D T A V
(TECHNICAL ASSISTANCE)

REPAIR MANUAL N°814

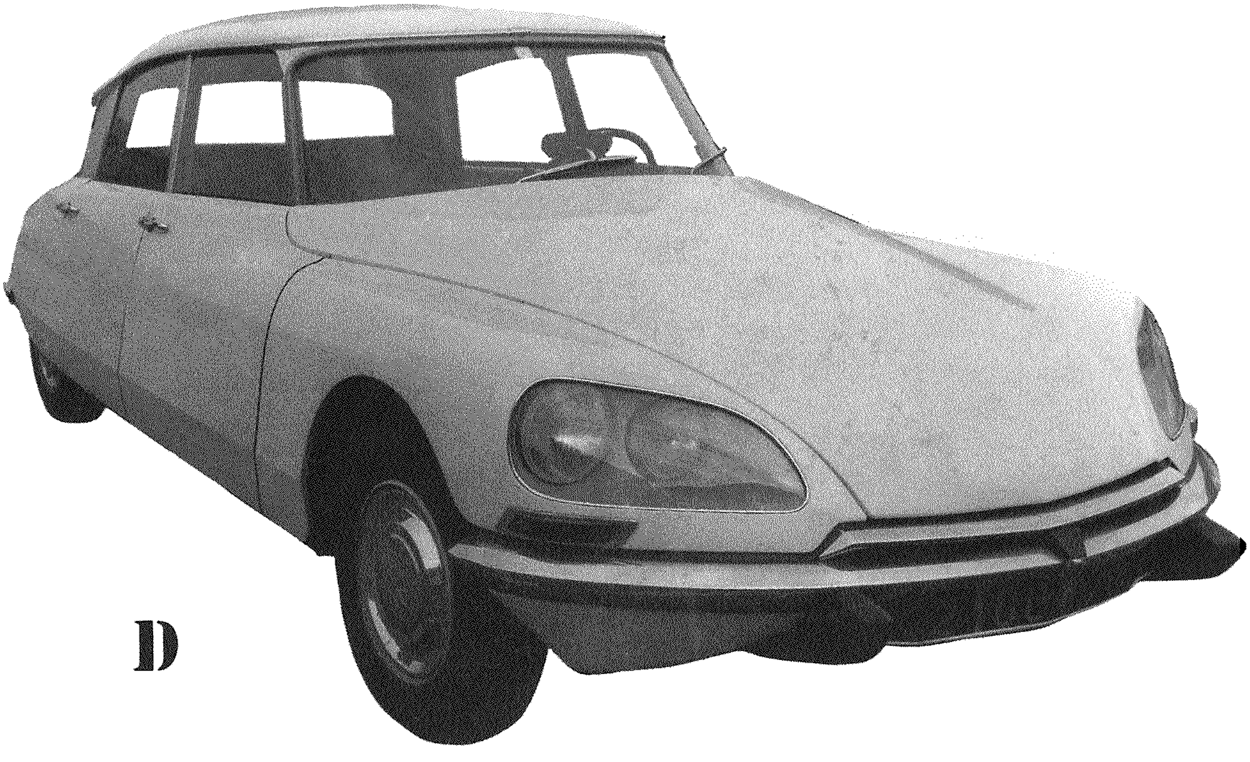
VOLUME I

MARCH 1974

D VEHICLE

(D vehicles all types produced
since september 1965)

CHARACTERISTICS
ADJUSTMENTS
CHECKS



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DTAV - (TECHNICAL ASSISTANCE) - 163, Av. Georges Clémenceau - 92000 NANTERRE FRANCE - Tél. 204-40-00 Extension 577 and 578
CITROËN CARS Ltd - SLOUGH - BUCKS - GREAT BRITAIN

USING THE MANUAL

PRESENTATION

To facilitate the use of the Manual we have arranged the repair operations into two volumes :

- Volume 1 contains :
- the CHARACTERISTICS - ADJUSTMENTS - CHECKS necessary at all repair workshops for adjustment or simple repairs.

- Volume II contains the operations of:
- DISMANTLING and ASSEMBLING.
- RECONDITIONING.
- ELECTRICAL SYSTEM - HEATING - AIR CONDITIONING.
- BODYWORK.

Each volume is sold separately and it is presented in a red Fibrex with a " MULTO " type clasp to facilitate adding amendments or taking out an operation needed by the repair workshop.

COMPOSITION

Each volume contains :

- a list of the operations appearing in the volume.
- the operations arranged in numerical order
- a list of all the tools mentioned in the operations and drawings for making the special tools that are not sold but that can be made by the repairer himself.

OPERATIONS

The operation sequence has been compiled to ensure the best quality of work in the shortest possible time,

The numbers of the operations are composed of :

a) letters indicating the vehicle :

- "D" concerns operations on D of all types (DTT)
- "D h" concerns operations on vehicles equipped with hylaudric gear-change
- "D m" concerns operations on vehicles equipped with a manual gear-change
- "DbW" concerns operations on vehicles equipped with automatic gear-change (DBW)
- "D.I.E." concerns operations on vehicles equipped with Electronic Fuel Injection
  (D.I.E. -operations are printed on pink paper).
- "DX" "DY" "DV" "DT", etc... concern operations on these types of vehicles only.

b) a number with three figures indicating the unit or unit component.

c) a figure indicating the nature of the section.
- figures 0 0 0 indicate the characteristics of the vehicle
- figures 0 0 indicate the characteristics of the unit
- figure 0 indicate checks and adjustment
- figures 1 4 7 indicate the removal and fitting
- figures 2 5 8 indicate stripping down and reassembly
- figures 3 6 9 indicate reconditioning

The arrows corresponding to the operation list marks allow the required operation to be found quickly.

TOOLS

Special tools are indicated in the text by a number followed by the letter T.
These tools are sold by :
- Etablissements FENWICK Department AMA 24 Bd. Biron - 93404 St Ouen FRANCE

Additional tools are indicated in the text by a number preceded by the letters MR.
The drawings for making these tools, arranged in numerical order, occur at the end of each volume.

TIGHTENING TORQUES

These torques are expressed in :
- Metre-Newtons (m Λ N) , the legal in France
- Metre-Kilogramme (mkg), since most torsion-spanners in current use are so graduated

1 mkg = 9.81 m Λ N exactly

The figures quoted are “rounded off”, taking 1 mkg at 10m Λ N, thus :

2 m Λ N is taken to equal 0.2 mkg (1.4 ft. lbs)
60 m Λ N is taken to equal 6 mkg (43 ft. lbs)

- Foot pounds (ft. lbs) converted at 7.22 ft. lbs = 1 mkg, and rounded off to practical figures.

Important . When a tightening torque figure is followed by the words “torsion spanner”, the operation must **of necessity** be carried out with a torsion spanner.

ADVISORY SERVICE

For all technical information concerning these vehicles, please contact :

- The Service Department,
Citroen Cars Limited,
SLOUGH - BUCKS - GREAT - BRITAIN

or :

- Département Technique Après-Vente
Assistance technique
163, Avenue G. Clémenceau
92000 NANTERRE - FRANCE

LIST OF OPERATIONS SHOWN IN VOLUME N° 1 OF MANUAL 814

Vehicles **D** *«all types», except IE*

Operation Number	DESCRIPTION
	CHARACTERISTICS ①
D.000	General characteristics (general dimensions, various capacities)
D.01	Protection of the electrical units
D.02	Work on the hydraulic system (precautions)
D.03	Ingredients recommended
	ENGINE - CARBURATION - IGNITION ②
D.100-00	Engine characteristics
D.112-0	Adjusting the valve rocker clearances
D.133-0	Adjusting the engine mountings (engine removed)
D.142-00	Characteristics and particular features of carburettors
D.142-0	Adjusting the carburettors and controls - Basic adjustments *(vehicles with hydraulic gearchange)* - Idling adjustment *(vehicles with manual gearchange)* - Accelerator control adjustment
Dbw. 142-0	Idling adjustment *(Borg Warner)*
D.173-0	Checking and adjusting the petrol pump - Adjusting the output - Checking the pressure - Checking for leaks
D.210-00	Characteristics and particular features of the ignition (distributors, sparking plugs, coils)
D.210-0	Checking and adjusting the ignition - Adjusting the initial static setting - Principle of the method for measuring advance with a stroboscopic lamp - Adjusting the ignition setting by stroboscopic lamp - Adjusting the ignition setting by stroboscopic lamp with dephaser - Test-bench check of a distributor - Cleaning and adjusting the sparking plugs - Checking a coil
D.220-0	Checking the oil pressure on the vehicle
D.230-0	Checking the cooling system (thermostat)
D.236-0	Adjustments of pulleys and belts - Alignment of the pulleys - Belt tensions
D. 312-00	Characteristics and control of clutch →| 10/1972
D 312-00 a	Characteristics and control of clutch |→ 10/1972
Dh.314-0	Checks and adjustments on clutch control *(vehicles with hydraulic gearchange)* - Checking for leaks in the clutch cylinder - Bleeding the centrifugal regulator - Checking clutch disengagement - Checking the clutch engagement pressure - Checking the pressure supplied by the hydraulic selector
Dm.314-0	Checking and adjusting the clutch control *(vehicles with manual gearchange)* - Simple pedal gear →| 9/1968 - Pedal gear with over-centre spring |→ *9/1968*
Dbw.320-00	Characteristics and particular points of torque converter

LIST OF OPERATIONS SHOWN IN VOLUME N° 1 OF MANUAL 814

Vehicles D « all types »

Operation Number	DESCRIPTION
	GEARBOX ④
D.330-00	Characteristics and particular features of the gearbox.
Dh.334-0	Checking and adjusting the gear control *(Vehicles with hydraulic gearchange)* - Adjusting the gear engagement stroke - Checking a clutch re-engagement lock - Adjusting a clutch re-engagement lock
Dm.334-0	Checking and adjusting the gear control *(Vehicles with manual gearchange)* - Adjusting the fourth gear engagement stroke
D.340-00	Characteristics and particular features of the five-speed gearbox
D.344-0	Checking and adjusting the gear control *(five-speed gearbox, see operation Dm.334-0)*
Dbw.350-00	Characteristics and particular points of automatic gearbox
Dbw.354-00	Principles of hydraulically controlled gearchange on automatic gearbox
Dbw.354-0	Checking and adjusting the gearchange control - Adjusting the brake bands - Adjusting the «kick-down» cable - Adjusting the selector - Adjusting switches of starter motor and reversing lights - Road checks - Checking the pressure of the oil in the gearchange control circuit.
	TRANSMISSION ⑤
D.372-00	Characteristics and particular features of the drive-shafts
D.372-0	Checking and adjusting the drive-shafts - Adjusting the end float of the cross-heads
	SOURCE AND RESERVE OF PRESSURE ⑥
D.390-00	Characteristics and particular features of the source and reserve of pressure
D.V 390-0	Checking the hydraulic units on the vehicles *(Vehicles DV.DT)*
D.391-0	Checking a suspension sphere
	FRONT AXLE ⑦
D.410-00	Characteristics and particular features of the front axle
D.410-0	Checking and adjusting the front axle - Adjusting the camber - Adjusting the wheel alignment
	REAR AXLE ⑧
D.420-00	Characteristics and particular features of the rear axle
	SUSPENSION ⑨
D.430-00	Characteristics and particular features of the suspension
D.430-0	Checking and adjusting the suspension and its controls - Initial setting of car heights - Adjusting the car heights - Adjusting the front anti-roll bar - Adjusting the manual height control
	STEERING ⑩
D.440-00	Characteristics and particular features of the steering (power-steering and manual steering).
D.440-0	Checking and adjusting the steering - Adjusting the lateral position of the steering - Adjusting the steering lock - Adjusting the angular position Power-steering - Adjusting the straight-ahead steering - Adjusting the crossover pressure
D.445-0	Adjusting the straight ahead steering position on power-steering

Manual 814-1

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LIST OF OPERATIONS SHOWN IN VOLUME N° 1 OF MANUAL 814

Vehicles « D » All types, except IE

Operation Number	DESCRIPTION
	BRAKES ⑪
D.450-00	Characteristics and particular features of the brake system
D.451-0	Checking and adjusting the brake units
D.453-0	Checking and adjusting the brake control - Bleeding the circuits - Pedal gear control *(All types except DV.DT)* - Control by metering valve *(DV.DT)*
D.454-0	Checking and adjusting the parking brake
	ELECTRICAL SYSTEM ⑫
DX.510-00	Arrangement of the electrical system *(DX.DJ ⟼ 9/1965 ⇥ 9/1966)*
DY.510-00	Arrangement of the electrical system *(DY-DL-DE ⟼ 9/1965 ⇥ 9/1966)*
DX.510-00 a	Arrangement of the electrical system *(DX-DJ-DY-DL ⟼ 9/1966 ⇥ 9/1967)*
DV.510-00 a	Arrangement of the electrical system *(DV ⟼ 9/1966 ⇥ 9/1967)*
DX.510-00 b	Arrangement of the electrical system *(DX-DJ-DY-DL ⟼ 9/1967 ⇥ 12/1967)*
DV.510-00 b	Arrangement of the electrical system *(DV ⟼ 9/1967 ⇥ 12/1967)*
DX.510-00 c	Arrangement of the electrical system *(All types) ⟼ 12/1967 ⇥ 10/1968)*
DX.510-00 d	Arrangement of the electrical system *(DX-DJ ⟼ 10 1968 ⇥ 1/1969)*
DY.510-00 d	Arrangement of the electrical system *(DY-DL-DV-DT ⟼ 9/1968 ⇥ 1/1969)*
DX.510-00 e	Arrangement of the electrical system *(DX-DJ ⟼ 1/1969 ⇥ 9/1969)*
DY.510-00 e	Arrangement of the electrical system *(DX-DL ⟼ 1/1969 ⇥ 9/1969)*
DX.510-00 f	Arrangement of the electrical system *(All types ⟼ 9/1969)*
Dm.510-00	Arrangement of the electrical system *(DJ-DT-DV ⟼ 4/1971)*
Dm.510-00 a	Arrangement of the electrical system *(Manual gearchange ⟼ 9/1971)*
Dh.510-00 a	Arrangement of the electrical system *(Hydraulic gearchange ⟼ 9/1971)*
Dbw.510-00	Arrangement of the electrical system *(Borg Warner)*
D.513-00	Electrical system of air conditioning
D.530-0	Characteristics and checks of electrical units (dynamo, alternator, regulator, starter motor) - Checking an alternator - Checking a regulator - Adjusting starter motor control pinion
D.540-0	Adjustments of headlamps and controls *(All types) ⟼ 9/1967* - Self-levelling control - Directional control
DX.540-0	Adjustments of headlamps and controls *(DX-DJ) ⇥ 9/1967*
DY.540-0	Adjustments of headlamps (fixed) - All types except *DX-DJ ⇥ 9/1967* - All types *⟼ 9/1967*
D.560-0	Checking and adjusting the windscreen wipers.
D.640-00	Characteristics and particular points of air conditioning system
D.640-0	Checking and adjusting the air conditioning system - Filling the air conditioning circuit
	BODYWORK ⑬
D.800-00	Interior dimensions
D.800-02	Adjustments on body panels
D.840-0	Adjusting the doors
D.852-0	Adjusting the bonnet (locking and unlocking)
D.961-0	Checking and repairing of the heated rear window
	TOOLS ⑭
	List of special tools appearing in this volume. Drawings for marking tools recommended for repairs.

NOTE : Electrical system : re-arrange in your manual, the operations « 510-00 » so as to place them in the order shown.

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⑫ ▶
⑬ ▶
⑭ ▶

LIST OF OPERATIONS SHOWN IN VOLUME N° 1 OF MANUAL 814

DS 21 vehicles with Electronic Fuel Injection (DX.IE and DJ.IE)

The operations for this type of vehicle alone have been covered.

For operations that do not appear on the list below, refer to the list of operations relating to "D" vehicles all types.

Operation Numbers	DESCRIPTION
	CHARACTERISTICS ①
D. IE-000	**General characteristics - (See Op. D. 000)**
	ENGINE - FUEL-SUPPLY - IGNITION ②
D.IE-100-00	Engine characteristics
D.IE-112-0	Adjusting the valve rocker clearances
Dh.IE-142-0	Basic adjustments *(vehicles with hydraulic gearchange)*
Dm.IE-142-0	Adjusting the idling *(vehicles with manual gearchange)*
Dbw.IE-142-0	Idling adjustment *(bw.IE vehicles)*
D.IE-144-00	Characteristics of the electronic fuel injection device
D.IE-144-0	Checking the electronic fuel injection device *(Citroen Tester 1494)*
D.IE-144-0 a	Checking the electronic fuel injection device *(Bosch Tester EFAW 228-S-11)*
D.IE-173-00	Checking and adjusting the ignition
D.IE-210-0	Characteristics of fuel supply - Adjusting the distributor at initial setting - Checking a distributor on test-bench - Adjustment of ignition setting with stroboscopic lamp. - Adjustment of ignition setting with stroboscopic lamp with dephaser - Cleaning and adjusting the sparking plugs } See Op. D.-210-0 - Checking a coil
	CLUTCH ③
D. IE-312-00	Characteristics and checks on the clutch. →| *10/1972* Characteristics and checks on the clutch |→ *10/1972* (See Op. D. 312-00 a)
	SUSPENSION ⑨
D. IE-430-00	Characteristics and particular features of the suspension
	ELECTRICAL SYSTEM ⑫
DX.IE-510-00	Arrangement of the electrical installation *(see Op. DX. 510-00 f)*
DJ.IE-510-00	Arrangement of the electrical installation *(DJ.IE |→ 4/1971 (see Op. Dm 510-00)*
D.IE-511-00	Arrangement of the electrical installation of the electronic fuel injection device *D.IE All Types →| 3/1970*
D.IE 511-00 a	Arrangement of the electrical installation of the electronic fuel injection device *D.IE All Types |→ 3/1970 →| 4/1971*
DX.IE-511-00	Arrangement of the electrical installation of the electronic fuel injection device *DX.IE |→ 4/1971*
DJ.IE-511-00	Arrangement of the electrical installation of the electronic fuel injection device *DJ.IE |→ 4/1971*

① ② ③ ⑨ ⑫

1. GENERAL CHARACTERISTICS

General Symbols	Official Symbols	Commercial Symbols	Introduced	ENGINE		Gearbox ratios	Fiscal rating (french)
				TYPE - BRAKE HORSEPOWER - TORQUE	Cubic capacity Bore - Stroke		
DX	DS 21	DS 21 Hydraulic	↦ 10/1965 ⇥ 10/1972	DX ⇥ 10/1968 100 CV DIN AT 5500 RPM 16.7 MKG (121 FT LBS) AT 3000 RPM (DIN) DX 2 (21 N) ↦ 10/1968 106 CV DIN AT 5500 RPM 17 MKG (123 FT LBS) AT 3500 RPM (DIN)	2.175 cc 90 × 85,5 mm	4 gears	12 CV
	DS 21	DS 21 Automatic	↦ 10/1971 ⇥ 10/1972	DX 2 (21 N) 106 CV DIN AT 5500 RPM 17 MKG (123 FT LBS) AT 3500 RPM (DIN)	2.175 cc 90 × 85,5 mm	3 gears	12 CV
	DS 23 Serie FE	DS 23 Hydraulic	↦ 10/1972	DX 4 (19 N) 115 CV DIN AT 5500 RPM 18,5 MKG (133 FT LBS) HT 3500 RPM (DIN)	2.350 cc 93,5 × 85,5 mm	4 gears	13 CV
	DS 23 Serie FE	DS 23 Automatic	↦ 10/1972	DX 4 (19 N) 115 CV DIN AT 5500 RPM 18,5 MKG (133 FT LBS) AT 3500 RPM (DIN)	2.350 cc 93,5 × 85,5 mm	3 gears	13 CV
	DS Serie FA	DS 21 Electronic injection Hydraulic	↦ 10/1969 ⇥ 10/1972	DX 3 (12 N) 125 CV DIN AT 5250 RPM 18,7 MKG (135 FT LBS) AT 2500 RPM (DIN)	2.175 cc 90 × 85,5 mm	4 gears	12 CV
	DS Serie FA	DS 21 Electronic injection Hydraulic	↦ 10/1971 ⇥ 10/1972	DX 3 (12 N) 125 CV DIN AT 5250 RPM 18,7 MKG (135 FT LBS) AT 2500 RPM (DIN)	2.175 cc 90 × 85,5 mm	3 gears	12 CV
	DS 23 Serie FG	DS 23 Electronic injection Hydraulic	↦ 10/1972	DX 5 (29 N) 130 CV DIN AT 5250 RPM 19,9 MKG (144 FT LBS) AT 2500 RPM (DIN)	2.350 cc 93,5 × 85,5 mm	4 gears	13 CV
	DS 23 Serie FG	DS 23 Electronic injection Automatic	↦ 10/1972	DX 5 (29 N) 130 CV DIN AT 5250 RPM 19.9 MKG (144 FT LBS) AT 2500 RPM (DIN)	2.350 cc 93,5 × 85,5 mm	3 gears	13 CV
	ID 21 Serie FH	Break 21 Hydraulic	↦ 2/1968 ⇥ 10/1972	DX 2 (21 N) 106 CV DIN AT 5500 RPM 17 MKG (123 FT LBS) AT 3500 RPM (DIN)	2.175 cc 90 × 85,5 mm	5 gears	12 CV
	DS Serie FF	Break 23 Hydraulic	↦ 10/1972	DX 4 (19 N) 115 CV DIN AT 5500 RPM 18.5 MKG (133 FT LBS) AT 3500 RPM (DIN)	2.350 cc 93,5 × 85,5 mm	5 gears	13 CV
DJ	DS 21 Serie M	DS 21 Mechanical	↦ 10/1965 ⇥ 10/1972	DX ⇥ 10/1968 100 CV DIN AT 5500 RPM 16.7 MKG (121 FT LBS) AT 3000 RPM (DIN) DX 2 (21 N) ↦ 10/1968 106 CV DIN AT 5500 RPM 17 MKG (123 FT LBS) AT 3000 RPM (DIN)	2.175 cc 90 × 85,5 mm	⇥ 10/1970 4 gears ↦ 10/1970 5 gears	12 CV
	DS Serie FB	DS 21 Electronic injection Mechanical	↦ 10/1969 ⇥ 10/1972	DX 3 (12 N) 125 CV DIN AT 5500 RPM 18.7 MKG (135 FT LBS) AT 2500 RPM (DIN)	2.175 cc 90 × 85,5 mm	⇥ 10/1970 4 gears ↦ 10/1970 5 gears	12 CV
	DS Serie FE	DS 23 Mechanical	↦ 10/1972	DX 4 (19 N) 115 CV DIN AT 5500 RPM 18.5 MKG (133 FT LBS) AT 3500 RPM (DIN)	2.350 cc 93 × 85,5 mm	5 gears	13 CV
	DS Serie FG	DS 23 Electronic injection Mechanical	↦ 10/1972	DX 5 (29 N) 130 CV DIN AT 5500 RPM 19.9 MKG (144 FT LBS) AT 2500 RPM (DIN)	2.350 cc 93 × 85,5 mm	5 gears	13 CV
	ID 21 Serie F	Break 21 Mechanical	↦ 10/1965 ⇥ 10/1972	DX ⇥ 10/1965 100 CV DIN AT 5500 RPM 16.7 MKG (121 FT LBS) AT 3000 RPM (DIN) DX 2 (21 N) ↦ 10/1968 106 CV DIN AT 5500 RPM 17 MKG (123 FT LBS) AT 3000 RPM (DIN)	2.175 cc 90 × 85,5 mm	4 gears	12 CV
	DS Serie FF	Break 23 Mechanical	↦ 10/1972	DX 4 (19 N) 115 CV DIN AT 5500 RPM 18.5 MKG (133 FT LBS) AT 3500 RPM (DIN)	2.350 cc 93 × 85,5 mm	4 gears	13 CV

General Symbols	Official symbols	Commercial symbols	Introduced	ENGINE	Cubic capacity	Gearbox ratios	Fiscal rating (French)
				MAXIMUM TORQUE	Bore - Stroke		
DY	DS 19 Serie A	DS 19 Hydraulic	↦ 10/1965 ⇥ 10/1968	DY 84 CV DIN AT 5250 RPM 14,6 MKG (106 LBS) AT 3500 RPM (DIN)	1,985 cc 86 × 85,5 mm	4 gears	11 CV
	DS 20	DS 20 Hydraulic	↦ 10/1968	DY 2 ⇥ 10/1971 DY 3 (17 N) ↦ 10/1971 91 CV DIN AT 5900 RPM 99 CV DIN AT 5500 RPM 14.4 MKG (104 FT LBS) AT 3500 RPM (DIN) 15.1MKG (110 FT LBS) AT 3500 RPM (DIN)	1,985 cc 86 × 85,5 mm	4 gears	11 CV
	ID 19 FH	Break 19 A Hydraulic	↦ 2/1968 ⇥ 10/1970	DY ⇥ 10/1968 DY 2 ↦ 10/1968 84 CV DIN AT 5250 RPM 91 CV DIN AT 5900 RPM 14.6 MKG (106 FT LBS) AT 3500 RPM (DIN) 14.4 MKG (104 FT LBS) AT 3500 RPM (DIN)	1,985 cc 86 × 85,5 mm	4 gears	11 CV
	ID 20 Serie FH	Break 20 Hydraulic	↦ 10/1968 ⇥ 10/1970	DY 2 91 CV DIN AT 5900 RPM 14.4 MKG (104 FT LBS) AT 3500 RPM (DIN)	1,985 cc 86 × 85,5 mm	4 gears	11 CV
DL	DS 19 Serie MA	DS 19 MA	↦ 10/1965 ⇥ 10/1968	DY 84 CV DIN AT 5250 RPM 14.6 MKG (106 FT LBS) AT 3500 RPM (DIN)	1,985 cc 86 × 85,5 mm	4 gears	11 CV
	DS 20 Serie M	DS 20 M	↦ 10/1968 ⇥ 10/1969	DY 2 91 CV DIN AT 5900 RPM 14.4 MKG (104 FT LBS) AT 3500 RPM (DIN)	1,985 cc 86 × 85,5 mm	4 gears	11 CV
	ID 19 F Serie A	Break 19 A Mechanical	↦ 10/1965 ⇥ 10/1968	DY 84 CV DIN AT 5250 RPM 14.6 MKG (106 FT LBS) AT 3500 RPM (DIN)	1,985 cc 86 × 85,5 mm	4 gears	11 CV
	ID 20 F	Break 20 Mechanical	↦ 10/1968	DY 2 ⇥ 10/1971 DY 3 (17 N) ↦ 10/1971 91 CV DIN AT 5900 RPM 99 CV DIN AT 5500 RPM 14.4 MKG (104 FT LBS) AT 3500 RPM (DIN) 15.1 MKG (110 FT LBS) AT 3500 RPM (DIN)	1,985 cc 86 × 85,5 mm	4 gears	11 CV
DV	ID 19 Serie B	ID 19 B	↦ 10/1966 ⇥ 10/1969	DV ⇥ 10/1968 DV 2 ↦ 10/1968 78 CV DIN AT 5250 RPM 81 CV DIN AT 5500 RPM 14.3 MKG (104 FT LBS) AT 3000 RPM (DIN) 13.7 MKG (99 FT LBS) AT 3000 RPM (DIN)	1,985 cc 86 × 85,5 mm	4 gears	11 CV
	ID 19 Serie B	D Special	↦ 10/1969 10/1971	DV 2 81 CV DIN AT 5500 RPM 13.7 MKG (99 FT LBS) AT 3000 RPM (DIN)	1,985 cc 86 × 85,5 mm	4 gears	11 CV
	DS Serie FC	D Special	↦ 10/1971 ⇥ 10/1972	DV 3 (3 N) 89 CV DIN AT 5500 RPM 14.7 MKG (106 FT LBS) AT 2500 RPM (DIN)	1,985 cc 86 × 85,5 mm	4 gears	11 CV
	DS Serie FD	D Special	↦ 10/1972	DY 3 (17 N) 99 CV DIN AT 5500 RPM 15.1 MKG (110 FT LBS) AT 3500 RPM (DIN)	1,985 cc 86 × 85,5 mm	4 gears	11 CV
DT	ID 20	ID 20	↦ 10/1968 ⇥ 10/1969	DY 2 91 CV DIN AT 5900 RPM 14.4 MKG (104 FT LBS) AT 3500 RPM (DIN)	1,985 cc 86 × 85,5 mm	4 gears	11 CV
	ID 20	D Super	↦ 10/1969 ⇥ 10/1971	DY 2 91 CV DIN AT 5900 RPM 14.4 MKG (104 FT LBS) AT 3500 RPM (DIN)	1,985 cc 86 × 85,5 mm	4 gears "serie" ↦ 10/1970 5 gears "option"	11 CV
	DS Serie FD	D Super	↦ 10/1971 ⇥ 10/1972	DY 2 91 CV DIN AT 5900 RPM 14.4 MKG (104 FT LBS) AT 3500 RPM (DIN)	1,985 cc 86 × 85,5 mm	4 gears "serie" 5 gears "option"	11 CV
	DS Serie FD	D Super	↦ 10/1972	DY 3 (17 N) 99 CV DIN AT 5500 RPM 15.1 MKG (110 FT LBS) AT 3500 RPM (DIN)	1,985 cc 86 × 85,5 mm	4 gears	11 CV
DP	DS 21 Serie M	D Super 5	↦ 10/1972	DX 2 (21 N) 106 CV DIN AT 5500 RPM 17. MKG (123 FT LBS) AT 3500 RPM (DIN)	2,175 cc 90 × 85,5 mm	5 gears	12 CV

Types of tyres and wheel rims :

- Front		⇥ 10/1968	↦ 10/1968
	D. ALL TYPES(except D.IE ALL TYPES) { DY-DT-DV-DL-DX DJ-Safari-All Types-DP	180 × 380 XAS	180 HR 380 XAS
	D.IE ALL TYPES		185 HR 380 XAS
- Rear	D. ALL TYPES (except D.IE ALL TYPES) and Safari ALL TYPES	155 × 380 XAS	
	DY-DT-DV-DL		155 HR 380 XAS
	DX-DJ-DP		165 HR 380 XAS
	Safari	180 × 380 XAS	180 HR 380 XAS
	D.IE ALL TYPES		185 HR 380 XAS
- Spare	D. ALL TYPES (except D.IE ALL TYPES) and Safari ALL TYPES	155 × 380 XAS	
	DY-DT-DV-DL		155 HR 380 XAS
	DX-DJ-DP		165 HR 380 XAS
	Safari	180 × 380 XAS	180 HR 380 XAS
	D.IE ALL TYPES		185 HR 380 XAS
- Rims	D. ALL TYPES (except D.IE ALL TYPES) DY-DL-DV-DT	5 J	5 1/2 J
	D.IE ALL TYPES-DP		5 1/2 J
	DY-DL-DV-DT	⇥ 3/1970 5 J	↦ 3/1970 5 1/2 J

Inflation pressures *(in bars)* :

⇥ 10/1968	Saloon		Safari		Ambulance	
	Front	Rear	Front	Rear	Front	Rear
180 × 380 XAS	28 P.I.S. (1.9)	25 P.I.S. (1.7)	28 P.I.S. (1.9)	30 P.I.S.(2.1)	28 P.I.S. (1.9)	26 P.I.S. (1.8)
155 × 380 XAS		28 P.I.S. (1.9)				

↦ 10/1968	Injection		DX-DJ-DP		DY-DL-DT-DV		Break		Ambulance	
	Front	Rear	Front	Rear	Front	Rear	Front	Rear	Front	Rear
185 HR 380 XAS	30P.I.S (2.1)	26P.I.S. (1.8)								
180 HR 380 XAS			29P.I.S. (2)		29 P.I.S. (2)		29P.I.S. (2)	32P.I.S. (2.2)	29P.I.S. (2)	28P.I.S. (1.9)
165 HR 380 XAS				29P.I.S (2)						
155 HR 380 XAS						29 P.I.S. (2)				

Number of seats :

- **D ALL TYPES and Commercial** 5
- **D Family and Break** 7

II. GENERAL DIMENSIONS

Wheel base	D. All Types		10 FT 3 Ins (3.125mm)		
Front track	DX-DJ-Break All Types DY-DV-DT	⇥10/1968 ⇥ 3/1970	4 FT 11 Ins (1.500 mm)	↦ 10/1968 ↦ 3/1970	4 FT 11 11/16 Ins (1.516 mm)
Rear track	DX-DJ-Break All Types DY-DV-DT	⇥10/1968 ⇥ 3/1970	4 FT 3 3/16 Ins (1.300 mm)	↦10/1968 ↦ 3/1970	4 FT 3 13/16 Ins (1.316 mm)
Overall length	D. All Types except Break Break All Types Break All Types	⇥10/1967	15 FT 10 1/2 Ins (4.838 mm) 16 FT 4 1/2 Ins (4.990 mm)	↦10/1967	15 FT 11 7/8 Ins (4.874 mm) 16 FT 5 7/8 Ins (5.026 mm)
Overall width		⇥10/1967	5 FT 10 1/2Ins (1.790 mm)	↦10/1967	5 FT 11 Ins (1.803 mm)
High position	D. All Types except Break All Types : Break All Types :		9 7/8 Ins (1.470mm) 5 1/4 Ins (1.530 mm)		

Ground clearance :

Low position	D. All Types (except Safari all Types)	2 1/2 Ins (0.065 m)
	Safari All Types	3 Ins (0.075 m)
Normal position	D. All Types (except D.IE and Safari All Types	6 Ins (0.150 m)
	D.IE All Types	5 1/2 Ins (0.145 m)
	Safari All Types	6 Ins (0.152 m)
1st intermediate position	D. All Types (except Safari All Types)	6 3/4 Ins (0.170 m)
	Safari All Types	7 5/16 Ins (0.185 m)
2nd intermediate position	D. All Types (except Safari All Types)	8 7/8 Ins (0.225 m)
	Safari All Types	9 Ins (0.228 m)
High position	D. All Types (except Safari All Types)	9 7/8 Ins (0.250 m)
	Safari All Types	10 Ins (0.252 m)
Turning radius	D All Types	18 FT (5.500 m)
Rear floor height	Safari All Types	1 FT 6 Ins (0.458 m)

Weights (CWT and Kg) :

DATES	⇥ 10/1967	↦ 10/1967	↦ 2/1968	↦ 10/1968	↦ 10/1969	↦ 10/1971	↦ 10/1972
Unladen weight :							
DX	25 ¼ (1280)	25 ½ (1300)	. . . .	. . . .	. . . .	25 ¾ (1310)	26 (1320)
DJ	25 ¼ (1275)	25 ½ (1290)	. . . .	. . . .	. . . .	25 ¾ (1310)	26 (1320)
DX Pallas	25 ½ (1295)	25 ¾ (1310)	. . . .	. . . .	. . . .	26 (1330)	26 ¼ (1340)
DJ Pallas	25 ½ (1290)	25 ¼ (1300)	. . . .	. . . .	. . . .	26 (1330)	26 ¼ (1340)
D.IE	. . . .	. . . .	. . . .	. . . .	26 ¼ (1340)		
D.IE Pallas	. . . .	. . . .	. . . .	. . . .	26 ½ (1360)		
DY	25 ¼ (1275)	25 ¼ (1280)					
DL	25 (1270)	25 (1270)					
DY Pallas	25 ½ (1285)	25 ½ (1290)					
DL	25 ¼ (1280)	25 ¼ (1280)					
Dv	24 ¾ (1245)	24 ¾ (1250)	. . . .	25 ½ (1260)	. . . .	. . . .	25 ¼ (1280)
DT	. . . .	. . . .	. . . .	25 ½ (1265)	. . . .	. . . .	25 ¾ (1310)
DP	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	25 ¾ (1310)
DXF	. . . .	. . . .	27 ¼ (1390)	27 ½ (1400)			
DJF	26 ½ (1350)	27 ¼ (1390)	. . . .	27 ½ (1400)			
DYF	. . . .	. . . .	26 ¾ (1375)	27 (1380)			
DLF	26 ¼ (1345)	26 ¾ (1375)	. . . .	27 (1380)			
Pay load :							
DX	9 ½ (480)	9 ½ (480)	. . . .	. . . .	. . . .	9 ¾ (490)	9 ½ (480)
DJ	9 ½ (485)	9 ¾ (490)					
DX Pallas	9 (465)	9 ¼ (470)					
DJ Pallas	9 ¼ (470)	9 ½ (480)	. . . .	. . . .	. . . .	9 ¼ (470)	9 (460)
D.IE	. . . .	. . . .	. . . .	. . . .	10 (500)		
D.IE Pallas	. . . .	. . . .	. . . .	. . . .	9 ½ (480)		
DY	9 ½ (485)	9 ½ (480)					
DL	9 ¾ (490)	9 ¾ (490)					
DY Pallas	9 ¼ (475)	9 ¼ (470)					
DL Pallas	9 ½ (480)	9 ½ (480)					
DV	9 ½ (480)	9 ½ (480)					
DT	. . . .	. . . .	. . . .	9 ¾ (495)			
DP	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	9 ¾ (490)
DXF	. . . .	. . . .	12 ¾ (650)				
DJF	12 ¾ (650)	12 ¾ (650)					
DYF	. . . .	. . . .	12 ¾ (650)				
DLF	12 ¾ (655)	12 ¾ (650)					
Max. laden weight :							
DX-DJ-DX Pallas-DJ Pallas	35 (1760)	35 ¼ (1780)	. . . .	. . . .	. . . .	35 ½ (1800)	
D.IE-D.IE Pallas	. . . .	. . . .	. . . .	. . . .	37 (1840)		
DY-DL-DY Pallas-DL Pallas	35 (1760)	35 (1760)	. . . .	. . . .	. . . .	. . . .	35 (1760)
DV	34 (1725)	34 (1730)	. . . .	34 ¼ (1740)			
DT	. . . .	. . . .	. . . .	35 (1760)			
DP	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	35 ½ (1800)
DXF	. . . .	. . . .	40 (2040)	40 ¼ (2050)			
DJF	39 ¼ (2000)	40 (2040)	. . . .	40 ¼ (2050)			
DYF	. . . .	. . . .	39 ¾ (2025)	40 (2030)			
DLF	39 ¼ (2000)	39 ¾ (2025)	. . . .	40 (2030)			

III. DIVER CAPACITIES

- Petrol tank		65 litres (14 Galls Imp)
- Cooling system	DX-DJ All Types (↦ 10/1972) - D.IE All Types	13 litres (23 Pts Imp)
	DX-DJ All Types - DP	10.8 litres (19 Pts Imp)
	DL-DY-DV-DT	10.6 litres (18 ½ Pts Imp)
- Hydraulic system (approx.)		6 litres (10 ½ Pts Imp)
- Engine (draining)		4.5 litres (8 Pts Imp)
- Gearbox (draining)	- Four speeds	2 litres (3 ½ Pts Imp)
	- Five speeds	2.25 litres (4 Pts Imp)
- Maximum weight on roof rack		80 Kg (176 lbs)
- Maximum gradient for garage access :		
	- *Normal* position	15 % (1 In 6 ½)
	- *High* position	30 % (1 In 3)
- Maximum starting slope with trailer of 1800 Kg (3.960 lbs)	Safari all types	10 % (1 In 10)
	DV-DT-DY-DL	11 % (1 In 9)
	DJ-DX All Types	11.5 % (1 In 8.7)
- Towing capacity :		
	- Trailer without brake	630 Kg (12 ¾ CWT)
	- Trailer with overrun brake	1250 Kg (24 ¾ CWT)
	- Trailer with continuous brake	1800 Kg (35 ½ CWT)

PROTECTION OF THE ELECTRICAL UNITS

PRECAUTIONS TO BE TAKEN WHILE WORKING ON A VEHICLE

Certain actions must be avoided at all costs as they would damage some of the electrical components or cause the electrical system lo be short-circuited. (Fire risk)

1. Battery :

a) Disconnect the lead terminals, negative first

b) Ensure that battery is correctly connected. Negative terminal must be earthed.

c) Connect both leads carefully. Earth lead last. Before clamping the negative on the battery terminal, bring them intermittently together to ensure that current does not pass. No spark must occur. If it does, a short-circuit in the electrical system is to be eliminated.

d) Before actuating the starter, ensure that both clamp terminals are correctly secured on the battery.

2. Alternator-Regulator

a) Do not allow the alternator to turn without being connected to the battery.

b) Before connecting the alternator, ensure that battery is correctly fitted (negative earthed)

c) Do not check the operation of the alternator by short-circuiting the negative or « EXC » terminals to earth.

d) Do not reverse the leads connected to the alternator.

e) Never try to prime the alternator. This would damage the component as well as the regulator

f) Do not connect a suppressor either to the alternator or regulator « EXC » terminals,

g) Do not connect battery to a charger and never carry out arc or spot welding on the car chassis without having first disconnected both positive and negative battery leads

3. Electronic fuel injection system

Certain actions must be avoided at all costs as they would damage the components of the electronic fuel injection system, in particular the electronic control unit.

a) Never use a rapid charger and never carry out arc or spot welding on the car chassis without having first disconnected both battery leads and isolated the + earth lead.

b) Never use a test lamp to check the continuity of a circuit.

c) Never strike a spark to check the continuity of a lead.

d) Never start a vehicle with a voltage exceeding 12 volts.

e) Never force a connector onto the unit concerned.
Take note of the inhibitor chamfers.

f) Only withdraw the connectors by taking hold of the sides and never by pulling on the leads. Check that the rubber caps completely cover the connectors when they are fully inserted.

g) The precautions to be taken during the alternator check also apply in this case.

h) Never alter the adjustment the exterior potentiometer of the electronic control units fitted since April 1971.

4. Ignition coil : a) Connect the supply lead of the coil to the ballast resistor terminal and not to the coil itself.

b) Connect the suppressor with a jump lead to the ballast resistor terminal and not to the coil itself. Only fit the suppressor recommended by the factory.

5. Quartz-iodine Bulb : a) Switch off the headlamps to replace a bulb. If the headlamps have just been used, it is advisable to allow the bulbs to cool a few minutes before handling the faulty one.

b) Do not touch the Q.I. bulb with the fingers. Should you accidentally touch a bulb, it should be wiped with soapy water and dried with a lint-free cloth.

CARS WITH SYNTHETIC HYDRAULIC FLUID.

L.H.S.2

The D vehicles produced up to September 1966 use a red fluid of synthetic base in their hydraulic circuits ***(Fluid L.H.S.2)***

The main reservoir, steering unit, HP pump (7 pistons), suspension spheres and accumulators ***are painted black.***

The general instructions given earlier apply to these cars, provided that the following instructions are scrupulously observed :

Cleaning :

Use ***alcohol*** only.

Assembly :

Follow the detailed operations in the Manual.

If seals or components need lubricating before assembly, use only ***synthetic fluid L.H.S.2.***

If a component in contact with the suspension fluid must be greased (e.g. steering pinion needles) use only a castor grease, ***such as ANTAR RC***.

7 Rubber parts :

Use only those seals, tubes and diaphragms made for use with ***synthetic fluid L.H.S.2***. Never fit parts of the same dimensions but intended for use with other fluids.

All seals with white markings must of necessity be renewed after dismantling. We have sent you a « Table of Seals » giving you the part numbers of the only items suitable for use with the synthetic fluid.

Units :

Use only units intended for use in systems containing ***L.H.S. fluid.*** Certain units are painted black, but in no case must units with ***green markings*** be used.

Testing :

Use test - bench 2290-T.

This test bench is ***painted grey*** and the accessories bear no marking.

These accessories, as well as the gauges, must only be used on vehicles functioning with synthetic fluid L.H.S.2.

Never use them with any other fluid or free testing units intended to function with any other fluid.

Hydraulic Fluid :

Use only factory ***approved fluids bearing the symbol L.H.S.2.***

BLACK RESERVOIR : use SYNTHETIC FLUID L.H.S.2.

CARS WITH MINERAL HYDRAULIC FLUID.

L.H.M

D vehicles produced since September 1966, with the exception of certain models for export markets, use a green fluid of ***mineral*** base in their hydraulic circuits ***(fluid L.H.M.).***

The main reservoir and the hydraulic units are ***printed green*** or bear ***green identification*** marks.

The general instructions given earlier apply to these vehicles provided that the following instructions are scrupulously observed.

Cleaning :

Use petrol or white spirit only.

Assembly :

Follow the detailed operations in the Manual.

If seals or units need lubricating before assembly, use only ***mineral fluid*** L.H.M.

If a component in contact with the suspension fluid must be greased, use only ***a mineral grease «universal joint grease» or bearing grease*** (see table of oils and greases).

Rubber parts :

Use only those seals, tubes and diaphragms made for use with ***mineral fluid L.H.M.***

Never fit parts of the same dimensions but intended for use with other fluids.

All seals bearing white markings must of necessity be renewed after dismantling.

We have sent you a « Table of Seals » giving you the part numbers of the only items suitable for use with mineral fluid.

Units :

Use only units with the green identification colour and intended for use in systems containing *mineral fluid L.H.M.*

Testing :

Use test-bench 3654 - T and its accessories 3655 -T.

This test-bench is ***painted green*** and the accessories ***bear green*** markings.

These accessories and the gauges must only be used on vehicles functioning with ***mineral fluid L.H.M.***

Never use them with any other fluid or for testing units intended to function with any other fluid.

NOTE : The « Le Bozec » pump used on test-benches for injectors in Diesel engines can be used, after cleaning, for testing units *functioning with mineral fluid L.H.M*. The tests must be carried out, of course, *with mineral fluid L.H.M.*

Hydraulic fluid :

Use only factory ***approved fluids bearing the symbol L.H.M.***

GREEN RESERVOIR : use MINERAL FLUID L.H.M.

WORK ON THE HYDRAULIC SYSTEMS

To ensure correct functioning of the hydraulic systems it is essential that the hydraulic fluid and all the component parts shall be perfectly clean. The most stringent precautions must be taken when working on the car and for the storage of fluids and parts.

1. STORAGE.

All pipes, units and spare parts must be protected from dust and possible knocks.

Seals and rubber pipes must not be exposed to dust, air, light, or heat, hydraulic fluid must be kept in its original containers, securely sealed. We recommend the use of one litre (1 $\frac{3}{4}$ Imp. pt) containers for topping up or five litres. (8.8 Imp. pts. approx.) when draining and refilling in order to avoid keeping several open containers.

2. PRECAUTIONS DURING THE WORK.

Before starting work, wash the car carefully or at least the area in which work is to be carried out.
Example :
- When replacing a rear suspension cylinder, carefully wash the corresponding wheel arch.

Before disconnecting a union, wash it and the surrounding area carefully with an appropriate solvent

Release the pressure.

Then proceed as follows :

a) Work on all units except brakes and brake control :

1) Unscrew the bleed screw on the pressure regulator.
2) Place the manual height control lever in the « ***low*** » position.

b) Work on the brake circuits :

1) Unscrew the bleed screw on the pressure regulator.
2) Place the manual height control in the « ***low*** » position

3) Connect a flexible pipe (plastic or rubber) to a front brake unit bleed screw or on the rear bleed screw of the centrifugal regulator or on the bleed screw of the hydraulic fast idling device . Slacken the bleed screw and depress the brake pedal to release the pressure in the brake accumulator.

c) Unions :

If the union is situated below the level of fluid in the reservoir, drain the latter to avoid loss of fluid or close the pipe immediately with an appropriate plug or cap.
The unions or union flange sealing plates must be fitted « freely » and without strain.

3. PRECAUTIONS AFTER DISCONNECTING THE UNIONS.

Close the open ends of all pipes
For the metal pipes use screwed unions.
For pipe assemblies protect the union flanges with self-adhesive masking-tape.
Protect plastic pipes in the same way.
For rubber pipes use cylindrical plugs :
diameter = 8 mm length = 50 mm
diameter = 12 mm length = 50 mm

4. PROTECTION OF HYDRAULIC UNITS AFTER REMOVAL :

Seal all the openings in the units as dismantling proceeds.

IMPORTANT NOTE :
All the plugs and caps must be carefully cleaned before use.

5. PRECAUTIONS BEFORE ASSEMBLY.

All steel pipes must be blown through with compressed air. Rubber pipes and ring seals must be carefully washed in an appropriate solvent then blown dry with compressed air. All hydraulic units must be cleaned with an appropriate solvent only. Nothing else must be used for this purpose. After cleaning, blow dry thoroughly with compressed air.

6. FITTING THE JOINT SEALS.

MOST IMPORTANT : Only use joint seals corresponding to the fluid used in the hydraulic circuit of the vehicle; (synthetic or mineral fluid). For this, consult the «table of seals» that we have sent you.

a) **Sealing plates :**

Before fitting a sealing plate, make sure that the ring seals are correctly positioned and in good condition
It is preferable to renew the ring seals at each dismantling.
When assembling in position, make quite sure that the fluid holes in the seal plates coincide with those in the flanges.

b) **Sealing sleeves :**

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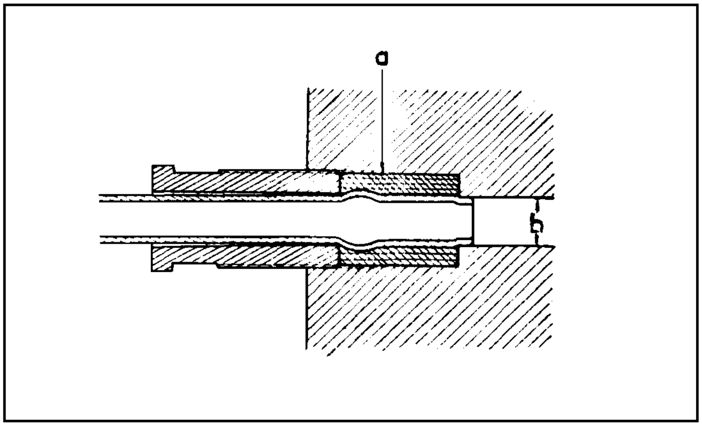

NOTE : All sealing sleeves must be renewed-after each dismantling operation :

1) Place a sealing sleeve « a » on the pipe. This sleeve should be set back 2 mm from the end of the pipe.

2) Centralise the pipe in the bore by aligning it with the axis of the bore.

MOST IMPORTANT : Make quite sure that the end of the pipe enters the small bore « b ».

3) Screw up the union nut by hand. On certain units the axis of the bore is oblique relative to the face of the boss for the nut.

4) Lightly tighten the nut.

Vehicles using synthetic fluid LHS (main reservoir painted black)

Tighten the nut to 5,9 to 7,5 mΛN (0.6 to 0,8 m.kg) (4½ to 6 ft.lbs)

Vehicles using mineral fluid LHM (main reservoir painted green)

Tighten the nut to 9 to 11 mΛN (9.9 to 1.1 m.kg) (6½ to 8 ft.lbs)

This slight tightening of the nut is sufficient to ensure a good seal. Excessive tightening will cause leakage.

c) **Ring seals :**

NOTE : These ring seals are so designed that their efficiency increases proportionately with the pressure in the pipes. Tightening the union does not increase sealing efficiency.

7. TACHOMETERS (REVOLUTION INDICATORS)

Certain checks and adjustments cannot be effectively carried out without the use of a tachometer.
To ensure accuracy when making these checks a precision instrument must be used. At 600 r.p.m.. particularly, it must be accurate to within ± 20 r.p.m.

Electric tachometers

The following instruments have been tested by us with satisfactory results :
« SOURIAU, type 1494» sold by Société SOURIAU, 13 rue du~Général Gallieni - 92 - BOULOGNE
« BOSCH, ref. 0681.199.592 » sold by the Société BOSCH-FRANCE, 32 Avenue Michelet, 93 - SAINT-OUEN
« SUN, model TDT. 12 » sold by the Société SUN-OVERSEAS, 19 rue de Paris - 92 - CLICHY
« CRIPTON, model BC. 40l/FA 7418 » sold by the Société NAUDER, 23 rue Boissière - 75 - PARIS (16e)

Electric tachometers should be checked periodically (about once a month). This check can be made by means of a stroboscopic disc MR 630- 58/ 9.

Stroboscopic disc.

This simple instrument can be made by you. For the constructional dimensions ask for note MR. 630--58/9 from our Service ‘ Division Technique Après- Vente ” 163, avenue Georges Clemenceau, 92-NANTERRE.
The pulleys and belts must be in good condition, the pulleys correctly aligned and the belt tension correct.

Checking the tachometer.

The stroboscopic disc is used for checking the electric tachometer. It enables the following engine speeds to be checked : 600 engine r.p.m. i.e. 300 HP pump r.p.m. : 1200 engine r.p.m. i.e. 600 pump r.p.m., and all the multiples of 300 r.p.m. on the high pressure pump, but at engine speeds over 1200 r p m reading becomes very difficult.

8. PRESSURE GAUGES.

When carrying out checks or adjustments on hydraulic units of the car, the use of pressure gauges is essential. In just the same way as precision tachometers are necessary for accurate checking and adjustment, so it is necessary to use sufficiently accurate pressure gauges.

The pressure gauges of test benches 2290-T and 3654-T are of the required accuracy. To preserve this accuracy it is necessary to protect the gauges by using dashpots (dampers). These are sold by Société FENWICK.

We strongly advise periodic checking of these pressure gauges, by comparison with a new pressure gauge reserved for the purpose, This pressure gauge can only be used with one hydraulic fluid (synthetic or mineral). It must therefore be very clearly marked (in red or in green accordingly).

9. CHECKS BEFORE COMMENCING OVERHAUL.

If any irregularity of operation occurs, make quite sure that the H.P. hydraulic circuit is under pressure before doing anything else :

To do this, proceed as follows :
With the engine running at idling speed :

- Unscrew the pressure regulator bleed screw 1-$\frac{1}{2}$ turns (one should be able to bear the pressure release)
- Tighten the bleed screw,and the valve must cut-out in less than 20 seconds (the moment of cut-out is indicated by a reduction in the noise of operation)

If this check is negative, check the following points in the order given :

- That there is sufficient hydraulic fluid in the reservoir.

- That the reservoir filter is perfectly clean, and in good condition.

- That air is not entering the suction pipe of the pump,

- That the belts of the high pressure pump are not slipping.

- That the bleed screw is securely closed.

10, CHECKS AFTER WORK HAS BEEN CARRIED OUT.

After all work, check the following :

1) All unions for possible leaks.

2) The clearance between pipes : the pipes must not touch each other nor must they touch any part of the vehicle, fixed or movable. Pay particular attention when assembling a steering rack or steering wheel.

DRAINING THE HYDRAULIC CIRCUIT.

(Fluid LHS 2 or LHM)

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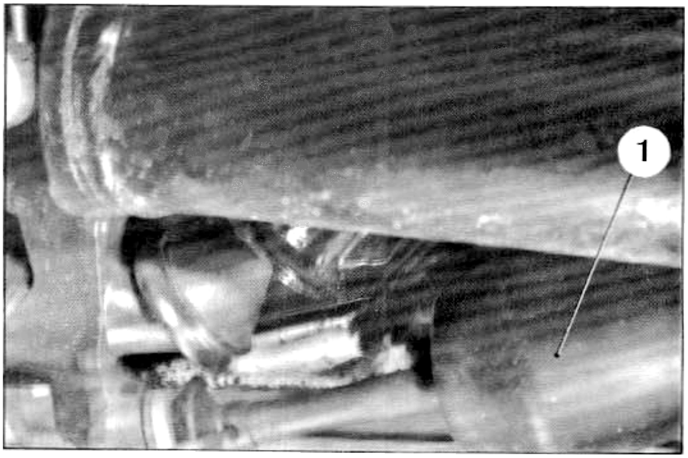

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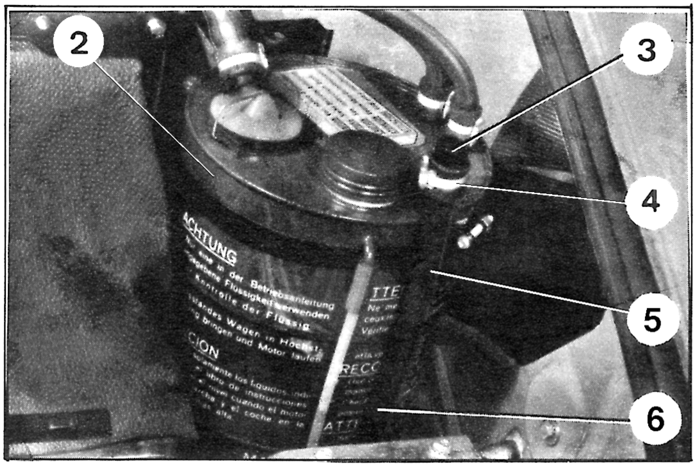

DRAINING.

1. Position the vehicle on a pit or car-lift.

2. Place the manual height control in the « *low* » position.

3. Unscrew the bleed screw on the pressure-regulator.

4. *On vehicles with power-steering:*
   Move the steering to left and right several times.

5. *Release the pressure in the brake-circuit.*
   Operate the hydraulic brake control by pressing on the brake pedal several times in succession.
   NOTE :
   On DS vehicles produced before September 1960: the brake pressure reserve is constituted by two accumulators, one front and one rear.
   On vehicles produced since September 1960 : the pressure reserve consists of only one front accumulator. The rear brakes are fed by the rear suspension.

6. **Empty the dust-shields (1) on the front suspension cylinders.**
   Compress the dust-shields (1) by hand, so that as much of the fluid contained in them as possible returns to the reservoir.

7. **Drain the reservoir. (2)**
   Vehicles produced since September 1967.
   The reservoirs (2) have a flexible drain tube (6).
   Slacken the hose clip (4) situated at the upper end of the flexible tube (6).
   Free the flexible tube (6) from the spring clip (5).
   Remove the plug (3).
   Drain the reservoir.
   Vehicles produced before September 1967.
   Use a syringe to empty the reservoir.

REFILLING.

8: *On vehicles produced since September 1967.*

- Place the plug (1) on the flexible pipe (3).
Insert the flexible tube (3) into the spring-clip (2).

9. Clean the reservoir filter
- with alcohol for the *L.H.S.2. fluid.*
- with petrol or white spirit for the *L.H.M. fluid*
Blow it through with compressed air.

10. Refill the reservoir with hydraulic fluid (LHS 2 or LHM as appropriate).

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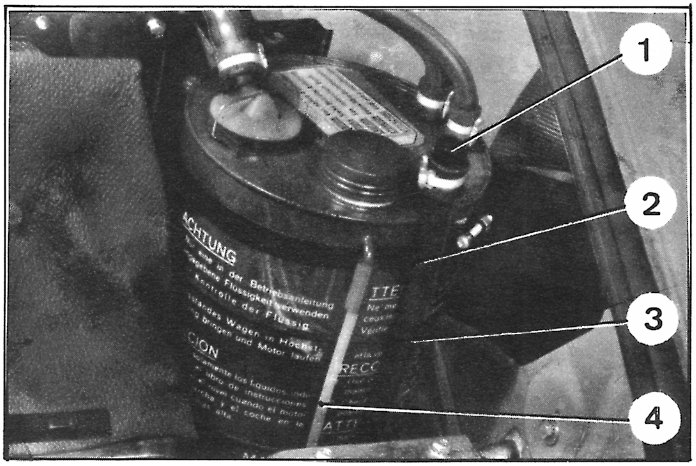

11. Prime the high pressure pump.

- Fill the pump with hydraulic fluid by pouring some into the inverted reservoir filter housing.
- Start the engine, allow to run for several minutes.

12. Tighten the pressure-regulator bleed screw.

13. Fill up the hydraulic fluid reservoir.

a) Vehicles produced since September 1960.
- Place the manual height control in the «high» position.
- The level of hydraulic fluid in the reservoir must be between the min. and max. on the transparent gauge (4).

b) Vehicles produced before September 1960.
- The level of hydraulic fluid in the reservoir is established when the vehicle is in the «normal running» position.

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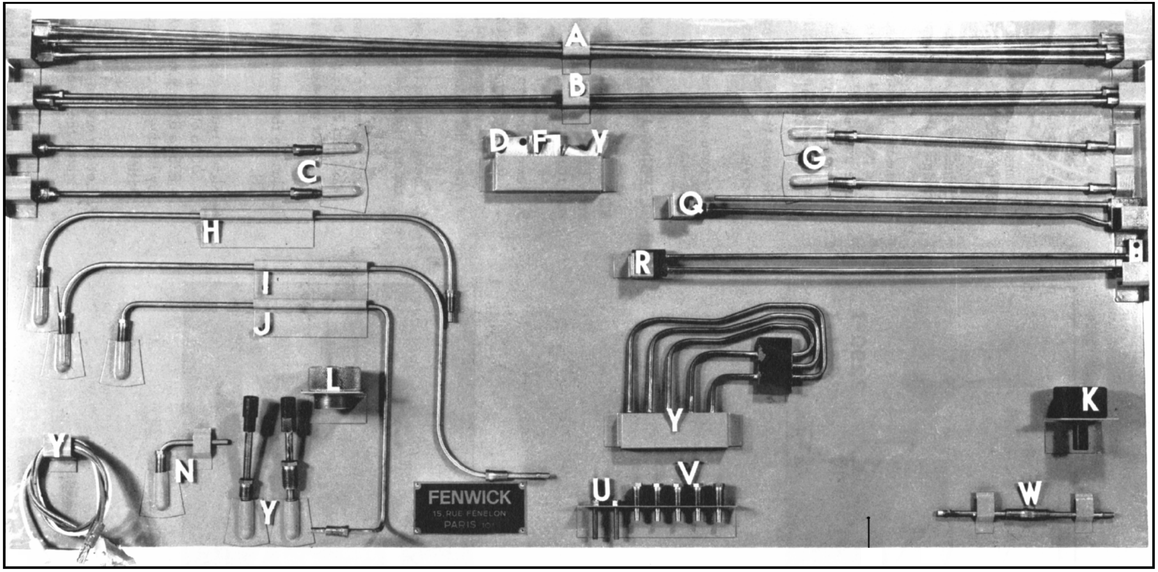
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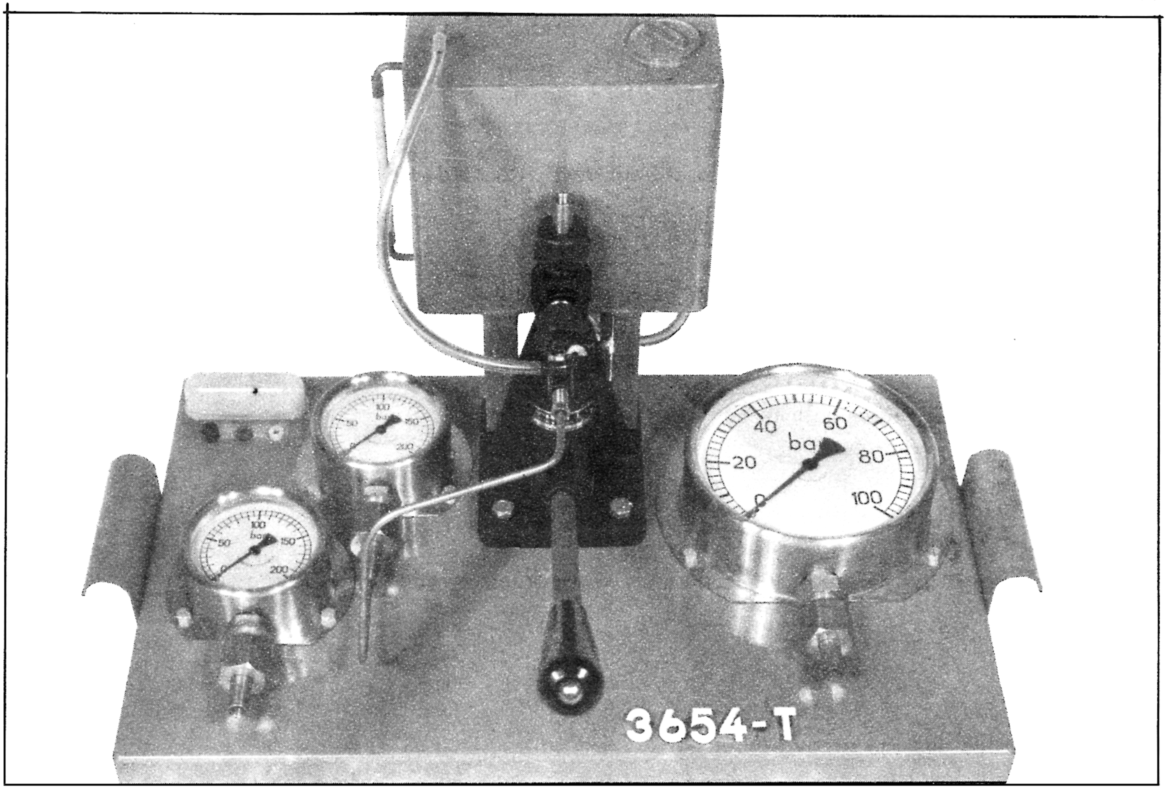
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REPAIRING A PLASTIC PIPE

NOTE :

a). This operation can be carried out by sleeving the pipe.

b). A pipe cannot have more than two sleeves which must be approx. 800 mm apart in order to preserve its flexibility.

C). The glue to be used is RILSAN cement sold in 60 cc bottle by : Société BOYRIVEN, 37 bis rue de Villiers,
92200 NEUILLY sur SEINE - FRANCE
Phone : Maillot 36-11
(RILSAN glue inflames the skin and should be spread exclusively with a wooden spatula).

1. Cut off the pipe and roughen about 90 mm at each end with abrasive paper. Nº 600.

2. Clean both ends and sleeve carefully with trichlorethylene.

3. Warm up rilsan glue in water bath to 60° C (140° F)
   Do not exceed this temperature.

NOTE : It is essential to operate as described above in order to reduce the drying-time.

4. Coat the pipe ends and the sleeve inner part with glue.
   Allow to dry for a few minutes.
   Insert pipe ends in the sleeve.
   Allow the assembly to dry for 3 to 4 hours before making use of the repaired pipe.

APPROVED PASTES, GLUES AND SOLVENTS

PRODUCTS	USES	SUPPLIERS
POLYCLENS	Grease remover for mechanical assemblies when cold. Can be in pure or diluted form. Rinse off with plenty of water.	ACBIMEX S.A.M. 12, avenue F.D. Roosevelt 75008 - PARIS TeI. : 359-84-32 or : Palais de la Scala MONTECARLO Tel. : 30-53-79
ADEXOLIN 56	Glue for gasket of water pump turbine.	AREXONS (S.I.P.A.L.) 406, tours Emile ZOLA 69100 - VILLEURBANNE TeI. : 84-17-35
RILSAN GLUE	Glue for plastic tube.	BOYRIVEN 37 bis, rue de Villiers 92200 - NEUILLY S'SEINE Tel. : 624-36-11
PROTOJOINT	Sealing of the housing-halfs or covers. Resistant to hydrocarbons	Jean BRASSART 44, rue La Boetie 75008 - PARIS Tel. : 359-54-82
CURTYLON	Paste for casing gaskets	CEFILAC Departement Joints CURTY 25, rue Aristide Briand : 69800 SAINT-PRIEST TeI. : 20-08-94 or 7 to 11, rue de la Py - 75020 - PARIS Tel. : 797-01-49
DEVCON	Sealing porosities in casings.	COMET 10, rue Emile Cazeau 60300 - Z.I. de SENLIS Tel. : 455-35-40
LOCTITE AUTOFORM	Sealing of the housing-halfs or covers. Resistant to hydrocarbons	
METALIT	Sealing porosities in casings.	DISIMPEX 1, rue Goethe 75016 - PARIS TeI. : 727-89-59
SILASTIC 733 RTV	Sealing porosities in casings.	DOW CORNING S.A.R.L. q 140, avenue Paul Doumer 92500 - RUEIL-MALMAISON Tel. : 977-00-40
MOLYKOTE 557	Silicone grease for water pump.	

OPERATION Nº D.03: *Approved pastes, glues and solvents*.

PRODUCTS	USES	SUPPLIERS
METOLUX A	Sealing porosities in casings	METOLUX 167, avenue de Fontenay 94300 - VINCENNES Tel. : 808-55-11
OIL AND GREASE REMOVER	Grease remover for mechanical units when cold	MULLER et Cie 28, avenue de l’Opéra 75002 - PARIS Tel. : 742-58-36
ROCOL ASP	Grease for water pump	LAB0 INDUSTRIE 1, rue Lavoisier 92000 - NANTERRE Tel. : 204-51-60
GREASE GSI 160	Silica grease for bearings	P.C.S.A. 23, rue Bossuet 91160 - LONJUMEAU Tel. : 920-00-71
ARALDITE	Glue	PROCHAL 5, rue Bellini 92800 - PUTEAUX Tel. : 772-18-33
MASTI-JOINT HD 37	Gasket paste	REXON 33, avenue du General Bizot 75012 - PARIS Tel. : 344-48-31
PLATE-LOWAC	Gasket paste (resistant to hydrocarbons)	S.E.B.I.S. 3 - 5, rue de Metz 75010 - PARIS Tel. : 770-13-08
PLASTISOL D.C.O. 625	Sealing paste for casing studs	SYNTHESIA 28 rue de l’Arbroust 94130 - NOGENT S’MARNE Tel. : 871-09-36
HEXYLENE GLYCOL	Rinsing out hydraulic piping (L.H.S. 2)	FRANÇAISE DES MATIERES COLORANTES 15, boulevard de l’Amiral Bruix 75016 - PARIS Tel. : 525-52-00
MASTIC GLUE Ref. 1500 (COLLAFEU)	Sealing paste for inlet manifold heating pipes	Ets BARTHELEMY 61 64, 71, rue DEFRANCE 94300 - VINCENNES Tel. : 328-42-87

LOCTITE

The spare parts dept sells two types of LOCTITE under the following numbers :
GX. 01.459 01 A
GX. 01.460 01 A
as well as the catalyst LOCQUIC-T GX. 01 461 01 A

USE : LOCQUIC-T is a catalyst meant for parts to which LOCTITE is to be applied. Non-metallic parts require previous treatment with LOCQUIC-T. Most zinc, cadmium and aluminium plated parts also require this treatment to allow the LOCTITE to harden quickly. LOCQUIC-T can also be used to clean grease from the parts. Use it also to give a better surface for adhesion.

Spray the surfaces to which the LOCTITE is to be applied. Brush or wipe to remove grease. Spray again to make perfectly clean. Repeat the operation if necessary. Do not apply the LOCTITE until the catalyst is completely dry.

