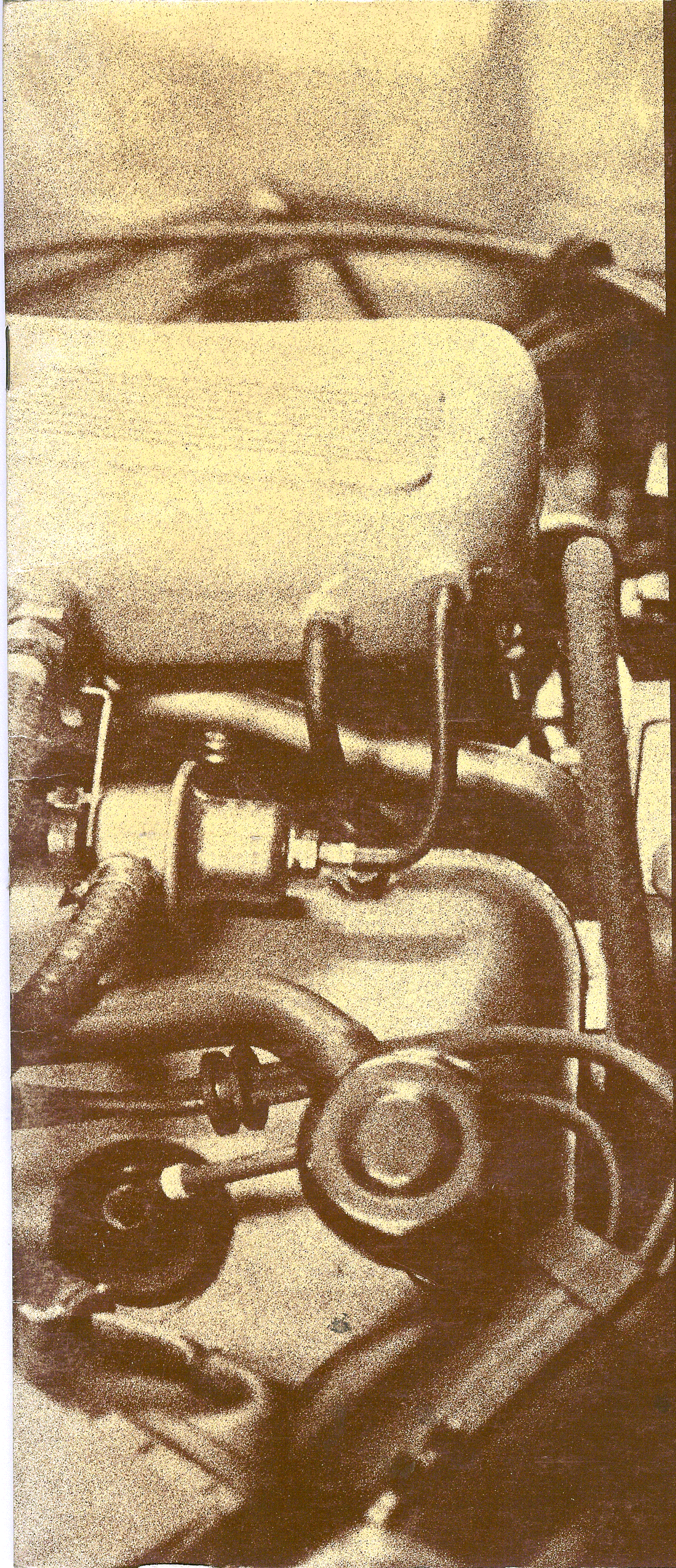

MANUALE PER LA MANUTENZIONE DEL MOTORE
MANUEL D'ENTRETIEN DU MOTEUR
MOTOR WARTUNGS-HANBUCH

GTV6 2.5

Alfa Romeo

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INHALTSVERZEICHNIS

MANUALE PER LA MANUTENZIONE DEL MOTORE
MANUEL D'ENTRETIEN DU MOTEUR
MOTOR WARTUNGS-HANBUCH

GTV6 2.5

PULIZIA O SOSTITUZIONE DEL FILTRO ARIA

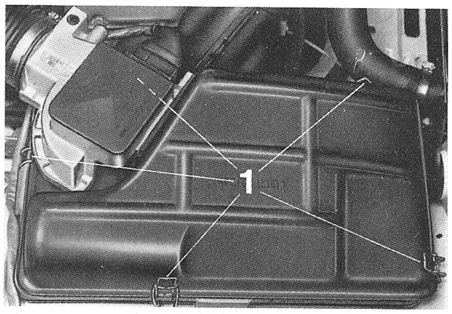
Sganciare le cinque mollette **1** che fissano il coperchio alla vaschetta del filtro e sollevare il coperchio quanto basta per estrarre l'elemento filtrante dal filtro, facendo attenzione a non deformare il condotto.
Al montaggio sistemare l'elemento filtrante correttamente (un segno su un lato dell'elemento indica qual'è il lato superiore). Montare il coperchio del filtro e fissarlo con tutte le mollette.

NETTOYAGE OU REMPLACEMENT DU FILTRE A AIR

Défaire les 5 genouillères **1** maintenant le couvercle sur la cuve du filtre et soulever le couvercle juste assez pour pouvoir extraire l'élément filtrant, en veillant à ne pas déformer le conduit.
Lors du montage replacer correctement l'élément (le côté de l'élément devant être tourné vers le haut est repéré par un signe). Monter le couvercle du filtre et le fixer à l'aide des genouillères.

SÄUBERN BZW. AUSWECHSELN DES LUFTFILTER-EINSATZES

Die fünf Klemmen **1** lösen, mit denen der Deckel des Luftfilters am Gehäuse gehalten wird; Deckel gerade so weit anheben, daß der Filtereinsatz entfernt werden kann. Hierbei darf der Schlauch nicht verbogen werden.
Bei Wiedereinsetzen des Filterelements ist darauf zu achten, daß es mit der richtigen Seite eingelegt wird (eine Markierung kennzeichnet die Oberseite des Filtereinsatzes).
Luftfilter-Deckel wieder aufsetzen und alle Klemmen befestigen.



SOSTITUZIONE O REGOLAZIONE CINGHIA DI COMANDO ALTERNATORE E POMPA DI RAFFREDDAMENTO

Regolazione della tensione

L'esatta tensione si ha con un cedimento di circa 10-15 mm applicando un carico di circa 8 kg. Per aumentare la tensione della cinghia svitare i dadi **1** e **2** sulla staffa di regolazione e la vite **3**. Spostare l'alternatore verso l'esterno per aumentare la tensione della cinghia e riavvitare il dado **2**. Controllare nuovamente la tensione della cinghia. Riavvitare la vite **3** ed il dado **1**.

Sostituzione della cinghia

Allentare il dado **2**, vite **3** e dado **1**. Spostare l'alternatore verso l'interno e asportare la vecchia cinghia. Sistemare la nuova cinghia sulle tre pulegge e spostare l'alternatore fino a raggiungere la tensione richiesta. Quindi serrare saldamente il dado **2** e controllare la tensione della cinghia, avvitare la vite **3** e il dado **1**.
Nota: prima di sostituire la cinghia di comando dell'alternatore togliere la cinghia di comando del compressore del condizionatore d'aria (se è montato).

REMPLACEMENT OU REGLAGE DE LA COURROIE D'ENTRAINEMENT D'ALTERNATEUR ET DE POMPE A EAU

Réglage de la tension:

La courroie est correctement tendue si elle fléchit d'environ 10 à 15 mm sous une charge de 8 kg. Pour augmenter la tension de la courroie desserrer les écrous **1** et **2** sur patte de réglage et la vis **3**. Déplacer ensuite l'alternateur vers l'extérieur et resserrer l'écrou **2**. Contrôler à nouveau la tension de la courroie. Resserrer la vis **3** et l'écrou **1**.

Remplacement de la courroie:

Desserrer l'écrou **2**, la vis **3** et l'écrou **1**. Déplacer l'alternateur vers l'intérieur et enlever l'ancienne courroie. Engager la courroie neuve dans la gorge des trois poulies et déplacer l'alternateur jusqu'à atteindre la tension voulue; serrer énergiquement l'écrou **2** contrôler la tension de la courroie, puis serrer la vis **3** et l'écrou **1**.
Nota: Avant de remplacer la courroie d'entraînement de l'alternateur, enlever la courroie d'entraînement du compresseur de conditionneur d'air (si la voiture en est équipée).

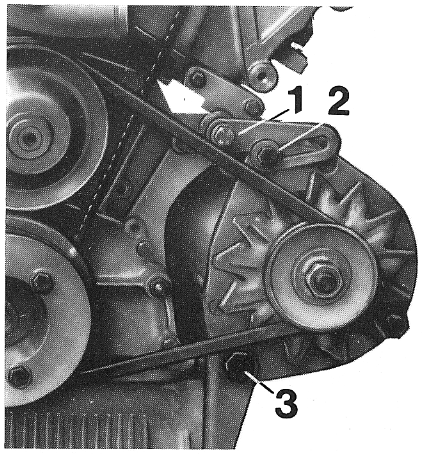
AUSWECHSELN BZW. EINSTELLEN DES KEILRIEMENS FÜR LICHTMASCHINE UND KÜHLWASSER-PUMPE

Nachstellen der Spannung

Die Riemenspannung ist einwandfrei, wenn bei Aufliegen eines Gewichts von ca. 8 kg ein Spiel von ungefähr 10-15 mm entsteht.
Zum Nachspannen des Riemens die Muttern **1** und **2** am Stellarm sowie die Schraube **3** lösen. Zum Spannen des Riemens den Generator nach außen schieben und Mutter **2** wieder anziehen: Riemenspannung prüfen.
Schraube **3** und Mutter **1** anziehen.

Riemen auswechseln

Mutter **2**, Schraube **3** und Mutter **1** lösen.
Generator nach innen schieben und alten Riemen entfernen. Den neuen Riemen auf die drei Riemenscheiben aufziehen und bis zur Einstellung der vorgeschriebenen Riemenspannung den Generator verschieben. Anschließend Mutter **2** fest anziehen und Riemenspannung prüfen! Schraube **3** und Mutter **1** anziehen.
Anm.: Vor Auswechseln des Generator-Keilriemens ist der Keilriemen des Klimaanlagen-Kompressors (wenn vorhanden) zu entfernen.



CONTROLLO DELLA TENSIONE DELLA CINGHIA DI COMANDO DEL COMPRESSORE DEL CONDIZIONATORE D'ARIA (se è montato)

L'esatta tensione si ha con un cedimento di circa 10 mm. Per la regolazione allentare le viti **1** e **2** fissando il tenditore. Riavvitare la vite **2**, controllare la tensione della cinghia, quindi avvitare la vite **1**.

COPPIE DI SERRAGGIO

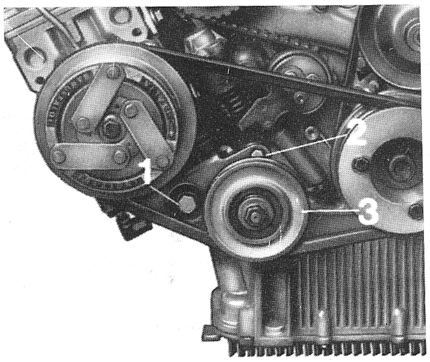
Dadi delle teste cilindri

1) al montaggio delle teste cilindri procedere come segue;
a motore freddo, serrare progressivamente nell'ordine indicato previa lubrificazione della rondella, dado e prigioniero a 8 kgm.
2) quando si effettua il tagliando dei 1300-1700 km allentare i dadi a motore freddo di un giro e quindi riavvitare nell'ordine indicato, previa lubrificazione della rondella e del dado, a 9 kgm.
N.B. L'ordine indicato nella figura vale per la testa cilindri destra. La sequenza di serraggio per la testa cilindri sinistra è simmetrica.

– Dadi cappello di banco (in olio)	7,8 ÷ 8 kgm
– Controdadi cappello di banco (in olio)	2 ÷ 2,4 kgm
– Dadi biella (in olio) ..	4,7 ÷ 5,2 kgm
– Dado puleggia albero motore (in olio)	24 kgm
– Dadi fissaggio volano (con fissatore Loctite 270)	11,5 kgm
– Cappelli albero distribuzione (in olio)	2 ÷ 2,2 kgm
– Dado fissaggio mozzo anteriore albero distribuzione	9,9 ÷ 11,9 kgm
– Vite puleggia tenditore cinghia alberi di distribuzione (con fissatore Loctite 270)	1,7 ÷ 2 kgm

CONTROLE DE LA TENSION DE LA COURROIE D'ENTRAINEMENT DU COMPRESSEUR DE CONDITIONNEUR D'AIR (si la voiture en est équipée)

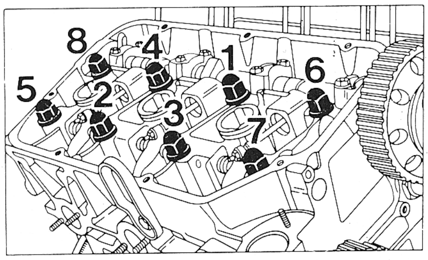
La tension exacte correspond à un fléchissement d'environ 10 mm. Pour le réglage, desserrer les vis **1** et **2**, en maintenant le tendeur comme indiqué. Resserrer la vis **2**, contrôler la tension de la courroie, puis resserrer la vis **1**.



COUPLES DE SERRAGE

– Ecrous des culasses

1) Pour le montage des culasses procéder comme suit:
Avec moteur froid et après avoir lubrifié écrous, rondelles et goujons, serrer progressivement suivant l'ordre indiqué, au couple de 8 kgm.
2) Lors du coupon des 1300-1700 km (avec moteur froid) désserrer les écrous d'un tour puis resserrer suivant l'ordre indiqué, au couple de 9 kgm; ne pas oublier de lubrifier préalablement les surfaces de contàct; écrou/rondelle.
N.B. L'ordre indiqué sur la figure cidessus se rapporte à la culasse droite. La séquence de serrage pour la culasse gauche est symétrique.



– Ecrous de chapeaux de paliers de vilebrequin (lubrifiés)	7,8 à 8 kgm
– Contre-écrous de chapeaux de paliers de vilebr. (lubrifiés)	2 à 2,4 kgm
– Ecrous de bielles (lubrifiés)	4,7 à 5,2 kgm
– Ecrou de poulie de vilebrequin (lubrifié)	24 kgm
– Ecrous de fixation du volant moteur (avec Loctite 270)	11,5 kgm
– Chapeaux de paliers d'arbre à cames (lubrifiés)	2 à 2,2 kgm
– Ecrou de fixation du moyeu d'arbre à cames.	9,9 à 11,9 kgm
– Vis de poulie de tendeur de courroie d'arbre à cames (avec Loctite 270)	1,7 à 2 kgm

PRÜFUNG DER SPANNUNG DES KEILRIEMENS DER KLIMAANLIAGE (wenn vorhanden)

Die Spannung ist einwandfrei, wenn der Riemen unter Druck um ca. 10 mm nachgibt. Zum Nachstellen die Schrauben **1** und **2** auf dem Spanner und die Schraube **3** lösen und den Spanner je nach Bedarf verstellen. Schraube **2** wieder anziehen, Riemenspannung prüfen und Schraube **1** und **3** anziehen.

ANZUGSMOMENTE

– Zylinderkopf-Schrauben

1) Beim -Montieren der Zylinderköpfe wie folgt verfahren: Bei kaltem Motor nacheinander in der gezeigten Reihenfolge - nachdem Unterlegscheibe, Mutter und Stiftschraube geschmiert worden sind - mit 8 kgm anziehen.
2) Bei Durchführung der 1300-1700 km-Inspektion (Service-Coupon) die Muttern bei kaltem Motor um eine Drehung lockern und nacheinander in der gezeigten Reihenfolge - nachdem die Kontaktflächen von Muttern und Unterlegscheiben geschmiert worden sind - mit 9 kgm anziehen.
N.B.: Die in der Zeichnung angegebene Reihenfolge gilt für den RECHTEN Zylinderkopf.
Für LINKE Zylinderköpfe ist die Reihenfolge spiegelbildlich umgekehrt.

– Hauptlagerdeckel-Muttern (geölt)	7.8-8 kgm
– Hauptlagerdeckel-Gegenmuttern (geölt)	2-2.4 kgm
– Pleuelstangen-Muttern (geölt)	4.7-5.2 kgm
– Kurbelwellen-Sicherungsmutter (geölt)	24 kgm
– Schwungrad-Sicherungsmuttern (unter Verwendung von Loctite 270 Dichtmittel)	11.5 kgm
– Nockenwellen-Lagerdeckel (geölt)	2-2.2 kgm
– Nockenwellennaben-Sicherungsmutter	9.9-11.9 kgm
– Bolzen für Nockenwellen-Riemenspannrolle (unt. Verwendung von Loctite 270 Dichtmittel)	1.7-2 kgm

CANDELE E ORDINE DI SCOPPIO

Le candele montate sul motore sono LODGE 2 HLE.

– Le candele sono del tipo a scarica superficiale con 4 punte ed elettrodo centrale che a causa delle superiori caratteristiche di prestazione durante tutte le condizioni di guida rispetto alle candele di tipo convenzionale non necessitano di manutenzione periodica, a parte la sostituzione agli intervalli richiesti. La distanza tra l'elettrodo e le punte non richiede alcuna registrazione periodica.

– Se l'isolante in ceramica risulta incrinato o se gli elettrodi sono eccessivamente usurati, le candele dovranno essere sostituite.

– L'impiego di candele non idonee alle caratteristiche di prestazioni del motore oppure dimensionalmente diverse possono essere causa di gravi danni al motore e modificare i livelli delle emissioni allo scarico.

– Prima di smontare le candele è necessario estrarre la prolunga agendo sul cappuccio di gomma.

– Prima di montare nuovamente le candele, lubrificarne la filettatura con ISECO MOLYKOTE A.

– Al montaggio, dopo aver fissato le candele alla coppia di serraggio di 2,5 - 3,5 kgm (a motore freddo) assicurarsi che la prolunga sia collegata meccanicamente ed elettricamente in modo corretto con il cavo: inserire il cappuccio di gomma sul cavo e tenendo il cavo fermo, avvitare completamente la prolunga, rimontare quindi il cappuccio sulla prolunga. Fissare la prolunga alle candele.

Ordine di scoppio 1-4-2-5-3-6

BOUGIES ET ORDRE D'ALLUMAGE

Le moteur est équipé d'origine de bougies LODGE 2 HLE.

– Ces bougies étant du type à décharge superficielle avec 4 électrodes de masse et une électrode centrale, leurs performances sont supérieures à celles des bougies conventionnelles, pour toutes les conditions d'utilisation du véhicule; ceci a pour conséquence d'éliminer tout entretien, excepté leur remplacement aux kilométrages préconisés (voir tableau d'entretien).
Par ailleurs, l'écartement entre les électrodes de masse et l'électrode centrale ne nécessite aucun réglage périodique.

– Si l'isolant en céramique est fendu ou si les électrodes présentent une usure excessive, les bougies devront être remplacées.

– L'utilisation de bougies non adaptées aux performances ou de dimensions différentes, peut endommager gravement le moteur et modifier le niveau des émissions à l'échappement.

– Avant de déposer les bougies il est nécessaire d'extraire la rallonge d'antiparasitage en agissant sur le capuchon en caoutchouc.

– Déposer les bougies (avant de remonter les bougies, lubrifier leur filetage avec de la graisse ISECO MOLYKOTE A).

– Lors du montage, après avoir serré les bougies au couple de 2,5 à 3,5 kgm (avec moteur froid), s'assurer que la rallonge d'antiparasitage soit correctement fixée au fil de bougie.

– Si la liaison fil - rallonge est douteuse, engager le capuchon en caoutchouc sur le fil et revisser complètement la rallonge en maintenant le fil; replacer ensuite le capuchon sur la rallonge. Fixer la rallonge aux bougies.

Ordre d'allumage: 1-4-2-5-3-6

ZÜNDKERZEN UND ZÜNDFOLGE

Der Motor wird standardmäßig mit LODGE 2 HLE Zündkerzen geliefert.

– Bei den Zündkerzen handelt es sich um Vierpunkt-Gleitfunken-Kerzen mit Mittelelektrode, die dank ihrer überlegenen Leistungskennwerte gegenüber herkömmlichen Zündkerzen keiner regelmäßigen Wartung bedürfen und lediglich in den vorgeschriebenen Abständen ausgewechselt werden (siehe hierzu Wartungsplan).
Eine routinemäßige Nachstellung des Abstands zwischen der Mittelelektrode und den Punkten ist nicht erforderlich.

– Ist der Keramik-Isolator gesprungen oder weisen die Elektroden übermäßige Abnutzungserscheinungen auf, sind die Zündkerzen unbedingt auszuwechseln.

– Bei Verwendung von Zündkerzen mit nicht identischen Leistungsspezifikationen oder abweichenden Abmessungen besteht die Gefahr eines ernsten Motorschadens sowie veränderter Emissionswerte.

– Vor dem Ausbau der Zündkerzen ist der jeweilige Kerzenstecker durch Ziehen an der Gummikappe zu entfernen.

– Zündkerzen entfernen (vor dem Wiedereinsetzen die Kerzengewinde mit ISECO MOLYKOTE A schmieren).

– Nachdem beim Wiedereinsetzen die Zündkerzen (bei kaltem Motor) mit einem Moment von 2.5-3.5 kgm angezogen worden sind, ist sicherzustellen, daß eine zuverlässige mechanische und elektrische Verbindung zwischen Stecker und Kabel besteht.

– Im Zweifelsfalle die Gummikappe am Kabel hochschieben und den Stecker bei stabilisiertem Kabel fest eindrehen; anschließend die Gummikappe wieder über den Stecker ziehen. Stecker an den Zündkerzen anbringen.

Zündfolge: 1-4-2-5-3-6.

CONTROLLO E REGOLAZIONE GIOCO VALVOLE

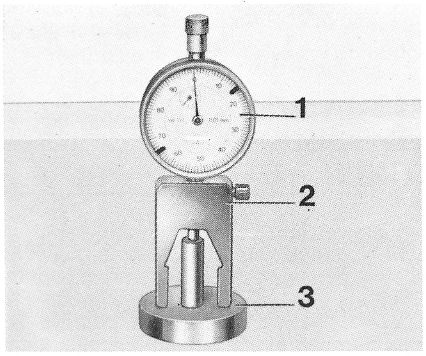
– Allentare le mollette di ritegno del coperchio del filtro aria **1** e asportare il coperchio (pag. 20-21).
– Disinnestare il connettore del potenziometro **5** del misuratore quantità aria
– Asportare il separatore olio dalla testa cilindri.
– Staccare:
● i tubi della valvola limitatrice depressione **13**;
● i due tubi ed il cavo elettrico dall'elettrovalvola supplemento aria **12**;
● il tubo **11** del by-pass del minimo.
– Allentare la fascetta di ritegno dal condotto **4** del misuratore quantità aria e asportare il condotto.
– Togliere le semiscatole che proteggono il distributore ed asportare la calotta con tutto il gruppo cavi elettrici.
– Allentare le due viti e staccare i cavi di massa.
– Smontare le candele e tappare le sedi.
– Allentare le viti e asportare i coperchi delle valvole.
– Con una chiave dinamometrica e nella sequenza indicata, (vedere pag. 3) controllare che la coppia di serraggio dei dadi della testa cilindri sia di 9 kgm.
Per controllare il gioco delle valvole di aspirazione, procedere come segue;
– Applicare un comparatore **1** sull'attrezzo **2** (C.6.0178); azzerare il comparatore sull'attrezzo **3** (C.6.0182);
– Ruotare l'albero motore fino a che non sia possibile posizionare l'attrezzo **2** sulla camma della valvola da controllare.
– Il gioco delle valvole di aspirazione deve essere 0,475 ÷ 0,500 mm a motore freddo.
– Per l'eventuale regolazione del gioco delle valvole di aspirazione, operare nel seguente modo:
– Ruotare l'albero motore finché la tacca **P** incisa sulla puleggia del motore e il perno di riferimento risultino allineati, di conseguenza le tacche sugli alberi di distribuzione devono essere allineate con le tacche di riferimento sui cappelli;

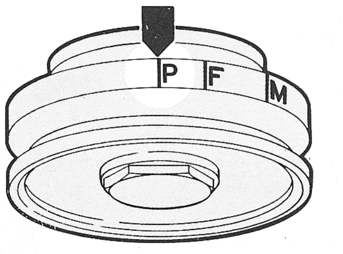
CONTROLE ET REGLAGE DE JEU AUX SOUPAPES

– Decrochez les 4 genouillères maintenant le couvercle du filtre à air **1** et déposer le couvercle (pag. 20-21).
– Debrancher le raccord du potentiomètre **5** de l'ensemhle debitmètre d'air.
– Déposer l'élément de décantation de l'huile de la culasse.
– Déposer:
● conduites de valve de depression **13**;
● les deux tuyaux et le fil du dispositif d'air additionnel **12**.
● le tuyau **11** du régulateur by-pass de ralenti.
– Desserrer les colliers de maintien du conduit **4** du débitmètre d'air et déposer le conduit.
– Déposer les protections du distributeur d'allumage et retirer la tête munie des fils de bougies.
– Desserrer les deux vis **11** et déposer les fils de masse.
– Déposer les bougies et recouvrir les puits de bougie.
– Desserrer les vis et déposer les couvre-culasse.
– A l'aide d'une clé dynamométrique et suivant la séquence indiquée (voir page 3), vérifier que les écrous de la culasse soient bien serres au couple de 9 kgm (88 Nm).
Pour contrôler le jeu aux soupapes d'admission, procéder comme suit:
– Appliquer un comparateur **1** sur le calibre **2** (n. C.6.0178) et régler le zéro du comparateur en utilisant le marbre d'étalonnage **3** (n. C.6.0182).
– Faire tourner le vilebrequin jusqu'à rendre possibile le positionnement de l'outil **2** sur la came de la soupape à régler.
– Le jeu aux soupapes d'admission doit être de 0,475 à 0,500 mm (avec moteur froid).
– Pour le réglage éventuel du jeu aux soupapes d'admission, effectuer les opérations suivantes:
– Faire tourner le vilebrequin jusqu'à ce que le repère **P** sur la poulie du moteur soit alignée avec l'index de référence; à cet instant, les repères sur les arbres à cames devront être alignés avec les repères des chapeaux de paliers.

ÜBERPRÜFEN UND EINSTELLEN DES VENTILSPIELS

– Die vier Klemmen der Luftfilter-Abdeckung **1** lösen un die Abdeckung abnehmen (seite 20-21).
– Potentiometer-Anschluß **5** vom Luftmengenmesser trennen.
– Gehäuseentüfter vom Zylinderkopf abnehmen.
– Zu demontieren:
● druckbegrenzungsventilleitungen **13**,
● die zwei Rohre und das Kabel vom Zusatzluftschieber **12**.
● das Rohr **11** vom Leerlauf-Überströmregler.
– Briede **11** der Luftmengenmesser-schlauch **4** lösen und Schlauch abnehmen.
– Die Zündverteiler-Schutzhülle entfernen und Verteilerkappe und Kabelbündel als Ganzes abnehmen.
– Die zwei Schrauben lösen und Erdungskabel abnehmen.
– Zündkerzen entfernen und Öffnungen Verstopfen.
– Schrauben lösen und Ventildeckel abnehmen.
– Mittels Drehmomentschlüssel und in der auf Seite 3 aufgeführten Reihenfolge sicherstellen, daß das Anzugsmoment für die Zylinderkopf-Schrauben bei 9 kgm liegt.
Zwecks Überprüfung des Einlaßventilspiels wie folgt verfahren:
– Eine Meßuhr **1** auf Werkzeug **2** (Werkzeug Nr. C.6.0178) montieren; Meßuhr mittels Werkzeug **3** (Werkzeug Nr. C.6.0182) auf Null stellen.
– Kurbelwelle durchdrehen, bis Werkzeug **2** auf dem Nocken des einzustellenden Ventils angesetzt werden kann.
– Das Einlaßventil-Spiel sollte bei kaltem Motor 0.475-0.500 mm betragen.
– Sollte eine Nachstellung des Einlaßventilspiels erforderlich sein, ist wie folgt zu verfahren:
– Kurbelwelle durchdrehen, bis die Markierung **P** auf der Motorriemenscheibe auf den Kontrollstift ausgerichtet ist. Jetzt sollten die Markierungen auf den Nockenwellen auf die Kontrollmarkierungen an den Lagerdeckeln ausgerichtet sein.





– Asportare i coperchi dal carter della cinghia di distribuzione;
– Utilizzando l'attrezzo A.2.0361 per fermare l'albero di distribuzione, ed una chiave adatta, svitare il dado di ritegno della puleggia all'albero di distribuzione;

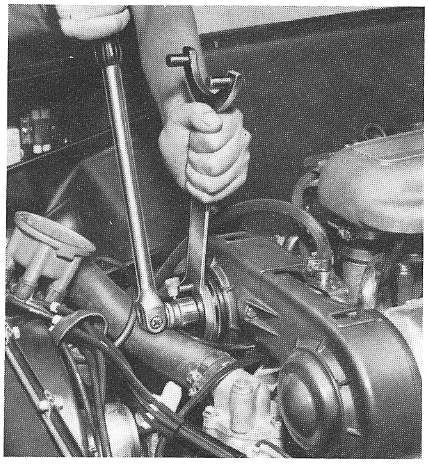
– Déposer les carters de sur le logement en plastique de la courroie de distribution.
– A l'aide de l'outil A.2.0361 de maintien de l'arbre à cames et d'une clé appropriée, dévisser l'écrou de fixation de la poulie d'arbre à cames.

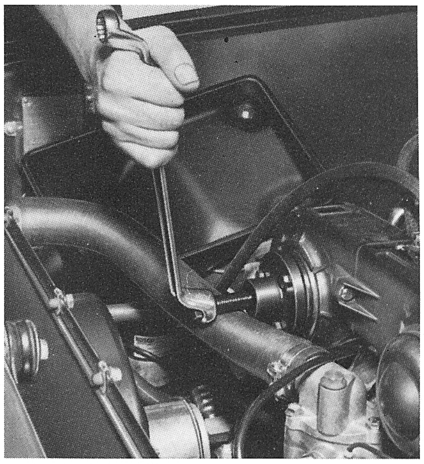
– Abdeckungen vom Plastikgehäuse des Steuer-Zahnriemens entfernen.
– Mit Hilfe des Werkzeugs A.2.0361 zum Blockieren der Nockenwelle sowie eines passenden Schlüssels die Mutter entfernen, mit der die Riemenscheibe an der Nockenwelle befestigt ist.

– Allentare le tre viti, sistemare l'attrezzo A.3.0521 e asportare il mozzo e la puleggia dentata;

– Desserrer les trois vis, placer l'outil A.30521 extraire le moyeu et la poulie crantée.

– Schrauben lösen, Werkzeug A.3.0521 ansetzen und Nabe sowie Zahnriemenscheibe abnehmen.

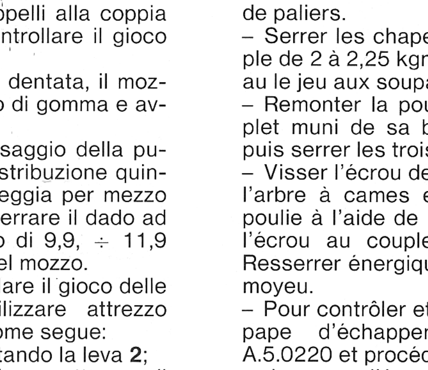


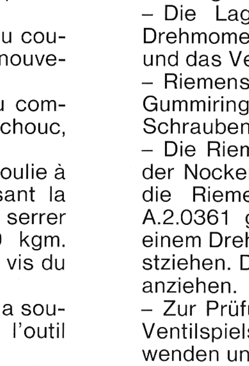


– Asportare i capelli dell'albero di distribuzione e togliere l'albero di distribuzione sollevandolo prima posteriormente;
– Estrarre i bicchierini valvole e recuperare i cappellotti;
– Misurare lo spessore dei cappellotti mediante comparatore attrezzo C.1.0108. Selezionare cappellotti dalla serie disponibile secondo la differenza stabilita in precedenza per riportare il gioco al valore prescritto;
– Lubrificare i bicchierini mediante olio motore e rimontarli; rimontare l'albero di distribuzione e i cappelli;
– Serrare i dadi dei cappelli alla coppia di 2 ÷ 2,25 kgm e ricontrollare il gioco valvole.
– Rimontare la puleggia dentata, il mozzo completo dell'anellino di gomma e avvitare le tre viti.
– Avvitare il dado di fissaggio della puleggia all'albero della distribuzione quindi tenendo ferma la puleggia per mezzo dell'attrezzo A.2.0361, serrare il dado ad una coppia di serraggio di 9,9, ÷ 11,9 kgm. Serrare le tre viti del mozzo.
– Per controllare e regolare il gioco delle valvole di scarico utilizzare attrezzo A.5.0220 e procedere come segue:
– allentare il dado **1** ruotando la leva **2**;
– ruotare la chiave **3** fino a ottenere il gioco prescritto, utilizzando lo spessimetro **4**.
Il gioco della valvola di scarico prescritto è di 0,225 ÷ 0,250 mm (a motore freddo).
– Serrare il dado **1** e ricontrollare il gioco valvole.

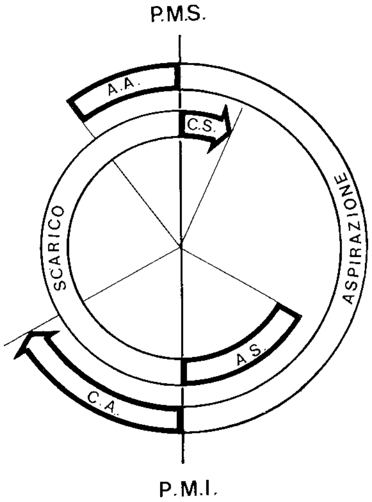
– Déposer les chapeaux de paliers, puis l'arbre à cames, en le soulevant d'abord par l'arrière.
– Extraire les poussoirs et récupérer les pastilles de réglage situées sous les poussoirs.
– Mesurer l'épaisseur des pastilles de réglage avec le comparateur N° C.1.0108. Sélectionner les pastilles de la série disponible suivant la différence établie précédemment, afin de ramener le jeu à sa valeur correcte.
– Lubrifier et remonter les poussoirs; remonter l'arbre à cames et les chapeaux de paliers.
– Serrer les chapeux de paliers au couple de 2 à 2,25 kgm et contrôler à nouveau le jeu aux soupapes.
– Remonter la poulie et le moyeu complet muni de sa bague en caoutchouc, puis serrer les trois vis.
– Visser l'écrou de fixation de la poulie à l'arbre à cames et, en immobilisant la poulie à l'aide de l'outil A.Z.0361, serrer l'écrou au couple de 9,9 à 11,9 kgm. Resserrer énergiquement les trois vis du moyeu.
– Pour contrôler et régler le jeu à la soupape d'échappement, utiliser l'outil A.5.0220 et procéder comme suit:
– desserrer l'écrou **1** en tournant le levier **2**;
– tourner la clé **3** jusqu'à obtenir le jeu spécifié, en utilisant la cale d'épaisseur **4**.
Le jeu à la soupape d'échappement doit être de 0,225 à 0,250 mm (avec moteur froid)
– Serrer l'écrou **1** et contrôler à nouveau le jeu aux soupapes.

– Nockenwellen-Lagerdeckel entfernen und Nockenwelle zum Herausnehmen zuerst am hinteren ende anheben.
– Ventilbecher abnehmen und die Einstellscheiben darunter entfernen.
– Die Stärke der Einstellscheiben mittels Werkzeug mit Meßuhr C.1.0108 messen. Ersatzscheiben aus dem Reparatursatz entsprechend aussuchen, um das Ventilspiel wieder auf den vorgeschriebenen Wert zu bringen.
– Ventilbecher mit Motoröl schmieren und wieder einsetzen; die Nockenwelle und Lagerdeckel wieder einbauen.
– Die Lagerdeckel-Muttern mit einem Drehmoment von 2-2,25 kgm anziehen und das Ventilspiel nochmals prüfen.
– Riemenscheibe sowie die Nabe mit Gummiring wieder einsetzen und die drei Schrauben anziehen.
– Die Riemenscheibe mit der Mutter an der Nockenwelle anschrauben; während die Riemenscheibe mittels Werkzeug A.2.0361 gehalten wird, die Mutter mit einem Drehmoment von 9.9-11.9 kgm festziehen. Die drei Naben-Schrauben fest anziehen.
– Zur Prüfung und zum Nachstellen des Ventilspiels das Werkzeug A.5.0220 verwenden und wie folgt vorgehen:
– Mutter **1** durch Drehen des Hebels **2** lösen.
– Schlüssel **3** drehen, bis das vorgeschriebene Spiel an der Fühlerlehre **4** abzulesen ist. Das vorgeschriebene Auslaßventilspiel (bei kaltem Motor) ist 0.225-0.250 mm.
– Ventil **1** anziehen und Ventilspiel nochmals prüfen.





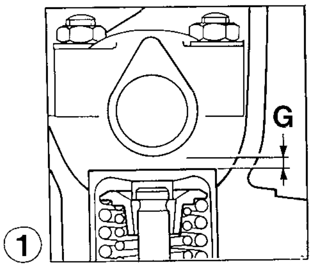
GIOCO VALVOLE E MESSA IN FASE DELLA DISTRIBUZIONE



I.0 = apertura aspirazione 36°50' prima P.M.S.
E.O. = apertura scarico 59°55' prima P.M.I.
I.C. = chiusura aspirazione 60°50' dopo P.M.I.
E.C. = chiusura scarico 23°55' dopo P.M.S.
fase di aspirazione = 277°40'
fase di scarico 263°50'

Gioco valvole di aspirazione (1)
G = 0,475 ÷ 0,500 mm

Gioco valvole di scarico (2)
G = 0,255 ÷ 0,250 mm



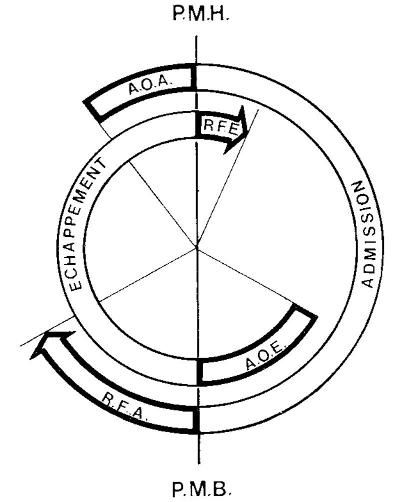
REGOLAZIONE REGIME MINIMO

La regolazione del minimo si deve effettuare con il motore a temperatura di regime, cambio in folle e tutti gli accessori disinseriti.
- Allentare il controdado **1**, ruotare la ghiera di regolazione finché la velocità del motore sia di 1000 ± 100 giri/min; serrare nuovamente il controdado **1**.

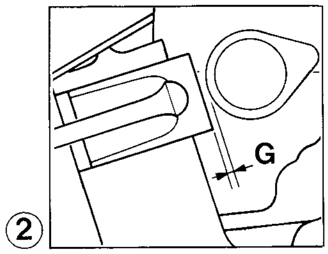
REGOLAZIONE CO% AL MINIMO

La lettura dei valori di monossido di carbonio (CO) deve essere effettuata con la strumentazione NDIR dall'estremità del tubo di scarico con motore regimato e al minimo: il valore deve essere di $0{,}5\ ^{+0,5}_{-0,2}\%$. Se la percentuale di CO supera il valore di cui sopra, agire sulla vite di regolazione **5** (con sede tappata da un sigillo **6**) situato nel misuratore quantità aria.
Quindi controllare che il minimo sia 1000 ± 100 giri/min, in caso contrario regolare nuovamente come indicato nel paragrafo precedente.
Al termine della regolazione CO, tappare la sede della vite di regolazione con l'apposito sigillo rosso (119.11.11.028.01).

JEU AUX SOUPAPES ET DIAGRAMME DE CALAGE DE LA DISTRIBUTION



A.O.A.: 36°50' avant le P.M.H.
A.O.E.: 59°55' avant le P.M.B.
R.F.A.: 60°50' après le P.M.B.
R.F.E.: 23°55' après le P.M.H.
Phase d'amission: 277°40'
Phase d'échappement: 263°50'
Jeu aux soupapes d'admission (1)
= 0,475 à 0,500 mm
Jeu aux soupapes d'échappement (2)
= 0,255 à 0,250 mm



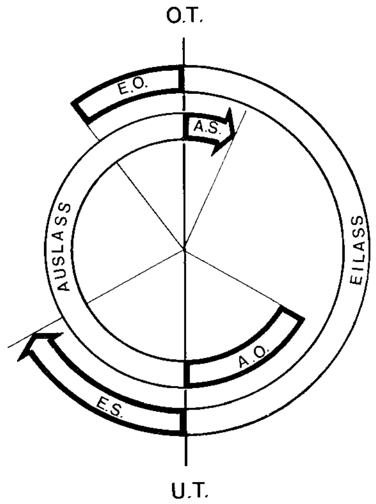
RÉGAGE DU RÉGIME DE RALENTI

Le réglage du régime de ralenti doit s'effectuer lorsque le moteur est à sa température normale de fonctionnement avec boîte de vitesses au point mort et tous accessoires électriques exclus.
- Desserrer le contre-écrou **1** du régulateur by-pass de ralenti et faire tourner la bague du régulateur de ralenti et faire tourner la bague du régulateur jusqu'à ce que la vitesse de rotation du moteur soit de 1000 ± 100 tr/mn; resserrer le contre-écrou **1**.

REGLAGE DU POURCENTAGE DE CO% AU RALENTI

Le pourcentage de monoxyde de carbone ne devra être relevé qu'à l'aide de l'appareillage NDIR, en sortie de tuyau d'echappement: la valeur relevée devra être de $0{,}5\ ^{+0,5}_{-0,2}\%$.
Si le pourcentage de CO dépasse cette valeur, agir à nouveau sur la vis de réglage **5** (cachée par le capuchon d'inviolabilité **6**) du groupe senseur de flux d'air.
Vérifier à nouveau le régime de ralenti (1000 ± 100 tr/mn); si nécessaire répéter le réglage comme indiqué au paragraphe précédent.
Après réglage du CO, replacer le capuchon d'inviolabilité rouge (REF. 119.11.11.0.28.01) sur la vis de réglage.
Contrôler que le contenu en HC ne dépasse pas 480 ppm.

GRAFISCHE DARSTELLUNG: VENTILSPIEL UND VENTIL-STEUERUNG



OT.UT. = oberer Totpunkt
B.D.C. = unterer Totpunkt

E.Ö. = Einlaß öffnet sich 36°50' vor oberem Totpunkt (O.T.)
A.Ö. = Auslaß öffnet sich 59°55' vor unterem Totpunkt (U.T.)
E.S. = Einlaß schließt sich 60°50' nach unterem Totpunkt (U.T.)
A.S. = Auslaß schließt sich 23°55' nach oberem Totpunkt (O.T.)

Einlaßhub = 277°40'
Auslaßhub = 263°50'

Einlaßventilspiel (1)
G = 0.475-0.500 mm

Auslaßventilspiel (2)
G = 0.225-0.250 mm

LEERLAUF-EINSTELLUNG

Die Einstellung der leerlauf-Drehzahl muß am Motor bei Betriebstemperatur mit dem Getriebe in Leerlauf-Stellung sowie unter abschaltung sämtlicher Zusatzgeräte vorgenommen werden.
- Sicherungsmutter **1** der Leerlauf-Regelvorrichtung lösen; den Leerlauf-Stellring drehen, bis die Drehzahl bei 1000 ± 100 UpM liegt; Sicherungsmutter **1** wieder anziehen.

EINSTELLEN DES CO%-GEHALTS IM LEERLAUF

Die Kohlenmonoxyd-Werte müssen ausschließlich mit NDIR- Instrumenten an der Auslaßöffnung hinten am Auspuff gemessen werden. Der Werte sollte bei $0{,}5\ ^{+0,5}_{-0,2}\%$ liegen. 1,5 %
Sollte der Co-Gehalt den vorgeschriebenen Grenzwert überschreiten, ist die Stellschraube **5** (von der Dichtung **6** verdeckt) am Luftmengenmesser nachzustellen.
Anschließend nachprüfen, ob die Leerlauf-Drehzahl noch bei 1000 ± 100 UpM liegt; Falls erforclerlich eine Neueinstellung gemäß dem vorangehenden Abschnitt vornehmen.
Nach erfolgter Einstellung des Co-Gehalts den Sitz der Stellschraube mittels der roten Dichtung (E.T. 119.11.11.028. 01) verschließen).
Sicherstellen, daß der HC-Gehalt 480 ppm nicht übersteigt.

SOSTITUZIONE CINGHIA COMANDO DISTRIBUZIONE

smontaggio (vedi anche fig. a pag. 20-21)

- Allentare le mollette di ritegno del coperchio **1** del filtro aria e rimuovere il coperchio.
- Disinnestare il connettore del potenziometro **5a** del misuratore quantità aria.
- Rimuovere il decantatore olio dalla testa cilindri.
- Staccare:
- i due tubi ed il cavo elettrico dalla elettrovalvola supplemento aria **12**;
- Il tubo **11** del by-pass del minimo.
- Allentare la fascetta di ritegno dal condotto del misuratore quantità aria **4** e rimuovere il condotto.
- Togliere le semiscatole che proteggono il distributore e asportare la calotta con tutto il gruppo cavi elettrici.
- Scollegare i cavi di massa allentando le viti sui coperchi delle valvole.
- Allentare le viti di ritegno e asportare i coperchi delle valvole.
- Rimuovere la cinghia di comando del compressore per condizionatore (se è montato) allentando le viti che fissano il tenditore.
- Asportare la cinghia di comando dell'alternatore allentando il dado di ritegno.
- Sganciare le due fascette di sostegno dei cavi candele e rimuovere le viti del carter di protezione della cinghia della distribuzione; rimuovere il carter.
- Togliere le candele onde facilitare le operazioni successive; tappare le sedi delle candele.
- Ruotare la puleggia dell'albero motore nello stesso senso di normale rotazione finché la tacca **P** non risulti allineata al perno di riferimento. In tali condizioni il pistone del cilindro N° 1 deve essere al P.M.S. con entrambe le valvole chiuse in fase di compressione; per accertarsi di aver raggiunto la condizione di cui sopra, asportare la calotta del distributore e controllare che la spazzola sia in corrispondenza della tacca incisa sul bordo della carcassa del distributore.
- Far leva sul braccio **1** del tendicinghia e sollevarlo; inserire il piolo di perno **2** (attrezzo A.2.0363) nell'apposito foro sul braccio tenditore.
- Allentare i dadi di ritegno tenditore **3** e **4** e quindi spingere il tendicinghia verso il basso a serrare il dado **4**.

A questo punto la cinghia di comando può essere tolta dalle pulegge.

REMPLACEMENT DE LA COURROIE DE DISTRIBUTION

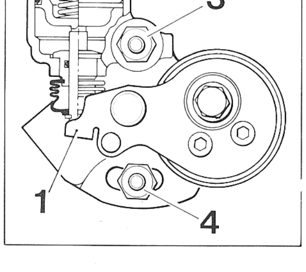
Dépose - (Voir Fig. a pag. 20-21)

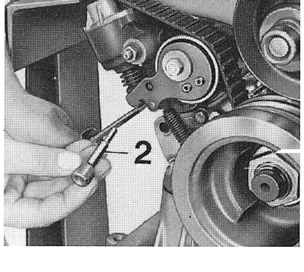
- Défaire les 4 genouillères de maintien du couvercle **1** de filtre à air et déposer le couvercle.
- Débrancher le raccord du potentiomètre **5a** de l'ensemble débitmètre d'air.
- Déposer:
- L'élément de décantation de l'huile de la culasse.
- Les deux tuyaux et le fil du dispositif d'air additionnel **12**.
- Le tuyau **11** du régulateur by-pass de ralenti.
- Desserrer les colliers de maintien du conduit **4** de senseur de flux d'air et déposer le conduit.
- Déposer les protections du distributeur d'allumage et retirer la tête munie des fils de bougies.
- Débrancher les deux fils de masse en dévissant les deux vis sur les couvre-culasse.
- Déposer les couvre-culasse après avoir dévisser leurs vis de fixation.
- Déposer la courroie d'entraînement du compresseur de conditionneur d'air (si monté sur le véhicule) en desserrant les vis de blocage du tendeur.
- Déposer la courroie d'entraînement de l'alternateur en desserrant la vis de blocage.
- Dégager les faisceaux de fils de bougies, puis déposer les carters de courroie de distribution après avoir retiré les vis de fixation. Déposer les carters.
- Déposer les bougies afin de faciliter les opérations successives; recouvrir les puits de bougies.
- Faire tourner la poulie du vilebrequin dans le même sens que celui de la rotation du moteur jusqu'à ce que le repère **P** soit aligné avec l'index de référence. Dans ces conditions le piston du cylindre N° 1 se trouve au P.M.H. et en compression (les deux soupapes fermées); pour plus de sécurité vérifier également (après avoir déposé la tête du distributeur d'allumage) que le doigt soit bien tourné vers l'encoche de référence située sur le bord du corps du distributeur.
- Soulever le bras **1** du tendeur et engager la broche **2** (outil N° A.2.0363) à travers le trou sur bras de tendeur, prévu à cet effect.
- Desserrer les écrous **3** et **4** de blocage du tendeur, puis pousser le tendeur vers le bas et serrer l'écrou **4**.
- La courroie d'entrainement peut maintenant être retirée de sur les poulies.

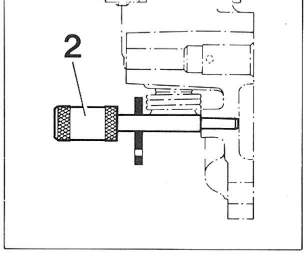
AUSWECHSELN DES STEUERZAHNRIEMENS

Ausbau (siehe Abb. Seite 20-21)

- Die vier Halteklemmen an der Luftfilter-Abdeckung **1** lösen und die Abdeckung abnehmen.
- Den Potentiometer-Anschluß **5a** vom Luftmengenmesser lösen.
- Den Gehäuseentüfter vom Zylinderkopf abnehmen.
- Zu demontieren:
- die zwei Röhre und das Kabel vom Zusatzluftschieber **12**.
- der Schlauch **11** vom Leerlauf-Überstromregler.
- Briede vom Luftmengenmesser-Schlauch **4** lösen und den Schlauch abnehmen.
- Die Zündverteiler-Schutzhüllen entfernen und die Verteilerkappe und Kabel als Ganzes abnehmen.
- Die zwei Erdungskabel durch Lösen der zwei Schrauben an den Ventildeckeln abnehmen.
- Sicherungsschrauben lösen und Ventildeckel abnehmen.
- Keilriemen der Klimaanlage (falls vorhanden) nach Lösen der Schrauben am Riemenspanner abnehmen.
- Nach Lösen der Sicherungsschrauben den Lichtmaschinen- Keilriemen abnehmen.
- Die Brieden zur Befestigung der gebündelten Zündkabel lockern und die Sicherungsschrauben an der Abdeckung des Steuerzahnriemens lösen; Abdeckung abnehmen.
- Zur Erleichterung der nächsten Schritte die Zündkerzen entfernen; die Einsatzöffnungen verstopfen.
- Die Kurbelwelle-Riemenscheibe in der gewohnten Drehrichtung bewegen, bis die Markierung **P** auf den Markierungsstift ausgerichtet ist. In dieser Position sollte sich der Kolben von Zylinder 1 am oberen Totpunkt (O.T.) befinden, wobei im Kompressionshub beide Ventile geschlossen sein müssen. Um sicherzustellen, ob die vorgenannte Voraussetzung gegeben ist, ist die Verteilerkappe zu entfernen und zu prüfen, ob der Läuferschenkel auf die Kontrollkerbe am Rand des Zündverteilergehäuses weist.
- Die Nase des Riemenspanners **1** nach oben drücken und durch Einführen des Sicherungsstiftes **2** (Werkzeug Nr. A.2.0363) in die hierfür vorgesehene Bohrung an der Spannernase in Position halten.
- Spanner-Sicherungsmuttern **3** und **4** lösen, alsdann den Riemenspanner ganz nach unten drücken und Mutter **4** fest anziehen.
- Jetzt kann der Steuerzahnriemen von den Riemenscheiben genommen werden.







MONTAGGIO CINGHIA COMANDO DISTRIBUZIONE

– Prima di montare la cinghia sulle pulegge, accertarsi che le tacche sull'albero di distribuzione e quelle relative dei cappelli di supporto siano allineate; questo controllo dovrebbe essere effettuato su entrambe le teste cilindri; controllare anche che la spazzola e la tacca di riferimento sul bordo del distributore siano allineate.

ATTENZIONE - Nel prosieguo delle operazioni, sino ad aver ultimato il montaggio della cinghia, è sempre necessario controllare che le suddette condizioni di allineamento continuino a sussistere.
– Calzare la cinghia sulle pulegge nel seguente ordine e mantenendo in tensione i rami tesi:
1) puleggia dentata albero motore; 2) puleggia testata di destra; 3) puleggia testata di sinistra; 4) puleggia di comando pompa olio-distributore; 5) tenditore.
– Per tendere la cinghia, allentare il dado **4** del tenditore e ricontrollare che le tacche di riferimento sia dell'albero di distribuzione che della spazzola del distributore siano ancora allineate.
– Ruotare la puleggia dell'albero motore di due giri in senso orario, fermando la rotazione non appena la tacca **P** sulla puleggia dell'albero motore si trova in corrispondenza con il perno di riferimento.
– Mantenere bloccata la puleggia dell'albero motore mediante una chiave a bussola e serrare i dadi **3** e **4** del tendicinghia. Ricontrollare l'allineamento delle tacche di riferimento.
– Sollevare leggermente il braccio del tenditore, estrarre il perno di ritegno e rilasciare il braccio del tenditore.
– Ruotare nuovamente la puleggia dell'albero motore di due giri e in senso orario arrestando la rotazione allorché la tacca **P** e il perno di riferimento risultano allineati.

REPOSE DE LA COURROIE DE DISTRIBUTION

– Avant de replacer la courroie sur les poulies, s'assurer du bon alignement des repères d'arbres à cames avec les repères sur chapeaux de paliers; ce contrôle devra être effectué sur les deux culasses. Vérifier également l'alignement entre doigt et encoche sur distributeur d'allumage.

ATTENTION: Durant l'exécution des opérations suivantes, les repères de calage devront toujours rester alignés.
– Placer la courroie sur les poulies dans l'ordre indiqué ci-après, en ayant soin de maintenir sous tension la portion de courroie sur le point d'être engagée sur une poulie.
1) Poulie crantée de vilebrequin - 2) Poulie de culasse droite - 3) Poulie de culasse gauche - 4) Poulie d'entraînement du distributeur d'allumage - 5) Galet de tendeur.
– Pour tendre la courroie, desserrer l'écrou **4** du tendeur et vérifier l'alignement des différents repères arbre à cames/chapeaux, doigt/encoche sur distributeur.
– Faire tourner la poulie de vilebrequin de deux tours dans le sens des aiguilles d'une montre, en cessant la rotation dès que le repère **P** sur poulie de vilebrequin coïncide avec l'index de référence.
– Immobiliser la poulie de vilebrequin à l'aide d'une clé plate ou à oeil et serrer les écrous **3** et **4** du tendeur. Vérifier à nouveau l'alignement des repères.
– Soulever légèrement le bras du tendeur, et retirer la broche afin de libérer le bras du tendeur.
– Faire tourner à nouveau la poulie de vilebrequin de deux tours dans le sens des aiguilles d'une montre en cessant la rotation dès que le repère **P** et l'index de référence coïncident.

ANBRINGEN DES STEUERZAHNRIEMENS

– Vor dem Anbringen des Steuerzahnriemens ist sicherzustellen, daß die Markierungen an der Nockenwelle und dem jeweiligen Lagerdeckel aufeinander ausgerichtet sind; dies gilt natürlich für beide Seiten. ebenso ist zu prüfen, ob der Läuferschenkel auf die Kontrollkerbe am Rande des Zündverteilergehäuses ausgerichtet ist.

ACHTUNG: Während der folgenden Arbeitsgänge sollten die vorgenannten Markierungen immer im Auge behalten werden: sie müssen während der gesamten Dauer der Riemen-Montage aufeinander ausgerichtet bleiben.

– Der Riemen ist in der nachgenannten Reihenfolge aufzuziehen, wobei darauf zu achten ist, daß das führende Ende immer unter Spannung ist:
1) Kurbelwellen-Zahnriemenscheibe; 2) Riemenscheibe rechts; 3) Riemenscheibe links; 4) Verteiler-Treibriemenscheibe; 5) Spanner.
– Zum Spannen des Riemens Mutter **4** am Spanner lösen und prüfen, ob die Kontrollmarkierungen an Nockenwelle und Verteiler-Läuferschenkel noch aufeinander ausgerichtet sind.
– Die Kurbelwellen-Riemenscheibe zwei Umdrehungen im Uhrzeigersinn bewegen, bis die Markierung **P** an der Riemenscheibe der Kurbelwelle auf den Kontrollstift ausgerichtet ist.
– Kurbelwellen-Riemenscheibe mittels Schlüssel blockieren und die Muttern **3** und **4** am Spanner anziehen. Ausrichtung der Kontrollmarkierungen erneut prüfen.
– Die Spannernase leicht hochdrücken und den Sicherungsstift wieder entfernen.
– Kurbelwellen-Riemenscheibe erneut zwei Umdrehungen im Uhrzeigersinn bewegen, bis die Markierung **P** auf den Kontrollstift ausgerichtet ist.

REGOLAZIONE TENSIONE CINGHIA COMANDO DISTRIBUZIONE

– Asportare il carter di protezione della cinghia della distribuzione allentando le viti di ritegno del carter stesso al basamento e la vite che unisce le due parti che compongono il carter.
– Sollevare il braccio tenditore **1**, quindi inserire il piolo di fermo **2** (attrezzo A.2.0363) nel foro del braccio.
– Allentare i dadi **3** e **4**, spingere il tenditore contro la cinghia e serrare i dadi **3** e **4**.

NOTA - L'allentamento dei dadi **3** e **4** dovrebbe già consentire il recupero dell'eventuale gioco della cinghia; è tuttavia consigliabile premere il tenditore contro la cinghia stessa.
– Sollevare il braccio **1** del tenditore ed estrarre il piolo di fermo quindi rilasciare il tendicinghia.

REGLAGE DE LA TENSION DE LA COURROIE DE DISTRIBUTION

– Déposer le carter de distribution en dévissant les vis de fixation du carter au bloc-cylindres et la vis unissant les deux parties du carter.
– Soulever le bras **1** du tendeur et introduire le broche **2** (outil N° A.2.0363) à travers le trous du bras.
– Desserrer les écrous **3** et **4**, pousser le tendeur contre la courroie et resserrer les écrous **3** et **4**.

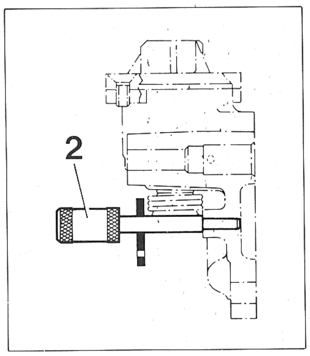
NOTA: Pour le réglage de la flèche de la courroie il serait en principe suffisant de desserrer les écrous **3** et **4**; il est cependant souhaitable de compléter l'effort exercé par le tendeur en le poussant contre la courroie.
– Soulever le bras du tendeur et enlever la broche de maintien afin de libérer le bras.

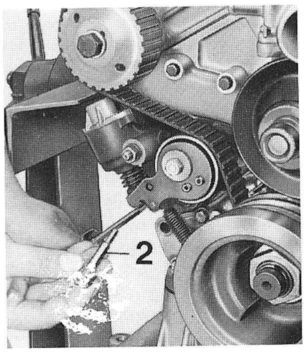
EINSTELLEN DER SPANNUNG DES STEURZAHNRIEMENS

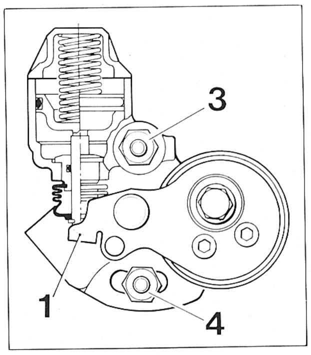
– Zur Demontage der Steuerzahnriemen-Abdeckung die Schrauben zur Befestigung der Abdeckung am Zylinderblock sowie die Verbindungsschraube für die beiden Abdeckungsteile lösen.
– Die Nase des Riemenspanners **1** nach oben drücken und Sicherungsstift **2** (Werkzeug Nr. A.2.0363) in die hierfür vorgesehene Bohrung an der Spannernase einführen.
– Muttern **3** und **4** lösen, Spanner gegen den Riemen drücken und Muttern **3** und **4** wieder anziehen.

AMMERKUNG: Das Lösen der Muttern **3** und **4** sollte ausreichen, um den Riemendurchhang aufzufangen. Es ist jedoch ratsam, den Spanner zusätzlich gegen den Riemen zu drücken, um diesem die erforderliche Spannung zu geben.

– Spanner an der Nase anheben und durch Entfernen des Sicherungsstifts den Spanner wieder freigeben.







CONTROLLO E REGOLAZIONE DELLA MESSA IN FASE ACCENSIONE

Controllare la fase di accensione mediante lampada stroboscopica e procedere come segue:

● Il motore deve essere termicamente regimato;
● Il motore deve girare al minimo.

ATTENZIONE: la messa in fase al minimo deve essere effettuata con la massima cura in quanto l'errata fasatura compromette il livello delle emissioni allo scarico.

– Collegare, con un ponticello, la lampada stroboscopica al terminale relativo alla candela del cilindro n° 1 sul distributore d'accensione. Collegare i cavi positivo e negativo della lampada stroboscopica ai relativi morsetti della batteria.
– Avviare il motore ed effettuare i seguenti controlli:
– Con il motore al minimo (1000 ± 100 giri/min), controllare che la tacca **F** (incisa sulla puleggia dell'albero motore) sia allineata con il perno di riferimento (7° ± 1° prima del P.M.S.).
– Con il motore a 5000 giri/min controllare che la tacca **M** sia allineata con il perno di riferimento.
Per la regolazione della fasatura, procedere come segue:
– Svitare il dado **1** di ritegno del distributore in modo da permettere la rotazione del distributore unitamente al morsetto di serraggio.
– Ruotare il corpo del distributore in senso antiorario oppure in senso orario a seconda che sia necessario anticipare o ritardare la fasatura di accensione.
– Serrare il dado impedendo il movimento del corpo del distributore.
– Ricontrollare la fasatura.

CONTROLE ET REGLAGE DU CALAGE DE L'ALLUMAGE

– Contrôler le calage à l'aide d'une lampe stroboscopique en procédant comme suit:

● Amener le moteur à sa température normale de fonctionnement
● Laisser tourner le moteur au ralenti durant le contrôle.

ATTENTION: Le calage de l'allumage au ralenti doit être effectué avec un maximum de soins, un mauvais réglage pouvant augmenter le niveau des émissions à l'échappement.

– Relier par un fil électrique la lampe stroboscopique au distributeur d'allumage (sortie HT vers la bougie du cylindre N° 1).
Relier les fils repérés par les signes + et – (ou par les couleurs rouge et noire) de la lampe stroboscopique aux bornes de la batterie.
– Démarrer le moteur et effectuer les contrôles suivants:
– Avec moteur au ralenti (1000 ± 100 tr/mn) contrôler que le repère F (sur poulie de vilebrequin) soit alignée avec l'index de référence (7° ± 1° avant le P.M.H.).
– Avec moteur à 5000 tr/mn, contrôler que le repère **M** soit aligné avec l'index de référence.
– Pour le réglage du calage procéder comme suit:
– Desserrer l'écrou **1** de blocage en rotation du distributeur;
– Faire tourner le corps du distributeur dans le sens inverse des aiguilles d'une montre ou dans le sens des aiguilles d'une montre suivant que l'on désire augmenter ou diminuer l'avance à l'allumage;
– Serrer l'écrou en empêchant la rotation du distributeur;
– Contrôler à nouveau le calage.

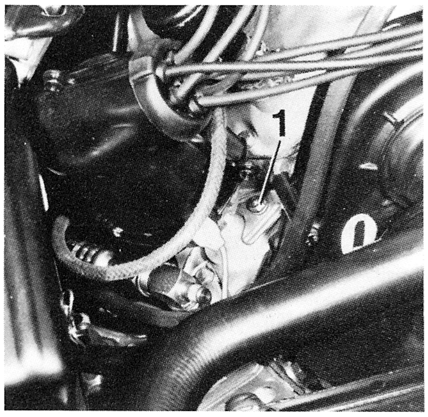
ZÜNDZEITPUNKT-KONTROLLE UND -EINSTELLUNG

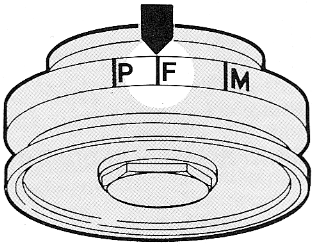
Zur Kontrolle der Zündzeitpunkteinstellung ist unter Verwendung einer Stroboskoplampe wie folgt vorzugehen:

● Motor auf Betriebstemperatur bringen;
● Motor bei Leerlauf-Drehzahl laufen lassen.

WICHTIG: Die Zündzeitpunkteinstellung bei Leerlauf-Drehzahl muß sehr präzise ausfallen, da eine ungenaue Einstellung im Leerlauf die Abgas-Emissionswerte stark beeinflußt.