WARNING : ***Precautions to be taken.*** Ensure good ventilation when using LOCTITE. Avoid prolonged or repeated contact with the skin. Do not swallow. Do not spray onto painted surfaces, keep the can of LOCTITE at a temperature of less than 44°C (111° F)

VEHICLES ALL TYPES

I. GENERAL CHARACTERISTICS

1. Engine type DX, DJ, DXF, DJF. ⇥ *10/1972*

(Inlet manifold external, distributor at front)

- Fiscal rating (French)............. 12 CV
- Number of cylinders.................4 in line
- Cubic capacity........................2.175 cc

- Bore ....90 mm
- Stroke.................................... . .85.5 mm
- Compression ratio.......................8.75/1

- **Brake horsepower :**

⇥ *10/1968* 109 HP SAE at 5500 rpm
100 HP DIN at 5500 rpm

↦ *10/1968* 115 HP SAE at 5750 rpm
106 HP DIN at 5500 rpm

- **Maximum torque :**

⇥ *10/1968* 17.7 mkg (128 ft Ibs) at 3000 rpm (SAE)
16.7 mkg (120 ft Ibs) at 3000 rpm(DIN)

↦ *10/1968* 17.4 mkg (125 ft Ibs) at 4000 rpm (SAE)
17 mkg (123 ft Ibs) at 3500 rpm (DIN)

2. Engine type DX 4 (19 N) → *10/1972*

- Fiscal rating (French)............ 13 CV
- Number of cylinders................4 in line
- Cubic capacity...................... 2.350 cc

- Bore...93.5 mm
- Stroke.......................................85.5 mm
- Compression ratio.......................8.75/1

- **Brake horsepower :**

↦ *10/1972* 124 HP SAE at 5750 rpm
115 HP DIN AT 5500 rpm

- **Maximum torque :**

↦ *10/1972* 19.1 mkg (140 ft Ibs) at 4000 rpm (SAE)
18.7 mkg (133 ft Ibs) at 3500 rpm (DIN)

3. Engine type DY, DL, DYF, DLF, DT.

(Inlet manifold internal, distributor at rear ⇥ 10/1968)
(Inlet manifold external, distributor at front ↦ 10/1968)

- Fiscal rating (French)............ 11 CV
- Number of cylinders................ 4 in line
- Cubic capacity.......................1.985 cc

- Bore..86 mm
- Stroke.......................................85.5 mm
- Compression ratio.......................8.75/1

- **Brake horsepower :**

⇥ *10/1968* 90 HP SAE at 5250 rpm
84 HP DIN at 5250 rpm

↦ *10/1968* 103 HP SAE at 6000 rpm
91 HP DIN at 5900 rpm

↦ *10/1971* 108 HP SAE at 5780 rpm
99 HP DIN at 5500 rpm

- **Maximum torque :**

⇥ *10/1968* 15.2 mkg (110 ft Ibs) at 3500 rpm (SAE)
14.6 mkg (106 ft Ibs) at 3500 rpm (DIN)

↦ *10/1968* 14.9 mkg (108 ft lbs) at 3400 rpm (SAE)
14.4 mkg (104 ft lbs) at 3500 rpm (DIN)

↦ *10/1971* 15.5 mkg (112 ft lbs) at 4000 rpm (SAE)
15.3 mkg (110 ft lbs) at 3500 rpm (DIN)

4. Engine type DV.

(Inlet manifold internal, distributor at rear →| *10/1968*
(Inlet manifold external, distributor at front |→ *10/1968*

- Fiscal rating (French)........................11 CV
- Number of cylinders..........................4 in line
- Cubic capacity................................1.985 cc

- Bore..86 mm
- Stroke...85.5 mm
- Compression ratio →| *10/1971*......8/1
  |→ *10/1971*......8.75/1

- Brake horsepower :

→| *10/1968*
84 HP SAE at 5250 rpm
78 HP DIN at 5250 rpm

|→ *10/1968*
91 HP SAE at 5750 rpm
81 HP DIN at 5500 rpm

|→ *10/1971*
98 HP SAE at 5750 rpm
89 HP DIN at 5500 rpm

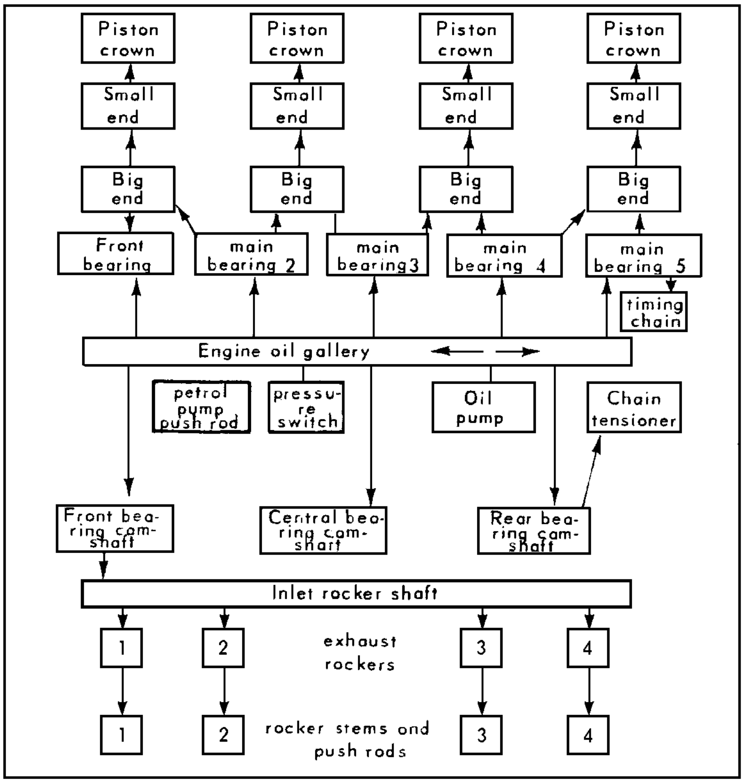
- Maximum torque :

→| *10/1968*
14.7 mkg (106 ft lbs) at 3000 rpm (SAE)
14.3 mkg (104 ft lbs) at 3000 rpm (DIN)

|→ *10/1968*
14 mkg (101 ft lbs) at 3000 rpm (SAE)
13.7 mkg (99 ft lbs) at 3000 rpm (DIN)

|→ *10/1971*
15 mkg (108 ft lbs) at 3000 rpm (SAE)
14.7 mkg (106 ft lbs) at 2500 rpm (DIN)

5. Oil circulation diagram.



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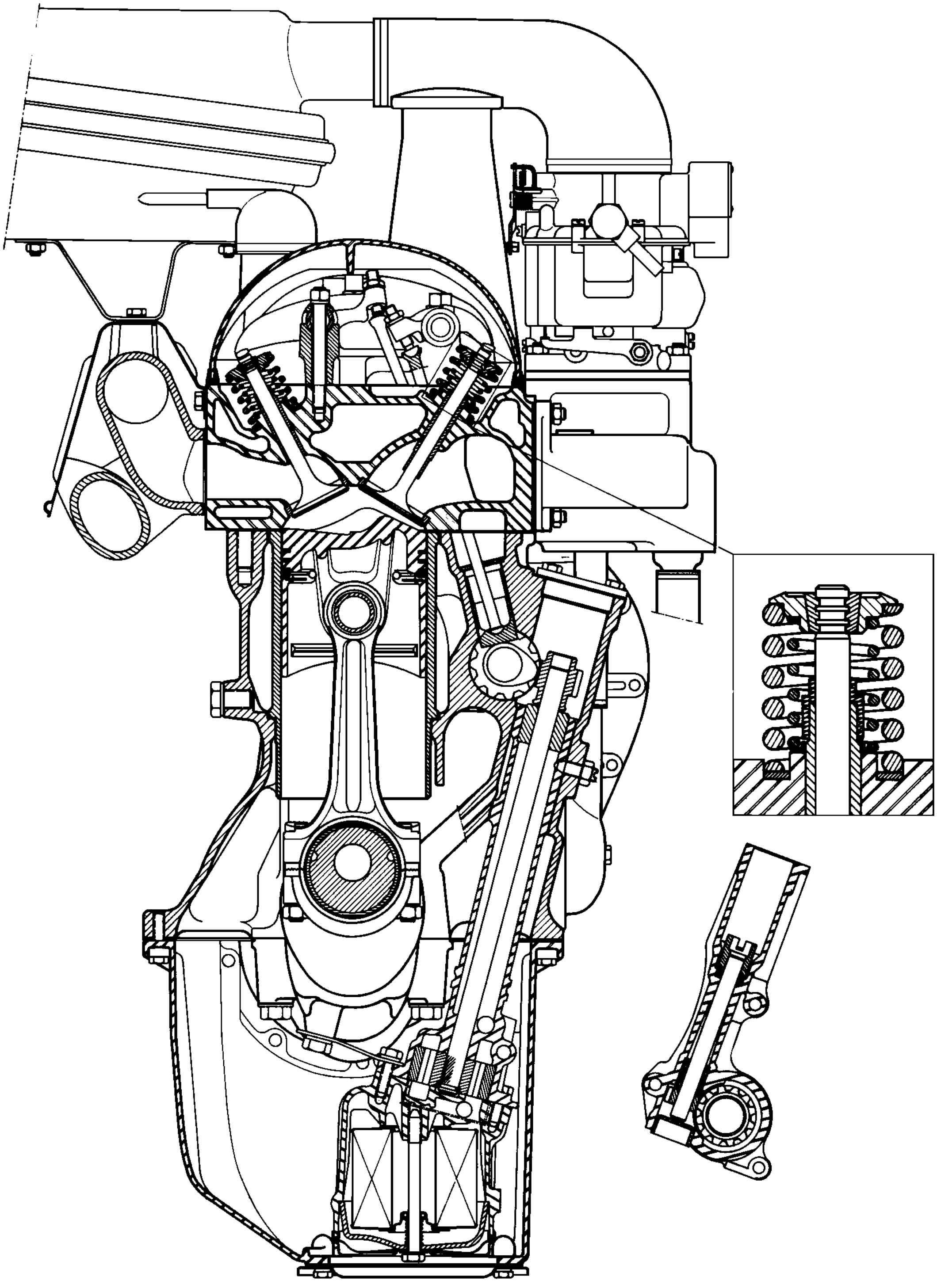
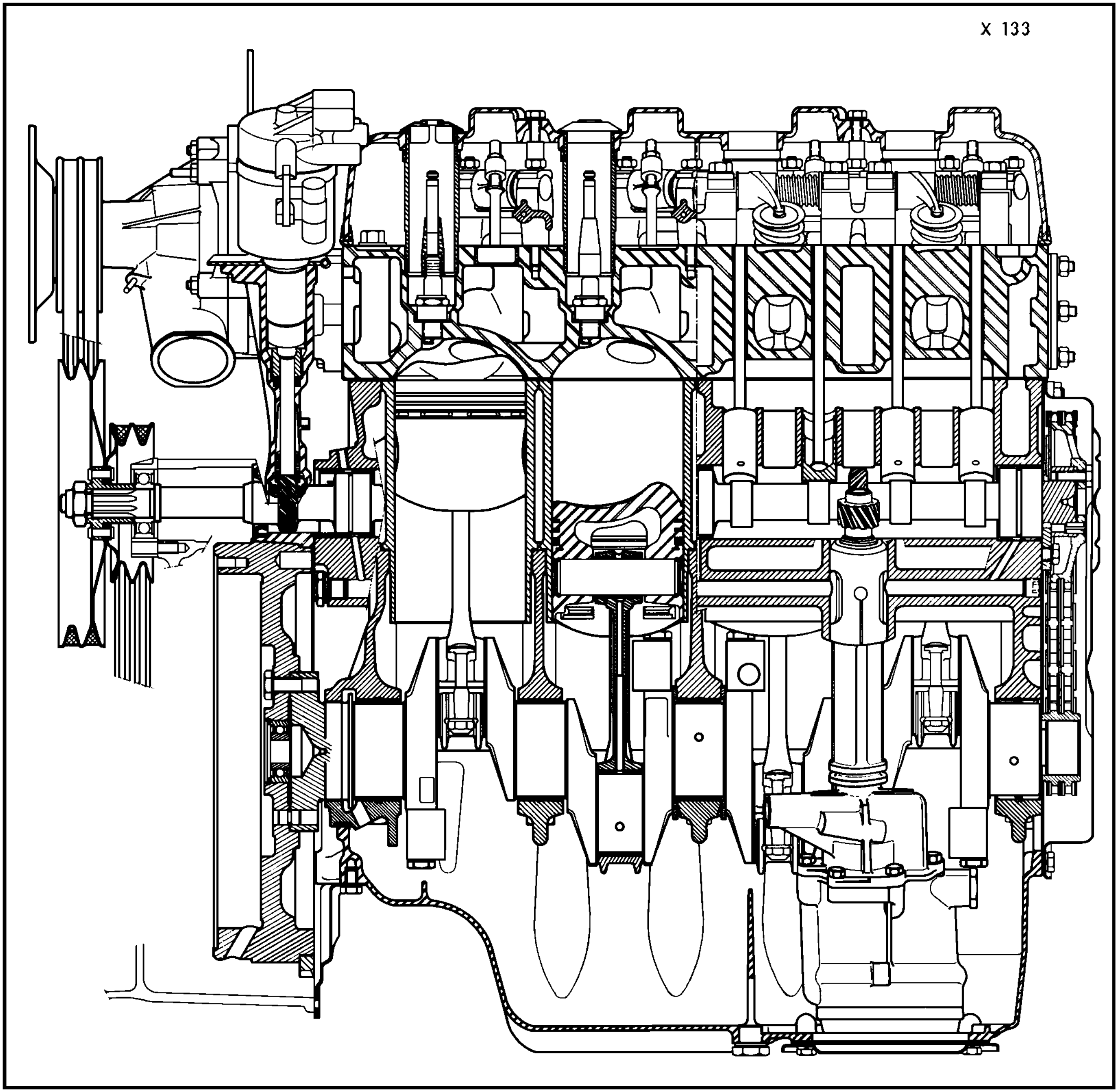
ENGINE
CROSS SECTION

X 134



ENGINE
LONGITUDINAL SECTION



II - PARTICULAR FEATURES

1. Housings.

a) Cylinder block.

- Crankcase and crankshaft bearing caps are matched.
- The crankshaft bearing caps are marked from the front of the engine (flywheel end) by the figures 1-2-3-4.
- Bore of crankshaft bearings .... 68.7 ± 0.005 mm
- General out-of-flat on the securing face of the cylinder head .... 0.05 mm max.
- Tighten screws securing main bearing caps to.......... 90 to 100 mΛN (9 to 10 mkg) (65 to 72 ft lbs)

b) Crankcase.

- Tighten securing screws to .... 14 to 9 mΛN (1.4 to 1.9 mkg) (10.1 to 13.75 ft lbs)
- Tighten drain plug to.. 35 to 45 mΛN (3.5 to 4.5 mkg) (25.3 to 32.5 ft lbs)
- Tighten screws securing closing panel of clutch casing to.. 9 to 12 mΛN (0.9 to 1.2 mkg) (6.5 to 6.68 ft lbs)

c) Timing gear housing.

- Tighten securing screws and nuts to .... 14 to 10 mΛN (1.4 to 1.9 mkg) (10.01 to 13.75 ft lbs)

2. Crankshaft and connecting rods.

a) Crankshaft with 5 bearings.

- Diameter of journals
  - 1st possibility .... $64.04^{+0.010}_{-0.005}$ mm
  - 2nd possibility........... $63.54^{+0.010}_{-0.005}$ mm
- Diameter of crank pins
  - 1st possibility .... $54^{+0.010}_{-0.005}$ mm
  - 2nd possibility........... $53.5^{+0.010}_{-0.005}$ mm
- Crankshaft bearings :

  Bore (two possibilities) .... 64.04 and 63.54 mm

  Width.. $28.6^{+0.100}_{-0.150}$ mm

  Outside diameter.. $68.705^{+1.200}_{-0.200}$ mm

  NOTE : On all types of engines, crankshafts are made of aluminium-alloy, except on those fitted with a Borg-Warner gearbox, which are made of cupro-lead.

- End float of crankshaft .... 0.045 to 0.160 mm

  NOTE : The adjustment of the end float crankshaft is made by choosing one of the lower half-cheeks of the central bearing, except for engines fitted with a Borg-Warner gearbox, where two half-cheeks can be found *(upper and lower)* on one side, or, the other of the central bearing.

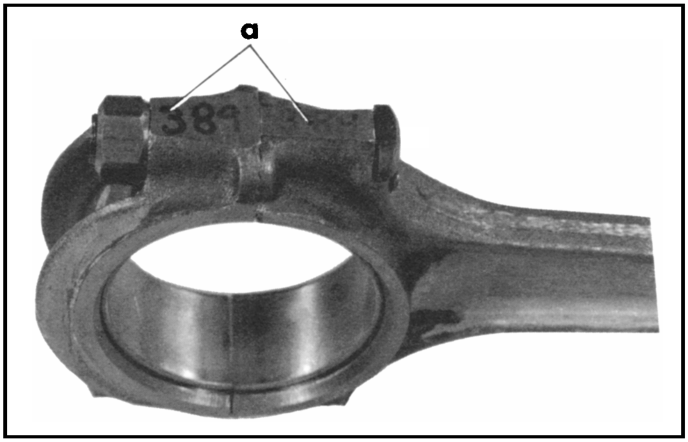
- Half-cheek of central bearing (two possibilities).......
  - 3.10 to 3.14 mm
  - 3.14 to 3.18 mm
- Tighten main bearing cap screws to........................ 90 to 100 mΛN (9 to 10 mkg) (65 to 72 ft lbs)

b) Connecting rods.

- Centre distance .... 160 ± 0.050 mm
- Bore of small end bushes.................................. $25.005^{+0.009}_{-0.003}$ mm
- Clearance of gugdeon pin in small end.................. 0.012 to 0.018 mm
- Bore of big end.. $57.69^{+0.005}_{-0.015}$ mm

- Big end bearings :
  - . Bore (two possibilities) .... 54 and 53.5 mm
  - . Width .... $25^{+0.100}_{-0.150}$ mm
  - . Outside diameter .... $57.695^{+1.200}_{-0.200}$ mm
- Diametrical clearance of connecting rods on crank pins .... 0.013 to 0.050 mm
- Weight variation of connecting rods on an engine. .... 7 g max.
- Tighten nuts on connecting rod caps to .... 68 to 75 mΛN (6.8 to 7.5 mkg) (49 to 54 ft lbs)
- Assembly : numbers marked on connecting rod bodies and caps (at « a ») .... towards camshaft

1190



Note :

↦ *2/1968* on DY-DL-DYF-DLF

↦ *10/1968* on all types except DV

The big end bearings, connecting rod and small end bush bear holes to ensure that oil is ejected to cool the underside of the piston crown.

- It is not possible, without special equipment, to change the small bushes.

3. Pistons and piston rings.

a) Pistons :

- Height of piston ring groove :

	Piston φ 93,5 mm	Piston φ 90 mm	Piston φ 86 mm
. Compression rings . Scraper rings	$2^{+0,060}_{+0,040}$ mm $2^{+0,050}_{+0,030}$ mm	$2^{+0,050}_{+0,030}$ mm	$2^{+0,045}_{+0,030}$ mm
. Oil control ring (with expander) ..	$4^{+0,040}_{+0,020}$ mm	$5^{+0,040}_{+0,020}$ mm	

- Bore (for gudgeon pin) : .... $25^{+0,010}_{+0,003}$ mm
- Gudgeon pin
  - Diameter .... $25^{\ 0}_{-0,004}$ mm
  - Length -
    - Piston φ 93,5 mm .... $81,9^{-0,100}_{-0,300}$ mm
    - Piston φ 90 mm .... $78,4^{-0,100}_{-0,300}$ mm
    - Piston φ 86 mm .... $74,4^{-0,100}_{-0,400}$ mm

b) Piston rings :

Piston ring	Qu.	Tickness (mm)	Width (mm)			Gap (mm)		
			ϕ 93.5	ϕ 90	ϕ 86	ϕ 93.5	ϕ 90	ϕ 86
Compression ring (3)	1	$2^{-0.010}_{-0.022}$	4 ± 0.12	3.9 ± 0.12	$3.82^{0}_{-0.25}$	0.35 to 0.55	0.35 to 0.55	0.20 to 0.40
Scraper ring (2)	1	$2^{-0.010}_{-0.022}$	4 ± 0.12	3.9 ± 0.12	$3.82^{0}_{-0.25}$	0.35 to 0.55	0.35 to 0.55	0.20 to 0.40
Oil control ring (1)	1	* $5^{-0.010}_{-0.022}$	2.9 ± 0.12	3 ± 0.12	$3.17^{-0}_{-0.25}$	0.25 to 0.40	0.25 to 0.40	0.20 to 0.40

* NOTE : For pistons of ϕ 93.5 mm, the thickness of the oil control ring is $4^{-0.010}_{-0.022}$ mm.

NOTE : Certain engines are fitted with simple oil control rings (1) (e.g. DV-DY-DL) or rings with expander and spring (DX-DJ). During repairs the ring with expander leaf-spring must be fitted on to all types of engine.

4. Barrels and cylinder head gasket :

a) Paper joint for base of barrel :

→| *9/1968* : Joint with packing for barrels ϕ 90 mm only.
|→ *9/1968* : Joint without packing for barrels ϕ 86 and 90 mm.
|→ *9/1971* : Joint without packing for barrels ϕ93.5 mm

b) Cylinder head gasket : two types of gasket, corresponding to the two types of joints on the barrel bases :

- Gasket *with circular seal* : to be fitted with barrel joints with packing.
- Gasket *with oval seal* : to be fitted with barrel joints without packing.

IMPORTANT : Observe this difference when changing the cylinder head gasket.

c) Pistons and barrels are matched.

5. Cylinder head :

- Original thickness .... 90 mm
- Max. bow .... 0.10 mm
- Max. regrind (surface) .... 0.10 mm

a) Valve seats :

- Valve seat angle : Inlet .... 120°
  Exhaust .... 90°
- Width of valve seat : .... 0.8 to 1.2 mm
- Nominal diameter of valve seat :
  Inlet →| *10/1968* .... 45 mm
  Inlet |→ *10/1968* .... 47 mm
  Exhaust .... 37.5 mm

b) Valve guides :

		Outside ϕ of guide	Cylinder head bore	Bore of guide
Inlet	1st possibility	$13^{+0.075}_{+0.055}$ mm	$13^{+0.023}_{-0.003}$ mm	$8^{+0.015}_{-0.010}$ mm
	2nd possibility	$13.25^{+0.075}_{+0.055}$ mm	$13.25^{+0.023}_{+0.003}$ mm	
Exhaust	1st possibility	$13^{+0.065}_{+0.045}$ mm	$13^{+0.023}_{0.003}$ mm	$8.99^{+0.015}_{-0.010}$ mm
	2nd possibility	$13.25^{+0.065}_{+0.045}$ mm	$13.25^{+0.023}_{-0.003}$ mm	

c) Changing and positioning the guides : Use instrument 3079-T.

d) Tightening torques :

- Cylinder head screws
  - 1st tightening............................30 mΛN (3 mkg) (23 ft lbs)
  - Final tightening........................60 to 65 mΛN (6 to 6.5 mkg) (43 to 47 ft lbs)

NOTE : *Observe tightening sequence.*

- Nut on exhaust rocker shaft ....21 to 28 mΛN (2.1 to 2.8 mkg) (15.19 to 20.3 ft lbs)
- Screw securing cylinder head cover..........................6 to 8 mΛN (0.5 to 0.8 mkg) (3.6 to 5.8 ft lbs)
- Nut securing closing plate ....21 to 28 mΛN (2.1 to 2.8 mkg) (15.19 to 20.3 ft lbs)

6. Valves.

a) Valves :

	INLET		EXHAUST
	All Types →| *10/1968*	All Types |→ *10/1968*	All Types
- Valve seat angle..................................	120°		90°
- Outside diameter of head	47 mm	49 mm	39 ± 0.1 mm
- Diameter of stem..................................	$7.95^{+0.015}_{0}$ mm		$8.95^{0}_{0.015}$ mm
- Total length (mm).................................	$115.47^{+0.600}_{-0.250}$	$116.05^{+0.600}_{-0.250}$	$104^{+0.550}_{-0.350}$

b) Valve springs :

	OUTER	INNER	
	All Types	All Types →| *10/1968*	All Types |→ *10/1968*
- Winding direction.............	right hand	left hand	
- Length under load............	39 mm under 28.9 ± 1.6 kg 30.5mm under 60 ± 3.2 kg	30.7 mm under 7.4 ± 0.5kg 22 mm under 12 ± 1 kg	31 mm under 12.6 ± 1 kg 22.5 mm under 25 ± 1 kg

c) Upper cups :

→| *10/1968 : The upper cups for the inlet-valve springs are different from those for the exhaust-valves. Do not confuse them.*

|→ *10/1968 : They are identical.*

d) Split cotters :

→| *10/1968 : The split cotters for the inlet valves are different from those for the exhaust valves. Do not confuse them.*

|→ *10/1968 : They are identical.*

7. Valve timing.

a) Camshaft :

- End-float.. 0.05 to 0.09 mm
- Cam lift
  - Inlet
    - →| *10/1968*.. 6.199 ± 0.02 mm
    - |→ *10/1968*.. 6.638 ± 0.02 mm
  - Exhaust.. 6.144 ± 0.02 mm

b) Cam followers :

- Diameter .... $24^{+0.05}_{-0.01}$ mm
- Lenght... $45^{+0.05}_{-1}$ mm

c) Setting :

	→| *10/1968*	|→ *10/1968*
Theoretical valve clearance	1 mm	1.1 mm
Inlet opens BTDC	5°	0° 30'
Inlet closes ABDC	37°	42° 30'
Exhaust opens BBDC	40° 30'	38° 30'
Exhaust closes ATDC	6° 30'	4° 30'

d) Engine timing :
With pistons 1 and 4 at TDC place the marks on the camshaft and crankshaft pinions opposite each other and aligned with the pinion axes.

e) Camshaft drive chain :
Clearance between tensioner and limiting device........0.1 to 0.5 mm.

f) Tightening torques :
Screw for camshaft fork..14 to 19 mΛN (1.4 to 1.9 mkg) (10.01 to 13.75 ft Ibs)
Screw securing timing gear wheel...........................14 to 19 mΛN (1.4 to 1.9 mkg) (10.01 to 13.75 ft Ibs)
Screw securing chain guide.....................................14 to 19 mΛN (1.4 to 1.9 mkg) (10.01 to 13.75 ft Ibs)
Screw securing chain tensioner............................... 9 to 11 mΛN (0.9 to 1.1 mkg) (6.5 to 7.9 ft Ibs)

8. Valve rockers.

a) Pushrods :

- Total lenght
  - Inlet......................................$189.10^{+0.3}_{-0.75}$ mm
  - Exhaust...............................$213.36^{+0.3}_{-0.75}$ mm
- Max. eccentricity...1 mm

b) Valve rocker running clearances :

HOT
- Inlet...0.20 mm (0.008 in)
- Exhaust.......................................0.25 mm (0.010 in)

COLD
- Inlet...0.15 mm
- Exhaust.......................................0.20 mm

9. Flywheel.

- Max. regrind...0.5 mm
- Tighten securing screws to....................................65 to 70 mΛN (6.5 to 7 mkg)

10. Oil circuit.

- Factory approved :
  - France :
    TOTAL GTS 20 W 50 (or GT 20 W 40)
  - Cold countries :
    TOTAL GTS 10 W 30 (or GT 10 W 30)
  - Sump capacity :
    - After draining...........................4.5 litres (8 pints Imp)
    - After dismantling or changing the filter element......................5 litres (8.8 pints Imp)
  - Difference between min. or maxi..........................1 litre ($1\frac{3}{4}$ pts)
  - Pressure : oil at 60° at 2000 rpm..........................3.8 bars min. (54 psi min)
  - Tightening torques :
    - Screw securing oil pump housing...................... 10 mΛN (1 mkg) (7 ft Ibs)
    - Pointed screw fixing pump..............................6 mΛN (0.6 mkg) (4.5 ft Ibs)
    - Screw securing pump bracket on crankshaft bearing..35 ± 5 mΛN (3.5 ± 0.5 mkg) (22-29 ft Ibs)
    - Union screw outer lubrification pipe for cylinder head..14 to 19 mΛN (1.4 to 1.9 mkg) (10.01 to 13.75 ft Ibs)
    - Oil pressure switch......................................22 mΛN (2.2 mkg) (15.91 ft Ibs)

OPERATION N° D.IE - 100-00 : *Characteristics and particular features of the engine.*

D. IE VEHICLES - ALL TYPES

I. GENERAL CHARACTERISTICS

The engines of vehicles with electronic fuel differ from those of other vehicles only in the following points :

1. Engine (type DX)

→| 10/1972

- Fiscal rating (french) . . . . 12 CV
- Number of cylinders . . . . 4 in line
- Cubic capacity . . . . 1.985 cc
- Bore . . . . 90 mm
- Stroke . . . . 85,5 mm
- Compression ratio 9/1

Type	Brake horsepower	Maximum torque
DX 3 (12 N)	139 CV SAE at 5500 rpm 125 CV DIN at 5250 rpm	20 mkg (144.66 ft lbs) at 4000 rpm (SAE) 18.7 mkg (135.25 ft lbs) at 2500 rpm (DIN)

|→ 10/1972

- Fiscal rating (french) . . . . 13 CV
- Number of cylinders . . . . 4 in line
- Cubic capacity . . . . 2.350 cc
- Bore . . . . 93,5 mm
- Stroke . . . . 85, 5 mm
- Compression ratio 8,75/1

Type	Brake horsepower	Maximum torque
DX 5 (29 N)	141 CV SAE at 5750 rpm 130 CV DIN at 5500 rpm	20.5 mkg (144 ft lbs) at 4000 rpm (SAE) 19.9 mkg (140 ft lbs) at 2500 rpm (DIN)

2. Carburation

- BOSCH electronic fuel injection device.

3. Ignition

- Distributor with triggering contact cassette . . . . BOSCH ZV 11/7 A 3 A

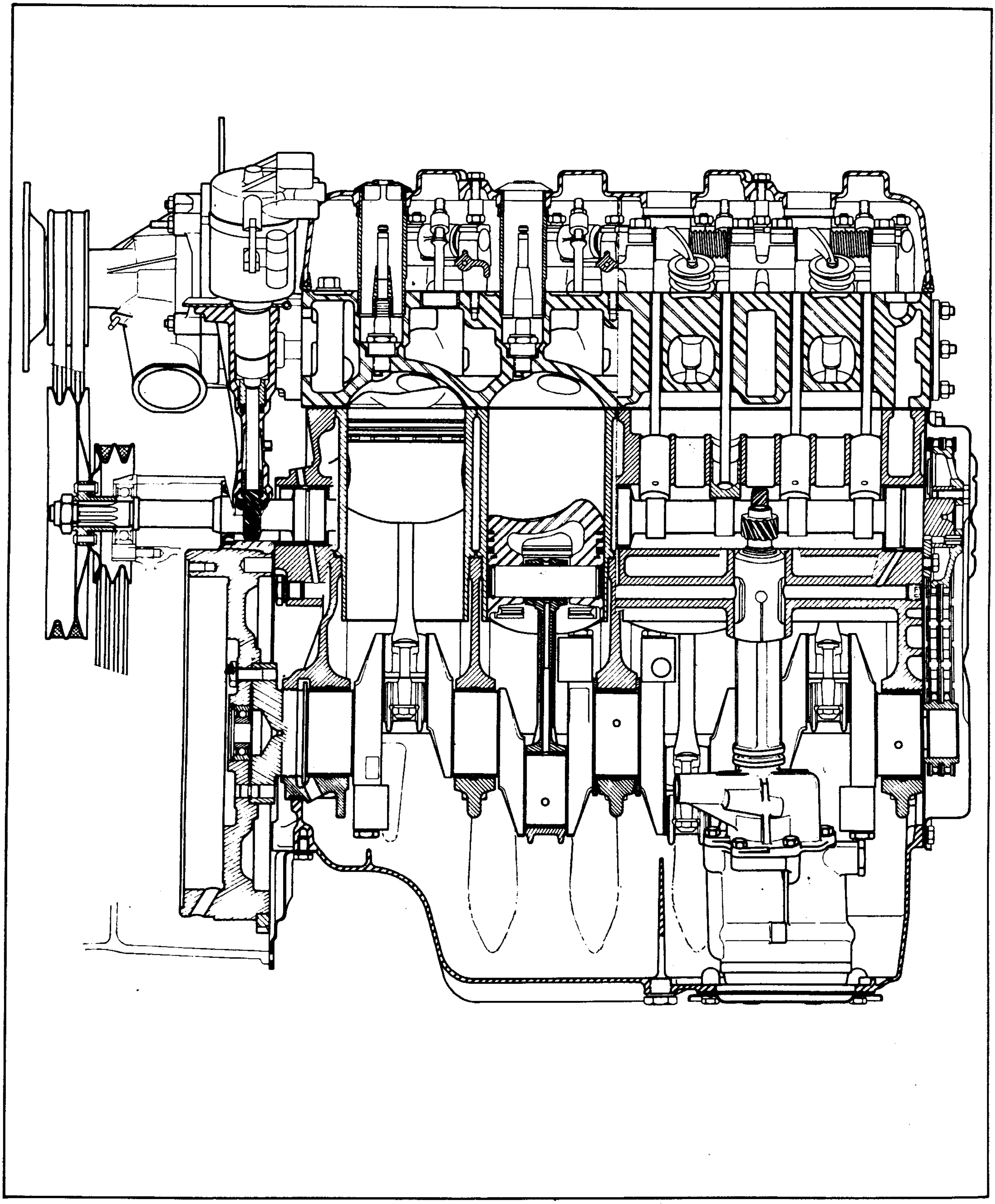
II. PARTICULAR FEATURES

- The valve rockers are adjusted *cold.*
- The crankcase is different : the oil circuit is different and includes an oil cooler. (except on DJ.IE vehicles |→ *9/1970)*

ENGINE

LONGITUDINAL SECTION

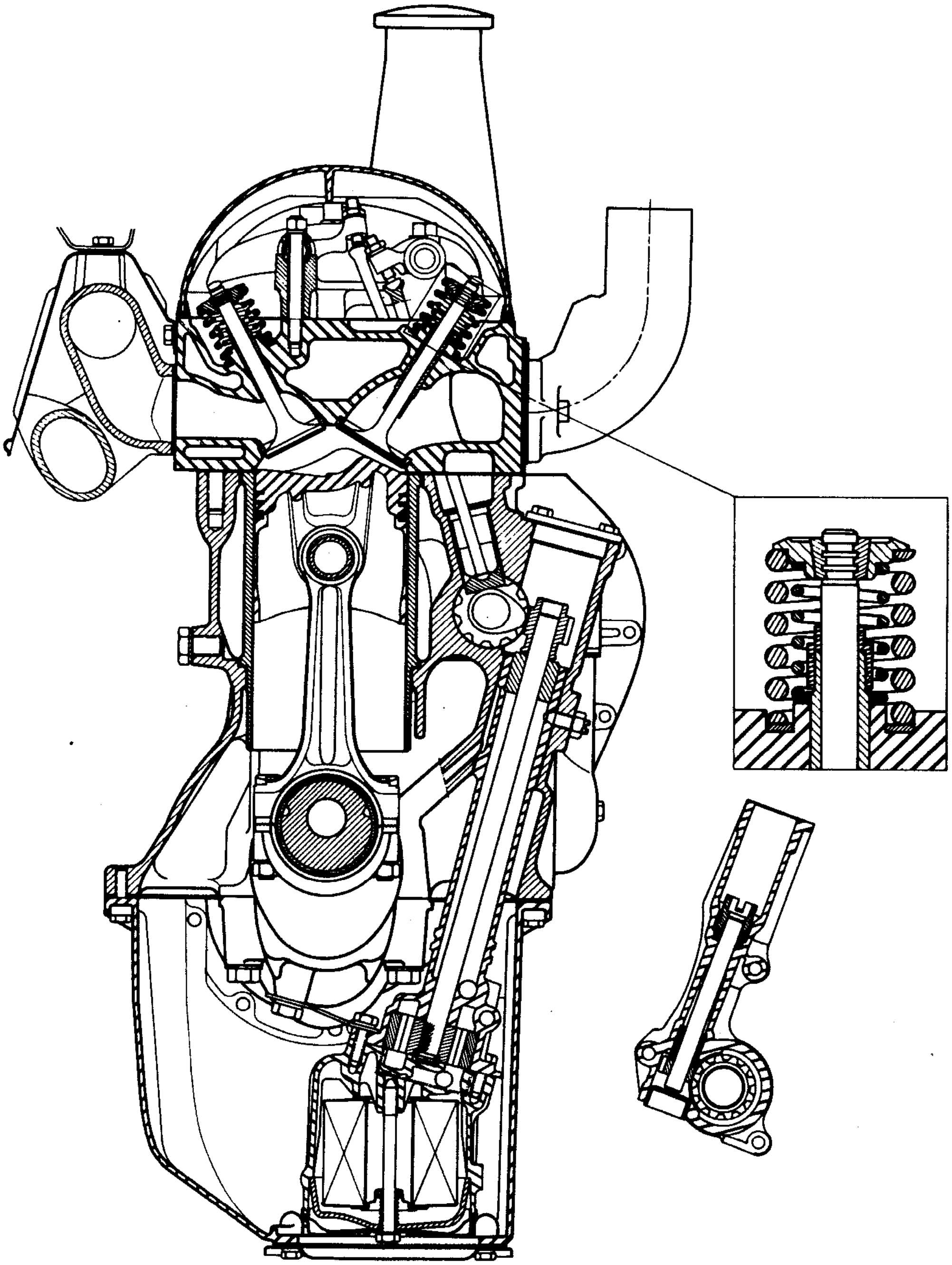
D.10-6



ENGINE

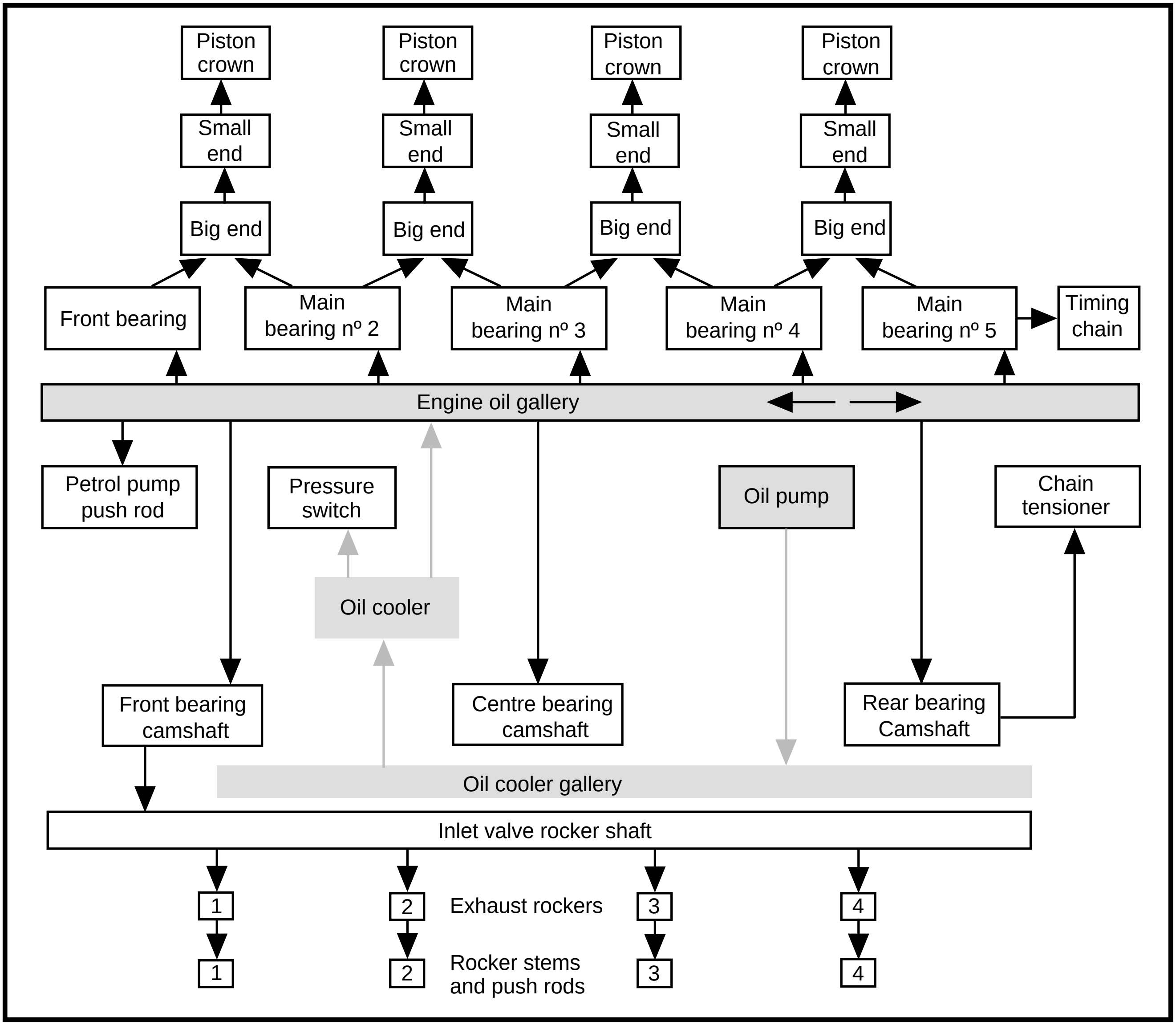
CROSS SECTION

D. 10-51



OIL CIRCULATION DIAGRAM

D.22-2

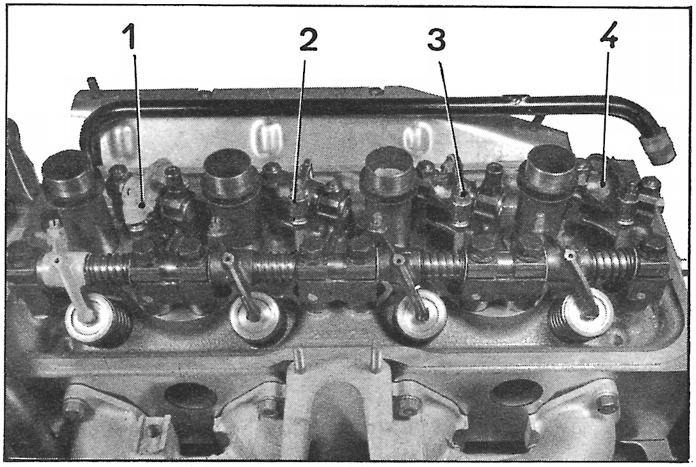


NOTE :
The cooler is no longer fitted to DJ.IE vehicles ⟼ ***1970***

ADJUSTING THE VALVE ROCKER CLEARANCES

VEHICLES ALL TYPES

1261



EXHAUST

ADJUSTMENT

1. Place the auxiliary clutch control in the engaged position. *(Hydraulic gearchange vehicles only).*

2. Disconnect the earth cable from the battery.

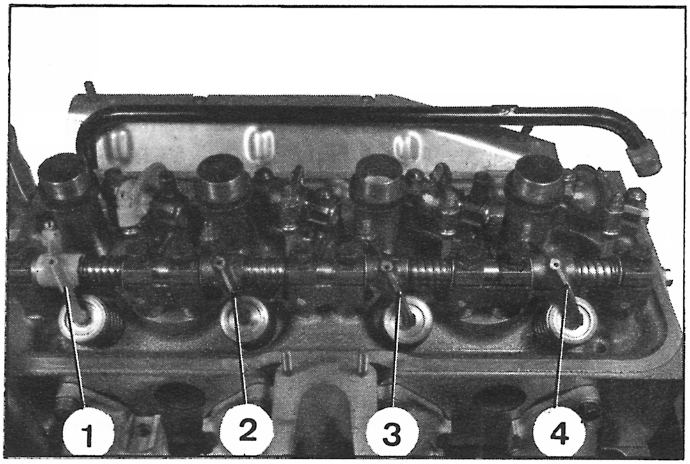
3. **Remove the cylinder head cover :**
   Disconnect the spark plug leads.
   Remove the cylinder head cover with its gasket.
   (Do not lose the seals for the spark plug wells).

4. **Adjust the clearances of the valve rockers (hot) to :**
   0,20 mm (0,008 ins) for the inlet valves
   0,25 mm (0,010 ins) for the exhaust valves

NOTE : *The adjustment is carried out while the engine is hot.*

Valve to be fully open	Adjust the valve rockers	
	Inlet	Exhaust
Exhaust 1st cylinder	3rd	4th
Exhaust 3rd cylinder	4th	2nd
Exhaust 4th cylinder	2nd	1st
Exhaust 2nd cylinder	1st	3rd

1261



INLET

a) All types of vehicle except D. bw :
Turn the engine with the starting handle, (after having operated the auxiliary clutch control, *on vehicle with hydraulic gearchange).*
b) D. bw Vehicles :
Place selector in position "P".
Turn the engine using the starter motor fed by a correctly charged 6 volt battery.

IMPORTANT : *Never try to turn the engine by the tightening nut of the camshaft pulley.*

OBSERVATION :

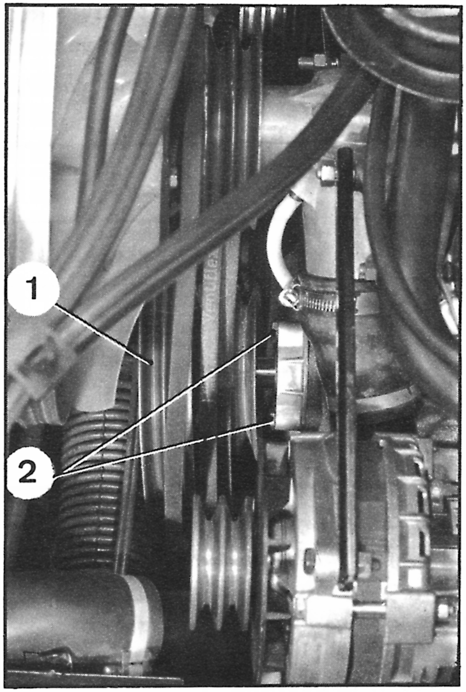
It is preferable to carry out the adjustment while the engine is hot. If it is not possible, adjust the valve rockers, engine cold, to :

0,15 mm (0,006 in) for the inlet valves
0,20 mm (0,008 in) for the exhaust valves.

5. Fit the cylinder head cover with its gasket. Make sure that the gasket is correctly positioned.
Tighten the bolts 7 mΛN (0.75 m.kg 5.4 ft.lbs). (Copper washers under the heads of the securing bolts).

6. Connect up the plug leads and the battery earth lead.

7. Put the hydraulic circuit under pressure by operating the auxiliary clutch control *(on hydraulic gearchange vehicles only).*



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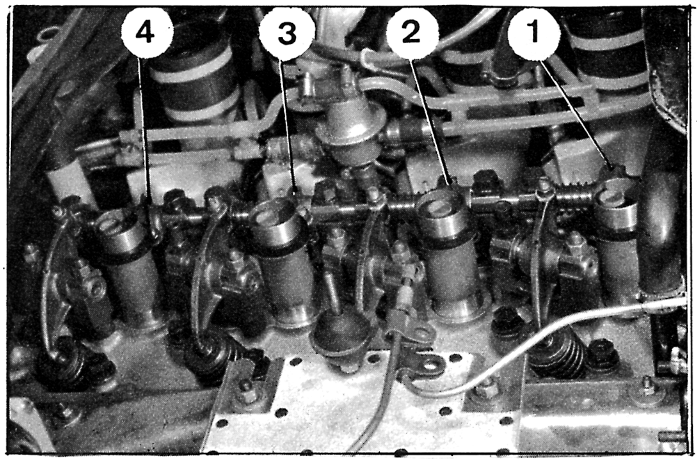
8. If valve rocker noise persits after adjustment, procede as follows :

- Remove the battery.
- Loosen the securing bolts of the alternator and the HP pump. Free the belts of the drive pulley.
- Engage the parking brake.
- Loosen the nut securing the drive pulley (1) and withdraw the pulley forwards as far as possible.
- Loosen the securing bolts (2) of the housing for the front camshaft bearing.
- Turn the crankshaft to bring the exhaust valve of cylinder 4 to full opening.
- Lock the securing bolts (2) of the bearing housing.
- Fit the drive pulley.
  Fit a new securing nut and tighten it to 72 - 80 mΛN (7 - 8 m.kg) (51 - 57 ft. lbs).
- Release the parking brake.
- Fit and tension the belts. Tighten the securing bolts of the alternator and the HP pump.
- Fit the battery and its support frame.
- Adjust the rockers as previously described (§ § 1 - 7).

ADJUSTING THE VALVE ROCKER CLEARANCES

D.IE VEHICLES ALL TYPES



INLET

1. Place the auxilary clutch control in the «engaged» position (only on vehicles with hydraulic gearchange)

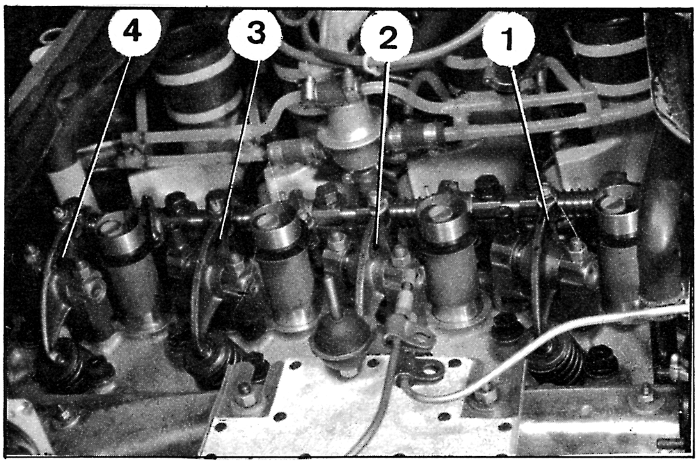
2. Disconnect the earth cable from the battery.

3: Disconnect the inlet air manifold.

4. Remove the cylinder head cover :
   Disconnect the sparking plug leads.
   Remove the cylinder head cover with its gasket (do not lose the seals for the spark plug wells)

5. Adjust the valve rocker clearances (cold) to :
   0,15 mm (0,006 in) for the inlet valve.
   0,20 mm (0,008 in) for the exhaust valve.

Valve to be fully open	Adjust the valve rockers	
	Inlet	Exhaust
Exhaust 1st cylinder	3rd cylinder	4th cylinder
Exhaust 3rd cylinder	4th cylinder	2nd cylinder
Exhaust 4th cylinder	2nd cylinder	1st cylinder
Exhaust 2nd cylinder	1st cylinder	3rd cylinder



EXHAUST

a) All types of vehicle except D. bw :
Turn over the engine using the starting handle.

b) D. bw Vehicles :
Place the selector lever in position "P".
Turn over the engine using the starter-motor fed by a correctly charged 6 volt battery.
IMPORTANT : *Never turn over the engine using the tightening nut of the camshaft pulley.*

6. Fit the cylinder head cover with its gasket.
   Check that the gasket is correctly positionned.
   Tighten the screws to 7 mΛN (0,75 m.kg) (5 1/2 ft lbs)
   (copper washers under the heads of the securing screws).

7. Fit the inlet air manifold.

8. Connect the spark plug leads and the earth cable of the battery.

9. Put the hydraulic clutch circuit under pressure by operating the auxiliary control *(only on vehicles with hydraulic gearchange).*

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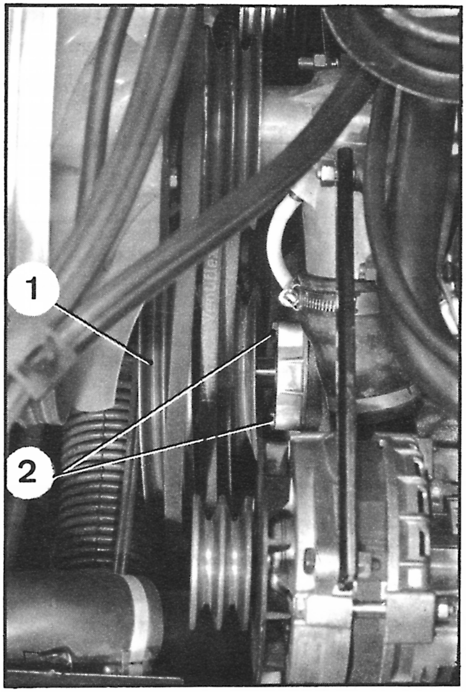

10. If valve rocker noise persists after adjustment, proceed as follows :

- Remove the battery
- Slacken the alternator and the H.P. pump mounting bolts. Disengage the belts from the drive pulley.
- Engage the parking brake
- Remove the nut securing the drive pulley (1) and withdraw the pulley as far as possible towards the front.
- Slacken the screws (2) securing the camshaft front bearing housing.
- Turn the crankshaft so that the exhaust valve of the 4th cylinder is fully open.
- Tighten the screws (2) securing the bearing housing
- Put the drive pulley in place. Fit a new securing nut and tighten it by 72 to 80 mΛN (7 to 8 mkg) (50 to 57 ft lbs)
- Release the parking brake.
- Fit and tension the belts. Tighten the securing screws and nuts on the alternator and H.P. pump.
- Fit the battery and the battery frame.
- Adjust the valve rockers as indicated in §§ 1 to 9

VEHICLES ALL TYPES

ADJUSTMENT OF THE ENGINE MOUNTINGS

(Engine out of car)

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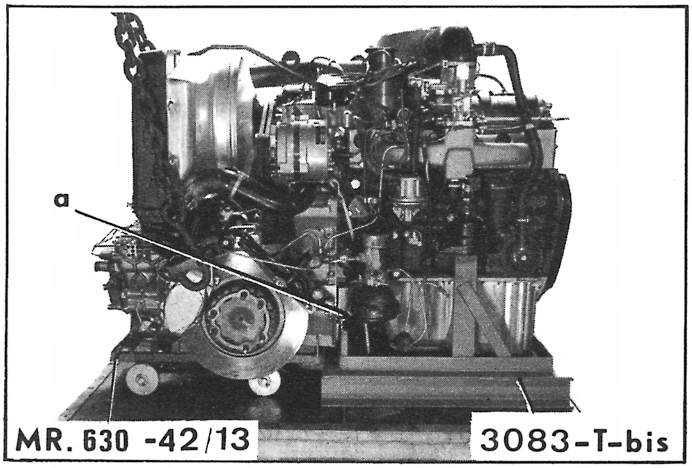

ADJUSTMENT

NOTE : The adjustment of the rear flexible mountings must be made under load; the engine complete, in running order and resting on its four support points.

1 Place the engine-gearbox assembly on stand 3083-T-bis and stand MR 630-42/13.

Raise the engine-gearbox assembly by the ends of the front crossmember, in order to free the front end of the crankcase from the engine stand at «a».

The engine gearbox assembly will then rest only on its four support points.

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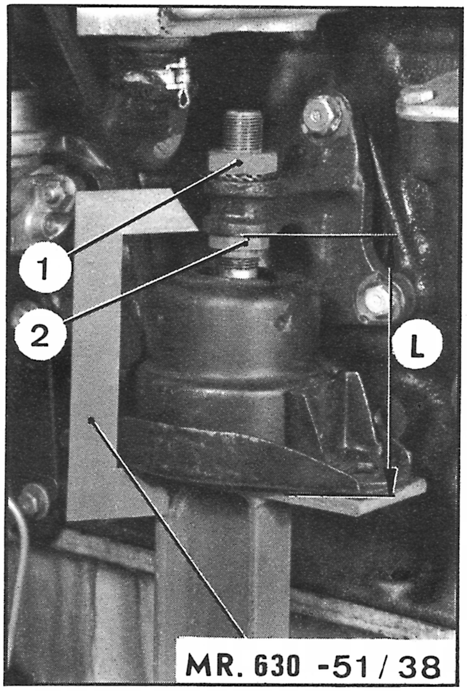


2 . Release lock-nut (1).
Adjust the nuts (2) so as to obtain a dimension $L = 91 ^{+2}_{0}$ mm on each flexible mounting (this measurement will be made by using template MR 630 -51/38).

Tighten the nuts (1) to 100 m ΛN (10 mkg) (72 ft lbs).

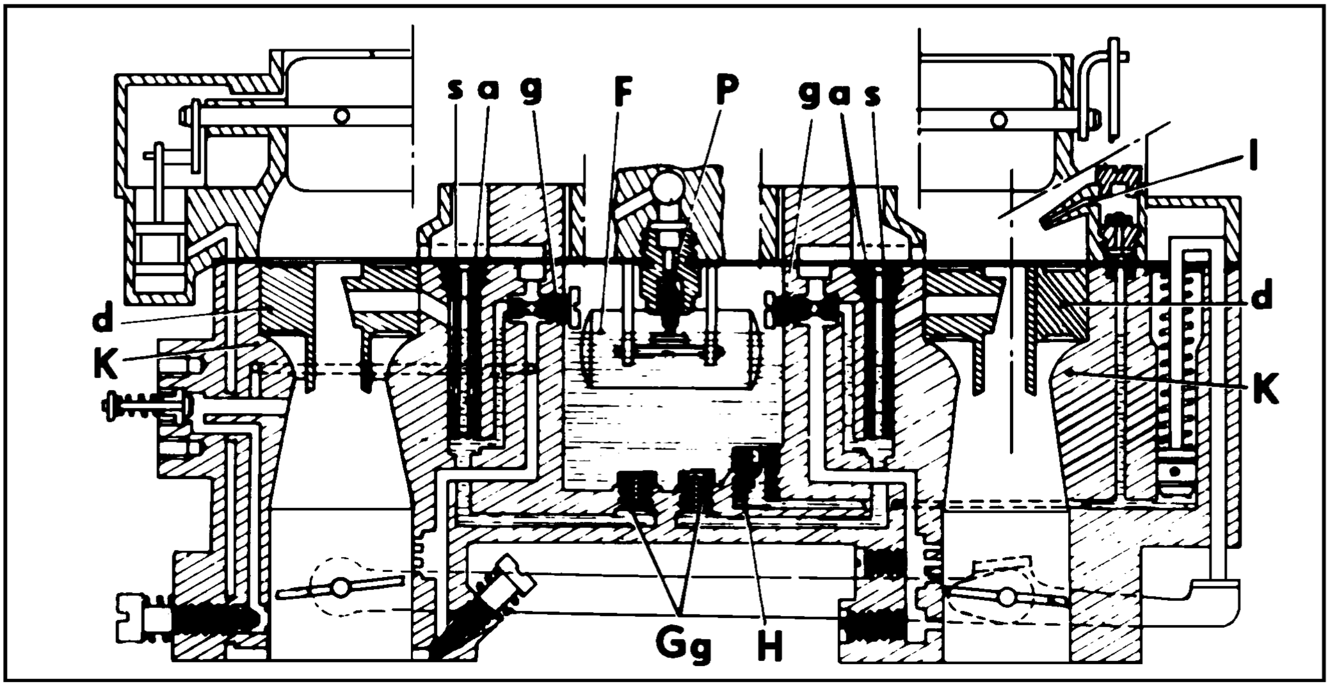
VEHICLES ALL TYPES

CARBURETTORS

CHARACTERISTICS AND PARTICULAR FEATURES

WEBER CARBURETTOR

D. 14-1



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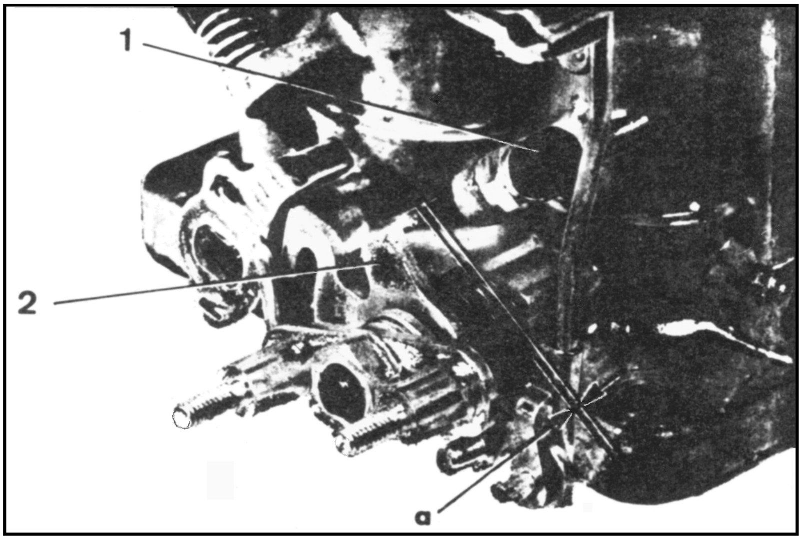

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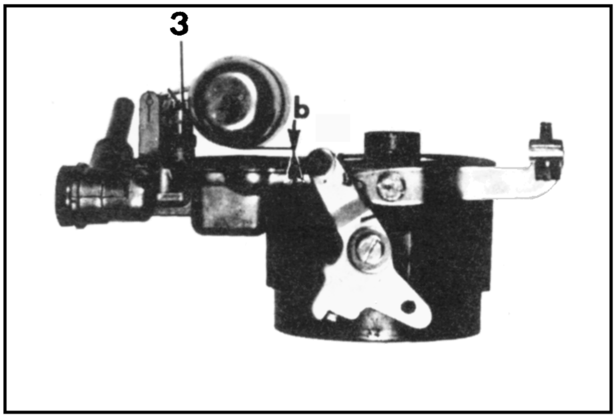

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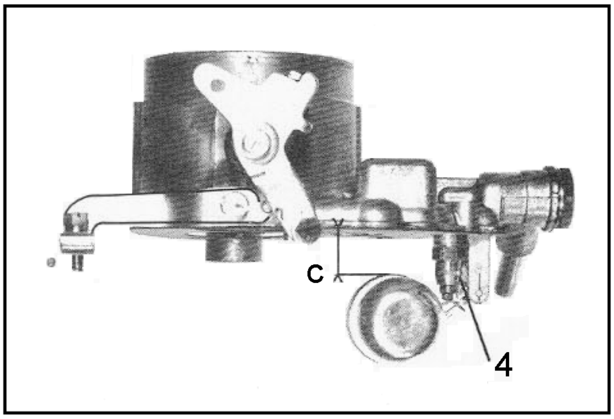


I - WEBER CARBURETTORS

1 - Characteristics :

Vehicle types		DY - DXF - DJ - DJF				DY - DYF - DL - DLF - DT			
Introduced		⇥ 10/1968		↦ 10/1968		⇥ 10/1968		↦ 10/1968	
Vehicles with hyd-gearchange *Vehicles with man-gearchange* *Vehicles with Borg-Warner*		28 X 36 DDE 28 X 36 DDE A1		28 X 36 DLE 28 X 36 DLE A1 28 X 36 DLE A5		28 X 36 DDE 2 28 X 36 DDE A2		28 X 36 DLE 2 28 X 36 DLE A 2	
Items	Key	Primary Choke	Second. Choke	Primary Choke	Second. Choke	Primary Choke	Second. Choke	Primary Choke	Second. Choke
Venturi diameter	K	23	27	23	27	23	27	20	26
Main jet	Gg	130	175	130	175	120	170	110	155
Air correction jet	a	155	155	AB	AB	140	140	AD	AA
Emulsion tube	s	F 16	F 16	F 16	F 16	F 16	F 16	F 16	F 16
Idling air jet	u	185	85	AD	AA	185	85	AD	AA
Idling jet	g	50	70	50	70 or 75*	45	55	50	70 or 75*
Progression holes dia.		80-90-120	80-90-170	80-90-120	80-90-170	80-90-120	80-90-170	80-90-120	80-90-170
Brass float (weight in gr.)	F	11	11	11	11	11	11	11	11
Needle valve	P	175	175	175	175	175	175	175	175
Accelerator pump injector	J	60	60	60	60	60	60	60	60
Accelerator pump valve	H	55	55	55	55	55	55	55	55
Diffuser	d	3,5	3,5	3,5	3,5	3,5	3,5	3,5	3,5

* *70 for man and Borg Warner - 75 for hyd.*

2 - Special points :

- Strangler flap setting :

With the strangler flap closed. and the carburettor in idling position, the distance between the point of the screw (1) (Throttle stop screw) and the lug (2) on the primary choke, must be : a = 3.8 mm.

If necessary bend the lug (2) to obtain this distance.

- Idling adjustment on primary choke

With the butterfly closed, the edge of the screw (1) in contact, turn the screw 1/3 of a turn. At this moment a feeler-gauge of 5/100 must pass between the butterfly edge and the bore.

- Adjustment of the float levels :

With the cover turned up-side down, the distance between the float and the cover gasket must be

b = 4.75 ± 0.1 mm

If it is not, adjust the tongue (3) which must, in this position, be parallel to the joint face of the cover and 19.75 mm away from the paper gasket.

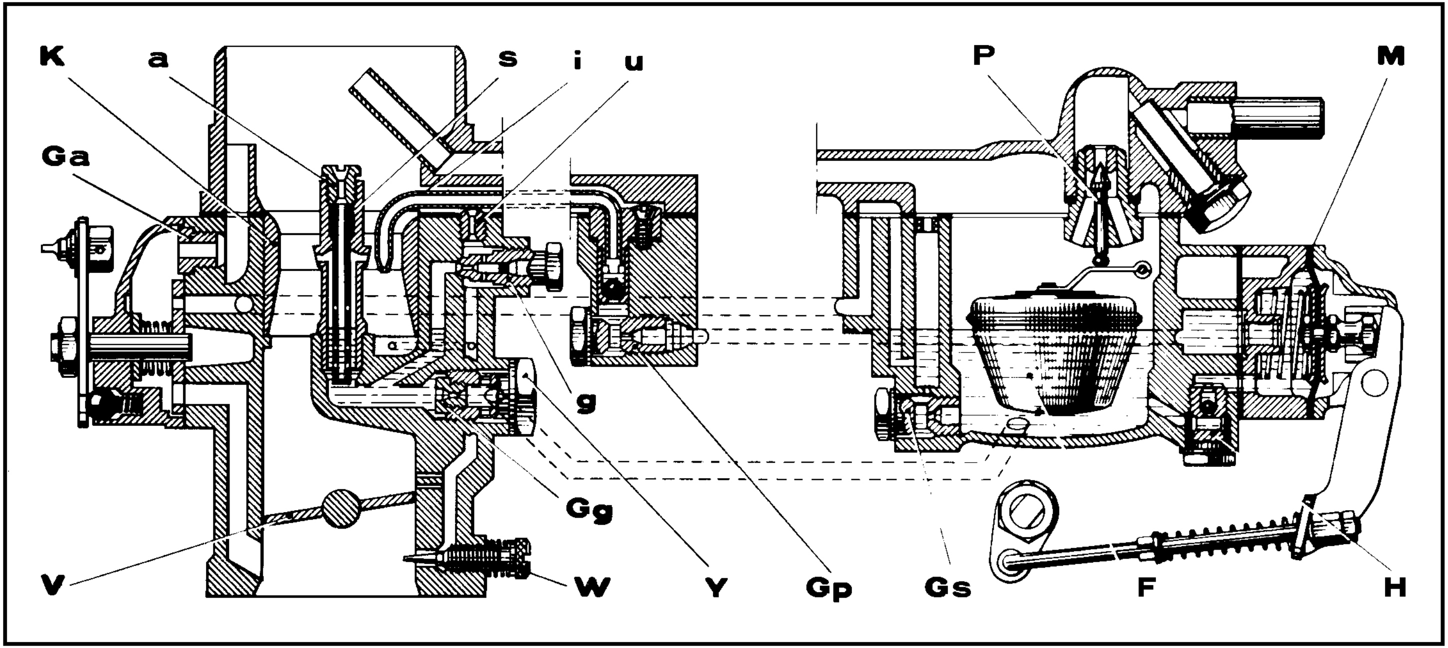
- When this cover is in its normal position, the distance between the float and the cover gasket must be :

c = 11.5 ± 0.1 mm

If it is not, adjust the tongue (4).

SOLEX CARBURETTOR

D. 14-50



II - SOLEX CARBURETTORS

1. Characteristics :

a) Vehicles DV.

Carburettor types		34 PBIC	34 PBIC 2	34 PBIC 3	32 BIC
Introduced		→| *7/1968*	→| *10/1968*	|→ *10/1968*	*Taxi Option* *
Items	Key				
Mark on choke lever		90	90 - 1	93	97
Choke tube	K	26		27	22
Main jet	Gg	135		142,5	125
Air correction jet	α	210	205	260 or AH	250 or AF
Emulsion tube N°	s	19	130	130	25
Idling jet	g	50		55	50
Idling air jet	u	130		X	
Mixture screw (type)	W	A 53		standard	
Accelerator pump (type)		72		72	without
Pump jet	Gp	50		50	without
Accelerator pump injector, low type	i	60		60	without
Starting jet	Gs	145		145	145
Nylon float (weight in g)	F	5,7		5,7	5,7
Standard needle valve	P	1,7		1,7	1,7
Progression holes		2 ϕ = 120		2ϕ=120.1ϕ=140	2 ϕ = 115
Movable air correction jet for choke	Gα	6		6	6

* *Butterfly opening limited to 9.6 mm (between butterfly edge and bore)*

b) Vehicles DE

Carburettor type 32 SDID 2		
Items	Primary choke	Secondary choke
Venturi diameter	24	26
Main jet (inverted type)	130	125
Air correction jet	155	150
Short diffuser	3.2	3.2
Progression holes	2 ϕ = 100	2 ϕ = 100
Idling jet	45	40
Idling air jet	0,80	0,80
Pump injector	45	
Econostat →| *3/1966*		80
|→ *3/1966*		60
Nylon float	7.5 g	
Needle valve with spring, seat	1.7 g	

NOTE : *Since February 1970 a certain number of DT vehicles have been fitted with SOLEX carburettors, 28 X 36 SFIF.*

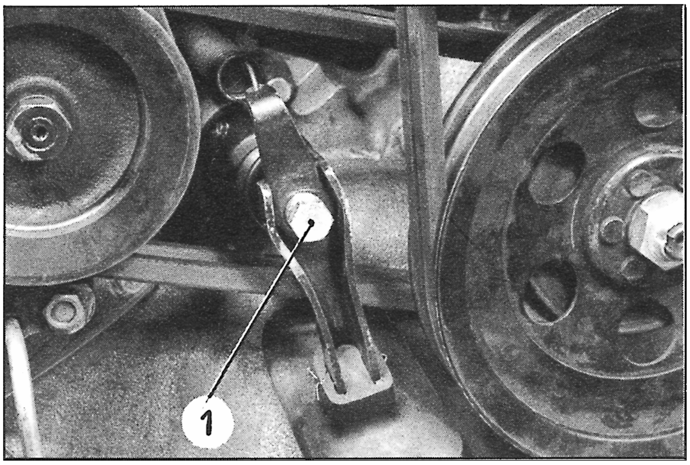
Carburettor Types	SOLEX 28 X 36 SFIF (MARK 26)	
Items	Primary choke	Secondary choke
Choke tube	20	26
Main jet	120	145
Air correction jet	1 AD	2 AA
Diffuser	N° 56 980	N° 56 980
Emulsion tube	N° 57 105	N° 57 105
Idling jet	55	65
Idling air jet	90	90
Progression holes 1st hole	90	100
2nd hole	90	100
3rd hole	110	
Nylon float	5.25 g	
Needle valve with spring	1.7	
Accelerator pump	diaphragm - type	
Upper accelerator pump injector (steel ball)	ϕ 60	
Device for cold starting	Assisted mechanical strangler flap	
Strangler flap closed : butterfly of primary choke open by	$1.40^{+0.10}_{0}$ mm	

BASIC ADJUSTMENTS.

OBSERVATIONS :

- *The basic adjustments are to be carried out when the vehicle gives an uncomfortable ride or when the engine stalls frequently.*
- *They consist of six separate operations which must of necessity be carried out completely and in the order indicated.*
- *The engine must be hot and the vehicle must have run for at least several minutes, otherwise these adjustments will change with time.*
- *The basic adjustments must be carried out with the greatest of care*

1408



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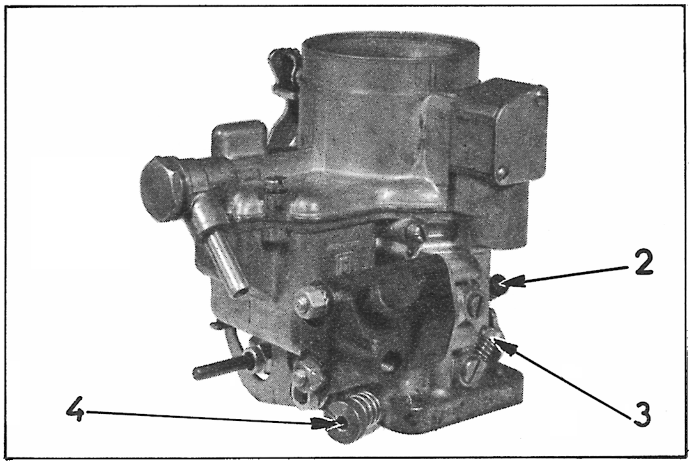

VEHICLES with HYDRAULIC GEARCHANGE.

I. ADJUSTING THE CLUTCH CLEARANCE.

1. Pre-adjustment :

NOTE : The engine must be hot. Any adjustment made with the engine cold may be incorrect when the engine is hot.

Run the engine at idling speed.

Put the starting handle extension into position.

Unscrew the adjusting screw (1) of the clutch fork by fractions of a turn, until the starting handle extension just begins to turn but may be stopped by hand.

2. Adjustment :

Tighten the screw (1) by two turns.

II. CHECKING THE CLUTCH CLEARANCE.

3. Check that the release spring on the fork is in good order and is firmly fixed.

Reduce the pressure in the cylinder by means of the auxiliary clutch control lever below the dashboard.

Check that the fork is free.

If it is not free, recommence the clutch clearance adjustment, which has probably been overdone.

III. ADJUSTING THE IDLING SPEED.

NOTE : This adjustment must be carried out when the engine is hot.

4. Screw in fully, without forcing, the accelerated idling adjusting screw (4).

5. Turn the secondary butterfly stop screw (2) to obtain a speed of :

- 550 r.p.m. approx. (vehicles ——→| 9/1968)
- 625 r.p.m. (vehicles |——→ 9/1968)

6. Turn the mixture screw (3) in one direction or the other until the point of maximum speed is reached for the butterfly opening as above.

7. Slowly unscrew the stop screw (2) until the speed is between :

- 550 and 600 r.p.m. (vehicles ——→| 9/1968)
- 625 and 675 r.p.m. (vehicles |——→ 9/1968)

Ensure that the H.P. pump does not charge while the tachometer is being read.

8. If the running is erratic, re-adjust the mixture screw (3) (do this very slowly).

NOTE : After each adjustment on the secondary butterfly adjusting screw (2) flip the throttle open slightly, with the manual clutch control in the engaged position, to ensure that the butterfly returns fully to the stop screw.

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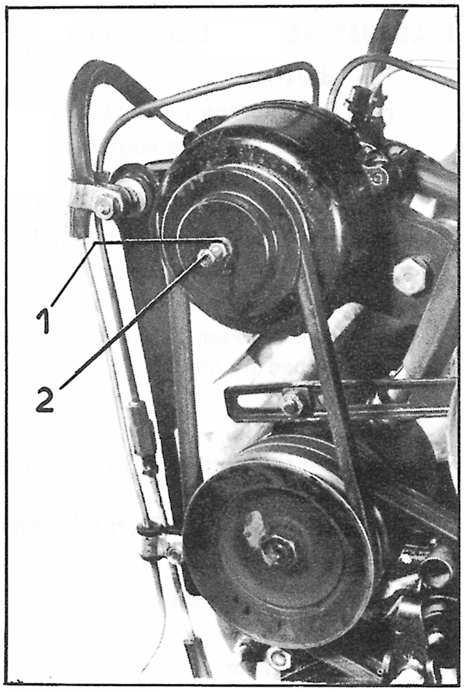

NOTE : The use of an electric tachometer (2436-T), is essential for the following operations. This tachometer is connected to the outlet terminal (red sleeve of the coil).
The electric tachometer has to be checked periodically according to amount of use.
The electric tachometer must conform to the following standards :

- dial of large diameter graduated from 0 to 1500 r.p.m. max.
- needle steady when in use.

IV. ADJUSTING THE CLUTCH DRAG SPEED.

NOTE : This adjustment must be carried out with the engine hot, and the vehicle standing on a flat, horizontal surface.

9. Start up the engine, engage first gear and accelerate very slowly. Clutch drag should commence between :
- 700 and 750 r.p.m. (vehicles →| 9/ 1968)
- 725 and 775 r.p.m. (vehicles |→ 9/ 1968)

10. If it does not, proceed as follows :
Stop the engine. Loosen the lock-nut (1) on the adjusting screw (2) of the centrifugal regulator.
If the clutch « drags » at a speed less than 700 or 725 r.p.m., tighten the screw.
Unscrew the adjusting screw if the clutch drag begins at a speed greater than 750 or 775 r.p.m.
Tighten the lock-nut (1).

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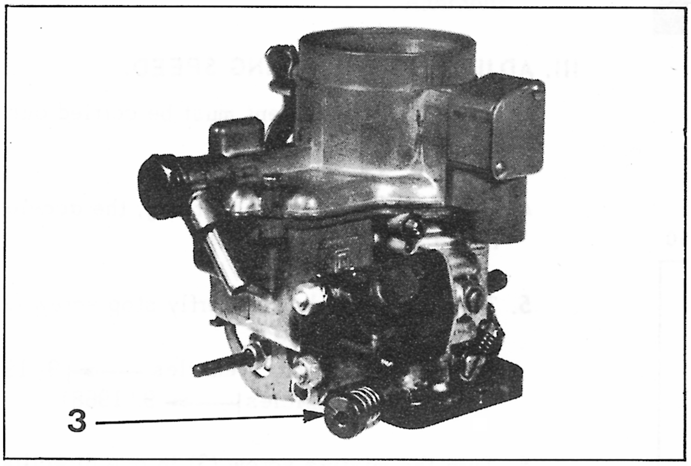

V. ADJUSTING THE ACCELERATED IDLING.

NOTE : This adjustment must be carried out with the engine hot.

11. With the engine idling : unscrew the adjusting screw (3) for accelerated idling until the speed is between :
- 875 and 925 r.p.m. (vehicles →| 9/ 1968)
- 850 and 900 r.p.m. (vehicles |→ 9/ 1968)

Ensure that the H.P. pump does not charge during the tachometer reading.

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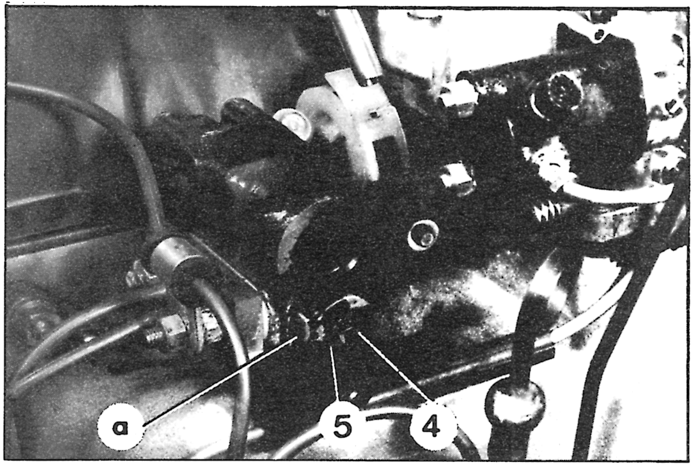

IV. ADJUSTING THE CLUTCH RE-ENGAGEMENT CONTROL.

NOTE : This adjustment must be carried out on the road with the engine hot.

12. If the clutch re-engagement time is too short, unscrew the screw (4) (anti-clockwise). If the time is too long, tighten the screw (4).
If the boss « a » contacts its stop before the correct adjustment is obtained :
- Unscrew the grub screw inside boss « a ».
- Turn the ring (5) and position it so as to afford the maximum adjustment in both directions.
- Tighten the grub screw.