– Ein Überbrückungskabel von der Stroboskoplampe zur Verteilerklemme für die Zündkerze zum Zylinder Nr. 1 spannen; anschließend Plus (+) - und Minus (–) - Kabel der Stroboskoplampe mit den entsprechenden Batteriepolen verbinden.
– Motor starten und folgende Prüfungen vornehmen:
– bei einer Drehzahl von 1000 ± 100 UpM muß die Markierung **F** (auf der Kurbelwellen-Riemenscheibe) auf den Kontrollstift ausgerichtet sein (7° ± 1° vor dem O.T.).
– bei einer Drehzahl von 5000 UpM muß die Markierung **M** auf den Kontrollstift ausgerichtet sein.
– Ist eine Nachstellung des Zündzeitpunktes erforderlich, ist wie folgt zu verfahren:
– Zündverteiler-Sicherungsmutter **1** am Zapfen lösen, so daß der Verteiler mitsamt der Halteklemme gedreht werden kann.
– Verteiler-Gehäuse im Uhrzeigersinn bzw. entgegengesetzt drehen, um Falls erforderlich den Zündzeitpunkt vorzuverlegen oder zu verzögern.
– Mutter wieder fest anziehen, wobei das Verteiler-Gehäuse nicht verschoben werden darf.
– Zündzeitpunkteinstellung erneut prüfen.





DISTRIBUTORE DI ACCENSIONE

Il sistema di accensione elettronica a impulsore magnetico ha caratteristiche di affidabilità e livelli di prestazioni superiori agli impianti convenzionali, inoltre riduce al minimo i controlli e le operazioni di manutenzione.
Lubrificare saltuariamente con alcune gocce di olio motore il feltrino dopo aver tolto la calotta e la spazzola.
Controllare che non ci siano incrinature o bruciature sulla calotta.

DISTRIBUTEUR D'ALLUMAGE

L'allumage électronique à génerateur d'impulsions magnétiques adopté sur ce modèle rend le moteur plus fiable et plus performant que s'il était équipé d'un allumage conventionnel: de plus, cet allumage électronique ne nécessite que peu de contrôles périodiques et d'opérations d'entretien.
De temps à autre, appliquer quelques gouttes d'huile moteur (neuve) sur le feutre de lubrification après avoir déposé la tête et le doigt du distributeur.
Examiner la tête du distributeur d'allumage; celle-ci ne devra être ni brûlée ni fendue.

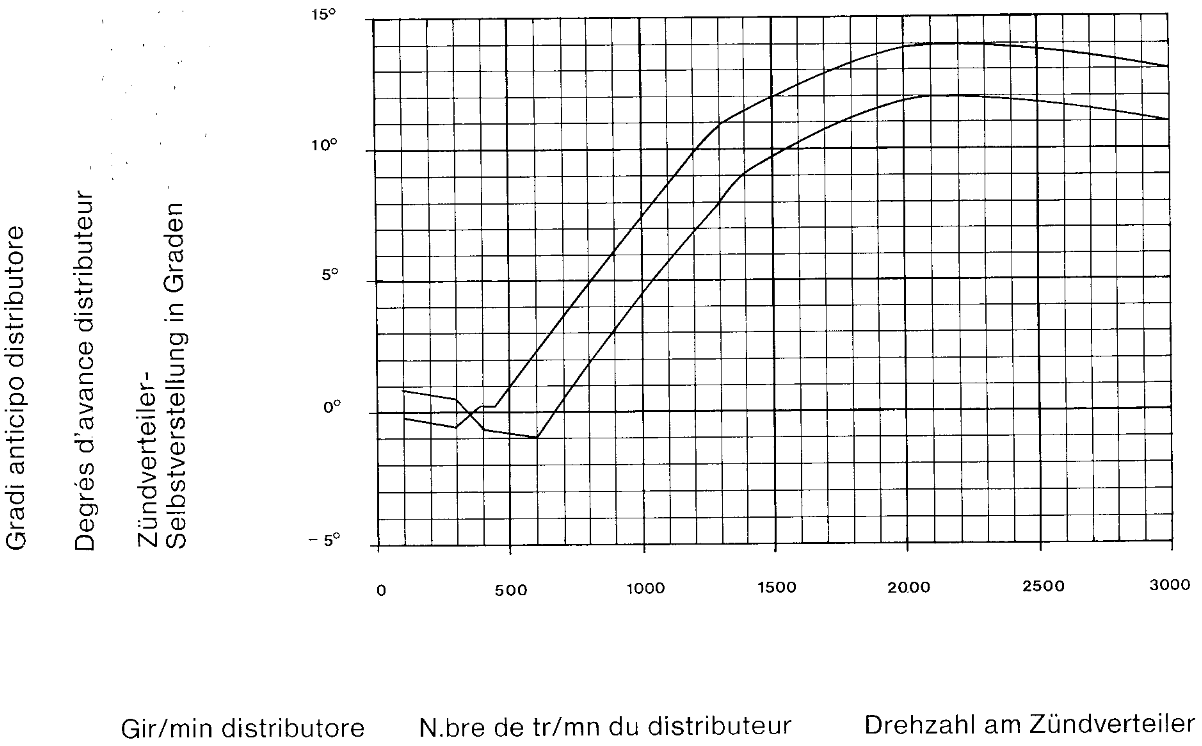
ZÜNDVERTEILER

Das unterbrecherlose elektronische Zündsystem zeichnet sich durch gleichbleibend höhere Leistungswerte im Vergleich mit konventionellen Zündsystemen aus; darüber hinaus sind Inspektions- und Wartungsanforderungen auf ein Minimum reduziert.
Befeuchten Sie die Filzeinlage gelegentlich mit ein paar Tropfen Motoröl nach Demontage der Abdeckung und des Läufers.
Die Verteilerkappe auf Risse und Brandspuren untersuchen.

DIAGRAMMA ANTICIPO AUTOMATICO (DISTRIBUTORE BOSCH PGFD6)

DIAGRAMME DE L'AVANCE AUTOMATIQUE (DISTRIBUTEUR D'ALLUMAGE BOSCH PGFD6)

SELBSTVERSTELLUNG KURVENBILD (BOSCH-VERTEILER PGFD6)



MONTAGGIO DEL DISTRIBUTORE SUL MOTORE

Per il montaggio del distributore procedere come segue:
- Ruotare l'albero motore in modo da portare il pistone del cilindro n° 1 in fase di compressione (entrambe le valvole chiuse);
- Ruotando l'albero motore allineare la tacca **F** incisa sulla puleggia con l'indice di riferimento;

MISE EN PLACE DU DISTRIBUTEUR D'ALLUMAGE

Pour la mise en place du distributeur d'allumage procéder comme suit:
- Faire tourner le vilebrequin de manière à amener le piston du cylindre N° 1 en position de compression (Soupapes toutes deux fermées);
- En faisant tourner légèrement le vilebrequin aligner le repère **F** sur poulie avec l'index de référence;

EINBAU DES ZÜNDVERTEILERS

Beim Einbau des Zündverteilers ist wie folgt zu verfahren:
- Die Kurbelwelle drehen, bis der Kolben von Zylinder Nr. 1 in Kompressionshub-Stellung ist (beide Ventile geschlossen).
- Durch leichtes Drehen der Kurbelwelle die Markierung **F** auf der Riemenscheibe auf den Kontrollzeiger ausgerichtet ist.
- Den Zündverteiler montieren.
- Zündverteiler-Kappe entfernen und

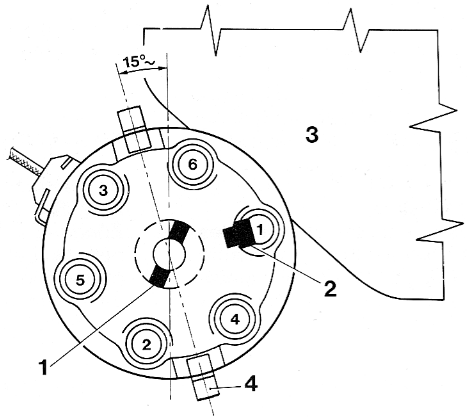
- Montare il distributore;
- Rimuovere la calotta del distributore e ruotare l'alberino in modo da portare la spazzola rivolta verso il cilindro n° 1;
- Rimontare la calotta e procedere alla messa in fase mediante lampada stroboscopica.

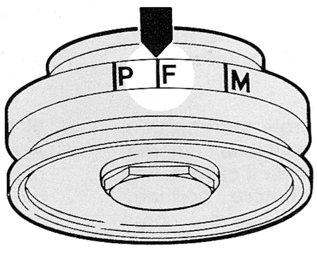
1. Dente di trascinamento
2. Spazzola rotante rivolta verso il cilindro n° 1
3. Testa cilindri destra
4. Mollette fermo-calotta.

- Mettre en place le distributeur;
- Déposer la tête et faire tourner le rotor jusqu'à ce que le doigt soit aligné avec le repère du cylindre N° 1 sur le corps du distributeur.
- Remonter la tête et régler le calage à l'aide d'une lampe stroboscopique.

1. Dent d'entraînement du doigt
2. Doigt orienté vers le cylindre N° 1
3. Culasse droite
4. Agrafe de tête

Antriebswelle drehen, bis der Läuferschenkel auf den Kontakt für Zylinder Nr. 1 ausgerichtet ist.
- Kappe wieder montieren und Zündzeitpunkteinstellung mittels Stroboskoplampe berichtigen.
1. Feststellung
2. Läuferschenkel zum 1. Zylinder
3. RECHTER Zylinderkopf
4. Kappenverschlußbügel





IMPIANTO DI ACCENSIONE ELETTRONICO A IMPULSORE MAGNETICO

1) NORME GENERALI DI CONTROLLO

È preventivamente da evitare ogni verifica di presenza di tensione o di corrente nei collegamenti elettrici, mediante scintillamento, scaricando a massa i punti di alta e bassa tensione, salvo per quanto indicato al punto 2b).
Sono da evitare inoltre le operazioni di seguito indicate:
- Interruzione del collegamento tra la presa alta tensione della bobina e il distributore scollegando il relativo cavo (lato bobina) quando il motore è in funzionamento o anche in fase di avviamento.
- Collegamento a massa del terminale di bassa tensione della bobina (morsetto 1) collegato al contagiri.
- Non è consentito l'impiego di apparecchiature di diagnostica che permettono di cortocircuitare il segnale di bassa tensione, tra il primario della bobina ed il contagiri.
Prima di alimentare il gruppo è necessario assicurarsi che i connettori dell'impianto elettrico siano ben inseriti e che il gruppo modulo - bobina sia fissato saldamente alla massa in modo da garantire una connessione efficace.
La pistola stroboscopica deve essere sempre direttamente collegata ai morsetti della batteria.

2) VERIFICA DI FUNZIONAMENTO DEL SISTEMA

a) Con la chiave d'accensione inserita (commutatore d'accensione chiuso) ed il motore fermo controllare mediante voltmetro, che la tensione sul morsetto 15 della bobina sia uguale a quella della batteria (~ 12 V).
Avviare il motore; nel caso di inconvenienti, dopo aver effettuato la fasatura dell'accensione ed avere staccato il cavetto contagiri, controllare se esistono interruzione negli avvolgimenti misurando la resistenza, mediante ohmmetro, del primario e del secondario, i cui valori devono risultare secondo quanto indicato:

ALLUMAGE ELECTRONIQUE A GENERATEUR D'IMPULSIONS MAGNETIQUES

1) NORMES GENERALES DE CONTROLE

Sauf cas particuliers (voir paragraphe 2b) ne jamais contrôler les circuits sous tension en reliant à la masse les fils haute et basse tension.
- A éviter par ailleurs:
- De débrancher le fil haute tension entre distributeur d'allumage et bobine (côté bobine) lorsque le moteur tourne ou démarre.
- De relier à la masse la sortie basse tension du distributeur d'allumage (sortie 1 reliée au compte-tours).
- D'utiliser un appareillage de diagnostic pouvant court-circuiter électroniquement le signal basse tension (enroulement primaire/compte-tours).
Avant de mettre le contact, s'assurer que les fils soient correctement branchés et que l'ensemble bobine-module soit parfaitement relié à la masse. Brancher toujours les lampes stroboscopiques aux bornes de la batterie.

2) MODALITÉS DE CONTROLE

a) Après avoir mis le contact (le moteur restant arrêté), contrôler à l'aide d'un voltmètre que la tension à la borne 15 de la bobine soit la même que celle aux bornes de la batterie (environ 12 V) Faire démarrer le moteur; en cas de mauvais fonctionnement, après avoir calé l'allumage et débranché le fil du compte-tours, vérifier que les enroulements primaire et secondaire ne soit pas interrompus: la résistance des enroulements doit être de:

KONTROLLE DES UNTERBRECHERLOSEN ZÜNDSYSTEMS

1) ALLGEMEIN INSPEKTIONSEMPFEHLUNGEN

Nie auf spannungführende Stromkreise mit Erdung von Hochspannungs-oder Niederspannungskabeln prüfen, sofern nichts anderweitig vorgeschrieben (siehe Kapitel 2).
Desweiteren sollte vermieden werden:
- Die Verbindung zwischen Hochspannungsklemme der Spule und dem Verteiler zu unterbrechen (durch Abklemmen des Kabels an der Spulenseite), wenn der Motor läuft oder beim Startvorgang;
- Die Niederspannungsklemme der Spule (Klemme 1, am Tourenzähler angeschlossen) zu erden.
- Verwenden Sie keine Diagnose-Geräte, die eine elektronische Kurzschluß-Störung des Niederspannungssignals (Primärspule/Tourenzähler) bewirken.
Vor dem Einleiten von Spannung in das Zündsystem ist sicherzustellen, daß die Kabelverbinder einwandfrei sitzen und die Spulen-/Modul-Einheit sicher geerdet ist.
Stroboskoplampe immer direkt an die Batterie- Pole anschließen.

2) ABLAUF DES PRÜFUNGSVORGANGS

a) Bei **eingeschalteter** Zündung und abgestelltem Motor mittels Voltmeter prüfen, ob die Spannung an Spulenklemme mit der Batterie-Spannung (ca. 12 V) identisch ist.
Motor starten. Bei nicht einwandfreiem Betrieb sind nach erfolgter Zündeinstellung und Trennung des Tourenzähler-Kabels die Primär- und Sekundärwicklungen auf Kontinuität zu überprüfen; die folgenden Widerstandswerte sollten festgestellt werden:

	BOSCH
R1 =	1,6-2,2 Ω
R2 =	8250 Ω

Controllare la funzionalità del distributore d'accensione scollegando, con la chiave d'accensione disinserita (commutatore d'accensione aperto) il connettore di collegamento tra il gruppo modulo bobina e distributore misurando, mediante ohmmetro, la resistenza della bobinetta dell'impulsore il cui valore deve risultare: BOSCH = 1100 ± 10% Ω

Togliere la calotta del distributore facendo attenzione a non far entrare corpi estranei nel sistema del trasduttore.

b) Come verifica generale dell'impianto, con la chiave d'accensione inserita, scollegare da una candela il cavo A.T. di connessione al distributore portando l'estremità libera a ~ 5 mm dal corpo motore.

ATTENZIONE - ALTA TENSIONE

Indossare i guanti di isolamento ed avviare il motore controllando che la scintilla scocchi regolarmente tra cavo e massa.

DATI TECNICI

- Tensione alimentazione: 6 ÷ 16 V
- Temperatura limite esercizio: −30° C ÷ +115° C
- Corrente assorbita: 2 ÷ 3,5 A

	BOSCH
R1	1,6-2,2 Ω
R2	8250 Ω

Pour contrôler le bon fonctionnement du distributeur d'allumage, avec contacteur d'allumage non actionné, débrancher le connecteur entre l'ensemble bobine/module et le distributeur; la résistance de l'enroulement du capteur magnétique doit être de:

BOSCH = 1100 ± 10% Ω

Retirer la tête du distributeur d'allumage en évitant que des corps étrangers n'entrent dans le transducteur magnétique.

b) Essai final de l'allumage:
Après avoir mis le contact et enfilé des gants isolants, débrancher le fil haute tension d'une bougie et, en le maintenant à environ 5 mm du moteur, contrôler la présence d'étincelles.

ATTENTION HAUTE TENSION

CARACTERISTIQUES

- Tension: 6 à 16 V
- Températures limites de fonctionnement: −30° C à 115° C
- Courant: 2 à 3,5 A

	BOSCH
R1	1,6-2,2 Ω
R2	8250 Ω

Durch Abklemmen des Verbinders zwischen Spulen/Modul- einheit und Zündverteiler bei abgeschalteter Zündung den Zündverteiler auf einwandfreie Funktion überprüfen.
An der Magnetwicklung sollte der folgende Widerstand festgestellt werden:

BOSCH = 1100 ± 10% Ω

Verteilerkappe entfernen und darauf achten, daß keine Fremdstoffe in den Magnet-Wandler gelangen.

b) Gesamtprüfung des Systems: Trennen Sie mit Schutzhandschuhen bei Zündung in EIN-Stellung das Hochspannungskabel von einer Zündkerze und prüfen Sie – während Sie das Kabelende ca. 5 mm vom Motor entfernt halten, ob Funkenbildung entsteht.

ACHTUNG - HOCHSPANNUNG

TECHNISCHE DATEN

- Spannung: 6 bis 16 V
- Betriebsgrenztemperaturen: −30° C bis +115° C
- Stromstärke: 2 bis 3,5 Amp.

REGISTRAZIONE TIRANTERIA COMANDO FARFALLA

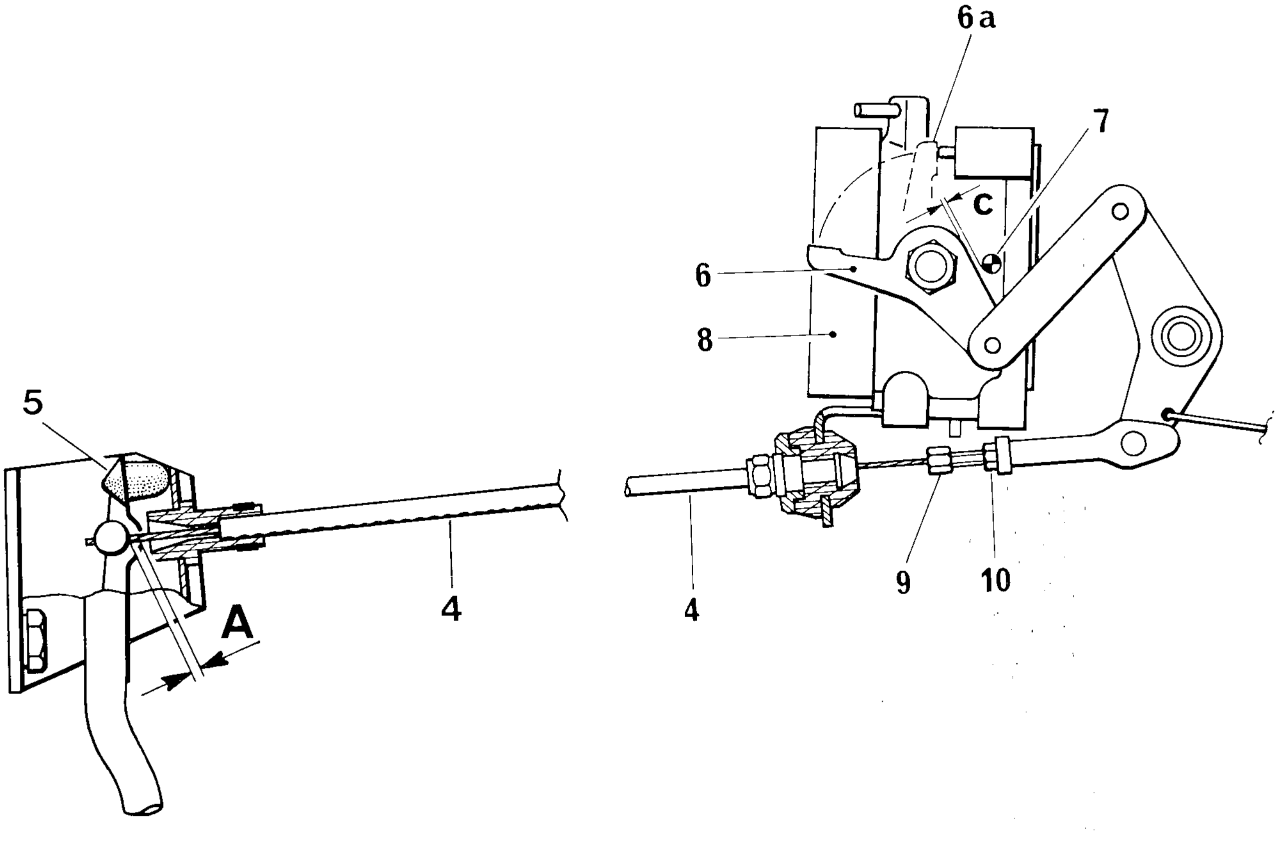
Azionare a mano la leva **5** e controllare che la corsa a vuoto **A** del rinvio pedale acceleratore sia 1-2 mm e la leva comando farfalla **6** non si sposti dalla sua posizione **6a**. In caso contrario, allentare il dado **10**, regolare la quota **A** agendo sul dado **9** quindi serrare il dado **10**. Con pedale acceleratore a fondo corsa, controllare che il gioco **C** tra la leva **6** e il perno di arresto **7** sia di 0,5 ÷ 1 mm. In caso contrario, svitare o avvitare il perno di fondo corsa situato sotto l'acceleratore.

REGLAGE DE LA TIMONERIE D'ACCELERATEUR

Actionner normalement le levier **5** manuellement et contrôler que la course à vide **A** de la pédale d'accélérateur soit de 1 à 2 mm et que le levier de papillon **6** ne bouge pas de sa position **6a**. Dans le cas contraire, desserrer le contre-écrou **10**, régler la course à vide **A** en agissant sur l'écrou **9** puis resserrer le contre-écrou **10**. Enfoncer à fond la pédale d'accélérateur pour contrôler que le jeu C entre levier de papillon **6** et butée de fin de course **7** soit de 0,5 à 1 mm. Dans le cas contraire, visser ou dévisser la vis de butée situées sous la pédale d'accélérateur.

EINSTELLEN DES GASGESTÄNGES

Hebel **5** per Hand betätigen und prüfen, ob das Gaspedal- Spiel **A** auch 1-2 mm beträgt und der Drosselklappenhebel **6** in Position **6a** verbleibt. Ist diese Voraussetzung nicht gegeben, Sicherungsmutter **10** lösen, Spiel **A** mittels Stellmutter **9** berichtigen und Sicherungsmutter **10** wieder anziehen.
Jetzt das Gaspedal voll durchtreten und prüfen, ob das Spiel **C** zwischen Drosselklappenhebel **6** und Endanschlag **7** bei 0.5-1 mm liegt. Ist dies nicht der Fall, den Anschlag unter dem Gaspedal nach Erfordernis hoch- bzw. herunterschrauben.



A - 1 mm
C - 0,5 ÷ 1 mm
4 - Cavo acceleratore
5 - Leva rinvio comando acceleratore
6 - Leva comando farfalla
7 - Perno di arresto
8 - Corpo farfalla
9 - Dado con manicotto per regolazione
10 - Dado di bloccaggio

A - 1 mm
C - 0,5 à 1 mm
4 - Câble de pédale d'accélérateur
5 - Levier de pédale
6 - Levier de papillon
7 - Butée de fin de course
8 - Corps de papillon
9 - Ecrou de réglage
10 - Contre-écrou

A - 1 mm
C - 0.5-1 mm
4 - Gaszug
5 - Pedalhebel
6 - Drosselhebel
7 - Endanschlag
8 - Drossel
9 - Stellmutter
10 - Feststellmutter

REGOLAZIONE INTERRUTTORE SULLA FARFALLA

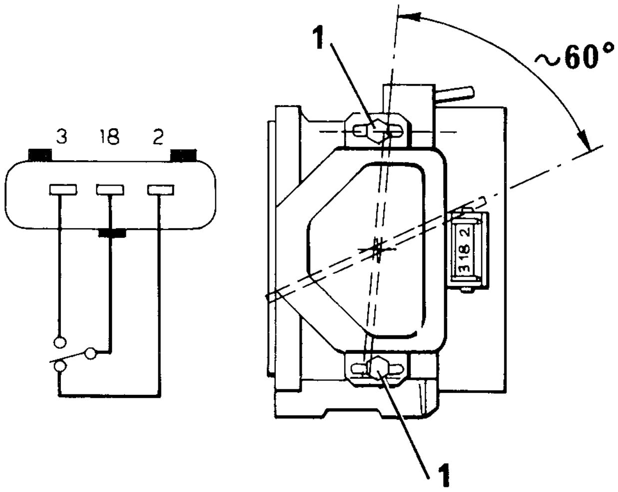
Collegare un ohmmetro tra il terminale (18) e il contatto del minimo (2) dell'interruttore sulla farfalla; con la farfalla completamente chiusa, ruotare l'interruttore allentando le viti **1**, fino ad ottenere un'indicazione 0 Ω (posizionamento corretto per il minimo).
Serrare le viti **1**. Collegare l'ohmmetro tra i terminali (18) e (3), azionare l'alberino farfalla per verificare se lo strumento indica 0 Ω (contatto a pieno carico chiuso) quando la farfalla ha compiuto una rotazione di circa 60 gradi. In caso contrario regolare il tirante acceleratore o sostituire l'interruttore.

REGLAGE DE L'INTERRUPTEUR DE PAPILLON

Relier un ohmmètre la borne (18) et le contact de ralenti (2) de l'interrupteur de papillon; avec papillon complètement fermé, faire tourner l'interrupteur en desserrant les vis **1** jusqu'à ce que l'instrument indique 0 Ω (position correcte de l'interrupteur de papillon).
Serrer les vis **1**. Relier l'ohmètre entre les bornes (18) et (3), provoquer l'ouverture du papillon et vérifier que l'instrument indique 0 Ω (contact de pleine ouverture fermé) lorsque le papillon a effectué une rotation de 60 degrés. Dans le cas contraire régler le tirant d'accélérateur ou remplacer l'interrupteur.

DROSSELKLAPPENSCHALTER-NACHSTELLUNG

Ohmmeter zwischen Klemme (18) und Leerlauf-Kontakt (2) des Drosselklappenschalters anschließen; bei vollständig geschlossener Drosselklappe den Schalter nach Lösen der Schrauben **1** drehen, bis ein Wert von 0 Ohm angezeigt wird (richtige Einstellung des Drosselklappenschalter). Schrauben **1** wieder festziehen. Jetzt das Ohmmeter zwischen Klemmen (18) und (3) anschließen und die Drosselklappe-Achse bewegen um zu prüfen, ob ein Wert von 0 Ohm angezeigt wird (Vollast-Kontakt schließt), wenn die Drosselklappe um ca. 60 Grad gedreht wird. Ist dies nicht der Fall, die Gaspedal-Verbindungsteile nachstellen oder den Schalter auswechseln.



PROVA PRESSIONE CARBURANTE

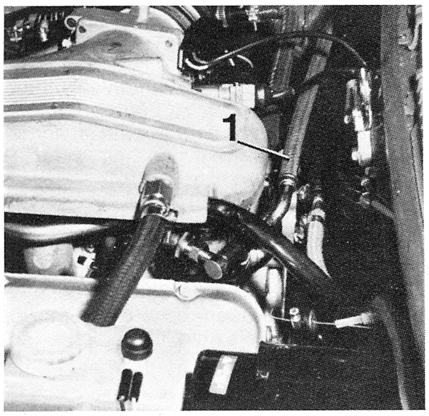
– Scollegare il tubo di alimentazione **1**; collegare un manometro ad un raccordo T; inserire il raccordo T tra le estremità del tubo di alimentazione precedentemente scollegato.
– Staccare il tubicino di depressione **2** che collega il regolatore della pressione del carburante **3** al collettore di aspirazione.
– Avviare il motore e con il motore al minimo controllare che la pressione del combustibile sia di 2,3 ÷ 2,7 bar.
– Collegare nuovamente il flessibile di depressione al collettore di aspirazione, con il motore al minimo la pressione del carburante deve diminuire a circa 0,5 bar per poi aumentare all'apertura della farfalla. In caso contrario controllare che non ci siano perdite nel tubo di depressione.

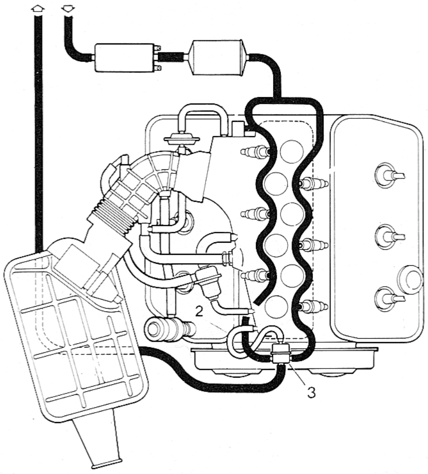
CONTROLE DE LA PRESSION DE REFOULEMENT DU CARBURANT

– Débrancher le tuyau d'alimentation **1**; équiper le manomètre de contrôle d'un raccord en T; refermer le circuit d'alimentation en plaçant le raccord en T au niveau de l'interruption.
– Débrancher le flexible de dépression **2** reliant le régulateur de pression du carburant **3** au conduit d'admission.
– Faire démarrer le moteur puis le laisser tourner au ralenti; contrôler la pression de refoulement qui doit être comprise entre 2,3 et 2,7 bars.
– Relier à nouveau le flexible de dépression au conduit d'admission; le moteur tournant au ralenti, la pression de refoulement doit diminuer d'environ 0,5 bar, et augmenter ensuite au moment de l'ouverture du papillon. Dans le cas contraire vérifier qu'il n'y ait pas de fuites au niveau du flexible de dépression.

PRÜFEN DES KRAFTSTOFFDRUCKS

– Kraftstoffzuflußleitung **1** absperren; ein Manometer auf ein T-Paßstück montieren; das T-Paßstück in die offenen Enden der abgesperrten Zuflußleitung einführen.
– Unterdruckschlauch **2** abnehmen, der den Benzindruck-Regler **3** mit dem Saugkrümmer verbindet.
– Motor starten und im Leerlauf den Kraftstoff-Druck ablesen, der bei 2,3-2,7 bar liegen sollte.
– Unterdruckschlauch wieder an den Saugkrümmer anschließen; bei Leerlaufdrehzahl muß der Druck auf ca. 0,5 bar absinken und bei Öffnen der Drosselklappe wieder steigen. Sollte dies nicht der Fall sein, ist der Unterdruckschlauch auf mögliche undichte Stellen zu untersuchen.





SOSTITUZIONE DEL FILTRO E DELLA POMPA DI ALIMENTAZIONE CARBURANTE

Per sostituire il filtro del carburante scollegare, operando sotto vettura, i tubi di mandata e di ritorno del carburante e allentare inoltre il supporto di sostegno. Nel rimontare il filtro assicurarsi che la freccia incisa sul filtro sia rivolta verso il senso di mandata del carburante agli iniettori.
Per sostituire la pompa del carburante scollegare i due connettori elettrici e le fascette dei tubi di mandata e di ritorno. Allentare inoltre il morsetto.
Nel rimontare la pompa del carburante prestare attenzione onde evitare l'errato collegamento dei conduttori positivo e negativo.

REMPLACEMENT DU FILTRE ET DE LA POMPE A ESSENCE

Pour remplacer le filtre à essence desserrer les colliers des flexibles d'alimentation et de refoulement (par le dessous de la voiture) ainsi que l'élément de maintien. S'assurer, en remontant le filtre, que le sens de la flèche sur le filtre soit le même que celui de refoulement du carburant vers les injecteurs.
Pour remplacer la pompe à essence, débrancher les deux connexions électriques et desserrer les colliers des tubes d'amenée et de refoulement ainsi que la pièce de fixation.
En remontant la pompe à essence, veiller à ne pas intervertir les fils + et – lors de leur branchement.

AUSWECHSELN VON KRAFTSTOFF-FILTER UND -PUMPE

Zum Auswechseln des Kraftstoff-Filters die Kraftstoffzuführungs- und -Rücklaufschläuche und BefestigungsBrieden von der Wagenunterseite her lösen. Bei Montage des neuen Filters sicherstellen, daß der Pfeil am Filter in Richtung der Kraftstoff-Zuführung zu den Einspritzdüsen weist.
Zum Auswechseln der Kraftstoff-Pumpe die beiden elektrischen Verbindungen unterbrechen, Brieden lösen und Kraftstoffzuführungs- sowie Rücklaufschläuche abnehmen; zum Schluß die Befestigungsbrieden lösen.
Bei Montage der neuen Kraftstoffpumpe darauf achten, daß das Plus-Kabel nicht mit dem Minus-Kabel verwechselt wird.

CONTROLLO DEL MISURATORE QUANTITÀ D'ARIA

Per rimuovere il misuratore quantità aria e controllare il funzionamento del piatto flottante, sganciare i 4 fermagli di ritegno coperchio filtro aria.
Svitare le quattro viti di fissaggio del misuratore al coperchio del filtro; le quattro viti sono accessibili dall'interno del coperchio filtro.
Ruotare completamente il piatto flottante e verificare che funzioni senza imputamenti.
Asportare l'eventuale sporco mediante un panno pulito privo di filacciature.
Dopo il montaggio, controllare la percentuale di CO nei gas di scarico.

CONTROLE DU DEBITMETRE D'AIR

Pour déposer le débitmètre d'air et contrôler le bon fonctionnement du volet flottant, défaire les 4 genouillères du couvercle de filtre à air. Dévisser les 4 vis du débitmètre de l'intérieur de la partie supérieure du filtre à air.
Rabattre complètement le volet du débitmètre d'air (jusqu'en butée), le volet devant pouvoir se déplacer librement.
Débarasser la zone du volet de tout dépôt à l'aide d'un chiffon ne s'effilochant pas.
Après repose, analyser le taux de CO des gaz d'échappement.

KONTROLLE DES LUFTMENGENMESSERS

Zwecks Demontage des Luftmengenmessers und Überprüfung der Schwingklappe auf ordnungsgemäße Funktion sind die vier Klammern an der Luftfilter-Abdeckung zu lösen.
Die vier Befestigungsschrauben des Luftmengenmessers von der Innenseite des oberen Luftfilterteils her lösen.
Die Klappe des Luftmengenmessers vollständig zurückschieben (bis an den Endanschlag stößt).
Die Klappe des Luftmengenmessers muß sich frei und ohne Anzeichen von Verklemmen bewegen.
Etwaigen Schmutz im Bewegungsbereich der Klappe mit einem sauberen Baumwolltuch entfernen.
Nach erfolgtem Wiedereinbau die CO-Konzentration im Abgas messen.

CONTROLLO DI TENUTA DEL SISTEMA DI ASPIRAZIONE ARIA

Per individuare eventuali perdite di aria, scollegare il tubo a valle della valvola supplementare aria e immettere un getto d'aria compressa mediante pistola.
Durante quest'operazione aprire completamente la valvola a farfalla.
Cospargere o spruzzare tutti i punti di tenuta con acqua saponata; la formazione di bolle o di schiuma evidenzia la presenza di perdite.

CONTROLE DES FUITES EVENTUELLES AU NIVEAU DU CONDUIT D'ADMISSION

Pour repérer l'existence de fuites au niveau du conduit d'admission de l'air, débrancher le conduit en aval du dispositif d'air additionnel et y appliquer un jet d'air comprimé.
Durant cette opération ouvrir complètement le papillon.
Mouiller tous les points d'étanchéité et raccord avec de l'eau savonneuse appliquée à la brosse ou par pulvérisation. L'apparition de bulles ou de mousse révèle la présence de fuites.

ÜBERPRÜFEN DER LUFTEINLASSLEITUNG AUF UNDICHTE STELLEN

Um das Lufteinlaßsystem auf undichte Stellen zu überprüfen, ist die Luftleitung unterhalb des Zusatzluftschiebers zu entfernen und mit einer Pressluftpistole durchzublasen.
Hierbei ist das Drosselklappenventil vollständig zu öffnen.
Unter Verwendung von Seifenlauge sämtliche Dichtungsstellen durch Bürsten oder Spritzen befeuchten.
Blasen- bzw- Schaumbildung ist ein Hinweis auf eine undichte Stelle.

VALVOLA LIMITATRICE DEPRESSIONE

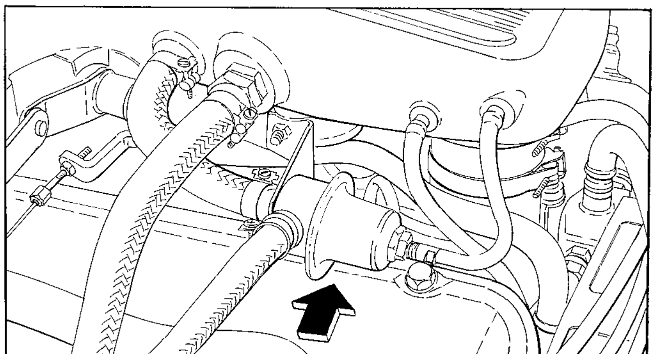
La valvola limitatrice depressione è montata su un by-pass che scavalca la farfalla acceleratore.
Quando a valle di quest'ultima si stabilisce una depressione molto alta (funzionamento in rilascio) la valvola si apre: si ottiene in tal modo una portata d'aria supplementare; portata d'aria che va a sommarsi alle portate d'aria del regolatore del minimo, del trafilamento farfalla e del blow-by. Questa portata d'aria supplementare ha lo scopo di diminuire le emissioni durante la fase di rilascio.

VALVE DE LIMITEUR DE PRESSIONE

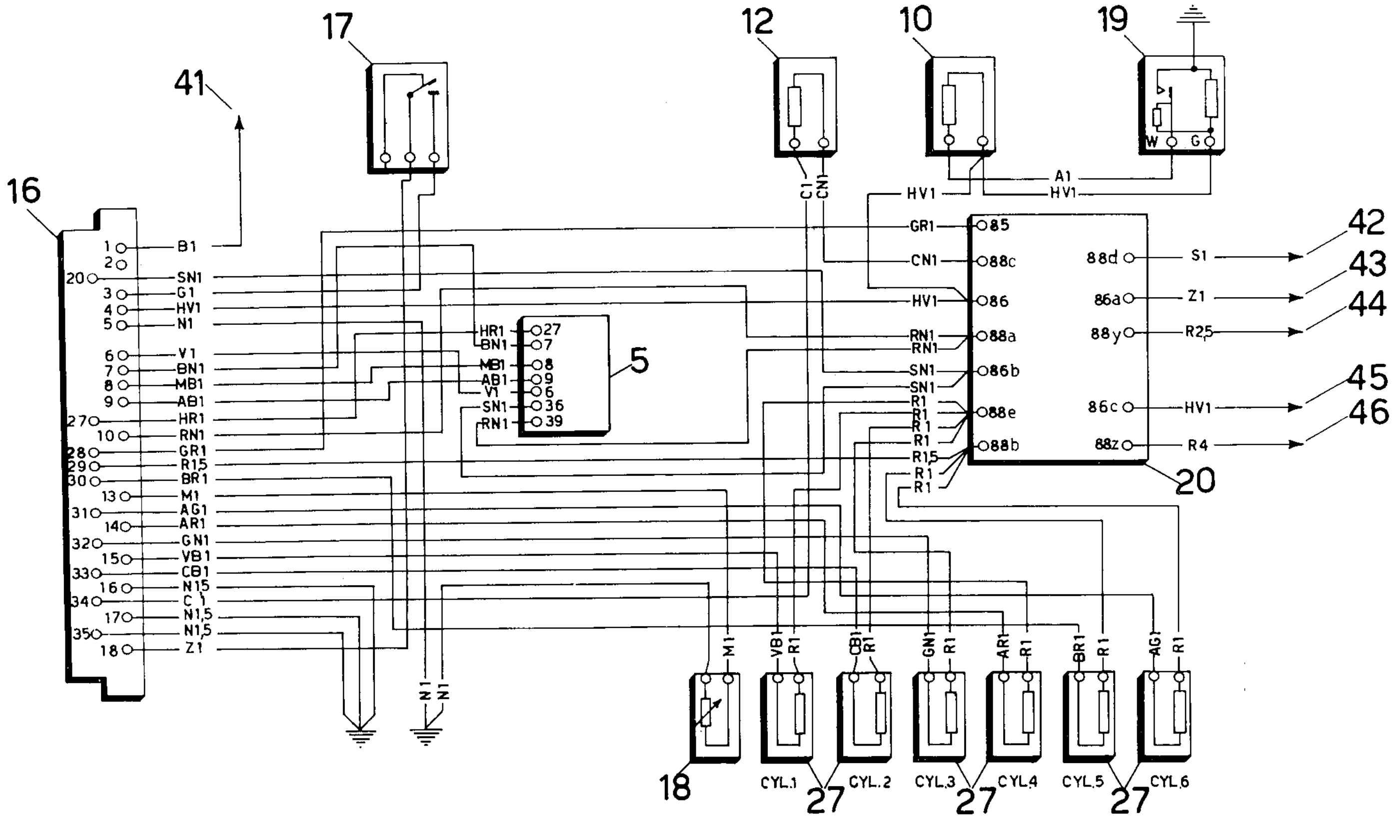
La valve de limiteur de pression est montée sur un circuit de dérivation tenant à l'écart le papillon d'accélérateur. Lorsqu'en aval de celui-ci s'établit une dépression élevée (décélération) la valve s'ouvre: de cette façon on obtient un débit d'air supplémentaire; débit qui s'ajoute à celui du régulateur de ralenti, du papillon, du blow-by. Ce débit supplémentaire a le but de diminuer le niveau des émissions à l'échappement en phase de décélération.

DRUCKBEGRENZUNGS-VENTIL

Das Druckbegrenzungsventil ist auf einem Bypass montiert, der die Drosselklappe umgeht. Sobald nach dieser ein sehr hoher Unterdruck entsteht (Schubbetrieb), öffnet sich das Ventil. Auf diese Weise wird ein zusätzlicher Luftdurchfluss erzielt, der zu den Luftdurchflüssen des Leerlaufreglers, des Drosselgasdurchtritts und des Blowbys kommt. Dieser zusätzliche Luftdurchfluss besteht zwecks Herabsetzung der Emissionen während des Schiebebetriebs.



SCHEMA ELETTRICO IMPIANTO DI INIEZIONE L-JETRONIC



Codice colore cavi
A. Blu
B. Bianco
C. Arancione
G. Giallo
H. Grigio
M. Marrone
N. Nero
R. Rosso
S. Rosa
V. Verde
Z. Viola

5. Misuratore quantità aria
10. Iniettore avviamento a freddo
12. Valvola supplemento aria
16. Connettore per centralina elettronica
17. Interruttore farfalla acceleratore
18. Sensore temperatura motore.
19. Interruttore termico a tempo
20. Doppio relè
27. Iniettori
41. Al termine n° 1 della bobina
42. All'interruttore inierziale
43. Al connettore commutatore d'accensione
44. Al fusibile n° 4 (uscita)
45. Al fusibile n° 7 (entrata)
46. Alla batteria

SCHEMA ELECTRIQUE DU SYSTEME D'INJECTION L-JETRONI

Couleur des fils
A. Bleu
B. Blanc
C. Orange
G. Jaune
H. Gris
M. Marron
N. Noir
R. Rouge
S. Rose
V. Vert
Z. Pourpre

5. Débitmètre d'air
10. Injecteur de départ à froid
12. Dispositif d'air additionnel
16. Connecteur femelle de centrale de commande
17. Interrupteur de papillon
18. Capteur de température d'eau du moteur
19. Thermo-contact temporisé
20. Combiné relais
27. Injecteurs
41. Vers la borne 1 de la bobine
42. Vers l'interrupteur à inertie
43. Vers le connecteur de contacteur d'allumage
44. Vers le fusible n° 4 (sortie)
45. Vers le fusible n° 7 (entrée)
46. Vers la batterie

SCHALTPLAN: "L-JETRONIC"-INJEKTIONSSYSTEM

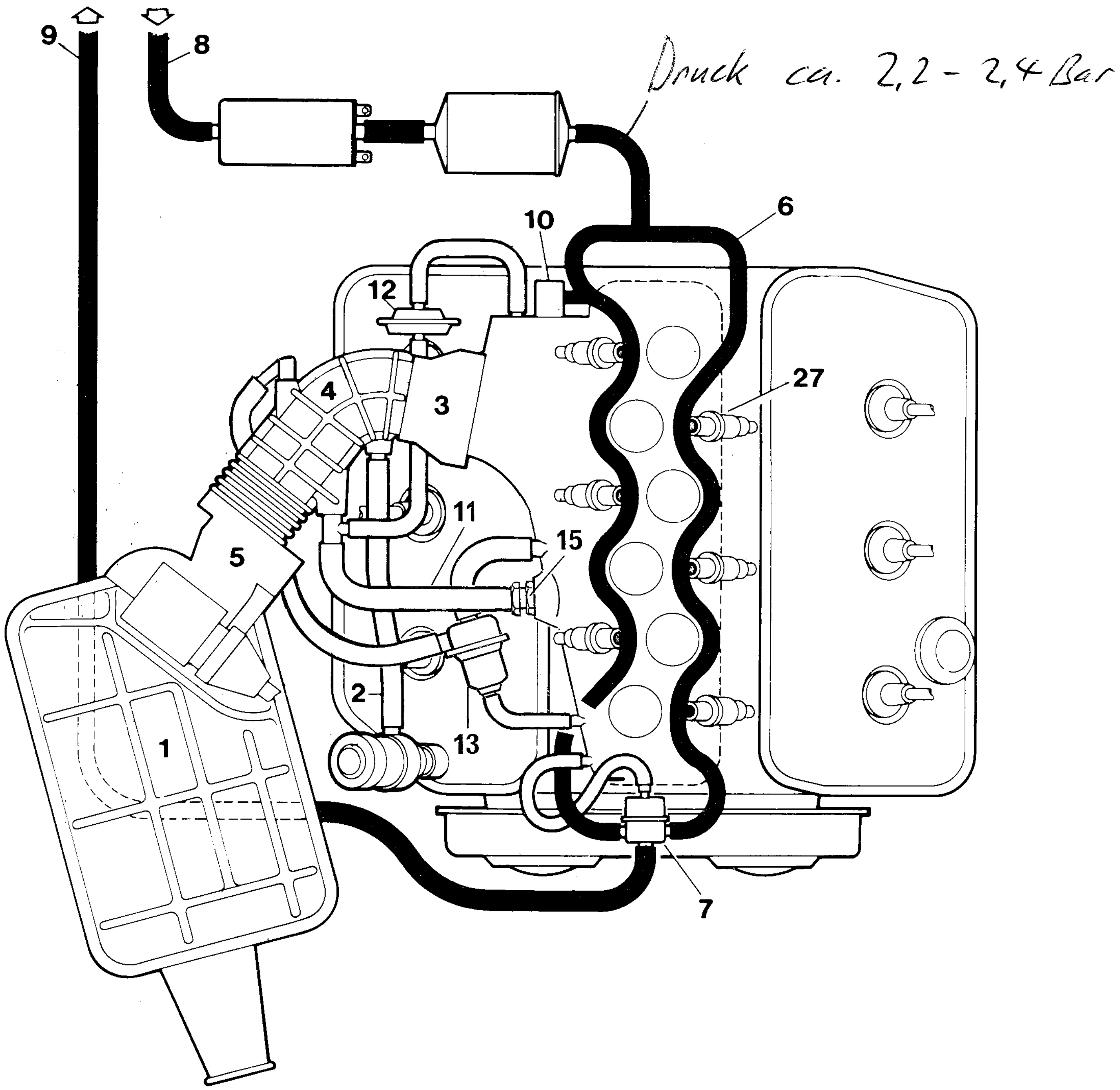
Kabelfarben-Code:
A. blau
B. weiß
C. orange
G. gelb
H. grau
M. braun
N. schwarz
R. rot
S. rosa
V. grün
Z. purpurfarben

5. Luftmengenmesser
10. Kaltstart-Ventil
12. Zusatzluftschieber
16. Anschluß zum elektronischen Regler
17. Drosselklappenschalter
18. Kühlmittel-Temperaturfühler II
19. Thermozeitschalter
26. Relais
27. Einspritzdüsen
41. zur Klemme 1 der Zündspule
42. zum Schwungkraft-Schalter
43. zum Zündschalter-Anschluß
44. zur Sicherung Nr. 4 (Ausgang)
45. zur Sicherung Nr. 7 (Eingang)
46. zur Batterie

SCHEMA CIRCUITI ARIA E BENZINA L-JETRONIC

CIRCUITS AIR ET CARBURANT DU SYSTEME D'INJECTION L-JETRONIC

"L-JETRONIC" KRAFTSTOFF- UND LUFTZUFÜHRUNGSKREIS-LÄUFE



1. Filtro aria
2. Tubo ricircolo gas di sfiato (blow-by)
3. Corpo farfalla acceleratore
4. Manicotto collegamento misuratore-farfalla
5. Misuratore quantità aria
5a. Connettore potenziometro del misuratore quantità aria
6. Tubo mandata carburante agli iniettori
7. Regolatore pressione carburante
8. Tubo alimentazione carburante
9. Tubo ritorno carburante
10. Iniettore avviamento a freddo
11. Tubo aria minimo
12. Valvola supplemento aria
13. Valvola limitatrice depressione
15. Ghiera regolazione minimo

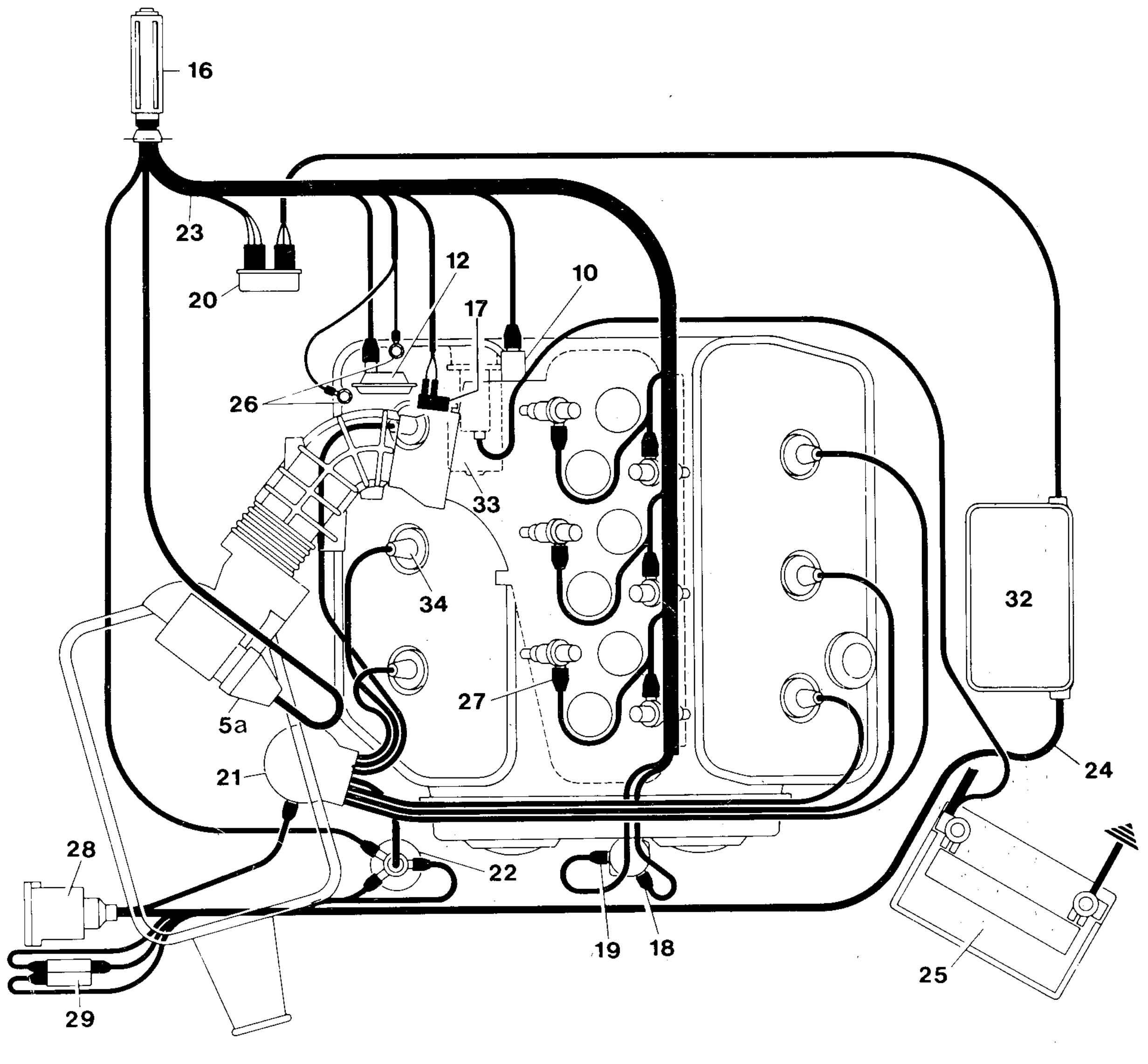
1. Filtre à air
2. Tube de recyclage des vapeurs d'huile
3. Corps de papillon
4. Manchon de liaison débitmètre volet d'accélérateur
5. Débitmètre d'air
5a. Connecteur du potentiomètre du débitmètre d'air
6. Rampe d'alimentation des injecteurs
7. Régulateur de pression de refoulement du carburant
8. Tuyau d'arrivée du carburant
9. Tuyau de retour du carburant
10. Injecteur de départ à froid
11. Tuyau d'air de ralenti
12. Régulateur d'air additionnel
13. Valve de limiteur depression
15. Ecrou de réglage du régime de ralenti

1. Luftfilter
2. Abgas-Rückführungsschlauch
3. Drossel
4. Luftzuführungsleitung
5. Luftmengenmesser
6. Kraftstoffzuführungsleitung
7. Kraftstoffdruck-Regler
8. Krafstoffhauptleitung
9. Kraftstoffrücklauf
10. Kaltstart-Ventil
11. Leerlauf-Luftschlauch
12. Zusatzluft-Regler
13. Druekbegrenzungsventil
15. Leerlauf-Regler

SCHEMA CABLAGGIO ELETTRICO L-JETRONIC

CIRCUIT ELECTRIQUE DU SYSTEME D'INJECTION L-JETRONIC

"L-JETRONIC"-KABELBAUM



16. Centralina elettronica
17. Interruttore farfalla acceleratore
18. Sensore temperatura motore
19. Interruttore termico a tempo
20. Doppio relè
21. Distributore di accensione
22. Bobina
23. Assieme cavi L-Jetronic
24. Impianto elettrico vettura
26. Collegamenti di massa
27. Iniettore
28. Centralina accensione elettronica
29. Resistenze in serie
32. Scatola porta fusibili
33. Motorino d'avviamento
34. Candele d'accensione.

16. Centrale de commande
17. Interrupteur de papillon
18. Capteur de température du moteur
19. Thermo-contact temporisé
20. Combiné relais
21. Distributeur d'allumage
22. Bobine d'allumage
23. Faisceau électrique L-JETRONIC
24. Faisceau voiture
26. Branchements à la masse
27. Injecteur
28. Module d'allumage électronique
29. Résistance
32. Boîte à fusibles
33. Démarreur
34. Bougies

16. Reglereinheit
17. Drosselklappenschalter
18. Motortemperatur-Fühler
19. Thermozeitschalter
20. Relais
21. Zündverteiler
22. Zündspule
23. L-Jetronic-Kabelbaum
24. Kabelbaum f. das Fahrzeug
25. Batterie
26. Erdungsanschlüsse
27. Einspritzdüse
28. elektronische Zündvorrichtung
29. Widerstand
32. Sicherungskasten
33. Starter-Motor
34. Zündkerze

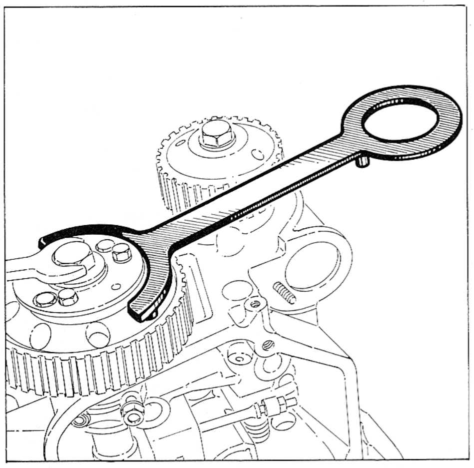
ATTREZZI SPECIFICI	OUTILS SPECIAUX	SPEZIALWERKZEUGE

A.2.0361

Attrezzo ferma puleggia albero distribuzione

Outil d'immobilisation de la poulie d'arbre à cames

Werkzeug zum Blockrieren der Nockenwellen-Riemen-scheibe

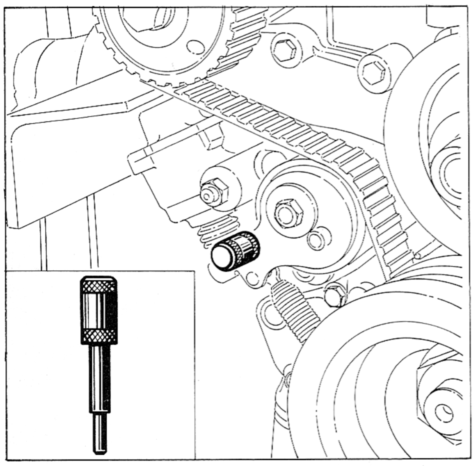


A.2.0363

Perno ferma tendicinghia

Broche de maintiene du tendeur de courroie

Stift zum Blockieren des Riemenspanners

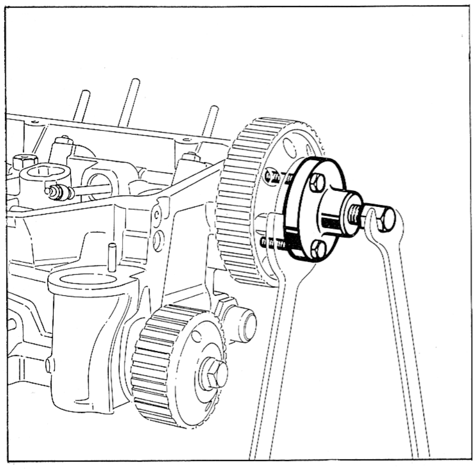


A.3.0521

Estrattore mozzo e puleggia dentata albero distribuzione

Extracteur de moyeu et de poulie crantée d'arbre à cames

Werkzeug zum Abziehen der Nockenwellen-Nabe und der Zahnriemenscheibe



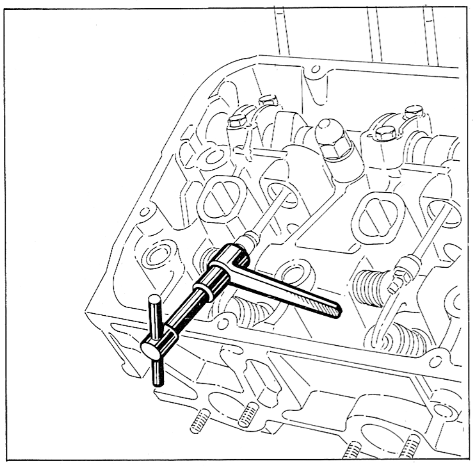
A.5.0220

Attrezzo per registrazione punterie lato scarico

Outils de réglage du jeu aux soupapes d'échappement

Werkzeug zum Nachstellen des ~~Einlaß~~ventilspiels

Auslass

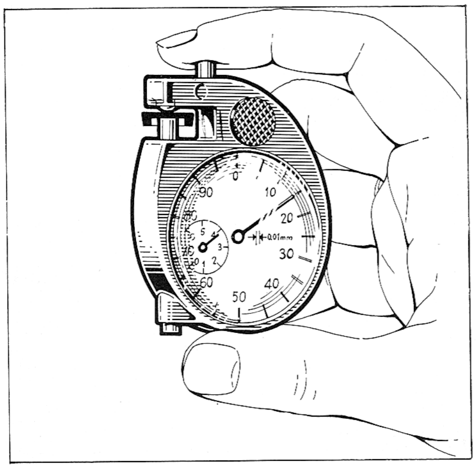


Comparatore per controllo cappellotti valvole

Comparateur de contrôle des pastilles de soupapes d'admission

Meßuhr zur Feststellung der Stärke der Ventilkappen

C.1.0108

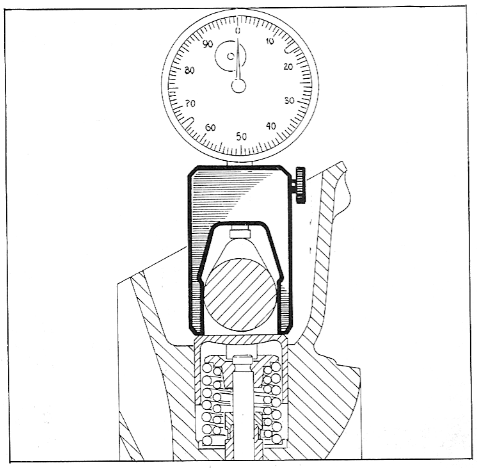


Calibro per controllo gioco valvole

Calibre de contrôle du jeu aux soupapes d'admission

Werkzeug zur Prüfung des Ventilspiels

C.6.0178

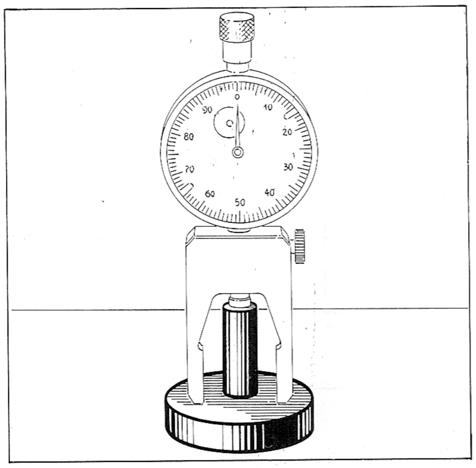


Riscontro per calibro controllo gioco valvole

"Marbre" pour calibre de contrôle du jeu aux soupapes

Prüflehre für Ventilspiel- Meßwerkzeug

C.6.0182



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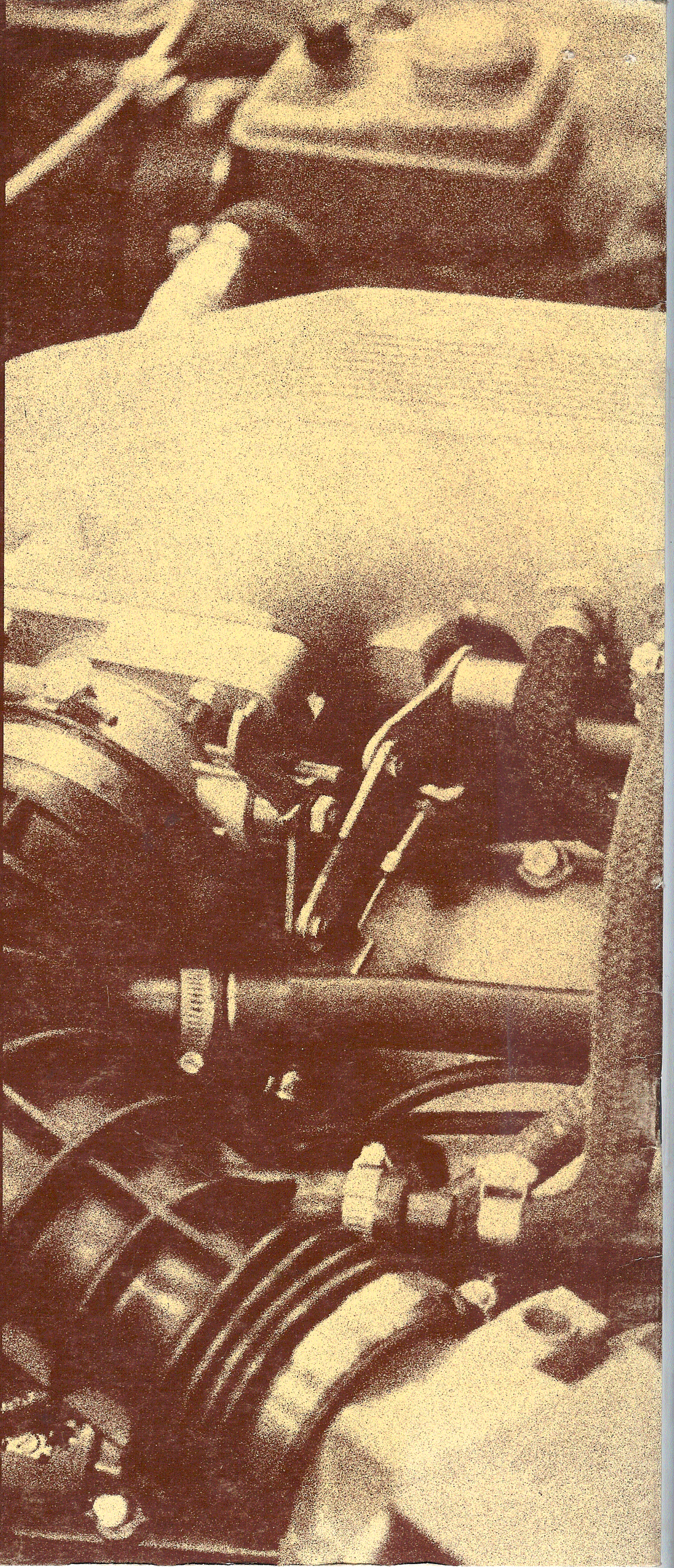


DIREZIONE ASSISTENZA

ENGINE MAINTENANCE MANUAL

ALFA ROMEO gtv 6 2.5

L-JETRONIC BOSCH INJECTION SYSTEM

(49 STATE VERSION)

1983
model year

Alfa Romeo

ENGINE MAINTENANCE MANUAL

ALFA ROMEO *gtv 6* 2.5

L-JETRONIC BOSCH INJECTION SYSTEM

(49 STATE VERSION)

1983
model year

WARNING:

The Clean Air Act, as amended, provides in sect. 203 that tampering with emission related components or specifications is prohibited.