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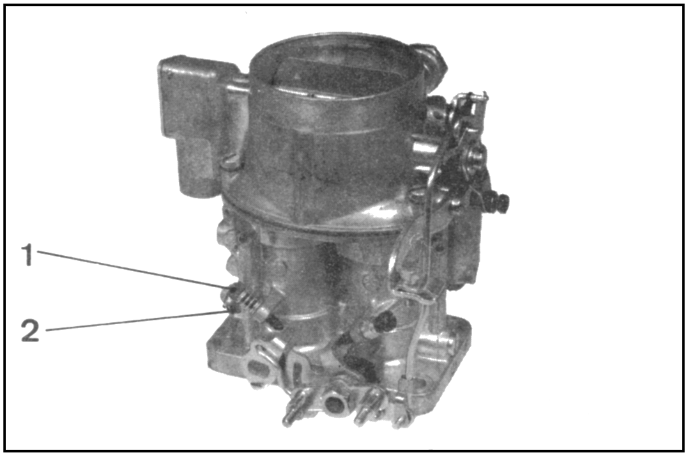

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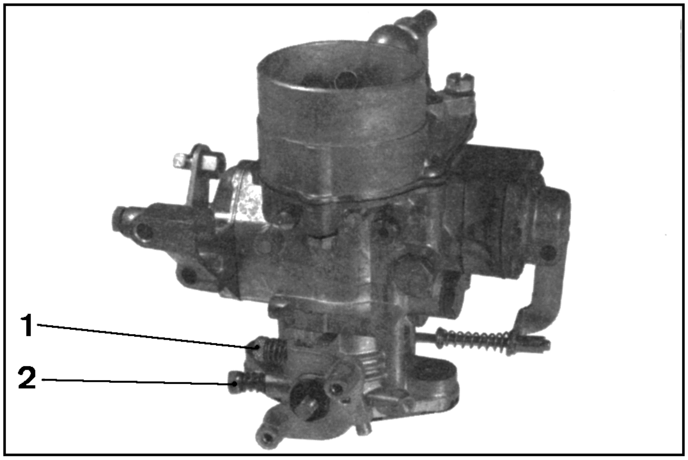
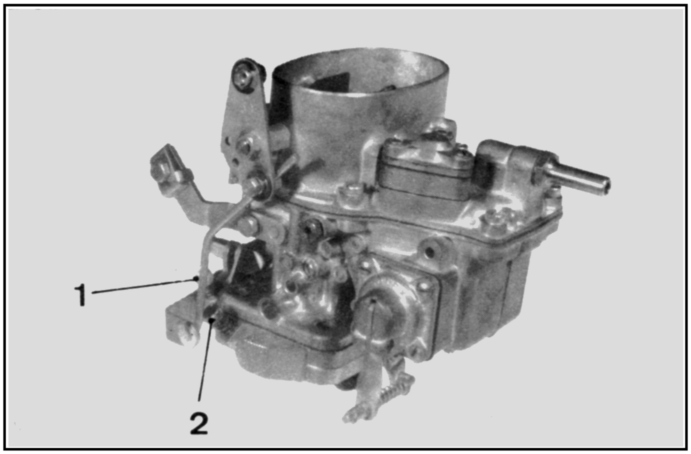




VEHICLES with MANUAL GEARCHANGE

VII. ADJUSTING THE IDLING SPEED.

NOTE :

This adjustment must be made with the engine hot.

Use of a tachometer is essential.
It must be exact and easy to read from 0 to 1500 r.p.m.

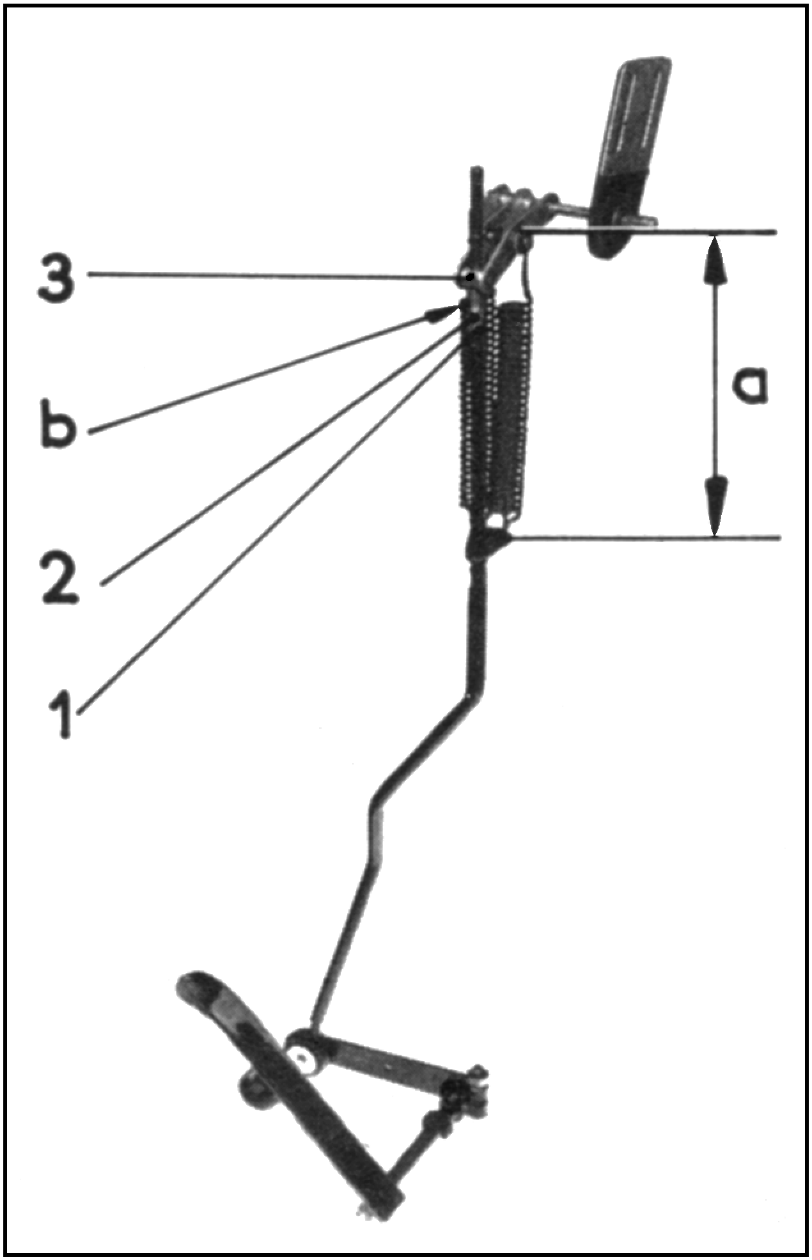
The reading is rendered incorrect during the time that the HP pump charges : wait until it has finished.
(It is possible to put the vehicle in the « low » position).

13. Turn the throttle stop screw (1) to obtain a speed of 550 r.p.m. approximately.

14. At this setting, find the maximum speed by means of the mixture screw (2).

15. Unscrew the throttle stop screw (1) slowly until the engine speed is between :
- 550 and 600 r.p.m. Vehicles →| 10/1968.
- 625 and 675 r.p.m. Vehicles |→ 10/1968.

VEHICLES ALL TYPES.



VIII. ADJUSTING THE ACCELERATOR CONTROL.

16. Check the measurement « a »; it should be : a = 135 mm.
If it is not, move the hooking plate for the accelerator return springs to obtain the measurement :

a = 135 mm.

17. a) With the accelerator pedal held fully down, open the butterfly or butterflies to the maximum and check the measurement « b » between the parts (2) and (3).
This measurement should be : b = 1-4 mm.

b) If it it not, adjust the nut and the lock-nut (1) on the accelerator control rod to obtain the correct measurement.

D. VEHICLES ALL TYPES
⟼ *September 1972*

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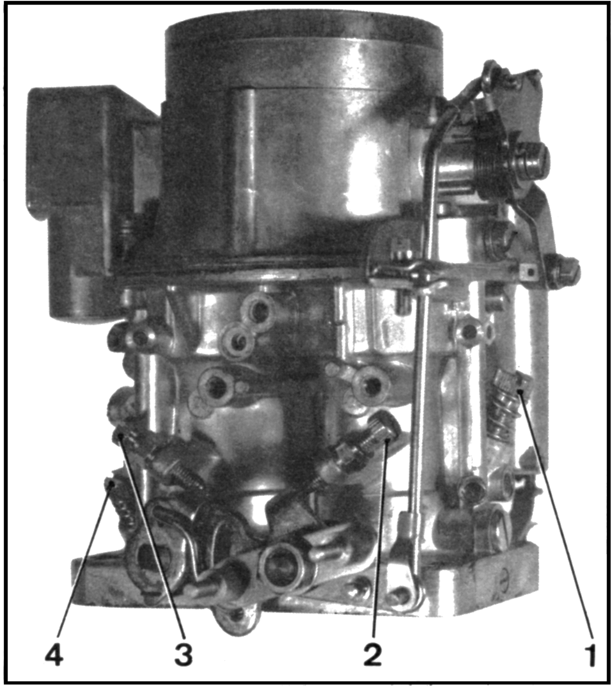

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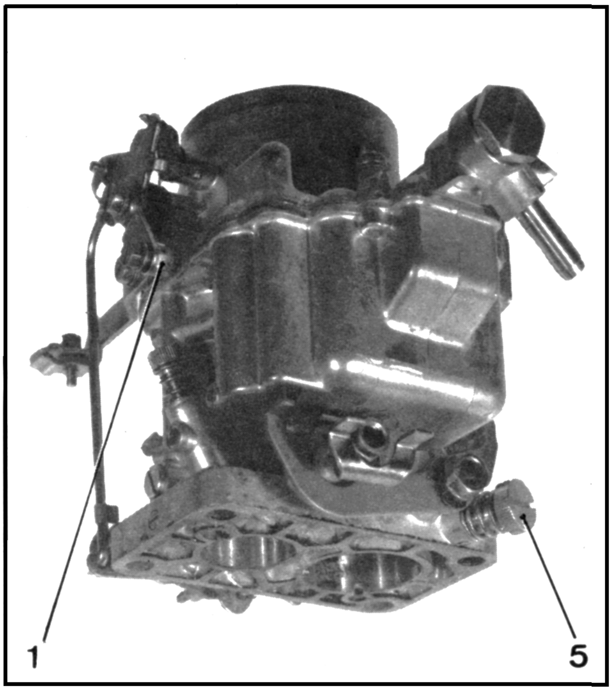


ADJUSTING THE IDLING SPEED

IMPORTANT NOTE :

On no account must the throttle stop screws (2) and (3) of the primary.and secondary throttle butterflies be altered, as these have been micrometer set by the manufacturer.

Manual 814-1

ADJUSTING THE IDLING SPEED (AND THE CO AND CO^2 MIXTURES) :

Idling adjustments must only be carried out on an engine *having the valve rockers and ignition correctly adjusted, and a clean air filter.*

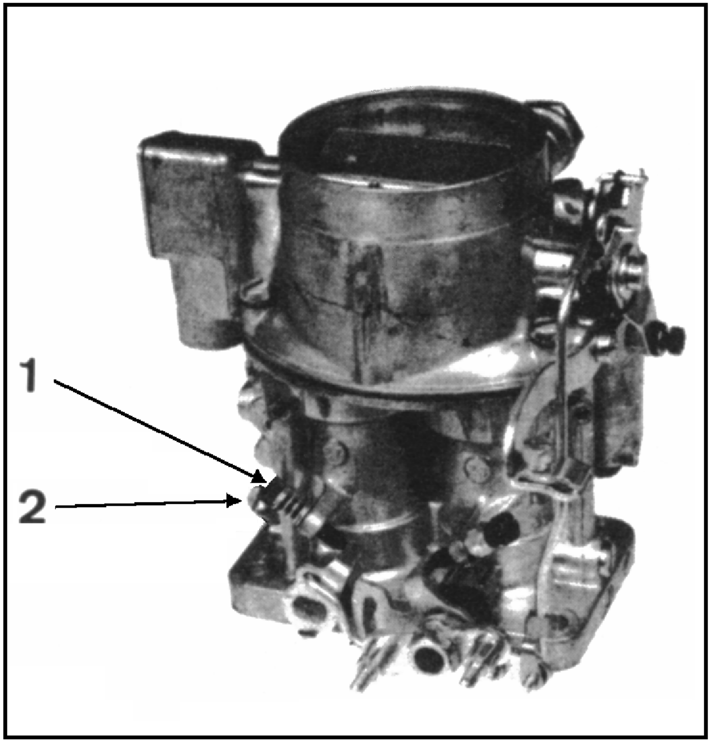
1. Ensure that the primary and secondary choke butterflies close properly.
2. Loosen the pressure regulator screw.
3. Warm up the engine to bring the *oil temperature from 70° to 80° C* (158° to 176° F). Keep this temperature during the whole of the idling adjustment operations.
4. *On DBW vehicles*, place the gear change selector in position «N» or «P».
5. Operate **the mixture screw (1)** to obtain a normal running speed, according to the model of the vehicle :
   a) *D Vehicles all types (except DBW)* : **650 ± 25 rpm**
   b) *DBW Vehicles* : **825 ± 25 rpm**
6. Operate **the rich mixture screw (4)** to obtain (use a tachmometer for CO and CO^2)::
   a) *DX-DJ-DJF Vehicles* : Mixture in carbon monoxide (CO) : 2 to 3,6 %
   : Mixture in carbonic gas (CO^2) : superior to 8 %
   b) *DP-DY-DT-DV-DLF Vehicles* : Mixture in carbon monoxide (CO) : 1.8 to 3.6 %
   : Mixture in carbonic gas (CO^2) : superior to 8.7 %

   NOTE : These mixtures in CO and CO^2 must be obtained with the engine at the correct idling speed. If necessary, operate simultaneously on the mixture screws (1) and (4). **Finally operate mixture screw (4).**

   NOTE : The authorised CO and CO^2 mixtures, correspond to an outside air temperature of between 15° and 30° (67° and 86° F)
7. *On Vehicles* with hydraulic gear change : Adjust idling screw (5) accelerate to bring the engine to a idling speed of 900 ± 25 rpm.

DBW VEHICLES

ADJUSTING THE IDLING SPEED



NOTE

This adjustment should be carried out with the engine warm.

The use of a tachometer is indispensable. It should be accurate and easily readable between 0 and 1500 r.p.m.

While reading the tachometer make sure that the H.P. pump is not working.

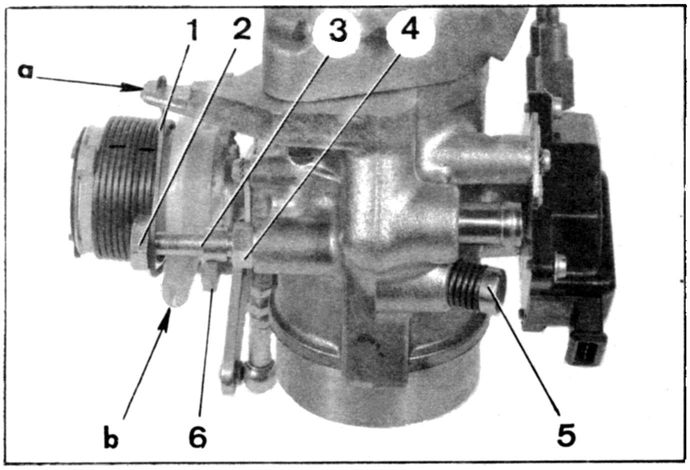
1. *Put the selector lever in the "N" or "P" position.*
2. Operate the butterfly stop screw (1) to obtain a speed of around 550 r.p.m.
3. For this adjustment find the fastest speed using the mixture screw (2).
4. Next slowly slacken the stop screw (1) then bring the engine speed to between :

800 and 850 r.p.m.

**E.F.I. VEHICLES with
HYDRAULIC GEARCHANGE**

BASIC ADJUSTMENTS.

7046



NOTE : It is essential to proceed in the following order :

I. ADJUSTING THE ACCELERATOR CONTROL AND THE THROTTLE VALVE.

1. Adjust the throttle closing :

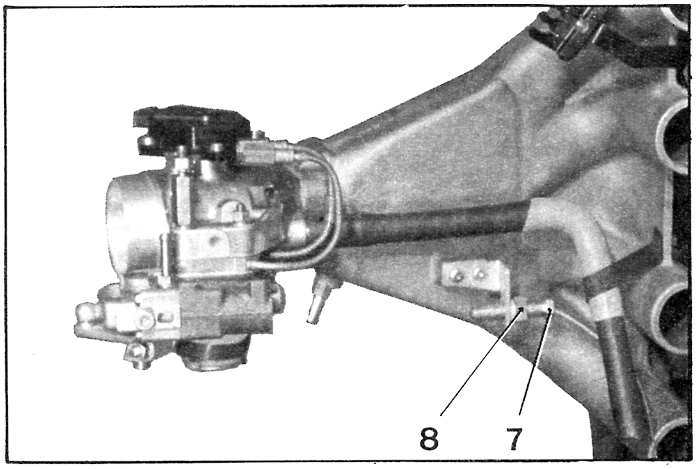
a) Detach the spring (1) from the throttle housing at « a » and disconnect the accelerator cable from the throttle control at « b ».
Hold the cable, to prevent it from slipping from its guide wheel (9).

b) Adjust the screw (2) until, with the control (6) in contact with the eccentric (3), the butterfly is on the point of sticking in the housing duct.

c) Unscrew the screw (2) slightly and tighten the lock-nut (4).

d) Connect the accelerator cable, to the control mechanism (6) at « b », and attach the spring (1) to the throttle housing at « a ».

5863



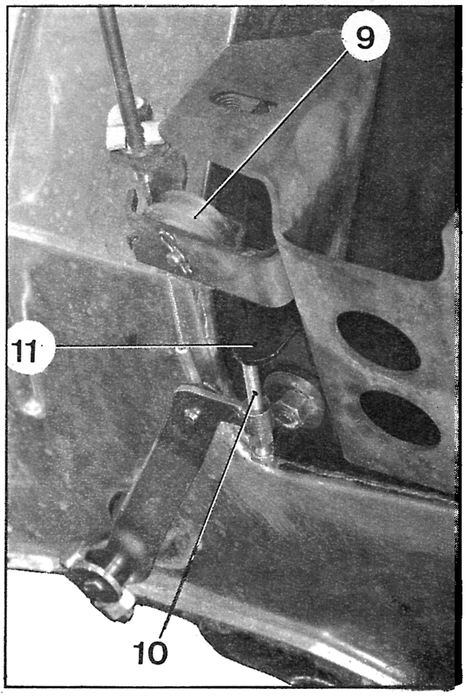
2. Adjust the accelerator control :

a) Check that the throttle opens and closes correctly. If it does not, loosen the lock-nut (8) and adjust the cable-sheath stop screw (7).

b) With the throttle closed, the clearance between the screw (10) and the stop (11) should be 1 mm.

3. Adjust the throttle spindle switch.

5767



II. ADJUSTING THE CLUTCH CLEARANCE.

4. Pre-adjustment :

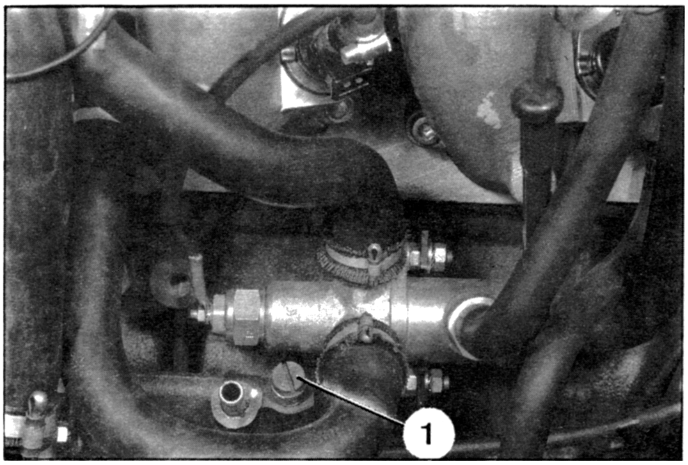
NOTE : *The engine must be hot. An adjustment made with the engine cold would be incorrect when the engine is hot.*

- Run the engine at idling speed.
- Put into position extension MR. 630-55/6 (if unavailable, use the starting handle extension).
- Unscrew the adjusting screw of the clutch fork by fractions of a turn at a time, until the extension just begins to turn but may be stopped by hand.

5. Adjustment :

Tighten the adjusting screw of the clutch fork by one turn, to one and a quarter turn.
Ensuring that the reverse gear engages without «grinding».

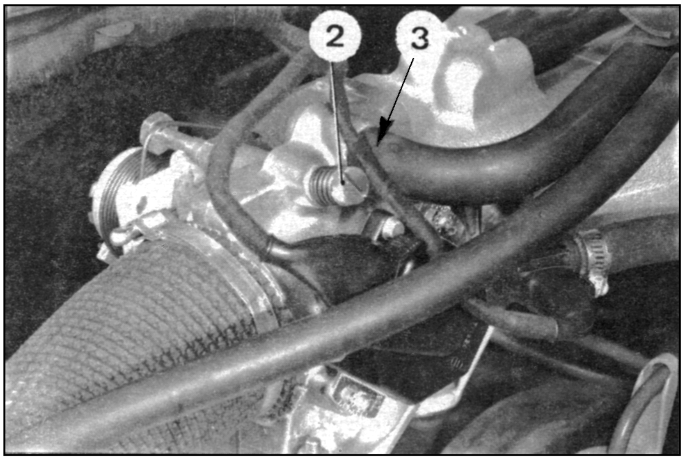
7215



III. CHECKING THE CLUTCH CLEARANCE.

6. Check that the fork release spring is in good order and correctly fitted.
- Reduce the pressure in the clutch cylinder by means of the auxiliary clutch control.
- Check that the fork is free.
- If it is not, recommence the clutch clearance adjustment which will have been overdone.

7124



IV. ADJUSTING THE IDLING SPEED.

NOTE : *This adjustment must be made with the engine hot.*

7. Screw in fully, without forcing, the accelerated idling adjusting screw (1).

8. Whilst adjusting the normal idling speed cut off the supply to the additional air control by blocking the hole (3) on the throttle valve housing, after removing the flexible pipe.

9. Adjust the screw (2) to obtain an engine speed of :

750 ± 25 rpm.

Make sure that the HP pump is not functioning whilst you read the tachometer.

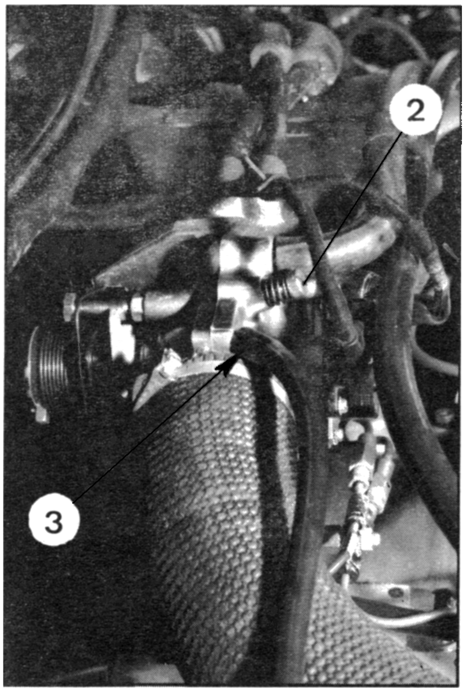
NOTE : *It is essential to use a workshop tachometer whose accuracy is checked periodically (at least once a year).*

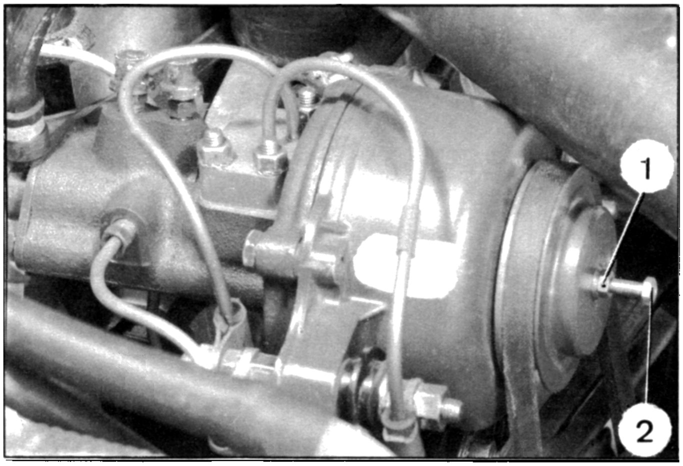
Do not use the dashboard tachometer.

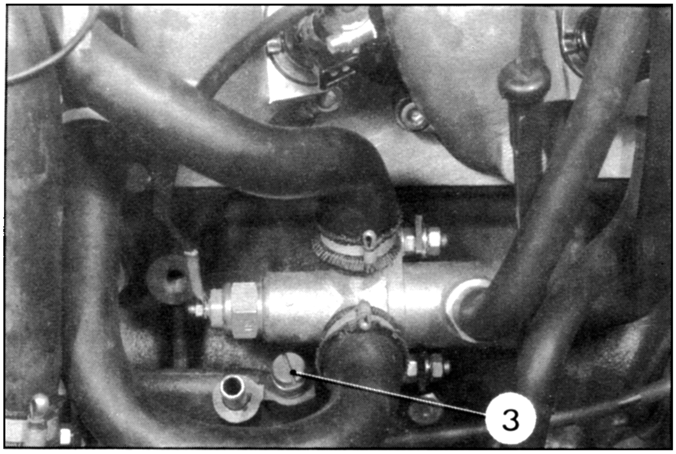
N.B. : On vehicles manufactured after March 1st 1971, the idling air circuit has been modified.

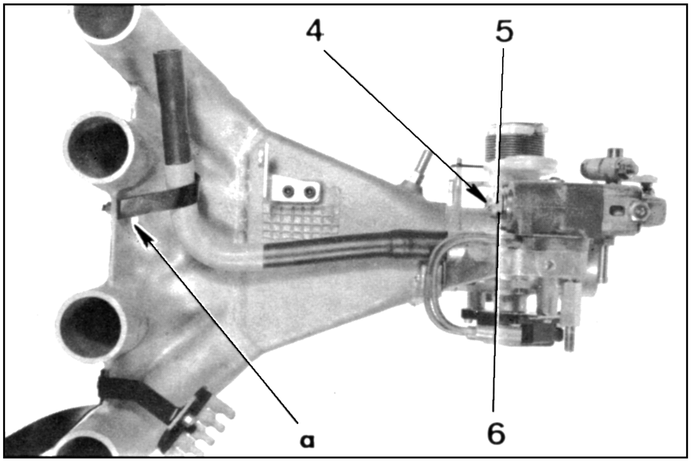
Vehicles manufactured before this date : if the regulating screw (2) becomes dirty (irregular idling), it is possible to modify these vehicles : see operation D.IE 142-6 of Manual 583-3.

5866









V. ADJUSTING THE CLUTCH DRAG SPEED.

IMPORTANT : *This adjustment must be made with the engine hot and the vehicle placed on a flat, horizontal surface.*

10. Switch on the engine, engage first gear and accelerate very slowly. Clutch drag should begin at

850 ± 25 rpm

11. If it does not, proceed as follows : stop the engine. Loosen the lock nut (1) of the regulating screw (2) on the centrifugal governor. If clutch drag begins at a speed of less than 825 rpm, tighten the screw, loosen it if clutch drag begins at a speed of more than 875 rpm
Tighten the lock nut (1)

VI. ADJUSTING THE ACCELERATED IDLING SPEEDS.

IMPORTANT : *This adjustment must be made with the engine hot.*

12. With the engine idling, undo the adjusting screw (3) For accelerated idling until a speed of 925 ± 25 rpm is obtained.
Ensure that the HP pump does not charge during the reading of the tachometer.

VII. ADJUSTING THE CLUTCH RE-ENGAGEMENT CONTROL.

NOTE : *This adjustment should be made on the road with the engine hot.*

13. If the time for re-engagement is too short, unscrew the screw (5) (anti-clockwise). If the time is too long, tighten the screw.

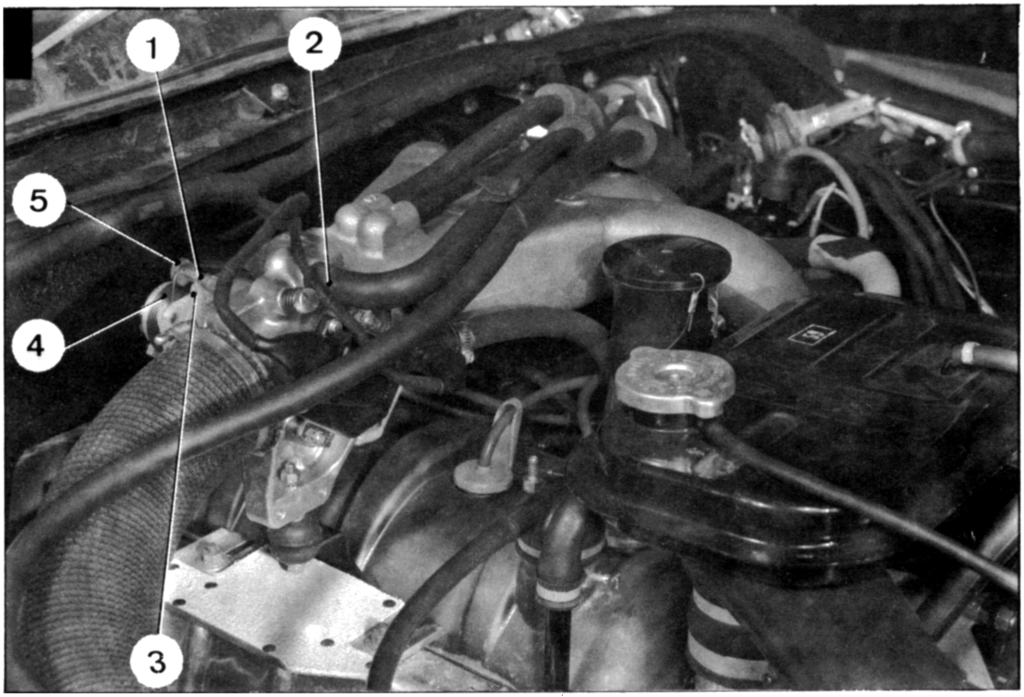
Pass a long screwdriver through the hole (a) in the manifold. If the pin contacts its stop before the correct adjustment is obtained :

- Slacken the screw locking the ring (6)
- Turn the ring (6) and position it so as to afford the maximum adjustment in both directions
- Tighten the screw.

VEHICLES with MANUAL GEARCHANGE

IDLING SPEED ADJUSTMENT

7124



NOTE : This adjustment must be made with the engine hot. Use of a workshop tachometer is essential. Do not use the dashboard tachometer.

1. Connect the electric tachometer onto the terminal «Rup» or «–» of the ignition coil.

2. Adjust the screw (2) to obtain an idling speed of 750 ± 25 r.p.m.

- *Ensure that the H.P. pump does not charge during the tachometer reading.*
- *After each adjustment of the screw (2) flip the throttle open slightly to ensure that the butterfly returns fully to its stop.*

NOTE : If the idling speed is difficult to obtain or is erractic :

Check that there is no additional air inlet between :
- the throttle-housing and the air inlet manifold.
- the air inlet manifold and the air inlet hoses.

Check :
- the adjustment :

a) - Disconnect the spring (4) from the throttle-housing, and disconnect the accelerator cable from the throttle control. Hold the cable to prevent it from slipping from its guide wheel, situated under the engine mounting.

b) - Adjust the screw (5) so that, when the control (3) is in contact with the eccentric (1), the butterfly is on the point of sticking in its housing.

c) - Unscrew the screw (5) slightly and tighten up its lock-nut.

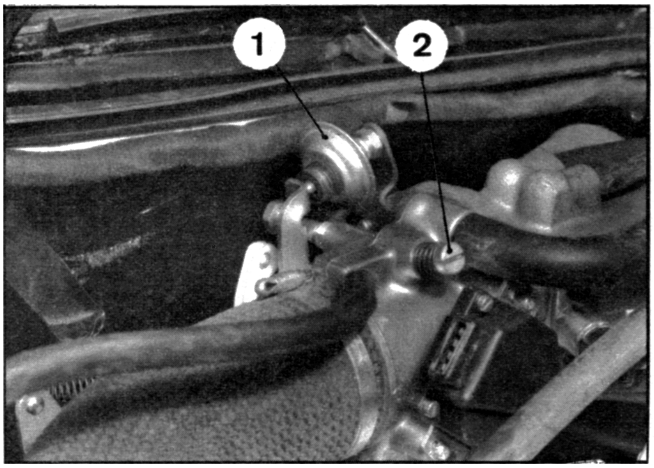
d) - Connect the accelerator cable and the spring (4).

- adjust the throttle spindle switch.(D.IE 144-0 or Op. D.IE-144-0a).
- the ignition setting (by means of a stroboscopic lamp). When the engine is turning at 1800 ± 50 rpm, check that the mark remains stable.

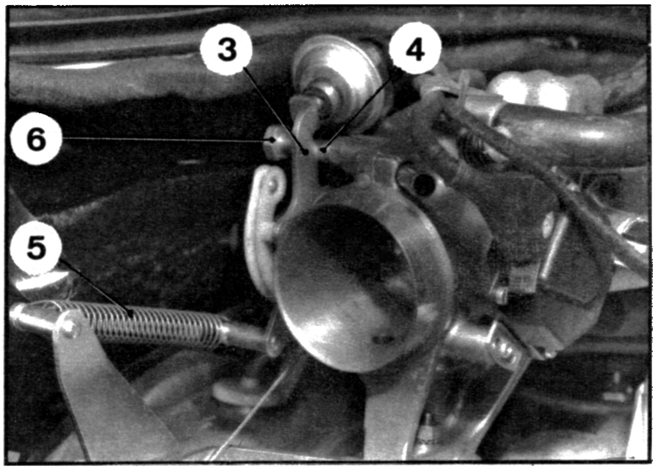
DBW. IE VEHICLES

ADJUSTING THE IDLING SPEED

10 388



10 387



NOTE : This adjustment must be made with the engine hot. Use of a workshop tachometer is essential.
-Do not use the dashboard tachometer.

1. Shunt the electric tachometer onto the terminal «RUP» or «—» of the ignition coil.

2. *Position the selector lever in the position «N» or «P».*

3. Adjust the screw (2) to obtain an idling speed of 975 ± 25 r.p.m..
- *Ensure that the H.P. pump does not charge during the tachometer reading.*
- After each adjustment of the screw (2) flip the throttle open slightly to ensure that the butterfly returns fully to its stop.

NOTE : If the idling speed is difficult to obtain or is erractic :

a) Check that there is no additional air inlet between :
- the throttle-housing and the air inlet manifold.
- the air inlet manifold and the air inlet hoses.

b) Check the adjustment of the air inlet butterfly :
- Disconnect the spring (5) from the throttle-housing, and disconnect the accelerator cable from the throttle control. Hold the cable to prevent it from slipping from its guide wheel, situated under the engine mounting.
- Adjust the screw (6) so that, when the control (3) is in contact with the eccentric (4) the butterfly is on the point of sticking in its housing.
- Unscrew the screw (6) slightly and tighten up its lock-nut.
- Connect the accelerator cable and the spring (5).

c) Adjust the throttle spindle switch (see Op. D.IE 144-0 or Op. D.IE 144-0 a).

d) Adjust the ignition setting (by means of a stroboscopic lamp). When the engine is turning at 1800 1800 ± 50 r.p.m. , check that the mark remains stable.

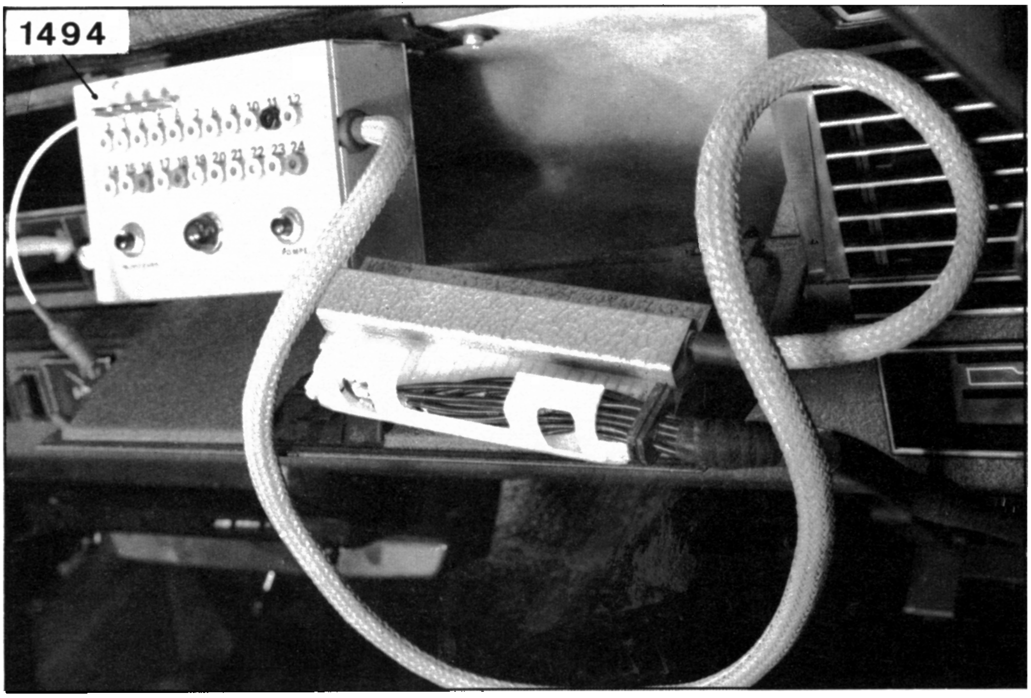
4. Check the throttle valve damper (1) :

After the engine speed has settled at 3000 r.p.m. release the accelerator pedal.
The time taken by the engine to decelerate from 2600 to 1100 r.p.m. should be *2-4 seconds.*
In order to obtain this, operate the throttle valve damper (1) on its support.

D.IE VEHICLES ALL TYPES

CHECKING THE ELECTRONIC FUEL INJECTION SYSTEM BY MEANS OF THE CITROEN 1494 TESTER, A VOLTMETER, AND AN OHMMETER

7898



NOTE : **The 1494 Tester allows each one of the components of the injection system to be checked, with the exception of the electronic control unit itself.**

This tester is sold by S.G.O.S, Company 59-63 Avenue Jean-Baptiste Clement
92100 - BOULOGNE - SUR - SEINE (Tel. 603 - 92 - 00)

Characteristics of the instruments to be used :

VOLTMETER : Resistance of the galvanometer in direct current : 10000 ohms/volt minimum, with at least two scales:

a) 0 to 3 or 5 volts D.C.
b) 0 to 15 or 30 volts D.C.

OHMMETER : Portable instrument powered by battery, **not a comparison instrument of the «Weaston Bridge» or magneto type.**

This ohmmeter should comprise :

a) A scale from 0 to 1 MΩ (1000000 ohms) minimum which will OF NECESSITY be used for checking all circuits including a contact, open or closed, i.e. to check :

- The throttle-spindle switch
- The distributor triggering contacts
- The full-load switch.

b) A scale which registers 0,1 Ω for values between 0 and 5 Ω. inclusive.

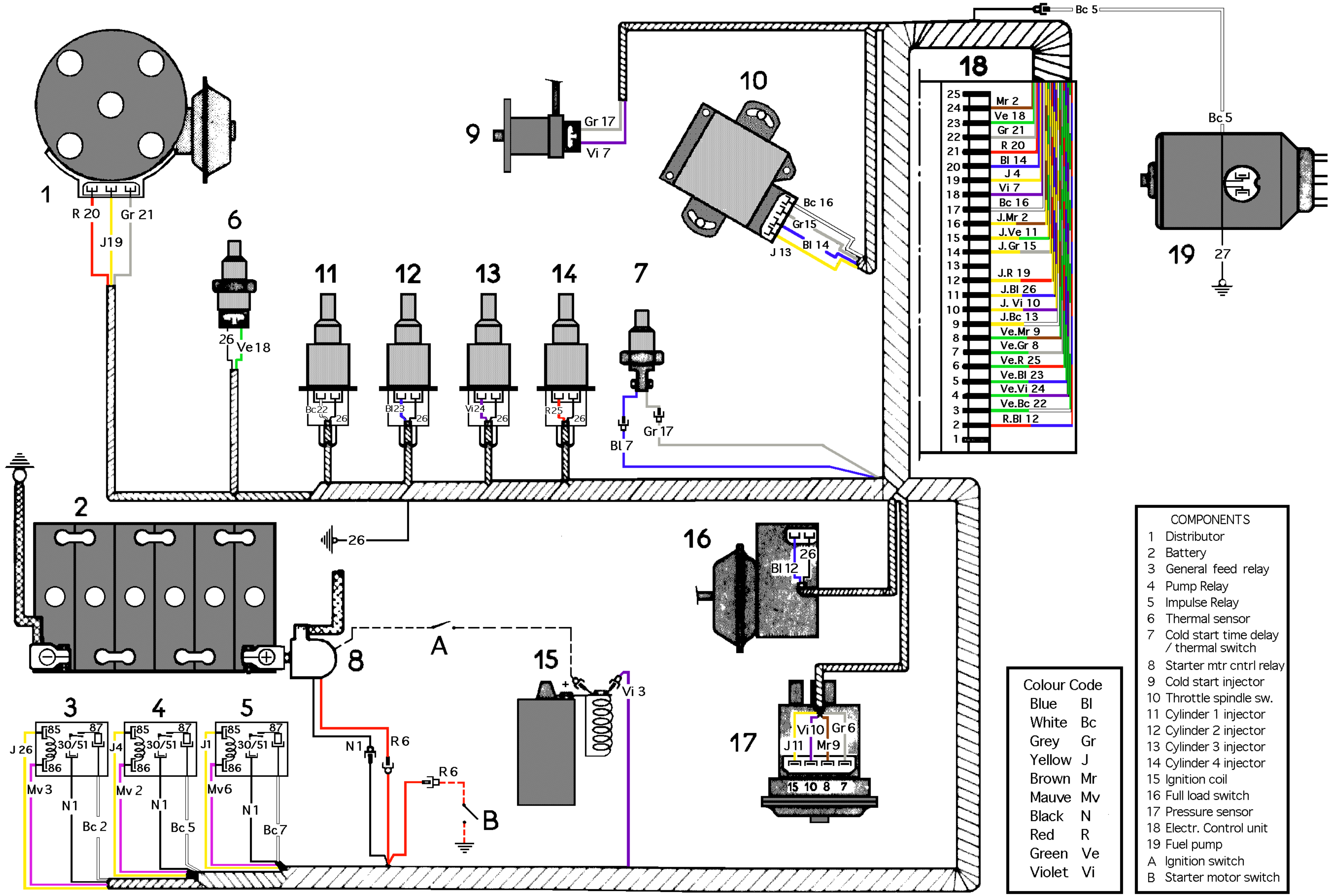
NOTE : The tester CENTRAD 819, the voltmeter-ohmmeter SOURIAU or CHAUVIN-ARNOUX C.D.A. 23, 1493 fulfils these conditions.

DIAGRAM D.IE 511-00
ELECTRONIC FUEL INJECTION SYSTEM

(DX.IE vehicles produced up to March 1970)

(see operation D.I.E 511-00)

D - 51-63 b



Colour Code

Blue	Bl
White	Bc
Grey	Gr
Yellow	J
Brown	Mr
Mauve	Mv
Black	N
Red	R
Green	Ve
Violet	Vi

COMPONENTS

1 Distributor
2 Battery
3 General feed relay
4 Pump Relay
5 Impulse Relay
6 Thermal sensor
7 Cold start time delay / thermal switch
8 Starter mtr cntrl relay
9 Cold start injector
10 Throttle spindle sw.
11 Cylinder 1 injector
12 Cylinder 2 injector
13 Cylinder 3 injector
14 Cylinder 4 injector
15 Ignition coil
16 Full load switch
17 Pressure sensor
18 Electr. Control unit
19 Fuel pump
A Ignition switch
B Starter motor switch

OPERATION N° D.IE - 144-0 : *Checking the electronic fuel injection system*

(CITROEN-TESTER 1494)

OPERATION Nº D.IE 144-0: *Checking the electronic fuel injection system.*
(CITROEN 1494 Tester)

WARNING :

Certain actions must be avoided at ail costs as they would damage the components of the electronic fuel injection system, in particular the electronic control unit :

1) ***Never use a rapid charger, and never carry out arc or spot welding on the car chassis without first having disconnected BOTH battery leads and isolated the « + » earth lead.***

2) ***Never use a test lamp lo check the continuity of a circuit.***

3) ***Never strike a spark to check whether a lead is live.***

4) ***Never start a vehicle with a voltage exceeding 12 volts.***

5) ***Never force a connector onto the unit concerned. Take note of the inhibitor chamfers.***

6) ***Only withdraw the connectors by taking hold of the sides, and never by pulling on the leads. Check that the rubber caps completely cover the connectors when these are fully inserted.***

7) ***The precautions to be taken to protect the alternator also apply in this case.***

8) ***Never alter the adjustment of the external potentiometer of one of the new control units.***

If faults occuring on the vehicle seem to be attributable to the electronic fuel injection system, it is essential to :

- Check the ignition

- Check the basic adjustments

- Check the electronic fuel injection system.

Checking the electronic fuel injection system

Preparation :

1) Check that the battery is fully charged (use a shunted voltmeter).

2) Carry out the full test procedure in the sequence stated.

3) Refer to operation D.IE 511-00 a or D.IE 511-00 or DJ. IE 511-00 or DX.IE 511-00 for identification of the various leads.

4) Remedy any faults as they are discovered before continuing the check.

5) Check the continuity of the leads by the use of the ohmmeter

(∞ indicates that the circuit is broken, 0 indicates that the circuit is correct)

6) **Check that the flat female connectors particularly those of the harness terminal blocks, are correctly fitted onto the contact blades of the various components. To check this, pull back the rubber covers on the terminal blocks ; the connectors of these must not be pushed outside the plastic casings.**

OPERATION N° D.IE - 144-0 : *Checking the electronic fuel injection system (CITROEN tester 1494)*

IMPORTANT : Before checking the electronic fuel injection system, it is essential to make sure that the control unit and the pressure sensor are correctly matched (see table below)

REPAIRING : When changing :

- *an electronic control unit :* refer to column "replacement § 1" of table below,
- *a pressure sensor :* refer to column "replacement § 2"

	ORIGINAL EQUIPMENT		REPLACEMENT COMPONENTS (essential fitting)	
DATE	CONTROL UNIT	PRESSURE SENSOR	1) CONTROL UNIT **ONLY**	2) PRESSURE SENSOR **ONLY**
from September 1969 to July 1970	*No mark* **N° DX. 144.906 A** (Ref. BOSCH N° 0.280.000.011)	*Standard* **N° DX. 144.263 A** (Ref. BOSCH N° 0.280.100.011)	- Fit a control unit **N° 5.439.822 A** *(Ref. BOSCH N° 0.280.000.042)* (or the Standard Change control unit N° 5.417.266 B) **- Keep original pressure sensor**	- Fit a *Standard* pressure sensor : **N° DX. 144.263 A** **- Keep original electronic control unit**
from July 1970 to December 1970	*Mark : 1 yellow dot* **N° DX. 144.906 A** (Ref. BOSCH N° 0.280.000.011)	*Mark : 1 black dot* **N° DX. 144.263 B** (Ref. BOSCH N° 0.280.000.023)	- Fit a control unit **N° ZC. 9.851.101 U** *(Ref. BOSCH N° 0.280.000.042)* (or the Standard Change control UNIT N° 5.439.822 A) **- Replace the original sensor** - by a *Standard* pressure sensor : **N° DX. 144.263 A**	- Fit a sensor : *1 black dot* **N° DX. 144.263 B** **- Keep original electronic control unit**
from January 1970 to April 1971	*Mark : 2 yellow dots* **N° 2 D. 5.402.234 K** (Ref. BOSCH N° 0.280.000.011)	*Mark : 1 black dot* **N° DX. 144.263 B** (Ref. BOSCH N° 0.280.100.023)		
from April 1971 to September 1972	*With external potentiometer* **N° DX. 144.906 B** (Ref. BOSCH N° 0.280.000.022) **AIR TEMPERATURE SENSOR N° 1 D 5.412.360 A**	*Standard* **N° DX. 144.263 A** (Ref. BOSCH N° 0.280.100.011)	- Fit a control unit : **N° DX. 144.906 B** *(Ref. BOSCH N° 0.280.000.022)* (or the Standard Change control unit N° 5.417.265 R) **- Keep original pressure sensor**	- Fit a *Standard* sensor : **N° DX. 144.263 A** **- Keep original electronic control unit**
Since September 1972	*With external potentiometer* **N° 5.429.447 D** (Ref. BOSCH N° 0.280.000.047 **AIR TEMPERATURE SENSOR N° 1 D 5.412.360 A**	*Mark : 1 blue dot* **N° 5.429.448 P** (Ref. BOSCH N° 0.280.100.048)	- Fit a control unit : **N° 5.429.447 D** *(Ref. BOSCH N° 280.000.047)* (or the Standard Change control unit N° 5.436.493) **- Keep original pressure sensor** *(1 blue dot)*	- Fit a sensor : *1 blue dot* **N° 5.429.448 P** *(Ref. BOSCH N° 0.280.100.048)* **- Keep original control unit**

IDENTIFICATION OF COMPONENTS : the control units and the sensors (pressure and temperature) always bear the supplier's reference number.

NOTE :

1. A pressure sensor N° DX. 144.119 A *(1 green dot)* has been fitted as a repair on a few vehicles only, this sensor is not on sale but it can be replace by pressure sensor N° DX. 144.263 B (*1 black dot)*

2. New components, the Replacement Parts Dept. supplies only three types of control units ;

a) *The control unit Nº 5.439.822 A* (Bosch Ref. N° 0280.000.042) replacing control units Nº DX. 144.906 A *(unmarked or with 1 yellow dot)* and N° 2 D 5.402.234 K *(2 yellow dots).*
IMPORTANT : With control unit N° 5.439.822 A :
- a standard pressure sensor N° DX. 144.263 A **must be fitted**
- **never fit** an air temperature sensor.

b) *The control unit Nº DX. 144.906 B* (Bosch Ref. N° 02.800.000.22) replacing on identical control unit.

c) *The control unit Nº 5.429.447 D* (Bosch Ref. N° 0.280.000.047) replacing an identical control unit.

NOTE : These three control units are fitted with an externally controlled potentiometer : *never alter its adjustment.*

FIRST PART

The following checks are to be carried out with the electronic control unit disconnected.

Remove the electronic control unit.

Disconnect the harness terminal block from the electronic control unit and check, by the sleeves that the leads of the 25 way terminal block are in the correct position, referring to the wiring diagrams on pages 17 or 18 and to the table on page 19, same operation.

Connect the terminal block of the CITROEN TESTER 1494 to the terminal block of the injection system harness.

Operations to be carried out	Additional checks to be carried out if the value stated is not obtained
1: Check the feed voltage of the electronic control unit :	
- *Switch on the ignition* (disconnect the lead «-» or «RUP» terminal from the ignition coil to prevent the coil from heating). - Connect the voltmeter (0-15 V scale) a) The «-» at terminal (11) of the tester (earth) The «+» at terminal 16 of the tester The voltmeter should read **11 to 12.5 volts.**	a) *If the voltmeter indicates no voltage :* Check whether there is any voltage at terminals 30/51 , 86, 87 of general feed relay (3), using a separate voltmeter. - terminal 30/51 : If voltage = 0. The lead black 1 from the starter motor relay (8) to terminal 30/51 of general feed relay (3) is O/C or disconnected. - terminal 86 : If voltage = 0 : . The ignition switch A is defective . Or one of the excitation leads on relay (3) is O/C or disconnected. - either the feed wire from the coil (15) to terminal (15) of the vehicle harness. - or the lead Violet 3 from the coil (15) to terminal 86 of the relay (3) (3) (mauve). - terminal 87 : If voltage = 0. The general feed relay (3) is not operating. . Lead yellow 26 from terminal 85 of the relay (3) to earth 26, on regulator, O/C or disconnected. . Relay is defective. - If there is voltage at terminals 30/51, 86, 87 of relay (3) : . Lead white (2) from terminal 87 of relay (3) to yellow-brown 2 of electronic control unit (18) terminal 16 is O/C or disconnected. . Lead yellow-blue 26 from electronic control unit (18) to terminal 11 to earth 26 on the regulator is O/C or disconnected. b) *If the voltmeter indicates less than 11 volts.* 1) Check whether there is any contact resistance in the leads : - Black 1 from starter motor relay (8) to terminal 30/51 of relay (3). - White 2 from terminal 87 of relay (3) to terminal 16, yellow-brown 2 of electronic control unit (18). - Yellow-blue 26 from electronic control unit (18) to earth 26 on the regulator. 2) Using a separate voltmeter, check whether there is any contact resistance at the points of general feed relay (3) (voltage drop between terminals 30/51 and 87).

Operations to be carried out	Additional checks to be carried out if the value stated is not obtained
b) The «-» at terminal **11** of the tester (earth). The «+» at terminal **24** of the tester. Voltmeter should read **11 to 12.5** volts. Switch off the ignition (connect the lead to the coil)	Check lead white 2 from terminal 87 of general feed relay (3) to brown 2 of the electronic control unit (18) terminal 24.
2. Check the starting voltage	
Connect the voltmeter (e.g. 0-15 volt scale). - the «-» at terminal **11** (earth) - the «+» at terminal **18.** *Operate the starter motor control* Voltmeter must read **9 volts min.**	a) *If the voltmeter shows no voltage, but the starter operates :* Check whether there is any voltage at terminals 30/51 and 85 of impulse relay (5). Terminal 30/51 : if no voltage . The lead black 1 from starter relay (8) to black 1 terminal 30/51 of relay (5) is O/C or disconnected. Terminal 85 : if no voltage. The lead black 1 from starter relay (8) to yellow 1 terminal 85 of relay (5) is O/C or disconnected. Check the lead mauve 6 from terminal 86 of the relay (5) to connection of red 6 with vehicle wiring harness. (lead from starter switch B). Check whether there is voltage at terminal 87 of relay (5). If voltage is 0 when the starter motor is operated, replace the impulse relay (5). Check lead, white 7, from relay (5) terminal 87 to violet 7 of the electronic control unit (18) terminal 18 (O/C or disconnected). b) *If the voltmeter shows no voltage and the starter does not operate :* In addition to the above test : - The starter motor switch B and the starter relay (8) - The lead red 6 from the injection system harness to the starter motor switch B - The starter switch earth through the charge warning light relay (terminal L on regulator). - The starter motor c) *If the voltmeter indicates less than 9 volts :* - Check the voltage drop across the contacts of the starter motor relay (8) and in the connection of the starter motor feed cable on the solenoid. Use a separate voltmeter and measure the voltage at the «+» terminal of the solenoid when the starter motor is operated. - Check the voltage drop across the contacts of the impulse relay (5). Use a separate voltmeter and check the voltage at terminal 30/51 and the voltage at terminal 87 of the impulse relay (5) : The voltage at terminal 87 of the impulse relay (5) must be the same as that at terminal 18 of the electronic control unit (read on the tester volt scale); if it is not, the lead white 7 from terminal 87 of the impulse relay (5) to violet 7 of terminal 18 of the electronic control unit has a high resistance. - Check the starter motor.

DJ.IE VEHICLES *manufactured since 26th April 1971*

On these vehicles, the starter motor and impulsion relays are no longer fitted (for the identification of the **leads**, refer to the diagrams showing the principles on the following page and to operation DJ.IE 511-00).

For these vehicles, the checking of the starting voltage is as follows :

(refer to diagram DJ.IE 511-00 and to the lead identification table on page 21).

2. Checking the starting voltage

(DJ.IE 4/1971

Connect the voltmeter
(e.g 0 - 15 v scale)
- Negative to terminal **11** (earth)
- Positive to terminal **18**

Activate the starter motor.

Should read 9 volts minimum

a) The starter motor works and the voltmeter shows no voltage :

Check :
- the shunt, on the leads marked Mv 18 and Bc 18
- the lead (Bc 18, **18**) from the shunt to terminal **18** of the electronic control unit (18) (interrupted)

b) The voltmeter shows no tension and the starter motor does not work :

In addition to the previous check test :
- the supply lead of starter switch B
  (Free lead to the supply lead of the light switch).
- the starter switch B
- the connecting lead R 18 from the harness of the electronic fuel injection system to the starter **switch** B
- the starter motor.

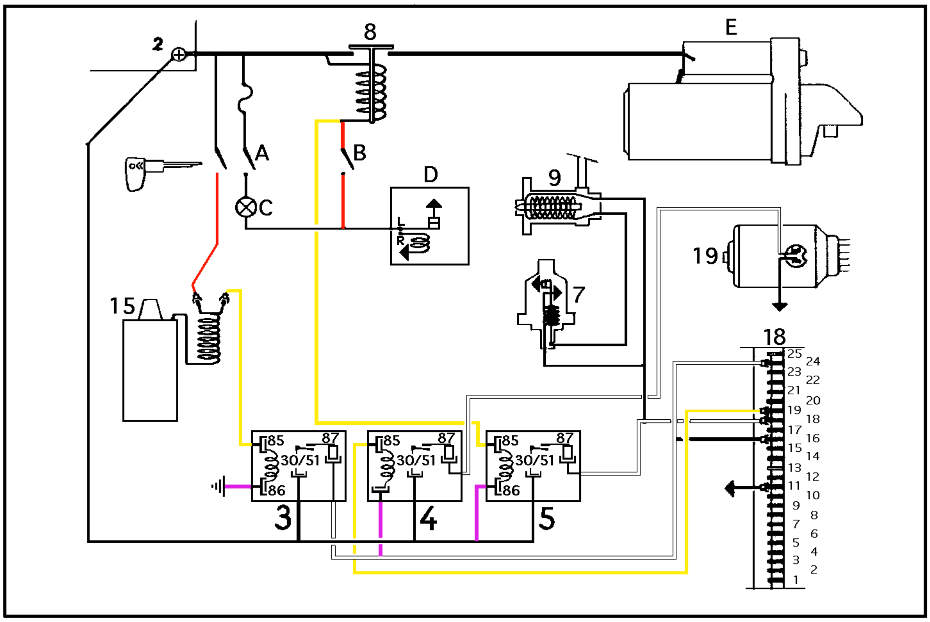
c) The voltmeter shows a voltage of less than 9 volts :

- Check the voltage drop in the **connection** of the **starter motor** supply cable. Use the voltmeter to **measure** the voltage **at the** "+" terminal of the battery and the voltage **at the "+" terminal** of the solenoid, when the **starter motor is activated.**
  - Check the voltage drop in **the connections** :
    - of the starter switch **supply lead** B
      (Free lead onto the light **switch supply lead)**
    - the contacts of the starter **switch** B
    - the connecting lead R 18 from **the harness of the electronic** fuel injection system **to the starter switch B**
    - the lead (Bc. 18, **18**) **of the shunt to the terminal 18 of the** electronic control unit (18).

Manual 814-1

DIAGRAMS SHOWING THE PRINCIPLES OF THE STARTER MOTOR CONTROL

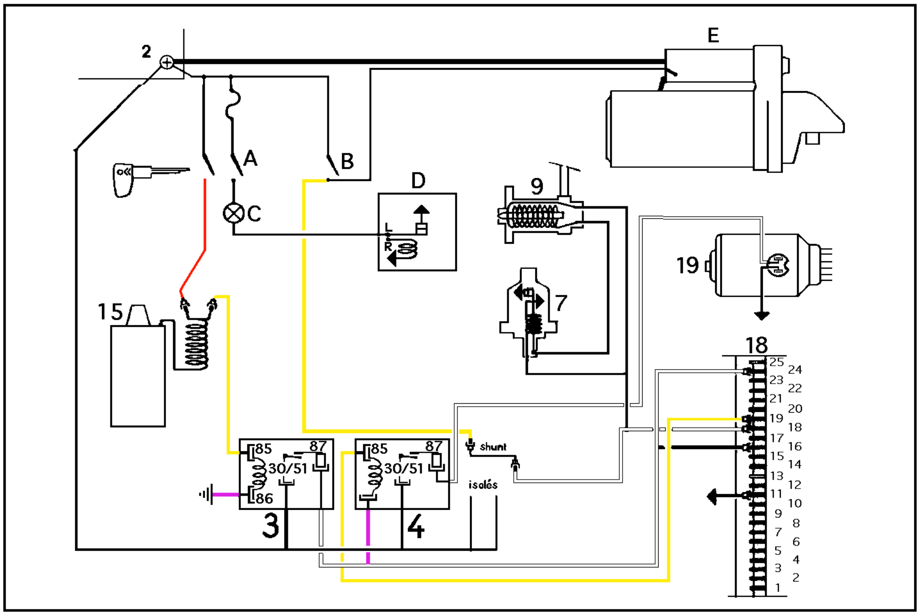
D.IE Vehicles all types
DJ.IE Vehicles produced up to April 1971



D. 51-67

DJ.IE, manufactured since April 1971

The starter motor and impulsion relays are no longer fitted



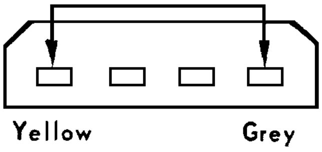
D. 51-68

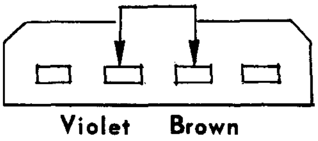
KEY :

NOTE : The markings of the components are identical to those used in the wiring diagrams

2. Battery
3. General supply relay
4. Fuel pump relay
5. Impulsion relay
7. Thermal time switch (cold start)
8. Starter motor control relay
9. Cold start injector
15. Ignition coil
18. Electronic control unit
19. Fuel pump

A. Vehicle ignition contact
B. Starter motor switch
C. Charging warning light
D. Relay voltage regulator relay
E. Starter motor

Operations to be carried out	Additional checks to be carried out if the value specified is not obtained
3: Check the insulation of the pressure sensor	
- Connect the **ohmmeter** (1 M Ω scale) a) between terminals 11 and 7. b) between terminals 11 and 8. **Pointer must read ∞**	a) *If the ohmmeter indicates zero resistance (short circuit) :* Withdraw the connector from the pressure sensor (17). Two possibilities now exist : - *If the ohmmeter now indicates «∞» resistance :* the pressure sensor is defective; replace it. - *If the ohmmeter now indicates zero resistance :* one or several of the following leads are short-circuited : - Green-grey 8 from terminal 7 of the electronic control unit (18) to to grey 8 of the pressure sensor (17) - Green-brown 9 from terminal 8 of the electronic control unit (18) to brown 9 of the pressure sensor (17) - Yellow-violet 10 from terminal 10 of the electronic control unit (18) to violet 10 of the pressure sensor (17) - Yellow-green 11 from terminal 15 of the electronic control unit (18) to yellow 11 of the pressure sensor (17) Replace the injection system wiring harness b) *If the ohmmeter indicates a resistance less than ∞, but not zero (faulty insulation) :* Carry out the same check as above.
4: Check the resistance of the windings of the pressure sensor.	
- Connect the **ohmmeter** a) **Primary winding** : - between terminals 7 and 15 **Pointer should read 90 Ω**  	a) Check that the connector on the pressure sensor is correctly fitted. b) *If the ohmmeter indicates a resistance considerably less than the value specified :* Withdraw the connector from the pressure sensor : - If the ohmmeter now indicates ∞, the pressure sensor is defective; replace it. - If the ohmmeter still indicates a resistance considerably less than the specified value, replace the injection system wiring harness. c) *If the ohmmeter indicates zero resistance :* Withdraw the connector from the pressure sensor : - if the ohmmeter now indicates ∞, the pressure sensor is defective; replace it. - If the ohmmeter now indicates 0, replace the injection system wiring harness. d) *If the ohmmeter indicates a resistance considerably higher than the specified value :* Check the following leads and their connections for excessive resistance : Green-grey 8 to grey 8, yellow-green 11 to yellow 11, from terminals 7 and 15 on the electronic control unit (18) to the pressure sensor (17). e) *If the ohmmeter indicates ∞ resistance :* Withdraw the connector from the pressure sensor and connect a jumper lead across the outer terminals (yellow and grey) of the connector : - If the ohmmeter now indicates 0, the pressure sensor is defective, replace it. - If the ohmmeter now indicates ∞, check the leads green-grey 8 to grey 8, yellow-green 11 to yellow 11, and their connections.

Operations to be carried out	Additional checks to be carried out if the specified value is not obtained
b) **Secondary winding :** - between terminals **8** and **10.** **Should read 350 Ω**	Check identical to a), b), c). d) *If the ohmmeter indicates a resistance considerably higher than the specified value :* Check the following leads and their connections for excessive resistance : Green-brown 9 to brown 9, and yellow-violet 10 to violet 10, from terminals 8 and 10 of the electronic control unit (18) to the pressure sensor (17). e) *If the ohmmeter indicates ∞ :*  Withdraw the connector from the pressure sensor and connect a jumper lead between the inner terminals (violet and brown). - If the ohmmeter now indicates 0. the pressure sensor (17) is defective; replace it. - If the ohmmeter now indicates ∞, check the leads green-brown 9 to brown 9 and yellow-violet 10 to violet 10, and their connections.
5. Check resistance of triggering contacts in distributor (1) :	
- Connect the ohmmeter **(OF NECESSITY ON THE 1 MΩ min)** a) Between terminals **12** and **21** *Operate starter motor to turn the distributor* **The ohmmeter pointer should oscillate.** b) Between terminals **12** and **22** *Operate starter motor to turn the distributor* **The ohmmeter pointer should oscillate.**	If the ohmmeter pointer does not oscillate, or if it remains at either ∞ or 0 : - Check that the connector on the distributor is correctly fitted. - Replace the triggering contact cassette.
6. Check the resistance of the throttle-spindle switch (10) : (On vehicles with hydraulic gear selection, place manual clutch control in «engaged» position)	
Connect the ohmmeter **(OF NECESSITY ON SCALE 1 M Ω min.)** a) Between terminals **20** and **14** *Depress the accelerator pedal slowly to the end of this travel.* **Ohmmeter pointer should show 8 to 10 oscillations between 0 and ∞** b) Between terminals **9** and **14** Carry out same check as above.	- Check that the connector on the throttle-spindle switch (10) is correctly fitted, if still incorrect : - Fit a new throttle-spindle switch (10) and adjust it (see paragraph 6 opposite).

Operations to be carried out	Additional checks to be carried out if the specified value is not obtained

7. Check the throttle-spindle switch (10)

Connect the **ohmmeter (OF NECESSITY ON SCALE 1 M Ω min.)**

Between terminals **17** and **14**
a) *Accelerator pedal released :*

Should read 0

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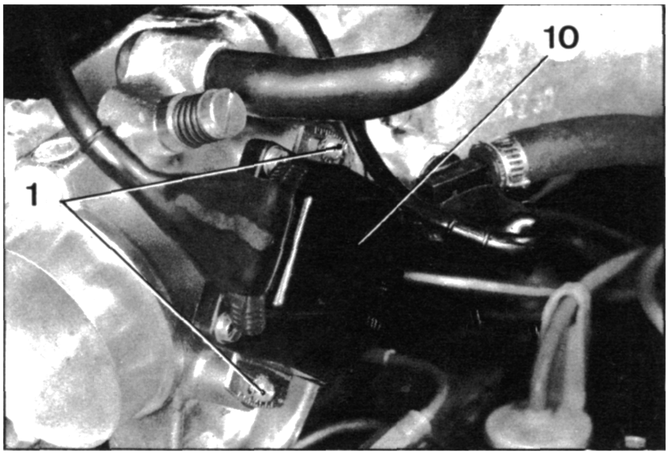
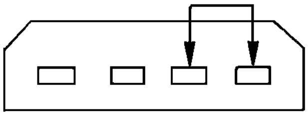


1) Accelerator pedal released

a) *If the ohmmeter indicates* ∞ the throttle-spindle switch (10) is incorrectly adjusted. Adjust the switch as follows :

- With the throttle closed (accelerator pedal released) the contacts of the throttle-spindle switch (10) must be closed. They must open for a movement of 2° of the throttle.
  To facilitate this adjustment the switch mountings are graduated (1 division = 2°)
- Slightly slacken the two retaining screws (1) for the throttle-spindle switch (10).
- With the tester ohmmeter indicating ∞ and the throttle in idling position, place a feeler gauge of 0.7 mm between the eccentric adjuster of the throttle stop and the lever on the throttle spindle. Then gently turn the switch (10) until the exact moment when the contatcs close (the pointer then indicates 0). Tighten the two switch retaining screws.
- Check the adjustment : with the accelerator pedal released, place a feeler gauge of 0.7 mm as above : the pointer must indicate 0. Insert a feeler gauge of 1.4 mm : the pointer must indicates ∞.

b) *If the ohmmeter still indicates* ∞ :
Check that the connector on the throttle-spindle switch (10) is properly fitted.
If it is correct :



- Withdraw the connector from the throttle-spindle switch (10) and connect a jumper lead between terminals grey and white of the connector.

c) *If the ohmmeter still indicates* ∞

- Check : The lead white 16 between the switch (10) and the electronic control unit (18) terminal 17 (white 16)
  The lead grey 15 between switch (10) and the electronic control unit (18) terminal 14 (yellow-grey 15).

Operations to be carried out	Additional checks to be carried out if the specified value is not obtained
	d) Refit the connector on the switch and adjust the switch (10) as in § a above. e) *If the ohmmeter still indicates ∞* Replace the throttle-spindle switch (10).
b) *With accelerator pedal slightly depressed* (butterfly opening = 2°) OHMMETER : must read ∞.	**2. Accelerator pedal slightly depressed** (butterfly opening = 2°) a) *If the test ohmmeter indicates 0 :* the throttle-spindle switch (10) is incorrectly adjusted. Re-set it (see § 7-1 a) b) *If the ohmmeter still indicates 0 :* withdraw the connector from the throttle-spindle switch (10). c) *If the ohmmeter still indicates 0 .* replace the injection system wiring harness. d) Refit the connector and proceed as in § a above. e) *If the ohmmeter still indicates 0 :* replace the throttle-spindle switch (10).
8. Check the resistance of the thermal sensor (6) :	
Connect the **ohmmeter** between terminals **11** and **23.** **Ohmmeter should read 2 500 Ω** (this value corresponds to 20° C. At a higher temperature resistance is lower).	a) *If the ohmmeter indicates ∞* Check that the connector is properly fitted to the thermal sensor. If it is correct, withdraw the connector from the thermal sensor (6) and connect lead green 18 to earth. - If the ohmmeter indicates 0. check the lead 26 between the thermal sensor (6) and earth on the regulator. - If it is correct, replace the thermal sensor (6). - If the ohmmeter indicates ∞, check the lead, green 18 to green 18, between terminal 23 on the electronic control unit (18) and the thermal sensor (6). b) *If the ohmmeter indicates 0 :* Withdraw the connector from the thermal sensor (6). - If the ohmmeter indicates 0, check the lead, green 18 to green 18, between between terminal 23 of the electronic control unit and the thermal sensor (6). - If the ohmmeter indicates ∞, replace the thermal sensor (6).
9. Check the winding of the injectors	
Connect the ohmeter sucessively to terminals : 11 and 3 injector of cylinder 1 11 and 4 injector of cylinder 3 11 and 5 injector of cylinder 2 11 and 6 injector of cylinder 4 Read 2,4 Ω (this value corresponds to 20° C (68° F)	a) *If the ohmmeter indicates 0, or a resistance considerably lower than 2.4 Ω :* Withdraw the connector from the correspomding injector, If the ohmmeter now indicates ∞, replace the injector. - If the ohmmeter indicates 0 or a value considerably lower than 2.4 : replace the injection system harness.

D.IE VEHICLES ALL TYPES *(produced since 5th April 1971)*

The electronic fuel injection control has been modified as follows on these models :

- Addition of an air temperature sensor fitted on the air filter.
- Modification of the electronic control unit : (see pages 2 a and 2 b)
- Modification of the injection system wiring harness (see operations DX.IE 511-00 and DJ.IE 511-00)

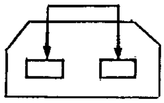
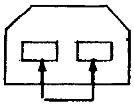
On these vehicles the checking of the electronic fuel injection system differs only to the extent that the air temperature sensor must also be checked.

For these vehicles after checking the resistance of the thermal sensor (§8, page 8), the resistance of the air temperature sensor must also be checked :

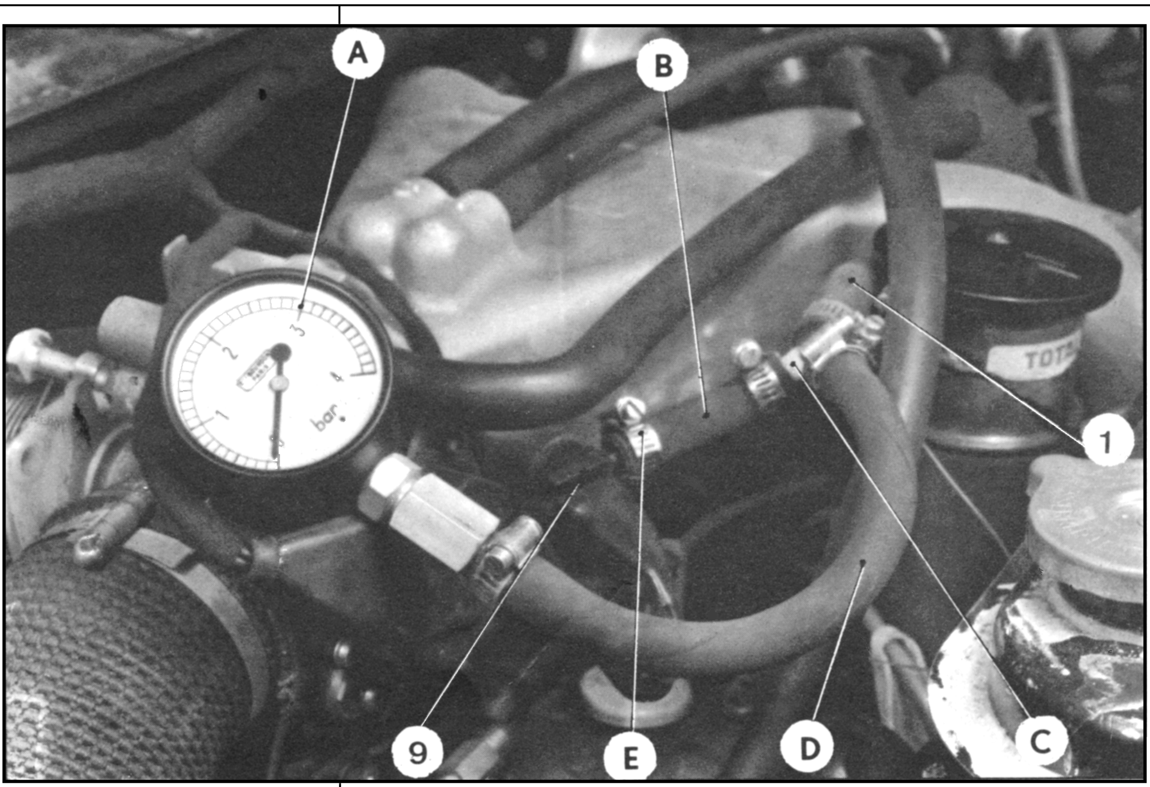
(refer to diagrams DX.IE 511-00 and DJ.IE 511-00 and to the lead identification tables on pages 20 and 21).

8 a Checking the resistance of the air temperature sensor. *(D.IE All Types ⟼ 4/1971)*

Connect the ohmeter to terminals **11** and **1** **Should read 300 Ω ± 40 Ω** (for a temperature of 20° C (68° F) When the temperature is higher, the resistance is weaker, and vice verso.	*a) Ohmmeter indicates ∞ :* Check the positioning of the connector on the air temperature sensor. If it is correct, remove the connector of the air temperature sensor (21) and earth lead **(1)** : - If the ohmmeter indicates 0 : check lead **11** between the air temperature sensor and the earth on the relay voltage regulator. If it is in order, replace the air temperature sensor (21). - If the ohmmeter indicates ∞ : check the lead **1,1** between terminal **(1)** of the control unit (18) and the air temperature sensor (21). *b) The ohmmeter indicates 0 :* Remove the connector from the air temperature sensor (21) : - If the ohmmeter indicates 0 : check the lead **1,1** between terminal **(1)** of the control unit and the air temperature sensor (21). - If the ohmmeter indicates ∞ : replace the air temperature sensor (21).