"Tampering" can be defined as any operation performed that causes any change in the specifications contained with in this manual.

All **ALFA ROMEO** vehicles are certified and are controlled to insure that they meet these specifications when they leave the factory. Vehicles being out of specification due to maladjustment or modification will usually exceed established emission standards for that vehicle, as well as consume excessive fuel.

The specifications contained in this manual have been furnished to Federal and State Environmental Control Agencies, and are those which are used in surveillance programs to determine the vehicle conformity to its certified configuration.

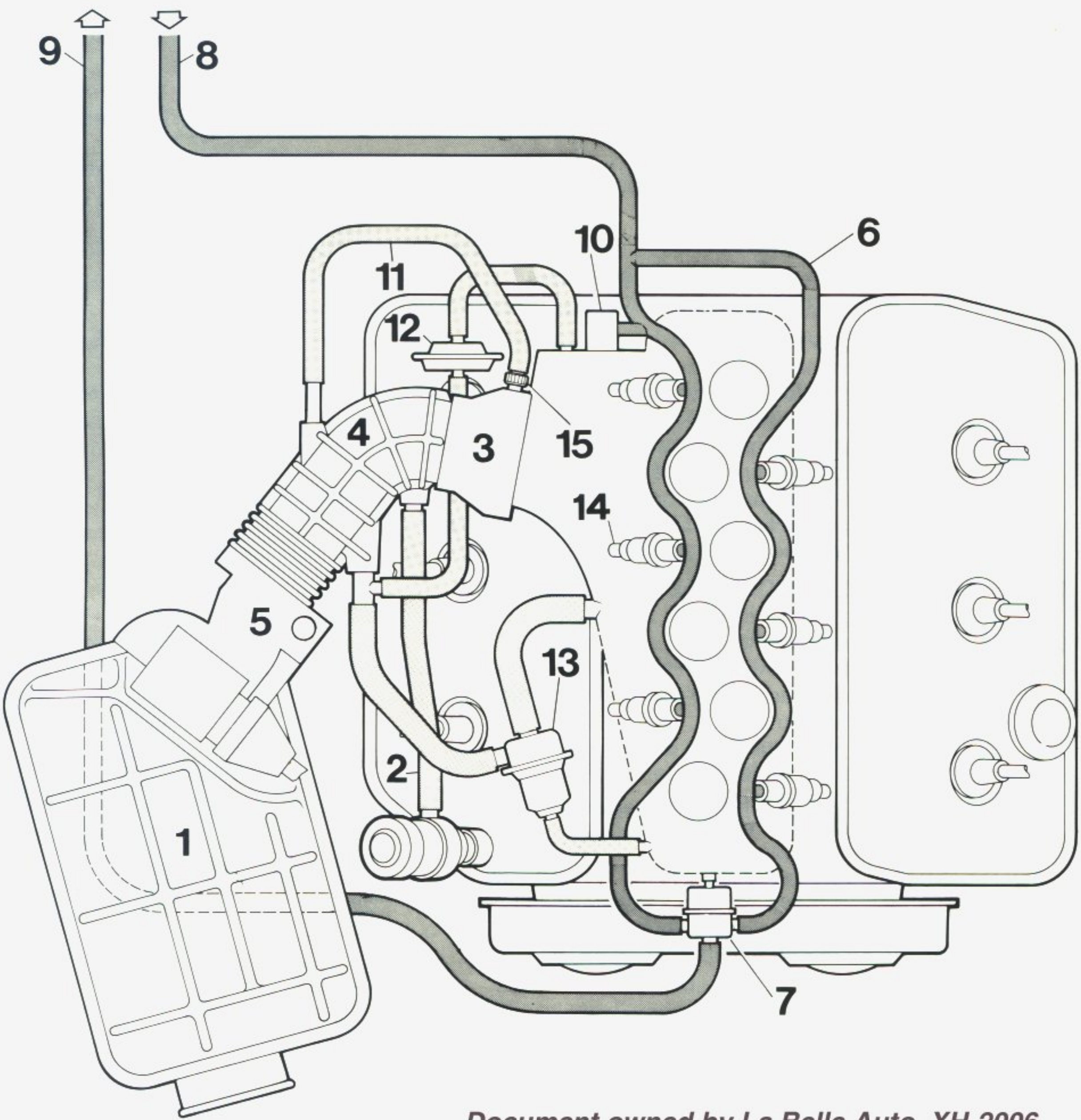
ATTENTION

For use in designated high altitude areas check and reset idle RPM (refer to chapter C 7).

CONTENTS

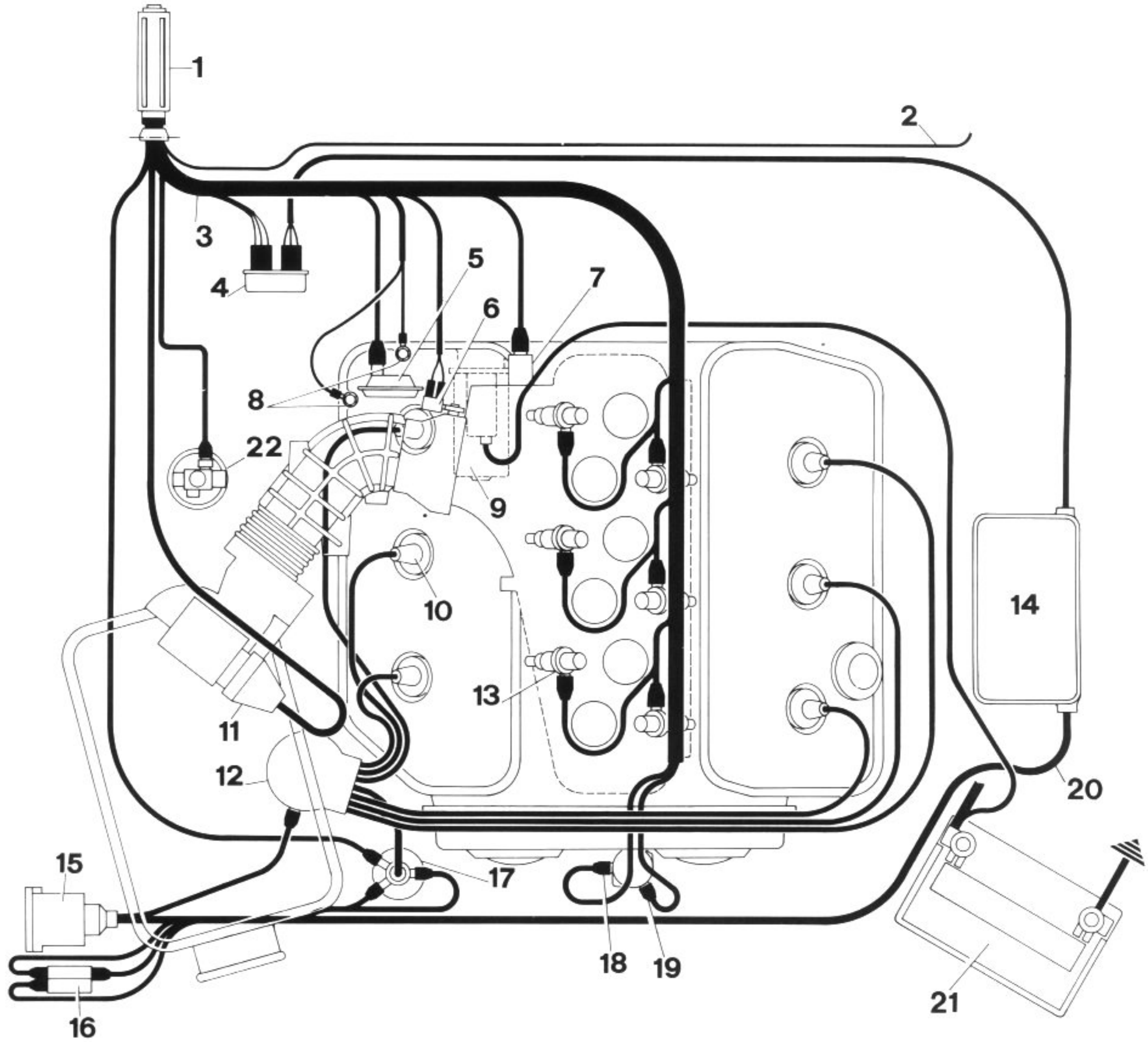
A L-JETRONIC INJECTION AND EMISSION CONTROL SYSTEM

A 1 AIR AND FUEL HOSES DIAGRAM OF L-JETRONIC INJECTION SYSTEM



1 Air filter
2 Crankcase ventilation hose
3 Throttle body
4 Air-flow sensor to throttle duct
5 Air-flow sensor
6 Fuel ring (main supply)
7 Pressure regulator
8 Fuel delivery line
9 Fuel return line
10 Start valve
11 Idle hose
12 Auxiliary-air device
13 Decel valve
14 Fuel injector (fuel-injection valve)
15 Nut for idle-speed adjustment

A 2 WIRING DIAGRAM OF L-JETRONIC INJECTION SYSTEM



1 Female connector to electronic control unit
2 Lead to lambda sensor
3 Jetronic wiring harness
4 Relay set
5 Auxiliary-air device
6 Full-load switch
7 Start valve
8 Ground terminals
9 Starter motor
10 Spark plug
11 Air-flow sensor
12 Ignition distributor
13 Fuel injectors
14 Fuse box
15 Ignition amplifier module
16 Series resistor, ignition
17 Ignition coil
18 Thermo-time switch
19 Temperature sensor II
20 Vehicle wiring harness
21 Battery
22 Filter for air conditioner

A 3 DESCRIPTION OF L-JETRONIC SYSTEM

The electronically controlled L-JETRONIC Bosch fuel injection is an intermittent, low pressure injection system.

The information required for fuel supply to the engine is obtained by measuring sensor and then converted into electronic signals.

An electronic control unit processes these signals and obtains the engine's fuel requirements from them: it then issues the electronic control pulses, corresponding to the required fuel quantity, to the injectors.

An electric pump in the fuel supply system draws fuel from the tank and delivers it, through a manifold and its connections, to the injectors. These in turn inject the fuel upstream of the engine intake valves. The system control element is the electronic unit, to which the following electric signals are issued:

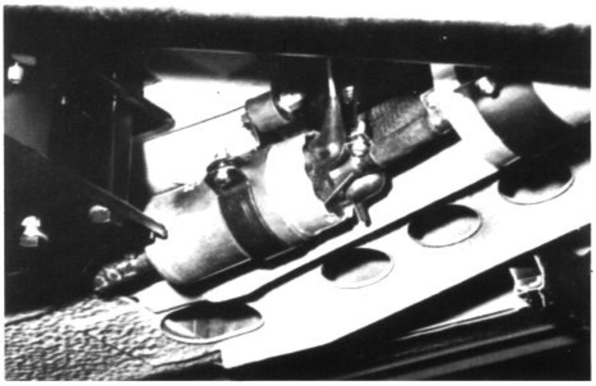
- Voltage from the battery
- Pulses from the ignition distributor
- Throttle valve fully open signal
- Engine coolant temperature
- Engine airflow intake
- Starter motor on signal
- Signal from the exhaust gas tester lambda sensor.

It then calculates injector opening time and issues an electric pulse of corresponding duration. As the fuel pressure upstream of the injectors is constant, the injected quantity is directly proportional to the above opening time; this time being calculated in relationship to the instantaneous operating conditions of the engine. The system is also equipped with the following devices:

- Cold start injector, to deliver additional fuel during start-up (controlled by thermo-time switch)
- Auxiliary air device to deliver a larger flow of air and fuel to the engine during initial cold running
- Decel valve, to improve engine running when releasing the throttle, eliminating backfiring and excess emission.

A 4 ELECTRIC FUEL PUMP

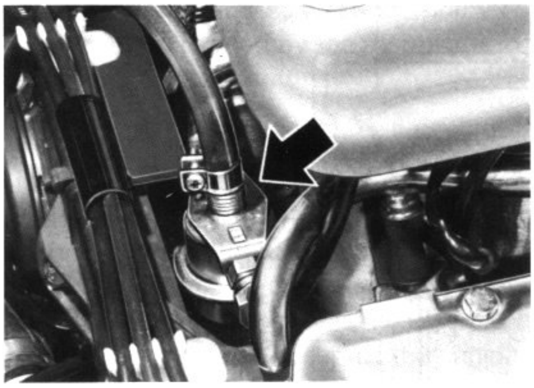
This pump is of the rotary cell and roller type; it is driven by a small motor submerged in the pressurized fuel after the pump set. A lower noise level is achieved by this solution; moreover, the pressurized fuel acts as a hydraulic bearing for the motor shaft on its bushings. The pump delivers more fuel than the actual maximum required by the engine so as to keep the fuel system under pressure at any operating condition. Inserting the ignition key (position 1) into the ignition switch and rotating it to position 2 (ignition "on") does not feed the electrical fuel pump; in position 3 (starting) instead, since the engine is cranked, the air sucked in causes the air flow sensor floating flap to rotate thus switching on the fuel pump feed circuit. This electronic safety circuit keeps a cylinder from filling with fuel, when the ignition is turned on, should its injection valve be faulty.



A 5 FUEL PRESSURE REGULATOR

The fuel under pressure enters the lower chamber and acts on the diaphragm; this overcomes the force of the spring and rises, together with its plate, thus opening the tank return connection. The regulating action of the fixed calibration spring is added to the action exerted by the pressure of the intake manifold air in the upper chamber.

When this pressure drops, the diaphragm rises, opens the return connection and thus correspondingly lowers the fuel pressure and viceversa. The purpose of this additional regulation is to hold the pressure drop between the fuel upstream of the injectors and the manifold air constant, so as to have the fuel flow rate depend exclusively on the injector's opening time.



A 6 FUEL INJECTORS

Each cylinder has its own electromagnetically operated injector; the injectors are electrically parallel-connected and simultaneously inject one-half of the required fuel flow rate at every crankshaft revolution. The injector mainly consists of a magnetic winding (coil), needle guide, magnetic core and needle. The magnetic core moves with the needle, which is pressed by a spring on its sealing seat on the body. The injector needle opens under the action of the magnetic field established by the coil upon an electric signal issuing from the electronic unit. The plunger core, and therefore the needle, has a very short stroke (some 0.15 mm) because of the disk stop which keeps the plunger from hitting the stationary inside part; needle opening time is 2-10 ms, according to the signal issued by the electronic unit. The tip of the injector is fitted with a Teflon heat protection bushing to avoid fuel evaporation and the consequent build up of dry residuals on the needle.

This bushing should not be removed when installing the injector.

A 7 AIR FLOW SENSOR (AFS)

The air flow sensor's task is to issue an electric signal, depending on the engine air intake flow, to the electronic control unit by means of a potentiometer.

The signal is used to enstablish injection duration.

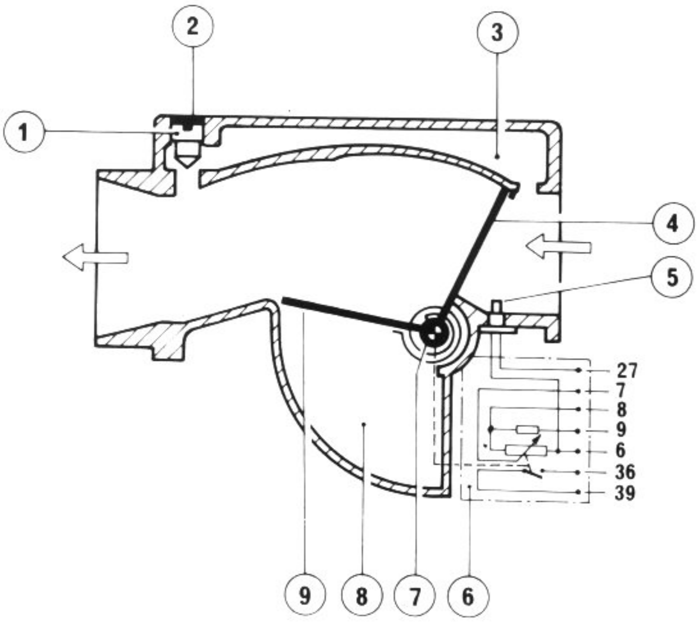
The sensing element is a floating flap valve which opens in proportion to the air intake flow; this in turn is a function of engine RPM and throttle valve setting. The angle setting of this flap valve is transferred to a potentiometer rigidly fastened to the valve shaft.

A compensating flap valve, coupled to the floating one, compensates any air column reflux pressure oscillations, so as to keep them from interfering with air flow sensing.

A bypass is placed across the floating flap valve and fitted with a screw and sealing plug. By acting on this screw, the CO value can be adjusted to the minimum as, while the total air intake flow remains the same, the percentage flow rate through the flap valve changes, thereby acting on its angle setting and on the fuel delivery from the injectors.

A fuel pump control switch is inserted on the potentiometer; this switch opens when the floating flap valve rests against its stop at idle, as a safety in case of engine shutdown with the ignition on. When starting up, the pump is parallel connected to the starter motor as at this stage, at least at the beginning, there is no air flow and the switch therefore stays open.

An air intake temperature sensor (temperature sensor I) is placed at the airflow sensor inlet.



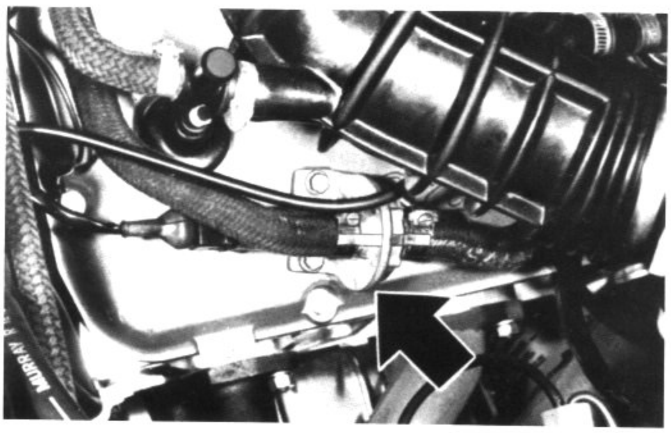
1 CO adjusting screw
2 Sealing plug
3 By-pass
4 Floating flap
5 Air temperature sensor I
6 Potentiometer
7 Return spring
8 Damping chamber
9 Compensating flap valve

A 8 AUXILIARY AIR DEVICE

The auxiliary air device is located on a throttle valve bypass and delivers an additional air flow when the engine is cold.

The bimetallic strip is sensitive to cylinder head temperature and closes the bypass when the engine is warmed up. The heating coils also act on this strip so as to have the bypass close before the whole engine is warmed up.

This device ensures cold engine smooth running, by offsetting the higher friction by a greater flow.



A 9 COLD START INJECTOR (START VALVE) and THERMO-TIME SWITCH

The cold start electric injector has the task of enriching the mixture in the intake manifold by injecting a fine fuel spray into it; it operates only when turning on the starter motor and if the thermo-time switch is closed.

The thermo-time switch consists of a bimetallic strip which opens the electric circuit when the temperature exceeds 35°C; under such conditions, the cold start injector. At the same time, the bimetallic strip is heated by its coil, and the circuit thus opens after a few seconds even though the starter motor is still running. This helps to avoid flooding the engine in the case of prolonged efforts to start the car.

A 10 ENGINE COOLANT TEMPERATURE THERMISTOR (TEMPERATURE SENSOR II)

During warm up after a cold start the engine requires a very rich mixture; this enrichment should be reduced as engine temperature increases and cease when the normal operating temperature is attained. Such temperature variations are transmitted by the thermistor to the electronic unit which adjusts the injected fuel flow to the engine temperature.

A 11 DECEL VALVE

The decel valve bypasses the throttle valve. When a very low pressure exists downstream of the throttle (as when releasing the accelerator while engine runs at high revs during deceleration), the decel valve opens and lets additional air in. This additional flow, by means of the air flow sensor, triggers a corresponding increase in fuel delivery. This eliminates the backfiring and hydrocarbon emission which might occur when releasing the throttle, should the engine be fed only by the air leaking through the closed throttle and by the corresponding fuel flow.

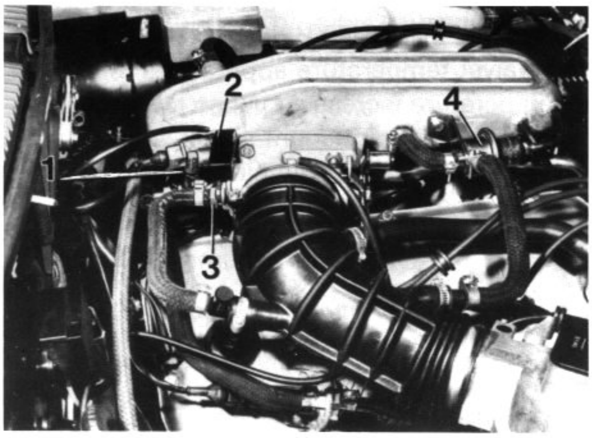
A 12 FULL THROTTLE SWITCH

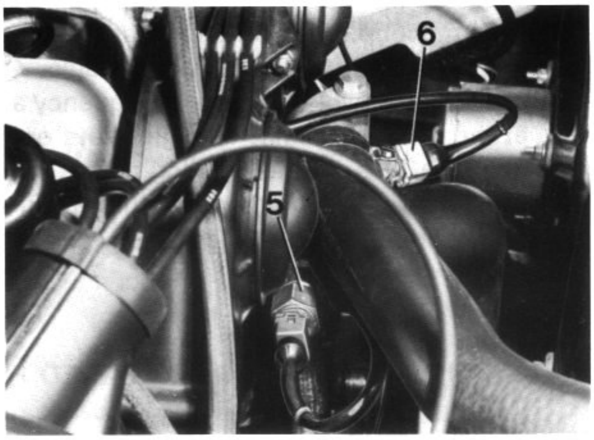
The switch closes when the throttle is fully opened. The corresponding electric signal causes a greater fuel flow and the simultaneous switching off of the lambda sensor circuit.

A 13 BYPASS FOR IDLE SPEED ADJUSTMENT

A screw-adjustable bypass bypasses the throttle valve.

The screw adjusts the idle speed without changing the CO value. In fact, the change in engine air intake, as controlled by the screw, is sensed by the airflow sensor which will also proportionally adjust the injected fuel rate.





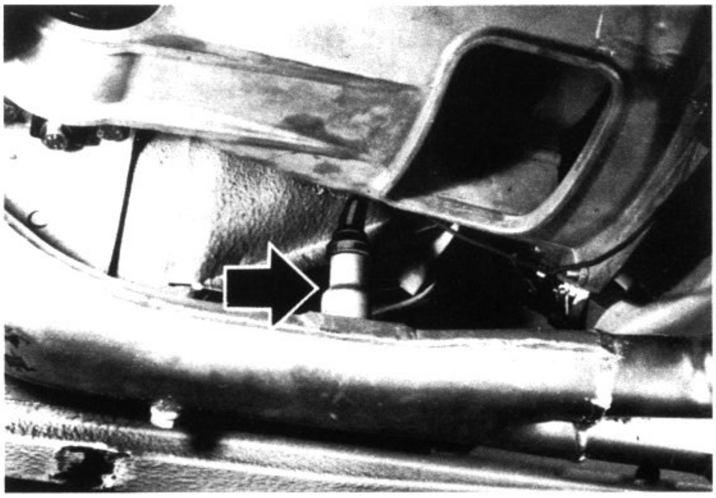
1 Cold start injector (start valve)
2 Full throttle switch (full-load switch)
3 Nut for idle-speed adjustment on by-pass
4 Decel valve

5 Thermo-time switch
6 Temperature sensor II

A 14 EXHAUST GAS LAMBDA SENSOR

The sensor's sensitive element is a ceramic capsule coated with a platinum sponge on both sides; the outside is exposed to the exhaust gases while the inside is in contact with the atmosphere. The oxygen content differential between air and exhaust gases is converted into an electric potential differential across the capsule.

This electrical signal is fed to the electronic control unit (ECU) which determines adjustments necessary to obtain the stoichiometric air fuel ratio required for maximum catalyst efficiency which results in minimal exhaust emissions.



A 15 CATALYTIC CONVERTER

In order to reduce emissions, there is a catalytic converter in the exhaust system. It is made of a alumina monolith coated with an active material of noble metals in a special steel container for high temperature resistance. The system converts the HC and CO in the exhaust into water and CO_2, which are not harmful.

The catalyst is efficient within a certain temperature range. At low temperature there is no catalytic conversion. High temperature can cause deformation on the metal container and deterioration of the alumina, with a subsequent loss of efficiency of the catalyst itself. High temperatures can be caused by an excessive quantity of unburned fuel going through the alumina, owing either to excessive loads on the engine or maladjustment of the engine. In order to avoid high temperatures, a thermocouple is mounted in the catalyst and controls a light (EXH. TEMP.) on the instruments panel thru a warning device module. As the catalyst temperature approaches maximum, the light starts to blink, increasing frequency as the temperature increases. When the temperature is at the maximum limit, the light stays on permanently (this permanent signal is held due to breaking of a fuse on the warning device module). To see if the electric circuit and the "Exh. Temp." light are working properly, turn the ignition key to the on position: the light will remain lit for a few seconds.

A 16 FILLER NECK FOR UNLEADED FUEL ONLY

The filler neck of the tank prevents accidental filling with other than unleaded gasoline. This is obtained by providing the tank with special device.

Only the nozzle of an unleaded gasoline pump is allowed to pass in the filler neck so as to open the flap valve and refuel the tank.

B RECOMMENDED USE

B1 FUEL REQUIREMENT

Octane Rating:

A gasoline's resistance to detonation or "knock" is noted by its octane rating. Purchase and use of correct octane fuel is essential to prevent "knock" which may eventually be harmuful to your car's engine. To higher the rating, the higher the ability to resist "knock". Regular fuels have an octane rating range from 91 to 95 RON (Research Octane Number) or 86 to 90 PON (Pump Octane Number). PON ratings appear on gasoline pumps in the U.S. This rating is determined in the following manner:

$$\frac{RON + MON^*}{2} = PON$$

For example: Research Octane Number and Motor Octane Number divided by 2 equals Pump Octane Number.

> The PON octane rating is usually 5 points less than the RON rating:
> 91 RON = 86 PON
> 95 RON = 90 PON

Use of fuels with octane ratings lower than 91 RON or 86 PON should be avoided.

* Motor Octane Number.

B 2 TEMPERATURE OF THE CATALYTIC CONVERTER

Excessive temperature in the catalytic converter during driving can cause damage to the alumina monolith thereby lowering its conversion efficiency as well as cause damage to the container and to the vehicle or possibly cause fire hazard. Engine malfunction that can cause catalytic converter overtemperature are:

- Spark plug fouling at one or more cylinders
- Defective electric fuel pump or fuel filter clogged (too low fuel pressure)
- Defective injector (s)
- Air filter element verty dirty
- Engine accelerator control linkage out of setting
- Engine and related devices not set to Factory specifications
- Leaks at the exhaust pipe upstream of the exh sensor
- Faulty pressure regulator
- Thermocouple (or relevent circuit) broken
- Too low a battery voltage (or defective charging circuit)

Driving methods that can cause catalyst overtemperature are:

- Use of wrong gears
- Too low level in the fuel tank
- Engine overloading for prolonged time e.g. when racing the engine, pulling trailers or climbing long hills or grades
- Driving or coasting with the ignition turned off

Then, when "EXH. TEMP." warning lamp is flashing indicating abnormal catalyst temperature, the driver **must reduce the engine load** by easing up on the accelerator pedal. If after a certain period the lamp does not stop flashing or if it stays lit permanently, indicating a further increase of the temperature, there is evidence of need for possible engine maintenance.

We reccommend that the car be driven slowly to the nearest Alfa Romeo dealer for diagnosis of the cause of the overtemperature.

B 3 PRECAUTIONS TO BE TAKEN IN CATALYTIC EQUIPPED MODELS

1 - Use only unleaded gasoline

2 - Avoid the fuel tank from becoming empty

3 - Do not ever operate the engine with a spark plug lead disconnected and do not ever ground spark plug

4 - Don't exceed overloading the engine for prolonged period. Be careful when pulling trailers or when climbing long hills or grades

5 - Avoid turning of ignition while driving in any condition or coasting. Vehicle must be stopped before shutdown

6 - Avoid parking over or in vicinity of combustible materials such as: dry grass, spilled fuel, dry leaves, rubbish, etc.

7 - Cylinder compression checking must be made after having removed the fuse protecting the fuel pump in order to avoid injecting fuel

8 - Do not tamper with any component of the emission control system. It is prohibited by law (see WARNING on page 2)

9 - Do not discard spent catalytic converter in with flammable refuse

10 - Have maintenance operations performed as prescribed in the Owner's Operational Manual. The perfect maintenance of the engine is the main factor for the life of the catalytic converter.

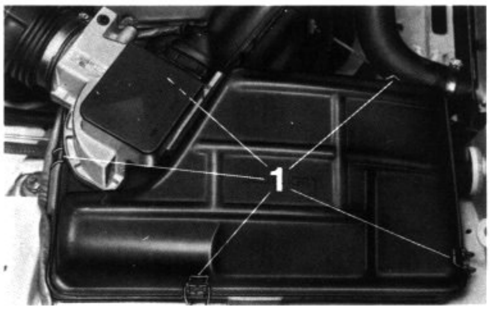
C REGULAR SERVICING

C 1 CLEANING OR CHANGING THE AIR CLEANER

Release the five clips 1 securing the cleaner cover to the cleaner pan and raise the cover just enough to get the filtering element out of the cleaner, paying attention not to strain the duct.

On refitting, take care to position the element correctly (a mark on one side of the element indicates which is the top side).

Refit the cleaner cover and secure it with all clips.



C 2 CHANGING OR ADJUSTING THE ALTERNATOR AND COOLANT PUMP DRIVE BELT

Tension adjustment

The tension is correct when on pressing the belt down by applying a load of abt. 8 kg, the amount of play is approximately 1/2 in. (10-15 mm).

To tighten the belt unscrew the nuts 1 and 2 on the adjusting arm and bolt 3. Move the alternator outward to increase the belt tension and re-tighten nut 2: re-check the belt tension.

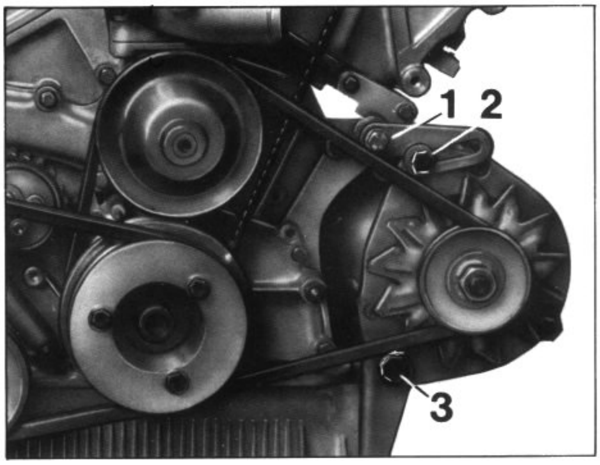
Tighten bolt 3 and nut 1.

Changing the belt

Slacken nut 2, bolt 3 and nut 1.

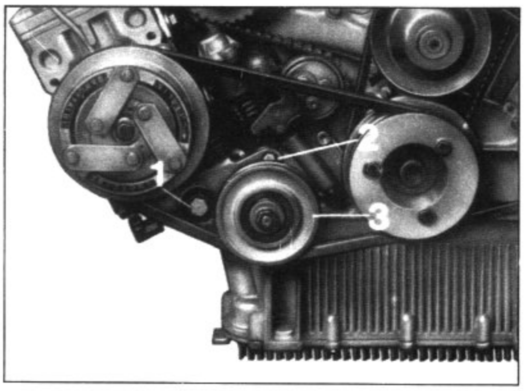
Move the alternator inward and remove the old belt. Fit the new belt to the three pulleys and move the alternator until belt tension is as specified. Then, securely tighten nut 2 and check belt tension; tighten bolt 3 and nut 1.

Note: prior to change the alternator drive belt remove the drive belt of the air conditioner compressor.



C 3 CHECKING THE TENSION OF A/C COMPRESSOR DRIVE BELT

The tension is correct when on pressing the belt down, the amount of play is about 10 mm. To adjust, slacken the bolts 1 and 2 securing the tensioner 3 and move the tensioner as required. Retighten bolt 2, check belt tension, then tighten bolt 1.