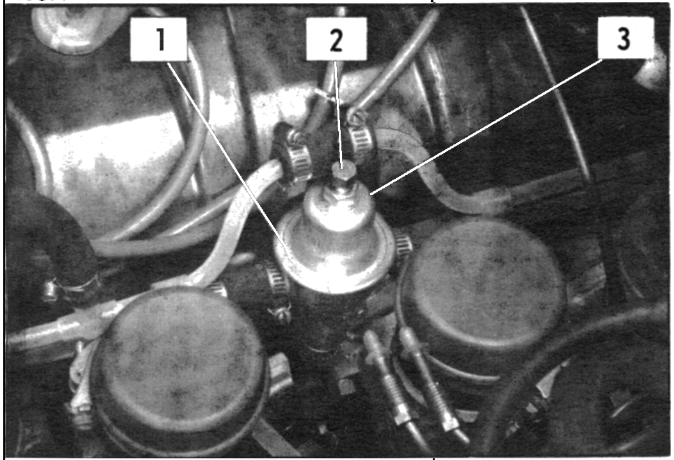
Operations to be carried out	Additional checks to be carried out if the specified value is not obtained
	b) *If the tester ohmmeter indicates ∞, or a value considerafly higher than 2.4:* Check that the connector is properly fitted on the injector. If it is correctly fitted, withdraw the connector from the corresponding injector and connect a jumper lead across the terminals. The ohmmeter should indicate 0.  E.g. N° 1 cylinder If the ohmmeter indicates ∞, or a value considerably higher than 2.4 Ω : Check the feed wire and the earth lead of the injector in question and the general earth lead. E.g. N° 1 injector : - Lead between electronic control unit (18) terminal 3 (green-white 22) and injector (11) of the 1st cylinder (white 22). - Earth lead 26 of the corresponding injector and general earth lead (26) at the regulator : Refit the connector on the injector. If the ohmmeter indicates ∞ or a value considerably higher than 2.4, replace the corresponding injector.
10. Check the full-load switch.	
Connect the **ohmmeter (OF NECESSITY ON SCALE 1 M Ω min.)** Between terminals **2** and **11**. **Should read 0** Withdraw the connector of the full-load switch. **Should read ∞.** Refit the connector.	a) *If the ohmmeter indicates ∞ :* Check that the connector on the full-load switch (16) is properly fitted. If it is correct, withdraw the connector from the full-load switch (16) and connect a jumper lead between the terminals.  If the pointer indicates ∞ : Check : -The lead between the electronic control unit (18) terminal 2 (red-blue 12) and the full-load switch (16) (blue 12). - The lead 26 between the full-load switch (16) and the earth 26 on the regulator. -The earth 26 on the regulator. If these leads and the earth (26) are correct, the full-load switch is defective; replace it. b) *If the pointer indicates 0.* Replace the injection system harness.

Manual 814-1

Operations to be carried out	Additional checks to be carried out if the specified value is not obtained
11. Check the fuel-feed pressure :	
8128 	
- First remove the cold start injector (9) from the induction air manifold, and disconnect the fuel pipe (1) from the injector (9). - Connect the pressure gauge A onto the cold start injector (9) as shown in the photograph above. - Use the 3-way union C, flexible pipes B and D and «quick-acting clips» E. NOTE : A, B, C, D, E are supplied with the tester 1494. *Switch on the ignition,.* *a) Press the push-button P on the Tester* PRESSURE GAUGE : **should read 1.92 to 2 bars (27 psi to 28 1/2 psi)**	a) *If the gauge registers 0* (the fuel pump is not working) Check that the 2-pole connector on the fuel pump is properly fitted. If so, withdraw the 2-pole connector from the pump and measure the voltage across the terminals using a separate voltmeter. - *If the voltmeter indicates 12 volts.* The fuel pump is defective; replace it. - *If the voltmeter indicates 0 volts.* Listen to determine whether the fuel pump relay (4) is operating when the button «P» is pressed on the tester. - *If the fuel pump relay (4) is operating :* Check the voltage at terminal 87 of relay (4) when button «P» of the tester is pressed. - If voltage = 0, check that there is current at terminal 30/51. If there is, replace fuel pump relay (4). - If voltage = 12 volts, check leads and connections for continuity : . Lead white 5 from fuel pump relay (4), terminal 87, to fuel pump connector (19). . Lead 27 from fuel pump connector (19) to earth (on the chassis side-member). If leads, white 5 and 27, and their connections are not faulty, the fuel pump relay (4) is defective. Replace it.

Operations to be carried out	Additional checks to be carried out if the specified value is not obtained
	If the fuel pump relay (4) does not operate : check the leads and connections for continuity : - Lead white 2 from the general feed relay (3) terminal 87 to mauve 2 of the fuel pump relay (4) terminal 86. - Lead yellow 4 from the fuel pump relay (4) terminal 85 to yellow 4 ot the electronic control unit (18) terminal 19. If the leads white 4 and yellow 4 and their connections are not faulty, the fuel pump relay (4) is defective. Replace it. b) *If the pressure gauge registers a pressure lower than 1.92 bars or higher than 2 bars :(27 psi to 28 1/2 psi)*

5877

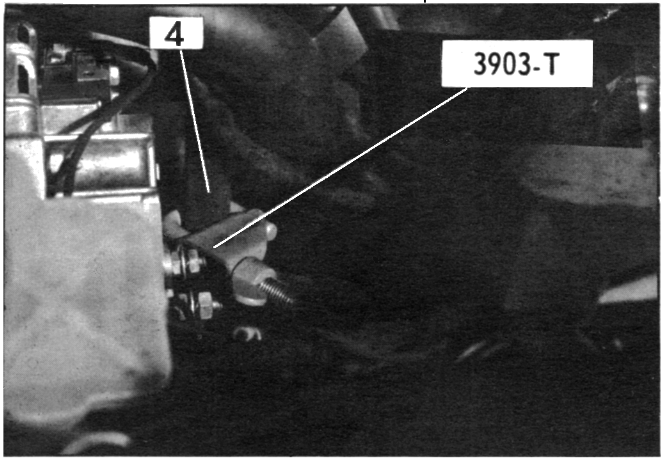


The fuel pressure regulator is maladjusted, it must be reset.
For this :
Slacken the lock-nut (3) and turn the adjusting screw (2) until the gauge registers a pressure between 1.92 and 2 bars (27 to 28 1/ 2 psi). If this pressure cannot be obtained by adjusting the pressure regulator (1) is defective ; replace it.

IMPORTANT : **The setting of the fuel pressure regulator has a great influence on fuel consumption and on the composition of the exhaust gases.**

b) **Press button « P » briefly** GAUGE : Should register a rapid pressure drop to 1.2 bars (18.5 psi). Wait approximatively 30 seconds, the pressure should not drop visibly any more.	*If the pressure falls rapidly below 1.2 bars (18.5 psi) when the button « P » is released :* isolate the fuel pump.

7187



To do this :
Place the clamp 3903 T in the middle of the rubber part of fuel feed line (4) before the injector for N° 1 cylinder.

Press the button «P» to pressurise the circuit and quickly close the fuel feed line (4) by means of clamp when the pump operates.

If the pressure does not drop :
Check the union of the fuel outlet pipe on the pump for leaks.

Operations to be carried out	Additional checks to be carried out if the specified value is not obtained
	c) *If the pressure drops to 0 :* - Check the fuel tightness of the cold-starting injector. Look to determine whether fuel is escaping. If it is, replace the injector. - Check the fuel tightness of the unions of the fuel feed pipes, on the injectors and on the fuel pressure regulator. - Check the fuel-tightness of each injector, eliminating them one by one. To do this : - Disconnect the fuel feed manifold from the rubber attached to the injector to be checked and plug the end. (use a flexible pipe, inside ϕ = 7 mm, length = 50 mm, plugged at one end. Ensure fuel-tightness at the plug and on the fuel-feed manifold by «quick-acting» clips. *) - Re-pressurise the circuit as shown above. *If the pressure does not drop:* the injector being checked is leaking and must must be repaired. *If the pressure still drop to 0 :* check the remaining injectors *If the pressure drops to 0 after all the injectors have been checked and eliminated :* the pressure regulator is leaking and must be replaced. Remove clamp 3903- T

12. Check the action of the injectors.

Switch on the ignition :

- Check the warning-lamp bulb (12 V - 4 w) **of the Tester.** To do this fit the **flying-lead** to terminal 11 and press push-button I; it should light up. If it does not, replace it.

- Pressurise the fuel circuit by briefly depressing button «P».

- Fit the **flying-lead** in turn to each of the male pins marked **3, 4, 5, 6** corresponding to the injectors of cylinders N° 1, 2, 3, and 4 respectively.

E.g. : Connect onto 3.
Quickly depress **button 1.**
During the very short period of injector operation :
- The warning lamp should light and enable the passing of current into the injector in question to be checked.
- The pressure gauge needle should descend (pressure drop). It stops when the button 1 is released.

If the pressure does not drop : replace the injector in question.

NOTE :
This check should not be carried out several times in succession, or the engine may «flood»

Operations to be carried out	Additional checks to be carried out if the specified value is not obtained
13. Check the action of the cold-start injector and of the time-delay thermal switch.	
- *Switch on the ignition* - Pressurise the fuel circuit by briefly pressing button P. - Activate the starter motor after having placed a container under the injector. - *The cold-start injector should function* (fuel-spray). - Remove the gauge with the flexible pipes. - First connect the feed pipe of the cold-start injector and fit the injector onto the air inlet manifold.	1) *If the engine coolant temperature is higher than 37º C* (the cold-start injector will not operate) (37° C = 98,6 ° F) If this is the case, disconnect the lead grey 17 from the thermal switch (7) for cold-starting and earth it. The cold-start injector should operate in these conditions for the time that the starter motor is activated. If it does not : Check : - The lead between the impulse relay (5) terminal 87 (white 7) and the electronic control unit (18) terminal 18 (violet 7). - The lead between the impulse relay (5) terminal 87 (white 7) and the cold-start injector (violet 7) - The lead between the impulse relay (5) terminal 87 (white 7) and the thermal switch (7) (blue 7) - The lead between the cold-start injector (9) (grey 17) and the thermal switch (7) (grey 17) Check the resistance of winding of cold-start injector (9) : It should be 4.2 ohms at 20° C. If not, replace the cold-start injector (9). (20° C = 68° F) 2) *If the engine coolant temperature is less than 16º C* (the cold-start injector will operate). (16° C = 60.8° F) If it does not operate, carry out the above check (§ 13-1) With the thermal switch (7) connected, if the cold-start injector (9) still do does not operate, the thermal switch (7) is defective. Replace it.

1. SECOND PART

The following checks are carried out without the Tester 1494, the electronic control unit being connected as normally.

14. Check the movement of the triggering contacts in the distributor.

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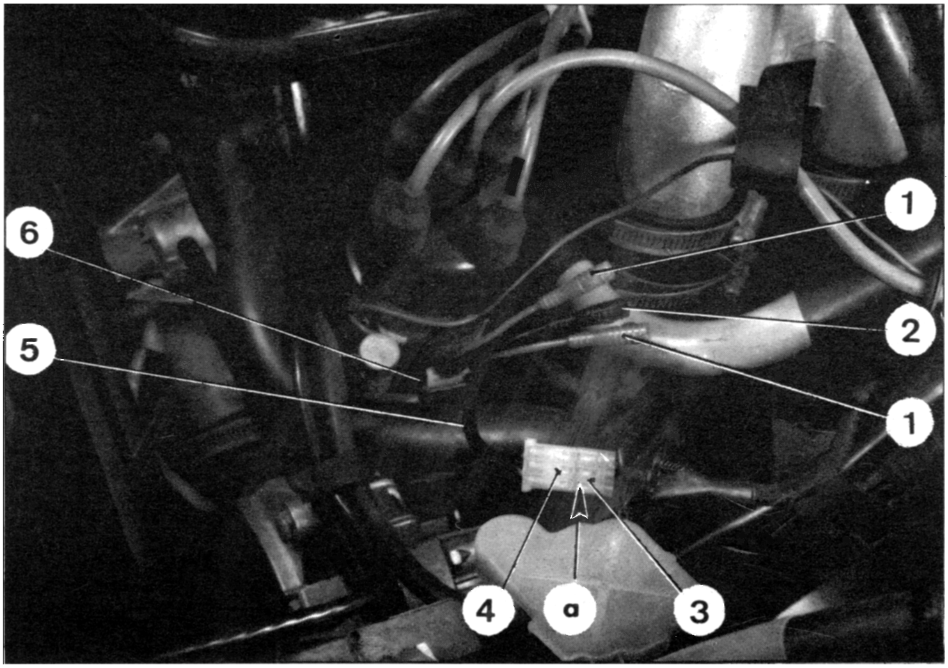

Put the intermediary wiring harness (5) into position between the connector (6) of the triggering contact holder and the vehicle harness. **Ensure that the inhibition chamfers «a» on the 3-way connectors (3) and (4) correspond.**

- Run the engine at 1500 rpm approx.

- Connect the **voltmeter.**

The «–» on plug (2) (black)

The «+» in turn on plugs (1) (red).

The pointer moves first towards the max. end of the scale, then oscillates about an average reading of 2.8 volts approx. Take note of this average reading for each of two red plugs (1).

The variation between the two average readings must be : 0.2 volts.

If the variation exceeds 1 volt : the triggering contacts are defective. Replace the contact holder. Remove the intermediary harness (5) and put the connector and the rubber cap into position on the distributor triggering contact holder.

15. Check the operation of the throttle-spindle switch.

With the engine idling, disconnect from the air inlet manifold, the rubber pipe leading to the supplementary air control : the engine speed should oscillate between 1100 and 1800 rpm.
Slightly open the throttle ; the engine speed should stabilise.
If it does not, adjust the throttle-spindle switch (see § 7 - 1a)

16. Check the full-load switch (16).

Withdraw the wiring connector from the full-load switch.

Remove the full-load switch from the chassis leaving the rubber pipe on the full-load switch connected to be air-inlet manifold.

1) Start the engine.
With the engine at idling speed, connect the **ohmmeter (WHICH MUST BE ON SCALE 1 M Ω minimum)** to the two terminals of the full-load switch.
The ohmmeter must read ∞

2) Stop the engine, disconnect the flexible pipe from the full-load switch.
The ohmmeter must read 0.
If it does not, the full-load switch is defective and must be replaced.

NOTE :

a) If the flexible pipe is disconnected from the full-load switch when the engine is running at idling speed, the idling will «hunt» due to too rich a mixture.

b) If the flexible pipe of the pressure sensor and that of the full-load switch are reversed on the inlet housing, flat-spots will appear during engine acceleration.

IMPORTANT NOTE :

The tests carried out above enable every part of the electronic fuel injection system to be checked **except for the electronic control unit itself.**

If no fault is found during the tests, the electronic control unit should not yet be pronounced faulty.

1) **First check the five earth leads careffully :**

- From the voltage regulator «a»
- From the injection system harness «b»
- From the battery «c»
- From the electrical fuel pump «d»
- From the car chassis «d»

See illustration on opposite page.

Check the tightness of the bolts and pull gently on the leads to ensure that they are properly secured to their terminals.

2) **Since it is difficult to check the contacts of the harness connections on the various injection system components, it is necessary to carry out a test-run with a new wiring harness.**

3) **Carry out a road test.** If trouble persists, disconnect the excitation lead (yellow sleeve) from the alternator, insulate it and **repeat the road-test :**

If the trouble disappears : either the alternator or the regulator is defective. Check them and replace whichever is faulty.

If the trouble persists : the electronic control unit is defective and must be replaced.

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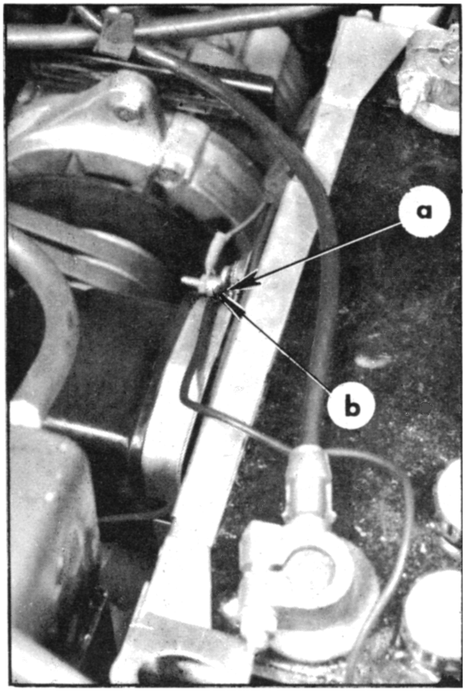

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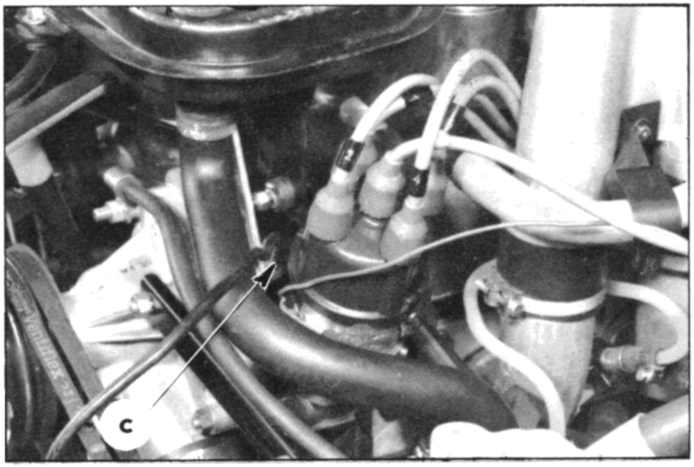

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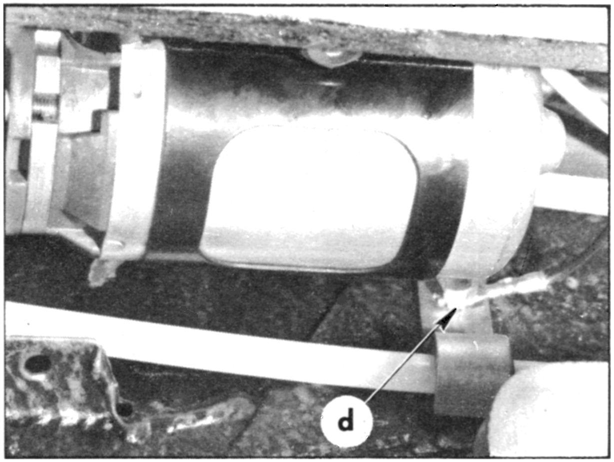

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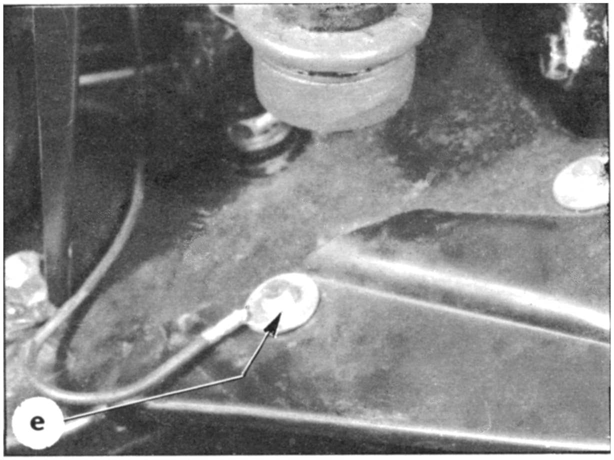


OPERATION N° D.IE - 144-0 : *Checking the electronic fuel injection system*

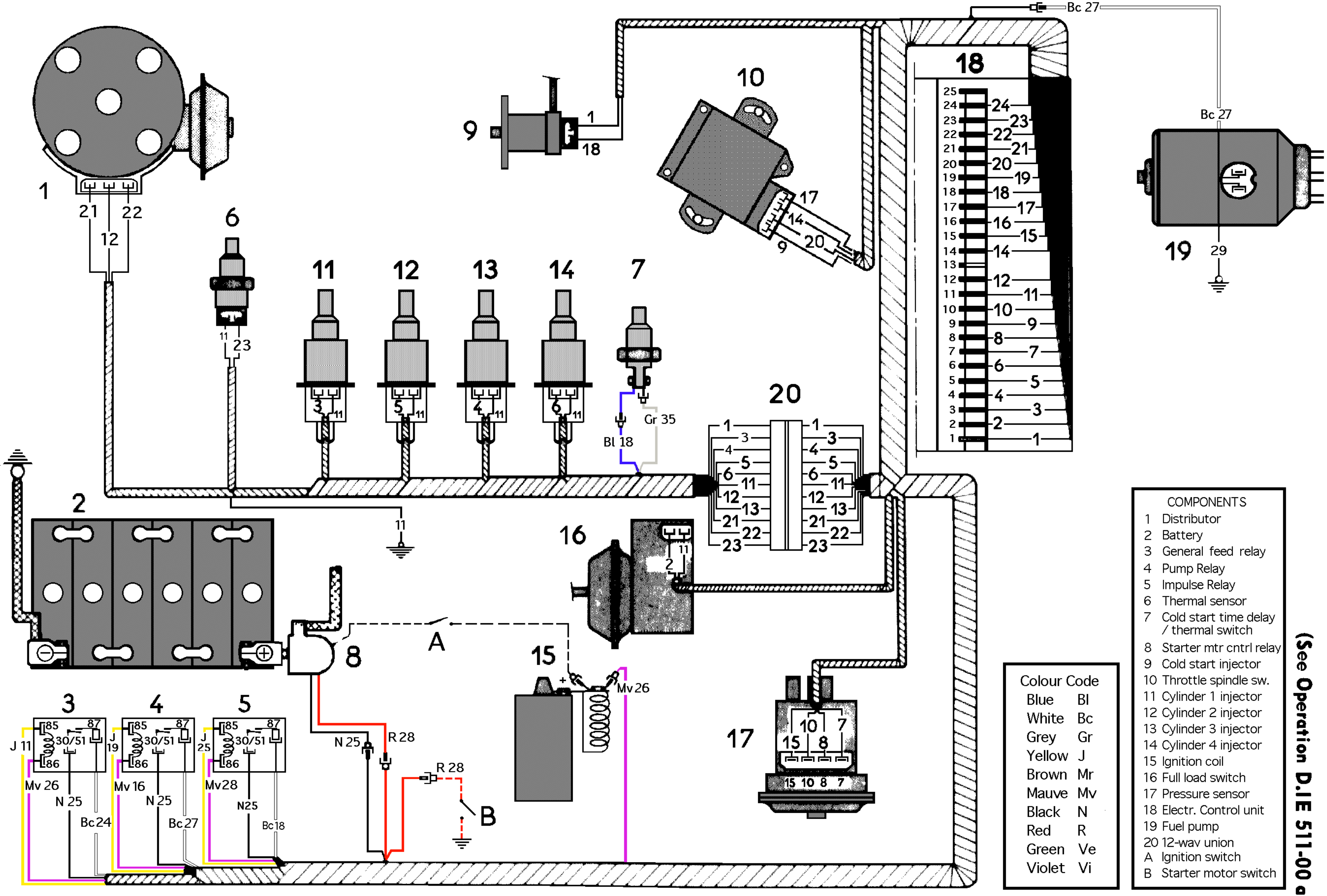
(CITROEN TESTER 1494)

DIAGRAM D.IE - 511-00

ELECTRONIC FUEL INJECTION SYSTEM

(D.IE Vehicles - all types - produced between March 1970 and April 1971)

(See Operation D.IE 511-00 a)



Colour Code	
Blue	Bl
White	Bc
Grey	Gr
Yellow	J
Brown	Mr
Mauve	Mv
Black	N
Red	R
Green	Ve
Violet	Vi

COMPONENTS

1	Distributor
2	Battery
3	General feed relay
4	Pump Relay
5	Impulse Relay
6	Thermal sensor
7	Cold start time delay / thermal switch
8	Starter mtr cntrl relay
9	Cold start injector
10	Throttle spindle sw.
11	Cylinder 1 injector
12	Cylinder 2 injector
13	Cylinder 3 injector
14	Cylinder 4 injector
15	Ignition coil
16	Full load switch
17	Pressure sensor
18	Electr. Control unit
19	Fuel pump
20	12-wav union
A	Ignition switch
B	Starter motor switch

D. IE VEHICLES (All Types) *produced between March 1970 and April 1971*

Wiring diagram D. IE 511-00 a differs from the wiring diagram D. IE 511-00 only in the following points :

1) Wiring harness in two parts : a 12-way terminal block with pins (20) links these two parts :

2) Marking of the various leads is partly modified : self-adhesive numbers replace the colour identification marks.

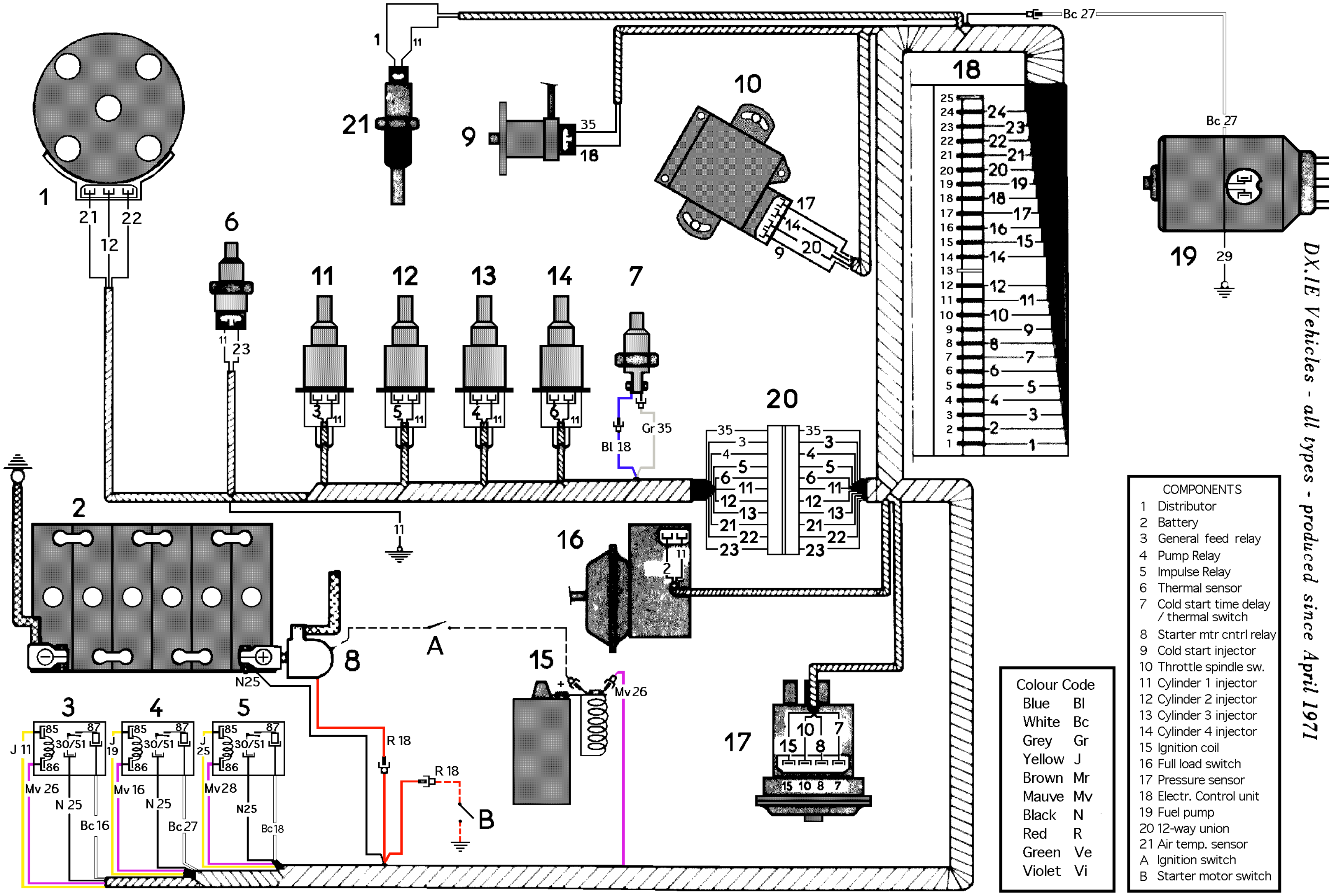
The check for the electronic fuel injection system described in this section corresponds to wiring diagram D. IE 511-00. To apply this section to the new wiring diagram D. IE 511-00 a it must be remembered that the wires correspond as follows :

DIAGRAM : **D. IE 511-00**	DIAGRAM : **D. IE - 511-00 a**
J 1, N 1	J 25, N 25
J - Mr 2, Mr 2, Bc 2, Mv 2	**16, 24,** Bc 24, Mv 16
Mv 3, Vi 3	Mv 26
J 4	J 19, **19**
Bc 5	Bc 27, Bc 27
Mv 6, R 6	Mv 28, R 28
Vi 7, Bc 7, Bl 7	**18,** Bc 18 **(13),** Bl 13
Ve - Gr 8, Gr.	**7, 7**
Ve - Mr 9, Mr 9	**8, 8**
J - Vi 10, Vi 10	**10, 10**
J - Ve 11, J 11	**15, 15**
R - Bl 12, Bl 12	**2, 2**
J - Bc 13, J 13	**9, 9**
Bl 14, Bl 14	**20, 20**
J - Gr 15, Gr 15	**14, 14**
Bc 16, Bc 16	**17, 17**
Gr 17, Gr 17	**1, (1),** Gr 1
Ve 18, Ve 18	**23, (23), 23**
J - R 19, J 19	**12, (12), 12**
R 20, R 20	**21, (21), 21**
Gr 21, Gr 21	**22, (22), 22**
Ve - Bc 22, Bc 22	**3, (3), 3**
Ve - Bl 23, Bl 23	**5, (5), 5**
Ve - vi 24, Vi 24	**4, (4), 4**
Ve - R 25, R 25	**6, (6), 6**
J - Bl 26, J 26, 26	**11,** J 11, **(11),** 11
27	29

NOTE : The figures in brackets show the markings of the leads of the terminal block (20).

OPERATION Nº D. IE - 144-0 : *Checking the electronic fuel injection system*
(CITROEN TESTER 1494)

DIAGRAM DX.IE - 511-00 **(See Operation DX.IE - 511-00)**
ELECTRONIC FUEL INJECTION SYSTEM
DX.IE Vehicles - all types - produced since April 1971



Colour Code	
Blue	Bl
White	Bc
Grey	Gr
Yellow	J
Brown	Mr
Mauve	Mv
Black	N
Red	R
Green	Ve
Violet	Vi

COMPONENTS

1	Distributor
2	Battery
3	General feed relay
4	Pump Relay
5	Impulse Relay
6	Thermal sensor
7	Cold start time delay / thermal switch
8	Starter mtr cntrl relay
9	Cold start injector
10	Throttle spindle sw.
11	Cylinder 1 injector
12	Cylinder 2 injector
13	Cylinder 3 injector
14	Cylinder 4 injector
15	Ignition coil
16	Full load switch
17	Pressure sensor
18	Electr. Control unit
19	Fuel pump
20	12-way union
21	Air temp. sensor
A	Ignition switch
B	Starter motor switch

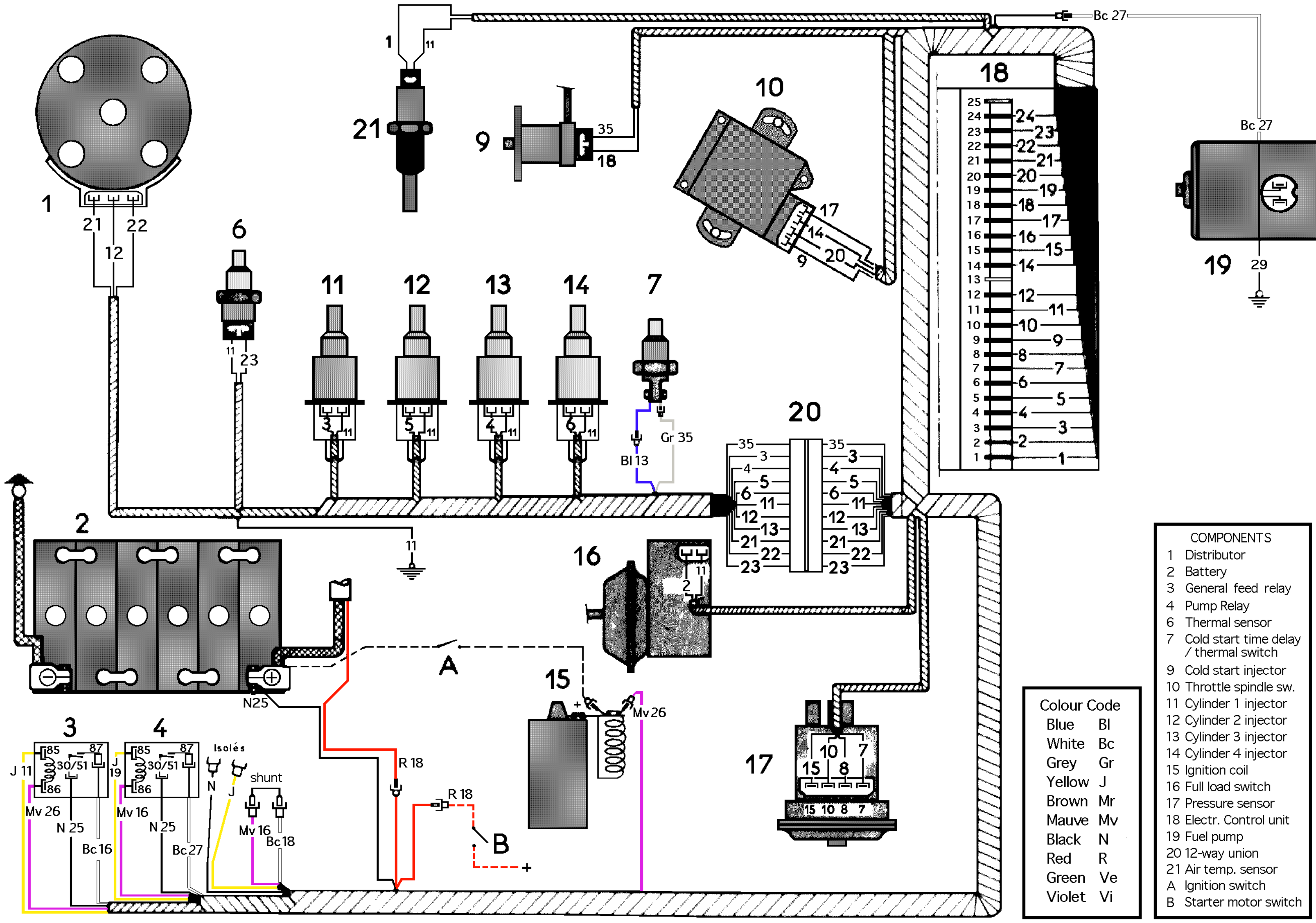
D. 51-63 e

DIAGRAM DJ.IE 511-00

ELECTRONIC FUEL INJECTION SYSTEM

DJ.IE vehicles produced since April 1971

(see operation DJ.IE 511-00)



Colour Code	
Blue	Bl
White	Bc
Grey	Gr
Yellow	J
Brown	Mr
Mauve	Mv
Black	N
Red	R
Green	Ve
Violet	Vi

COMPONENTS

1	Distributor
2	Battery
3	General feed relay
4	Pump Relay
6	Thermal sensor
7	Cold start time delay / thermal switch
9	Cold start injector
10	Throttle spindle sw.
11	Cylinder 1 injector
12	Cylinder 2 injector
13	Cylinder 3 injector
14	Cylinder 4 injector
15	Ignition coil
16	Full load switch
17	Pressure sensor
18	Electr. Control unit
19	Fuel pump
20	12-way union
21	Air temp. sensor
A	Ignition switch
B	Starter motor switch

D.IE VEHICLES (all types) *produced since April 1971*

The wiring diagrams DX.IE 511-00 and DJ.IE 511-00 of these vehicles differ from wiring diagram D.IE 511-00 only in the following points (vehicles introduced before March 1970) :

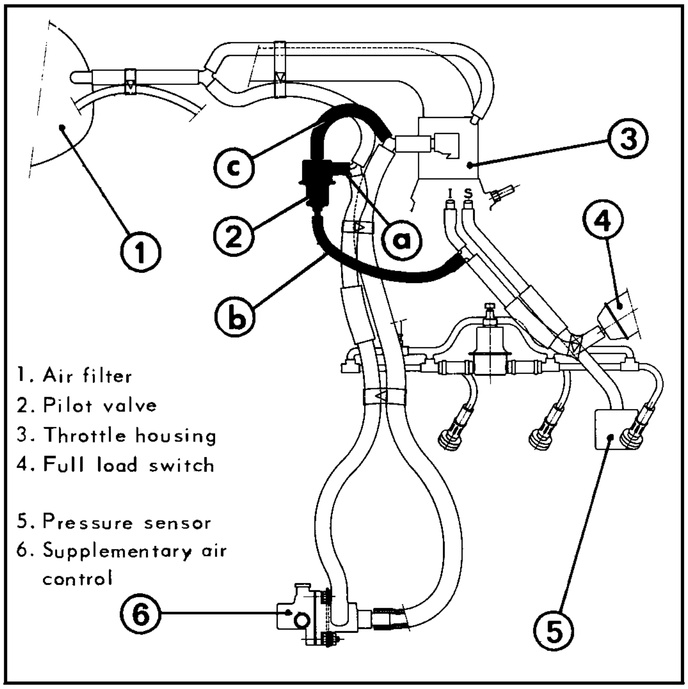
1) The wiring harness is in two parts. A 12-way terminal block with pins (20) connects the two parts.
2) The addition of an air temperature sensor (modified control unit).
3) The starter motor and impulsion relays are no longer fitted.
4) The markings of the various wires have been partly modified. Self adhesive numbers replace the colour markings.

The check for the electronic fuel injection system described in this section corresponds to the wiring diagram D.IE 511-00. In order to apply this to the new wiring diagrams DX.IE 511-00 and DJ.IE 511-00, it must be remembered that the leads correspond as follows.

DIAGRAMS		
D.IE 511-00	**DX.IE 511-00**	**DJ.IE 511-00**
J1, N1	J 25, N 25	N, J, (insulated)
J - Mr 2, Mr 2, Bc 2, Mv 2	**16, 24,** Bc 16, Mv 16	**16, 24,** Bc 16, Mv 16
Mv 3, Vi 3	Mv 26, Mv 26	Mv 26, Mv 26
J 4, J 4	J 19, **19**	J 19, **19**
Bc 5, Bc 5	Bc 27, Bc 27	Bc 27, Bc 27
Mv 6, R 6	Mv 28, R 28	Mv 18, R 18
Vi 7, Bc 7, Bl 7	**18,** Bc 18 **(13),** Bl 18	**18,** Bc 18 **(13),** Bl 18
Ve - Gr 8, Gr 8	**7,7**	**7,7**
Ve - Mr 9, Mr 9	**8,8**	**8,8**
J - Vi 10, Vi 10	**10, 10**	**10, 10**
J - Ve 11, J 11	**15, 15**	**15, 15**
R - Bl 12, Bl 12	**2,2**	**2, 2**
J - Bc 13, J 13	**9,9**	**9, 9**
Bl 14, Bl 14	**20, 20**	**20, 20**
J - Gr 15, Gr 15	**14, 14**	**14, 14**
Bc 16, Bc 16	**17, 17**	**17, 17**
Gr 17, Gr 17	35, (35), Gr 35	35, (35), Gr 35
Ve 18, Ve 18	**23, (23), 23**	**23, (23), 23**
J - R 19, J 19	**12, (12). 12**	**12, (12), 12**
R 20, R 20	**21, (21), 21**	**21, (21), 21**
Gr 21, Gr 21	22, **(22), 22**	22, **(22), 22**
Ve - Bc 22, Bc 22	**3, (3), 3**	**3, (3), 3**
Ve - Bl 23, Bl 23	**5, (5), 5**	**5, (5); 5**
Ve - Vi 24, Vi 24	**4, (4), 4**	**4, (4), 4**
Ve - R 25, R 25	**6, (6), 6**	**6, (6), 6**
J - Bl 26, J 26, 26	**11,** J 11, **(11),** 11	**11,** J 11, **(11),** 11
27	29	29
Air temperature sensor (21)	1	1

NOTE : The figures in brackets indicate the markings of the terminal block leads (20).

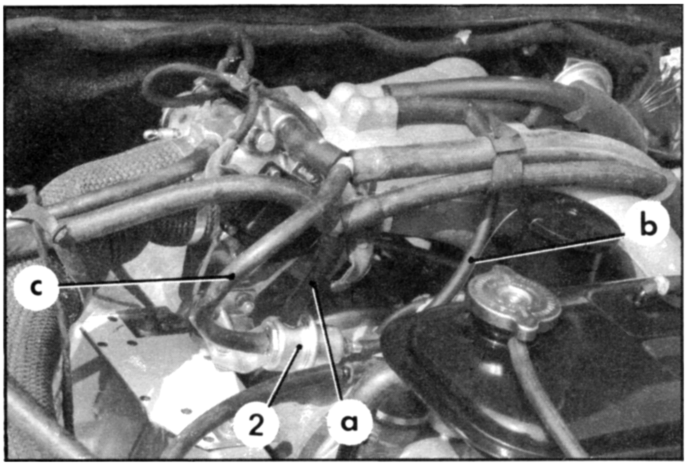
DJ.IE VEHICLES ↦ *9/1972*



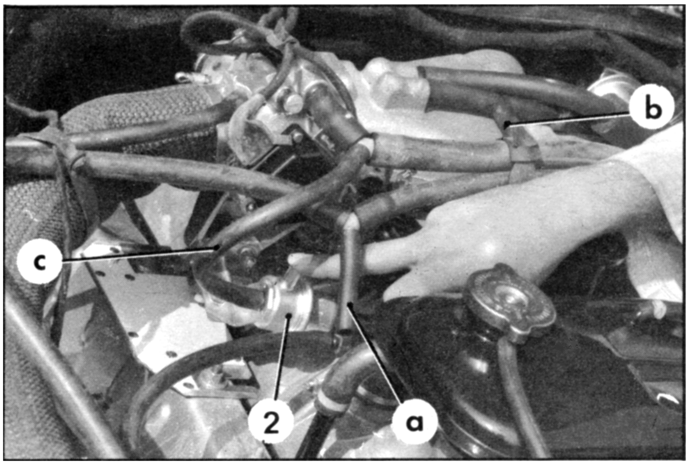
"DECEL" circuit :

Vehicles DJ.IE released Since September 1972,

To comply with anti-pollution standards, a supplementary supply of air is accomplised when releasing the accelerator (butterfly air intake closed). During deacceleration, there is no injection cut-out like on the preceded models. Supplementary air intake is by way of a PILOT valve, having a favourable sweeping effect to burn the exhaust gases . Consequently, when deaccelerating, the injection is held, and the fuel injected is proportioned according to the quantity of air intake accepted by the "DECEL system" (PILOT valve) to allow a perfect combustable mixture.



NOTE : *On vehicles DX.IE,* the anti-pollution circuit is constituted by the idling system **being accelerated.** On these models *released since September 1972,* as on models DJ.IE. These is no injection cut down. The supplementary air intake system is cut-off when releasing the accelerator and pressing on the foot brake.



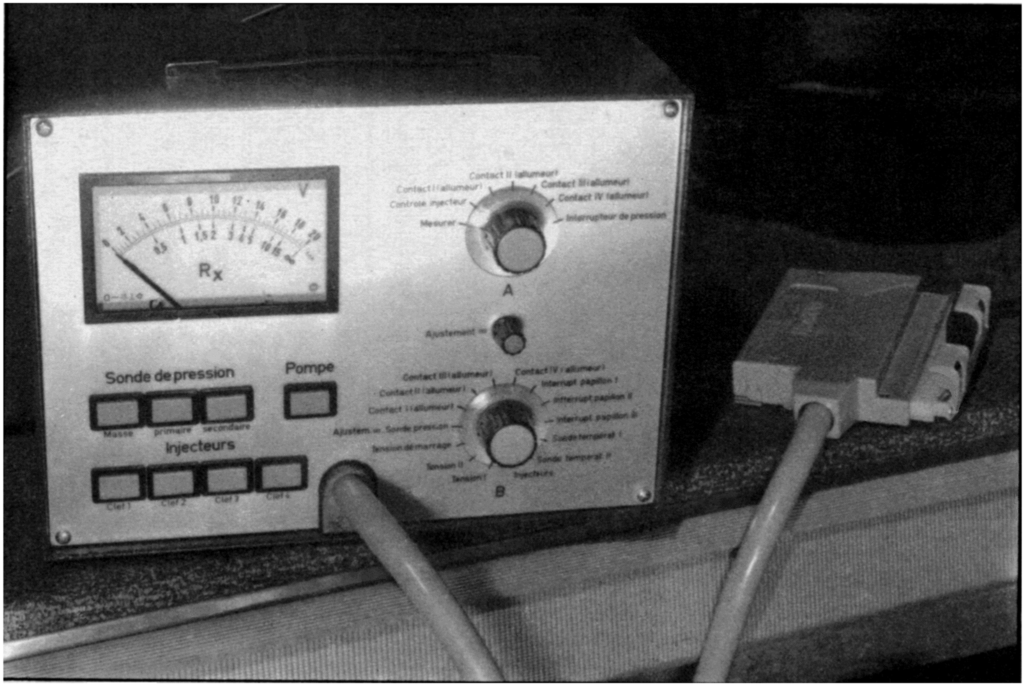
17. Anti-pollution supply checker "DECEL" :

Bring the engine speed to about 2500-3000 rpm, and disconnect the tube "a" from the PILOT valve (2)

With the index finger, check to see if the depression (suction) can be felt, if not, check the pipes B and C and their connection. If these are in good condition, the PILOT valve must be faulty, replace it.

D. IE VEHICLES ALL TYPES

CHECKING THE ELECTRONIC CONTROL UNIT USING BOSCH EFAW 228 - S 10 TEST UNIT



EFAW 228 - S 11 : Markings in French
EFAW 228 - S 10 : Markings in English
EFAW 218 : Markings in German

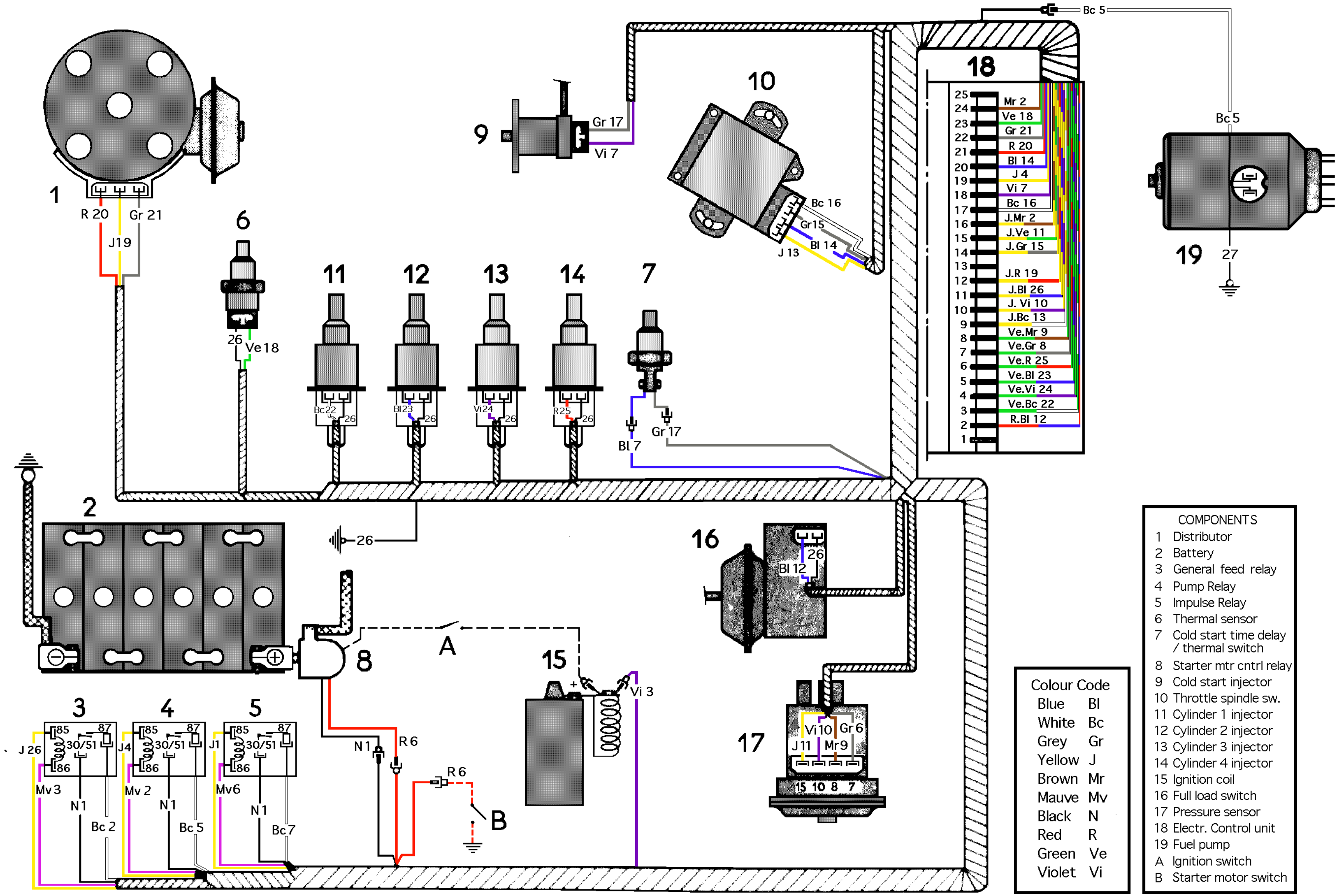
NOTE : **The test unit can be used to check every component of the electronic fuel injection except the electronic control unit itself.**

D - 51-63 b

DIAGRAM D. IE 511-00

ELECTRONIC FUEL INJECTION SYSTEM

D.IE Vehicles - All types - produced up to March 1970



Colour Code

Blue	Bl
White	Bc
Grey	Gr
Yellow	J
Brown	Mr
Mauve	Mv
Black	N
Red	R
Green	Ve
Violet	Vi

COMPONENTS

1	Distributor
2	Battery
3	General feed relay
4	Pump Relay
5	Impulse Relay
6	Thermal sensor
7	Cold start time delay / thermal switch
8	Starter mtr cntrl relay
9	Cold start injector
10	Throttle spindle sw.
11	Cylinder 1 injector
12	Cylinder 2 injector
13	Cylinder 3 injector
14	Cylinder 4 injector
15	Ignition coil
16	Full load switch
17	Pressure sensor
18	Electr. Control unit
19	Fuel pump
A	Ignition switch
B	Starter motor switch

OPERATION N° D. IE - 144-0 a : *Checking the electronic fuel injection system (BOSCH Test Unit EFAW 228 - S 10)*

VEHICLES D. IE ALL TYPES

IMPORTANT :

Certains actions must be avoided at all costs as they would damage the components of the electronic fuel injection system, in particular the electronic control unit itself.

1) *Never use a rapid charger, and never carry out arc or spot welding on the car chassis without first having disconnected both battery leads and isolated the "+" earth lead.*
2) *Never use a test lamp to check the continuity of a circuit.*
3) *Never strike a spark to check whether a lead is live.*
4) *Never start a vehicle with a voltage exceeding 12 volts.*
5) *Never force a connector onto the unit concerned.* **Take note of the inhibitor chamfers.**
6) *Only withdraw the connectors by taking hold of the sides and never by pulling on the leads. Check that the rubber caps completely cover the connectors when these are fully inserted.*
7) *The precautions to be taken during the alternator check also apply in this case.*
8) *Never alter the adjustment of the external potentiometer on the new control units.*

If faults occuring on the vehicle seems to be attributable to the electronic fuel injection system, it is essential to :
- Check the ignition.
- Check the basic adjustments.
- Check the electronic fuel injection system.

Checking the electronic fuel injection system :

Preparations :

1) Check the charge of the battery (voltmeter shunted)
2) Carry out the full check in the correct order.
3) Refer to operations D. IE 511-00, D. IE 511-00 α, DX.IE 511-00 or DJ.IE 511-00 in order to identify the various leads.
4) Repair faults discovered before continuing check up.
5) Check the conductivity of the leads using an ohmmeter.
   (∞ = circuit broken   0 = correct circuit)
6) Check that the flat female terminals, in particular those of harness terminal block are pushed right over the lugs of the difference components. To ensure this, remove the rubber hoods of the connectors; the flat terminals of the latter must not be pushed out of the plastic housings.

OPERATION N° D.IE - 144-0 a : *Checking the electronic fuel injection system*

(BOSCH Test Unit EFAW 228 - S10)

IMPORTANT : Before checking the electronic fuel injection system, it is essential to make sure that the control unit and the pressure sensor are correctly matched (seé table below)

REPAIRING : When changing :

- *an electronic control unit* : refer to column "Replacement § 1" of table below.
- *a pressure sensor* : refer to column "Replacement § 2"

	ORIGINAL EQUIPMENT		REPLACEMENT COMPONENTS **(essential fitting)**	
DATE	CONTROL UNIT	PRESSURE SENSOR	1) CONTROL UNIT **ONLY**	2) PRESSURE SENSOR **ONLY**
from September 1969 to July 1970	*No mark* **N° DX. 144.906 A** (Ref. BOSCH N° 0.280.000.011)	*Standard* **N° DX. 144.263 A** (Ref. BOSCH N° 0.280.100. 011)	- Fit a control unit : **N° ZC. 9.851.101 U** *(Ref. BOSCH N° 0.280.000.042)* (or the standard control unit N° 5.417.266 B) - **Keep original pressure sensor**	- Fit a *standard* pressure sensor : **N° DX. 144.263 A** - **Keep original electronic control unit**
from July 1970 to December 1970	*Mark : 1 yellow dot* **N° DX. 144.906 A** (Ref. BOSCH N° 0.280.000.011)	*Mark : 1 black dot* **N° DX. 144.263 B** (Ref. BOSCH N° 0.280-000.023)	- Fit a control unit : **N° ZC. 9.851.101 U** *(Ref. BOSCH N° 0.280.000.042)* (or the Standard control unit N° 5.417.266 B) - **Replace the original sensor** by a *Standard* pressure sensor : **N° DX. 144.263 A**	- Fit a sensor : *1 black dot* **N° DX. 144.263 B** - **Keep original electronic control unit**
from January 1971 to April 1971	*Mark : 2 yellow dots* **N° 2 D 5.402.234 K** (Ref. BOSCH N° 0.280.000.011)	*Mark : 1 black dot* **N° DX. 144.263 B** (Ref. BOSCH N° 0.280.100.023)		
from April 1971 to September 1972	*With external potentiometer* **N° DX. 144.906 B** (Ref. BOSCH N° 0.280.000.022) **AIR TEMPERATURE SENSOR : N° 1 D 5.412.360 A**	*Standard* **N° DX. 144.263 A** (Ref. BOSCH N° 0.280.100.011)	- Fit a control unit : **N° DX. 144.906 B** *(Ref. BOSCH N° 0.280.000.022)* (or the Standard control unit N° 5.417.265 R) - **Keep original pressure sensor**	- Fit a *Standard* sensor : **N° DX. 144.263 A** - **Keep original electronic control unit**
Since September 1972	*With external potentiometer* **N° 5.429.447 D** (Ref. BOSCH N° 0.280.000.047) **AIR TEMPERATURE SENSOR : N° 1 D 5.412.360 A**	*Mark : 1 blue dot* **N° 5.429.448 P** (Ref. BOSCH N° 0.280.100.048)	- Fit a control unit : **N° 5.429.447 D** *(Ref. BOSCH N° 0.280.000.047)* (or the Standard control unit N° 5.436.493 R) - **Keep original pressure sensor** *(Mark : 1 blue dot)*	- Fit a sensor : *1 blue dot* **N° DX. 144.263 A** *(Ref. BOSCH N° 0.280.100.048)* - **Keep original electronic control unit.**

IDENTIFICATION OF COMPONENTS : The control units and the sensors (pressure and temperature) always bear the supplier's reference number.

NOTE :

1. A pressure sensor N° DX. 144.119 A *(1 green dot)* has been fitted as a repair on a few vehicles only. This sensor is not on sale but it can be replaced by pressure sensor N° DX. 144.263 B *(1 black dot).*

2. **New components; the Replacement Parts Dept. supplies only three types of control units :**

a) *The control unit N° ZC. 9.851.101 U* (Bosch ref. N° 0.280.000.042) replacing control units N° DX. 144.906 A *(unmarked or with 1 yellow dot)* and N° 2 D 5.402.234 K *(2 yellow dots).*
IMPORTANT : With control unit N° ZC. 9.851.101 U.
- a standard pressure sensor N° DX. 144.263 A **must be fitted.**
- **never fit** an air temperature sensor.

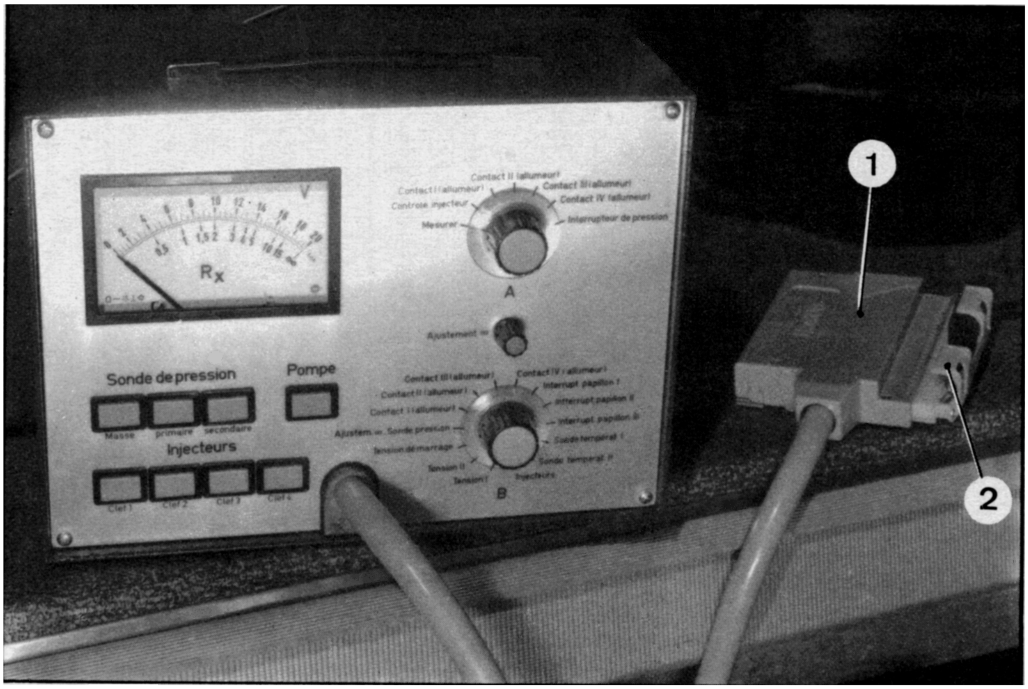
b) *The control unit N° DX. 144.906 B* (Bosch ref. N° 02.800.000.22) replacing an identical control unit.

c) *The control unit N° 5.429.447 D* (Bosch Ref. N° 0.280.000.047) replacing an identical control unit.

NOTE : These three control units are fitted with an externally controlled potentiometer : *never alter its adjustment.*

I. FIRST PART

7192



Connect the terminal block (1) of the BOSCH Test Unit EFAW 228 - S 10 and the terminal block (2) of the electronic control unit.

IMPORTANT NOTE : **Do not connect up the electronic control unit otherwise the readings would be distorted.**
To do this :
- Remove the electronic control unit.
- Disconnect the terminal block (2) of the control unit harness and check the positionning of the leads of the 25 way connector using the reference marks and referring to the wiring diagrams.
- Connect the terminal blocks (1) and (2).

TURN THE SWITCH TO THE "MEASURE" POSITION

Precautions :

- It is necessary to switch on the ignition to carry out the following checks.
- To avoid heating the ignition coil, disconnect it. (Disconnect the lead from the "-" or the "RUP" terminal on the coil).

Operations to be carried out	Additional checks to be carried out if the value specified is not obtained
1. Check the feed voltage of electronic control unit.	
a) Switch **B** : in position "**voltage 1**" **Switch on the ignition** VOLTMETER : should read 11 to 12.5 volts.	a) *If the voltmeter indicates no voltage :* Check whether there is voltage at terminals 30/51, 86, 87 of general feed relay (3), using a separate voltmeter - terminal 30/51 : if voltage = 0 The black lead N 1 from the starter motor relay (8) to the terminal 30/51 of the general feed relay (3) is O/C or disconnected. - terminal 86 : if voltage = 0 The ignition switch (A) is defective, or the excitation leads on relay (3) are O/C or disconnected. Either : feed wire from the coil (15) to the vehicle harness, or lead (violet 3) from coil (15) to terminal 86 of relay (3) (mauve 3), defective. - terminal 87 : if voltage = 0 the general feed relay is defective : - Yellow lead 26 from terminal 85 or relay (3) to earth 26, on regulator, O/C or disconnected. - Relay (3) is defective. - If there is voltage at terminals 30/51, 86, 87 of relay (3) : - The lead (white 2) from terminal 87 of relay (3) to terminal 16 (yellow brown 2) of electronic control unit (18) is O/C or disconnected. - The lead (yellow-blue 26) from electronic control unit (18) terminal 11 to earth 26 on the regulator is O/C or disconnected. b) *If the voltmeter indicates less than 11 volts :* Check whether there is any contact resistance in the leads : - Black (1) from starter motor relay (8) to terminal 30/51 of general feed relay (3). - White (2) from terminal 87 of relay (3) to yellow-brown 2, terminal 16 of electronic control unit (18). - Yellow-blue (26) from electronic control unit terminal block (18) terminal 11 to earth 26 at regulator. Using a separate voltmeter check wheter there is contact resistance across the points of the general feed relay (3) (voltage drop between terminals 30/51 and 87).
b) Switch **B** : in position "**voltage II**" VOLTMETER : should read 11 to 12.5 volts	Check lead (white 2) from terminal 87 of the general feed relay (3) to terminal 24 (brown 2) of the electronic control unit.

Manual 814-1

Operations to be carried out	Further checks to be carried out if the specified value is not obtained
2. Check the starting voltage at terminal 87 of impulse relay (5).	
- Switch **B** : in "**Starting voltage**" position - **Operate the starter** so that the pointer just stabilises. - VOLTMETER : should read 9 volts minimum	a) *If the voltmeter shows no voltage, but the starter operates :* - Check whether there is any voltage at terminals 30/51 and 85 of impulse relay (5). - Terminal 30/51 : If no voltage : The lead (black 1) from starter relay (8) to black 1, terminal 30/51 of impulse relay (5) is O/C or disconnected. - Terminal 85 : If no voltage : The lead, black 1, from starter relay (8) to yellow 1, terminal 85 of impulse relay (5) is O/C o or disconnected. - Check the lead mauve 6 from terminal 86 of impulse relay (5) to connection of lead, red 6, with vehicle wiring harness (lead from starter switch B). - Check whether there is any voltage at terminal 87 of impulse relay (5) (5). If voltage is still 0 when starter motor is operated, replace the impulse relay (5). - Check the lead, white 7, from impulse relay (5) terminal 87 to violet 7 of electronic control unit (18), terminal (18) (O/C or disconnected). b) *If the voltmeter indicates no voltage and the starter does not operate :* - In addition to the test above, check : - The starter motor switch B and the starter motor relay (8). - The lead, red 6, from the harness of the injection system to starter motor switch B. - The starter switch earth B through the charge warning light relay (terminal L on regulator). - The starter motor. c) *If the voltmeter indicates less than 9 volts :* - Check the voltage drop across the contacts of the starter motor relay (8) and in the connection of the starter motor feed cable on the solenoid. Use a separate voltmeter and measure the voltage at the "+" terminal of the battery and the voltage at the "+" terminal of the solenoid when the starter motor is operated. - Check the voltage drop across the contacts of the impulse relay (5). Use a separate voltmeter and check the voltage at terminal 30/51 and the voltage at terminal 87 of the impulse relay (5) : The voltage at terminal 87 of the impulse relay (5) must be the same as that at terminal 18 of the electronic control unit (read on the tester volts scale); if it is not, the lead white 7 from terminal 87 of the impulse relay (5) to violet 7 of terminal 18 of the electronic control. - Check the starter motor.

DJ.IE VEHICLES PRODUCED SINCE 26th. APRIL 1971

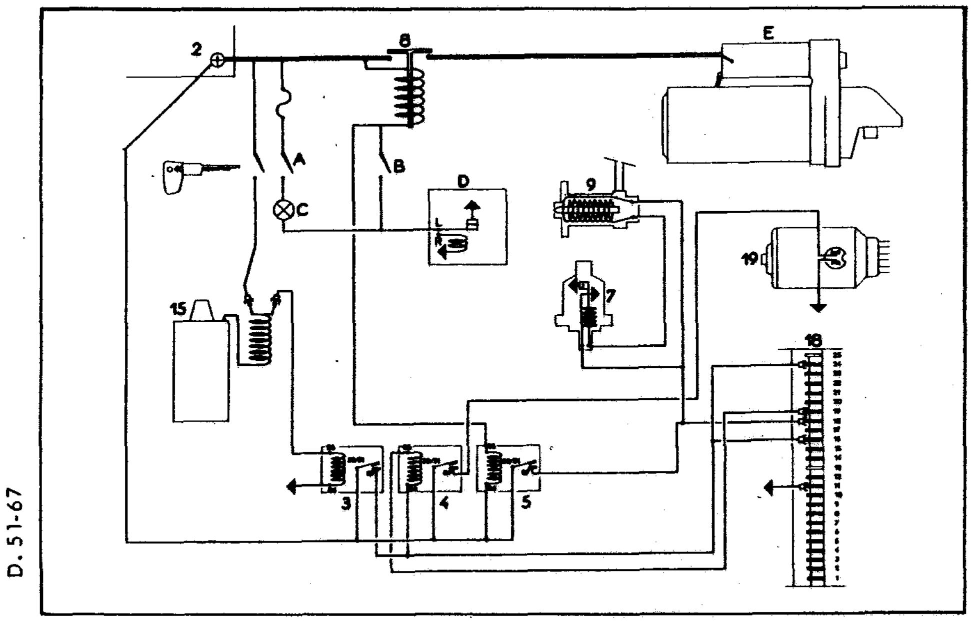
The starter motor and impulsion relays are not fitted on these vehicles (refer to the diagrams on the following page and to operation DJ.IE 511-00 to identify the markings of the leads).

For these vehicles, the check on the starter motor voltage becomes as follows :
(refer to diagram DJ.IE 511-00 and to the lead identification table).

Operations to be carried out	Further checks to be carried out if the specified value is not obtained
2. Check the starter motor voltage	**(DJ.IE ⟼ 4/1971)**
- Switch **B** in position "**starter motor voltage**" - **Operate the starter** motor long enough to allow the needle to become steady - VCLTMETER : should read 9 volts minimum -	a) *The starter motor works and the voltmeter shows no voltage :* - Check the shunt on the leads (mauve 18) and (white 18) - The lead (white 18, 18) from the shunt to the terminal 18 on the electronic control unit (18) (interrupted) b) *The voltmeter shows no voltage and the starter motor does not work :* In addition to the preceding checks, test : - The feed wire of the starter motor switch B (jump lead on the lighting feed wire). - The starter motor switch B - The connecting lead (red 18) from the electronic fuel injection system harness to the starter motor switch B. - The starter motor. c) *The voltmeter shows a voltage of less than 9 volts :* - Check the voltage drop in the connection of the starter motor feed cable. Use the voltmeter to measure the voltage at the "+" terminal of the battery and at the "+" terminal of the solenoid when the starter motor is operated. - Check the voltage drop in the connections. - Of the feed wire of the starter motor switch B. (jump lead on the lighting switch feed wire). - Of the contacts of the starter motor switch B. - Of the connecting lead (red 18) from the electronic fuel injection system harness to the starter motor switch B. - From the shunt lead (white 18.18) to the terminal (18) of the electronic control unit (18)

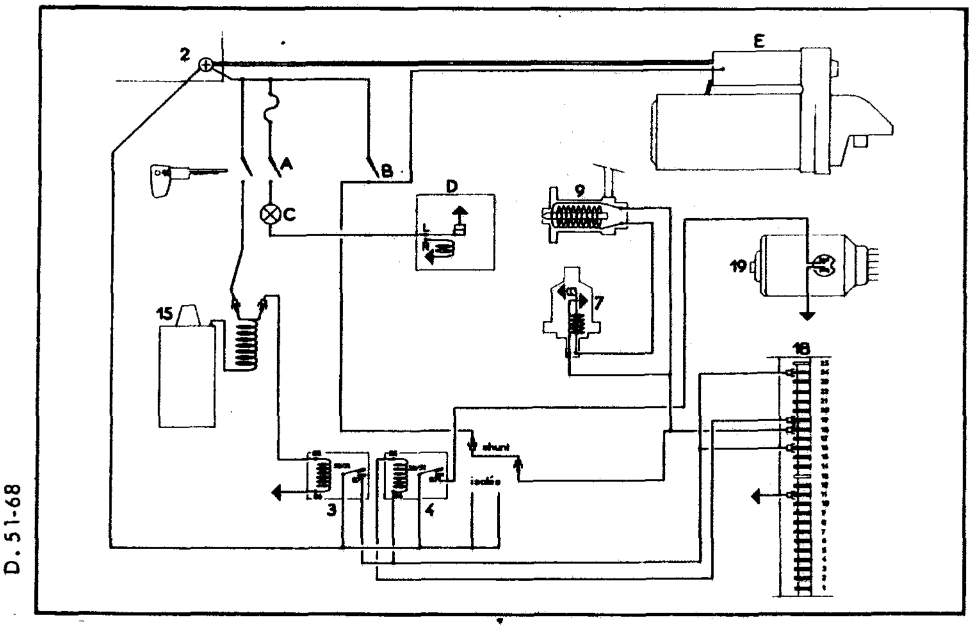
DIAGRAMS SHOWING THE PRINCIPLES OF THE STARTER CONTROL

DX.IE Vehicles
DJ.IE Vehicles produced up to April 1971



DJ.IE Vehicles produced since April 1971

The starter motor and impulsion relays are no longer fitted.

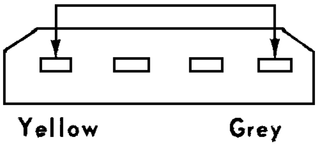


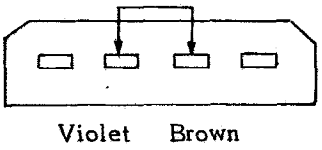
KEY :

NOTE : The marks on the parts are identical to those used in the wiring diagrams.

2. Battery
3. General feed relay
4. Fuel pump relay
5. Impulsion relay
7. Thermal time switch (cold start)
8. Starter motor control relay
9. Cold start injector
15. Ignition coil

18. Electronic control unit
19. Fuel pump
A. Vehicle ignition contact
B. Starter motor switch
C. Charging warning light
D. Relay voltage regulator relay
E. Starter motor

Operations to be carried out	Additional checks to be carried out if the specified value is not obtained
3. Check the resistance between the windings of the pressure sensor (17) and earth :	
Switch **B** : in position «**Adjust ∞**» **Pressure sensor.** **- Adjust the tester (ohmmeter) to position ∞ by turning the «Adjust ∞» control.** **- Press button marked «Earth»** OHMMETER : pointer on ohms scale should read ∞	a) *If ohmmeter indicates zero resistance* (short circuit) Withdraw the connector from the pressure sensor (17) Two possibilities now exist : - *If the ohmmeter now indicates «∞» resistance :* The pressure sensor is defective; replace it. - *If the ohmmeter now indicates zero resistance :* One or several of the following leads are short-circuited. - Green-grey 8 from terminal 7 of the electronic control unit (18) to Grey 8 of the pressure sensor (17) - Green-brown 9 from terminal 8 of the electronic control unit (18) to brown 9 of the pressure sensor (17) - Yellow-violet 10 from terminal 10 of the electronic control unit (18) to violet 10 of the pressure sensor (17) - Yellow-green 11 from terminal 15 of the electronic control unit (18) to yellow 11 of the pressure sensor (17) If so, replace the injection system wiring harness. b) *If the ohmmeter indicates a resistance less than ∞, but not zero (faulty insulation)* Carry out the same check as at a).
4. Check the resistance of the primary winding of pressure sensor (17) :	
Switch **B** : in position « **Adjust ∞ pressure sensor** » **Press « Primary» button.** OHMMETER : should read 0.8 to 1.2 on the lower scale (actual value 90 Ohms approx.).	a) Check that the connector on the pressure sensor is correctly fitted. b) *If the ohmmeter indicates a resistance considerably less than the specified value :* Withdraw the connector from the pressure sensor : - If the ohmmeter indicates ∞, the pressure sensor is defective; replace it. - If the ohmmeter still indicates a resistance considerably less than the specified value, replace the injection system wiring harness. c) *If the ohmmeter indicates zero resistance :* Withdraw the connector from the pressure sensor : - If the ohmmeter now indicates ∞ the pressure sensor is defective; replace it. - If the ohmmeter indicates 0, replace the injection system wiring harness. d) *If the ohmmeter indicates a resistance considerably higher than the specified value :* Check the following leads and their connections for excessive resistance : Green-grey 8 to grey 8, yellow-green 11 to yellow 11, from terminals 7 and 15 on the electronic control unit (18) to the pressure sensor (17) e) *If the ohmmeter indicates ∞ resistance :* Withdraw the connector from the pressure sensor and connect a jumper lead across the outer terminals (yellow and grey) of the connector :  - If the ohmmeter now indicates 0, the pressure sensor is defective, replace it. - If the ohmmeter indicates ∞, check the leads green-grey 8 to grey 8, yellow-green 11 to yellow 11, and their connections.

Operations to be carried out	Additional checks to be carried out if the specified value is not obtained
5. Check resistance of secondary winding of pressure sensor (17) :	
Switch **B** : in position « **Adjust ~ pressure sensor** » **Press « Secondary » button** OHMMETER : should read 3 to 4 on the Rx scale (350 ohms approx.)	- Checks identical to 4 a), b), c). d) *If the ohmmeter indicates a resistance considerably higher than the specified value :* Check the following leads and their connections for excessive resistance: Green-brown 9 to brown 9, and yellow-violet 10 to violet 10, from terminal 8 and 10 of the electronic control unit (18) to the pressure sensor (17) e) *If the ohmmeter indicates ∞* Withdraw the connector from the pressure sensor and connect a jumper l lead between the inner terminals (violet and brown).  - If the ohmmeter now indicates 0, the pressure sensor (17) is defective. Replace it. - If the ohmmeter now indicates ∞, check the leads green-brown 9 to brown 9 and yellow-violet 10 to violet 10, and their connections.
6. Check resistance of triggering contacts in distributor (1) .	
1) Switch **B** : in position « **Distrib. contact I** » **Operate starter motor** to turn distributor OHMMETER : the pointer should oscillate. 2) Switch **B** : in position « **Distrib. Contact II** » Carry out same check as above (§ 6 - 1)	If the ohmmeter pointer does not oscillate, or if it remains at either ∞ or 0 . - Check that the connector on the distributor is correctly fitted. - Replace the triggering contact cassette.
7. Check the correct operation of the throttle-spindle switch (10) (pulse-width)	
1) Switch **B** . in position « **Throttle value switch I** » **Depress the accelerator pedal slowly to the end of its travel.** *(On vehicles with hyd gearchange place manual clutch control in « engaged » position)* OHMMETER : must show 8 to 10 oscillations between 0 and ∞ 2) Switch **B** : in position « **Throttle value switch II** » Carry out same check as above (§ 7 - 1)	- Check that the connector on the throttle-spindle switch (10) is correctly fitted; if still incorrect : - Fit a new throttle-spindle switch (10) and adjust it (see § 8 - 1 a, below)

Operations to be carried out	Additional checks to be carried out if the specified value is not obtained

8. Check resistance of the contacts of the throttle-spindle switch (10) :

Switch **B** : in position « **Throttle valve switch III** »

1) Accelerator pedal released

- OHMMETER : must read 0

a) *If the ohmmeter indicates ∞ :* the throttle-spindle switch (10) is incorrectly adjusted. Adjust the switch.