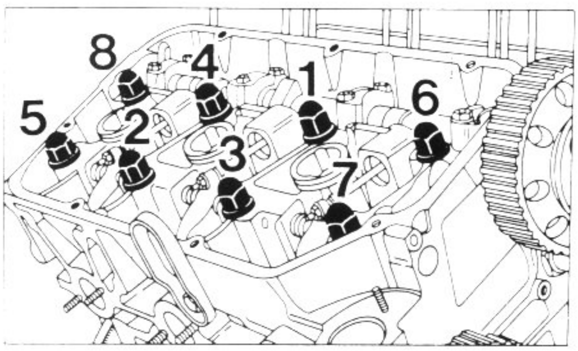


C 4 TIGHTENING TORQUES

— Cylinder head nuts

1) When fitting the cylinder heads, proceed as follows:
   With the engine cold, tighten progressively in the sequence shown, after having previously lubricated the washer, nut and stud 8 kgm (57.9 ft. lbs)
2) After approx. 1,500 miles and engine cold, slacken the nuts by one turn and retighten the nuts in the sequence indicated, after having previously oiled the surfaces of washer and nut 9 kgm (65.1 ft. lbs)

N.B.: When carrying out the 1,500 mile service (free service coupon) proceed as indicated in item 2 above.



N.B.: The sequence shown on the above illustration is for the RH cylinder head.
The tightening sequence is symmetrical for the LH cylinder head.

— Main bearing cap nuts (oiled) . . . . 7.8-8 kgm (56.4-57.9 ft. lbs)

— Main bearing cap locknuts (oiled) . . . . 2-2.4 kgm (14.5-17.4 ft. lbs)

— Connecting rod nuts (oiled) . . . . 4.7-5.2 kgm (34-37.6 ft. lbs)

— Crankshaft pulled retaining nut (oiled) . . . . 24 kgm (173.6 ft. lbs)

— Flywheel retaining nuts (using Loctite 270 sealant) . . . . 11.5 kgm (83.1 ft. lbs)

— Camshaft bearing caps (oiled) . . . . 2-2.2 kgm (14.5-15.9 ft. lbs)

— Camshaft hub retaining nut . . . . 9.9-11.9 kgm (71.6-36 ft. lbs)

— Camshaft belt tensioner pulley bolt (using Loctite 270 sealant) . . . . . . 1.7-2 kgm (12.3-14.5 ft. lbs)

C 5 SPARK PLUGS AND FIRING ORDER

The standard plugs fitted to the engine are LODGE HLE

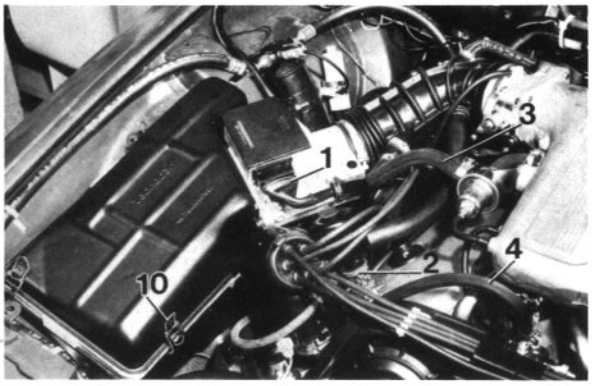
- The spark plugs are of the surface gap type with four points and central electrode, which due to their superior performance characteristics during all driving conditions when compared to conventional type spark plugs, require no regular maintenance other than replacement at the required service interval (consult maintenance schedule).
  No routine adjustment is necessary of the gap between the electrode and points.
- If the ceramic insulator is cracked or the eletrodes are excessively worn away, the spark plugs must be replaced.
- Use of spark plugs which do not meet identical performance specifications or are dimensionally different can promote serious engine damage as well as alter emission levels
- Prior to remove the spark plugs it is necessary to withdraw the extension by pulling on the rubber cap.
- Remove the spark plugs.
- On refitting, after having tightened the spark plugs to a torque of 2.5-3.5 kgm (18-25.3 lb-ft.)(when engine is cold), make certain the extension makes a reliable mechanical and electrical connection with the wire.
- If doubt exhits, slide the rubber cap along the wire and by holding the wire steady, fully screw in the extension; then, bring the rubber cap back over the extension. Fit the extension onto the spark plugs.

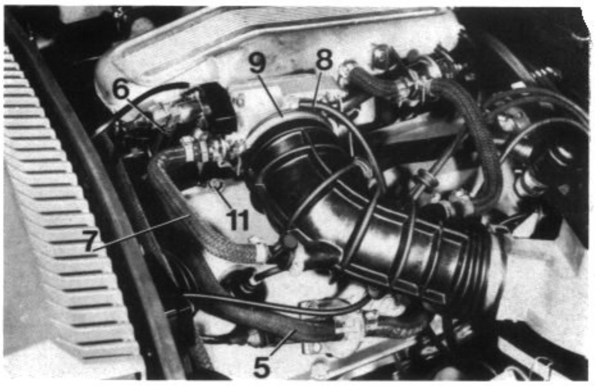
Note: when renewing the spark plugs reconnect wires according to firing order and make sure no one of plug wires is disconnected since this will seriously damage the catalytic converter.

Firing order: 1-4-2-5-3-6.

C 6 CHECKING AND ADJUSTING THE VALVE CLEARANCE

- Loosen the four retainers securing the air cleaner cover **10** and remove the cover.
- Disconnect the potentiometer connector **1** from the air flow sensor assy.
- Remove the oil decanter **2** from the cylinder head.
- Detach:
  - The air pipe **3** connecting the decel valve to the air flow sensor duct.
  - The pipe **4** from pressure regulator.
  - The two pipes and the wire from the auxiliary air device **5**
  - The pipe from the cold start valve **6**
  - The pipe **7** from the idle by-pass adjuster.
  - The two vacuum pipes **8** (upper and lower) from the throttle body.





— Loosen the strap **9** securing the air flow sensor duct and remove the duct.

— Take away the ignition distributor protective shells and remove distributor cap and the wire bundle as a unit.

— Loosen the two screws **11** and remove the ground cables.

— Remove the spark plugs.

— Loosen the screws and remove the valve covers.

— With a torque wrench and according to the sequence shown check that the tightening torque of cylinder head nuts is 8 kgm (78 Nm).

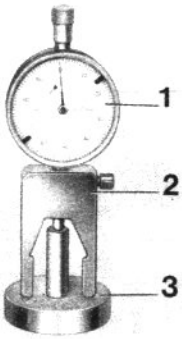
To check the intake valve clearance, proceed as the follows:

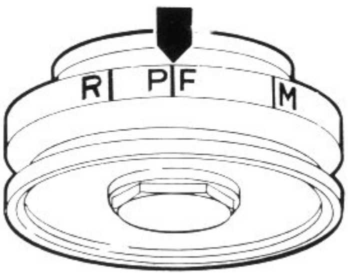
— Fit a dial gage 1 to the tool **2** (T. no. C.6. 0178); set the gage to zero with tool **3** (T. no. C.6. 0182);

- Rotate the crankshaft until it is possible to locate the tool **2** on the cam of the valve tobe adjusted.
- The intake valve clearance should be **0.475-0.500 mm** with engine cold.

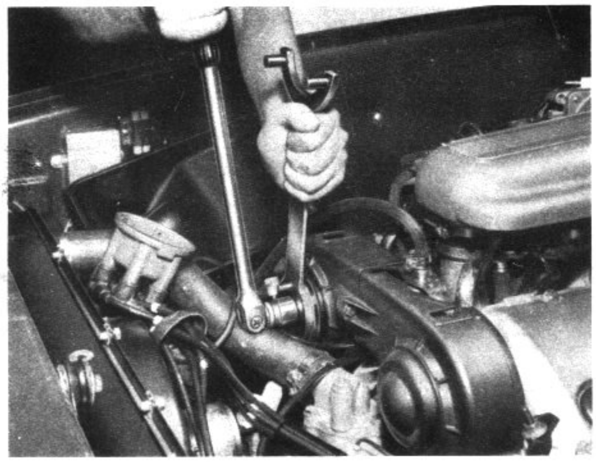
If the intake valve clearance requires adjustment, the following procedure should be complied with:

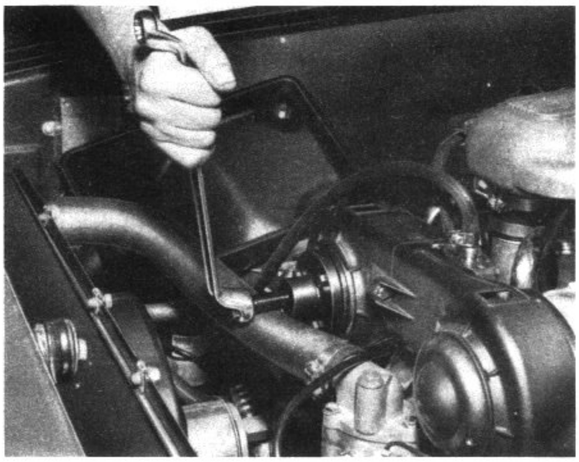
- Rotate the crankshaft until the mark P-F on engine pulley and the reference pin are aligned; as a consequence the markers on camshafts must be in line with the reference ones on the bearing caps.





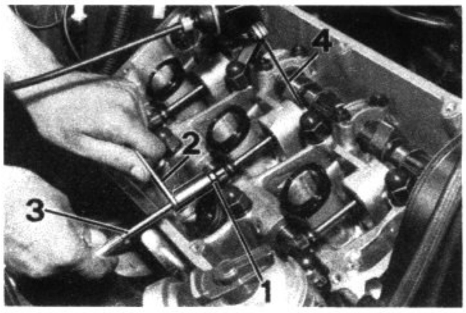
- Remove the covers from the plastic housing of the timing belt.
- With the aid of tool A.2.0361, for holding the camshaft stationary, and a suitable wrench, unscrew the nut securing the pulley to the camshaft.
- Loosen the three screws, fit tool A.3.0521 and remove the hub and the toothed pulley.



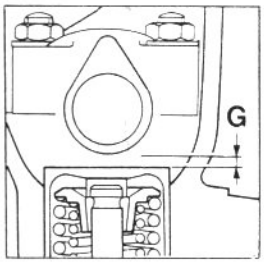


• Remove the camshaft bearing caps and take the camshaft away by raising it at the rear first.
• Withdraw the valve cups and collect the adjusting pads below them.
• Measure the thickness of the adjusting pads with the dial gage tool no. C.1.0108. Select pads from the pad set according to the difference established previously to restore the clearance to the specified value.
• Lubricate the valve cups with engine oil and refit them; re-install the camshaft and the bearing caps.
• Tighten the bearing cap nuts to a torque of 2-2.25 kgm (20-23 Nm) and again check the valve clearance.
• Re-install the pulley, the hub complete with the rubber ring and tighten the three screws.
• Screw in the nut securing the pulley to the camshaft; then, holding the pulley stationary with tool A.2.0361, torque the nut to 9.9-11.9 kgm (97-117 Nm). Securely tighten the three hub screws.

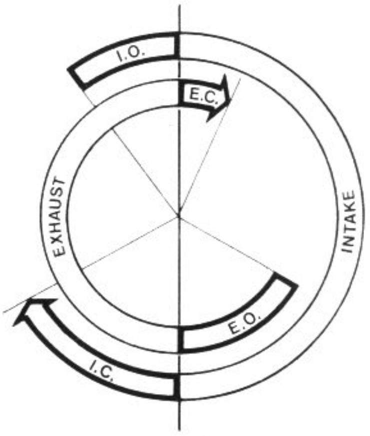
— To check and adjust the exhaust valve clearance use tool A.5.0220 and proceed as follows:
  • loosen nut 1 by rotating lever 2;
  • rotate wrench 3 until the specified clearance, as read with the feeler gage 4, is obtained. The specified exhaust valve clearance (engine cold) is **0.225-0.250 mm**
  • Tighten nut 1 and again check valve clearance.

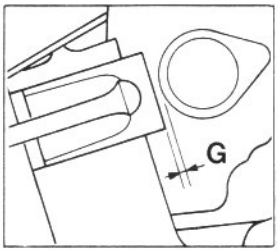


VALVE CLEARANCE AND VALVE TIMING DIAGRAM



Intake valve clearance
G = 0.475-0.500 mm





Exhaust valve clearance
G = 0.225-0.250 mm

I.O. = Intake opens 36° 50′ before T.D.C.
E.O. = Exhaust opens 59° 55′ before B.D.C.
I.C = Intake closes 60° 50′ after B.D.C.
E.C. = Exhaust closes 23° 55′ after T.D.C.

Induction stroke = 277° 40′
Exhaust stroke = 263° 50′

C 7 ADJUSTING THE IDLE SPEED

The idle adjustment must be performed with the engine at operating temperature, gearbox in neutral and all accessory equipment off.

— Loosen the idle by-pass adjuster locknut 1, turn the adjuster ring until engine speed is 800-1000 RPM; retighten locknut 1.

ADJUSTING CO% AT IDLE

The reading of values of carbon monoxide must be taken exclusively with NDIR instrumentation from the tap upstream of the catalytic converter.

— Disconnect the connector **2** of the lead from the lambda sensor 3.

— With tool A.5.0212, remove the screw at the exhaust gas tap; in its place fit the tool C.2.0051 (item 4) and connect it to the analyser; CO percentage should fall between **0.5-0.7 % (lambda sensor disconnected)**.

— If the CO percentage exceeds the above stated limit, reset the adjusting screw 5 (hidden by the seal 6) on the air flow sensor assy.

— Remove air flow sensor.

— Place unit in holding fixture (or vise) taking care not to warp or damage housing.

— Drill hole into idle adjustment aluminum plug but do not drill through completely as you will make damage to adjuster.

— Blow out chips with air.

— Insert tap suitable for hole drilled.

— Twist tap until sufficient thread bite is achieved.

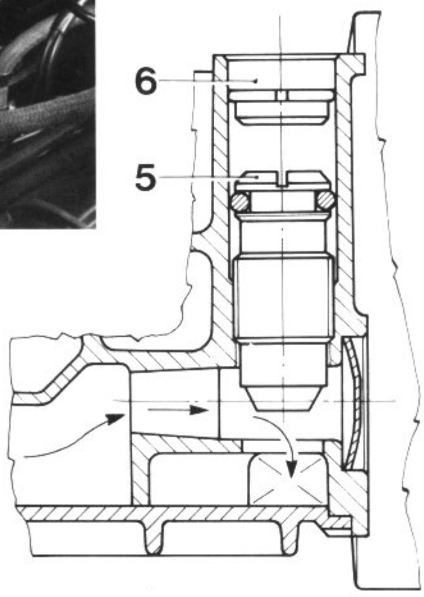
— Remove plug by pulling directly upward as if you were pulling a bottle cork.

— Adjuster screw is now accessible.

— Install air flow sensor on vehicle and make adjustment with engine running, after engine has reached normal operating temperature.

— Following adjustment reseal idle access hole by pressing in new plug seal.

Then, check whether the idle speed is 800-1000 RPM; if not, re-adjust as directed in the preceding paragraph.

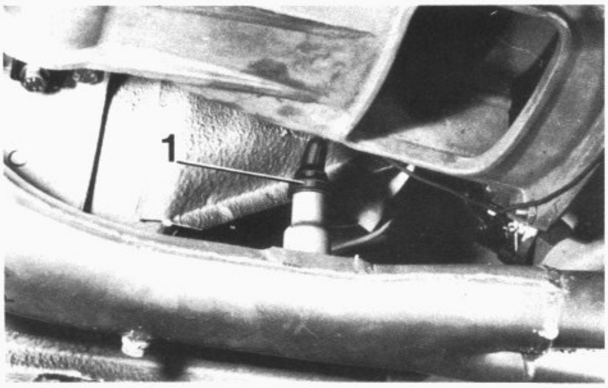


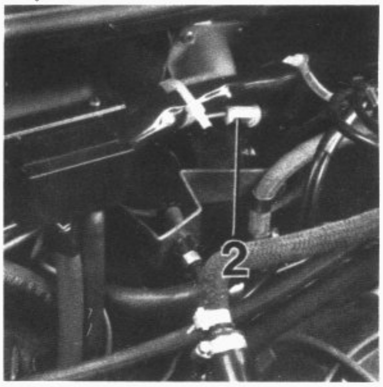
C 8 SUBSTITUTING THE LAMBDA SENSOR

— A continous red light on the dash board, bearing the word EXH. SENSOR, reminds that the vehicle has accumulated 30,000 miles and that the lambda sensor needs to the replaced. Proceed as follows:

- From inside the engine compartment, disconnect the lambda sensor lead connector 2.
- From the underside of car remove the rubber cap 1 then the metal cover; fully loosen the nut, withdraw the sensor from the exhaust pipe; remove the sensor and the relevant lead.
- Apply R. Gori Never Seez or Bosch 5.964.080.105 grease to the sensor mount threads; screw the sensor into its adapter and tighten securely.
- Fit the metal cover and the rubber cap to the sensor.
- Reconnect the connector **2** to the sensor lead.
- Once the substitution of the lambda sensor has been performed, it is needed to reset the counter by pushing the reset button **3** on the counter itself.

Location of mileage counter is at the right fender skirt under the dash board cowl. Remove the control unit cover panel and the passenger's parcel shelf by loosening the side screws.





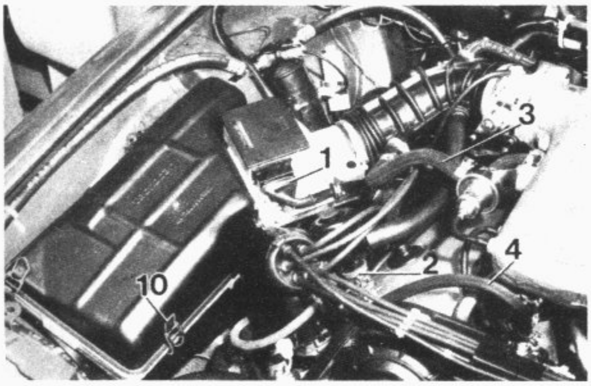
TEST CONCEPT FOR VEHICLES WITH LAMBDA CLOSED-LOOP CONTROL AND L-JETRONIC

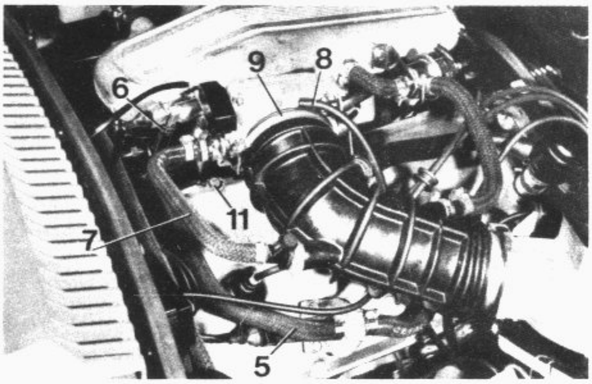
Test step	Result	If No
Connect CO tester at test fitting upstream of catalyst. Operate engine at idle speed (operating temperature)	Yes ↓	
Remove sensor wire from sensor (do not ground cables). Measure CO. Nominal value: 0.5 ... 0.7 % by vol.	Yes ↓ / No →	Adjust CO via bypass in air-flow sensor to 0,6 % by vol. After adjustment fit the plug (see C 7).
Take sensor cable (coming from control unit) to ground. Measure CO. Nominal value: CO rises (up to approx. 6 % by vol.)	Yes ↓ / No →	1. Check lead 24 to control unit for open circuit. 2. Control unit defective.
Take sensor cable away from ground. Measure CO. Nominal value: 0.5 ... 0.7 by vol.	Yes ↓ / No →	Control unit defective.
Re-connect sensor. Measure CO. Nominal value: 0.5 ... 0.7 % by vol.	Yes ↓ / No →	Sensor defective. Control unit defective
Disconnect air hose from pressure regulator and seal off bore to intake manifold. Measure CO. Nominal value: 0.5 ... 0.7 % by vol. No change.	Yes ↓ / No →	Sensor defective. Control unit defective
Re-attach air hose to pressure regulator. Set speed to approx. 2000 min^{-1} (without load) Measure CO. Nominal value: 0.5 ...0.7 % by vol. No change.	Yes ↓ / No →	Sensor defective. Control unit defective
Operate engine at idle speed again. Actuate full-load switch manually (close). Measure CO. Nominal value: Co rises (approx. 3 ... 5 % by vol.)	No →	1. Full-load switch defective 2. Check leads 18 and 3 for open circuit. 3. Control unit defective.

D DIAGNOSTIC PROCEDURES AND REPAIRS

D 1 RENEWING THE TIMING BELT

- Loosen the four retainers securing the air cleaner cover 10 and remove the cover.
- Disconnect the potentiometer connector 1 from the air flow sensor assy.
- Remove the oil decanter 2 from the cylinder head.
- Detach:
  - the air pipe 3 connecting decel valve to the air flow sensor duct;
  - the pipe 4 from pressure regulator;
  - the two pipes and the wire from the auxiliary air device 5;
  - the pipe from the cold start valve 6;
  - the pipe 7 from the idle by-pass adjuster;
  - the two pipes 8 (upper and lower) from the throttle body;
- Loosen the strap 9 securing the air flow sensor duct and remove the duct.
- Take away the ignition distributor protective shells and remove distributor cap and the wire bundle as a unit.
- Disconnect the 11 two ground cables by loosening the two screws at the valve covers.



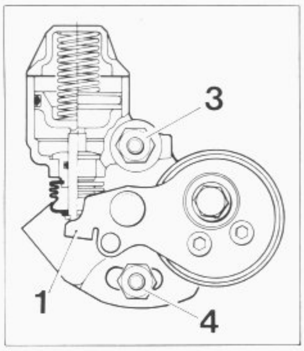


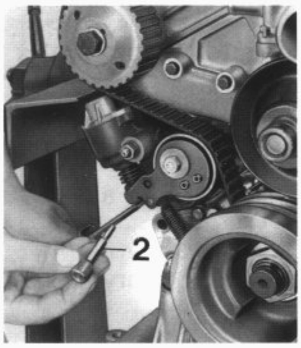
- Loosen the securing screws and remove the valve covers.
- Remove the compressor drive belt by loosening the tensioner securing screws.
- Remove the alternator drive belt by loosening the securing screw.
- Slacken the clips fastening the spark plug wires bundle and loosen the screws securing the timing belt cover; remove the cover.
- Remove the spark plugs so as to accomplish more easily the next steps.
- Rotate the camshaft pulley in normal direction of rotation until the mark PF lines up with the reference pin. In this condition the cylinder no. 1 piston should be at the TDC with both valves closed on compression stroke; to ascertain whether the above condition is met, remove the distributor cap and check that the rotor arm is pointing toward the reference notch on the edge of distributor body.

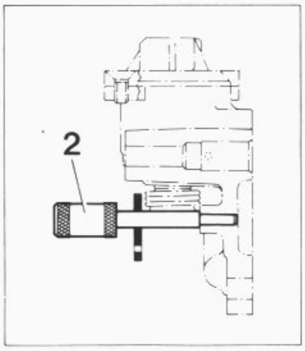
— Pry up the arm 1 of tensioner and hold it upward by inserting the locking pin 2 (tool no. A.2.0363) into the hole in the tensioner arm.

— Loosen the tensioner securing nut 3 and nut 4 then press the tensioner all the way downward and tighten nut 4.

— At this stage the driving belt can be taken off the pulleys.







D 2 FITTING THE TIMING BELT

— Prior to fit the belt to the pulleys, make certain the marks on the camshaft and those on the relevant bearing cap are aligned; this check should of course be performed on both banks; also check whether the rotor arm and the reference notch on edge of distributor body are in line.

CAUTION — While going through the following steps always keep a watchful eye on the above mentioned reference marks: they must stay aligned throughout the belt fitment sequence.

— Fit the belt to the pulleys in the following order taking care to maintain under tension the leading section of the belt:
1st crankshaft toothed pulley; 2nd right bank pulley; 3rd left bank pulley; 4th distributor drive pulley; 5th tensioner

— To tension the belt, loosen tensioner nut 4 and check whether the reference marks both at camshaft and at the distributor rotor arm are still aligned.

— Rotate the crankshaft pulley by two turns clockwise and stop turning as soon as the mark P-F on crankshaft pulley is in line with the reference pin.

— Hold the crankshaft pulley steady with a wrench and tighten the tensioner nuts 3 and 4. Recheck reference marks alignment.

— Pull up slightly the tensioner arm, remove the locking pin to free the tensioner arm.

— Again rotate the crankshaft pulley by two turns clockwise and stop when mark P-F and reference pin are aligned.

D 3 ADJUSTING THE TIMING BELT TENSION

— Remove the timing belt cover by loosening the screws securing the cover itself to the cylinder block and the screw holding together the two cover section.

— Pry up the tensioner arm **1**, then insert the locking pin **2** (tool no. A.2.0363) into the hole in the arm.

— Loosen nuts **3** and **4**, push the tensioner against the belt and tighten nuts **3** and **4**.

NOTE: Loosening nuts **3** and **4** should be enough to take up all belt sag; it is however advisable to push the tensioner against the belt as an aid in putting the belt under proper tension.

— Raise the tensioner arm and remove the locking pin to free the arm.

D 4 CHECKING AND ADJUSTING THE IGNITION TIMING

To check the ignition timing use a stroboscopic timing light and follow this procedure:

— warm the engine up to operating temperature;

— the engine must run at idling speed;

WARNING: a very accurate check of the timing at idle speed has to be performed since incorrect timing at idle greatly affects exhaust emissions.

— Connect a jumper across the timing light and the ignition distributor terminal for cylinder no. 1 spark plug; finally, connect the positive (+) and negative (—) leads of timing light to the relevant battery terminals.

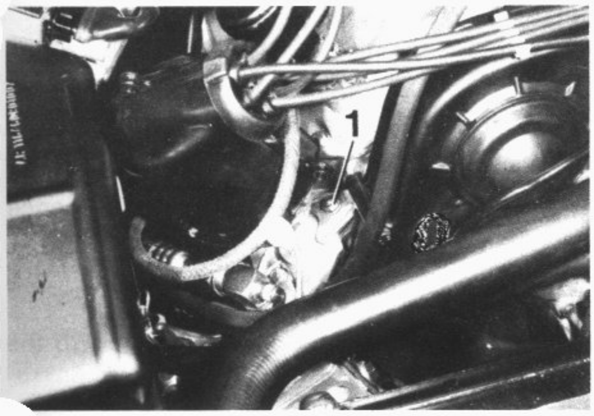
— Start the engine and check for the following:

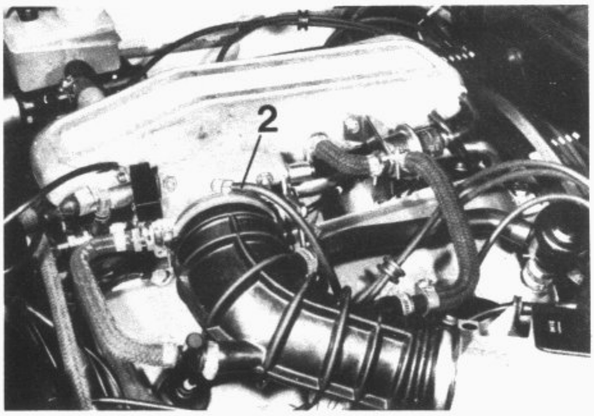
- with engine running at idle (800-1000 RPM), see whether the mark **R** (on crankshaft pulley) is in line with the reference pin (5° ± 1° ATDC) or apart from the pin by a distance not exceeding ± 2 mm (with vacuum hoses connected).
- with engine running at 5000 RPM and the vacuum pipe 2 (the upper one) disconnected, check whether the mark **M** is aligned with the reference pin (26°-29° BTDC) or apart from the pin of a distance not exceeding 3 mm.

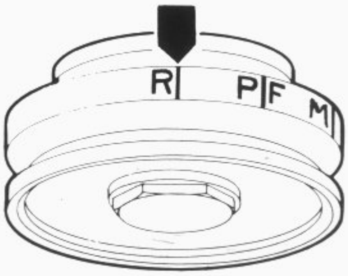
— If the timing requires adjustment, proceed as follows:

- unscrew the distributor securing nut **1** on the stud so as to allow the distributor to be rotated together with its supporting clamp;
- rotate the distributor body counter-clockwise or clockwise according to whether it is necessary to respectively advance or retard the ignition setting;
- retighten the nut, taking care not to move the distributor body;
- recheck timing.

— To inspect the vacuum retardation regulator for proper operation check whether engine RPMs rise as the vacuum connection pipe is disconnected.







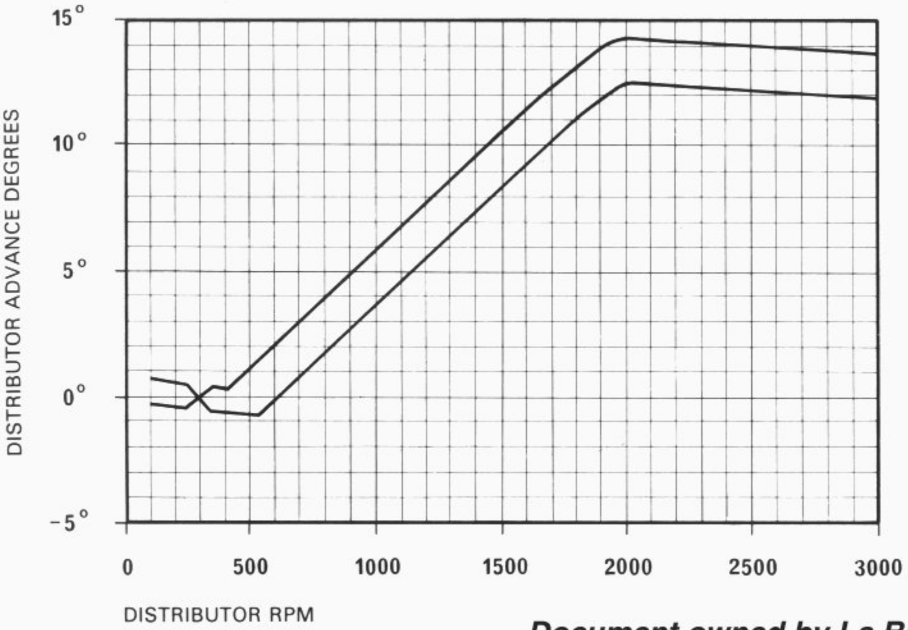
D 5 IGNITION DISTRIBUTOR

The breakerless, electronic ignition system features reliability and performance levels constantly higher than the conventional systems; furthermore, the need for regular inspection and maintenance operation is reduced to a minimum.

Occasionally, apply some drops of engine oil to the felt after having removed the cap and the rotor arm.

Inspect the cap for no sign of cracking or burning.

AUTOMATIC ADVANCE GRAPH

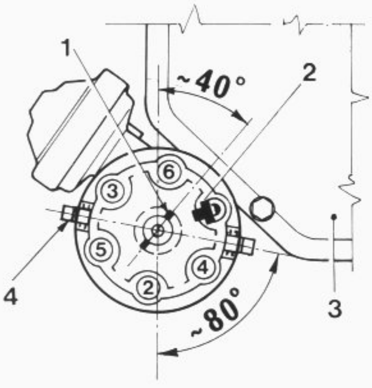


D 6 INSTALLING AND TIMING THE DISTRIBUTOR

To install the distributor, proceed as follows:

- Rotate the crankshaft to bring no. 1 cylinder piston to the compression stroke (both valves closed);
- By slightly rotating the crankshaft bring the mark PF on pulley into line with the reference pointer;
- Fit the distributor;
- Remove the distributor cap and rotate the drive shaft to bring the rotor arm in line with the contact for no. 1 cylinder;
- Refit the cap and adjust timing with a stroboscopic light.