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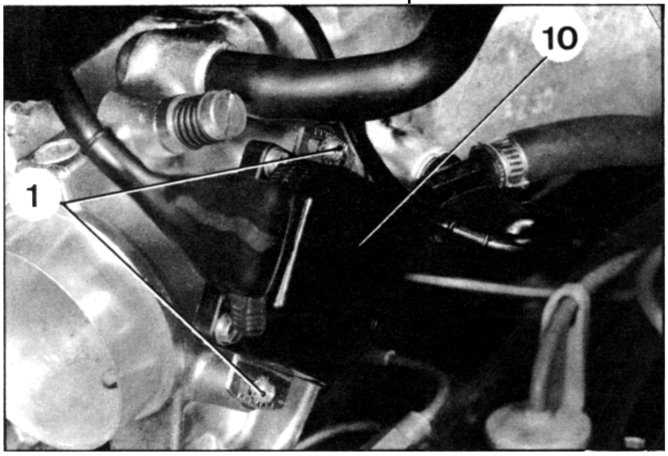


With the throttle closed (accelerator pedal released) the contacts of the throttle-spindle switch (10) must be closed. They must open for a movement of 2° of the throttle.

To facilitate this adjustment the switch mountings are graduated (1 division = 2°)

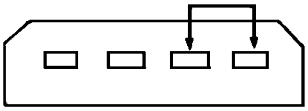
Slightly slacken the two retaining screws (1) for the throttle-spindle switch (10).

With the ohmmeter needle indicating and the throttle in idling position, place a feeler gauge of 0.7mm between the eccentric adjuster of the throttle stop and the lever on the throttle-spindle.

- Then gently turn the switch (10) until the exact moment when the contacts close (the pointer then indicates 0).
  Tighten the two switch retaining screws.
- Check the adjustment . With the accelerator pedal released, place a feeler gauge of 0.7 mm as above : the pointer must indicate 0.
  Insert a feeler gauge of 1.4 mm : the pointer must indicate ∞.

b) *If the ohmmeter still indicates ∞ :*

Check that the connector on the throttle-spindle switch (10) is properly fitted.



- If it is correct, withdraw the connector from the throttle-spindle switch (10) and connect a jumper lead between terminals grey and white of the connector.

c) *If the ohmmeter still indicates ∞ :*

Check : - The lead white 16 between the switch (10) and the electronic control unit (18) terminal 17 (white 16).
- The lead grey 15 between switch (10) and the electronic control unit (18) terminal 14 (yellow-grey 15)

d) Refit the connector on the switch and adjust the switch (10) as in § a above.

e) *If the ohmmeter still indicates ∞ :*

Replace the throttle-spindle switch (10).

2. With accelerator pedal very slightly depressed (butterfly opening = 2°)

- OHMMETER : must read ∞

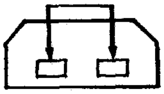
a) *If the test ohmmeter indicates 0 :* The throttle-spindle switch (10) is incorrectly adjusted. Re-set it (see § 8 - 1 a)

b) *If the ohmmeter still indicates 0 :* Withdraw the connector from the throttle-spindle switch (10).

c) *If the ohmmeter still indicates 0 :* Replace the injection system wiring harness.

d) Refit the connector and proceed as in § a above.

e) *If the ohmmeter still indicates 0 :* Replace the throttle-spindle switch (10)

Operations to be carried out	Additional checks to be carried out if the specified value is not obtained
9. Check the resistance of the thermal sensor (6) :	
Switch **B** in position « **Temperature Sensor II** » - OHMMETER : must read 0.3 to 2.5 on Rx scale (2500 Ohms approx. at 20° C) NOTE : The specified value of 2500 Ohms corresponds to 20° C. At a higher temperature resistance is lower.	a) *If the ohmmeter indicates ∞ :* Check that the connector is properly fitted to the thermal sensor. If it is correct, withdraw the connector from the thermal sensor (6) and connect lead green 18 to earth. - If the ohmmeter indicates 0, check the lead 26 between the thermal sensor (6) and earth on the regulator. - If it is correct, replace the thermal sensor (6). - If the ohmmeter indicates ∞, check the lead, green 18 to green 18, between terminal 23 on the electronic control unit (18) and the thermal sensor (6), b) *If the ohmmeter indicates 0 :* Withdraw the connector from the thermal sensor (6). - If the ohmmeter indicates 0, check the lead, green 18 to green 18, between terminal 23 of the electronic control unit and the thermal sensor (6) - If the ohmmeter indicates ∞, replace the thermal sensor (6).
10. Check the injectors (11), (12), (13), and (14) :	
- Switch **B** : in position «**Injectors**» - **Adjust pointer to ∞ on scale, using « Adjust ∞ » knob.** - **Press valve buttons 1,2,3 and 4 in sequence corresponding to Injectors n° 1, 2,3 and 4** - OHMMETER : must read 2 to 3 on Rx scale (2.4 Ohms at 20° C).	a) *If the tester ohmmeter indicates 0, or a value considerably lower than 2 :* Withdraw the connector from the corresponding injector. If the ohmmeter now indicates ∞, replace the injector. - If the ohmmeter still indicates 0 or a value considerably lower than 2, replace the injection system harness. b) *If the tester ohmmeter indicates ∞, or a value considerably higher than 3* Check that the connector is properly fitted on the injector. If it is correctly fitted, withdraw the connector from the corresponding injector and connect a jumper lead across the terminals. The ohmmeter should indicate 0.  - If the ohmmeter indicates ∞, or a value considerably higher than 3 : Check the feed wire and the earth lead of the injector in question and the general earth lead. E.g. 1st injector. - Lead between electronic control unit (18) terminal 3 (green-white 22) and injector (11) of the 1st cylinder (white 22). - Earth lead 26 of the corresponding injector and general earth lead (26) at the regulator : Refit the connector on the injector. If the ohmmeter indicates ∞ or a value considerably higher than 3, replace the corresponding injector.

D.IE VEHICLES (All types) *produced since 5 th April 1971*

The electronic injection control of these vehicles has been modified as follows :

- the addition of an air temperature sensor
- modification of the control unit (see pages 3 and 4)
- modification of the electrical harness of the injection system. (see operations DX.IE 511-0 and DJ.IE 511-00)

The operations involved in checking the electronic fuel injection system of these vehicles differ only to the extent that an additional check on the air temperature sensor is necessary.

For these vehicles, after checking the resistance of the thermal sensor (§ 9 page 7) the air temperature sensor must be checked.
(Refer to diagrams DX.IE 511-00 and DJ.IE 511-00 and to the lead identification table)

9a Check the resistance of the air temperature sensor *(D.IE All types 4/ 1971)*

- Switch **B** in position **Thermal sensor 1**
- Ohmmeter, should read 2 to 5 on the lower scale (real value around 300 Ω at 10° C).

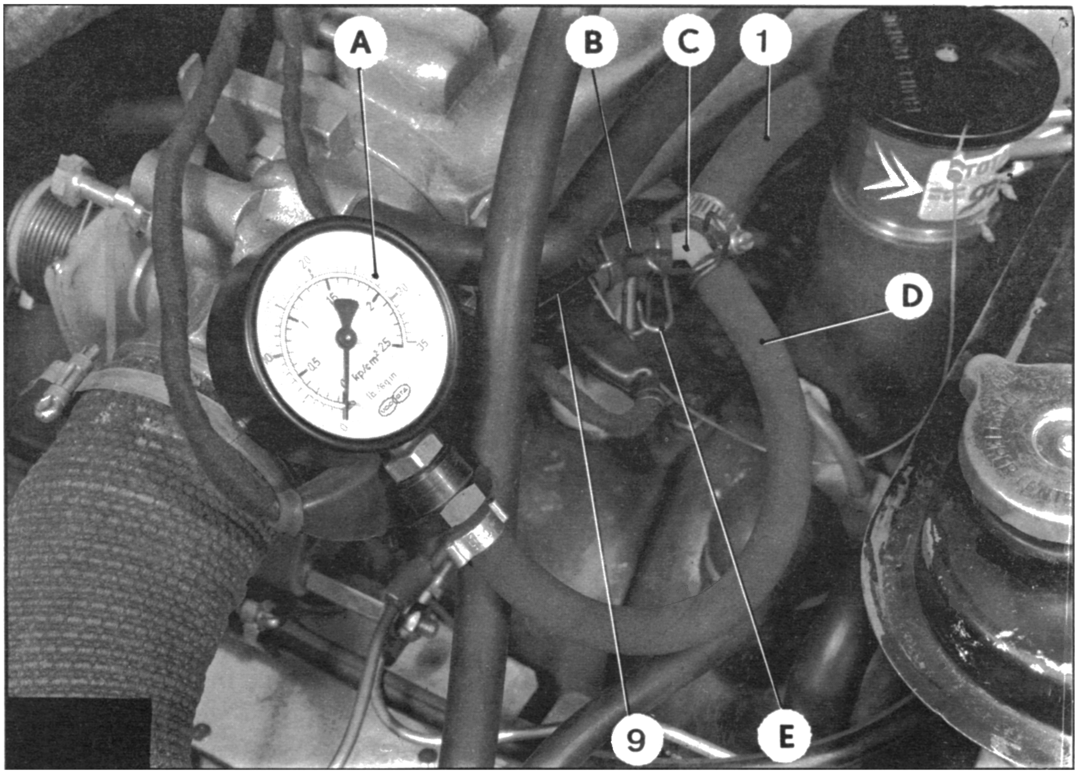
NOTE : The specified value of 300 Ω corresponds to 20° C.
At a higher temperature resistance is lower

a) *Ohmmeter shows* ∞ *:*
Check that the connector is properly fitted to the air temperature sensor. If it is correct remove the connector from the air temperature sensor (2) and connect the lead 1 to earth :
- If the ohmmeter shows O : check the lead 11 between the air temperature sensor (21) and the earth on the regulator. If it is correct, replace the air temperature sensor (21).
- If the ohmmeter shows ∞ : check the lead 1,1, between terminal (1) of the electronic control unit (18) and the air temperature sensor (21).

b) *Ohmmeter shows O :*
Remove the connector from the air temperature sensor (21)
- If the ohmmeter shows O : check the lead 1,1 between the terminal (1) of the electronic control unit and the air temperature sensor (21)
- If the ohmmeter shows ∞ : replace the air temperature sensor (21).

Operations to be carried out	Additional checks to be carried out if the specified value is not obtained

11. Check the fuel-feed pressure :



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- First remove the cold start injector (9) from the induction air manifold, and disconnect the fuel pipe (1) from the injector (9).

- Connect the pressure gauge A onto the cold start injector (9) as shown in the photograph above.

- Use the 3-way union G, flexible pipes B and D and «quick-acting clips» E.

NOTE : A, B, C, D, E are supplied with the BOSCH Tester EFAW 228-S 10

- Switch **A** : in position «**Valve check**» (position of switch B unimportant)

1. Press the button marked « Pump»

PRESSURE GAUGE : should read 2 kg/cm^2(28.5 psi)

a) *If the gauge registers 0* (the fuel pump is not working). Check that the 2-pole connector on the fuel pump is properly fitted. If so, withdraw the 2-pole connector from the pump and measure the voltage across the terminals using a separate voltmeter :

- *If the voltmeter indicates 12 volts :* The fuel pump is defective; replace it.
- *If the voltmeter indicates 0 volts :* Listen to determine whether the fuel pump relay (4) is operating when the «Pump» button is pressed on the tester.
- *If the fuel pump relay (4) is operating :*
  Check the voltage at terminal 87 of relay (4) when the «Pump» button of the tester is pressed.
  - . If voltage = 0 : check that there is current at terminal 30/51. If there is, replace fuel pump relay (4).
  - . If voltage = 12 volts : check leads and connections for continuity :
    - Lead white 5 from fuel pump relay (4), terminal 87, to fuel pump connector (19).
    - Lead 27 from fuel pump connector (19) to earth (on the chassis sidemember).

If leads white 5 and 27, and their connections are not faulty, the fuel pump relay (4) is defective. Replace it.

- *If the fuel pump relay (4) does not operate :* check the leads and connections for continuity :
  - . Lead white 2 from the general feed relay (3) terminal 87 to mauve 2 of the fuel pump relay (4) terminal 86.
  - . Lead yellow 4 from fuel pump relay (4) terminal 85 to yellow 4 of the electronic control unit (18) terminal 19.

If the leads white 4 and yellow 4 and their connections are not faulty, the fuel pump relay (4) is defective.

Replace it.

Operations to be carried out	Additional checks to be carried out if the specified value is not obtained

b) *If the gauge registers a higher or lower pressure than 2 kg/ cm2 (28.5psi)* The fuel-pressure regulator is maladjusted ; it must be re set For this :

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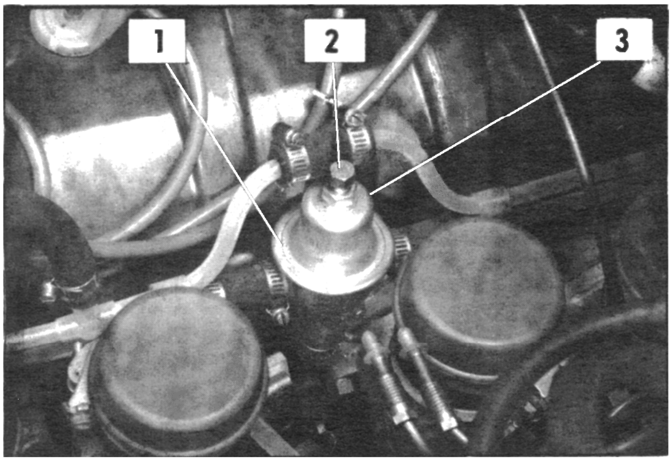


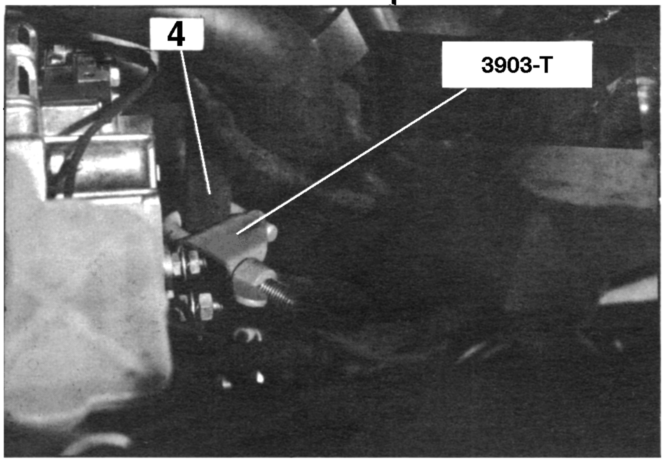
Slacken the lock-nut (3) and turn the adjusting screw (2) until the gauge registers a pressure of 2 kg/ cm2 (28.5 psi). If this pressure cannot be obtained by adjusting, the pressure regulator (1) is defective ; replace it.

IMPORTANT

The setting of the pressure regulator has a great influence on fuel consumption and on the composition of the exhaust gases.

2. Press the «Pump» button briefly
GAUGE : should register a rapid pressure drop to 1.2 kg/ cm2 (18.5 psi). Wait approximately 30 seconds; the pressure should not drop visibly any more.

a) *If the pressure falls rapidly below 1.2 kg/ cm2 (17 psi) when the «Pump» button is released.*



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Isolate the fuel pump. To do this :
Place clamp 3903-T in the middle of the rubber part of fuel feed line (4) before the injector for N° 1 cylinder.

Press the «Pump» button to pressurise the circuit and quickly close the fuel feed line (4) by means of clamp 3903-T when the pump operates.

b) *If the pressure does not drop :*
Check the union of the fuel outlet pipe on the pump for leaks.

c) *If the pressure drop to 0 :*

- Check the fuel-tightness of the cold-starting injector. Look to determine whether fuel is escaping. If it is, replace the injector.
- Check the fuel-tightness of the unions of the fuel feed pipes, on the injectors and on the pressure regulator.
- Check the fuel tightness of each injector, eliminating them one by one.

To do this :

- Disconnect the fuel feed manifold from the rubber attached to the injector to be checked and plug the end (use a flexible pipe, inside diameter = 7 mm, length = 50 mm, plugged at one end. Ensure fuel-tightness at the plug and on the fuel-feed manifold by «quick-acting» clips *).

Re-pressurise the circuit as shown above.
If the pressure does not drop : the injector being checked is leaking and must be replaced.
If the pressure drop to 0 : check the remaining injectors.
If the pressure drops to 0 after all the injectors have been checked and eliminated : the pressure regulator is leaking and must be replaced.
Remove clamp 3903-T.

Operations to be carried out	Additional checks to be carried out if the specified value is not obtained
12. Check the action of the injectors :	
Switch **A** : in position «**Injector check**» Pressurise the circuit by briefly pressing the «**Pump**» button. **Press very briefly on each of the «valve» buttons 1, 2, 3 and 4 in turn.** While each button is depressed, the needle of the pressure gauge should drop. It must stop as soon as the button is released.	- *If the pressure does not drop :* replace the corresponding injector.
13. Check the action of the cold-start injector (9) and of the time delay thermal switch (7) :	
Switch **A** : in position «**Injector check**» With the fuel circuit pressurised, briefly activate the starter motor, after having placed a container under the cold-start injector (9) The cold-start injector should spray fuel.	a) *If the engine coolant temperature is higher than 37° C :* The cold-start injector will not operate. If this is the case, disconnect the lead Grey 17 from the thermal switch (7) for cold-starting and earth it. The cold-start injector should operate in these conditions all the time that the starter motor is activated. If it does not : Check : - The lead between the impulse relay (5) terminal 87 (white 7) and the electronic control unit (18) terminal 18 (violet 7). - The lead between the impulse relay (5) terminal 87 (white 7) and the cold-start injector (blue 7). - The lead between the impulse relay (5) terminal 87 (white 7) and the terminal switch (7) (blue 7). - The lead between the cold-start injector (9) (grey 17) and the thermal switch (7) (grey 17) Check the resistance of the winding of cold-start injector (9) : It should be 4.2 ohms at 20°C. If not, replace the cold-start injector (9). b) *If the engine coolant temperature is less than 16° C :* The cold-start injector will operate If it does not operate, carry out the above check. With the thermal switch (7) connected. if the cold-start injector (9) still does not operate, the thermal switch (7) is defective. Replace it.
14. Remove the pressure gauge, the flexible pipes and the «quick-acting» clips. First connect the cold-start injector feed pipe to the injector and then refit the cold-start injector onto the air inlet manifold.	

II. SECOND PART

With the terminal block (1) of BOSCH tester EFAW 228 S-10 still connected to the terminal block (2) of the injection system harness, CONNECT THE ELECTRONIC CONTROL UNIT (3) to the other side of the terminal block (1) of the BOSCH tester.

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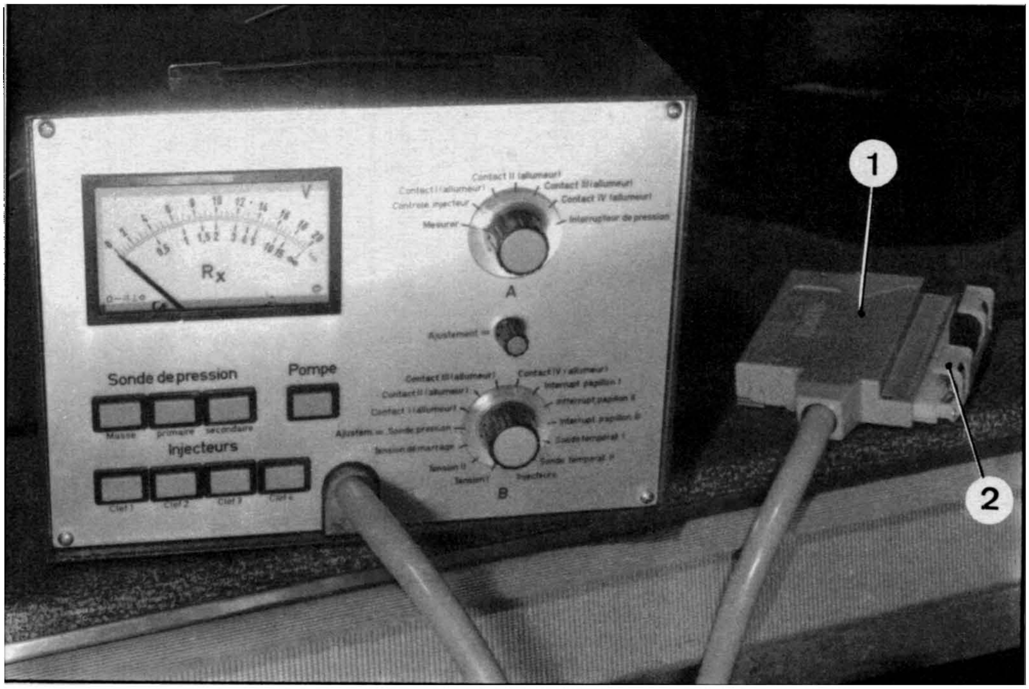


15. Check the movement of the triggering contacts in the distributor

- Switch **A** : in position «**Distrib. Contact 1**».
- **Run the engine at 1500 rpm approx. and turn switch A from position «Distrib. Contact 1» to «Distrib. Contact II» alternately.**
- VOLTMETER - The needle should move towards the max. end of the scale then oscillate about an average reading. The variation between the two average readings must not be more than **two divisions** (Read on the upper scale-voltmeter) between positions «**Distrib. Contact I**» and «**Contact II**».

If the variation exceeds two divisions (upper scale-voltmeter) :
The triggering contacts are defective. Replace the contact cassette.

16. Check the operation of the throttle-spindle switch :

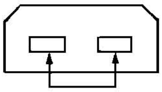
- Switch **A** : in position «**Distrib. Contact I**« or «**Distrib. Contact II**».
- With the engine idling, disconnect from the air inlet manifold, the rubber pipe leading to the supplementary air control : the engine speed should oscillate between 1100 and 1800 rpm.
- Slightly open the throttle : the engine speed should stabilise. If it does not, adjust the throttle-spindle switch (see § 8 - 1 a).

17. Check the full-load switch (16) :

- Switch **A** : in position «**Pressure switch**»

Check that the connector on the full-load switch is properly fitted.

1) With the engine stopped and ignition on, the voltmeter needle should indicate a value lower than 6 (upper scale-voltmeter)
2) Start the engine
   With the engine idling, the needle should indicate a value above 17 (upper scale-voltmeter) ; otherwise :
   If the needle indicates 0 :
   Withdraw the connector from the full-load switch (16) and connect a jumper lead between the terminals :
   If the needle indicates a value above 17,



Check : - The lead between the electronic control unit (18) terminal 2 (red to blue 12) and the full-load switch (16) (blue 12),
- The lead 26 from the full-load switch (16) to earth (26) on the electric regulator.
- The earth (26) on the regulator.

If these leads and the earth (26) are correct, the full-load switch) 16) is defective and must be replaced.

3) Snap open the throttle : the needle must move smartly between the two values indicated previously.
If the needle only drops slowly :

- Disconnect from the air inlet manifold the flexible pipe leading to the switch (16) :
  The engine idling should become «jumpy» (mixture too rich).

If it does not, replace the full-load switch.

18. Switch off the ignition
Remove the BOSCH TESTER EFAW 228 S-10.
Refit the electronic control unit.

III. PART THREE

IMPORTANT NOTE :

The BOSCH TESTER EFAW 228 S-10 enables every part of the electronic fuel injection system to be checked except for the electronic control unit itself.

If no fault is found during the tests, the electronic control unit should not yet be pronounced faulty :

1) **First check the five earth leads carefully :**

- From the voltage regulator (a)
- From the injection system harness (b)
- From the battery (c)
- From the electrical fuel pump (d)
- From the car chassis (e)

See illustrations on page 17.

Check the tightness of the bolts and pull gently on the leads to ensure that they are properly secured to their terminals.

2) **Due to the difficulty of checking the contacts of the wiring harness terminals on the various components of the electronic injection system, a new wiring harness must be tried.**

3) **Carry out a road test.** If the trouble persists disconnect the excitation lead (yellow sleeve) from the alternator, insulate it, and **repeat the road-test :**

If the trouble disappears : either the alternator or the regulator is defective. Check them and replace whichever is faulty.

If the trouble persists : the electronic control unit is defective and must be replaced.

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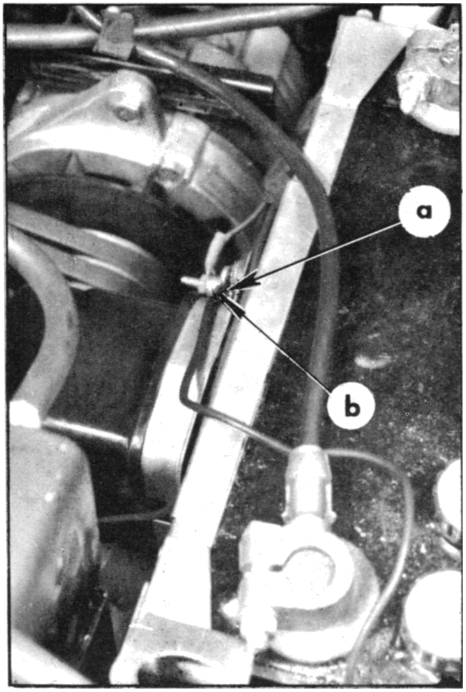

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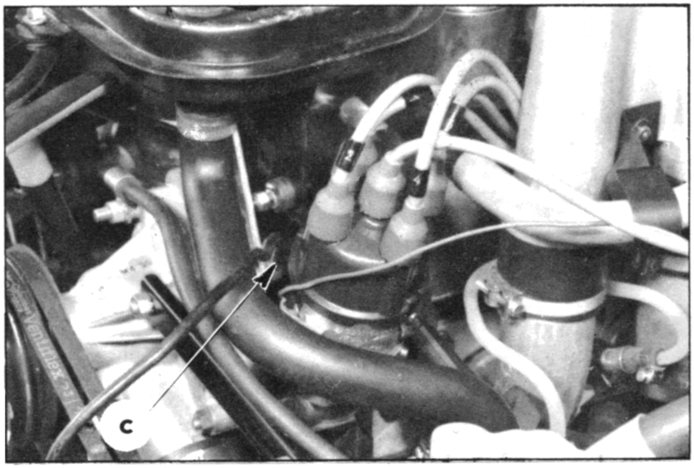

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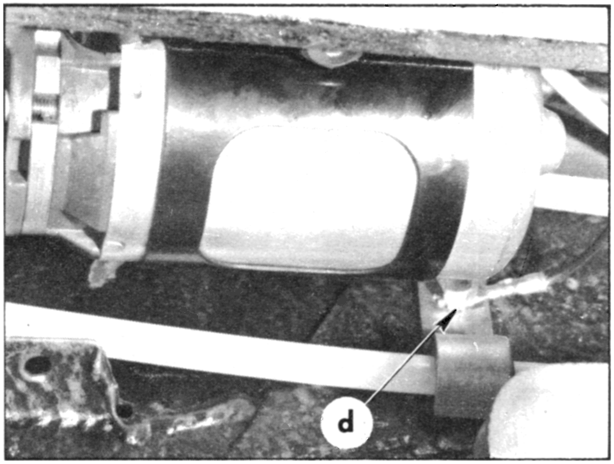

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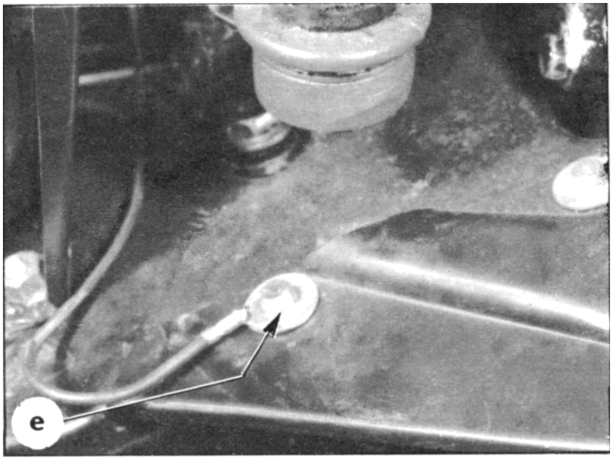


OPERATION N° D.IE 144-0 a : Checking the electronic fuel injection system

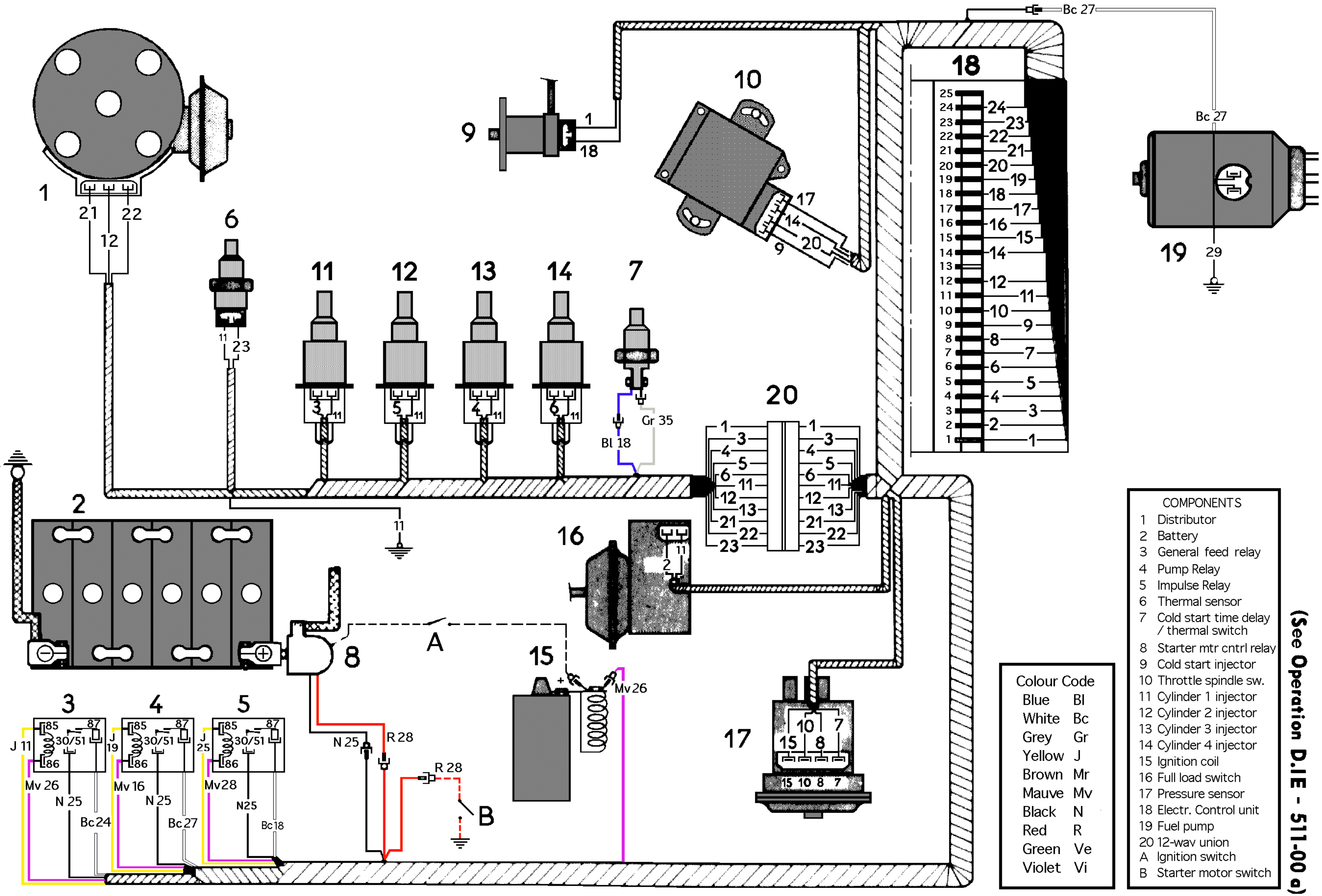
(BOSCH Test Unit EFAW 228-S10)

DIAGRAM D.IE - 511-00

ELECTRONIC FUEL INJECTION SYSTEM

D.IE Vehicles - All Types - produced between March 1970 and April 1971

D - 51-63 c



Colour Code	
Blue	Bl
White	Bc
Grey	Gr
Yellow	J
Brown	Mr
Mauve	Mv
Black	N
Red	R
Green	Ve
Violet	Vi

COMPONENTS	
1	Distributor
2	Battery
3	General feed relay
4	Pump Relay
5	Impulse Relay
6	Thermal sensor
7	Cold start time delay / thermal switch
8	Starter mtr cntrl relay
9	Cold start injector
10	Throttle spindle sw.
11	Cylinder 1 injector
12	Cylinder 2 injector
13	Cylinder 3 injector
14	Cylinder 4 injector
15	Ignition coil
16	Full load switch
17	Pressure sensor
18	Electr. Control unit
19	Fuel pump
20	12-wav union
A	Ignition switch
B	Starter motor switch

(See Operation D.IE - 511-00 a)

D. IE VEHICLES (All Types) *produced between March 1970 and April 1971*

Wiring diagram D. IE 511-00 a differs from the wiring diagram D. IE 511-00 only in the following points :

1) Wiring harness in two parts : a 12-way terminal block with pins (20) links these two parts :

2) Marking of the various leads is partly modified : self-adhesive numbers replace the colour identification marks.

The check for the electronic fuel injection system described in this section corresponds to wiring diagram D. IE 511-00. To apply this section to the new wiring diagram D. IE 511-00 a it must be remembered that the wires correspond as follows :

DIAGRAM : **D. IE 511-00**	DIAGRAM : **D. IE - 511-00 a**
J 1, N 1.	J 25, N 25
J - Mr 2, Mr 2, Bc 2, Mv 2	**16, 24,** Bc 24, Mv 16
Mv 3, Vi 3	Mv 26
J 4	J 19, **19**
Bc 5	Bc 27, Bc 27
Mv 6, R 6	Mv 28, R 28
Vi 7, Bc 7, Bl 7	**18,** Bc 18 **(13)**, Bl 13
Ve - Gr 8, Gr.	**7, 7**
Ve - Mr 9, Mr 9	**8, 8**
J - Vi 10, Vi 10.	**10, 10**
J - Ve 11, J 11	**15, 15**
R - Bl 12, Bl 12	**2, 2**
J - Bc 13, J 13	**9, 9**
Bl 14, Bl 14.	**20, 20**
J - Gr 15, Gr 15	**14, 14**
Bc 16, Bc 16	**17, 17**
Gr 17, Gr 17	**1, (1),** Gr 1
Ve 18, Ve 18	**23, (23), 23**
J - R 19, J 19	**12, (12), 12**
R 20, R 20.	**21, (21), 21**
Gr 21, Gr 21	**22, (22), 22**
Ve - Bc 22, Bc 22	**3, (3), 3**
Ve - Bl 23, Bl 23	**5, (5), 5**
Ve - vi 24, Vi 24	**4, (4), 4**
Ve - R 25, R 25	**6, (6), 6**
J - Bl 26, J 26, 26	**11,** J 11, **(11),** 11
27	29

NOTE : The figures in brackets show the markings of the leads of the terminal block (20).

D. 51-63 d

OPERATION Nº D. IE - 144.0a : *Checking the electronic fuel injection system*

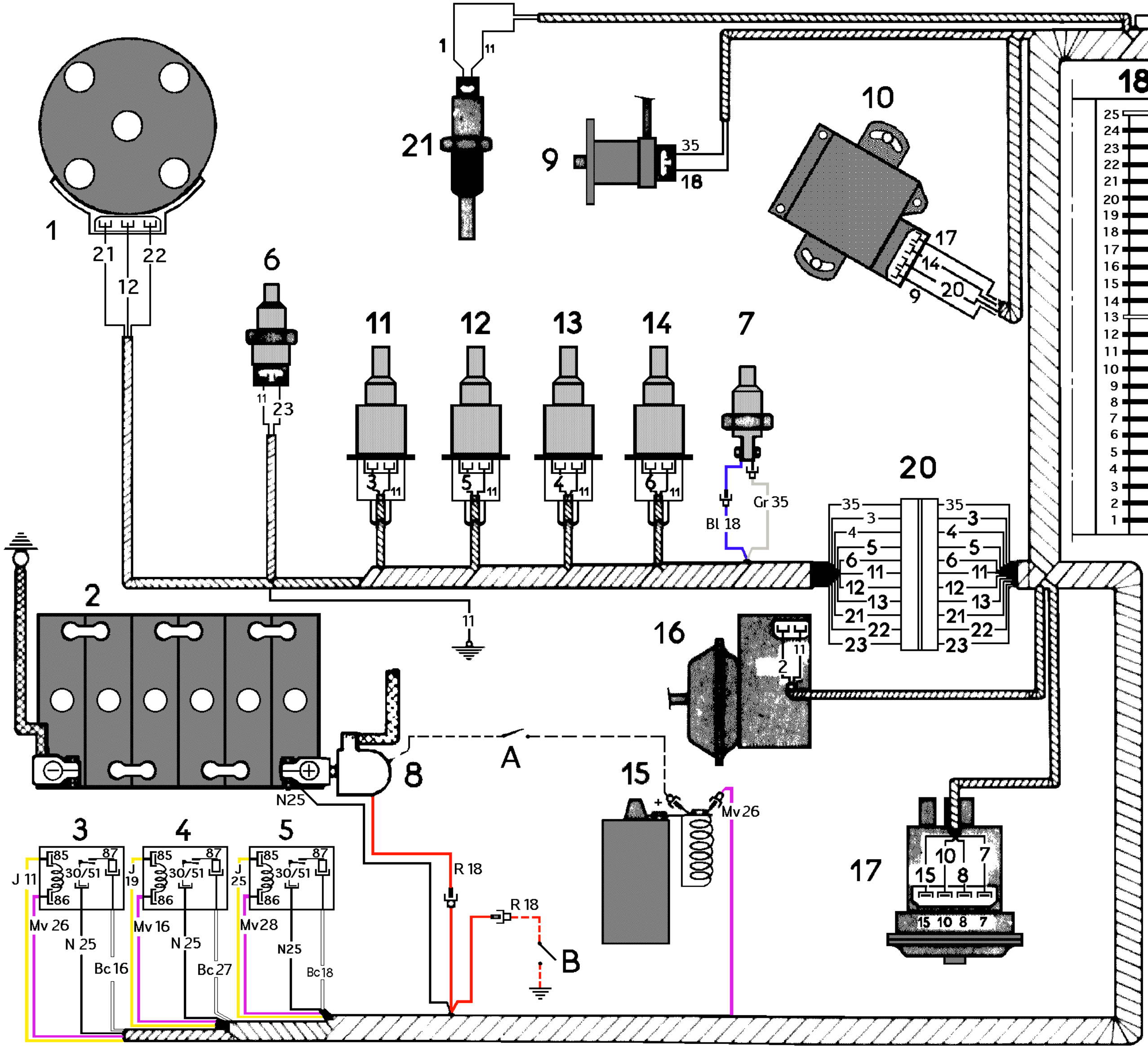
(BOSCH EF AW 228-S10 Test Unit)

DIAGRAM DX.IE - 511-00

ELECTRONIC FUEL INJECTION SYSTEM

DX.IE Vehicles produced since April 1971

(See Operation DX.IE - 511.00)



Colour Code	
Blue	Bl
White	Bc
Grey	Gr
Yellow	J
Brown	Mr
Mauve	Mv
Black	N
Red	R
Green	Ve
Violet	Vi

COMPONENTS

1	Distributor
2	Battery
3	General feed relay
4	Pump Relay
5	Impulse Relay
6	Thermal sensor
7	Cold start time delay / thermal switch
8	Starter mtr cntrl relay
9	Cold start injector
10	Throttle spindle sw.
11	Cylinder 1 injector
12	Cylinder 2 injector
13	Cylinder 3 injector
14	Cylinder 4 injector
15	Ignition coil
16	Full load switch
17	Pressure sensor
18	Electr. Control unit
19	Fuel pump
20	12-way union
21	Air temp. sensor
A	Ignition switch
B	Starter motor switch

OPERATION Nº DJ.IE - 144-0 a : *Checking the electronic fuel injection system*

(BOSCH Test Unit EFAW 228 - S 10)

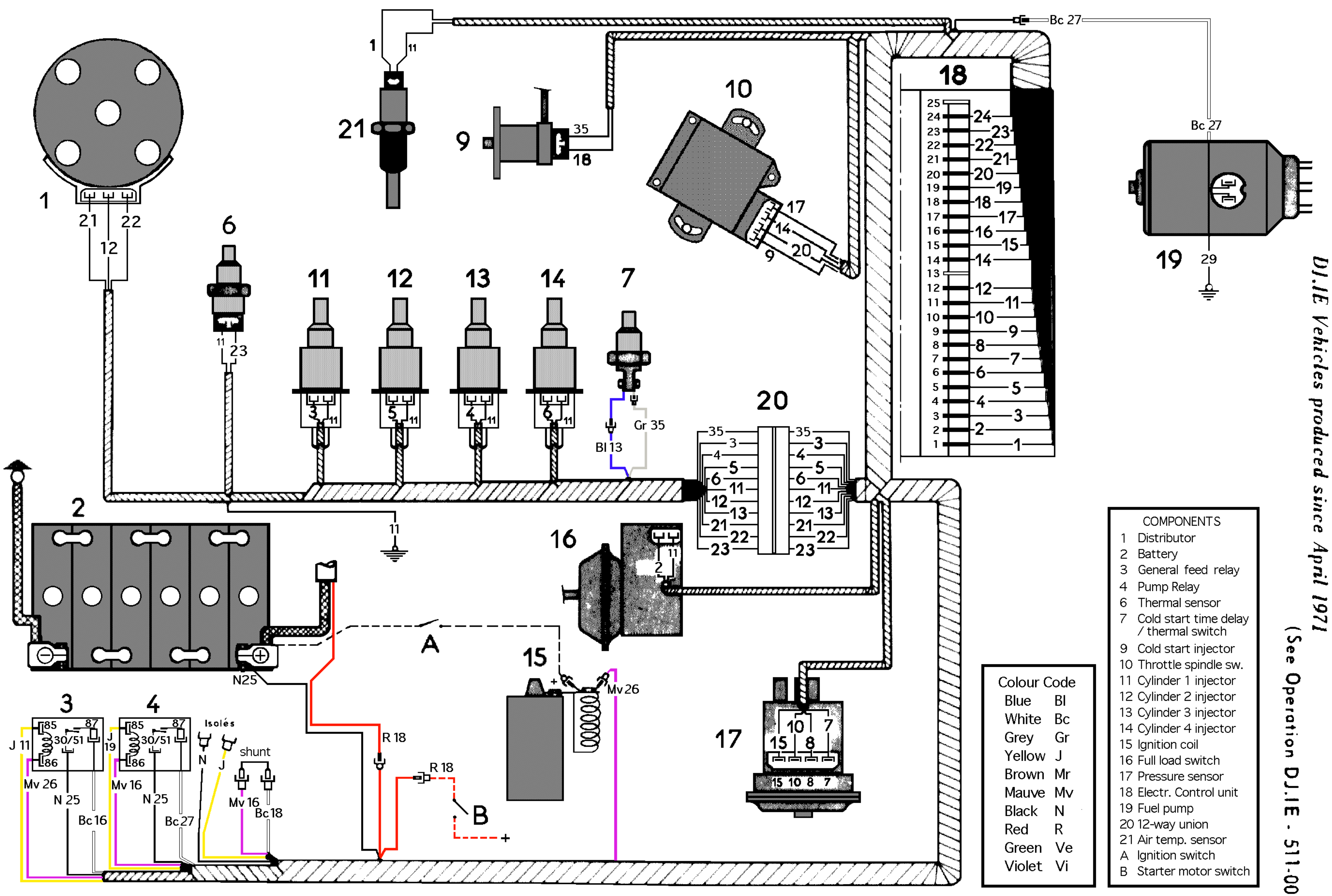
DIAGRAM DJ.IE 511-00

ELECTRONIC FUEL INJECTION SYSTEM

DJ.IE Vehicles produced since April 1971

(See Operation DJ.IE - 511-00)

D. 51-63 e



Colour Code	
Blue	Bl
White	Bc
Grey	Gr
Yellow	J
Brown	Mr
Mauve	Mv
Black	N
Red	R
Green	Ve
Violet	Vi

COMPONENTS	
1	Distributor
2	Battery
3	General feed relay
4	Pump Relay
6	Thermal sensor
7	Cold start time delay / thermal switch
9	Cold start injector
10	Throttle spindle sw.
11	Cylinder 1 injector
12	Cylinder 2 injector
13	Cylinder 3 injector
14	Cylinder 4 injector
15	Ignition coil
16	Full load switch
17	Pressure sensor
18	Electr. Control unit
19	Fuel pump
20	12-way union
21	Air temp. sensor
A	Ignition switch
B	Starter motor switch

OPERATION N° D.IE - 144-0 a : *Checking the electronic fuel injection system (BOSCH Test Unit EFAW 228 - S 10)*

D.IE VEHICLES (All Types) *produced since April 1971*

The wiring diagrams DX.IE 511-00 and DJ.IE 511-00 for these vehicles differ from the wiring diagram D.IE 511-00 only in the following points :

1) The harness is in two parts. A 12-way terminal block (20) connects the two parts.
2) The addition of an air temperature sensor (21) (modified control unit).
3) The starter motor and impulsion relays are no longer fitted on the DJ.IE models.
4) The markings of the various leads have been partly modified. Self-adhesive numbers replace the colour markings.

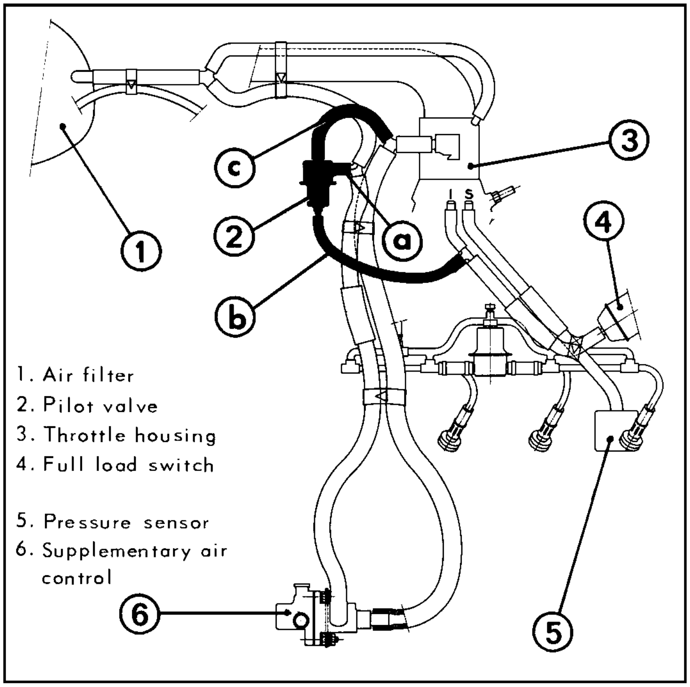
The check fot the electronic fuel injection system griven in this section corresponds to the wiring diagram D.IE 511-00. To apply this section to the new wiring diagrams DX.IE 511-00 and DJ.IE 511-00, it must be remembered that the wires correspond as follows.

DIAGRAMS		
D.IE 511-00	**DX.IE 511-00**	**DJ.IE 511-00**
J 1, N 1	J 25, N 25	N, J (insulated)
J - Mr 2, Mr 2, Bc 2, Mv 2	**16, 24,** Bc 16, Mv 16	**16, 24,** Bc 16, Mv 16
Mv 3, Vi 3	Mv 26, Mv 26	Mv 26, Mv 26
J 4, J 4	J 19, **19**	J 19, **19**
Bc 5, Bc 5	Bc 27, Bc 27	Bc 27, Bc 27
Mv 6, R 6	Mv 28, R 28	Mv 28, R 28
Vi 7, Bc 7, bl 7	**18,** Bc 18, **(13),** Bl 18	**18,** Bc 18, **(13),** Bl 18
Ve - Gr 8, Gr 8	**7, 7**	**7, 7**
Ve - Mr 9, Mr 9	**8, 8**	**8, 8**
J - Vi 10, Vi 10	**10, 10**	**10, 10**
J - Ve 11, J 11	**15, 15**	**15, 15**
R - Bl 12, Bl 12	**2, 2**	**2, 2**
J - Bc 13, J 13	**9, 9**	**9, 9**
Bl 14, Bl 14	**20, 20**	**20, 20**
J - Gr 15, Gr 15	**14, 14**	**14, 14**
Bc 16, Bc 16	**17, 17**	**17,117**
Gr 17, Gr 17	35, (35), Gr 35	35, (35), Gr 35
Ve 18, Ve 18	**23, (23), 23**	**23, (23), 23**
J - R 19, 19	**12, (12), 12**	**12, (12), 12**
R 20, R 20	**21, (21), 21**	**21, (21), 21**
Gr 21, Gr 21	22, **(22), 22**	22, **(22), 22**
Ve - Bc 22, Bc 22	**3, (3), 3**	**3, (3), 3**
Ve - Bl 23, Bl 23	**5, (5), 5**	**5, (5), 5**
Ve - Vi 24, Vi 24	**4, (4), 4**	**4, (4), 4**
Ve - R 25, R 25	**6, (6), 6**	**6, (6), 6**
J - Bl 26, J 26, 26	**11,** J 11, **(11),** 11	**11,** J 11, **(11),** 11
27	29	29
Air temperature sensor	**1**	**1**

NOTE : The figures in brackets show the markings of the leads of the terminal block (20).

DJ.IE VEHICLES ↦ *9/1972*

D. 14-52 a



1. Air filter
2. Pilot valve
3. Throttle housing
4. Full load switch
5. Pressure sensor
6. Supplementary air control

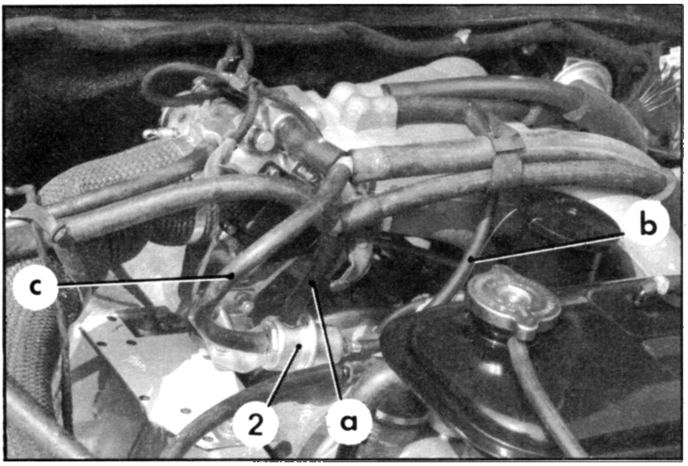
"DECEL" circuit

DJ.IE Vehicles released since september 1972.

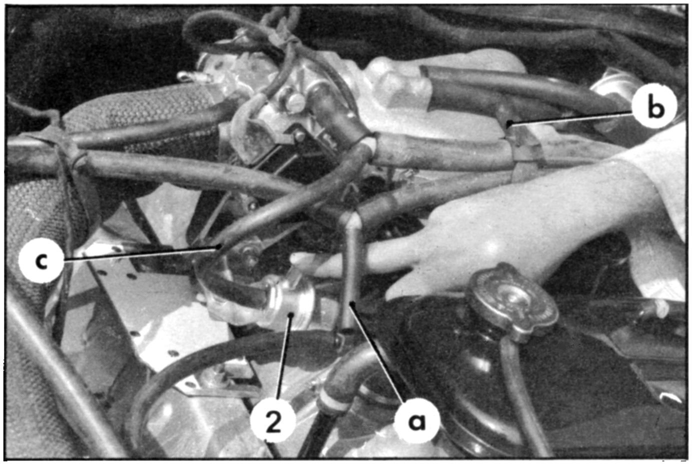
To comply with anti-pollution standards, a supplementary intake of air is accomplished when releasing the accelerator (butterfly air intake valve closed). During a period of the de-acceleration stage, there is no injection cut-out like on the preceded models. Supplementary air intake is carried out by the PILOT valve, having a favourable sweeping effect to burn the exhaust gases. Consequently, during the de-acceleration period, the injection is held, and the fuel injected is proportioned according to the quantity of air intake accepted by the "DECEL system" (PILOT valve) to allow a perfect combustable mixture.

NOTE : *On DX.IE vehicles*, the anti-pollution circuit is set up by the idling system being accelerated. On models *released since September 1972* as on DJ.IE models there is no more injection cut-out. The supplementary air intake system is cut-off when releasing the accelerator and pressing on the foot brake.

11 341



11 342



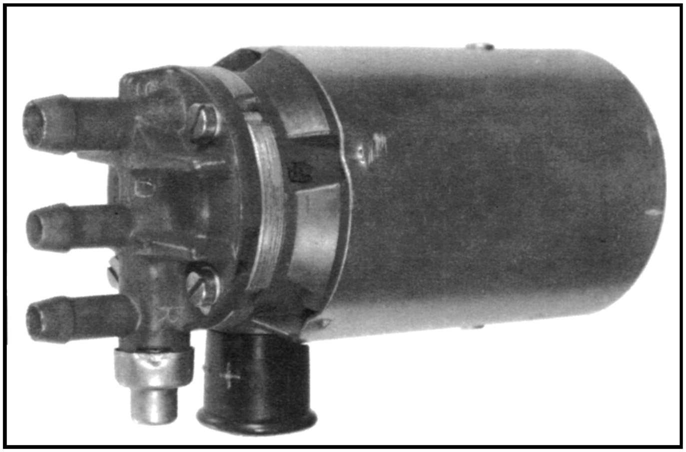
17 Checking the anti-pollution circuit "DECEL"

Disconnect the tube "a" from the pilot valve (2). Bring the engine speed to about 2500-3000 rpm, and release the accelerator.

Using the index finger, check to see if the depression (suction) can be felt. If not, check the pipes "b" and "c" and there connection.
If these are in good condition, the PILOT valve must be faulty, replace it.

D.IE VEHICLES, ALL TYPES

5511



1. CHARACTERISTICS OF THE FUEL PUMP

- Electric fuel pump
- Reference number. . . . . . . BOSCH OF 525 H
- Output : . . . . 60-80 litres/hour (13 gal. 2 pt - 17 gal. 5 pt (Imp.) / Hour)
- Regulated pressure : . . . . . 4 bars (58 psi)
- Power : . . . . 40 watts (approx).

II CHARACTERISTICS OF THE FUEL FILTER

- Filter of the paper type
- Reference number : BOSCH, FJ 629 K
- Renewal : *every 30,000 km (18,000 miles)*

NOTE : On these vehicles the suction feed tube in the fuel tank is not fitted with a filter. *Do not fit one.*

III. RENEWING A FUEL FILTER

REMOVAL

1. Remove the double finishing panel under the R.H. sidemember.

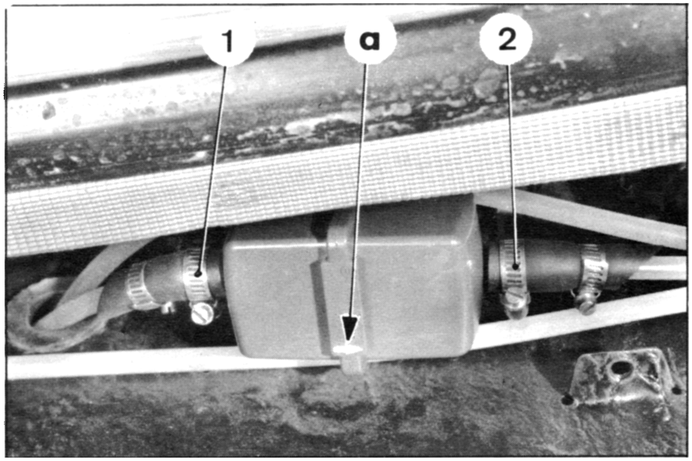
2. Undo the clamps (1) and (2) and disconnect the pipes from the filter.

FITTING.

3. Offer up the filter, **the arrow "a" positioned towards the front of the vehicle.**

   Connect the pipes and tighten the clamps (1) and (2).

4. Fit the double finishing panel under the R.H. sidemember.



5509

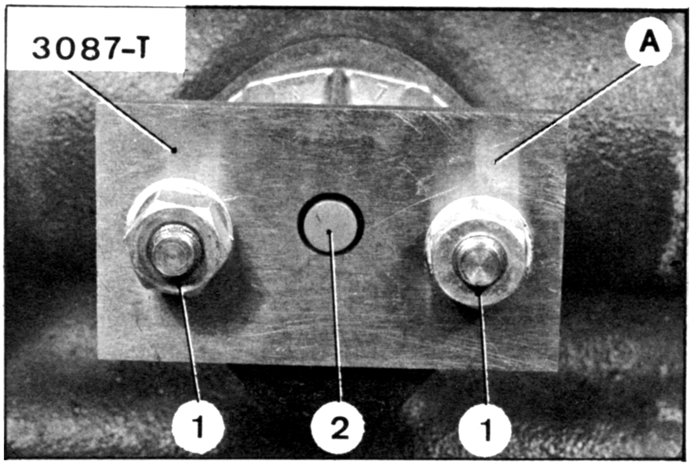
VEHICLES ALL TYPES

I. ADJUSTING THE PUMP OUTPUT

NOTE : This operation is to be carried out if it is noted that the petrol feed is not correct or after the replacement of a spacer, push-rod guide, cylinder block or engine.
It is not carried out if a pump alone has been replaced. This operation is done by determining the length of the push-rod to be fitted.
Push-rod are supplied in three different lengths :

- 48,06 mm : one reference groove on the push-rod
- 48,57 mm : two reference grooves on the push-rod
- 49,08 mm : three reference grooves on the push-rod

2007



1. Remove the pump

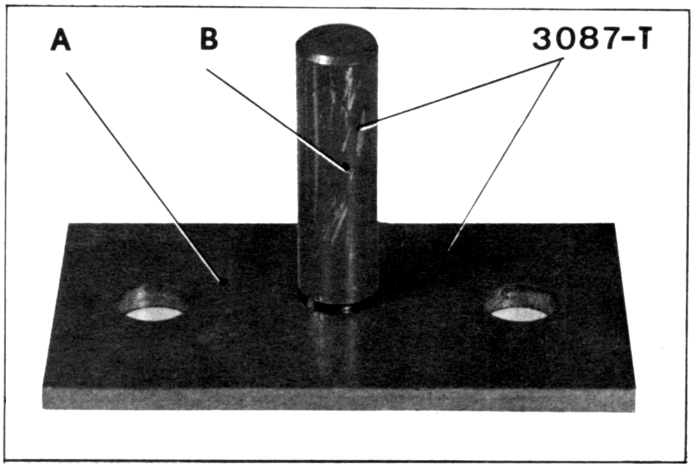
2. Fit plate A (3087 - T assembly) on the pump assembly studs. Tighten the nuts (1) by 21 to 28 mΛN (2,2 to 2,8 m.kg) (flat washer under nut) (16 to 20 ft.Ibs)

3. Check the length of the push-rod

a) *First condition*

Turn the engine over so as to bring the push-rod (2) to its outermost position.
In this position the push-rod (2) must not stand proud of the outer face of plate A (at most it may be flush). Check by means of a straight-edge.

2008



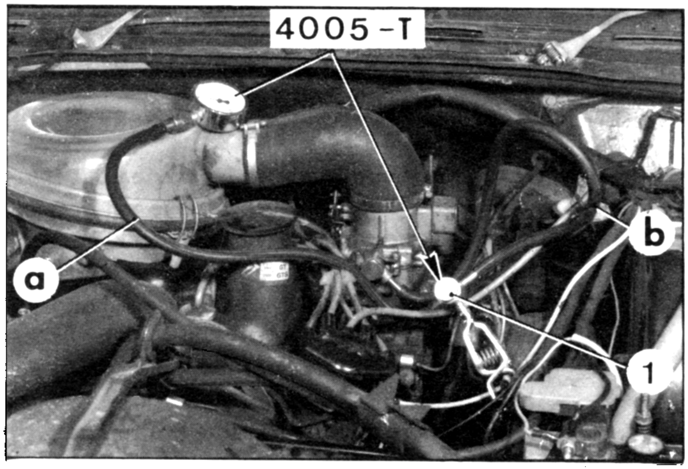
b) *Second condition :*

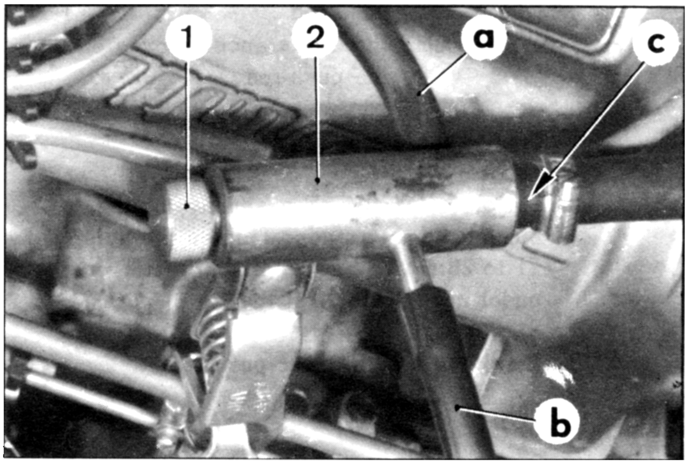
Turn the engine over so as to bring the push-rod to its innermost position.
Fit gauge B into plate A (3087-T assembly)
When the end of the small diameter of the gauge bears upon the push-rod the larger diameter must not be inserted into the aperture in plate A.

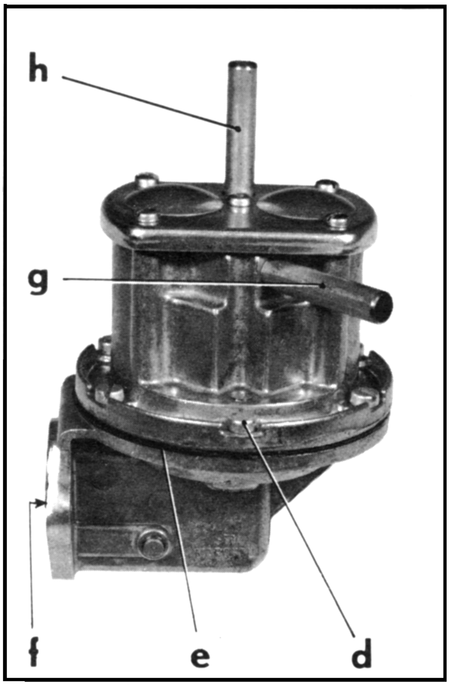
c) *Choose amongst the push-rods the one that fulfills these two conditions.*

4. Remove assembly 3087-T.

5. Refit the pump







II. CHECKING THE FUEL PRESSURE USING THE 4005-T TESTER (on vehicle).

1. Place the tester on the vehicle :
   - a) Disconnect the fuel conduit from the carburettor, and connect it to the fuel tester (2) on «c».
   - b) Connect the conduit «a» from the tester (2) to the manometer.
   - c) Connect the conduit «b» from the tester, to the carburettor.
   - d) Loosen the thumb screw (1) about one and a half turns.
     Start the engine.
2. *Check the fuel pressure (output nil) :*
   Tighten the thumb screw (1).
   Read the stabilized pressure on the manometer which should be :
   330 Millibars maximum.
3. *Check the tightness of the fuel pump return valve :*
   Stop the engine : The pressure should not fall too quickly.
4. *Check the tightness of the carburettor valve :*
   - a) Losen the thumb screw (1).
   - b) Start the engine, and let it turn over for a few minutes.
   - c) Stop the engine : The pressure should not fall too quickly
5. Remove the 4005-T tester.
   Connect the fuel feed pipe to the carburettor.

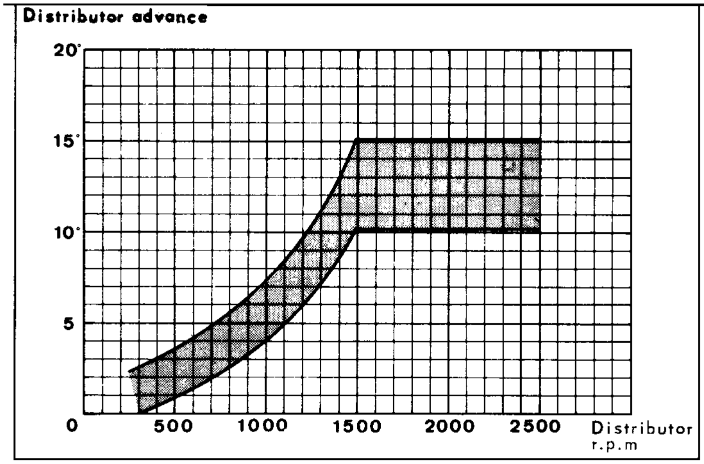
III. CHECKING FOR LEAKS
(fuel pump removed)

1. Close the carburettor feed hole «h» with a plug.
   Fit a rubber tube to the suction hole «g».
2. Submerge the pump completely in a vessel containing clean petrol.
3. Through the tube connected to hole «g», blow compressed air at a pressure of 100 to 300g/ cm^2 (1.4 to 4.2 psi).
4. To begin, some bubbling may occur, due to the action of the diaphragm.
   Maintain the pressure for a few seconds.
   If bubbles of air escape via the hole for the control lever at «f», it means that the diaphragm is leaking and the lower body must be replaced.
   If air bubbles escape between the contact faces of the upper body and the lower body at «e» or round the securing screws at «d» it means that the joint faces are defective or that the screws are not sufficiently tight.

OPERATION N° D. 210-00 : *Characteristics and particular features of the ignition.*

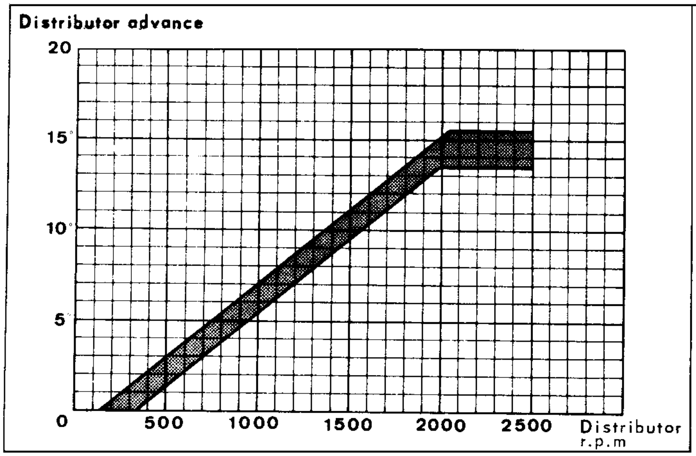
Manual 814-1

CENTRIFUGAL ADVANCE C1



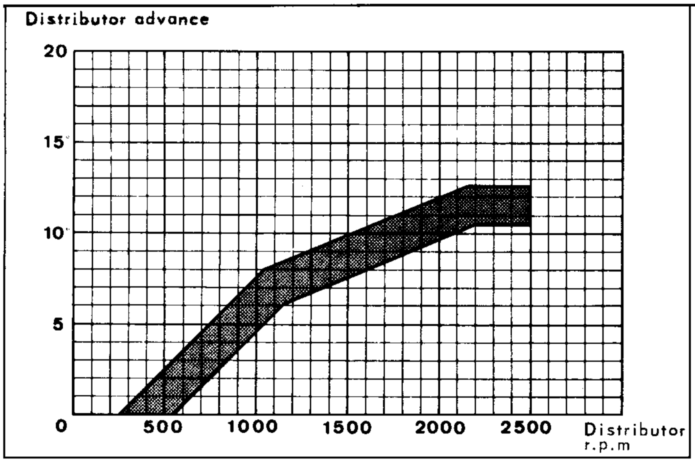
D. 21-50

CENTRIFUGAL ADVANCE C2



D. 21-52

CENTRIFUGAL ADVANCE C3



D. 21-51

VEHICLES ALL TYPES.

I - DISTRIBUTORS

DS ⟼ *10/1955* ⟶| *7/1959*

Distributor with two contact breakers

Adjust the synchronisation of the breakers

- Condensers: . . . . 0.18 to 0.27 μF

ID ⟶| *2/1964*

- References : DUCELLIER 3491 A or
  SEV-MARCHAL N4C-FG/LB
- Force necessary to separate the breaker points.
  SEV-MARCHAL . . . . . . 850 to 1000 gm.
  DUCELLIER . . . . 700 to 850 gm.
- Dwell angles of the contact-breakers.
  SEV-MARCHAL . . . . 59 ± 2°
  DUCELLIER . . . . 57 ± 2°
- Condenser . . . . 0,18 to 0,27 μ F.

DS ⟼ *7/1959* ⟶| *9/1965*

- References : DUCELLIER 3944 A
  SEV-MARCHAL N4-YG

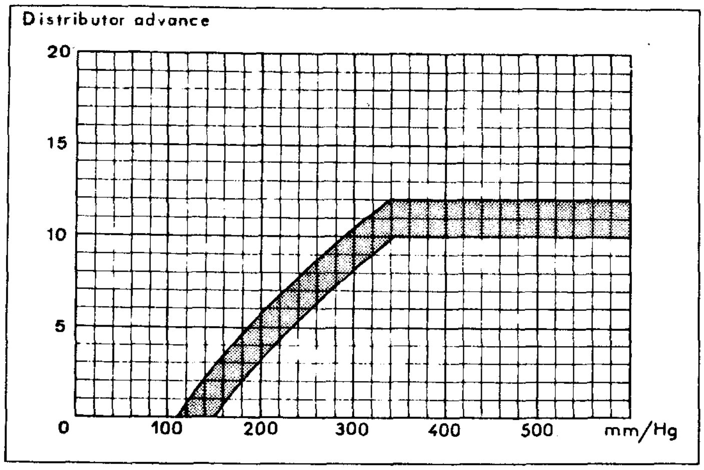
ID ⟼ *2/1964* ⟶| *9/1964*

- References: DUCELLIER 3941 B
  SEV-MARCHAL N41C-YG/LB
- Force necessary to separate the breaker points.
  SEV-MARCHAL . . . . . . 850 to 1000 gm.
  DUCELLIER . . . . 700 to 850 gm.
- Dwell angles of the contact-breakers.
  SEV-MARCHAL . . . . 59 ± 2°
  DUCELLIER . . . . 57 ± 2°
- Condenser . . . . 0,18 to 0,27 μ F.

LOW-PRESSURE OPERATED ADVANCE

D1

D. 21-53



ID →| *2/1964*

- References : DUCELLIER 3941 A
  SEV-MARCHAL N4C-FG/LB

ID |→ *2/1964* →| *9/1964*

- References : DUCELLIER 3941 B
  SEV-MARCHAL N41C-YG/LB
- Force necessary to separate the breaker points.

SEV-MARCHAL . . . . . . 850 to 1000 gm.
DUCELLIER . . . . 700 to 850 gm.

- Dwell angles of the contact-breakers.

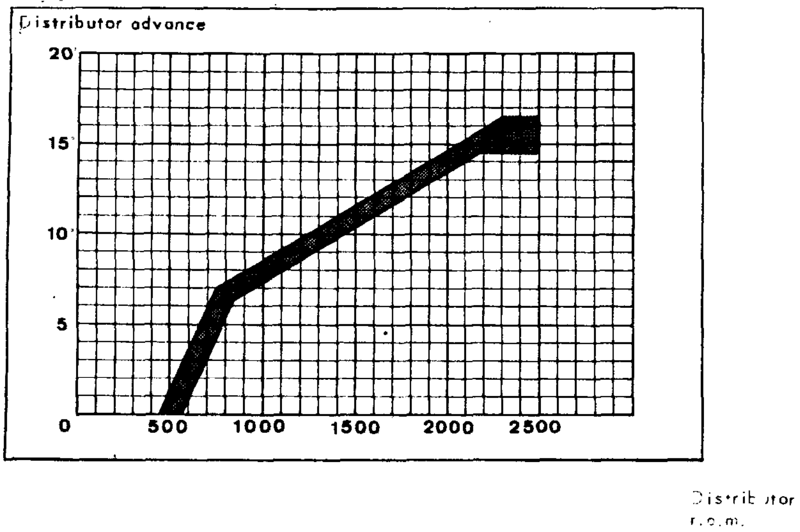
SEV-MARCHAL . . . . 59 ± 2°
DUCELLIER . . . . 57 ± 2°

- Condenser . . . . 0,18 to 0,27 μ F.

CENTRIFUGAL ADVANCE

C4

D. 21-54



ID |→ *9/1964* →| *9/1965*

- References : DUCELLIER 4141 A
  SEV-MARCHAL N41 A 123
- Force necessary to separate the breaker points.

SEV-MARCHAL . . . . . 850 to 1000 gm.
DUCELLIER . . . . 700 to 850 gm.

- Dwell angles of the contact-breakers.

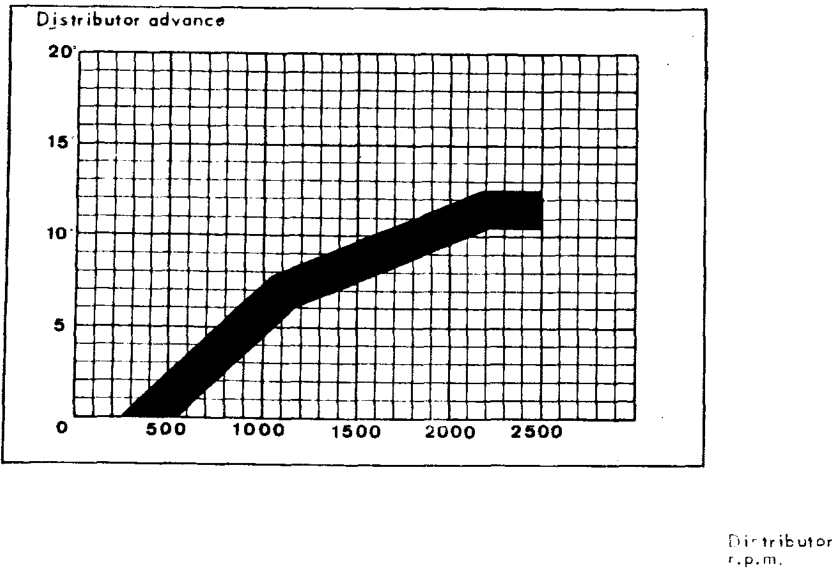
SEV-MARCHAL . . . . 59 ± 2°
DUCELLIER . . . . 57 ± 2°

- Condenser . . . . 0,18 to 0,27 μ F.

CENTRIFUGAL ADVANCE

C5

D. 21-55



DE |→ *9/1965* →| *9/1966*

- References : DUCELLIER 3944 A
  SEV-MARCHAL N4-YG
- Force necessary to separate the breaker points.

SEV-MARCHAL . . . . . 850 to 1000 gm.
DUCELLIER . . . . 700 to 750 gm.

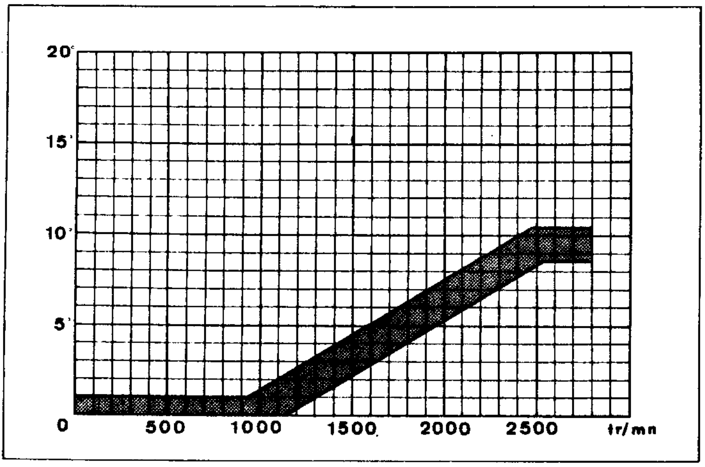
- Dwell angles of the contact-breakers.

SEV-MARCHAL . . . . 59 ± 2°
DUCELLIER . . . . 57 ± 2°

- condenser

→| 9/1969 . . . . . . 0,18 to 0,27 μ F.
|→ 9/1969 . . . . . . 0,15 to 0,30 μ F.

C 6



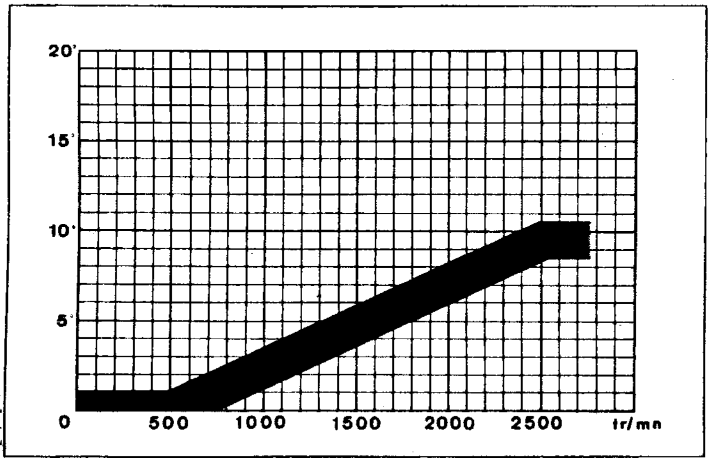
DX - DJ - DXF - DJF ⟼ *9/1965* ⟶| *9/1968*

: DUCELLIER 4155 B
SEV - MARCHAL A 147

SEV - MARCHAL	850 à 1000 g
DUCELLIER	700 à 850 g

SEV - MARCHAL	59° ± 2°
DUCELLIER	57° ± 2°
Condenser :	0,18 à 0,27μF

C 7



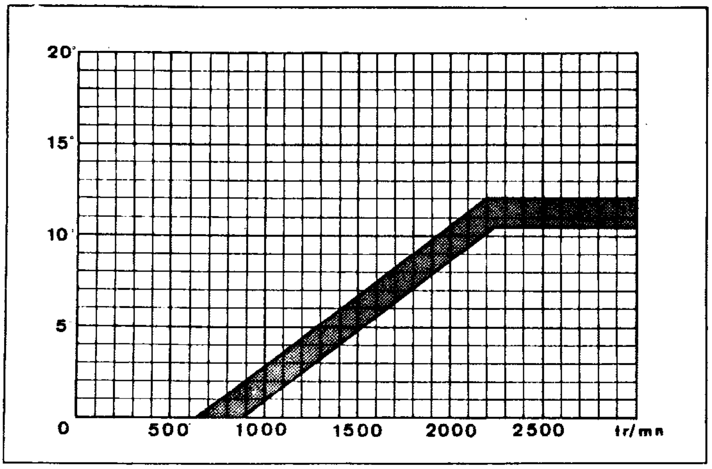
DY - DL - DYF - DLF ⟼ *9/1965* ⟶| *9/1968*

: DUCELLIER 4169 A
SEV - MARCHAL A 158

SEV - MARCHAL	850 à 1000 g
DUCELLIER	700 à 850 g

SEV - MARCHAL	59° ± 2°
DUCELLIER	57° ± 2°
Condenser :	0,18 à 0,27μF

C 8



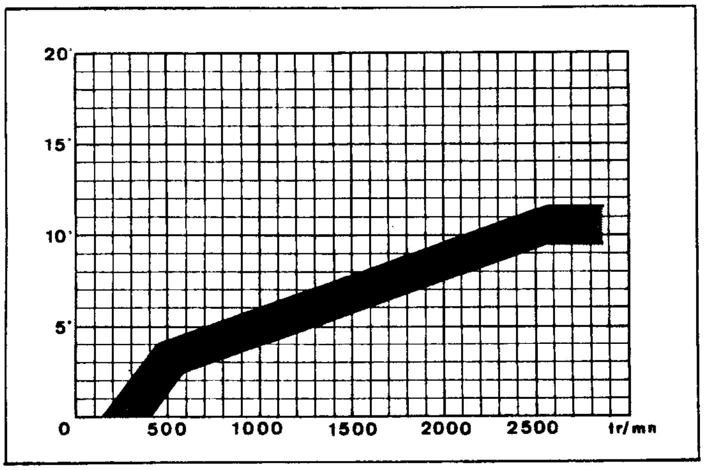
DV ⟼ *9/1966* ⟶| *9/1968*

: DUCELLIER 4173 A
SEV - MARCHAL A 154

SEV - MARCHAL	850 à 1000 g
DUCELLIER	700 à 850 g

SEV - MARCHAL	59° ± 2°
DUCELLIER	57° ± 2°
Condenser :	0,18 à 0,27μF

CENTRIFUGAL ADVANCE C 9



D. 21-59

DX - DJ - DXF - DJF |→ *10/1968* →| *9/1972*

DP |→ *9/1972*

- Références : DUCELLIER 4253 A et 4253 B
  SEV - MARCHAL A 222

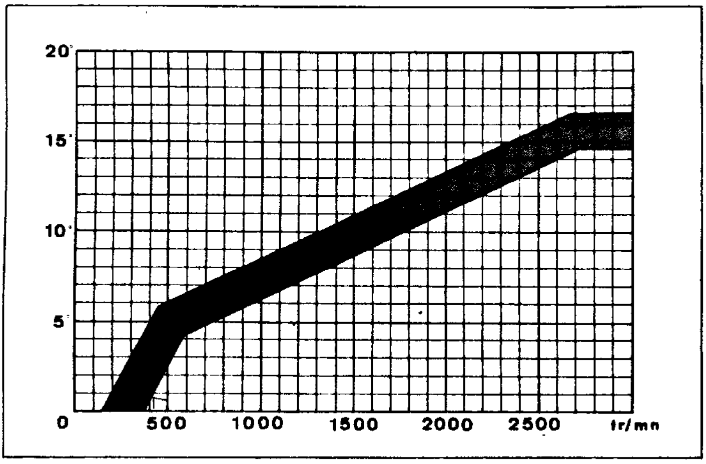
NOTE : *Since February 1972, SEV-MARCHAL distributors are fitted with a cassette. The curved marks and adjustments are identical to the preceded distributors.*

- Force necessary to separate the breaker points :
  SEV - MARCHAL .... 850 à 1000 g
  DUCELLIER .... 700 à 850 g

- Dwell angles of the contact-breakers.
  SEV - MARCHAL .... 59° ± 2°
  DUCELLIER .... 57° ± 2°

- Condenser :
  →| *9/1969* .... 0,18 à 0,27 μ F
  |→ *9/1969* .... 0,25 à 0,30 μ F

CENTRIFUGAL ADVANCE C 10



D. 21-60

DY - DL - DYF - DLF - DT - DV

|→ *10/1968* →| *5/1969*

- References : DUCELLIER 4254 A
  SEV - MARCHAL A 224

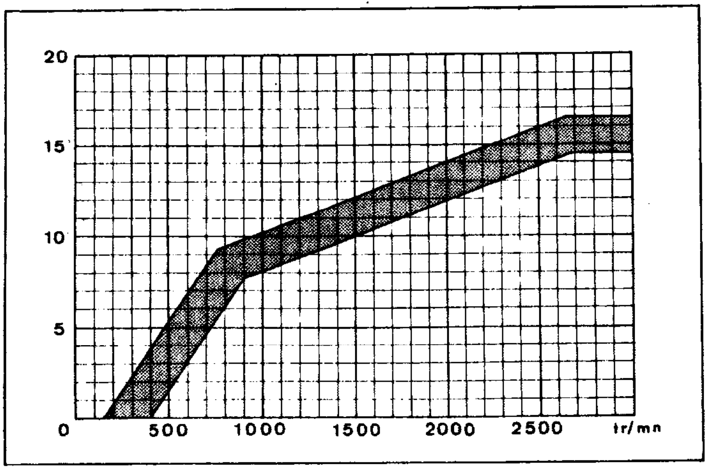
NOTE : Since February 1972, SEV-MARCHAL distributors are fitted with a cassette. The curved marks and adjustments are identical to the preceded distributors.

- Force necessary to separate the breaker points :
  SEV - MARCHAL .... 850 à 1000 g
  DUCELLIER .... 700 à 850 g

- Dwell angles of the contact-breakers.
  SEV - MARCHAL .... 59° ± 2°
  DUCELLIER .... 57° ± 2°

- Condenser : .... 0,18 à 0,27 μF

CENTRIFUGAL ADVANCE C 11



D. 21-66

DY - DL - DYF - DLF - DT |→ *5/1969*

DV |→ *9/1972*

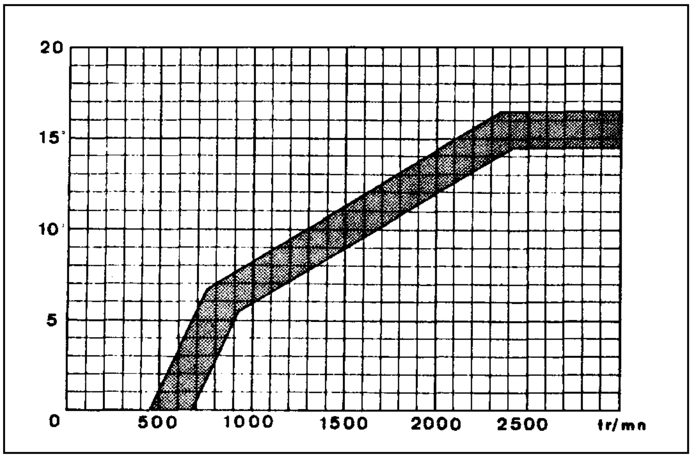
- References : DUCELLIER 4291 A et 4291 B
  SEV - MARCHAL A 251

SEV - MARCHAL .... 850 à 1000 g
DUCELLIER .... 700 à 850 g

SEV - MARCHAL .... 59° ± 2°
DUCELLIER .... 57° ± 2°

Condenser :
→| *9/1969* .... 0,18 à 0,27 μ F
|→ *9/1969* .... 0,25 à 0,30 μ F

CENTRIFUGAL ADVANCE C 12



D. 21.67

DV ↦ *5/1969* ⇥ *9/1972*

DX - DX.BW - DJ ↦ *9/1972*

- References : DUCELLIER 4254 B 4254 C
  SEV-MARCHAL A 252

NOTE : Since February 1972, SEV-MARCHAL distributors are fitted with a cassette. The curved marks and adjustments are identical to the preceded distributors.

- Force necessary to separate the breaker points :
  SEV-MARCHAL ....850 a 1000 g
  DUCELLIER .... 700 a 850 g
- Dwell angles of the contact-breakers.
  SEV-MARCHAL .... 59° ± 2°
  DUCELLIER .... 57° ± 2°
- Condenser :
  ⇥ *9/1969* .... 0,18 à 0,27 μF
  ↦ *9/1969* .... 0,25 à 0,30 μF

RECAPITULATORY TABLE OF ADVANCED CURVES

<table>
<tr><th>Type of vehicle</th><th colspan="7">Curve and type of distributor (DUCELLIER or SEV-MARCHAL)</th></tr>
<tr><td rowspan="2">DS</td><td colspan="2">⇥ 7/1959</td><td colspan="5">↦ 7/1959 ⇥ 9/1965</td></tr>
<tr><td colspan="2">C 1</td><td colspan="5">C 3 (3944 A or N 4 - YG)</td></tr>
<tr><td rowspan="2">ID</td><td colspan="2">⇥ 2/1964</td><td colspan="3">↦ 2/1964 ⇥ 9/1964</td><td colspan="2">↦ 9/1964 ⇥ 9/1965</td></tr>
<tr><td colspan="2">C 2 and D 1 (3941 A or N 4 C - FG/LB)</td><td colspan="3">C 3 and D 1 (3941 B or N 41 C - YG/LB)</td><td colspan="2">C 4 (4141 A or N 41 A 123)</td></tr>
<tr><td rowspan="2">DE</td><td colspan="7">↦ 9/1965 ⇥ 9/1966</td></tr>
<tr><td colspan="7">C 5 (3944 A and N 4 - YG)</td></tr>
<tr><td rowspan="2">DX - DJ
DXF - DJF</td><td>⇥ 10/1968</td><td colspan="2">↦ 10/1968
⇥ 5/1969</td><td>↦ 5/1969
⇥ 9/1969</td><td colspan="2">↦ 9/1969
⇥ 9/1972</td><td>↦ 9/1972</td></tr>
<tr><td>C 6 (4155 B or A 147)</td><td colspan="3">C 9 (4253 A or A 222)</td><td colspan="2">C 9 (4253 B or A 222)</td><td>C 12 (4254 C or A 252)</td></tr>
<tr><td>DY - DL - DT
DYF - DLF</td><td>C 7 (4169 A or A 158)</td><td colspan="2">C 10 (4254 A or A 224)</td><td>C 11 (4291 A or A 251)</td><td colspan="2">C 11 (4291 A or A 251)</td><td>C 11 (4291 B or A 251)</td></tr>
<tr><td>DV</td><td>C 8 (4173 A or A 154)</td><td colspan="2">C 10 (4254 A or A 224)</td><td>C 12 (4254 B or A 252)</td><td colspan="2">C 12 (4254 C or A 252)</td><td>C 11 (4291 B or A 251)</td></tr>
<tr><td>DP</td><td colspan="6"></td><td>C 9 (4253 B or A 222)</td></tr>
</table>

II. SPARKING PLUGS.

For the brands and types of plugs recommended refer to the appropriate technical bulletins which appear periodically.

III. COILS

⇥ *9/1969* : SEV-MARCHAL 3 H
or DUCELLIER 2070 B

↦ *9/1969*: SEV-MARCHAL E 44 910 312
or DUCELLIER 2777 B

IMPORTANT NOTE : The new ignition coils (with external ballast-resistance) must of necessity be fitted with the ignition condensers of 0,25 to 0,30 μ F.

VEHICLES ALL TYPES
→| 7/1971

I . PRE-SETTING OF STATIC TIMING

1. Check the gap between the contact breaker points (cam angle).

2. **Find the position of static timing on the engine :**

a) Release the pressure in the clutch cylinder. To do this operate the manual clutch control *(Vehicles with hyd. gearchange)*

b) Bring the first cylinder to the beginning of the compression stroke, noting the position of the distributor rotor. Insert a timing pin "A" of diameter 6 mm into the hole provided in the clutch bell housing (under the generator).

Slowly turn the engine until the timing pin enters the slot in the flywheel. In this position the engine is at the firing point. (First cylinder) i.e. 12° before T.D.C.

NOTE : On a vehicle fitted with a 5-speed gearbox raise the front, L.H. side so that the wheel is off the ground. Engage 5th. gear and turn the front, L.H. wheel in order to turn the engine.

WITHDRAW THE TIMING PIN.

3. **Adjust the distributor :**

Connect a test-lamp to the condenser terminal and to earth. Switch the ignition on.

Loosen the screw (2) securing the distributor clamp.

Place the spark control in the position "SUP" if it is marked and tighten the securing nut (1)

Slowly turn the body of the distributor in an anti-clockwise direction. Stop the moment the lamp lights, which is the point at which the contacts just open.

Tighten the screw (2) securing the distributor clamp.

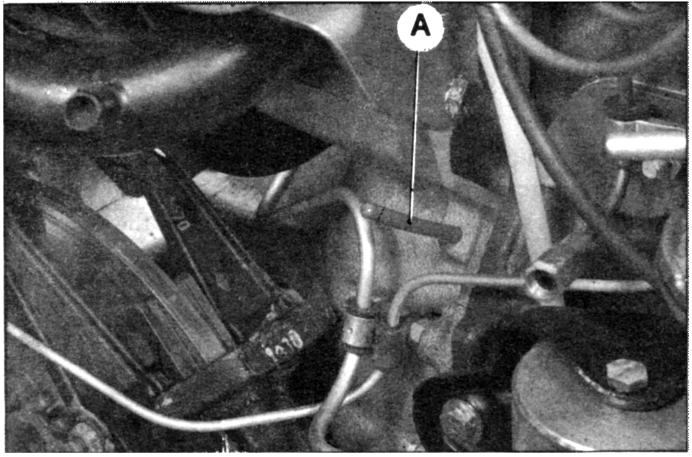
Switch the ignition off.

Put the manual clutch control in the *drive position (vehicles with hydraulic gearchange).*

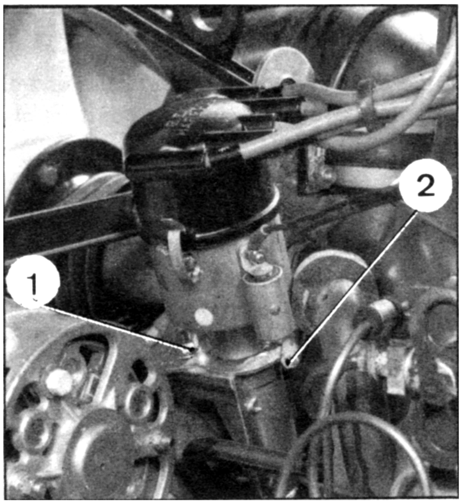
IMPORTANT :

The pre-setting of static timing using a test lamp is only intended for starting the engine. In no case will it suffice for the distributor timing (firing point) which must be carried out with a strobe lamp (see setting of static timing).

3387



3390



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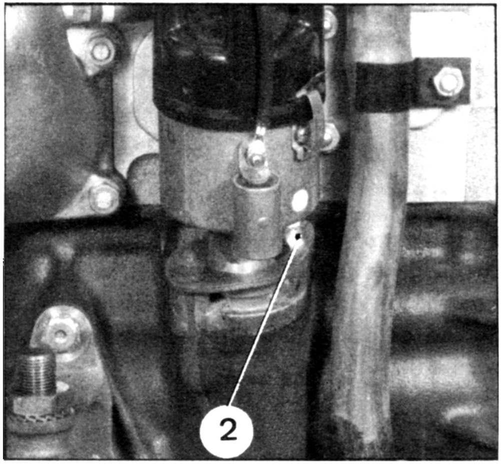
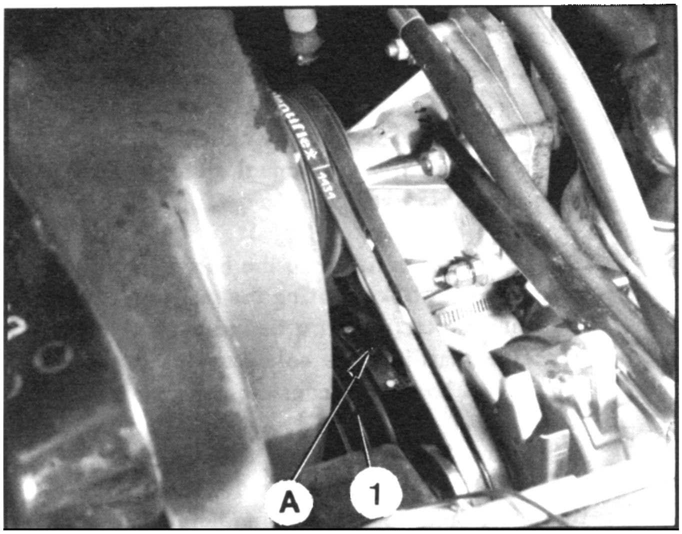
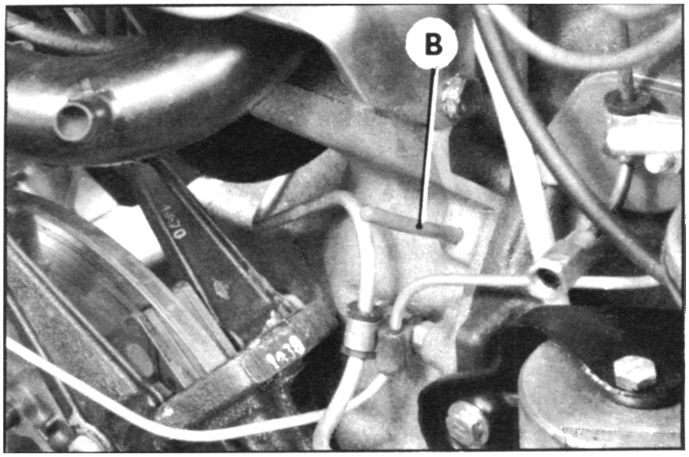


T.T. VEHICLES
↦ 7/1971



10 140

NOTE ; On a vehicle fitted with a 5-speed gearbox, raise the front, L.H. side of the vehicle so that the wheels are off the ground. Engage 5th. gear and turn the front L.H. wheel so as to turn the engine.



3387

II. PRE-SETTING OF STATIC TIMING

As from 1st July 1971 the engine flywheels have been modified :

The notch in the engine flywheel for the pre-setting of the static timing corresponds to the top dead centre of cylinders 1 and 4 when the timing pin in the clutch housing is engaged in this notch.

A gauge A is fixed to the water pump (see diagram opposite).

One graduation on the gauge corresponds to one contact breaker degree.

Pre-setting of static timing :

1. Check the gap between the contact breaker points (cam angle).
2. Bring the first cylinder piston to the end of the compression stroke, noting the position of the distributor rotor.
3. Insert the timing pin B (ϕ = 6 mm) into the hole in the clutch housing and slowly turn the engine until the pin enters the flywheel notch. *At this point the first cylinder position is at top dead centre, end of compression stroke.*
4. WITHDRAW THE TIMING PIN
5. Make sure that the mark on the drive pulley (1) (yellow mark) is situated opposite the zero point on the gauge. If necessary make this mark (in cases where the drive pulley is being removed).
6. Turn the distributor so that the contact breaker points just begin to open (use a test lamp).

IMPORTANT :

The pre-setting of static timing using a test lamp is only intended for starting the engine. In no case will it suffice for the distributor timing (firing point) which must be carried out with a strobe lamp (see setting of static timing).

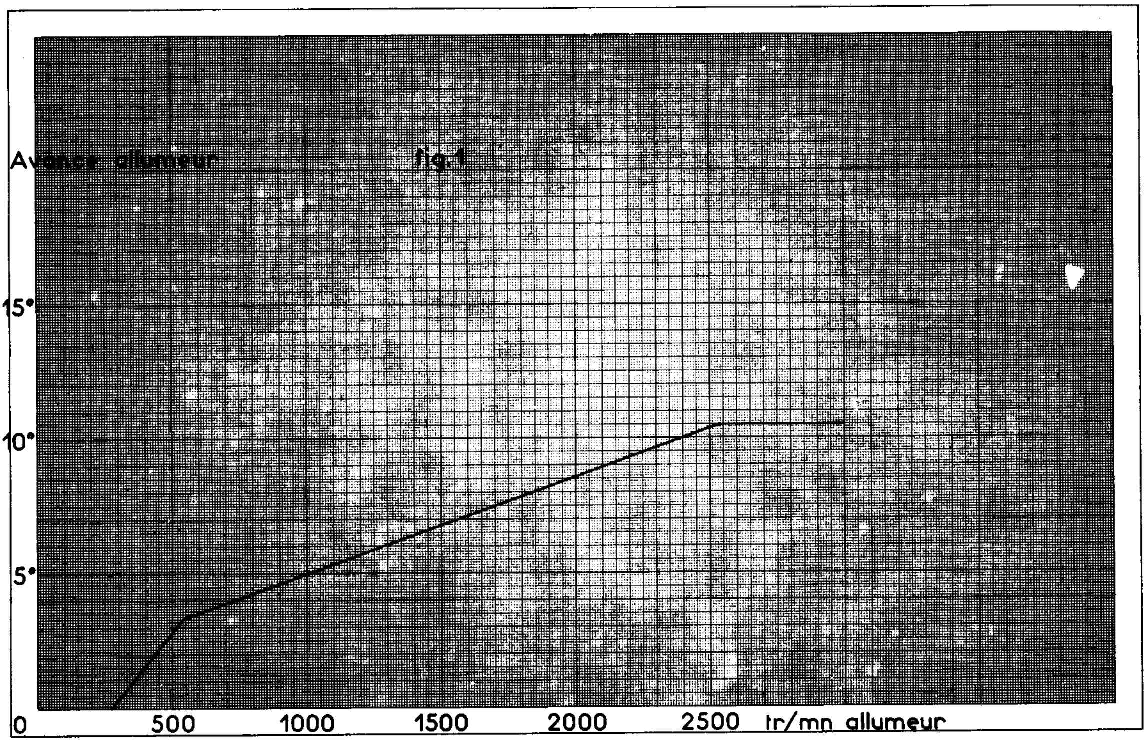


fig.1

Avance allumeur
15°
10°
5°
0
500
1000
1500
2000
2500
tr/mn allumeur

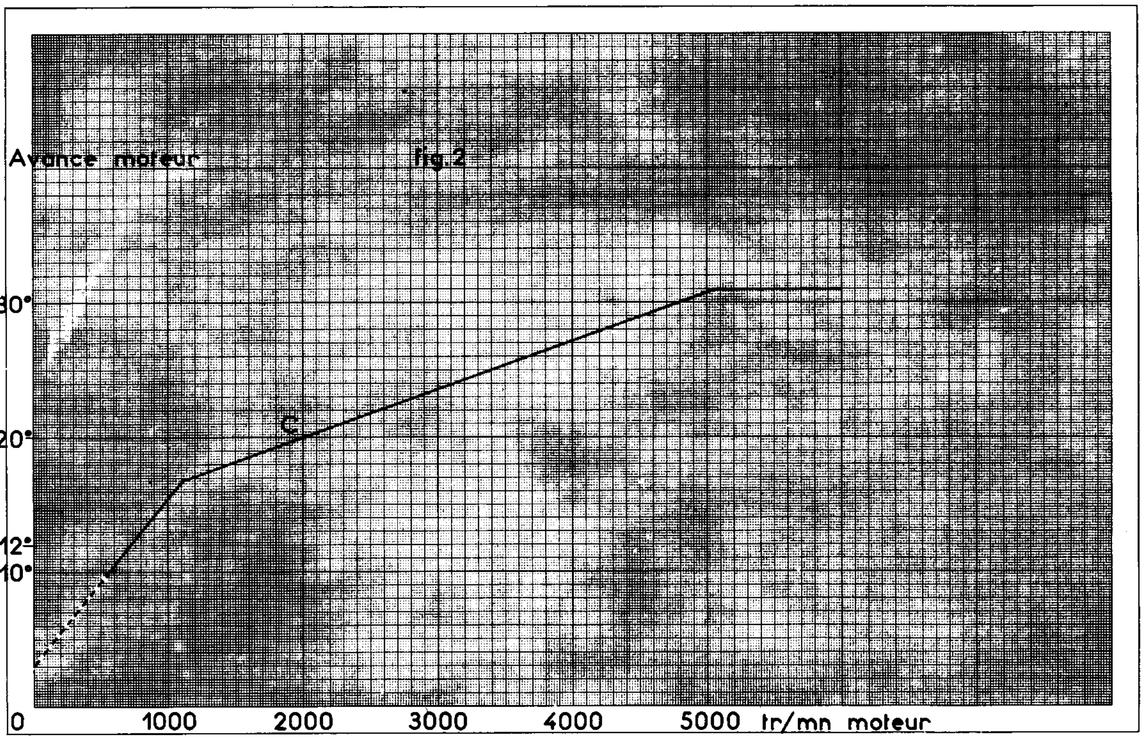


fig.2

Avance moteur
30°
20°
12°
10°
B
A
C
0
1000
2000
3000
4000
5000
tr/mn moteur

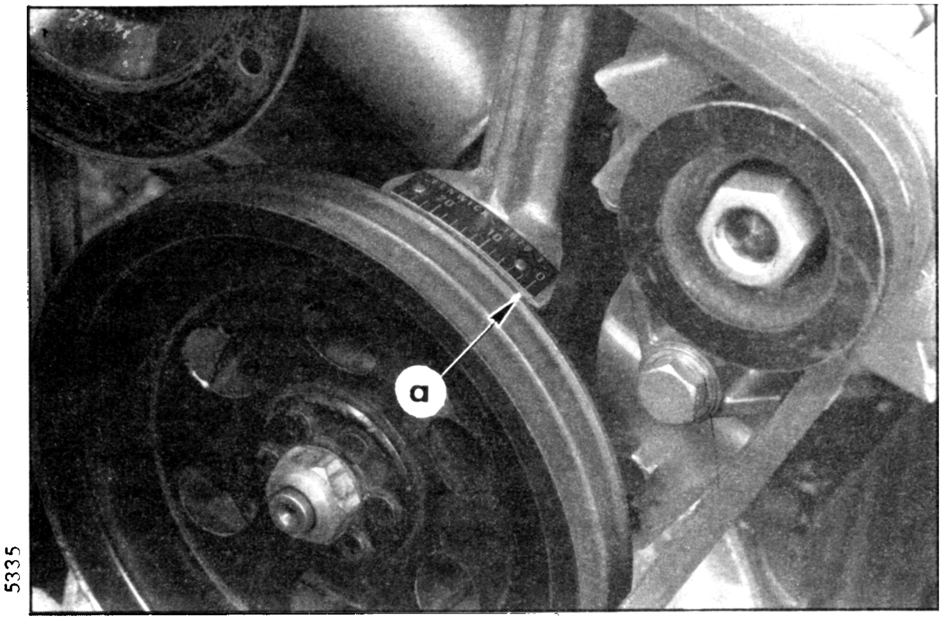


fig 3

Tracing the mark on the drive pulley, engine stopped, timing pin in place in the engine flywheel :

Mark "a" opposite the "zero" of the gauge.

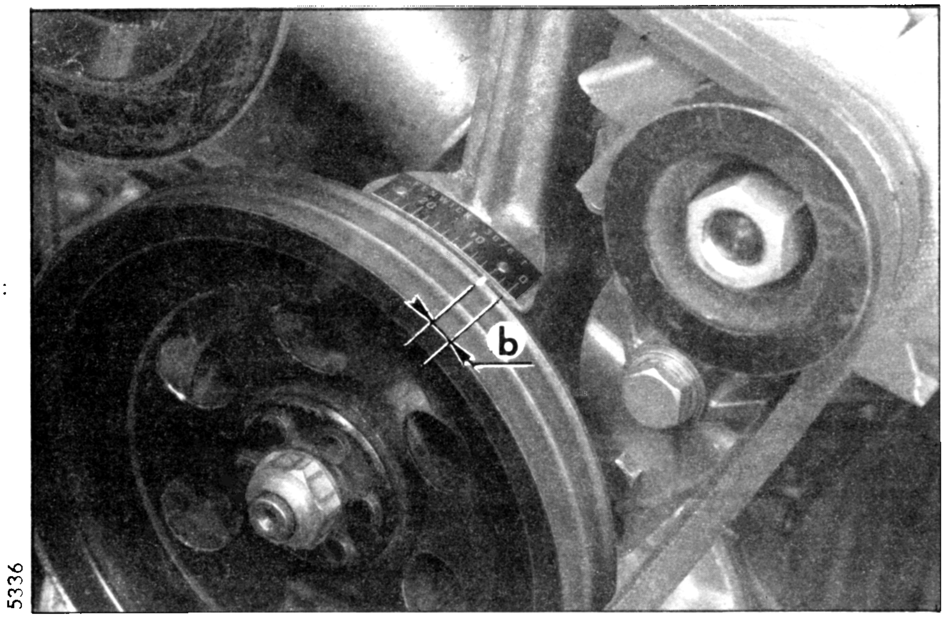


fig. 4

With the engine turning at 2000 r.p.m., the position of the mark on the pulley when the distributor is set correctly :

b   4° distributor

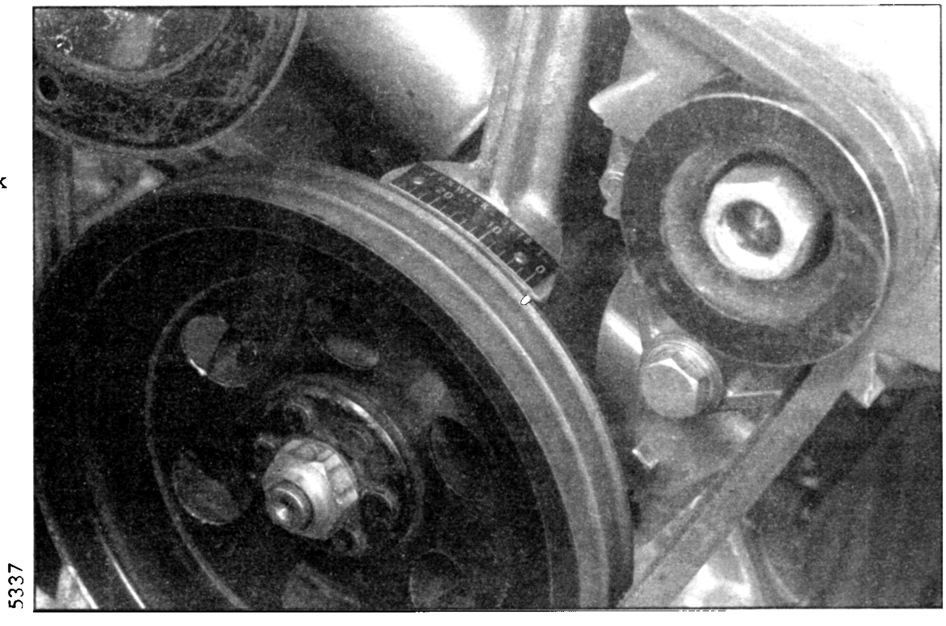


fig. 5

With the engine idling, the mark on the pulley may be below the "zero" of the graduated gauge

III. PRINCIPLE OF THE METHOD OF MEASURING THE ADVANCE BY USE OF STROBOSCOPIC LAMP.

Figure 1 represents the advance curve obtained on the test bench of the distributor alone (advance in distributor degrees in relation to the speed of rotation in distributor r.p.m.), the point 0° being the point at which the breakers open when the distributor is at rest.

On the engine, the spark advance at a given speed represents the number of crankshaft advance degrees between the moment when the spark occurs (firing point) and the T.D.C. of the piston.

Figure 2 represents the advance curve of the preceding distributor assembled on the engine. The curves in figure 1 and figure 2 are identical but displaced vertically from the static ignition value; moreover turning the distributor also displaces the advance curve vertically : the advance curve rises when the distributor is turned in the advance-increase direction, and vice-versa.

Setting the ignition advance by stroboscope is done by passing the advance curve through a determined point. When timing the distributor, with the engine stopped in a position determined by the mark on the engine flywheel, the point through which the distributor advance curve passes is situated on the line 0 engine r.p.m. (at A, figure 2).

If the timing is carried out by stroboscope, the point through which the advance curve passes, corresponds to a determined engine speed (at C, figure 2). In the example chosen (DX *engine, since October 1968)* the timing point is 20° crankshaft at 2000 engine r.p.m.

The position of the engine flywheel found with the locating pin, allows the crankshaft position to be obtained that corresponds to the static advance position 12° in relation to the T.D.C. (at A, figure 2)

Distance B represents the number of degrees between the static advance point and the firing point required. In the example chosen distance B represents 8° crankshaft.

Practical method :

- *With the engine at rest, place the timing pin in the engine flywheel* (the crankshaft is still in the 12° advance position) : make a mark "a" on the camshaft drive pulley opposite a fixed reference (the zero of the gauge) (fig. 3)
- *With the engine running at 2000 r.p.m.* the advance point should be at 20° crankshaft.
  This point is therefore displaced by :
  20° - 12° = 8° crankshaft
  in relation to the static advance point.
  The static advance point having been marked on the drive pulley the position of the mark "a" indicates the distributor advance : the difference "b" should therefore be 4° (fig. 4).

NOTE :

It may be noted on figure 2 that when the engine turns at a speed of less than 700 r.p.m. approximately the advance point read on the stroboscope is less than 12°

When the engine is idling it is possible for the mark on the drive pulley to take the position shown in figure 5.

P.T.O.

TABLE OF VALUES FOR ADJUSTING THE STATIC IGNITION TIMING

- Column A : engine speed at which the timing must be carried out
- Column B : total angle of spark advance in crankshaft degrees in relation to the T.D.C.
- Column C : angle of advance in relation to the static ignition timing in distributor degrees.

Vehicle type	Remarks	A	B	C
		Speed in engine r.p.m. to carry out timing	Total advance in crankshaft degrees	Advance in relation to static setting in distributor degrees
DS *(Oct. 55 to July 59)*	Distributor with double Contact Breakers *Curve* **C1**	2000	22°	5°
ID *(Until Feb. 1964)*	Vacuum advance capsule disconnected *Curve* **C2** *and* **D1**	2000	22°	5°
DS *(July 59 to Sept. 65)*	*Curve* **C3**	2000	22°	5°
ID *(Feb. 64 to Sept. 64)*	Vacuum advance capsule disconnected *Curve* **C3** *and* **D1**	2000	22°	5°
ID *(Sept. 64 to Sept. 65)*	*Curve* **C4**	2000	26°	7°
DE *(Sept. 65 to Sept. 66)*	*Curve* **C5**	2000	22°	5°
DX.DJ.DXF.DJF. * *(Sept. 65 to Sept. 68)*	Mark on distributor DX-05 b *Curve* **C6**	3000	18°	3°
DY.DL.DYF.DLF. *(Sept. 65 to Sept. 68)*	Mark on distributor DY-05 *Curve* **C7**	2000	16°	2°
DV *(Sept. 66 to Sept. 68)*	Mark on distributor *Curve* **C8**	2000	15°	1°30'
DX.DJ.DXF.DJF. *(Oct. 68 to Sept.72)* **DP** *(Since Sept. 72)*	Mark on distributor DX-05i *Curve* **C9**	2000	20°	4°
DY.DL.DYF. DLF. DV. DT. *(Oct. 68 to May 69)*	Mark on distributor DV-05 d *Curve* **C10**	2000	24°	6°
DY.DL.DYF.DLF.DT. *(Since May 69)* **DV** *(Since Sept. 72)*	Mark on distributor DY-010A *Curve* **C11**	2000	28°	8°
DV *(May 69 to Sept. 72)*	Mark on distributor DV-010A *Curve* **C12**	2000	24°	6°
DX.DXBW.DJ.DXF.DJF. *(Since Sept. 72)*	Mark on distributor DV-010A *Curve* **C12**	2000	23°	

* If the distributor is changed on vehicles DX.DJ.DJF. produced between September 1965 and September 1968 it is possible to fit the distributor of vehicles DX.DJ.DXF.DJF. produced since October 1968, i.e. :

- either distributor SEV-MARCHAL (supplier's mark A 222)............................ DX. 211-014 a.
- or distributor DUCELLIER (supplier's mark 4253-A) : .... DX. 211-05 j.

Distributor timing therefore takes place at :

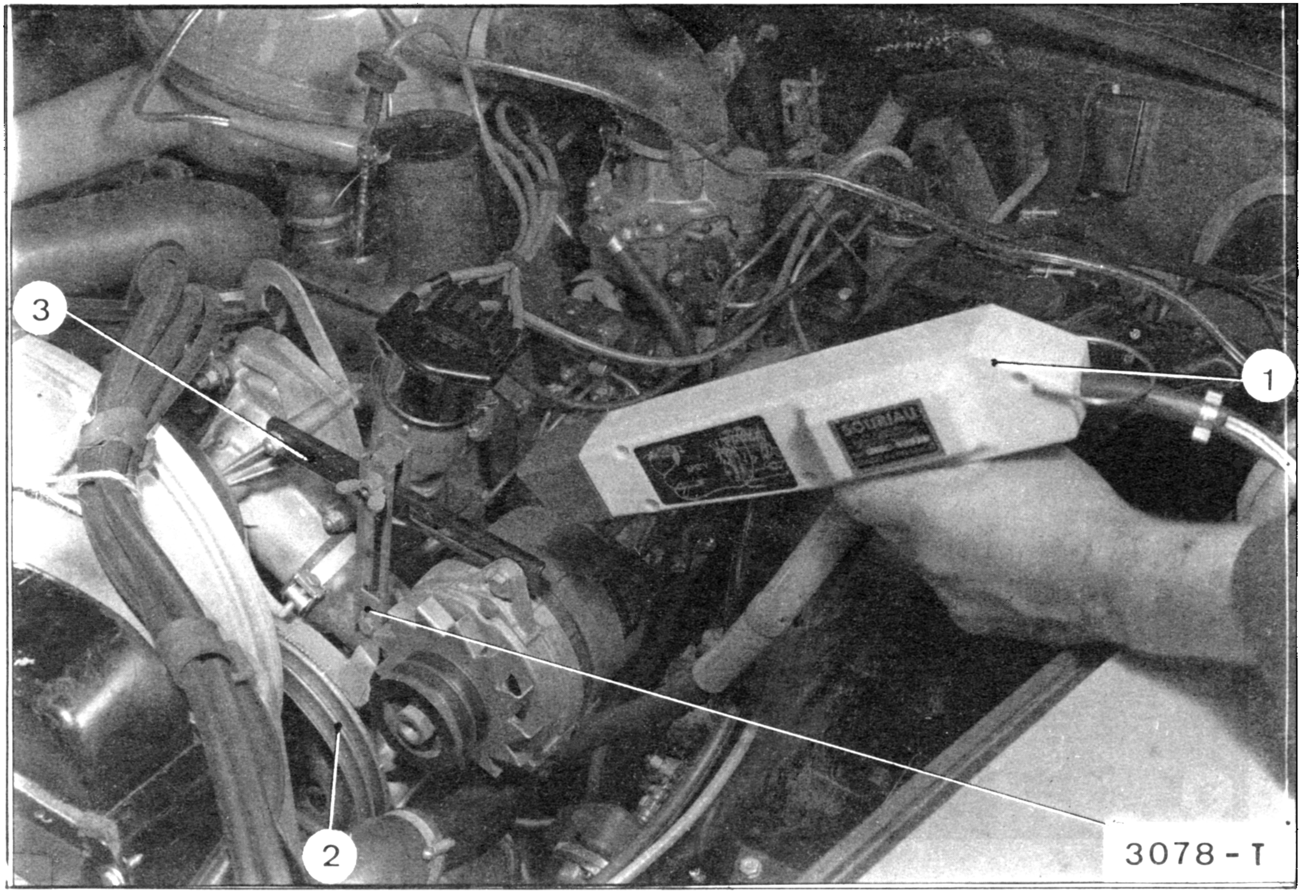
Speed	Total advance	Advance in relation to the static setting
2000 r.p.m.	20°	4°

IV. ADJUSTING THE STATIC TIMING

(With a stroboscopic lamp)

VEHICLES ALL TYPES
→ 7/1971

4511



1. If the distributor has been removed, pre-set it so that the engine can run (see same operation § I)

2. Connect the tachometer.

3. Fit instrument 3078 - T onto the alternator bar (3) so that the gauge is level with the edge of the drive pulley (2).

4. Put the engine at the static ignition setting inserting the timing pin into its hole.

5. Paint a thin white line on the drive pulley (2) opposite the «zero» mark on the gauge (see fig. 3 page 3).

WITHDRAW THE TIMING PIN.

6. Power the stroboscopic lamp and connect its high voltage lead to the plug lead cylinder n° 1.

7. Light up the mark with the stroboscopic lamp.
The mark seems to move when the engine speed increases :
- Let the engine run at the speed indicated in column A of the table on page 4.
- The mark should be opposite the graduation corresponding to the value given in column C of the table on page 4 (each graduation on the gauge represents 2° distributor : see fig. 4 page 3)

8. If it is not, unscrew the screw on the distributor clamp and turn the distributor so that the mark is in line with the correct section (the ignition advance angle increases when the distributor turns anti-clockwise).

9. Tighten the distributor clamp screw to 3 mΛN (0,3 m.kg) (2.16 ft.lbs)

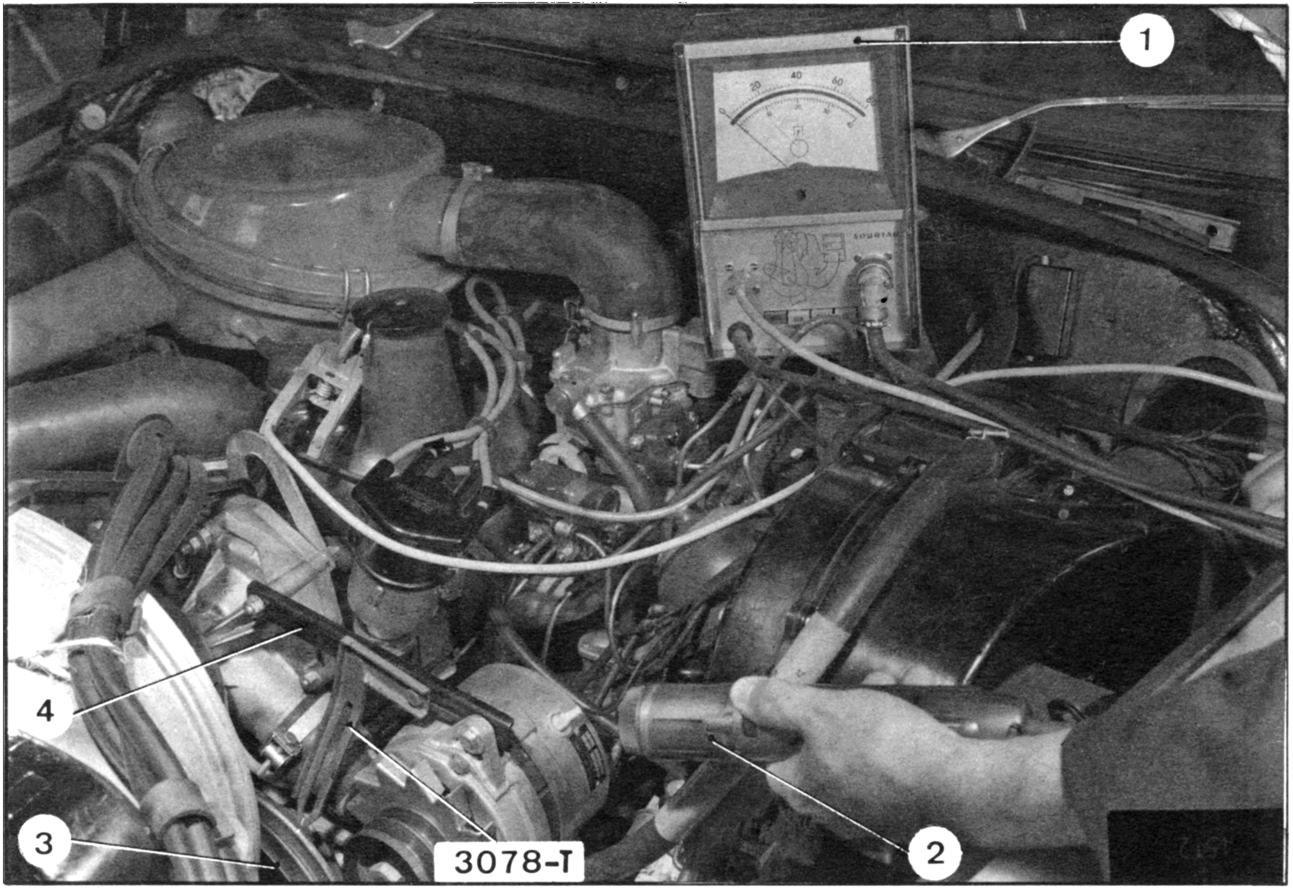
10. Switch off the ignition.

11. Remove the stroboscopic lamp, instrument 3078 - T and the tachometer.

VEHICLES ALL TYPES
→ 7/1971

V. ADJUSTING THE STATIC TIMING

(With a stroboscopic lamp with dephaser)



1. If the distributor has been removed preset it so that the engine can run (see same operation § I)

2. Connect the tachometer.

3. Fit instrument 3078-T onto the alternator bar (4) so that the gauge is level with the edge of the drive pulley

4. Put the engine at the initial static setting by inserting the timing pin into its hole .

5. Paint a small white line on the drive pulley (3) opposite the mark «O» on the gauge (see fig. 3 page 3).

WITHDRAW THE TIMING PIN.

6. Feed the stroboscopic lamp and connect its high voltage lead to the plug lead of cylinder no 1. Adjust the dephaser (1) to «zero».

7. Let the engine run at the speed indicated in column A of the table on page 4.

8. Light up the mark with the stroboscopic lamp (2).

9. Using the dephaser control bring the mark on the drive pulley (3) opposite the «zero» mark on the gauge.
- Take a reading from the dephaser dial.The result shown by the needle should correspond to the ignition advance angle given in column C of the table on page 4.

10. If it does not, unscrew the screw on the distributor clamp and turn the distributor until the mark gives the correct result. (The ignition advance angle increases when the distributor is turned anti-clockwise).

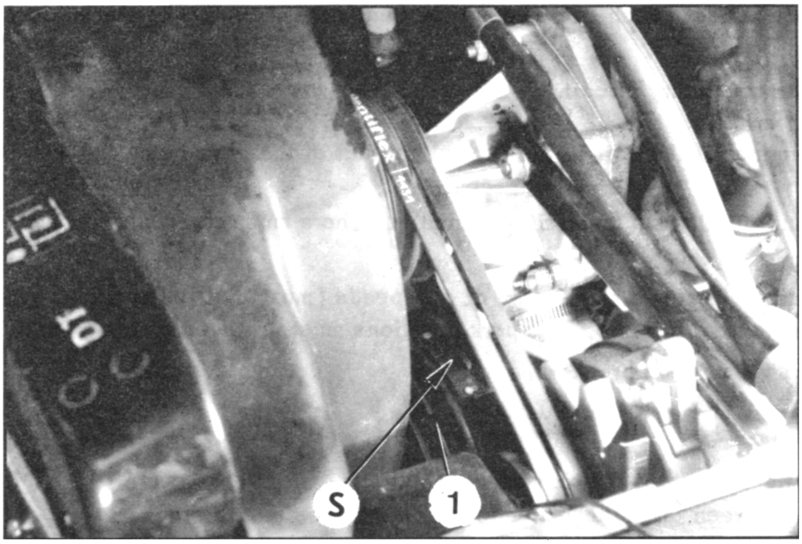
11. Tighten the distributor clamp screw to 3mΛN (0,3 m.kg.) (2.16 ft.lbs) Switch off the ignition

12. Remove the stroboscopic lamp,instrument 3078-T and the tachometer.

VEHICLES ALL TYPES
⟼ 7/1971

VI - ADJUSTING THE STATIC TIMING

10140



1. If the distributor has been removed, pre-set it so that the engine can run (see same operation,§ II).
2. Bring the piston of the first cylinder to TDC (see same operation, § II).
3. Make sure that the mark on the drive pulley (1) (yellow mark) is situated opposite the "zero" mark of the gauge "S". If necessary, make this mark.
4. Use the table on page 4 to read off, for the type of vehicle in question, the engine speed *(column A)* and the corresponding total advance in crankshaft degrees *(column B)*.
5. **Convert this value into distributor degrees :**

$$\text{distributor advance} = \frac{\text{crankshaft advance}}{2}$$

E.g. for a DV : distributor advance $= \frac{24°}{12} = 12°$

a) **When using a strobe lamp :**

- Let the engine run at the speed indicated *(column A)*.
- The drive pulley mark (illuminated by the strobe lamp) should be opposite the division corresponding to the value just calculated. If this is not the case, alter the angular position of the distributor. During the adjusting operation, check and, if necessary, correct the engine speed.

b) **When using a strobe lamp with a dephaser :**

- Let the engine run at the speed indicated *(column A)*.
- Operate the dephaser control to keep the drive pulley mark (illuminated by the strobe lamp) opposite the "zero" mark of the gauge.
- Read the value of the advance on the dephaser dial and make sure that it corresponds to the one expected. If this is not the case, alter the angular position of the distributor. During the adjusting operation, check and, if necessary, correct the engine speed.

NOTE :
The dephaser dials normally have two scales :
- one indicating crankshaft degrees,
- the other indicating distributor degrees.

VII. TEST BENCH CHECK OF A DISTRIBUTOR.

The curves and characteristics of the different types of distributor are shown in operation D. 210-00.

1. Check the condition of the contact breaker points and adjust the contact gap.

2. Position the distributor on the test bench and connect the bench coil negative to the primary terminal of the distributor.

3. Check the insulation of the secondary circuit.
Adjust the spark gaps to 7 mm.
Connect the secondary terminal of the coil to the central contact of the distributor and the spark plug leads to the contact breakers.
Allow the distributor to turn at 1000 r.p.m. for fifteen minutes. There must be no misfiring.

4. Check the spark grouping :
The angular difference must not exceed 1°30' max. at all speeds (max. distributor speed : 3000 r.p.m.).
At each opening point the max. variation of the spark positions must not be more than 1° 30'.

5. Check the dwell angles of the contact breakers.
DUCELLIER distributor 57 ± 2°
SEV-MARCHAL distributor 59 ± 2°

6. Check the adjustment of the automatic ignition advance curve.
The actual curve must be between the minimum and maximum curves on the graph.

NOTE : a) It is possible to modify the tension of the flyweight springs by bending the spring anchor clips.

b) If there are sparks at any other than the four normal positions the cam follower contact is bouncing. Check the force necessary to separate the points.( ).

7. Check the primary circuit insulation.
With the condenser removed bring the temperature of the distributor to 60° (140° F). When the contact points are open apply 110 volts alternating current between the insulated positive terminal and earth, inserting a lamp in series. Maintain this voltage for 1 min. The lamp must not light up. If it does the insulation is defective.

8. Check the condenser.
a) Check the insulation :
Apply 110 volts alternating current between the condenser and its casing for 1 min. Insert a mains lamp in series in the circuit. If the lamp lights the insulation is defective.

b) Check the capacities :
Use a capacitance-meter.

VIII. CLEANING AND ADJUSTING THE SPARK PLUGS.

NOTE : This operation is necessary after prolonged town driving at low speed. Such use of the vehicle induces considerable fouling of the plugs.

9. Eliminate all lead and oil deposits on the insulator and electrodes by using a hardwood spatula. Do not use any metallic object.

10. Clean the plugs in petrol and blow out with compressed air.

11. Clean the plugs with a sand-blasting machine, supplied with compressed air at 6 bars max. (85 p.s.i.)

Blow out with an air jet at a maximum pressure of 4 bars (56 p.s.i.) to remove the sand without forcing any between the insulator and the body of the plug.

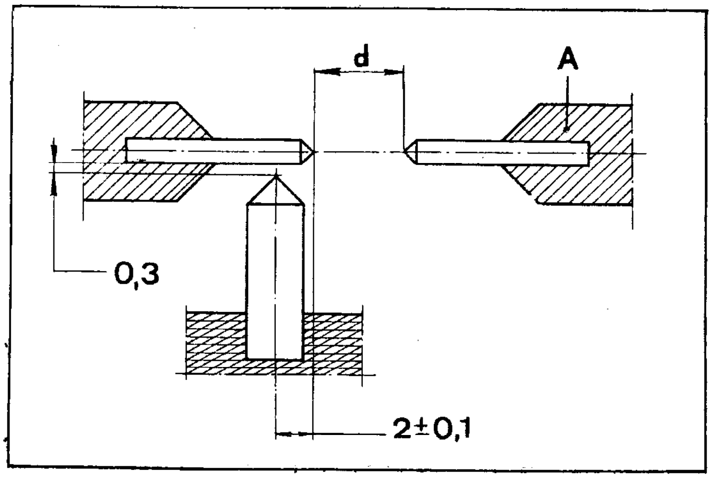
IMPORTANT NOTE : *Incomplete cleaning of the plugs after sand-blasting can cause rapid engine wear. It is therefore essential to eliminate all traces of sand after this operation.*

12. Remove all sand that may be left on the base of the insulator by scraping with a very hard wood spatula.

13. Maintaining the sand-blasting machine.
a) Use only the sand supplied by the manufacturer of the machine.
b) Store the sand in a very dry place.
c) Renew the sand in the machine after cleaning about 100 plugs.

14. Adjust the electrode gaps to 0,60 mm - 0.70 mm (0.024 to 0.028 in)

IX - CHECKING AN IGNITION COIL



1. Check the insulation of the primary circuit.

Check the insulation of the primary circuit using an ohmmeter connected between the primary terminal marked (× or BAT) and the housing. Resistance must be infinite

This check may also be carried out with a lamp supplied with 110 volts, connected as the ohmmeter. The lamp must not light.

2. Check the secondary circuit.

Place the coil (with or without external resistance) on a test bench, with a shunted spark gap (50 K ohms) adjusted as shown opposite.

a) Run the distributor at 500 r.p.m.

With the spark gap at 15 mm min. slowly bring the moving contact A closer and lock it when the first spark appears. At this moment the spark gap must be "d".

Repeat this test at least three times and take the average of the gaps measured. The average gap must be at minimum 9 mm. (0,35 ins)

b) Run the distributor at 2000 r.p.m.

Repeat the test shown in § 2 a.

The average gap must be at minimum 4 mm. (0,16 ins)

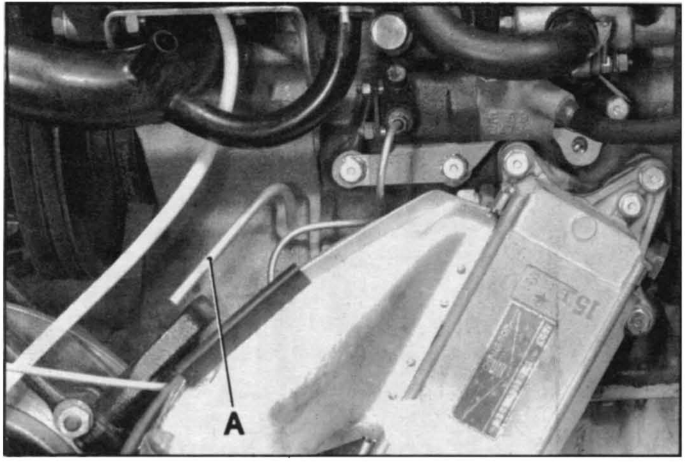
IMPORTANT NOTE :

Since September 1969 the new ignition coil with external resistance is fitted together with a new ignition condenser with increased capacity : 0,25 to 0,30 μ F instead of 0,18 to 0,27 μ F.

N.B. : The coil should be capable of carrying 12 volts for ten hours.

I. ADJUSTMENT OF THE DISTRIBUTOR AT THE STATIC SETTING

D. IE VEHICLES ALL TYPES
➡ *7/1971*



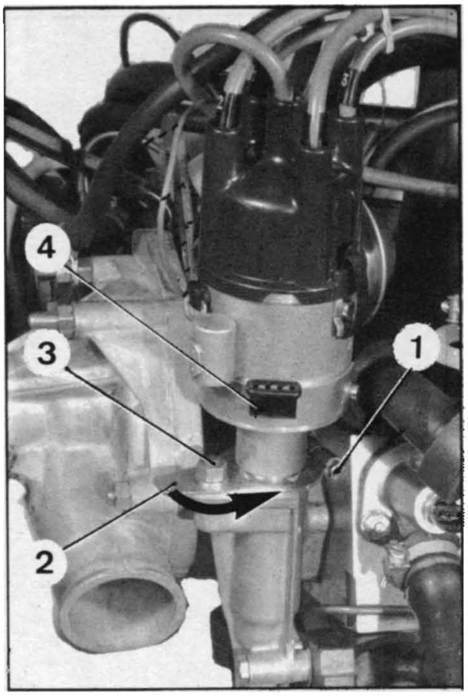
NOTE : Ensure that the distributor is properly positioned, the connector (4) of the triggering contact must be on the opposite side to the engine.

1. Check the contact-breaker setting.

a) *Using a set of feeler gauges.*
Remove the distributor head and check that the gap at the contact breaker points is $0{,}40 \pm {}^{0{,}05}_{0}$ mm (0,014 to 0,018 in) if not, adjust it to this.

b) *Using a dwellmeter.*
With the engine running, the dwell reading should be 56 % ± 3 if it is not remove the distributor head, turn distributor by means of the starter motor and adjust the contact breaker gap.

c) *Using a cam-angle (dwell-angle) tester or an oscilloscope.*
With the engine running the closing angles of the breaker should be 50° ± 3°. If it is not, remove the distributor head turn the distributor by means of the starter motor and adjust the contact breaker. gap.

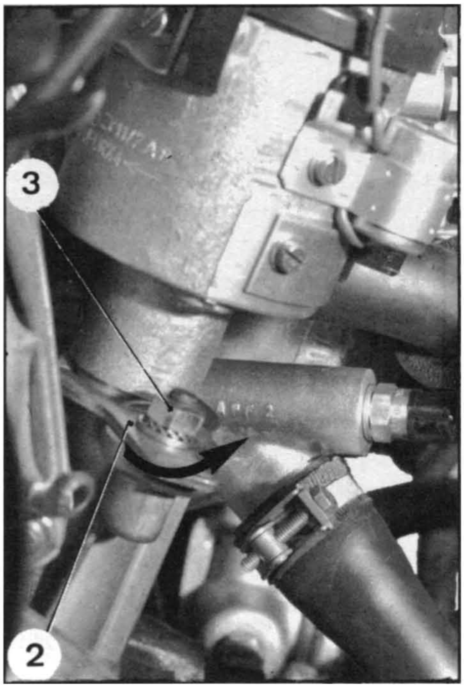


2. To find the position of initial advance on the engine.

a) Bring n° 1 cylinder to the end of its compression stroke.
NOTE : On vehicles fitted with a 5-speed gearbox place the front L.H. side of the car on supports, so that the wheel is clear of the ground engage 5th. gear and use the L.H. wheel to turn the engine.

b) Insert a 6 mm diameter locating pin "A" into the hole (situated under the alternator) provided in the clutch bell-housing
To do this :
Gently turn the engine until pin falls into the flywheel slot. In this position the engine is at firing point (n° 1 cylinder) i.e. 8° 30' before T.D.C.

c) WITHDRAW THE LOCATING PIN.



3. Adjust the distributor to the static setting.

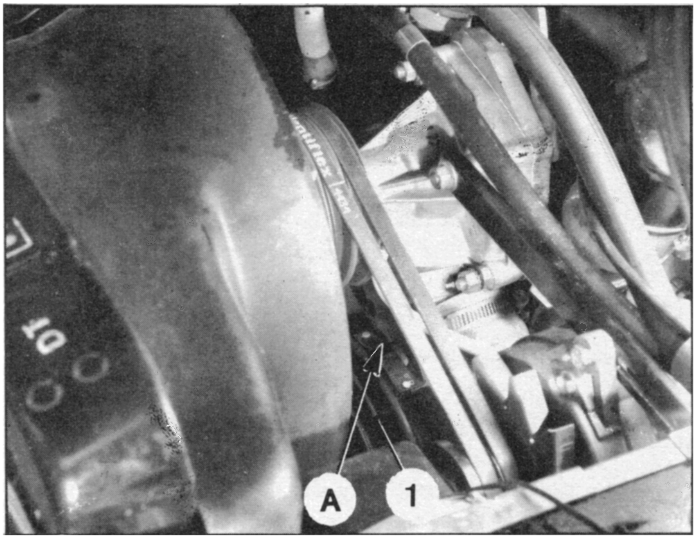
Connect a warning lamp to the terminal "-" or "RUP" of the ignition coil and to earth. Switch on the ignition.
Slacken the securing screw (1) of the distributor clamp plate.
Turn the advance control (2) to the end of the slot in the direction of the arrow and tighten the securing nut (3).
Slowly turn the distributor body in an anti-clock wise direction. Stop as soon as the lamp lights which is the point at which the contacts open.
Tighten the screw (1) securing the distributor clamp plate to 3 mΛN (0,3 m.kg). (2,16 ft.lbs).
Switch off the ignition.

IMPORTANT :
The pre-setting of the static timing using a check lamp allows only the starting of the engine, under no circumstances is it sufficient for setting the distributor (static timing). This must be done using a strobe lamp (see corresponding operation).

D. IE VEHICLES ALL TYPES

→ *7/1971*

II. PRE-SETTING THE STATIC TIMING



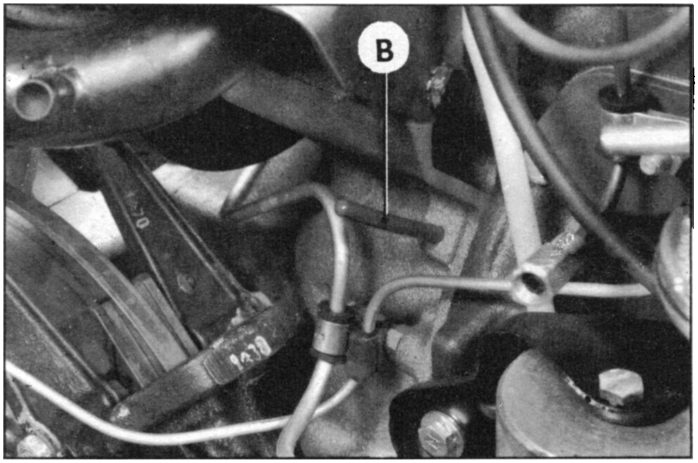
NOTE : Make sure that the distributor is properly positioned, the connector of the triggering contact must be on the opposite side to the engine.

Since 1st. July 1971, the engines have been modified.

- The notch of the engine flywheel, intended for the pre-setting of the static timing, corresponds to toc of pistons 1 and 4 when the static timing pin engages in this notch on being inserted into the clutch casing.
- A graduated scale a is fixed to the water pump (see illustration opposite)
  1 graduation of the scale corresponds to 1° of the distributor.

Pre-setting of the static timing.

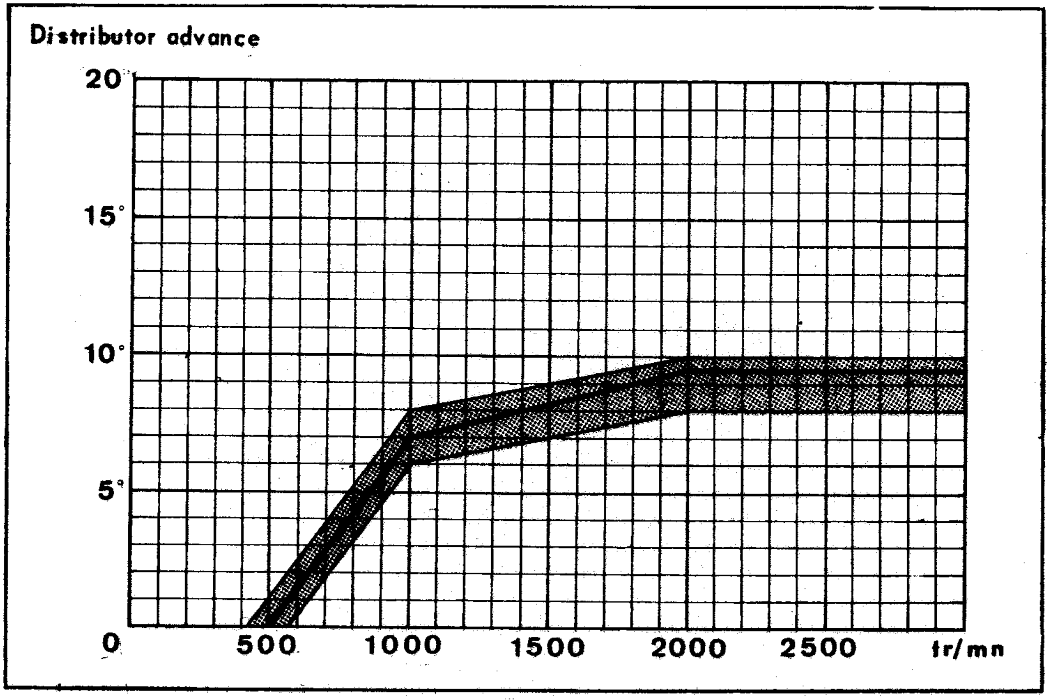
1. Check the contact-breaker gap (cam-angle).
2. Bring the piston of cylinder 1 to the end of its compression stroke whilst keeping the distributor rotor in position.
   NOTE : On vehicles equipped with five speed gearbox, place the front L.H. side of the vehicle on supports so that the front L.H. wheel is clear of the ground. Engage 5th. gear and use the wheel to turn the engine.
3. Insert the pin B (ϕ = 6 mm) in the hole in the clutch casing and turn the engine slowly until the pin enters the notch of the flywheel. *At this moment the piston of cylinder 1 is at top dead centre, the end of its compression stroke.*
4. WITHDRAW THE PIN.
5. Make sure that the existing mark on the drive pulley (1) (yellow mark) is positioned opposite the zero graduation on the scale. If necessary, make this mark (if the drive pulley is removed).
6. Turn the distributor to the point where the contact-breakers start to open (use check lamp)



IMPORTANT :
The pre-setting of the static timing using a check lamp permits only the starting of the engine, under no circumstances is it sufficient for the setting of the distributor (static timing) which must be done using a strobe lamp (see relevant operation).

III. TEST BENCH CHECK OF A DISTRIBUTOR

D. 21-68



CENTRIFUGAL ADVANCE CURVE FOR BOSCH ZV 11/7 A 3 A DISTRIBUTOR

1. Check the condition of the contact breaker points and adjust their gap to $0,40 \pm {}^{0,05}_{0}$ mm (0,016 to 0,018 in)

2. Place the distributor in position on the test bench and connect the test bench coil negative to the distributor primary terminal.

3. **Check the insulation of the secondary circuit.**

   Adjust the spark gaps to 7 mm.(0.27 ins)
   Connect the coil secondary terminal to the distributor central terminal and the spark plug leads to the spark gaps
   Turn the distributor at 1000 r.p.m. for 15 minutes there should be no misfiring at the spark gaps.

4. **Check the spark grouping.**
   The angular difference must not exceed 1° max. at all speeds. (max. distributor speed 3000 r.p.m.)
   At each opening point the maximum variation of the sparking positions must not exceed 1°.

5. **Check the dwell angles of the contact breaker.**

   The dwell angle must be 50° ± 3°.

6. **Check the adjustment of the centrifugal advance curve :**

   The actual curve must be between the min. and max. curves on the graph.

   NOTE :
   If there are sparks at any other than the four normal positions for speeds equal to or lower than 3200 r.p.m, the cam follower contact is bouncing.
   Replace the contact breaker.

7. **Check the primary circuit insulation.**

   Bring the temperature of the distributor, with the condenser removed to 60° C (140° F). With the contact open apply 110 volts alternating current between the positive terminal and earth inserting a mains lamp in series. Maintain this voltage for 1 min. The lamp should not light, if it does, the insulation is defective.

8. **Check the condenser.**

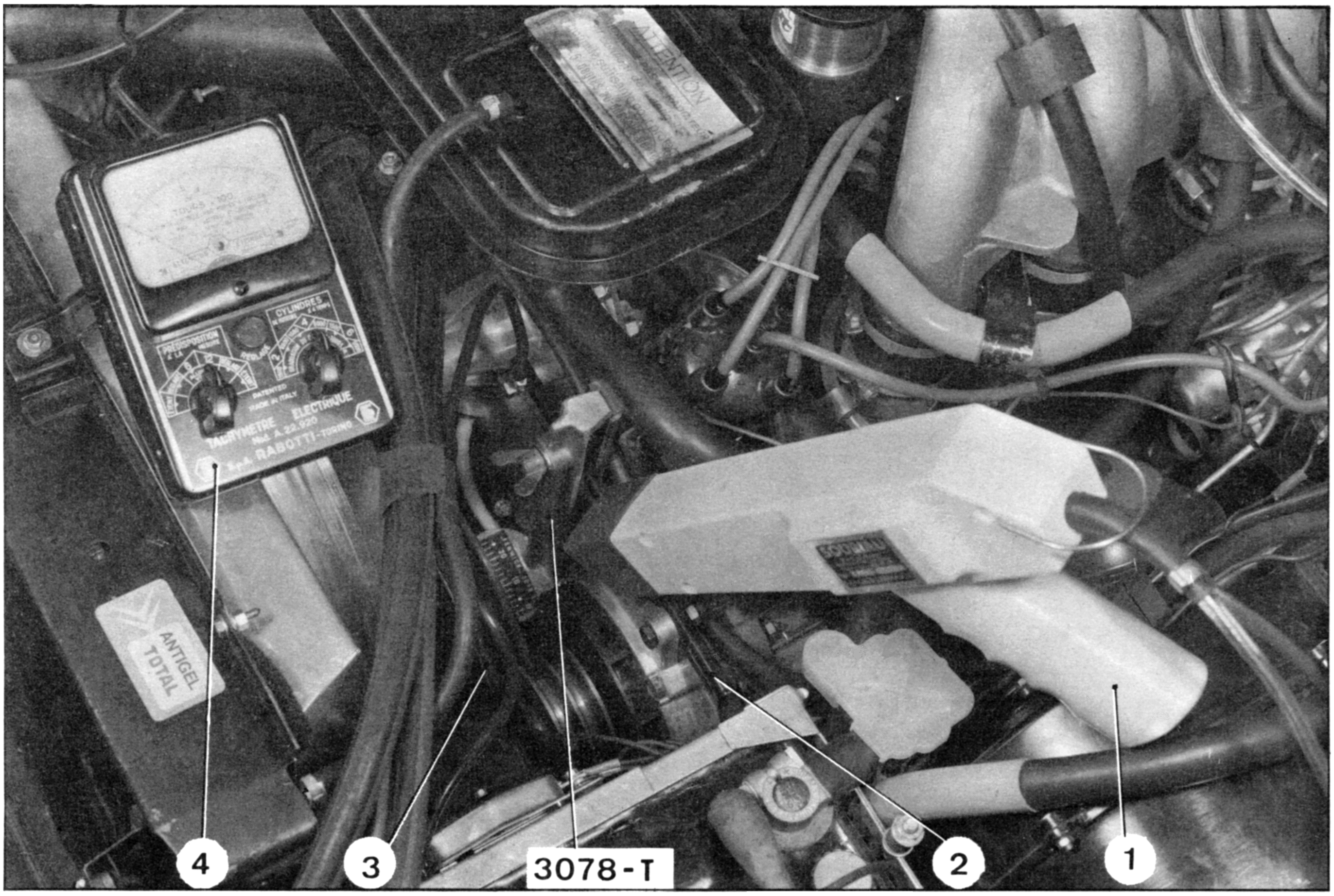
   Checking the capacities :
   Use a capacitance - meter. The capacitance must be between 0,15 and 0,25 u F.

D.IE VEHICLES ALL TYPES
→| *7/1971*

IV. ADJUSTING THE STATIC TIMING

(With a stroboscopic lamp)

5624



NOTE : The distributor must be timed, with the engine running at 1800 r.p.m..
Ignition advance must be 22° (crankshaft degrees in relation to T.D.C.)

1. If the distributor has been removed, set it at the static setting so that the engine can run (see same operation chap. 1).
2. Connect the tachometer (4)
3. Fit the bracket of the gauge 3078-T onto the alternator bar (2) so that the gauge is level with the edge of the drive pulley)3) (each division of the gauge represents 2° distributor).
4. When the engine is at the static setting, point a thin white line on the drive pulley (3) opposite the «O» mark on the gauge.