1 Keying tooth
2 Rotor arm to 1st cylinder
3 R.H. cylinder head
4 Cap retaining clip

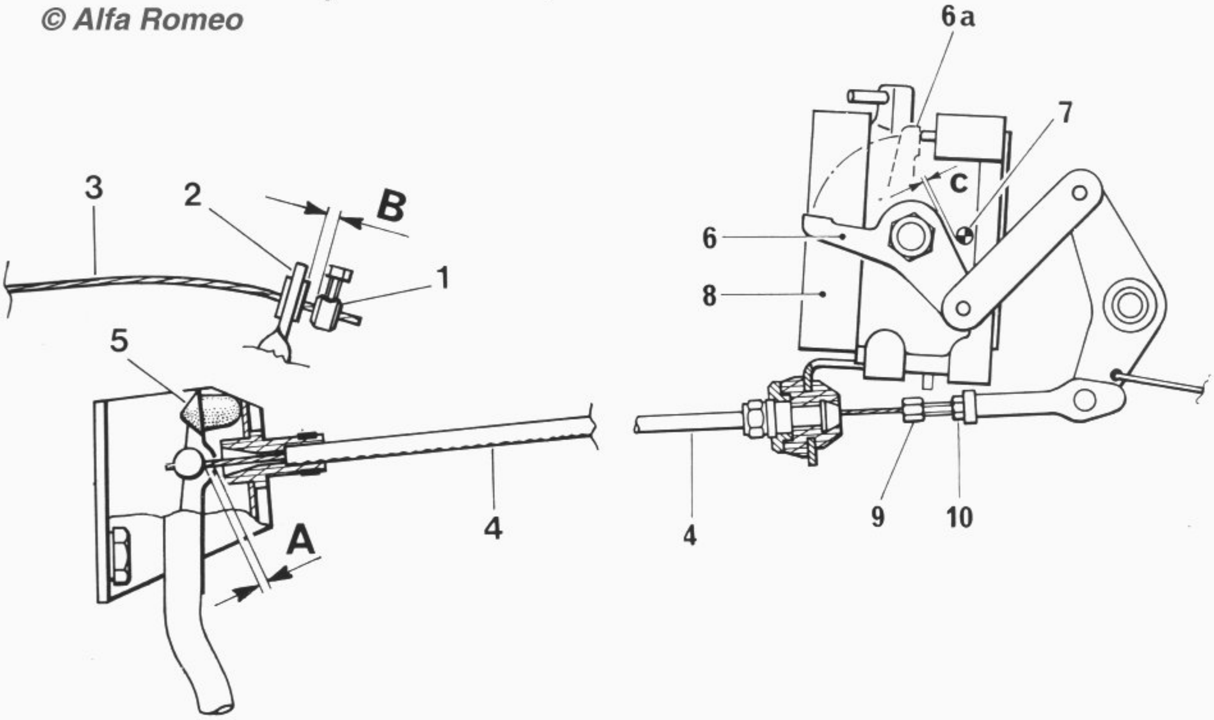


D 7 SETTING THE THROTTLE LINKAGE

Operate the lever **5** by hand to check whether the accelerator pedal free travel **A** is 1-2 mm and the throttle lever **6** does not stir from its **6a** position. If this condition is not met, loosen locknut **10**, re-set free travel **A** by adjusting nut **9** then retighten locknut **10.**

Fully depress the accelerator pedal to check whether the clearance **C** between the throttle lever **6** and the limit stop **7** is 0.5-1 mm.If not so, unscrew or screw in the stop beneath the accelerator pedal.

With the accelerator pedal and the hand throttle control in their inoperative positions, there should be a clearance **B** of 5-6 mm between cable clamp **1** and accelerator pedal link **2**. To adjust this clearance, loosen the setscrew of clamp **1** and change the position of clamp.

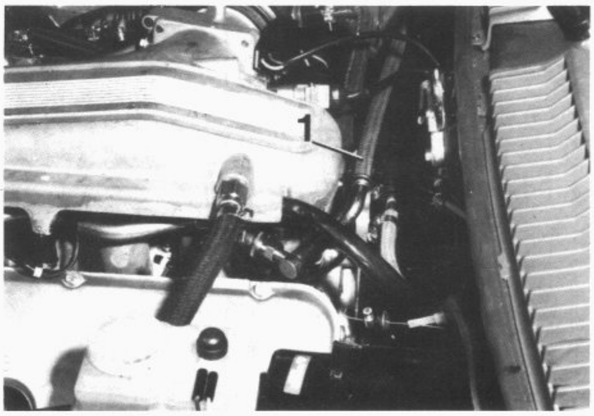


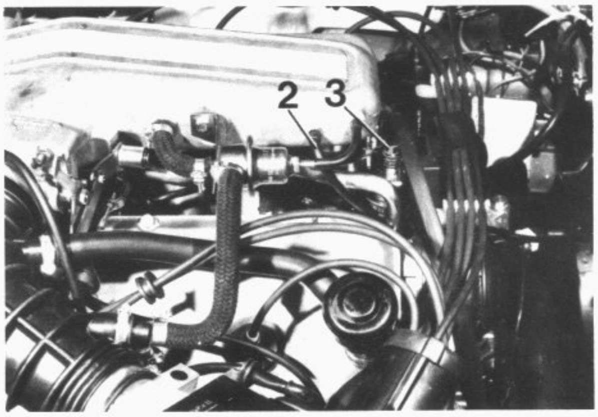
A — 1-2 mm
B — 5-6 mm
C — 0.5-1 mm
1 — Hand throttle cable clamp
2 — Accelerator pedal link
3 — Hand throttle cable
4 — Accelerator cable

5 — Pedal lever
6 — Throttle lever
7 — Limit stop
8 — Throttle body
9 — Adjusting nut
10 — Locknut

D 8 TESTING THE FUEL PRESSURE

- Disconnect the fuel ring inlet line 1; connect a pressure gage to a T-adapter; insert the T-adapter across the ends of inlet line previously disconnected.
- Detach the vacuum hose **2** connecting the fuel pressure regulator **3** to the intake manifold.
- Start the engine and, at idling speed, take a reading of the fuel pressure which should be 2.3-2.7 bar.
- Re-connect the vaccum hose to the intake manifold; at idle the fuel pressure must drop to abt. 0.5 bar and rise again on opening the throttle. If not, check the vacuum hose for possible leaks.



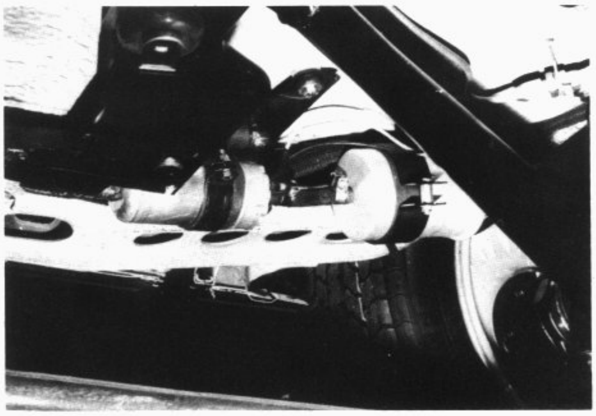


D 9 SUBSTITUTING THE FUEL FILTER AND THE FUEL PUMP

For substituting the fuel filter slacken, from the underside of car, the fuel inlet and outlet hoses and slacken the supporting clamp. On refitting the filter, make certain the arrow→on filter is pointing toward the direction of fuel delivery to the injectors.

For substituting the fuel pump, loosen the two electric connections, slacken the clips and disconnect the inlet and outlet lines; finally, slacken the supporting clamp.

On refitting the fuel pump, pay attention not to change the positive wire over with the negative wire.



D 10 RENEWING THE INJECTORS

To renew the injectors proceed as follows:

- unfasten the clip and remove the vacuum pipe **1** of brake booster from the intake manifold;
- disconnect ground strap from intake manifold to cylinder head;
- disconnect the vacuum hose **2** from pressure regulator at intake manifold;
- disconnect the pipe **3** from the decel valve;
- disconnect the throttle cable **4**;
- disconnect the two pipes (upper and lower) of the advance control from the throttle body **5**;
- loosen the strap **6** fastening the throttle body to the air flow sensor duct;
- remove the pipe **7** from the auxiliary air device;
- disconnect by-pass pipe **8** at idle adjusting nut;
- remove the connector **9** from the cold start valve and disconnect the fuel inlet pipe;
- remove the connector **10** from the full load switch;
- remove the six connectors from the injectors;
- unfasten the six clamps (upper ones) on the six intake throats;
- remove the intake manifold.

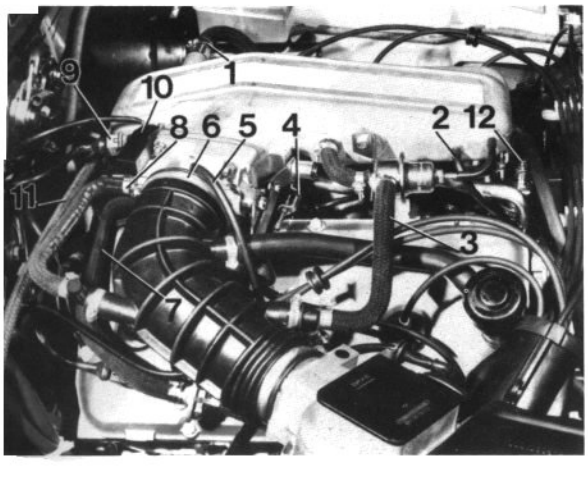
Disconnect the fuel inlet pipe **11** from the fuel ring and the fuel outlet pipe **12** from the pressure regulator.

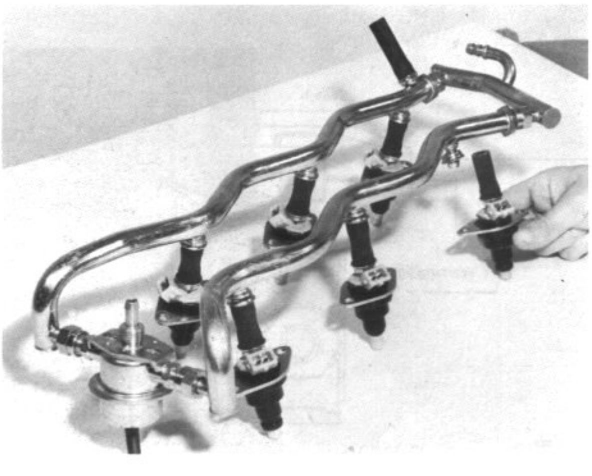
Loosen the twelve screws securing the injectors retainers.

- Remove the fuel ring complete with the injectors; let the fuel drain off from them.
- Cut the rubber pipe connecting the injector to the fuel ring; care should be taken not to damage the serrated adapter.
- Fit the retainer washer first, then the new injector complete with its rubber pipe onto the fuel ring adapter

WARNING — When installing the injector/rubber pipe assembly, make sure the electrical fitting is facing outward and slanting toward the pressure regulator.

Refit the components in reverse order of removal. Special attention should be paid for proper fitment of the sealing ring between injector and intake throat.





D 11 CHECKING THE AIR-FLOW SENSOR

In order to remove the air-flow sensor and check the floating flap for proper operation, release the four clips securing the air cleaner cover.

Unscrew the four fastening screws of the air-flow sensor from the inside of the top part of the air cleaner.

Deflect air-flow sensor flap completely (as far as it hits the limit stop).

Air-flow sensor flap must move freely with no sign of binding.

Remove dirt in the area of the air-flow sensor flap using a clean cloth free of lint.

After re-installation, test the concentration of CO in the exhaust gas and check the lambda sensor.

D 12 INSPECTING THE AIR-INTAKE DUCTING FOR LEAKS

In order to inspect the air-intake system for leaks, disconnect the duct downstream of the auxiliary-air device and blow thru with a compressed-air gun.

Open the throttle valve fully when doing this.

Using soapy water, brush or spray all sealing points.

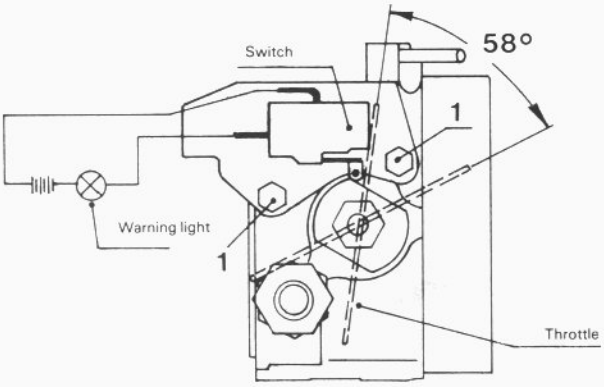
Bubbles or the formation of foam indicate a leak.

D 13 SETTING THE FULL-LOAD SWITCH

Connect a lamp across switch terminals.

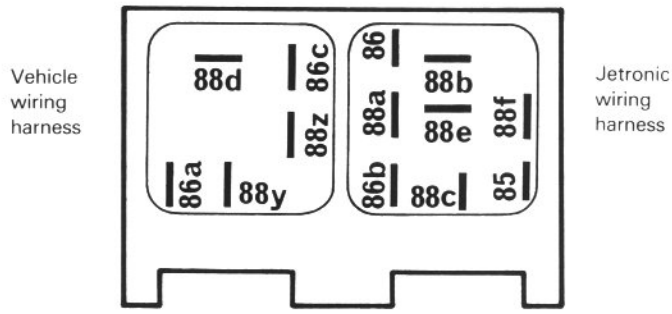
Turn the throttle spindle and check whether the contacts close (lamp light up) when the throttle is rotated by 58°. If this is not the case, loosen the two mounting screws (1) and rotate the switch.

To test the control unit efficiency connect together the full-load switch wires: the engine should turn at a slightly higher speed.



D 14 CHECKING THE RELAY SET

Check power supply to injectors switch on ignition. Using test lamp or voltmeter, measure voltage across term. 88z and ground as well as across term. 88b and ground

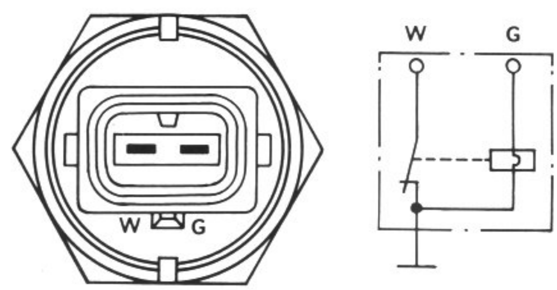


D 15 CHECKING THE THERMO-TIME SWITCH

The thermo time switch is so located as to sensing the coolant stream; the coolant must therefore be partially drained and collected during removal, of the switch. Check whether the resistance across switch terminals, with switch in-car and connector removed, falls within the limits stated below.

Resistance measurements across:

1. Term. "G" and ground (housing):
   below +30°C: 25 to 40 Ω
   above +40°C: 50 to 80 Ω
2. Term. "W" and ground (housing):
   below +30°C: 0 Ω
   above +40°C: 100 to 160 Ω
3. Term. "G" and term. "W"
   below +30°C: 25 to 40 Ω
   above +40°C: 50 to 80 Ω

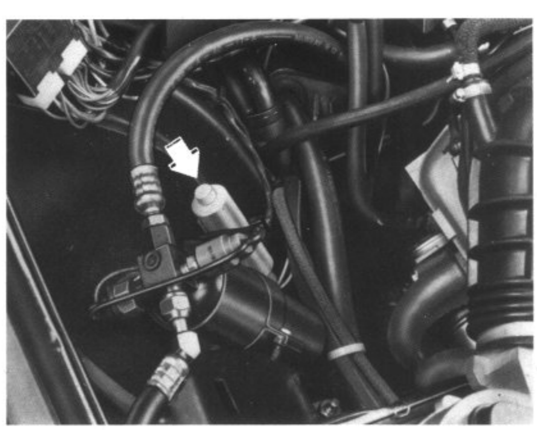


D 16 THE INERTIA SWITCH

The inertia switch is in the engine compartment, on the right.

Purpose of this switch is to cut off the current fed to the electrical fuel pump in the event of an impact.

Pushing the switch button re-starts the fuel pump.



D 17 CHECKING THE CATALYST OVERTEMPERATURE WARNING DEVICE

– The check of the warning device is indirect.

– The warning device must be replaced in these cases:

1. When the warning light stays off when the ignition key is turned on and only after having tried the following steps and getting negative results:
   – Check the electric circuit of the "EXH. TEMP." warning light and the bulb
   – Check the power supply at the monitor box
2. When, with cold catalytic converter, the warning light flashes with key in on position.
3. When, with cold catalytic converter, after replacing the fuse, the light stays on continuously with ignition key on, after checking that the thermocouple functions.

NOTE: The fuse for the warning device is special fuse of 0,1 amp rating and fuses of higher value must never be used.

Removal reinstallation of the monitor
Location of warning device is at the right fender skirt under the dashboard cowl.

Remove the control unit cover panel and the passenger's parcel shelf by loosening the side screws.

Disconnect the power wire.

Disconnect the terminals of the thermocouple.

Remove the clamping screw of the monitor.

Reconnect the thermocouple and the power wire of the monitor.

NOTE: The thermocouple must be connected before the power wire because the disconnecting of the thermocouple will cause rupture.

D 18 THERMOCOUPLE CHECK

Any checking of the thermocouple must be done after disconnecting the monitor.

– Disconnect a terminal of the thermocouple by loosening the screw on the warning device.

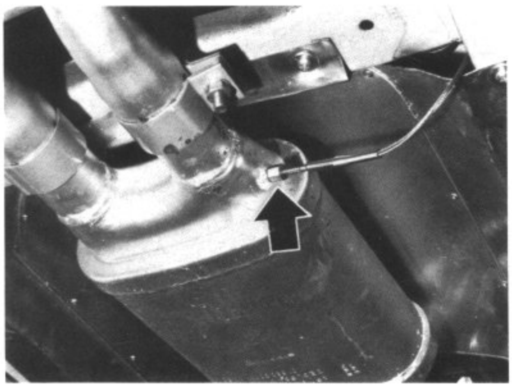
– Measure with a multimeter the resistance across the terminals of the thermocouple which should be:

$$R - 4.1 \begin{matrix} +\ 0.9 \\ -\ 0.3 \end{matrix} \text{ ohms}$$

– Measure the resistance of the insulation between each terminal and the braided metal sleeve; it should be:

$$Ri \geq 1 \text{ megohm } (1.000.000 \text{ ohms})$$

– R & R the thermocouple if any on the above steps give negative results.



Removal & reinstallation of thermocouple

— Disconnect the terminal of the thermocouple from the monitor.

— Slide out the terminals from the engine compartment.

— Loosen the connection on the catalytic converter and screw out the themocouple.

For the reinstallation, repeat the same operations, only on reverse.

NOTE — The terminals of the thermocouple has different dimensions in order to avoid reversing polarity of the connection which would damage the monitor. Do not try to install them by forcing them on the screws.

D 19 CHECKING THE CATALYTIC CONVERTER

The catalytic converter has been designed to have a life of 50,000 miles without maintenance. However, if the car has been driven with the EXH. TEMP. light on permanently, it is possible that the catalyst has been damaged. In this case, a control of the catalyst has to be made after eliminating the reason for the lighting of the EXH. TEMP. light. In particular check that the emissions at idle (read upstream) are within the limits prescribed.

Checking catalytic converter efficiency

The engine must be already stabilized at normal operating temperature.

— Run the engine in neutral at 2500-3000 RPMs for 2-3 minutes.

— Bring the engine to idle and after 30 seconds, check the HC which must be not more than 180 ppm.

If you can't meet the tailpipe to the above, replace the catalytic converter.

Removal and reinstallation of the catalytic converter.

Slide the thermocouple from the catalyst after loosening the fastening nut and after freening the hose from the clamp in proximity to the converter.

Remove the lambda sensor from the exhaust pipe.

Remove the exhaust pipe from the exhaust manifold.

Loosen and remove the two bolts 1 from the mounting pad bracket. Take away the front section of the exhaust pipe including the catalytic converter and fit the new one; remove the plug and re-fit the thermocouple.

Refit the lambda sensor.

D 20 FUEL EVAPORATIVE SYSTEM LEAKAGE DIAGNOSTIC PROCEDURE

Sympton

Fuel odor

Possible cause

Vapor leakages from systems connections, fittings or components.

Correction

Procedure "A"

1. disconnect the vapor vent line from the oil separator in the engine compartment and blank off the line end
2. Remove the check valve and fit a T-adapter; connect the check valve to one outlet of the T-adapter and the air-cylinder or compressed air to the other outlet of the adapter.
   To gain access to the check valve located under the trim panel of the backshelf, disconnect the strut from the hatch, then remove cushion and seat back from the rear seat.
3. Pressurize the system with compressed air source until the pressure is 10 inches water then close the line. If 10 inches water is not obtainable, open pressure supply line and probe system for leaks (HC analyzer or "Snoop" leak detector).
4. Measure the pressure drop in this system, it should not exceed 0.5 inches water within 10 minutes.
5. If the pressure drop exceedes 0.5 inches water within 10 minutes, check for leakages by covering the connections and fittings with Snoop" leak detector or soapy water.
6. Bubbles will appear where leaks exist.
7. If leakage is found around the fuel cap/filler neck area, first replace fuel cap. If now OK, cap was defective, if no change, replace filler neck.
8. Replace suspect defective components or secure accordingly in the case of loose clamps, etc.
9. Perform step 3 and 4 again to prove correct diagnosis.
10. If after following above procedure, there is still some question as to leakages, see "Fuel Injection System Supply Leakage Diagnostic Procedure".

Alternate procedure "B" - Perform with fuel tank 3/4 full or more

1. Disconnect the vapor vent line from the oil separator in the engine compartment and blank off the line end.
2. Remove the check valve and fit a T-adapter; connect the check valve to one outlet of the T-adapter and the air cylinder or compressed air to the other outlet of T-adapter.
   To gain access to the check valve located under the trim panel of the backshelf, disconnect the strut from the hatch, then remove cushion and seat back from the rear seat.
3. Pressurize the system by use of propane injection into the vapor vent line until the pressure is 10 inches water.
4. Check for propane leaks from the system connections, fittings and components by means of a HC sensor (probe) connected to a HC analyzer.
5. Repair leak by replacement (or secure accordingly in the case of loose clamps, etc.).
6. Perform steps 3 and 4 above to prove correct diagnosis.
7. If after following above procedure, there is still some question as to leakages, see "Fuel Injection System Supply Leakage Diagnostic Procedure".

D 21 FUEL INJECTION SYSTEM SUPPLY LEAKAGE DIAGNOSTIC PROCEDURE

Symptom

Fuel odor or visible signs of fuel leakage.

Possible cause

Fuel leakage from system connections, fittings, or components.

Precautions

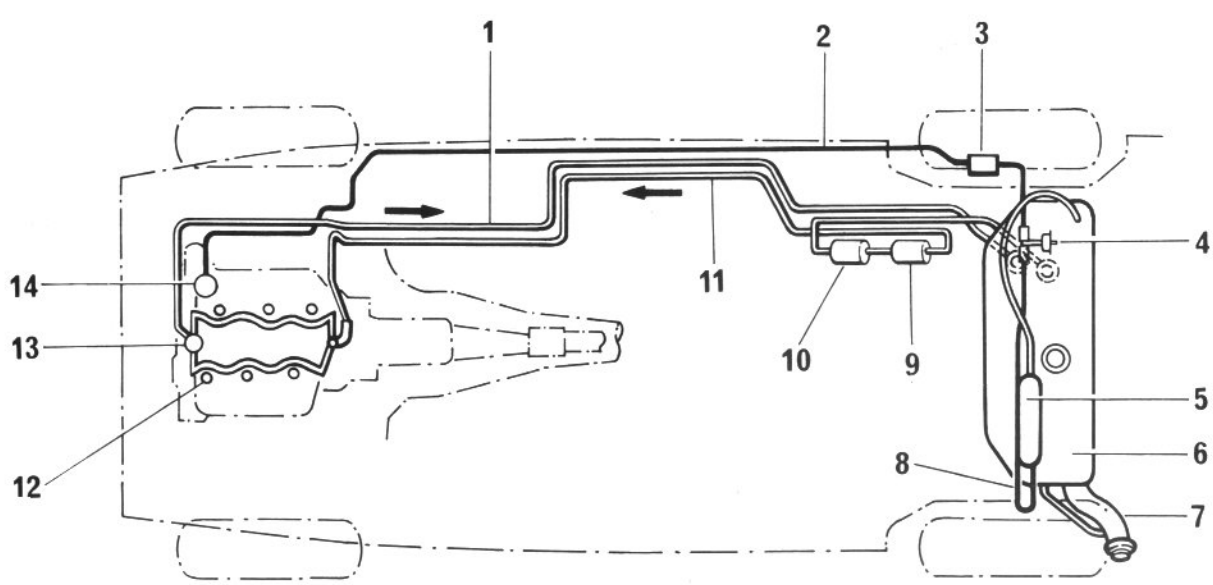
Have a fire extinguisher handy in the event of a fuel leak hazard - NO SMOKING!

Correction

1. Warm up engine to operating temperature.

2. Turn off ignition.
3. Visually inspect all fuel system components and connections for signs of leakage.
4. Using an exhaust analyzer (NDIR), probe the entire system including all components and connections.
5. The HC analyzer's needle will react when the probe is in the area of a fuel leak.

   NOTE: This check should be performed slowly to allow for instrument reaction time delays.
6. After locating source of leak by steps 4 and/or 5 above, correct the leak by component replacement or tightening in the case of loose clamps, hoses, etc.
7. After completing step 6, start engine and let it idle for a few minutes, then turn off ignition.
8. Repeat steps 3 and 4 above as a double check to verify diagnostics and repair.
9. After completion of steps 1 thru 8, a road test of at least 30 minutes should follow, repeated by a final check to insure system security.



1. Fuel-return line
2. Fuel vapor line
3. Check valve
4. Air inlet valve
5. Expansion tank
6. Fuel tank
7. Fuel filler
8. Fuel tank vent line
9. Fuel filter
10. Fuel pump
11. Fuel feed line
12. Injector
13. Fuel pressure regulator
14. Oil separator

D 22 RAPID DIAGNOSIS FOR L-JETRONIC

NOTE:

When using this throubleshooting chart it is assumed that the **engine** is in **proper working order**, that the **ignition** is **correctly adjusted** and that the **electrical system** has been **checked** and repaired, if necessary

TROUBLE

1. Engine does not start or starts only with difficulty
2. Engine starts and then cuts out again
3. Erratic idling
4. Poor thottle take-up
5. Combustion misses in all driving condition
6. Excessive fuel consumption
7. No peak output
8. CO concentration during idling too high
9. CO concentration during idling too low

1	2	3	4	5	6	7	8	9	CAUSE	REMEDY - TEST NOTES
●	●								Relay set defective	Check voltage supply
●									Electric fuel pump not operating	Check pump fuse. Voltage at relay set and electric fuel pump? If yes, replace electric fuel pump
●									Start valve not opening	Resistance approx. 4 Ω. Check spray discharge
●		●			●		●		Start valve leaking	Check for leaks under pressure
●									Thermo-time switch defective	Check switching point as per specification
●	●		●						Auxiliary-air device not opening	Visual inspection: Engine warm - device closed Engine cold - device open, electr. O.K.
		●							Auxiliary-air device not closing	Engine warm - device must be closed
●			●		●	●	●	●	Air-flow sensor defective	Check freedom of movement of air-flow sensor flap. Remove dirt
	●								Pump contact in air-flow sensor defective	Check resistance (between term. 36 and term. 39 ∝ Ω). Deflect air-flow sensor flap 0 Ω
●		●	●					●	Intake system leaking	Check intake manifold, bolted-on assemblies and all hose connections for leaks.
●		●			●	●		●	Fuel-injection valves defective	Check whether valves are pulsing by feeling.
●		●				●		●	Fuel pressure too low or zero	Check pressure, filter, fuel lines, pressure regulator
					●		●		Fuel pressure too high	Connecting hose, pressure regulator - intake manifold, plugged on? Fuel return line blocked or pinched, pressure regulator defective
●	●				●		●		Start control in control unit defective Start valve and thermo-time switch missing	Replace control unit
●	●				●		●		Temperature sensor II in engine defective	Measure resistance
		●							Throttle valve not closing	Stop throttle valve from jamming. Align throttle linkage. Then adjust throttle valve
						●			Throttle valve not opening fully	Set throttle linkage and accelerator cable to limit stop
				●					Bad central ground, loose contacts Defective plug-connection cables	Remedy fault
●	●	●	●	●	●	●	●	●	Break in wiring harness and plug-connection cables	Eliminate break
		●	●			●			Throttle-valve switch defective	Check adjustment. Check full-load and idle contacts
					●		●		CO exhaust gas setting too rich	Check idle and exhaust gas setting
		●						●	CO exhaust gas setting too lean	Check idle and exhaust gas setting
							●		Lambda sensor defective	See special test chart (pag. 20).
●	●	●	●	●	●	●			Control unit defective	Test using analogue tester

D 23 IMPORTANT GENERAL INFORMATION

Never start engine without the battery cables being connected tightly.

Do not use a fast charger for starting engine.

Never disconnect battery from vehicle electrical system with engine in operation.

Disconnect battery from vehicle electrical system when fast charging.

Prior to testing the L-Jetronic, it must be ensured that the ignition is in order, i.e. it must comply with specifications.

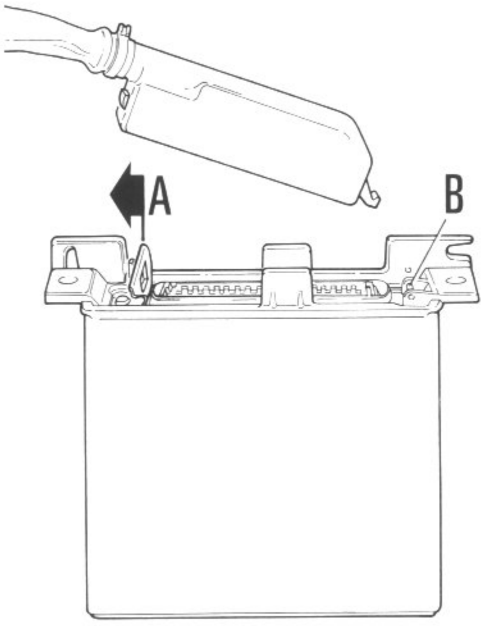
Remove control unit at temperatures above 80°C (drying stove).

Ensure that all wiring harness connectors and terminal 1 are correctly attached.

Never connect or disconnect wiring harness plug of control unit with ignition switched on.

When testing compression, open circuit the **red** power supply lead between battery and relay set by disconnecting the plug-connection cable. This ensures that the voltage supply to the L-Jetronic and therefore also to the fuel-injection valves is interrupted. Undesired injection is theraby avoided.

WARNING: Damage may result to catalytic converter if above precaution is not adhered to.

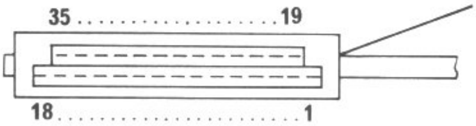


ATTENTION

To gain access to the electronic control unit, whose location is at the right fender skirt under the dashboard cowl, remove the control unit cover panel and the passanger's parcel shelf.

To disconnect the female connector from the electronic control unit, push the stop toward the direction of arrow **A**, withdraw the connector upward and release it from area **B**.

To link the connectors, engage them at area **B** and apply pressure at **A** paying attention not to demage the pins.



Top view plug.
Cable 1 is identified by an insulating sleeve.
Cable from control unit to ignition coil without connector plug.

E TROUBLESHOOTING PROCEDURE

The troubleshooting program is arranged in two columns: the left column contains the symptom of troubles; the right column states the test steps to be performed.

If the questions in the left column can be conclusively answered in the affirmative way without testing, proceed to the next symptom in the same column. On the other hand, should the stated trouble be suspected, the directions in the right column must be followed until the trouble is found.

When the sequence of directions in the right column is completed, troubleshooting is continued in the symptom column.

STARTER RUNS; ENGINE DOES NOT START OR STARTS ONLY WITH DIFFICULTY

Symptom (Yes ↓)	No →
Electrical connections O.K.?	Check electrical connections. Safety switch in luggage compartment must be closed.
Ignition O.K.?	Check battery voltage, ignition distributor, spark plugs, ignition coil, ignition point etc.
Connect analogue tester between control unit and Jetronic wiring harness. Test vehicle according to test chart.	If following electrical test, engine still does not start or only starts with difficulty, look for mechanical trouble: Compression, basic valve setting and engine oil pressure.
All hoses and line connections properly attached? (Visual inspection)	Check whether hoses of air-intake system and of fuel line system are correctly attached, not kinked or damaged. Eliminate defects.
Is fuel pump operating (listen)?	1. Disconnected pump plug. Start engine and check voltage and plug. If voltage = replace fuel pump. Disconnected pump plug. 2. Disconnected pump plug Start engine and check voltage at plug. No voltage! Check voltage at pump fuse no. 4 and relay set term 88 y and term. 88 d. No voltage? = replace pump fuse and/or relay set. Voltage present after fuse, pump does not operate - check safety switch and replace if necessary.
Fuel pressure O.K.? Test value 2.3-2.7 bar	Test value not reached: 1. Pinch off return line: Pressure rises above 4 bar = replace pressure regulator Pressure remains below 4 bar = replace fuel pump. 2. Check fuel line and filter for throughflow. 3. Strainer in tank blocked. 4. Corrosion in tank. Test value exceeded: 1. Fuel return line blocked or constricted. 2. Replace pressure regulator.
Start valve O.K.?	Check voltage supply to start valve. For this purpose, disconnect plug from start valve. Connect test lamp to term. 45 and term. 46 of start valve. Start engine. Test lamp must light up if coolant temperature below +30°C. Test lamp does not light up above +40°C. If not correct: check leads 45, 46 and 47 for continuity using test lamp. If O.K., see thermo-time switch. ↓ Yes
↓ Yes	

STARTER RUNS, ENGINE DOES NOT START OR STARTS ONLY WITH DIFFICULTY (continuation)

Yes

Perform electric check on start valve: resistance approx. 4 Ω.

Yes

Perform mechanical check on start valve:
Remove valve from intake manifold and hold in container
Disconnect lead 1 from ignition coil. Caution: fire hazard! During starting and at a temperature of below +30°C, valve must discharge spray (max. 20 s)
At above +40°C, valve must not discharge spray. valve must likewise not discharge spray with ignition switched on and pressure built up.
Conduct spray-discharge test above +40°C as follows:
Disconnect plug from thermo-time switch and connect terminal "W" to ground.