   WITHDRAW THE TIMING PIN.

5. Connect the stroboscopic lamp (1) to the voltage source feeding the instrument, and to the plug lead of n° 1 cylinder.

   IMPORTANT NOTE : The secondary voltage of the first cylinder's ignition circuit must be picked up at the distributor head.

6. Light up the mark with the stroboscopic lamp. The mark seems to move when the engine speed increases. When the engine runs at 1800 ± 50 r.p.m. the mark should correspond to 6° 45' distributor (3 1/3 divisions approx.)
7. If it does not, unscrew the screw on the distributor clamps and turn the distributor so that the mark corresponds to the correct section (the ignition advance angle increases when the distributor is turned anti-clockwise).
8. Tighten the distributor clamp screw to 3 mΛN (0,3 m.kg) (2.16 ft.lbs)
9. Switch off the ignition.
10. Remove the stroboscopic lamp (1) graduated scale 3078-T and tachometer (4).

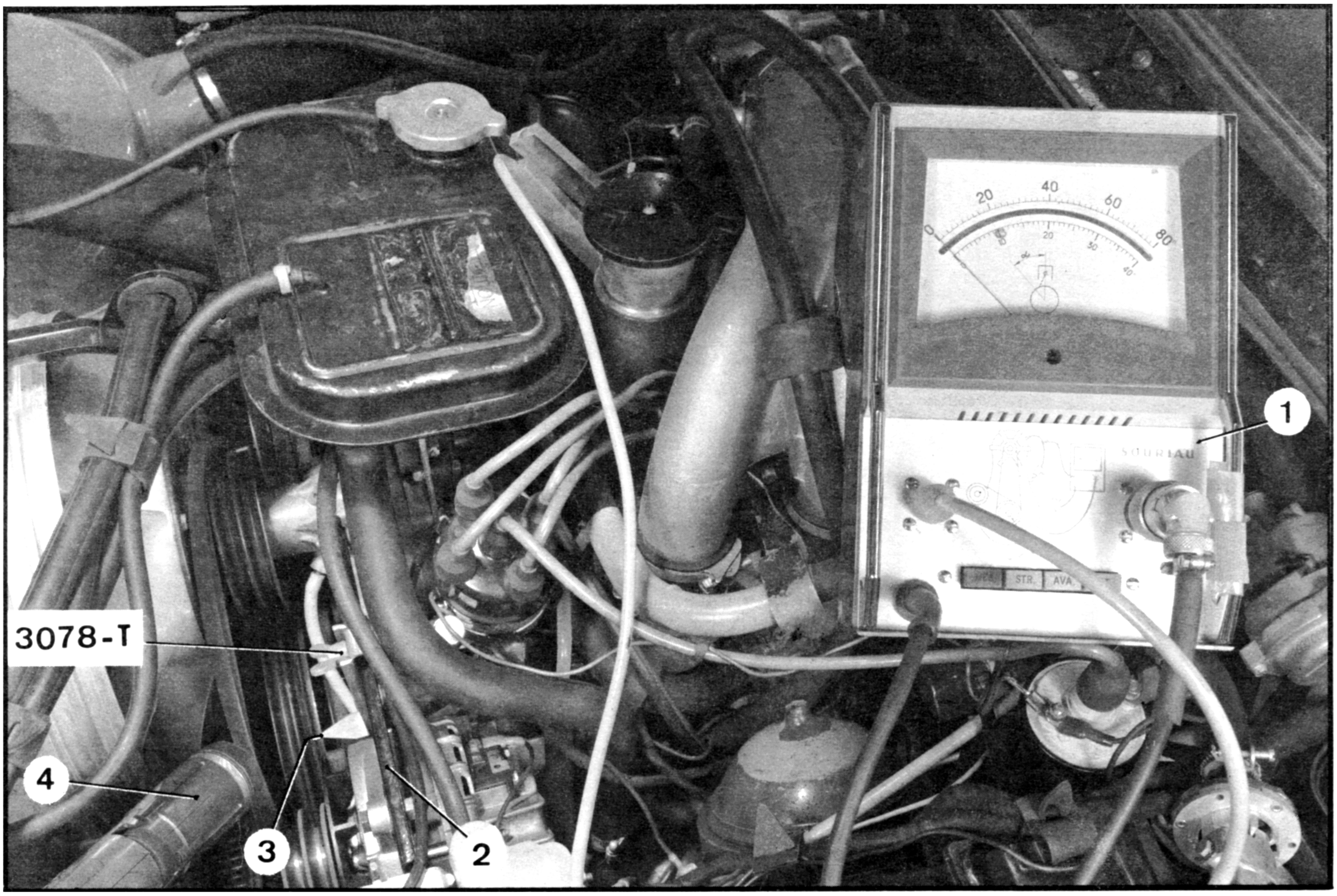
V. ADJUSTING THE STATIC TIMING

(With a stroboscopic lamp with dephaser)

D. IE VEHICLES - ALL TYPES

➡ *7/1971*

7267



NOTE : The distributor must be timed engine running at 1800 r.p.m.
Ignition advance must be 22° (crankshaft degrees in relation T.D.C.)

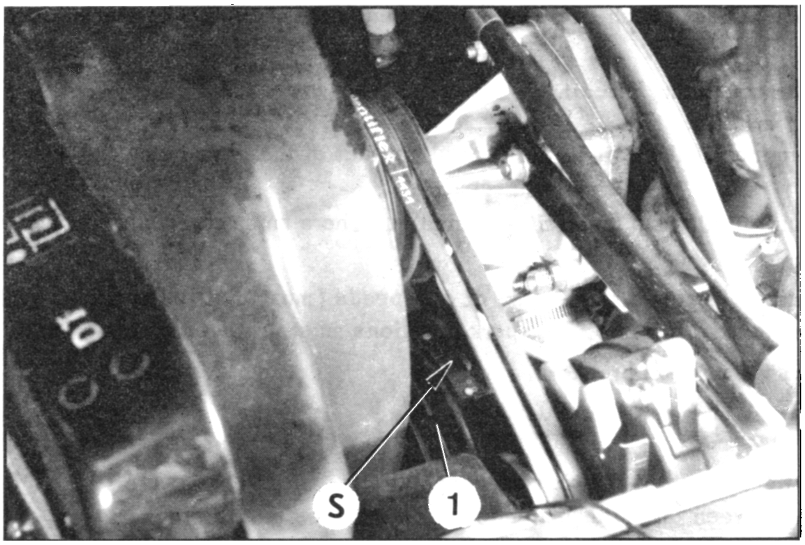
1. If the distributor has been removed set it at the static setting so that the engine can run (see same operation chap. 1).
2. Connect the tachometer.
3. Fit the bracket of graduated scale 3078-T on to the alternator bar (2) so that the scale is level with the edge of the drive pulley (3).
4. When the engine is at the static setting, point a thin white line on the drive pulley (3) opposite the timing pointer mark.

   WITHDRAW THE TIMING PIN.
5. Connect the instrument to the voltage source and to the plug lead of n° 1 cylinder. Adjust the dephaser (1) to «zero».
6. Run the engine at 1800 ± 50 r.p.m..
7. Light up the marks with the stroboscopic lamp (4).
8. Using the dephaser control, bring the mark on the drive pulley (3) in line with the timing pointer mark. With the engine running at 1800 ± 50 r.p.m. the division shown by the needle on the dephaser scale corresponds to the ignition advance angle. If the setting is correct, it should read 6° 45' distributor.
9. If the reading varies from this loosen the distributor clamp and turn the latter so as to bring the mark on the drive pulley (3) into line with the mark of timing pointer 3078-T. The distributor advance angle increases as the distributor is turned anticlockwise.
10. Tighten the clamp of the distributor to 3 mΛN (0.3 m.kg 2.16 ft. lbs). Switch off the ignition.
11. Remove the strobe lamp (4) and the dephaser (1), the graduated scale 3978-T, and the tachometer.

D. IE VEHICLES ALL TYPES
⟼ *7/1971*

VI. ADJUSTING THE STATIC TIMING

10140



1. If the distributor has been removed, pre-set it so that the engine can turn over (see this operation, chap. II)

2. Bring the piston of cylinder 1 to TDC (see same operation, chap. II)

3. Make sure that the mark on the drive pulley (1) (yellow mark) is opposite the zero graduation of the scale "S". If necessary, make this mark.

4. The distributor advance should be 22° (crankshaft degrees in relation to TDC) with the engine turning at 1800 r.p.m.

5. **Convert this value into distributor degrees :**

$$\text{distributor advance} = \frac{\text{crankshaft advance}}{2} \qquad \text{i.e. distributor advance} = \frac{22°}{2} = 11°$$

a) **Using a strobe lamp :**
- Turn the engine at 1800 r.p.m.
- The mark on the drive pulley (lit by the strobe lamp) should be opposite the division corresponding to the value previously calculated. If this not the case, adjust the angular position of the distributor. During the operation, check and correct the engine speed. If necessary.

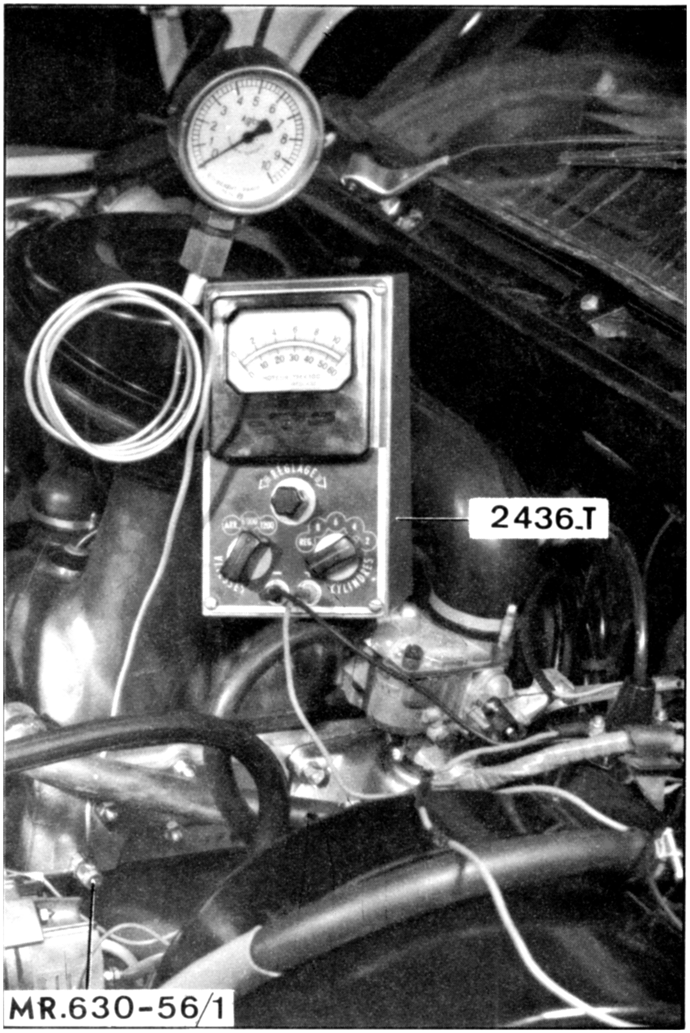
b) **Using strobe lamp with dephaser :**
- Turn the engine at 1800 r.p.m.
- Adjust the dephaser control to keep the mark on the drive pulley (lit by the strobe lamp) opposite the zero mark on the graduated sector.
- Read the distributor advance on the dephaser dial, and make sure it is correct. If this is not the case adjust the angular position of the distributor. During the operation check and correct the engine speed if necessary.

NOTE :
The dial of a dephaser, usually has 2 readings scales.
- one shows crankshaft degrees
- the other shows distributor degrees.

IMPORTANT : The secondary voltage of cylinder 1's ignition circuit must be picked up at the distributor head.

VEHICLES ALL TYPES

CHECKING THE OIL PRESSURE



CHECKING

1. Run the engine until the oil temperature is about 60°C

   Stop the engine

2. Remove the lubrication screw from the cylinder head.
   Connect a pressure gauge graduated from 0 to 10 bars (0-150PSI).
   Link this to the engine by pressure feed pipe using the union MR. 630-56/1

3. Connect a tachometer to the coil then let the engine run at 2000 r.p.m. (electric rev.counter 2436-T)

4. Read the pressure on the gauge. It should be 3.8 bars min. (54PSI)

5. Stop the engine, remove the pressure gauge and refit the lubrication screw with its copper gasket.

6. Remove the tachometer

NOTE : If the pressure is incorrect the oil pump must be removed and reconditioned.

Manual 814-1

VEHICLES ALL TYPES

CHECKING A THERMOSTATIC REGULATOR

	Reference of regulators	Date	Types of vehicles *	Start of valve opening
ALCOHOL	V. 1743	→| *10 / 1972*	DX A.T. (except BW)DJ A.T. DY A.T.	$78^{\circ}{}^{0^{\circ}}_{-3^{\circ}}$C(167- 172.4° F)
	CL. 35-3800	→| *10/ 1972*	DV-DT-DL	75° ± 1°C(165,2-168,8°F)
WAX ELEMENT	V. 28 Ref. 5950	|→ *3 / 1972* →| *10/ 1972*	DX BW	$83^{0}_{-3^{\circ}}$C(181.4 - 183.9 F) or 79±1.5°C(172.4 - 175.2°F)
		|→ *10/ 1972*	DY	
		|→ *10/ 1972*	DX A.T. and DJ A.T.	79±1,5°C(172,4-175,2° F)
	V. 28 - Ref. 6153	|→ *10/ 1972*	DT-DLF-DV DP	79 ±1,5°C(172,4-175,2°F)

Checking :

Immerse the regulator in water and warm up progressively.

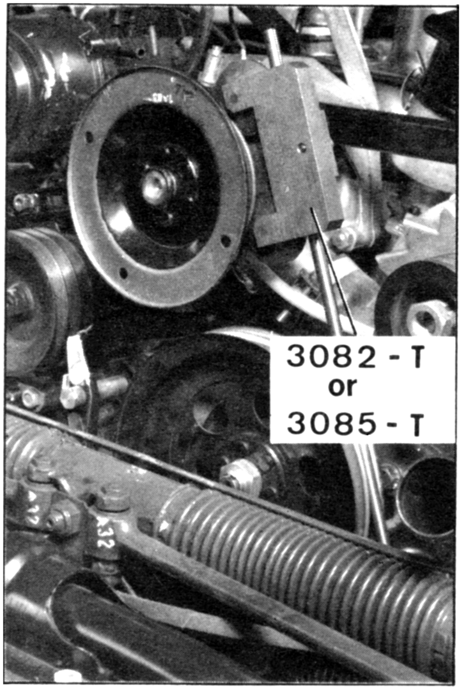
The regulator valve must start to open the temperature indicated on the above table for each type of vehicle.

Replace the apparatus if it does not satisfy the above conditions.

VEHICLES ALL TYPES

1. ALIGNMENT OF THE PULLEYS

3406



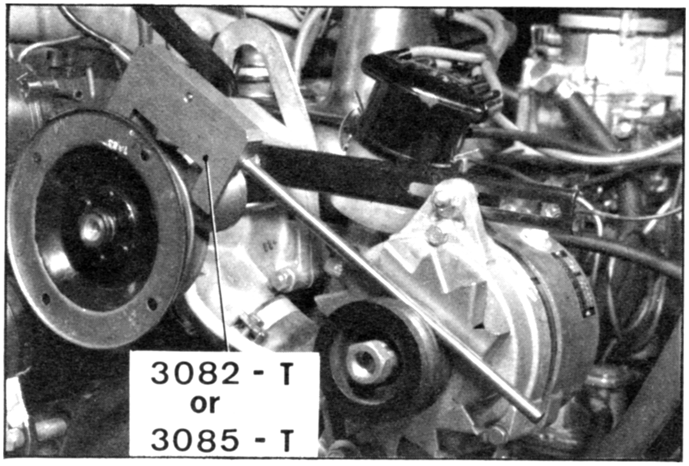
NOTE : The adjustments are made starting from the water pump pulley which is fixed on its spindle.

1. Adjustment of the drive pulley :

Place tool 3082-T, or 3085-T, in one of the grooves of the water pump pulley. The rod must centralise in the corresponding groove of the drive pulley.

Decrease or increase the thickness of the adjusting washers placed behind the pulley in order to obtain correct alignment.

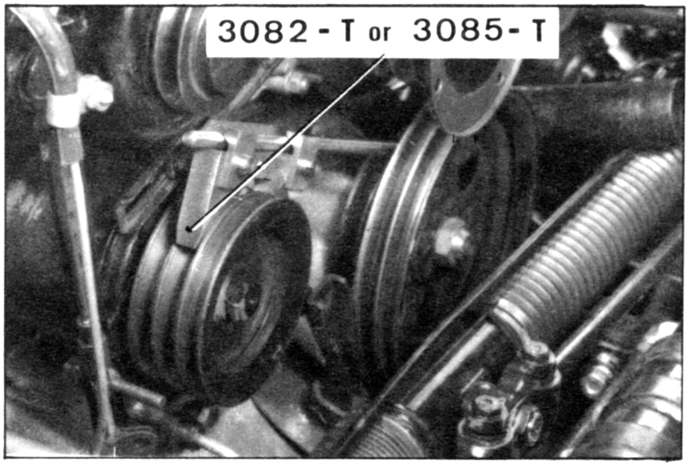
3407



2. Adjustment of the alternator or dynamo pulley :

Place tool 3082-T, or 3085-T, in one of the grooves of the water pump pulley. The rod must centralise in the corresponding groove of the dynamo pulley or alternator pulley.
If not decrease or increase the thickness of the adjusting washers placed behind the alternator or dynamo pulley.

1280

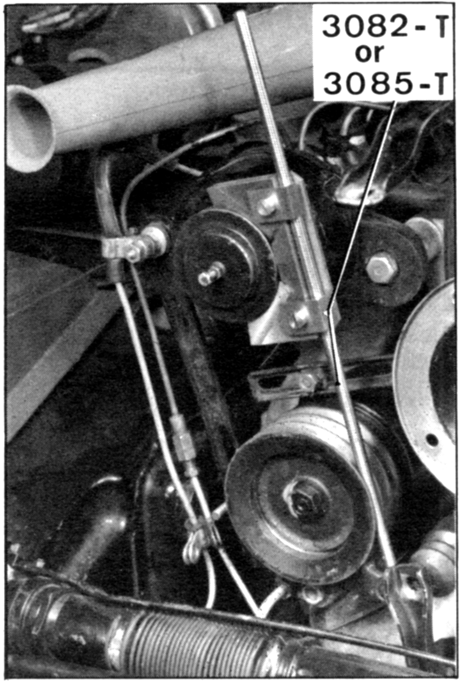


3. Adjustment of the high pressure pump pulley :

Place tool 3082-T, or 3085-T in the second or the third groove of the high pressure pump pulley. The rod must centralise in the corresponding groove of the drive pulley.

Decrease or increase the thickness of the packing pieces between the high pressure pump and the fixing boss of the pump on the clutch housing.

1281

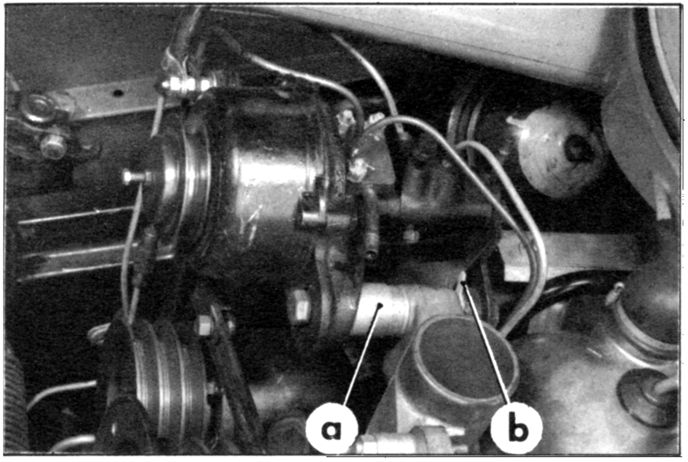


4. Adjustment of the centrifugal regulator pulley :

Place tool 3082-T, or 3085-T in the groove of the regulator pulley. The rod must centralise in the first groove of the high pressure pump pulley.

Decrease or increase the thickness of the packing pieces at (a) to obtain correct alignment.

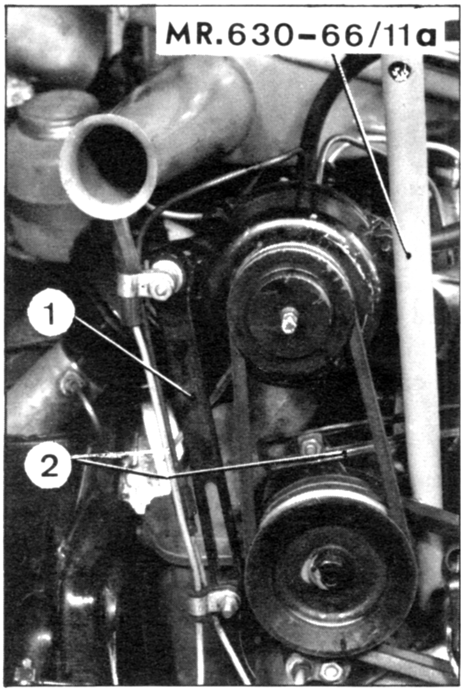
1282



Then modify the packing piece at (b) so that before tightening there is a maximum clearance of 1 mm between the support clip and the housing.

Tighten the securing nut, which will take up this clearance.

1308



II ADJUSTMENT OF BELT TENSIONS

5. Tension of high pressure pump belts. :

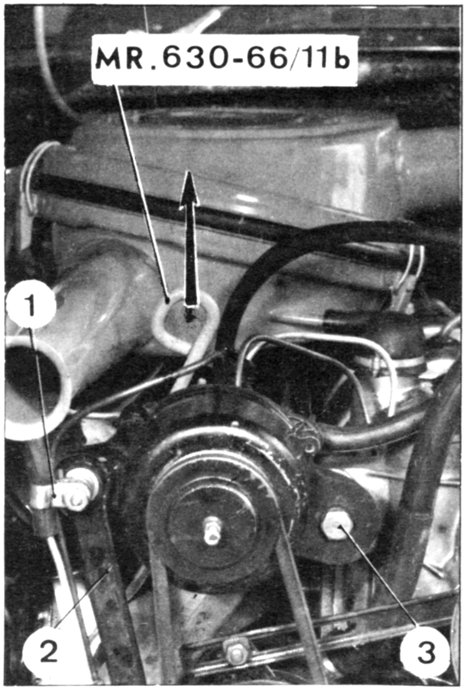
Unscrew the nuts securing the tie-rods (1) and (2), and the pump securing bolt.

Tension the belts using a lever (lever MR. 630-66/11 a). Lever on the clutch cylinder and and on the pump body.

Exert an effort of 5 kg. (11 lbs).) on the end of the lever (spring balance) which will correspond to a tension of 40 kg. (88 lbs) on the belt.

Keeping the belts in tension, tighten the nuts securing the pump'retaining bolt and the tie rods (1) and (2).

1306



6. Tension of the centrifugal regulator belt.

(Vehicles with hydraulic gear change only)

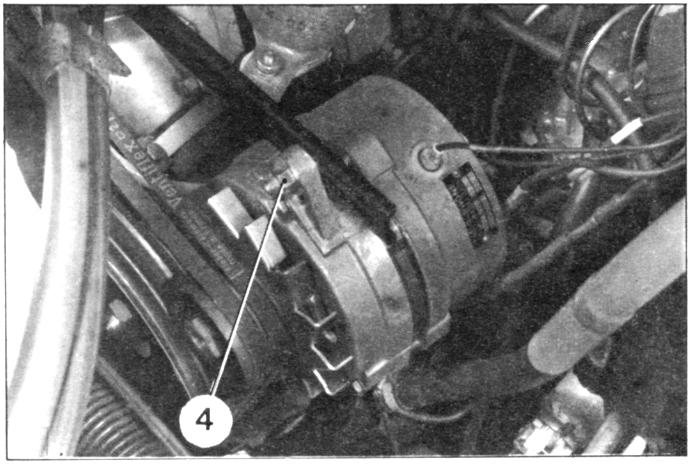
Unscrew :
- the clip (1)
- the tie-rod (2)
- the mounting spindle (3)

Tension the belt using the hooked tool MR. 630-66/11b.
This hook passes round the regulator body behind the mechanical part. Exert an effort of 25 to 30 kg. upwards (use a spring balance) (55 to 66 lbs.)

Keep the belt in tension and tighten :
- the tie-rod (2)
- the mounting spindle (3)
- the clip (1)

7. Tension of the alternator or dynamo belts :

3377



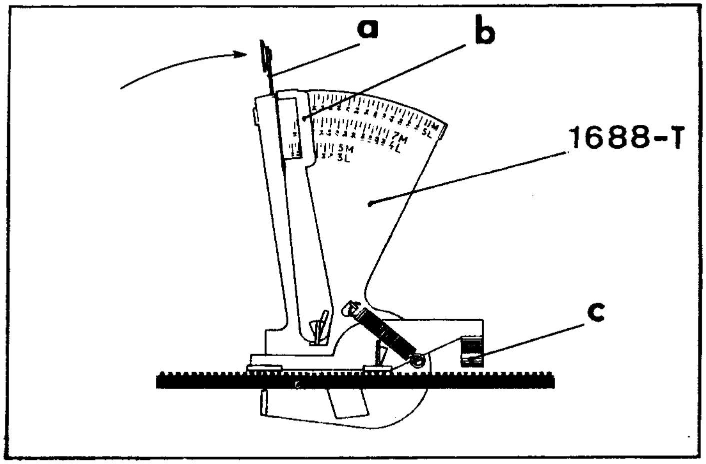
Unscrew the nut (4) of the generator tie-rod and the generator securing screws.

Tension the belts by means of a lever (MR. 630-66/11a) using the boss between the twc securing clips of the generator and using the generator body for leverage.

Exert an effort of 5 kg. (11 lbs.) on the end of the lever (use a spring balance), which corresponds to a tension of 28 kg. (62 lbs) on the belt.
Keeping the belts in tension, tighten the generator securing screws and tighten the nut (4) on the generator tie-rod.

8. **Tension of compressor drive belt** *(vehicles with air conditioning)*

NOTE : To perform this operation correctly, a GATES 150 tension-meter, sold under No. 1688 - T, MUST be used.



S 23-1

a) Fit the meter 1688 - T on the belt as shown in the illustration opposite, the scale « b » against the lever « a ».
Without touching the body of the meter, press the lever « a » in the direction indicated by the arrow until the tab « c » touches the belt.

b) Read the belt tension on the scale 11 M - 5 L corresponding to the belt.

c) If the belt is new, the tension should be between : . . . . 85 and 90 Lbs
(38 and 41 kg)

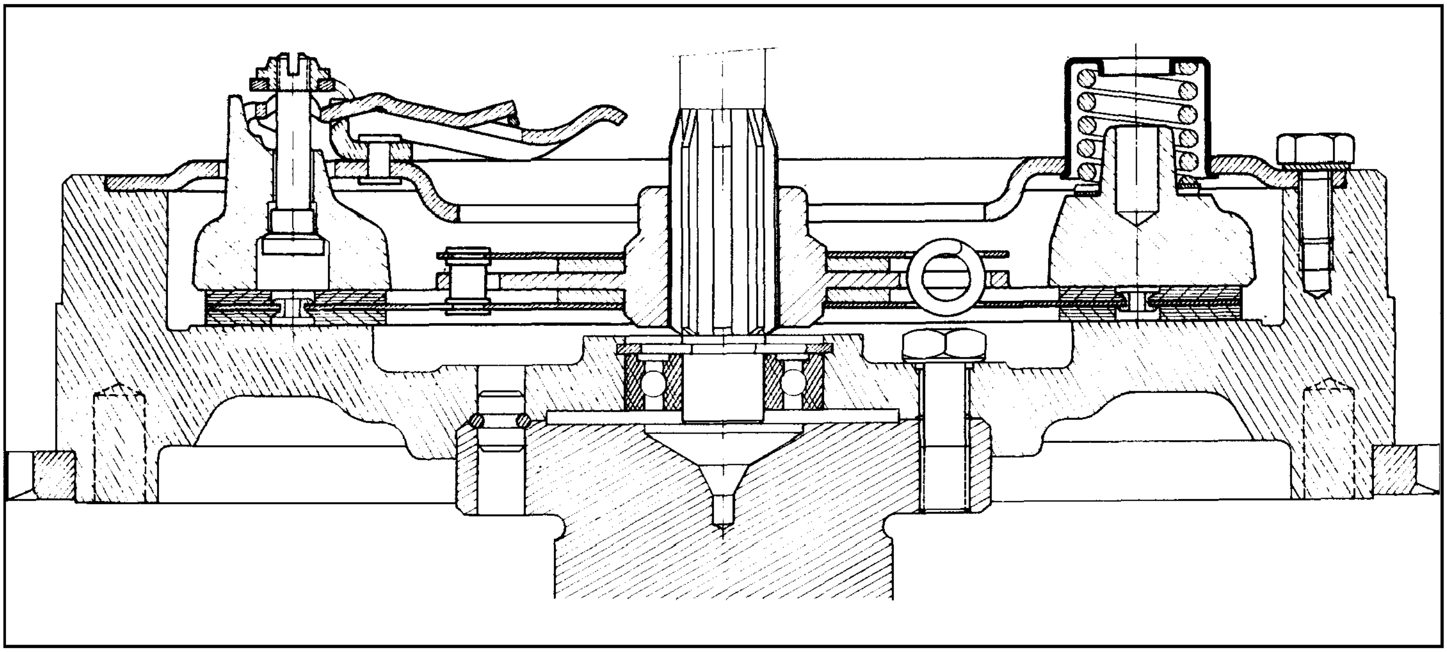
d) If the belt is used, the tension should be between : . . . . 40 and 50 Lbs
(18 and 23 kg)

e) If the tension does not correspond to the values given, loosen the securing bolts of the compressor tensioner and tension the belts.

f) Retighten the bolts and re-check the tension

VEHICLES ALL TYPES *except D.IE*
→| 10/1972

D. 31-1



SPECIAL FEATURES

Tighten the screws securing the clutch mechanism to the flywheel to 21 to 28 mΛN (2.1 to 2.8 mkg) (15 to 20 ft lbs)

After resurfacing : the distance between the disc thrust face and the clutch driving plate on the engine flywheel :

$$29 \, {}^{+0.2}_{\;0} \text{ mm}$$

Since September 1966 to October 1972

The clutch plate has been modified. The spring support is oblique.

Springs.
a) Vehicles produced before Sept. 1966.

Number	Mark	Length	Load
6	mauve	27.3 mm	$60.75^{+2.5}_{0}$ kg
3	green	27.3 mm	49^{+2}_{0} kg

b) Vehicles produced since Sept 66 up to Oct. 72

Number	Mark	Length	Load
9	pink	31 mm	59^{+4}_{0} kg

Adjustment of the toggles can only be carried out on an assembly.

Mechanical clutch control *(manual gear change) :*

Height of the pedal measured from the underside of the pedal plate to the floor panel :

on PA vehicles (with carpet lining) . . . . 137 ± 1 mm
on all vehicles except PA (without carpet lining) . . . . 142 ± 1 mm

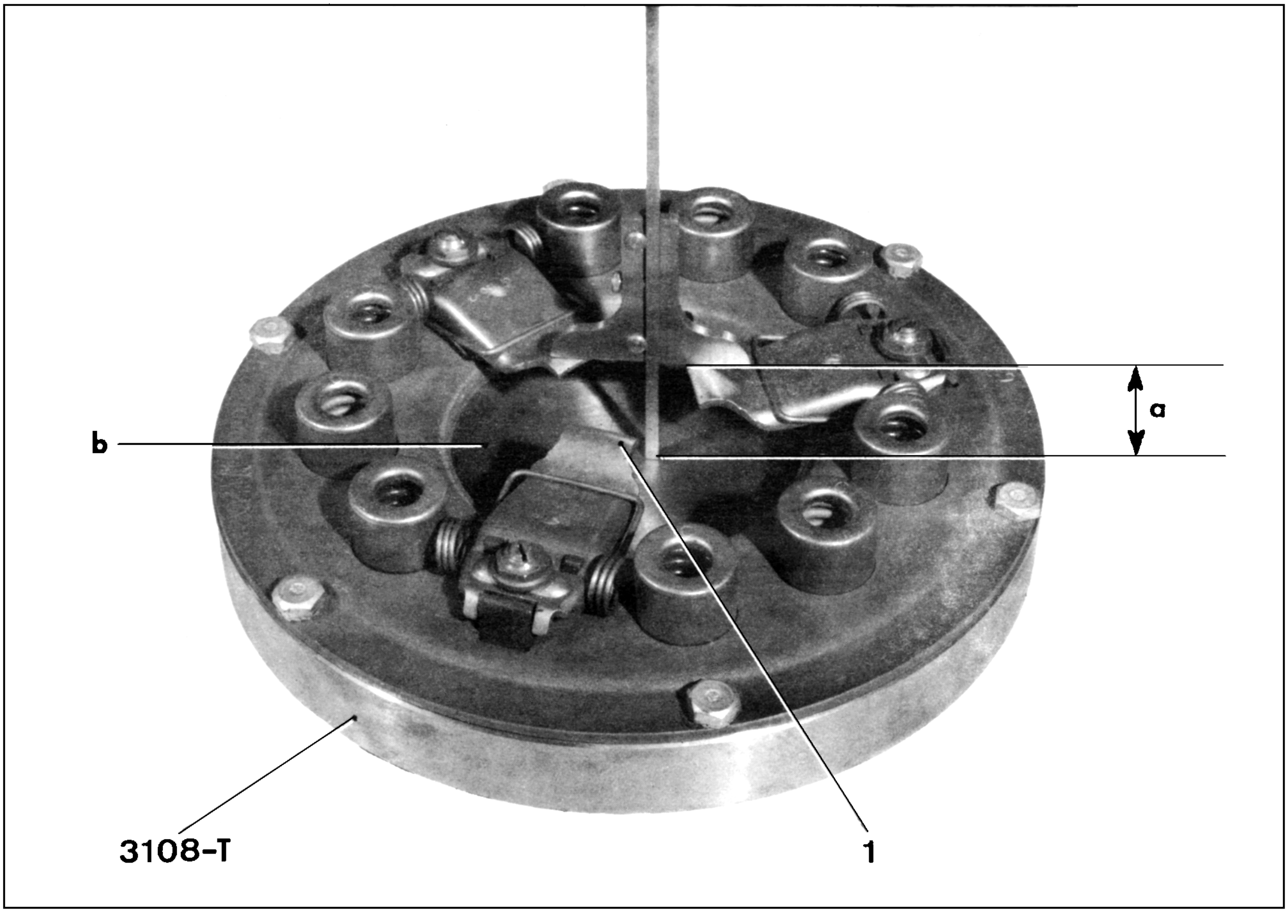
Clearance between the end of the connecting rod and the clutch housing:

- simple pedal gear . . . . = 2.5 to 3.5 mm
- Pedal gear with compensator spring . . . . = 3 to 4 mm

Clutch clearance . . . . = 1.6 to 2.4 mm
Diameter of the clutch cylinder. . . . . = 18.5 mm

Checking the mechanism :

1403



- Fit the mechanism onto instrument 3108-T

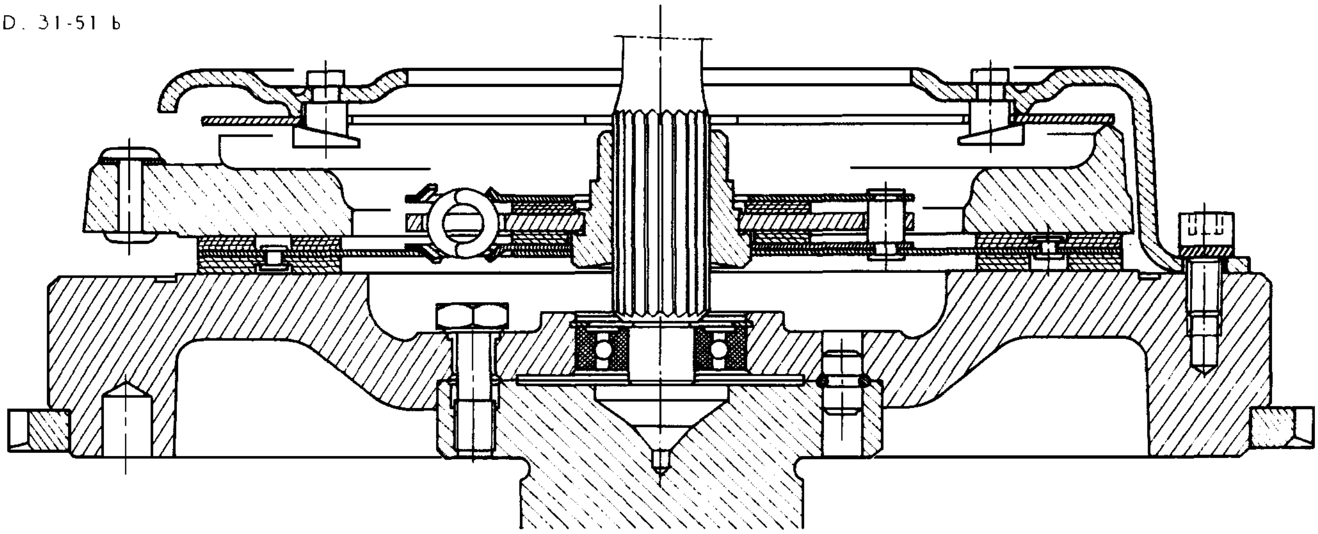
- Using a depth gauge, measure the distance «a» between the upper part of the toggles (1) and the bottom «b» of assembly 3108-T.

- This distance must be «a» = $39.8\ ^{+1.5}_{0}$ mm

- Move the clutch up and down by means of a rack press and measure the distance «a» again.

VEHICLES - ALL TYPES
⟼ *10/1972*

D. 31-51 b



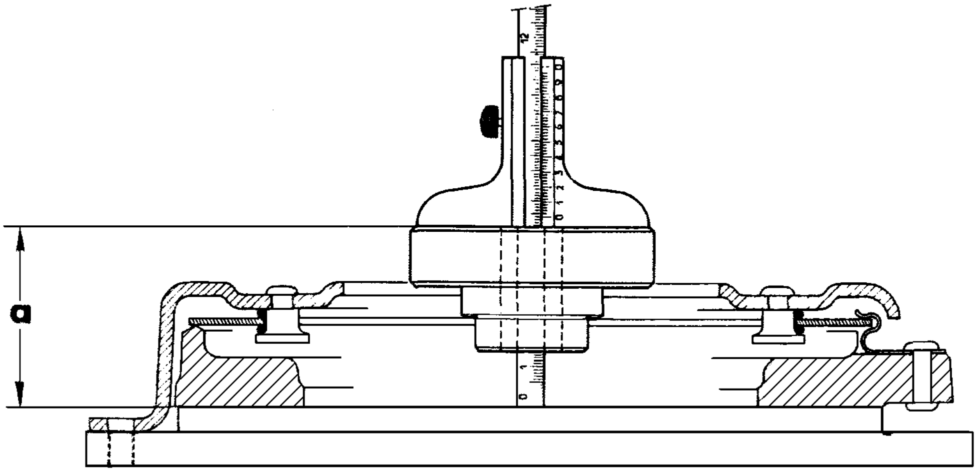
SPECIAL POINTS

Clutch type 235 DBRI 490 : No operation is possible on the clutch mechanism except for the mechanism check.

- Tighten the screws securing the mechanism on the flywheel (recessed hex-head screws of 6 mm) : .... 35 mAN (3.5 mkg) (26 ft lbs)
- After resurfacing of the engine flywheel, the distance between the disc thrust face and the clutch driving plate (on the engine flywheel) is............ $0.35^{\ 0}_{-0.15}$ mm

Checking the mechanism can only be carried out on a fixture (fixture MR 630-55/9), as shown below.
Distance «a» must be 58,7 ± 1.40 mm. If it is not, the mechanism must be replaced.
Diameter of clutch cylinder.. 24 mm.
Clutch disc thickness.. 8 mm.

MR. 630_55/9



Clutch plate

Type of engine	DY.3 (17 N)	DX.2 (21 N)	DX.4 (19 N)	DX.5 (29 N)
Ø Exterior of the plate	225 mm		228,5 mm	

Mechanical clutch control *(Manual gearchange vehicles):*

a) Height of the pedal measured from the underside of the pedal plate to the floor panel :

- on PA. vehicles (with carpet lining) . . . . 137 ± 1 mm
- on all vehicles except P.A, (without carpet lining) . . . . 142 ± 1 mm

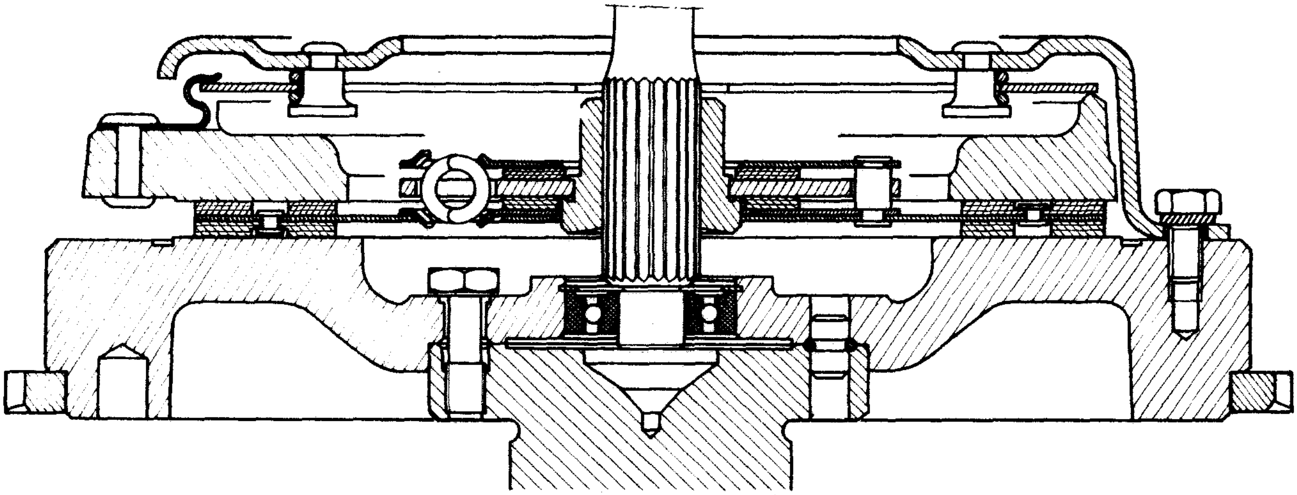
b) Clearance between the end of the connecting rod and the clutch housing . . . . 3 to 4 mm

c) Clutch clearance . . . . 1.6 to 2.4 mm

OPERATION N° D.IE 312-00: *Characteristics and checks on the clutch*

D.IE - VEHICLES - ALL TYPES
→ *10/1972 except BW*

D. 31-51



SPECIAL POINTS

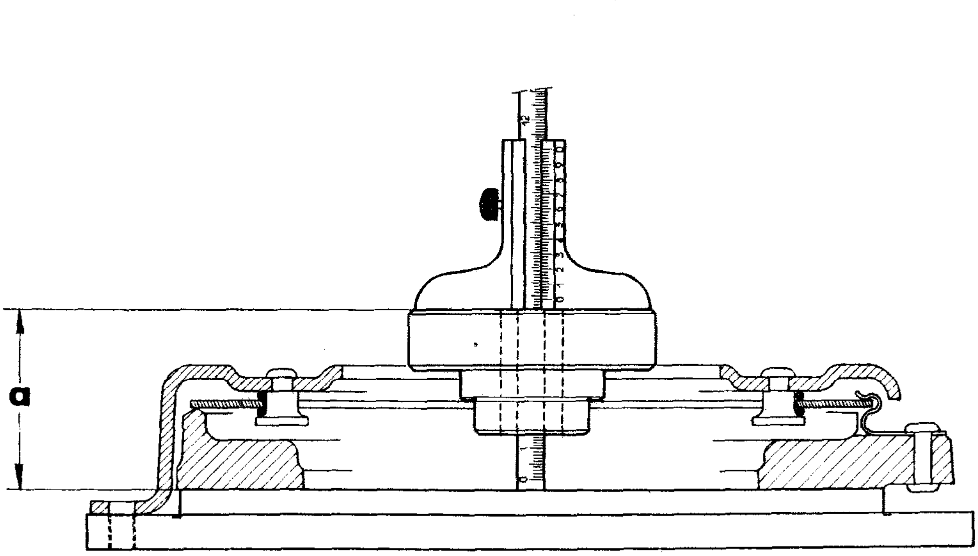
Clutch type 230 - DIB 440. No operation is possible on the clutch mechanism except for the mechanism check.

-

- Tighten the bolts securing the mechanism on the flywheel (grower washer) to... 40 m.N (4 mkg) (29 ft lbs)
- After resurfacing of the engine flywheel, the distance between the disc thrust face and the clutch driving plate (on the engine flywheel) is .... = $0.35^{\ 0}_{-0.15}$ mm

Checking the mechanism can only be carried out on a fixture (fixture MR 630-55/9), as shown below.
Distance «a» must be 59.8 ± 1.40 mm. If it is not, the mechanism must be replaced.
Diameter of clutch cylinder .... 22.5 mm →| *7/1972*
24 mm |→ *7/1972*

MR. 630_55/9



Mechanical clutch control *(Manual gearchange vehicles):*

a) Pedal height measured from the lower face of pedal to the panel of the floor :

- on PALLAS vehicles (rubber pad in place) . . . . 137 ± 1 mm
- on all vehicles except PALLAS (rubber pad removed) . . . . 142 ± 1 mm

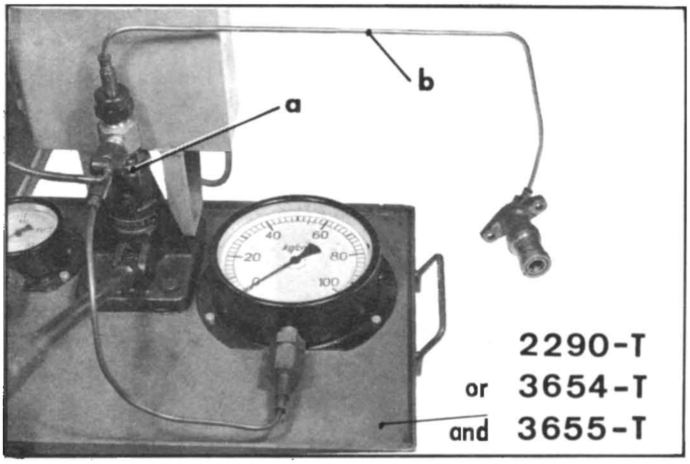
b) Clearance between end of the connecting rod and the clutch casing . . . . = 3 to 4 mm

c) Clutch clearance . . . . = 1.6 to 2.4 mm

OPERATION N° Dh. 314-0 : *Checks and adjustments on the hydraulic clutch control.*

VEHICLES with HYDRAULIC GEARCHANGE

2200



I . BASIC ADJUSTMENTS.

(See operation D. 142-0)

II . CHECKING THE CLUTCH CYLINDER FOR LEAKS.

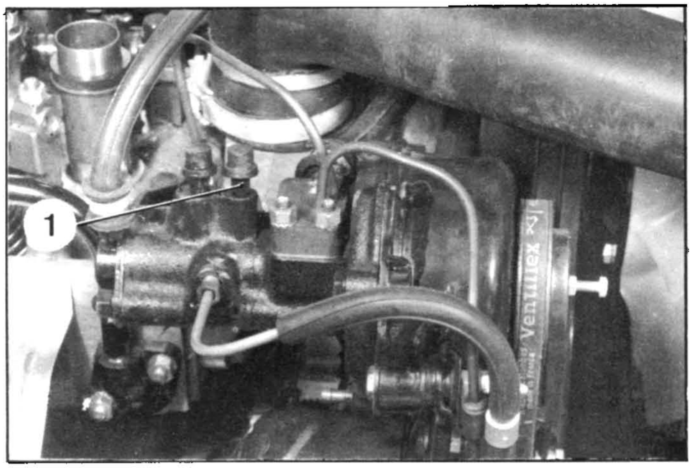
1. Use test bench 2290-T for vehicles with *L.H.S. fluid* or test bench 3654-T and its accessories 3655-T for those with *green L.H.M. fluid.*
   Connect the pump to the pressure gauge reading 0-100 bars (0-1500 p.s.i.).
2. Using a pipe « b », connect the tapping in the clutch cylinder to the pump.
3. Close the pump bleed screw « a » and pump up to a pressure of 75 bars (1070 p.s.i.).
   The pressure gauge must not show any drop in pressure. If it does, the ring seal or the piston and cylinder are defective.
4. Release the pressure by slackening the bleed screw « a » on the pump.

   Remove the pipe « b ».

III. BLEEDING A CENTRIFUGAL REGULATOR.

NOTE : The bleeding is carried out without pressure. Lightly unscrew the bleed screw of the pressure regulator.

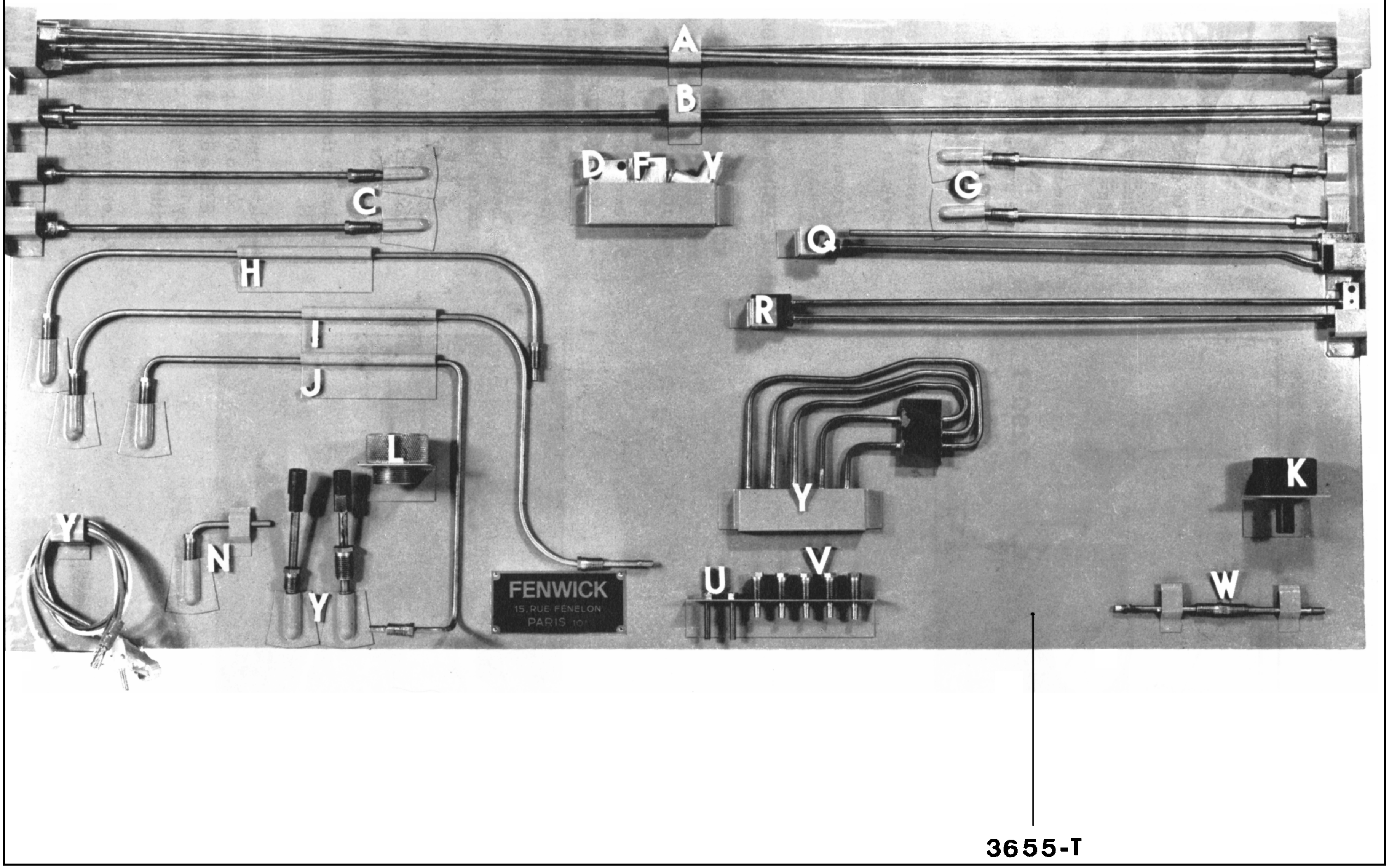
2180



5. Remove the cap from the front bleed screw (1) of the regulator and fit on to this flexible pipe (preferably transparent). Insert the end of the pipe in the hydraulic fluid reservoir.
6. Check that the two bleed screws on the regulator are tight.

   Start the engine and run it at a speed between 1500 and 2000 r.p.m. by turning the adjusting screw for accelerated idling.
7. Slacken the centrifugal regulator bleed screw (1) (1).
8. Slowly reduce the engine speed to :
   - 500 to 600 r.p.m. (*Vehicles* →| *9/1968*)
   - 625 to 675 r.p.m. (*Vehicles* |→ *9/1968*)

   by turning the adjusting screw for accelerated idling.
9. Let the engine idle for about 2 minutes, then tighten the bleed screw.
10. Remove the flexible pipe and fit the rubber cap onto the bleed screw (1).
11. Adjust the accelerated idling speed.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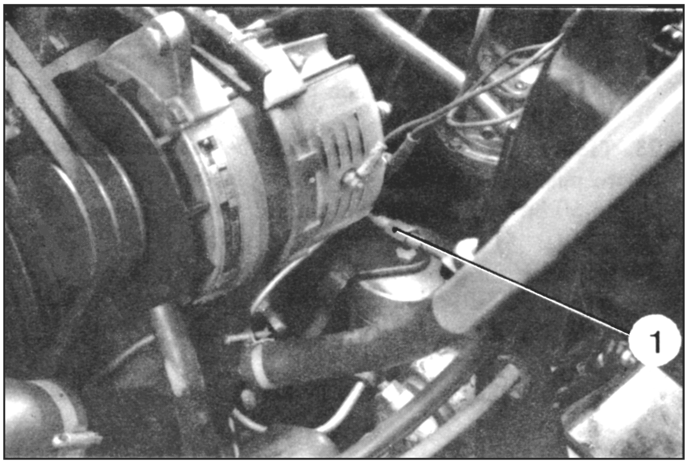

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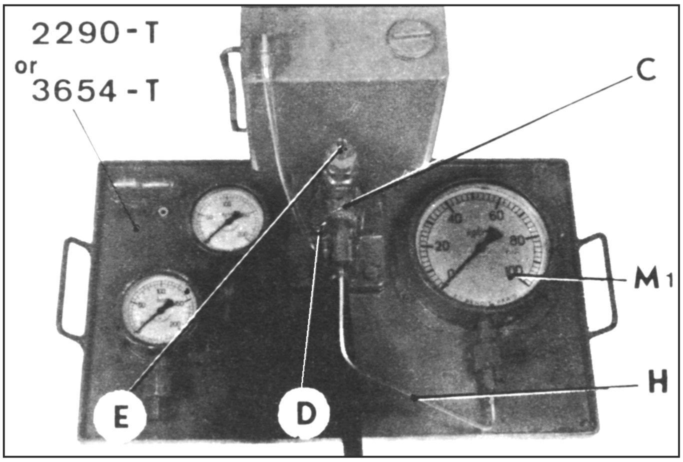
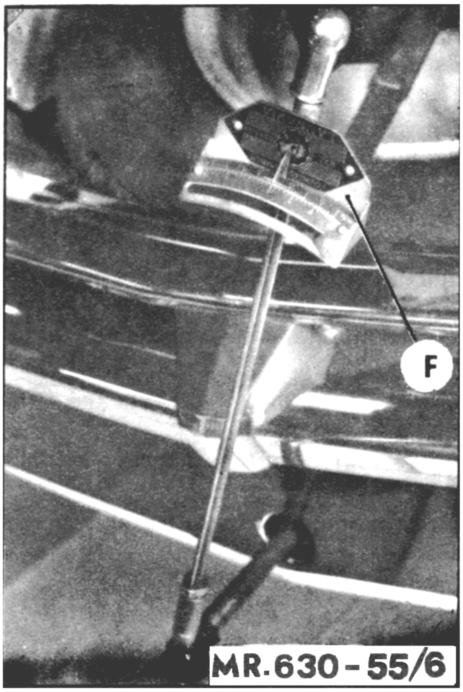


4731



IV. CHECKING THE CLUTCH DISENGAGEMENT.

12. Put the vehicle in the « low » position. Slacken the bleed screw on the pressure regulator.

13. Disconnect :
- the lead from the negative terminal of the battery,
- the fuel feed pipe on the fuel pump,
- the union (1) on the connecting pipe between the hydraulic selector and the clutch re-engagement control.

14. Remove the front, L.H suspension sphere.

15. Prepare the test bench :
- *bench 2290-T for vehicles with LHS 2 fluid. or bench 3654-T for vehicles with LHM fluid. and accessories 3655-T.*
- Connect the pressure gauge M1 (100 bars) (1500 PSI) to pump C on the test bench by means of pipe H.
- Connect outlet E of the pump C on the test bench to the union just disconnected (§13), female part, clutch re-engagement control end, by means of a pipe A and a pipe B.

16. Insert instrument MR 630-55/6 into the hole for the starting handle.

Place a torsion wrench F with flexure 0 to 20 mΛN (0 to 2 m.kg.), (14.4 Ft.lbs) fitted with a socket of 14, on the end of instrument MR. 630-55/6.

17. Tighten the bleed screw D on the hydraulic bench; Proceed to pump, increasing the pressure.

18. Apply on effort of 15 mΛN (1,5 m.kg.) (10,8 Ft lbs) on to instrument 630-55/6. Note the pressure at which clutch disengagement takes place, i.e. the moment when the instrument starts to turn for a torque of 10 mΛN (1m.kg.) (7 Ft. lbs). Note this pressure. (e.g. : P = 38 bars) (540 PSI).

V. CHECKING THE CLUTCH ENGAGEMENT PRESSURE.

19. By pumping, increase the pressure to 40 bars. (570 PSI). Then release the pressure very slowly by slackening the bleed screw D on the test bench.

At the same time, turn the handle while watching the pointer of the torque wrench F.

Note the pressure at the exact moment when slipping is obtained for a torque of 10 mΛN (1m.kg.) (7.2 ft lbs) (e.g.: P1 = 28 bars - 410 psi)

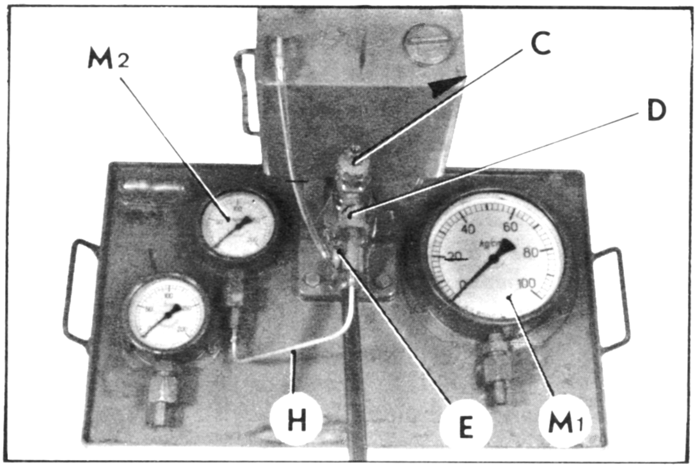
The difference between this pressure and that noted in §18 should be no more than 11 bars (160 psi) (in the example taken :
P - P1 = 38 - 28 = 10 bars) (150 PSI).

20. Unscrew completely the bleed screw D on the test-bench.

21. Withdraw the torque wrench and instrument MR. 630-55/6 from the starting handle hole.

VI. CHECKING THE PRESSURE SUPPLIED BY THE HYDRAULIC SELECTOR.

4717



22. Prepare the test bench.
- a) Disconnect the pipe H from the pressure gauge M1 and from the test bench pump.
- b) Connect the pressure gauge M2 (200 bars) (3000 PSI) to the test bench pump D by means of pipe H.

23. Tighten the bleed screw E on the test bench. Start to pump. Increase the pressure in the clutch cylinder to 50 bars.(720 psi), so causing clutch disengagement.

n **24.** Connect the pressure gauge M1 on to the union previously disconnected (§13), male part, hydraulic selector outlet, by means of the two pipes A.

25. Connect the lead to the negative terminal of the battery.

26. Connect the fuel feed pipe to the fuel pump.

27. Start the engine. Adjust the normal idling speed :
- 550 to 600 r.p.m. *(Vehicles →| 9/1968)*
- 625 to 675 r.p.m. *(Vehicles |→ 9/1968)*

28. Tighten the bleed screw on the pressure regulator.

29. Engage gear.
- The pressure indicated by pressure gauge M1 should be 29 bars min (420 psi).

IMPORTANT :

1°) *During this entire operation, check the pressure in the clutch cylinder by pressure gauge M2; it should not drop.*

2°) *Put the gear lever into neutral position and stop the engine.*

30. Release the pressure in the clutch cylinder by opening bleed screw E on the test bench.

31. Slacken the bleed screw on the pressure regulator.

32. Disconnect both the pipe assemblies. Union to pressure gauge M1. Union to test bench pump.

33. Connect the union to the pipe assembly hydraulic selector and clutch re-engagement control.

34. Fit the front, LH suspension sphere.

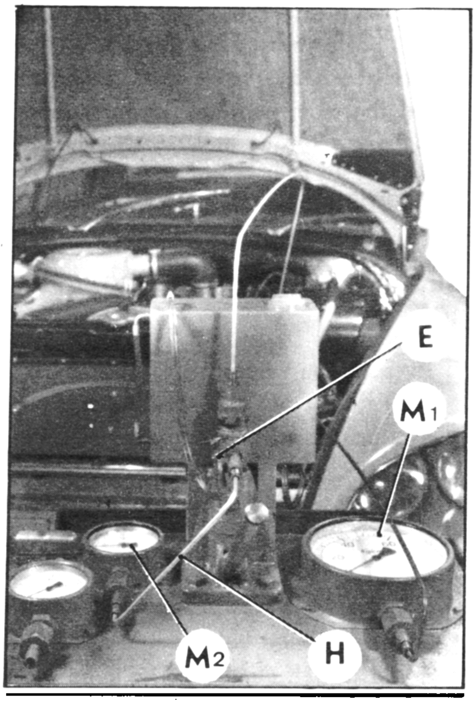
35. Tighten the bleed screw on the pressure regulator.

36. Start the engine. Adjust the accelerated idling :
- 875 to 925 r.p.m. *(Vehicles →| 9/1968)*
- 850 to 900 r.p.m. *(Vehicles |→ 9/1968)*

37. Put the vehicle in the « normal » height position.

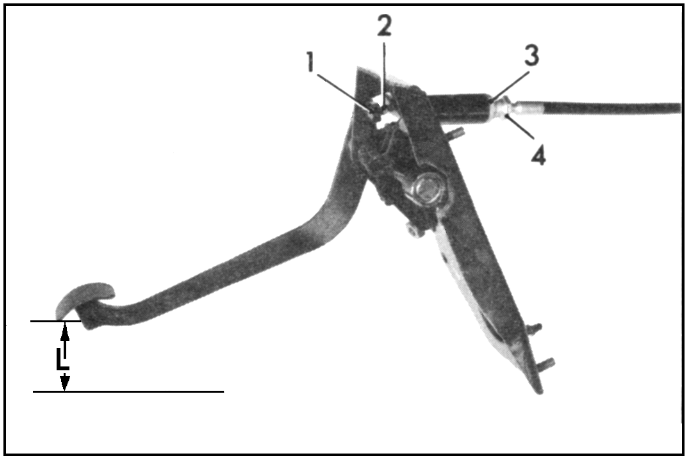
38. Fit the rubber plug on to the starting handle passage.

4716



VEHICLES WITH MECHANICAL GEAR SELECTION
→ *September 1968*

1369



I - ADJUSTING THE CLUTCH CONTROL

1. Check the height of the pedal :

Standard Vehicles : The height should be $L = 142 ^{+5}_{0}$ from the underside of the pedal plate (with the rubber pad removed) to the floor panel

PA. Vehicles (improved presentation) : The height should be $L = 137 ^{+5}_{0}$ mm from the underside of the pedal plate, (with the rubber pad in place) to the floor panel.

To obtain this measurement, unscrew the lock nut (1) and adjust the stop screw (2).

2. Adjust the length of the sheath :

The clearance between the end of the connecting rod (5) and the clutch casing must be J' = 2,5 to 3,5 mm.

To obtain this measurement, move the threaded sleeve (4) by turning the nut (3).

3. Adjust the clutch clearance :

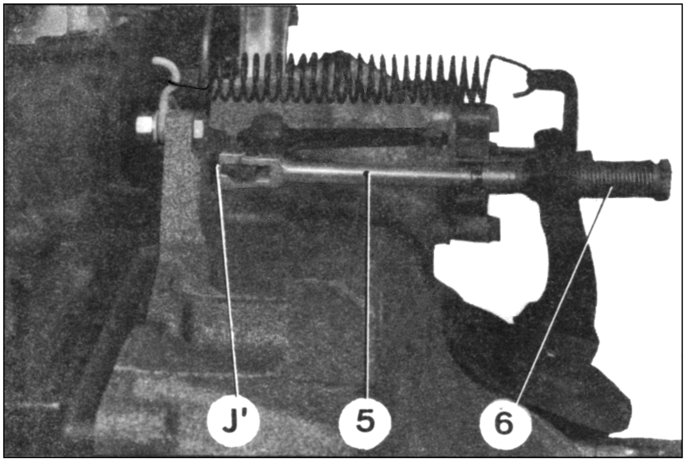
Using a rule, measure the clearance « j' » given above.

An assistant should depress the clutch pedal by hand up to the point where resistance is felt when the thrust face comes into contact with the toggles.

Measure once again the clearance « j ». The difference « j-j' » should be between 1,6 and 2,4 mm.

If it is not, adjust the screw (6).

3332-1

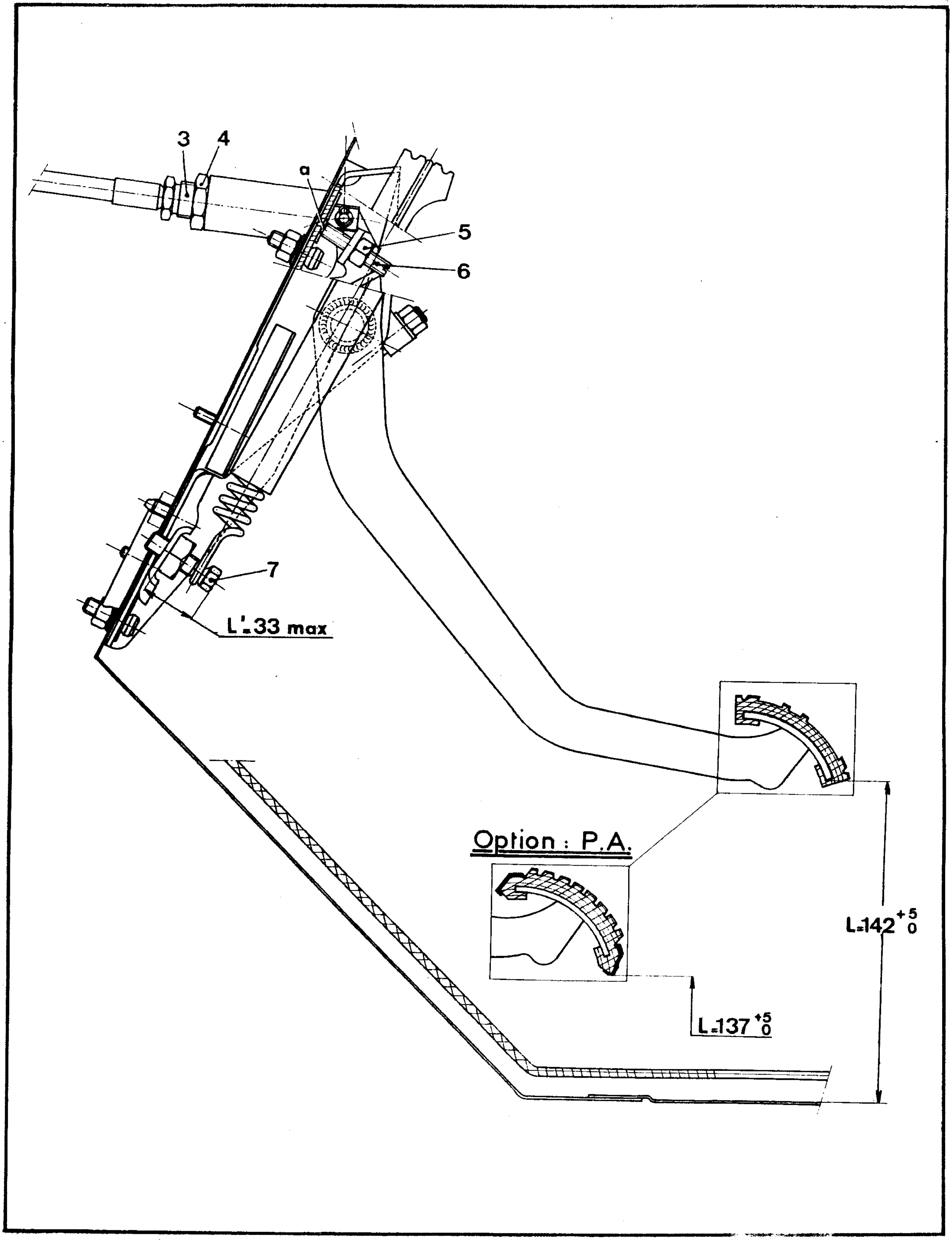


4. Check that when the clutch is disengaged fully, there is a clearance between the end of the screw (6) and the sealing sheath of the steering rack.

If there is not, the screw (6) must be replaced by a new screw :
- thickness of the head = 3 mm
- length of the thread = 46,5 mm

VEHICLES WITH MANUAL GEAR SELECTION, *produced since September 1968*

D. 31-2



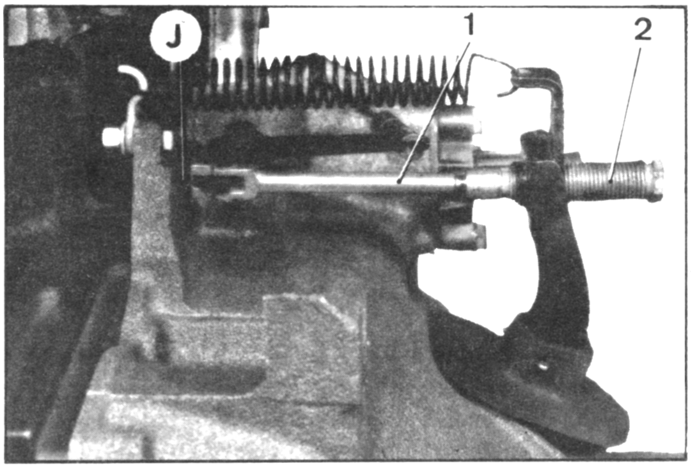
VEHICLES WITH MECHANICAL GEAR SELECTION

⊢→ - *September 1968*

II - ADJUSTING THE CLUTCH CONTROL

(Pedal gear with overload spring.)

3332-1



5. Adjusting the height of the pedal :

a) *Standard Vehicles :* The height must be : $L = 142^{+5}_{0}$ mm from the under side of the pedal plate (rubber pad removed) to the floor panel.

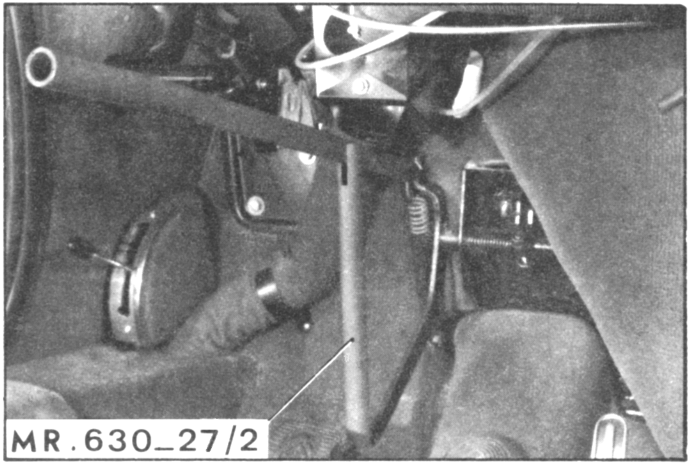
b) *P.A vehicles (improved presentation).* The height must be : $L = 137^{+5}_{0}$ mm from the under side of the pedal plate (rubber pad in place) to the floor panel. To obtain this measurement, slacken the lock nut (5) and adjust the stop screw (6).

6 Adjust the length of the sheath :

The clearance between the end of the connecting rod (1) and the clutch casing must be : J = 3 to 4 mm.

To obtain this measurement, move the threaded sleeve (3) by adjusting the nut (4).

4523



7. Adjust the overload spring :

a) Insert a sprag of 9 mm between the end of the connecting rod (1) and the clutch casing, to stop the clutch cable from pulling on the clutch pedal.

Check that when the clutch pedal is fully depressed, it is stopped at «a». If it is not, turn the adjusting screw (7) until the correct position is obtained.

b) If adjustment by tightening screw (7) is not possible, move the upper anchoring point for the spring towards the front of the vehicle. (Use tool MR. 630-27 2). Slacken the screw (7) to obtain the adjustment..

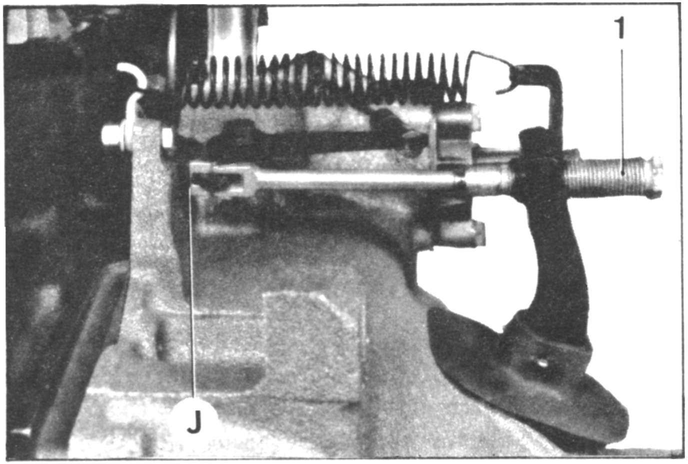
c) If adjustment by slackening screw (7) (L' = 33 mm max.) is not possible, move the upper anchoring point for the spring towards the rear of the vehicle by means of tool MR. 630-27/2.

Tighten screw (7) to obtain the adjustment.

d) Place a sprag of 10,2 mm between the end of the connecting rod (1) and the clutch casing. When fully depressed, the clutch pedal should not be stopped at «a». Remove the sprag.

IMPORTANT NOTE : The overload spring must be adjusted and checked with care, so as to avoid rapid deterioration of the clutch stop through bringing it into contact with the toggles of the clutch mechanism, in the «engaged» position.

3332-1



8. Adjust the clutch clearance.

Using a rule, measure the clearance « J » given above. An assistant should depress the clutch pedal by hand up to the point where resistance is felt when the thrust face comes into contact with the toggles.