Yes

Thermo-time switch O.K.?

No

Check thermo-time switch. Disconnect plug and measure resistance directly at thermo-time switch.

1. Between terminal "G" and ground:
   below +30°C = 25-40 Ω
   above +40°C = 50-80 Ω
2. Between terminal "W" and ground:
   below +30°C = 0 Ω
   above +40°C = 100-160 Ω
3. Between term. "G" and term. "W":
   below +30°C = 25-40 Ω
   above +40°C = 50-80 Ω

If not correct: replace thermo-time switch.

Yes

Check leads from start valve term. 45, 46 and 47 for continuity (see "Wiring diagram L-Jetronic injection system").

Yes

Auxiliary air device machanically O.K.?

No

Visual inspection of auxiliary-air device (hoses disconnected):
When cold, device must be open. When engine is warm, it must be closed. If not, replace auxiliary-air device.

Yes

Air-flow sensor O.K.?

No

Remove air-flow sensor

1. Open air-flow sensor flap manually. It must be possible to open air- flow sensor flap with uniform ease as far as stop and flap must then close automatically as far as stop. Air-flow sensor flap must not catch during opening. Pay attention to chafe marks. Clean air-flow sensors which are severally soiled inside or replace.

2. Connect analogue tester and set test step 2.2 (pag. 47). Test value: when air-flow sensor flap is deflected, voltage must continuously drop from 7...8 V to approx. 1 V. If incorrect, remove air-flow sensor.

Yes

Temperature sensor II

No

Measure resistance directly at sensor using ohmmeter:
at −10°C = 7 ... 12 k Ω
+20°C = 2 ... 3 k Ω
+80°C = 250 ... 400 Ω

Yes

Intake system free of leaks?

No

Check intake manifold, bolted-on assemblies and all hose connections for leaks. Locate leaks using compressed air and soapy water.

ENGINE STARTS AND THEN CUTS OUT AGAIN

Check (Yes → next check)	No →
Ignition O.K.?	Ensure proper condition of battery voltage, ignition point, spark plugs, ignition coil, ignition distributor etc.
Testing with analogue tester. Connect analogue tester between control unit and Jetronic wiring harness. Test vehicle according to test chart, Test O.K.?	Look for mechanical trouble: Check compression, basic valve setting and engine oil pressure. Correct if necessary.
All hoses and line connections properly attached? (visual inspection).	Check whether hoses of air-intake system and of fuel line system are correctly attached, not kinked or damaged. Eliminate defects.
Does fuel pump operate (listen)?	1. Disconnected pump plug. Start engine and check voltage and plug If voltage = replace fuel pump. Disconnected pump plug. 2. Disconnected pump plug Start engine and check voltage at plug No voltage! Check voltage at pump fuse no. 4 and relay set term. 88 y and term. 88 d. No voltage? = replace pump fuse and/or relay set. Voltage present after fuse, pump does not operate - check safety switch and replace if necessary.
Fuel pressure O.K.? Test value 2.3-2.7 bar	Test value not reached: 1. Pinch off return line: Pressure rises above 4 bar = replace pressure regulator Pressure remains below 4 bar = replace fuel pump. 2. Check fuel line and filter for throughflow. 3. Screen in tank blocked 4. Corresion in tank Test value exceeded: 1. Fuel return line blocked or constricted 2. Replace pressure regulator.
Fuel pressure remains constant after starting?	Check fuel pump contact in air-flow sensor: Remove air-flow sensor. Discinnect plug from air-flow sensor and connect ohmmeter to term. 36 and term. 39 of air-flow sensor. Slightly open air-flow sensor flap manually. Reading must change from $\infty\ \Omega$ to $0\ \Omega$
Start valve O.K.? (Leaks)	Check start valve for leaks. For this purpose, pinch off fuel line using a hose clamper. Engine will not start. Replace start valve.
Intake system free of leaks?	Check intake manifold, bolted- assemblies and all hose connections for leaks. Locate leaks using compressed air and soapy water.

ERRATIC IDLING, ENGINE SPEED ADJUSTMENT (AT IDLE) AND EMISSION TEST

Note: All work on idling must be carried out with the engine at operating temperature, with transmission in neutral and the air conditioner switched off.

Ignition O.K.?
- No → Ensure proper condition of battery voltage, ignition point, spark plugs, ignition coil, ignition distributor etc.
- Yes ↓

Testing with analogue tester. Connect analogue tester between control unit and Jetronic wiring harness. Test vehicle according to test chart. Test O.K.?
- No → Look for mechanical trouble: check compression, basic valve setting and engine oil pressure. Correct if necessary.
- Yes ↓

Throttle valve closed?
- No → Set throttle valve to "hairs-breadth" clearance. Ascertain whether throttle valve can be closed further, causing a drop in engine speed. Eliminate any sticking of throttle valve. Straighten throttle linkage if bent. Readjust adjusting screw of throttle valve.
- Yes ↓

Adjust idling speed by means of idling screw. With engine at operating temperature 800...1000 rpm with transmission In neutral, air conditioner switched off. Test value not reached; erratic idling?
- No → Emission test using CO tester with engine at operating temperature: **max. 0.3...1.0** Vol.% before the catalyst and with **Lambda sensor connected**. Let engine run. When air conditioner is switched off. and on, idling speed must remain approx. constant.
  Test:
  Let warm engine idle with air conditioner switched off. Connect connection leads of solenoid-operated air valve to battery using test leads. Engine speed is increased by approx. 150 rpm. If engine speed does not change, replace solenoid-operated air valve.
- Yes ↓

All hoses and line connections properly attached? (visual inspection)
- No → Check whether hoses of air-intake system and of fuel line system are correctly attached, not kinked or damaged. Eliminate defects.
- Yes ↓

Auxiliary-air device mechanically O.K.?
- No → Visual inspection of auxiliary -air device (hoses disconnected): When cold, device must be open; when engine is warm, it must be closed. If not correct, replace auxiliary-air device.
- Yes ↓

Start valve O.K.? (Leaks)
- No → Check start valve for leaks. For this purpose, pinch of fuel line using a hose clamper. The engine will not start. Replace start valve.
- Yes ↓

Fuel-injection valves mechanically O.K.?
- No → With engine operating, disconnect valve plugs one after the other from injections valves. If injection valve is good, engine speed must drop noticeably.
- Yes ↓

ERRATING IDLING, ENGINE SPEED ADJUSTMENT (AT IDLE) AND EMISSION TEST (continuation)

Yes

Vacuum limiter O.K.?

No →

Pinch off connecting hose before or after vacuum limiter.
Change in speed?
If yes: replace vacuum limiter

If no:
Disconnect connecting hose before throttle valve and seal of connection on throttle valve. Rev up briefly. Speed approx. 3500 RPM. Stop revving and check with finger on vacuum hose whether air is being taken in.
No air-replace vacuum limiter.

Yes

Fuel pressure O.K.?
Test value 2.3-2.7 bar.

No →

Test value not reached:

1. Pinch off return line:
   Pressure rises above 4 bar = replace pressure regulator
   Pressure remains below 4 bar = replace fuel pump
2. Check fuel line and filter for throughflow.
3. Tank strainer blocked.
4. Corrosion in tank.

Test value exceeded:

1. Fuel return line blocked or constricted.
2. Replace pressure regulator.

Yes

Temperature sensor II O.K.?

No →

Measure resistance directly at sensor using ohmmeter:
at $-10°C = 7 \ldots 12\ k\Omega$
$+20°C = 2 \ldots 3\ k\Omega$
$+80°C = 250 \ldots 400\ \Omega$

Yes

Air-flow sensor O.K.?

No →

Remove air-flow sensor

1. Open air-flow sensor flap manually. It must be possible to open air-flow sensor flap with uniform ease as far as stop and flap must then close automatically as far as stop. Air-flow sensor flap must not catch during opening. Pay attention to chafe marks. Clean air-flow sensor which are severely soiled inside or replace.

2. Connect analogue tester and set test stop 2.2 (pag. 47)
   Test value: when air flow sensor flap is deflected, voltage must continuously drop from 7...8 V to approx. 1 V.
   If not correct replace air-flow sensor.

Yes

Emission test (repeat) using CO tester with engine at operating temperature max. 0.3...1.0% by volume O.K.?

No →

If CO concentration too high, turn bypass screw in air-flow sensor 1/2 revolution counterclockwise. Recheck engine speed and CO concentration. Make correction in several Lambda steps. Use new plug (see C7)
Check closed-loop control.

Yes

Intake system free of leaks?

No →

Check intake manifold, bolted-on assemblies and all hose connections for leaks. Locate leaks using compressed air and soapy water.

POOR THROTTLE TAKE–UP

Check	If No
Ignition O.K.?	Ensure proper condition of battery voltage, ignition point, spark plugs, ignition coil, ignition distributor etc.
Yes ↓	
Testing with analogue tester. Connect analogue tester between control unit and Jetronic wiring harness. Test vehicle according to test chart. Test O.K.?	Look for mechanical trouble: Check compression, basic valve setting and engine oil pressure. Correct if necessary.
Yes ↓	
All hoses and line connections properly attached (visual inspection).	Check whether hoses of air-intake system and of fuel line system are correctly attached, not kinked or damaged. Eliminate defects.
Yes ↓	
Auxiliary-air device mechanically O.K.?	Visual inspection of auxiliary-air device? When cold, device must be open. When engine is warm, it must be closed. If not, replace auxliary-air device.
Yes ↓	
Air-flow sensor O.K.?	Remove air-flow sensor 1. Open air-flow sensor flap manually. It must be possible to open air-flow sensor flap with uniform ease as far as stop and flap must then close automatically as far as stop. Air-flow sensor flap must not catch during opening. Pay attention to chafe marks. Clean air-flow sensors which are severely soiled inside or replace. 2. Connect analogue tester and set test step 2.2 (pag. 47). Test value: when air-flow sensor flap is deflected, voltage must continuously drop from 7...8 V to approx. 1 V. If not correct, replace air-flow sensor.
Yes ↓	
Temperature sensor II O.K.?	Measure resistance directly at sensor using ohmmeter: at $-10°C = 7 \ldots 12\ k\Omega$ $+20°C = 2 \ldots 3\ k\Omega$ $+80°C = 250 \ldots 400\ \Omega$
Yes ↓	
Intake system free of leaks?	Check intake manifold, bolted-on assemblies and all hose connections for leaks. Locate leaks using compressed sir and soapy water.

COMBUSTION MISSES IN ALL DRIVING CONDITIONS

Check (Yes → next check)	No
Ignition O.K.?	Ensure proper condition of battery voltage, ignition point, spark plugs, ignition coil, ignition distributor, loose contacts on safety switch etc.
Testing with analogue tester. Connect analogue tester between control unit and Jetronic wiring harness. Test vehicle according to test chart. Test O.K.?	Look for mechanical trouble: Check compression, basic valve setting and engine oil pressure. Correct if necessary.
Plug-in connections of Jetronic wiring harness O K.?	Check plug-in connections for proper attachment and corrosion. Check grounds leaks 5, 16, 17, 35 and 49 for continuity and loose contacts.
Voltage supply to fuel-injection system O.K.?	Disconnect both wiring harness plugs from relay set. Check whether all receptacles and leads are O.K. Check all connection leads for continuity while moving wiring harness. Suspected lead breaks. See also preçeding test step with analogue tester.
Start valve O.K.? (Leaks)	Pinch off fuel pressure hose before connection to start valve using a hose clamper. If missing ceases, replace start valve.
Aternator with regulator O.K.? (Combustion misses due to voltage peaks)	Disconnect plug from alternator with engine switched off. Start engine. If missing cases, check alternator and regulator.
Fuel quantity O.K.?	Measure fuel quantity: Disconnect fuel feed line at fuel ring main. (Junction at front). Attach extension hose and place open end in a 5 litres container with measuring scale. Disconnect air hose on air-flow sensor. Open air-flow sensor flap manually until pump operates. Measured value (after 1 minute of operation) 1.5...2.0 l/min.
Burbling during overrun? No burbling, O.K.?	If a decel valve is fitted: Pinch off connecting hose before or after vacuum limiter. Change is speed? If yes - replace vacuum limiter.
Air-flow sensor O.K.?	Remove air-flow sensor 1. Open air-flow sensor flap manually. It must be possible to open air-flow sensor flap with uniform ease as far as stop and flap must then close automatically as far as stop. Air-flow sensor flap must not catch during opening. Pay attention to chafe marks. Clean air-flow sensors which are severely soiled inside or replace. 2. Connect analogue tester and set test step 2.2 (pag. 47). Test value: when air-flow sensor flap is deflected, voltage must continuously drop from 7...8 V to approx. 1 V. If not, replace air-flow sensor.
Control unit O.K.?	Connect analogue tester. Let engine run. Tap control unit lightly and move multiple plug. Look for combustion misses. Repair plug-in connection on multiple plug or replace defective control unit.

EXCESSIVE FUEL CONSUMPTION – Town traffic?

Note: Are all brakes free?

Check (Yes → next check)	No
Ignition O.K.?	Ensure proper condition of battery voltage, ignition point, spark plugs, ignition coil, ignition distributor etc.
Testing with analogue tester. Connect analogue tester between control unit and Jetronic wiring harness. Test vehicle according to test chart. Test O.K.?	Look for mechanical trouble: Check compression, basic valve setting and engine oil pressure. Correct if necessary.
Fuel pressure O.K.? Test value 2.3-2.7 bar.	Test value not reached: 1. Pinch of return line: Pressure rises above 4 bar = replace pressure regulator Pressure remains below 4 bar = replace fuel pump 2. Check fuel lines and filter for throughflow. 3. Tank strainer blocked. 4. Corrosion in tank. Test value exceeded 1. Fuel return line blocked or constricted 2. Replace pressure regulator.
Fuel injection valves mechanically O.K.?	With engine running, disconnect valve plugs one after the other from injection valves. If injection valves is good, engine speed must drop noticeably.
Start valve O.K.? (Leaks)	Pinch of fuel pressure hose before connection to start valve using hose clamper. If missing ceases, replace start valve.
Air-flow sensor O.K.?	Remove air-flow sensor 1. Open air-flow sensor flap manually. It must be possible to open air-flow sensor flap with uniform ease as far as stop and flap must then close automatically as far as stop. Air-flow sensor flap must not catch during opening. Pay attention to chafe marks. Clean air-flow sensors which are severely soiled inside or replace. 2. Connect analogue tester and set test step 2.2. (pag. 47). Test value: when air-flow sensor flap is deflected, voltage must continuously drop from 7...8 V to approx. 1 V. If not, replace air-flow sensor.
Emission test using CO tester with engine at operating temperature max. 0.3...1.0 by volume O.K.?	If CO concentration too high, turn bypass screw in air-flow sensor 1/2 revolution counterclockwise. Recheck engine speed and CO concentration. Make corrections in several steps. Use new plug (see C7). Check Lambda closed-loop control.

NO PEAK OUTPUT. MAXIMUM SPEED NOT REACHED

Check	Result	Action
Ignition O.K.?	No	Ensure proper condition of battery voltage, ignition point, spark plugs, ignition coil, ignition distributor etc.
	Yes	↓
Testing with analogue tester. Connect analogue tester between control unit and Jetronic wiring harness test vehicle according to test chart. Test O.K.?	No	Look for mechanical trouble: Check compression, basic valve setting and engine oil pressure. Correct if necessary.
	Yes	↓
Does throttle valve open fully?	No	Throttle linkage, accelerator pedal O.K.? If necessary, straighten linkage, floor mat catching etc.
	Yes	↓
Full-load switch O.K.?	No	Accelerator pedal in rest position: Resistance between term. 3 and term. 18 on full-load switch ∞ Ω. Accelerator pedal fully depressed: Resistance between term. 3 and term. 18 on full-load switch 0 Ω. O.K? If not - replace full-load switch.
	Yes	↓
Fuel pressure O.K.? Test value 2.3-2.7 bar on chassis dinamometer at maximum power. Check pressure O.K.?	No	Test value not reached: 1. Pinch off return line: Pressure rises above 4 bar = replace pressure regulator Pressure remains below 4 bar = replace fuel pump 2. Check fuel line and filter for throughflow. 3. Tank strainer blocked. 4. Corrosion in tank Test value exceeded: 1. Fuel return line blocked or constricted 2. Replace pressure regulator.
	Yes	↓
All hoses and line connections correctly attached? (Visual inspection)	No	Check whether hoses of air-intake system and of fuel line system are corectly attached, not kinked or damaged. Eliminate defectes.
	Yes	↓
Fuel quantity O.K.?	No	Measure fuel quantity: Disconnect fuel feed line at fuel ring main (junction at front). If necessary, attach extension hose and place open end in a 5 l container with measuring scale. Remove air hose from air-flow sensor. Open air-flow sensor flap manually until pump operates. Measured value (after 1 minute of operation): 1.5...2.0 l/min.
	Yes	↓
Air-flow sensor O.K.?	No	Remove air-flow sensor 1. Open air-flow sensor flap manually. It must be possible to open air-flow sensor flap with uniform ease as far as stop and flap must then close automatically as far as stop. Air-flow sensor flap must not catch during opening. Pay attention to chafe marks. Clean air-flow sensors which are severely soiled inside or replace. 2. Connect analogue tester and set test step 2.2 (pag. 47). Test value: when air-flow sensor flap is deflected, voltage must continuously drop from 7...8 V to approx. 1 V. If not, replace air-flow sensor.
	Yes	↓
Intake system free Of leaks?	No	Check intake manifold, bolted-on assemblies and all hose connections for leaks. Locate leaks using compressed air and soapy water.

F TESTING THE BOSCH ELECTRONIC INJECTION SYSTEM

PROCEDURE WITH BOSCH TESTER (0.684.100.202)

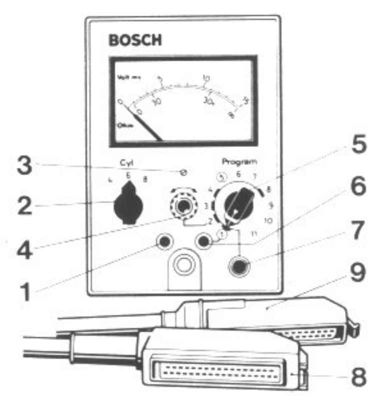
- Remove the shelf from under the instrument panel at right-hand side.
- Loosen the control unit securing screws and remove the control unit from the side panel.
- Connect the female connector of the Bosch tester to the control unit and the male connector to the car's wiring harness.
- Turn the cylinder selector switch to "6".
- Switch on the ignition; the red lamp on tester will come on.

NOTE: The red indicator lamp must stay lit throughout test procedure. The lamp goes off a trouble exists with voltage supply.

- The green lamp monitors the triggering of injection pulses (terminal 1).
  When starting motor is actuated this lamp stays on constantly.

Tester with analogue display

1 — Indicator lamp "red"
2 — Cylinder selector switch
3 — Mechanical zero adjustment
4 — Adjustment knob
5 — Rotary switch "program"
6 — Indicator lamp "green"
7 — Program button
8 — Connection to wiring harness
9 — Connection to control unit



TEST CHART

- Disconnect the connector of jetronic wire bundle of cars harness from the control unit and connect the tester across control unit and wire bundle. Great attention should be paid in disconnecting and connecting the connector's halves (see page 36).
- Ignition "on" for all test steps.
- Turn switch "cylinder" to position "6".

TEST STEP	OPERATION				INDICATION			TEST		TROUBLESHOOTING	
	Program switch position	Press program button	Actuate adjustment knob	Trigger function on vehicle	Instrument V, Ω, ms	Lamp red	Lamp green	Assemblies	Function	Malfunction	Checks and remedies
1.1	1				0. V			Gauging instrument in tester.	Tester mechanical zero-setting.	Pointer not indicating-zero.	Adjust the zero setting of tester's gauging instrument.
1.2	1				0. V	Lit	Lit	Relay set (main relay)	Voltage supply	Red lamp not lit up	Check lead from relay set term. 85 to multiple plug term. 28, from control unit term. 28 to control unit term. 16 as well as multiple plug term. 16 to ground terminal for a break using ohmmeter (nominal value 0 Ω). With ignition switched on, test voltage at relay set terms. 88 c, 88 z, 88 a, 88 e, 88 b, 88 f to multiple plug term. 10. Eliminate any lead breaks or contact resistances or replace relay set.
1.3	1			Disengage gear; actuate starting motor	8 ..... 15 V	Lit	Flickers	Starting motor term. 50 and relay set	Instrument: Voltage at control unit term. 4	No voltage indication	Voltage indication less than 8 V; battery insufficiently charged or large voltage drops. No voltage indication: test voltage when starting at relay set term. 86 a - relay set term. 86 - multiple plug term. 4. Look for break or replace relay set.
1.4	1			Disengage gear; actuate starting motor	8 ..... 15 V	Lit	Flickers	Lead from control unit term. 1 to ignition coil term. 1	Green lamp: Control unit triggering of ignition coil term. 1.	Green lamp does not flicker	Test lead 1 from ignition coil term. 1 to multiple plug term. 1 for a break.
1.5	1	Press			0. V	Lit	Lit	Relay set (pump relay), pump contact in air-flow sensor	Control unit term. 20 no voltage	Voltage indication	Disconnect air-flow sensor plug. Repeat test. Voltage indication: replace relay set, voltage indication 0 V: replace air-flow sensor (pump contact does not open).
1.6	1	Press		Disengage gear; actuate starting motor	8 ..... 15 V	Lit	Flickers	Relay set (pump relay)	Voltage at control unit term. 20	No voltage indication	Slightly open by hand the air-flow sensor floating flap then repeat the test step, if malfunction persists, remove the plug from air-flow sensor and open slightly the floating flap; the ohmmeter connected across term. 36 and term. 39, should indicate 0 Ω. If reading is correct, check for continuity the leads from relay set terms. 36 and 39 to the relevant terminals of air-flow sensor as well as from relay set term. 20 to the relevant one of multiple set.
1.7	1	Press		Disengage gear; actuate starting motor	8 ..... 15 V	Lit	Flickers	Lead from control unit term. 1 to ignition coil term. 1	Green lamp: Control unit triggering of ignition coil term. 1	Green lamp does not flicker	Check for continuity the lead from coil's trem. 1 to intermediate fitting then to term. 1 of control unit's multiple plug.

TEST STEP	OPERATION				INDICATION			TEST		TROUBLESHOOTING	
	Program switch position	Press program button	Actuate adjustment knob	Trigger function on vehicle	Instrument V Ω ms	Lamp red	Lamp green	Assemblies	Function	Malfunction	Checks and remedies
2.1	2		Set pointer to 15 V		15 V	Lit	Lit	Tester	Adjustment of indicating instrument to battery voltage.	Adjustment not possible	Tester defective.
2.2	2	Press			7.....8 V	Lit	Lit	Air-flow sensor	Potentiometer in air-flow sensor (air-flow sensor flap in off-position)	No indication or indication deviates from nominal value.	Check leads from air-flow sensor to multiple plug for break using ohmmeter: terminals 6, 7, 8 and 9 on both assemblies. Voltage drops at plug-in contacts. Replace or clean air-flow sensor and check air-flow sensor flap for freedom of movement.
3.1	3				70.....500 Ω	Lit	Lit	Relay set (pump relay) and ground connection	Resistance from control unit term. 20 to ground via pump relay coil	Resistance outside tolerance	Resistance between relay set term. 96 b and term. 85 = 70-500 Ω Replace relay set if necessary. Check following leads for breaks using ohmmeter: Multiple plug term. 20 to relay set term. 86 b, relay set term. 85 to multiple plug term. 28, multiple plug term. 16 to ground terminal.
3.2	3	Press			25.....60 Ω	Lit	Lit	Auxiliary-air device and fuel pump	Joint resistance of auxiliary-air device and fuel pump from control unit term. 34 to ground.	Resistance outside tolerance	Resistance between auxiliary-air device term. 34 and term. 48 approx. 35 Ω Resistance between relay set term. 88 d and ground: approx. 1 Ω In case of break, check ground lead and positive lead to pump. Check following connections for breaks using ohmmeter: Multiple plug term. 34 to auxiliary-air device term. 34, auxiliary-air device term. 48 to relay set term. 88 c, relay set term. 88 d (in case of break replace relay set). Test plug-in connection.

TEST STEP	OPERATION				INDICATION			TEST		TROUBLESHOOTING	
	Program switch position	Press program button	Actuate adjustment knob	Trigger function on vehicle	Instrument V, Ω, ms	Lamp red	Lamp green	Assemblies	Function	Malfunction	Checks and remedies
4.1	4				30Ω..30 k Ω (temperature dependent)	Lit	Lit	Temperature sensor II (engine)	Resistance from control unit term. 13 to central ground via temperature sensor II	Resistance outside tolerance	Measure resistance value directly at temperature sensor II (term. 13 and term. 49): at −10°C: 7...... 12 k Ω +20°C: 2...... 3 k Ω +80°C: 250......400 Ω Temperature sensor II. Check following leads for breaks using ohmmeter: multiple plug term. 13 to temperature sensor II term. 13; temperature sensor II term. 49 to ground terminal. Test plug-in connections.
4.2	4	Press			30Ω...30k Ω (temperature dependent)	Lit	Lit	Temperature sensor I (air) in air-flow sensor	Resistance from control unit term. 27 to central ground	Resistance outside tolerance	Measure resistance value directly at air-flow sensor term. 27 and term. 6: at −10°C: 7...... 12 k Ω +20°C: 2...... 3 k Ω +80°C: 250......400 Ω Temperature sensor I. Check following leads for breaks using ohmmeter: multiple plug term. 27 to air-flow sensor term. 27; air-flow sensor term. 6 to multiple plug term. 6.
5.3	5			Fully depress accelerator pedal	0 Ω	Lit	Lit	Full-load switch	Resitance from control unit term. 18 to term. 3 on full-load switch	No 0 Ω indication	Does throttle valve open fully? Check throttle linkage from accelerator pedal to throttle valve. Check plug-in connections. Direct resistance measurement at full-load switch between term. 18 and term. 3 (open throttle valve fully). Replace full-load switch if necessary. Check lead from multiple plug term. 3 to full-load switch term. 3 for a break. Check lead from multiple plug term. 18 to full-load switch term. 18 for a break.

TEST STEP	OPERATION				INDICATION			TEST		TROUBLESHOOTING	
	Program switch position	Press program button	Actuate adjustment knob	Trigger function on vehicle	Instrument V, Ω, ms	Lamp red	Lamp green	Assemblies	Function	Malfunction	Checks and remedies
6	6				3.90...5.70 ms	Lit	Lit		Starting fuel delivery		
7	7				[1] 3.40...4.80 ms	Lit	Lit		Post-start enrichment and warm-up		
8.1	8				2.80...4.10 ms	Lit	Lit		Basic adjustment I		
8.2	8	Press			[2] 4.05...5.70 ms	Lit	Lit	Control unit	Full-load correction	No indication or indication outside tolerance	1. Check the ground terminal and test for current supply to leads 5 and 49; check for loose contacts. 2. Check plug-in connections at multiple plug. 3. Faulty control unit.
9	9				[3] 1.35...2.30 ms	Lit	Lit		Basic adjustment II		
10	10				5.60...7.60 ms	Lit	Lit		Basic adjustment III		
11.1	11				[3] 4.20...5.85 ms	Lit	Lit		Lambda closed-loop control	Indication outside tolerance	See chapter "Test concept for vehicles with lambda closed-loop control and L-Jetronic"
11.2	11	Probe each injector manually and ascertain needle movement by feeling			[3] 4.20...5.85 ms	Lit	Lit	Injector	Needle movement	Needle movement connot be felt	1. Injection times properly set: injectors however fail to work (no needle movement). Check ground terminal and leads 16 and 17. Check lead from term. 29 to relay set term. 88 b; if this operates properly, replace the control unit (faulty final stage). 2. Replace the injector, if needle movement can now be felt the former injector is faulty, winding resistance: 2-3 Ω If no needle movement can be felt, check leads from multiple plug to relay set terms. 88 b, 88 e, 88 f. Check the connections.

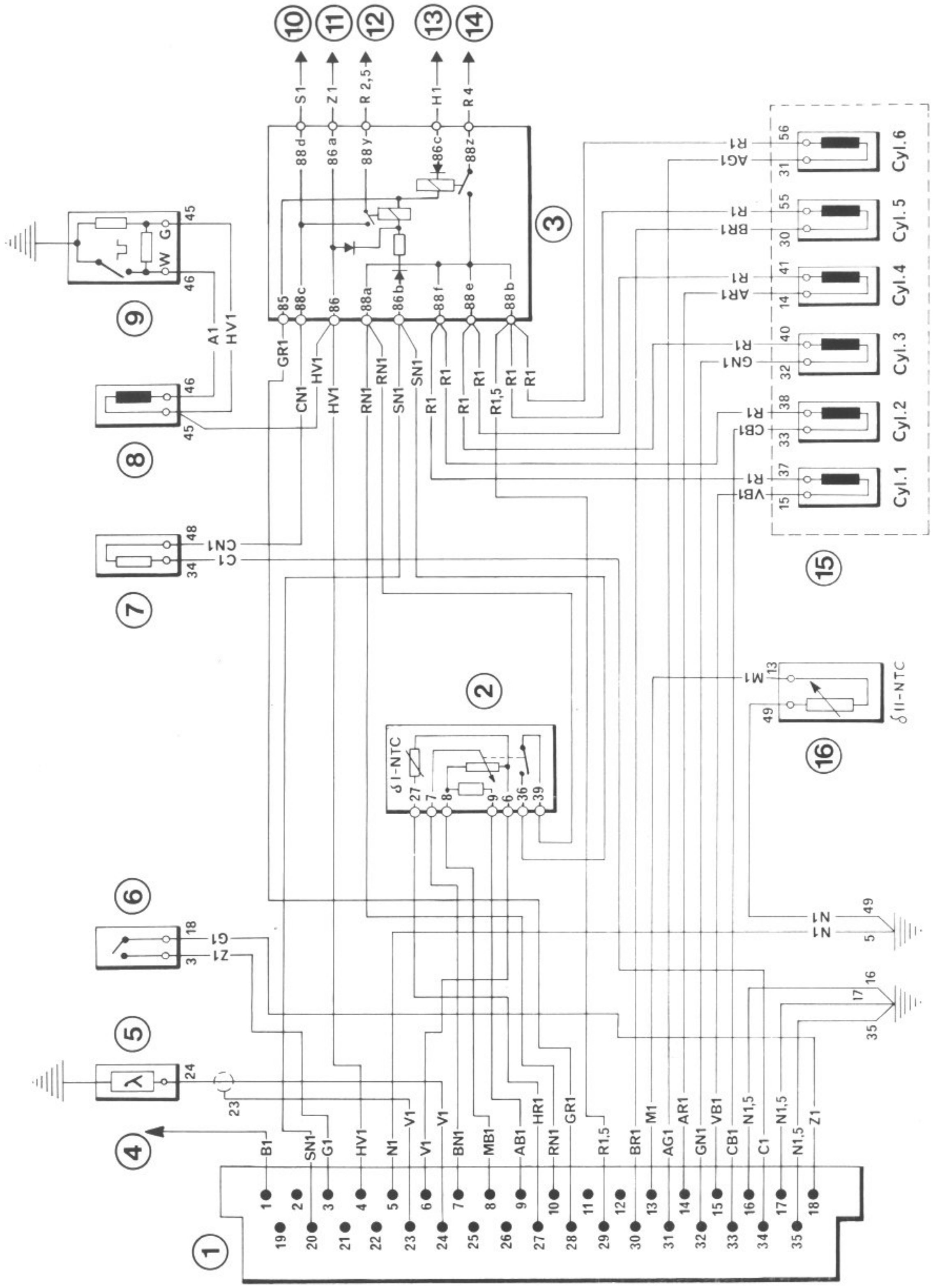
Note: When switching over from test steps 6-11 the pointer must be seen to move between the individual test steps.

1) When switching over to test step 7, the hight reading (post start enrichment) is regulated down to the warm-up value. The post-start enrichment can be used only as a functional test: high reading. The test value given here is the warm-up value after max. 30 seconds of regulation time.

2) The test value must rise after the program button has been pressed, i. e. test value of test step 8.2 is greater than test step 8.1.

3) Wait for pointer to settle.

G WIRING DIAGRAM: L-JETRONIC INJECTION SYSTEM



1 - Female connector to electronic control unit
2 - Air-flow sensor
3 - Relay set
4 - To terminal no. 1 of ignition coil
5 - Lambda sensor
6 - Full-load switch
7 - Auxiliary air-device
8 - Cold start valve
9 - Thermo-time switch
10 - To inertia switch
11 - To ignition switch connector
12 - To fuse no. 5 (outlet)
13 - To fuse no. 8 (inlet)
14 - To battery
15 - Injectors
16 - Coolant temperature sensor

Cable Color Code

A. blue
B. white
C. orange
G. yellow
H. grey
M. brown
N. black
R. red
S. pink
V. green
Z. purple

Alfa Romeo

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