Again measure the clearance « J' ».

The difference J' - J should be between 1,6 and 2,4 mm.

If it is not, adjust the screw (1).

Check that when the clutch is fully disengaged, there is a clearance between the end of the screw (1) and the sealing sheath of the steering rack.

If there is not, the screw (1) must be replaced by a new screw :

- thickness of the head = 3 mm.
- length of the thread = 46,5 mm.

OPERATION No. Dbw 320-00 : *Characteristics and particular features of the torque converter*

DBW. VEHICLES All types

I. DESCRIPTION

- The "DS 21" vehicles (carburettor or electronic fuel injection) may be optionally fitted with a BORG-WARNER fully automatic gearbox "type 35".

- Principal components of the transmission :
  - A torque converter composed of three elements (impellor, turbine, reactor) permitting a variable multiplication ratio of the torque, from 2.3 to 1.
  - An oil pump (activated by the converter impellor) supplying oil under pressure necessary to the operation of the converter and the hydraulic gear change control unit and also for the lubrication of the epicyclic gear train.
  - A hydraulically controlled automatic gear box, including an epicyclic gear train making it possible to obtain three forward gears and one reverse gear.

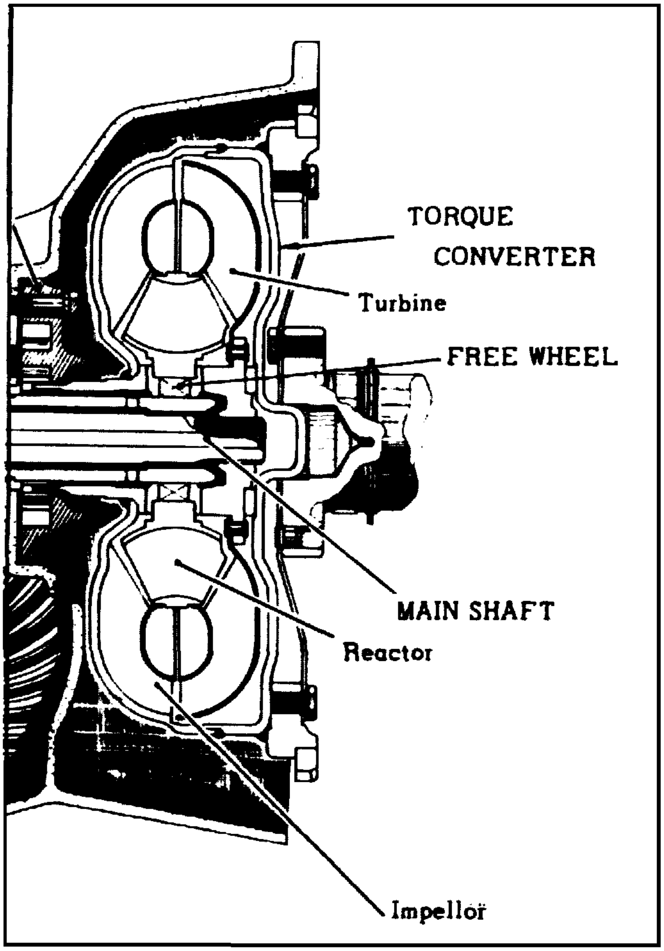
II. ADVANTAGES OF THE CONVERTER

- The converter multiplies the engine torque when starting and on accelerating, allowing :
  - the use of only a 3-speed gearbox,
  - flexible driving behaviour, even at low speeds,
  - rapid acceleration at low engine speed,
  - increased "pulling power", a desirable quality when pulling caravans or for driving with full load.

- The converter, coupled with an epicyclic gear train gearbox makes the following possible :
  - the elimination of the classical cut out clutch,
  - the damping of noises and vibrations, the engine being mechanically isolated from the gearbox.

- The converter ensures under all circumstances smooth transmission of the power generated by the engine without any jolting.

III. CHARACTERISTICS



D. 35-54

Converter - hydraulic coupler.
Brand :
FERODO 250 I (transmission 1680)
Licence : BORG WARNER.

It is composed of a leakproof housing filled with oil and containing three bladed wheels :

- Two of these are mobile · the impellor and the turbine.
- the third, the reactor, is fitted on a free wheel by which it is immobilised until the turbine reaches a certain speed when it frees the reactor.

Until this speed, the assembly operates as a torque converter achieving a ratio of variable multiplication, from 2,3 to 1.

Beyond this speed, it operates as a hydraulic coupler.

IV. PARTICULAR FEATURES

The converter and the gearbox use the same oil.
This oil is of a different quality to that used for the crownwheel and pinion and differential assembly which is to be found in a separate housing.

- Oil type : . . . . TOTAL ATF. 33
- Total capacity of the converter assembly, gearbox and control circuit on filling at the factory: . . . . Approx. 6 lts. ($10\frac{1}{2}$ pts)
- Volume of oil renewed after draining: . . . . Approx. 2.5 lts (4.4 pts)

The gearbox and convertor assembly are filled through the front dip stick tube.

IMPORTANT : Filling must only take place with the engine running and with the selector lever in position «P».

Tightening torques :

- Screws securing the diaphragm on the crankshaft : . . . . 70 m \N (7 mkg. or 50.6 ft lbs)
- Screws securing the diaphragm on the converter : . . . . 70 m \N (7 mkg. or 50.6 ft lbs)

4-SPEED GEARBOX

DX-DL-DV-DT ALL TYPES VEHICLES
DJ ↦ *9/1970*

1. CHARACTERISTICS.

1. Gear ratios :

NOTE : The speeds are given for vehicles fitted with 180-380 XAS, 180 HR. 380 XAS and 185 HR. 380 XAS types for which the rolling circumference is : 2,07 m. (81.5 in)

a) *Vehicles all types (except D.V.)* ⇥ *9/1967*

Gear	Tooth ratio	Gearbox ratio	Crown wheel and pinion	Overall ratio	Speed (1000 engine r.p.m.) km/h	m.p.h.
1	$\frac{12}{39}$	0,3076(3,25 : 1)		0,0703(14,22 : 1)	8,7	5.5
2	$\frac{17}{33}$	0,5151(1,94 : 1)	$\frac{8}{35}$	0,1177(8,49 : 1)	14,6	9.
3	$\frac{22}{28}$					
4	$\frac{27}{33}$	0,7857(1, 27 : 1)	(4.375 : 1)	0,1795(5,58 : 1)	22,3	14
	$\frac{13}{22} \times \frac{22}{41}$	1,1739(0,85 : 1)		0,2683(3,73 : 1)	33,3	21.
REV.		0,3170(3,15 : 1)		0,0724(13,80 : 1)	9	5.6

b) *Vehicles all types (except DV and DT)* ↦ *9/1967*

Gear	Tooth ratio	Gearbox ratio	Crown wheel and pinion	Overall ratio	Speed (1000 engine r.p.m.) km/h	m.p.h.
1	$\frac{12}{39}$	0,3076(3,25 : 1)		0,0703(14,22 : 1)	8,7	5.5
2	$\frac{18}{33}$	0,5454(1,83 : 1)	$\frac{8}{35}$	0,1246(8,02 : 1)	15,5	9.63
3	$\frac{29}{35}$	0,8285(1,21 : 1)		0,1893(5,29 : 1)	23,5	14.60
4	$\frac{27}{23}$	1,1739(0,85 : 1)	(4.375 : 1)	0,2683(3.73 : 1)	33,3	20.69
REV.	$\frac{13}{22} \times \frac{22}{41}$	0,3170(3,15 : 1)		0,0724(13.80 : 1)	9	5.6

c) *Vehicles DT* ↦ *10/1968 and DV* ⇥ *9/1969*

Gear	Tooth ratio	Gearbox ratio	Crown wheel and pinion	Overall ratio		Speed (1000 engine r.p.m.) Km/h — m.p.h.	
				Torque 8/35 DV	Torque 7/34 DT	Torque 8/35 DV	Torque 7/34 DT
1	$\frac{12}{39}$	0,3076(3,25 : 1)	$\frac{8}{35}$	0,0703 (14.22 : 1)	0,0633 (15.78 : 1)	8.7-(5.5)	7,9 (4.91)
2	$\frac{18}{33}$	0,5454(1,83 : 1)	(4,375 : 1)	0,1246 (8.02 : 1)	0,1123 (8,90 : 1)	15.5-(9.63)	13.9 (8.64)
3	$\frac{23}{27}$	0,8518(1,17 : 1)		0,1947 (5.11 : 1)	0,1752 (5.71 : 1)	24.2-(15.10)	21,8 (13.55)
4	$\frac{28}{22}$	1,2727(0,79 : 1)	$\frac{7}{34}$ (DT)	0,2909 (3.45 : 1)	0,2619 (3,83 : 1)	36.1-(22.43)	32.5 (20.19)
REV.	$\frac{13}{22} \times \frac{22}{41}$	0,3170(3,15 : 1)	(4,857 : 1)	0,0724 (13.80 : 1)	0,0652 (15,29 : 1)	9.-(4.38)	8.1 (5.06)

d) *Vehicles DV ⟼ 9/1969 ⟶| 9/1971*

Gear	Tooth ratio	Gearbox ratio	Crown wheel and pinion	Overall ratio	Speed (1000 engine r.p.m.) km/h	m.p.h.
1	$\frac{12}{39}$	0,3076(3,25 : 1)		0,0633(15,78 : 1)	7,9	4.91
2	$\frac{18}{33}$	0,5454(1.83 : 1)		0,1123(8.90 : 1)	13,9	8.64
3	$\frac{29}{35}$	0,8285(1.21 : 1)	7/34	0,1705(5.87 : 1)	21.2	13.17
4	$\frac{27}{23}$	1,1739(0.85 : 1)	(4.857.1)	0,2416(4.14 : 1)	30	18.64
REV.	$\frac{13}{22} \times \frac{22}{41}$	0,3170(3.15 : 1)		0,0652(15.29 : 1)	8.1	5.03

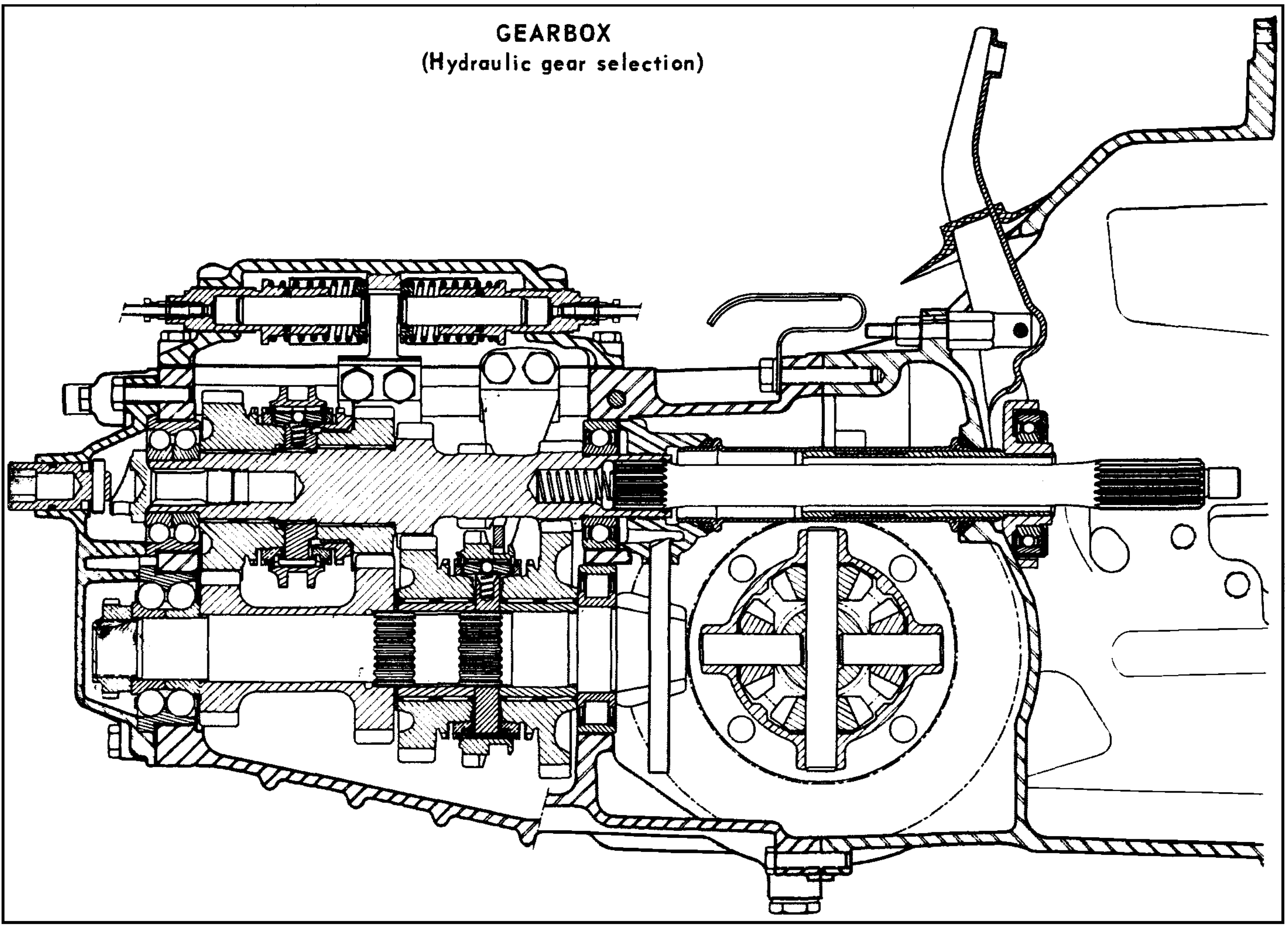
e) *Vehicles DV and DT ⟼ 9/1971*

Gear	Tooth ratio	Gearbox ratio	Crown wheel and pinion	Overall ratio	Speed (1000 engine r.p.m.) km/h	m.p.h.
1	$\frac{12}{39}$	0,3076(3.25 : 1)		0,0633(15.78 : 1)	77,9	4.91
2	$\frac{18}{33}$	0,5454(1.83 : 1)		0,1123(8.90 : 1)	13.9	8.64
3	$\frac{30}{34}$	0,8823(1.13 : 1)	7/34	0,1817(5.50 : 1)	22,6	14.13
4	$\frac{28}{22}$	1.2727(0;79 : 1)	(4.857:1)	0,2619(3.84 : 1)	32,5	20.31
REV.	$\frac{13}{22} \times \frac{22}{41}$	0,3170(3.15 : 1)		0,0652(15.29 : 1)	8,1	5.03

2. Oil capacity of gearbox :

- Capacity : ....2 litres (3 1/2 pts. imp)
- Oil :...TOTAL EP. 80

D. 33-2

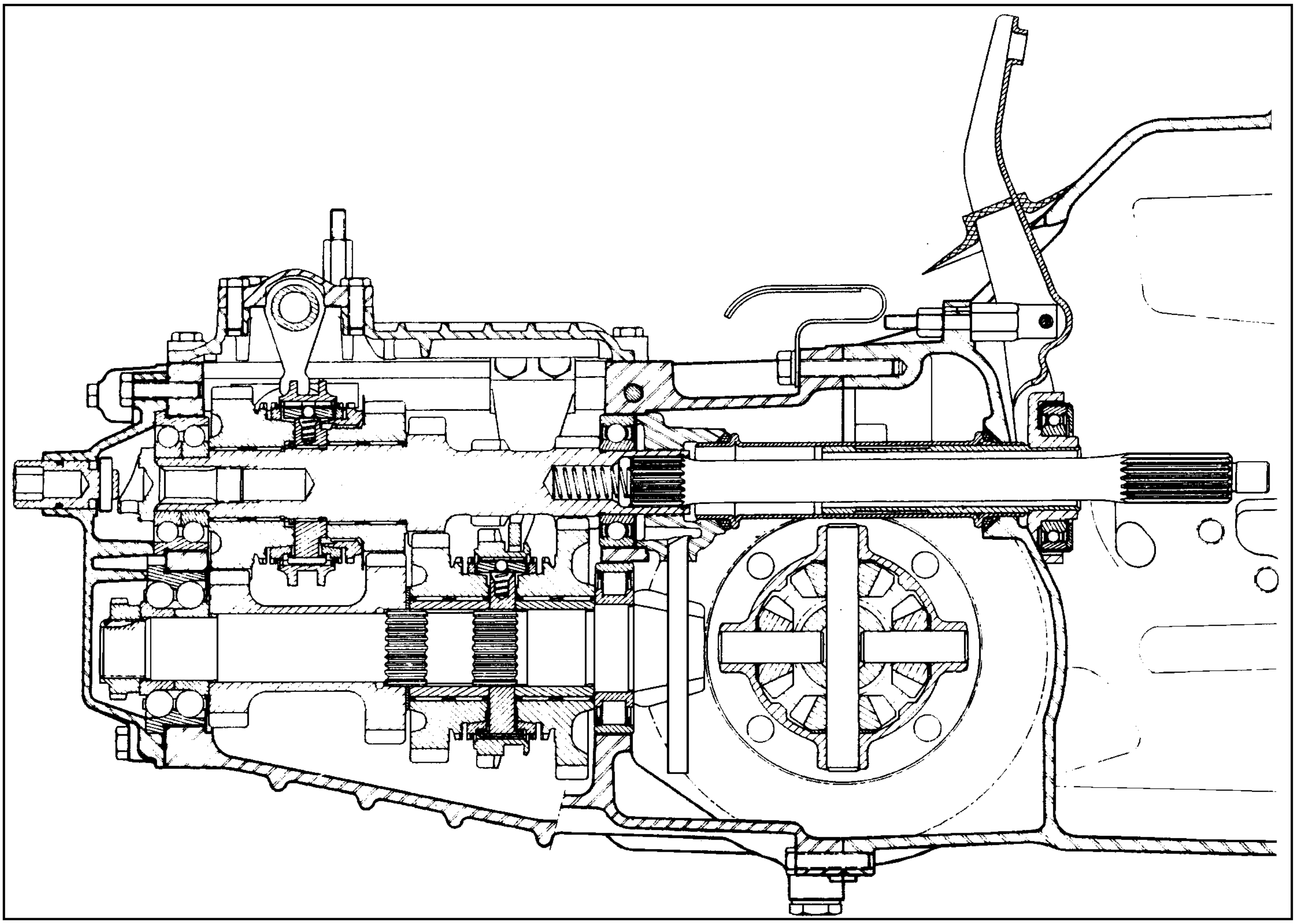


GEARBOX
(Hydraulic gear selection)

GEARBOX

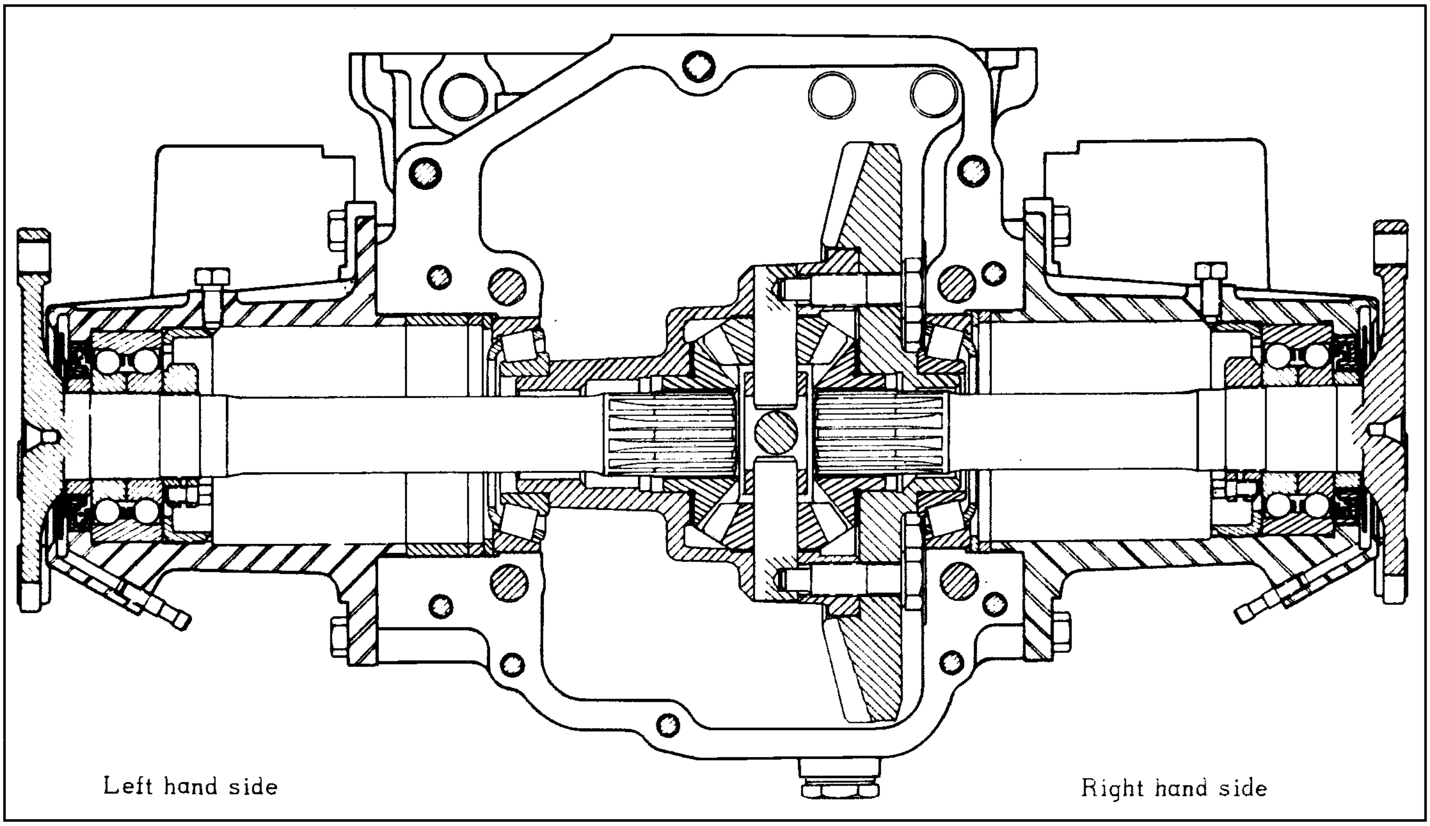
(Mechanical gear selection)

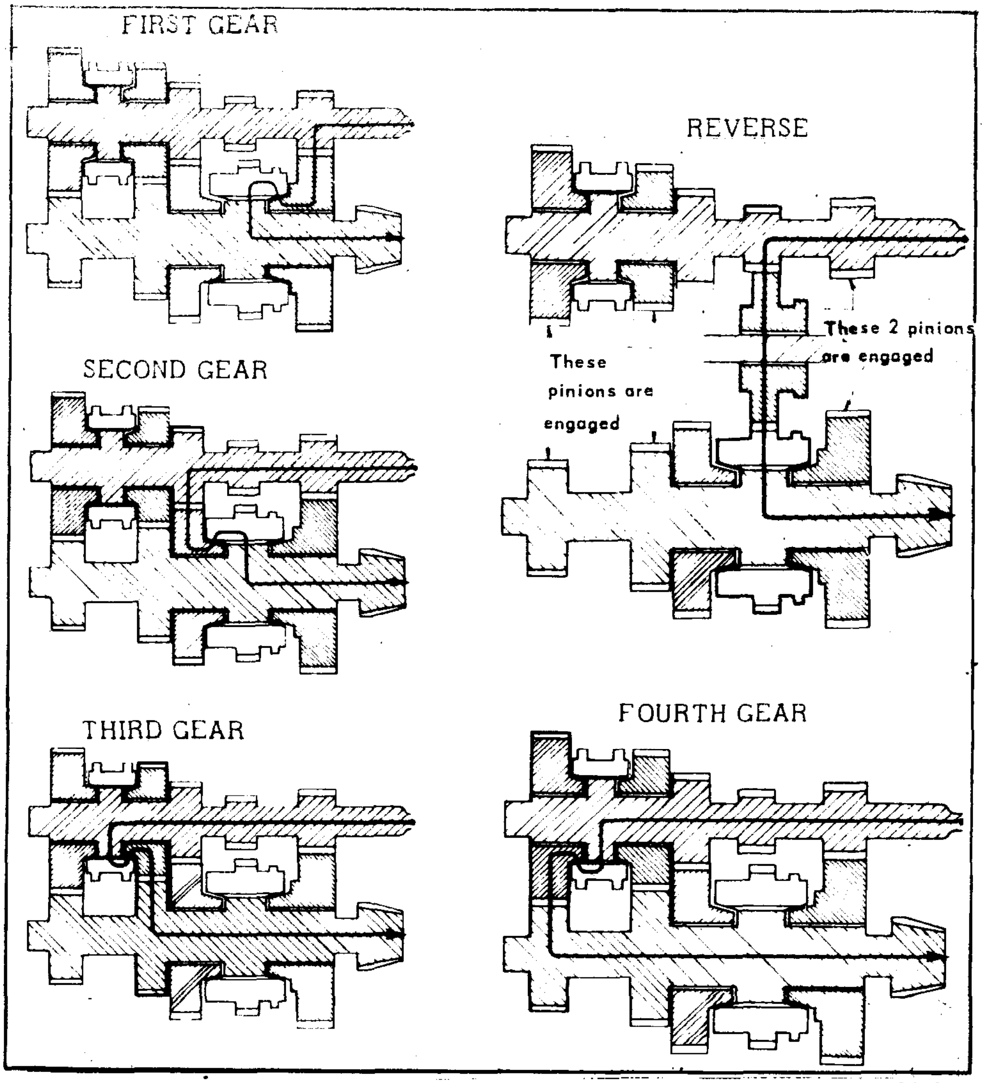
D. 33-3



DIFFERENTIAL

D. 34-1





D. 33-1

II. SPECIAL POINTS

1. Speedometer drive :

- Torque of 8/35 :	$\frac{10}{21}$ = 0,4761
- Torque of 7/34 :	$\frac{7}{16}$ = 0,4375

2. Adjustments *(Gearbox, all types)*

- Distance between thrust race guide screw and clutch casing joint face :	94 to 95 mm.
- End-float of 3rd and 4th synchro	J = 0,10 max.
- Distances between 1st and 2nd synchro and loose pinions :	equal to within 0,4 mm.
- Clearance between front bearing and front bearing cap :	0,05 mm. max.
- Adjustment of 4th gear engagement stroke :	J = 0, to 0,6 mm.

2a. Special adjustments *(hydraulic gear selection) :*

- Clutch re-engagement lock : distance between front face of clamp and end of 1st -2nd shaft :	1 mm approx.
- Release springs of control cylinders :	
- Length under load :	48,8 mm for 24,5 ± 1,5 kg (50.7 to 57.3 lbs) 31,5 mm, turns joined
- Adjustment of gear engagement strokes (exept for reverse) Clearance between slider and loose pinion :	J = 0,4 to 0,6 mm

3. Tightening torques :

- Dog nut (main shaft)	150 to 170 mΛN (15 to 17 m.kg) (110 to 123 ft lbs)
- Bevel. pinion shaft nut	200 to 220 mΛN (20 to 22 m.kg) (145 to 160 ft lbs)
- Screw securing fork or operating dog	40 mΛN (4 m.kg) (29 ft lbs)
- Draining and filler plug	35 to 45 mΛN (3,5 to 4,5 m.kg) (25 to 32 ft lbs)
- Screw securing clutch lock clamp *(hydraulic gear selection)*	20 mΛN 2 (2 m.kg) (14 ft lbs)

4. Adjustements on differential and crown wheel and pinion :

- Crown wheel and pinion :	
Conic distance : etched on upper face of bevel pinion.	
Matching number : etched on pinion and crown.	
- Back-lash (on outer diameter of crown)	0,16 to 0,24 mm
- Differential :	
Planet gear end-float at point of min. clearance	0,1 mm max.
End-float of satellites	0,3 mm max.

5. Tightening torques (differential and crown wheel and pinion) :

- Differential shaft :	
Bush nut (on outer bearing bush)	100 mΛN (10 m.kg) (72 ft lbs)
Nut (on inner bearing bush)	150 mΛN (15 m.kg) (110 ft lbs)
Grub screw of nut (inner bearing bush)	115 to 130 mΛN (2 to 3 m.kg),(83 to 95 ft lbs)
Screws securing drive outlet shafts	20 to 30 mΛN (2 to 3 m.kg) (14 to 22 ft lbs)

6. Modifications *(gearbox all types)* |⟶ *9/1969.*

- The sliding reverse pinion (wide tooth) and the 1st-2nd synchro have been modified.

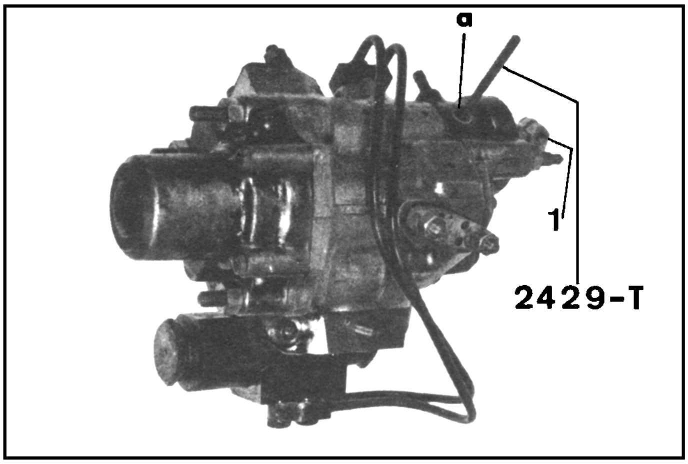
- The gearbox housing has been modified to enable the new sliding reverse pinion to be fitted.

NOTE : It is possible to fit new pinions into an original housing if the gauge 3188-T is used (thickness 3 mm) to adjust the reverse pinion at neutral.

VEHICLES WITH HYDRAULIC GEAR CHANGE

I - CHECKING AND POSITIONING THE HYDRAULIC SELECTOR

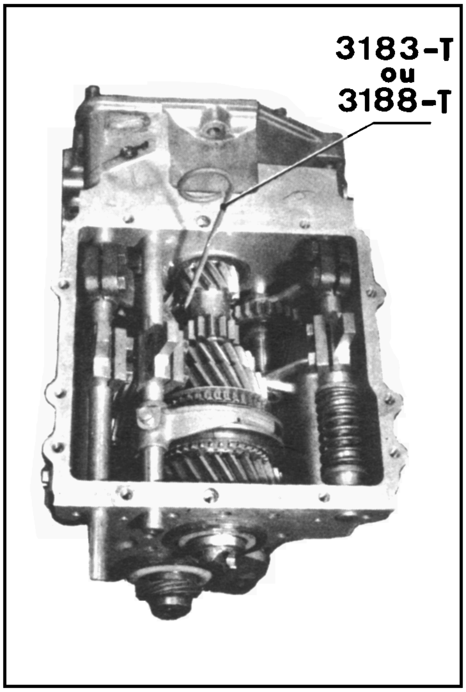
2536



1. Put the gear selector lever in the first speed position
2. Remove rubber plug from locating hole " a "
3. Insert alignment rod $\phi = 3{,}94$ mm (2429 T) : it must penetrate approximately 30 mm. to obtain a correct position of the selector. If it does not, slightly turn the selector lever to ensure complete insertion of rod.
4. Loosen coupling clamp (1) . Put the selector lever back to the first speed position. Tighten the clamp.
5. Withdraw the alignment rod (2429 T) and refit rubber plug in locating hole.

II - ADJUSTING THE GEAR CHANGE CONTROL

1428



6. Remove the gearbox cover.
7. Remove the covers of the selector fork shafts for reverse, third and fourth gears.
8. If required, check and adjust the operating dogs by means of fixture 3172 T.
9. **Checking the position of the gears :**

NOTE : With the cover removed the gearbox *is not in neutral position,* the reverse fork shaft is brought beyond neutral by its return spring. To select a gear, it is essential to bring reverse to neutral using a screw driver or gauge :
3183 T *hydraulic gear change* →| *9/1969*
3188 T *hydraulic gear change* |→ *9/1969*

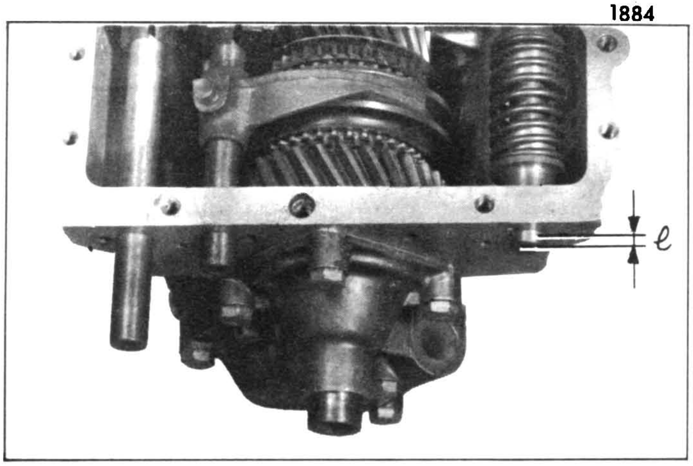
a) Check the position of first gear :
Engage first gear, the sliding pinion of first/second gear in contact with the first gear loose pinion.
Measure and note the distance by which the fork shaft projects from the face of the housing.
For example : 34,3 mm

b) Check the position of second gear :
Engage 2nd gear, the sliding pinion in contact with the 2nd. gear loose pinion
Check and note the fork shaft projection
For example : 55,3 mm.

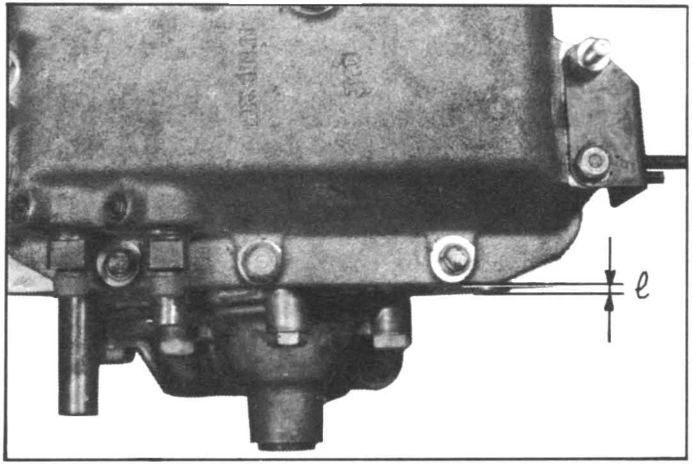
c) Check the position of third gear :
Engage 3rd gear, the sliding pinion in contact with the 3rd gear loose pinion
Measure and note the fork shaft projection.
For example : 1.3 mm

d) Check the position of fourth gear :
Engage 4 th gear, the sliding pinion in contact with the 4 th gear loose pinion.
Again check the fork shaft projection.
For example : 23,9 mm.

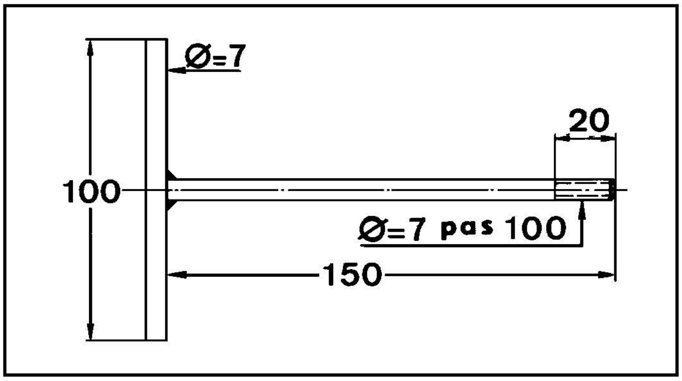
1884



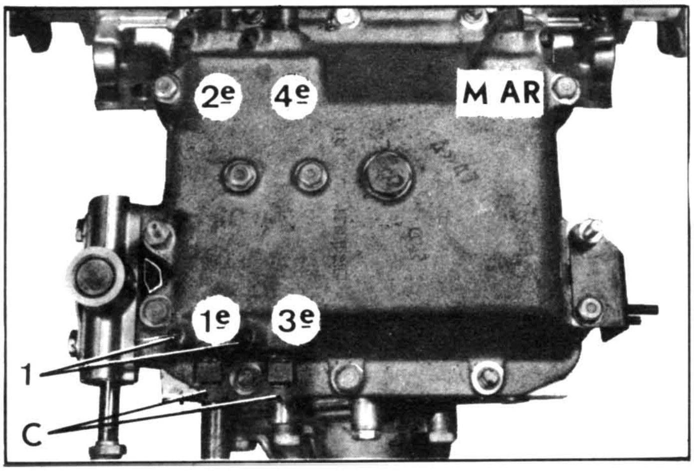
1886



X. 59



1886



10 . Check the position of neutral for reverse :

Determine the end float of the reverse fork shaft when in neutral.
Engage 3rd or 4 th. gear.
Free the gauge 3183-T (or 3188-T)
Push the reverse fork shaft towards the rear of the gearbox and measure, by means of a depth gauge, distance "ℓ" between the end of the shaft and the front face of the gear box, for example : "ℓ" = 1,6 mm
Pull the shaft forwards and check distance "ℓ1", for example "ℓ1" = 2,6 mm. Take the average of both measurements :

$$\frac{\ell + \ell 1}{2} = \frac{1,6 + 2,6}{2} = 2,10 \text{ mm}$$

In the example chosen, it will therefore be necessary to adjust the shaft to a distance ℓ = 2,10 mm

11. Fit the cover (smear the joint face with CURTYLON paste). Tighten the securing screws.

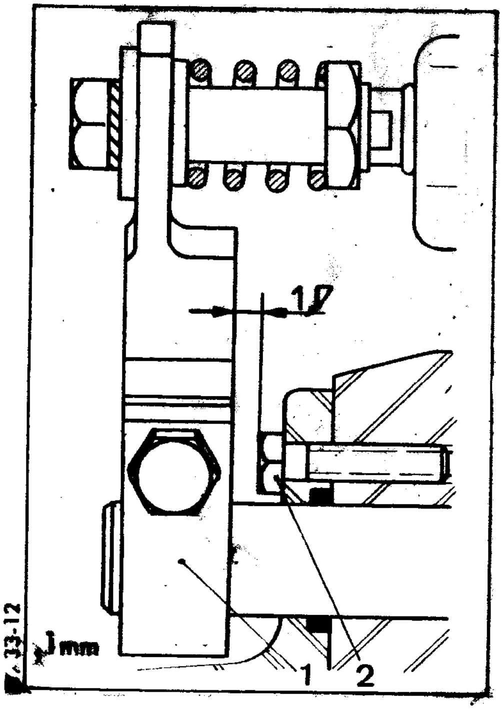
12. Adjusting the cylinder of reverse gear. :

Screw the cylinder-piston assembly to bring it into contact with the selector control dog while inserting some " Hyperix " paste into the tapped hole for the cylinder stop screw. Then screw in the cylinder until the shaft protrudes beyond the front face of the gearbox. (for example ℓ = 2,10mm dimension previously determined).
Smear the cylinder stop screw with CURT-YLON paste).
Place a rubber pad into the tapped hole and tighten the screw.

NOTE : It is essential to renew the rubber pads of the gear change control cylinders after each dismantling.

13. Adjusting the strokes of the selector fork shafts:
NOTE : To engage the different gears, during this 1 operation, fit a screw ϕ 7 or better still a threaded " T " in the tapped holes of the shafts.

a) **Adjust the stroke of first gear :**
Engage Ist gear fully- Make sure that this gear is fully engaged by checking the shaft projection (i. e. 34,3 mm as determined in § 9 line a).
Screw in the cylinder-piston assembly for 2nd gear to bring it into contact, while introducing some " Hyperix " paste in the tapped hole receiving the screw (1) , a slight shift of the 1st-2nd selector shaft is definable by touch and indicates that piston and control dog are in contact. Then screw the cylinder a further 1/ 2 of a turn to obtain a clearance of 0,7 to 0,9 mm. between sliding sleeve and loose pinion. Smear the cylinder stop screw (1) with CURT-YLON paste.
Place a rubber pad in the tapped hole. Tighten the screw.
Remove screw C holding the piston in the cylinder.



~~b)~~ Adjust the stroke ~~of second~~ gear :

Pull on the shaft to engage 2nd gear fully.

- Make sure that gear is fully engaged by checking the shaft projection (for example 55,3 mm as determined in § 9 line b)

Remove screw or threaded T fitted on the end of the shaft.

Bring the cylinder-piston assembly for first gear in contact with the control dog and operate as described above.

c) **Adjust the stroke of third gear.**

Engage 3 rd gear fully. Make sure that the gear is fully engaged by checking the shaft position (1,3 mm measurement determined in § 9 line c)

Bring the cylinder-piston assembly for fourth gear in contact with the control dog and operate as indicated above in line a (1.3 mm. measurement determined in § 9, line C).

d) **Adjust the stroke of fourth gear.**

Engage 4th gear fully. Ensure that the gear is fully engaged by checking the protusion of the shaft (23,9 mm as measured in § 9 line d)

Bring the cylinder-piston assembly for 3 rd gear in contact with the control dog and operate as described above in line a.

14. Fit the front cover over the end of reverse gear shaft Curtylon and the cover over the end of 3rd/4th gear shaft.

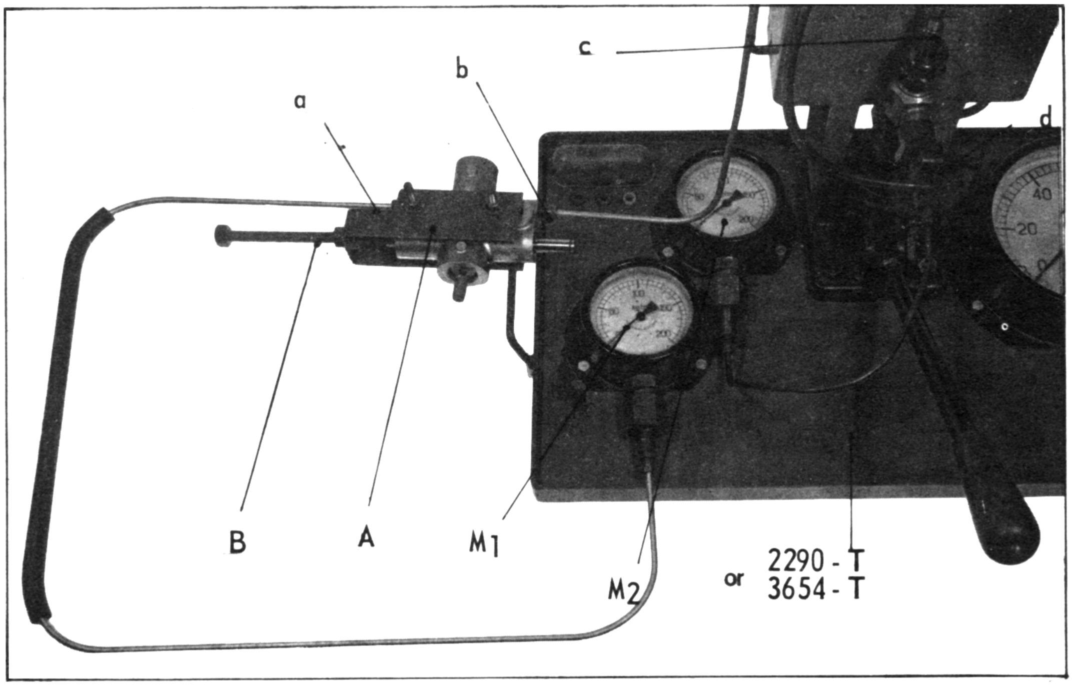
Make sure that the ring seal is in position

15. Adjusting the clutch lock :

With first gear engaged, ensure that there is a clearance (at "J") between the clamp (1) and the head of the screw (2) securing the cover of the shaft,

III. CHECKING A CLUTCH LOCK

2549



16. NOTE

⟶| *9/1966* - Use test-bench 2290-T (*painted grey*) the accessories bear no markings

|⟶ *9/1966* - Use test-bench 3654-T (*painted green*) the accessories bear green markings

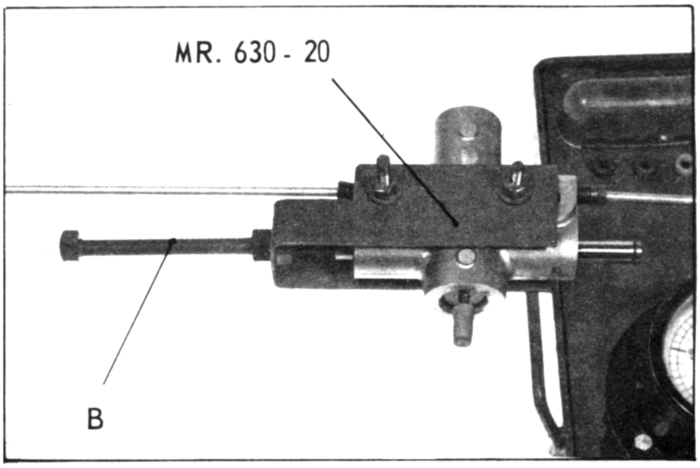
17. Connect pump outlet «c» to pressure gauge M2 and to clutch lock feed pipe «b». Connect lock outlet «a» to pressure gauge M1.
Fit fixture MR. 630-43/20.

18. Operate the pump to build up the pressure to 70 bars (1000 psi) read on gauge M2.

19. The clutch lock control rod being in neutral position-pressure gauges M1 and M2 must give the same reading.

20. Bring the screw B of fixture 630-43/20 in contact with the control rod and screw in by 1½ turns. Release the pump bleed screw «d». Pressure given by gauge M2 must drop to zero while remaining unchanged on gauge M1.

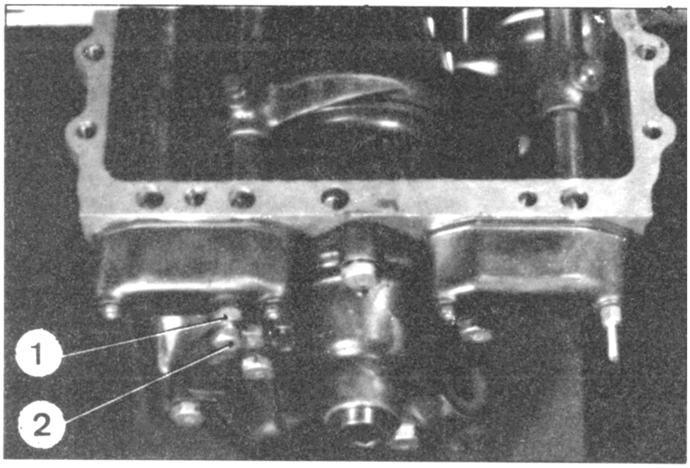
2550



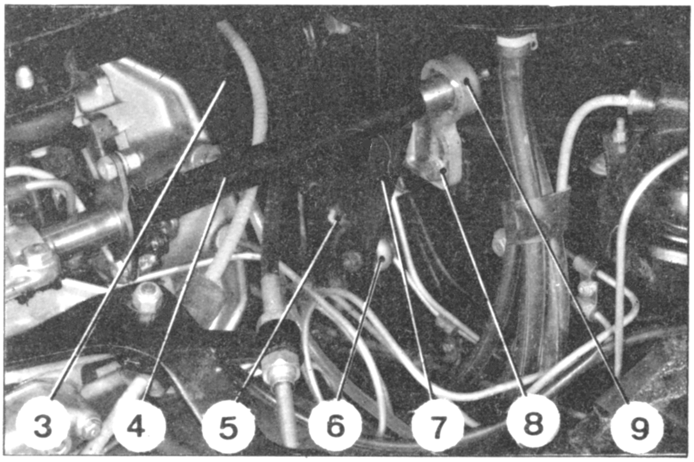
21. Tighten on screw B from 7 to 13 turns. Pressure read on gauge M1 must drop to zero.

22. Reverse fixture MR 630-43/20 in order to operate on the other end of clutch lock control rod.

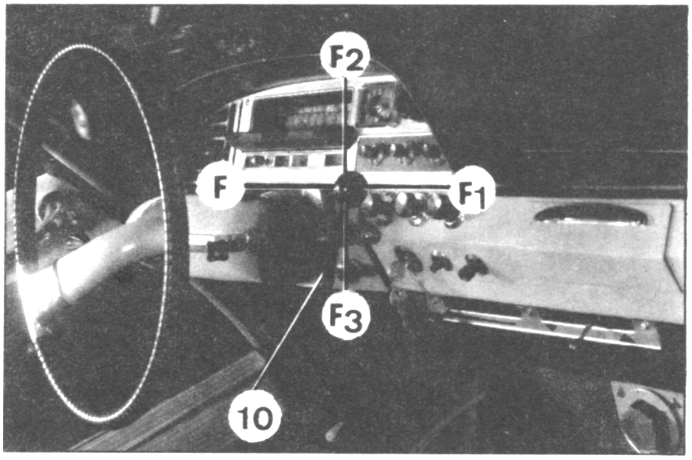
23. The same readings must be obtained while repeating the operations explained (§ § 4 and 5).



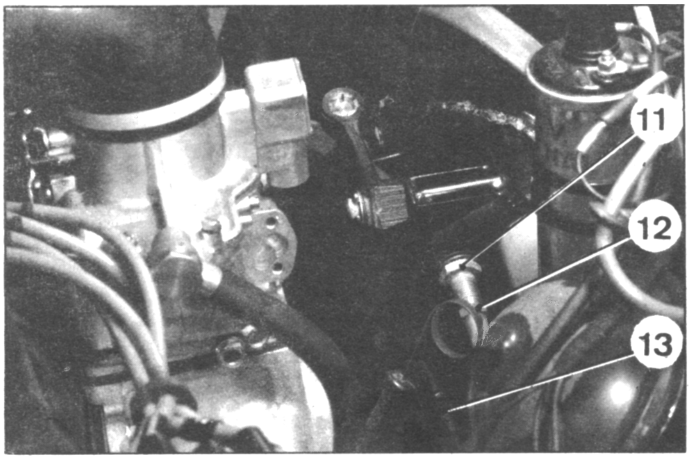
1522



1951



2032



1950

VEHICLES WITH MANUAL GEAR CHANGE

N.B. : This operation applies for both 4 and 5 speed gearboxes

I. ADJUSTING THE STROKE OF FOURTH GEAR

1. Remove the gear box cover
2. Engage fourth gear, the sliding sleeve for 3rd/4th gear in contact with the 4th gear loose pinion, bring screw (2) in contact with the fork shaft and screw in by $\frac{1}{2}$ a turn to obtain a clearance of 0,4 to 0,6mm between sliding gear and 4th gear loose pinion. Tighten lock nut (1)
3. Fit gearbox cover. Tighten the securing bolts

II. CHECKING THE GEAR CHANGE RELAY LEVER

4. Check the relay lever alignment (4)
5. While changing the gears, the shift lever must not touch the gate surround (10)

III. ADJUSTING THE GEAR CHANGE CONTROL

6. Adjust the control relay lever

Relay lever (4) and control lever for fork shaft spindle must be in line. Proceed as follows to obtain correct position :

a) Disconnect rod (3) from lug (7) on relay lever.
b) After slackening the securing screws move the lever mounting (8) in its stud-holes as well as in the stud-holes of the bracket to obtain correct vertical and lateral position.
c) Tighten the mounting securing screws
d) Connect rod (3) to lever (7)

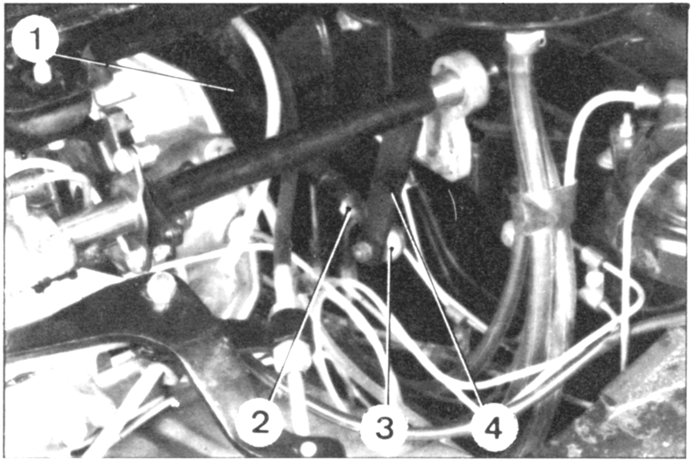
7. Adjust the movement of the gear shift lever

a) Gear selection travel (travel F.F1) Adjust the control cable length so that gear shift lever does not touch surround (10)

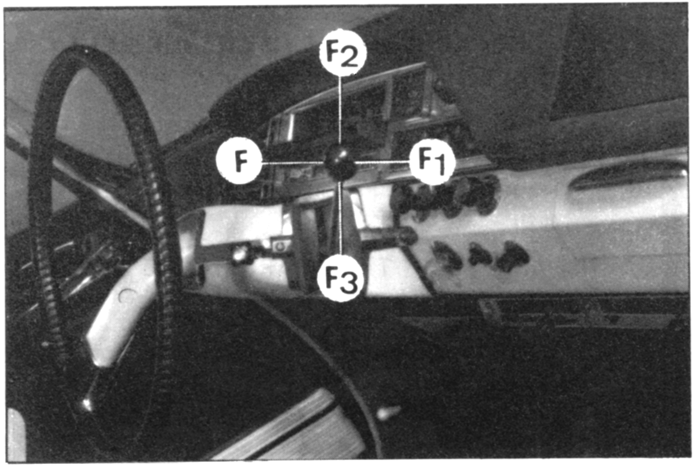
To do this

a) Slacken nut (11) and operate connecting bush (12) to adjust the cable sheath
b) Tighten nut (11)

1951



2032



b) **Gear shift travel** (movement F2-F3)

Adjust the control rod length (1) so that gear change lever does not touch the surround in any selected position.

To do this :

a) Slacken nut (2)

b) Disconnect control rod (1) from lug (4)

c) Operate ball pin (3)

d) Connect ball pin (3) to lug (4)

e) Tighten nut (2)

5 SPEED GEAR BOX

OPERATION N° 340-00 : *Characteristics and particular features of 5 speed gear box* **Op. D 340-00** 1

VEHICLES : DJ all type ⟼ *9/1970*
DT *(option)* ⟼ *9/1970*
DP ⟼ *9/1972*

I. CHARACTERISTICS

1. Gear ratios :

NOTA : Speeds are given for vehicles fitted with tyres 180 HR 380 XAS or 185 HR 380 XAS whose rolling circumference is 2,07 m. (81.4 ins), under load.

a) *DJ All types and DP vehicles*

Gears	Tooth ratios	Gearbox ratios	Crown wheel and pinion	Overall ratios	Speed at 1000 RPM
1st	12/39	0,3076 - 3,25	8 / 35 = 0,2285 4,375 : 1	0,07032 - 14,22	8,734 (5.4 MPH)
2nd	.... 17/33	0,5151 - 1,94		0,1177 - 8,49	14,624 (9 MPH)
3rd	28/37	0,7567 - 1,32		0,1729 - 5,78	21,483 (13.3 MPH)
4th	.... 33/32	1,0312 - 0,97		0,23562 - 4,244	29,275 (18.1 MPH)
5th	37/29	1,2758 - 0,78		0,29162 - 3,42	36,2199 (22.4 MPH)
REV	.... 13/41	0,3170 - 3,15		0,07247 - 13,78	9.001 (5.6 MPH)

b) *DT Vehicles (optional)*

Gears	Tooth ratios	Gearbox ratios	Crown wheel and pinion	Overall ratios	Speed at 1000 RPM
1st	12/39	0,3076 - 3,25	7 / 34 = 0,2058 4,857 : 1	0,0633 - 15,785	7,861 (4.9 MPH)
2nd	.... 17/33	0,5151 - 1,94		0,1060 - 9,42	13,172 (8.1 MPH)
3rd	28/37	0,7567 - 1,32		0,1558 - 6,41	19,350 (11,9 MPH)
4th	.... 33/32	1,0312 - 0,97		0,2123 - 4,71	26,369 (16,3 MPH)
5th	37/28	1,3214 - 0,76		0,2720 - 3,691	33,789 (20,8 MPH)
REV	.... 13/41	0,3170 - 3,15		0,0652 - 15,299	8,107 (5 MPH)

Manual 814-1

2. Gear ratio for speedometer :

- Crown wheel and pinion 7/34 .... 7/16 = 0,4375
- Crown wheel and pinion 8/35 .... 10/21 = 0,4761

3. Capacity and quality of oil :

- Capacity .... 2,25 litres (4,4 pts)
- Oil .... TOTAL EP 80

II. PARTICULAR FEATURES

1. End-float for 3rd and 4th gear synchromesh : .... J = 0,10 mm maxi

2. Tightening torques on gearbox :

- securing screw for fork or control dog .... 40 m daN (4 mkg)
- plug for filling and draining .... 35-45 m daN (3,5 to 4,5 mkg) (25 to 32 ft lbs)

3. Adjusting crown wheel and pinion and differential

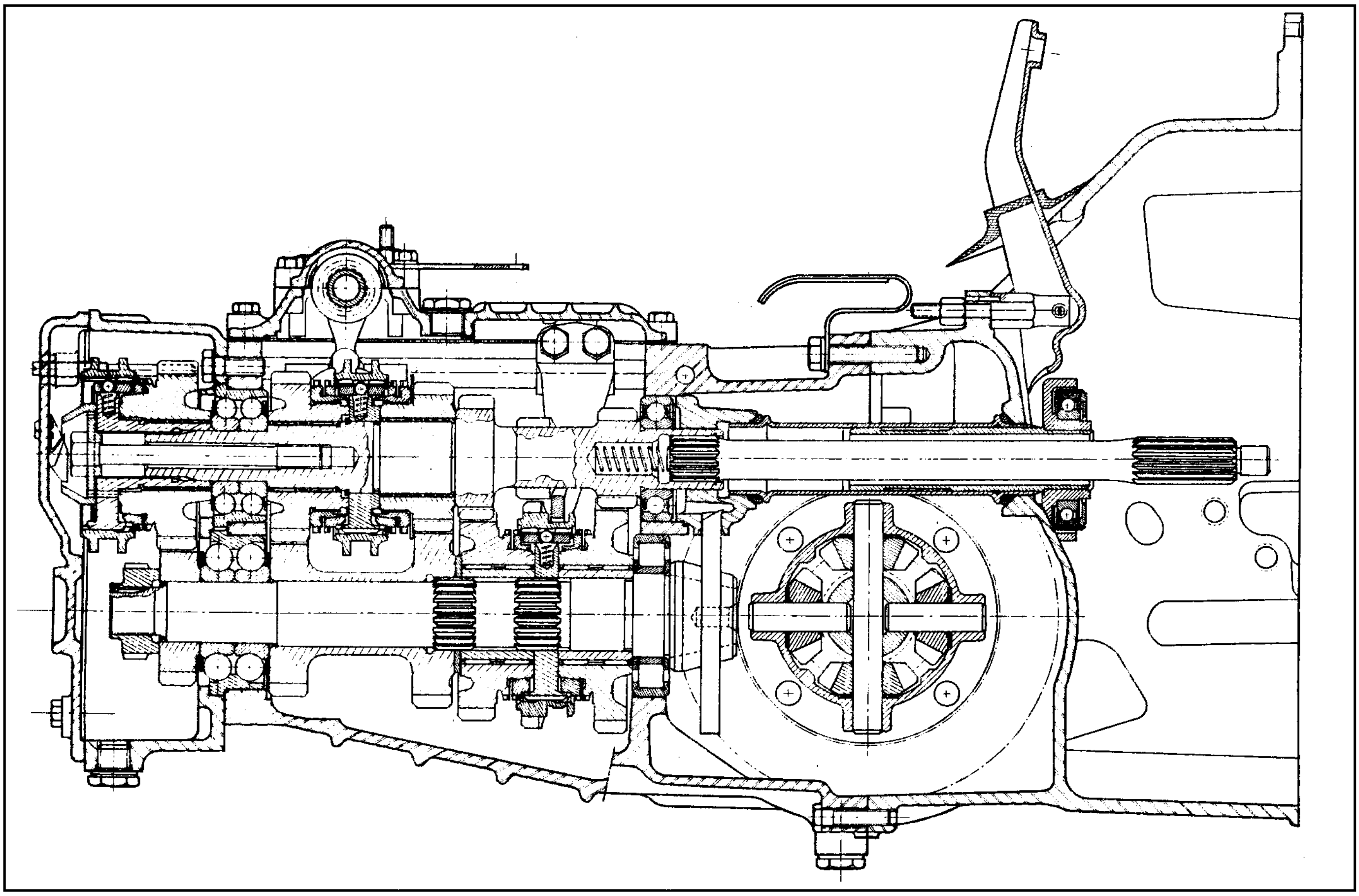
- Crown wheel and pinion: . Conic distance : engraved on end face of bevel pinion
  . Matching number : engraved on crown wheel and pinion
  . Backlash (measured at outer end of crown wheel teeth) 0,16 to 0,24 mm
- Differential : . Satellite end-float at point of minimum clearance 0,3 mm at the most
  . Planet end-float at point of minimum clearance 0,1 at the most

4. Tightening torques for crown-wheel and pinion and differential

- Differential shaft :
  . Bush-nut (bearing outer cage) .... 100 m daN (10 mkg) (72 ft lbs)
  . Nut (bearing inner cage) .... 150 m daN (15 mkg) (108 ft lbs)
  . Screw locking nut for bearing inner cage .... 10 m daN (1 mkg) (7.2 ft lbs)
  . Screws securing crown wheel and differential housing .... 115-130 m daN (11.5-13 mkg) (84-95 ft lbs)
  . Screws securing drive outlets .... 20-30 m daN (2-3 mkg) (14.4-22 ft lbs)

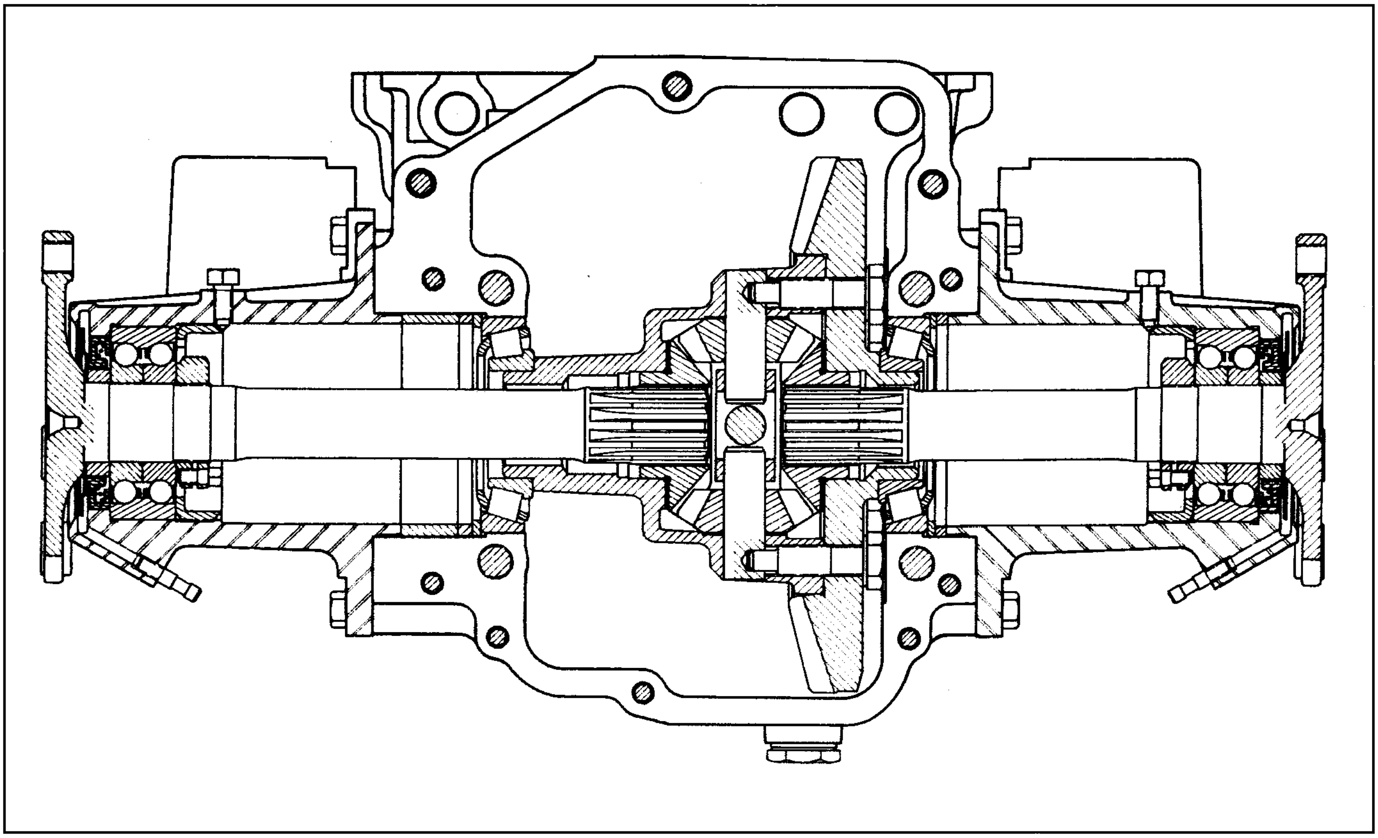
GEARBOX

D 33-13b



DIFFERENTIAL

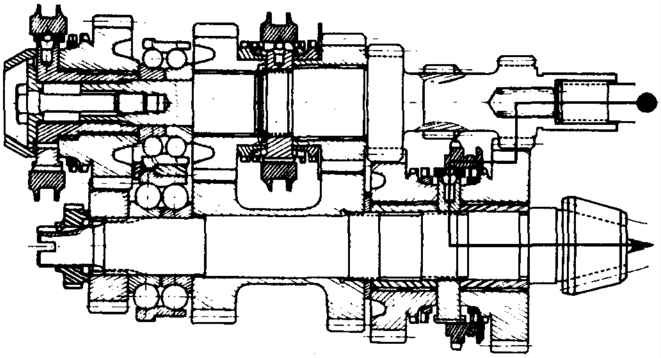
D. 34-1



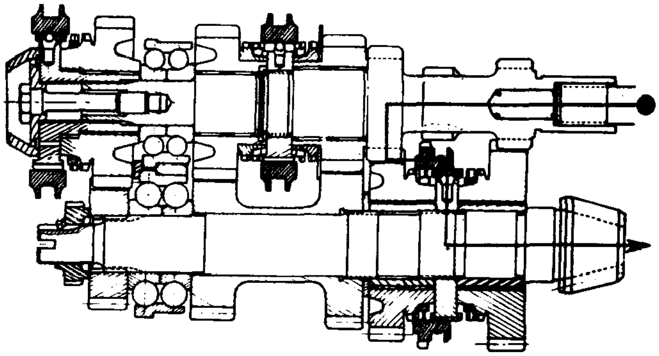
III. DIAGRAMS OF GEARS

S. 33-2 b

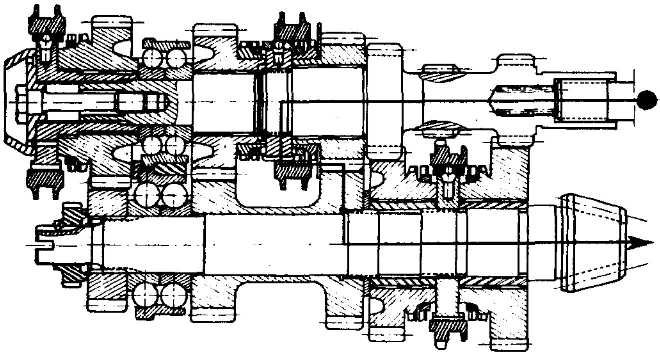
1st GEAR



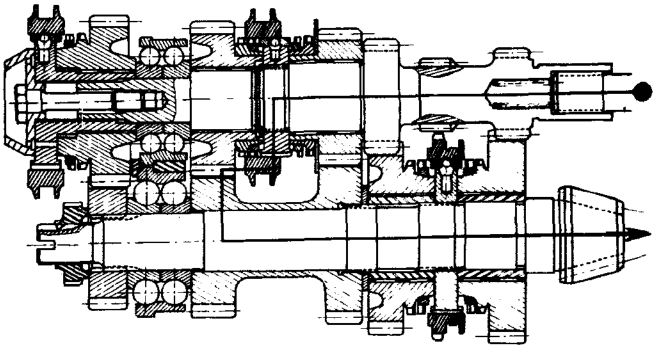
2nd GEAR



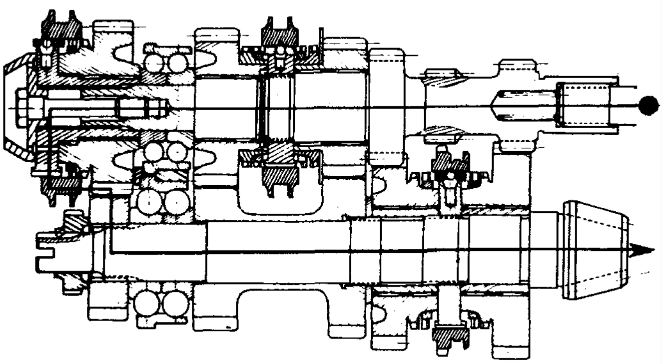
3rd GEAR



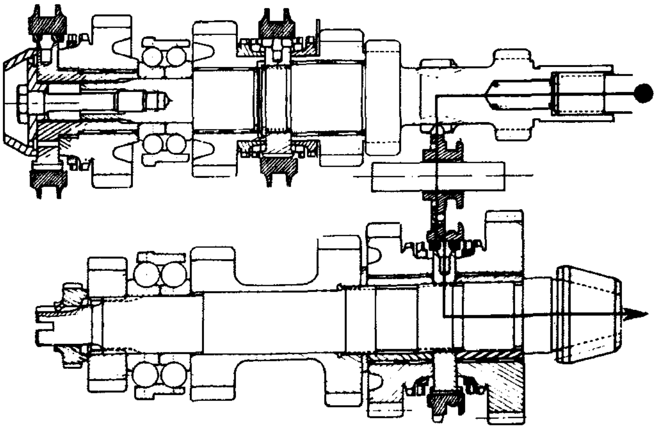
4th GEAR



5th GEAR



REVERSE GEAR



OPERATION No. Dbw 350-00 : *Characteristics and particular features of the automatic gearbox.*

DBW VEHICLES - All types

BORG-WARNER AUTOMATIC TRANSMISSION

BORG-WARNER automatic transmission, type 35, can be fitted as an option on «DS 21» carburettor or electronic injection vehicles.

1. GENERAL DESCRIPTION.

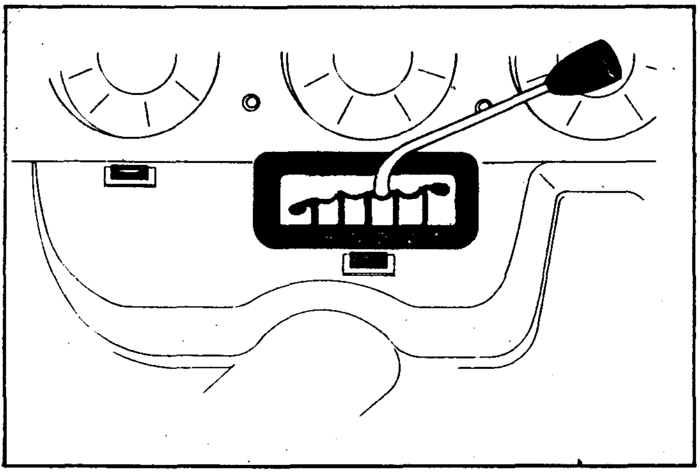
This transmission consists of :

1. A three-element torque convertor (impellor, turbine and reactor) forming a variable engine torque multiplication ratio ranging between 2,3 and 1.
2. A gearbox comprising mainly :
   - an epicyclic gear train which makes it possible to obtain three forward gears and one reverse gear.
   - a hydraulic gear selector permitting automatic gear changing.
3. An oil pump, driven by the convertor impellor which feeds the convertor and the hydraulic gear selector as well as lubricating the epicyclic gear train.

II. ADVANTAGES.

- The torque convertor steps up the engine torque when starting and accelerating. This permits the use of a three-speed gearbox only.
- Connected to an epicyclic gear train, it enables the classical clutch mechanism to be eliminated (since the pinions should not be engaged, it is not necessary to immobilise them when changing gear).
- This assembly ensures smooth transmission of the engine power without jerking. This prolongs the life of the parts.
- For the driver the advantages are :
  - extra comfort and less fatigue since he is not preoccupied with changing gear and the clutch pedal is eliminated.
  - smoother driving.
- However, the driver can regulate the automatic mechanism of the gearbox to adapt his driving to the prevailing conditions. :
  Depending on how he uses the accelerator, he can vary the amount of time he remains in each gear and so regulate the acceleration power of his car (within the limits of the engine's possibilities). In certain cases, if the speed of the vehicle permits it, he can even change down by fully depressing the pedal. In addition, by moving the selector lever, he can limit the automatic mechanism to the first two gears, and in certain exceptional cases, use first gear only.

III. PRACTICAL OPERATION



1. Gearbox controls

The driver has two methods of controlling the operation of the gearbox :

a) *The selector lever :* This has 6 positions : «P» - «R» - «N» - «D» - «2» - «1».
The positions «D» and «2» and «1» correspond to the three different types of forward motion.

b) *The accelerator :* This pedal has two functions :
- To alter the position of the carburettor butterflies (or the strangler-flap on injection models).
- To operate the hydraulic selector (which is connected by a cable to the butterfly spindles).:

The length of time in each gear increases the more the pedal is depressed and consequently the more rapid is the acceleration of the vehicle (the engine turns at higher speeds).
When the pedal is fully depressed this time is at a maximum. However, if the speed of the vehicle permits, a lower gear may be engaged. A hard point in the pedal travel marks this extreme position called the «*KICK-DOWN*» position. At the same time it corresponds to the maximum opening of the butterflies (or the strangler flap).

2. POSITION «P» : Parking
- In this position, the epicyclic gear train is freed from the convertor : the motion of the engine is not therefore transmitted to the wheels.
- The outlet shaft is locked by a dog engaging in the outer teeth of the crown wheel of the epicyclic gear train : the front wheels are locked mechanically.
- This position is used for parking and for carrying out adjustments with the engine running.

NOTE : It is possible to operate the starter motor in this position.
IMPORTANT : NEVER SELECT POSITION «P» WHILE THE VEHICLE IS MOVING.

3. POSITION «R» : Reverse.
This position should be selected when the vehicle is completely stopped and with the engine idling (the reversing lamps light up automatically).

4. POSITION «N» : Neutral.
In this position the epicyclic gear train is disconnected from the convertor : the engine's motion cannot therefore be transmitted to the wheels.

NOTE : It is possible to operate the starter motor in this position.

5. POSITION « D » : Automatic changing of the three forward gears (drive).

This position is used for the normal running of the vehicle :

a) *Acceleration of the vehicle, standing start :*

- When starting the first gear is always used
- The successive gears are engaged automatically as the vehicle accelerates. The more the pedal is depressed, the more appreciable is this acceleration : it is at a maximum in the «KICK-DOWN» position. However the gears cannot be changed above a certain speed which corresponds to the speed of maximum power of the engine :
- Changing from 1st. to 2nd. gear : max, speed = 38 to 41 mph (60 to 65 km/h)
- Changing from 2nd. to 3rd. gear : max. speed = 72 to 76 mph (115 to 120 km/h)

b) *Deceleration of the vehicle :*

When the vehicle slows down the gear is changed down automatically.

NOTE : In position «D» the engine no longer has any decelerating effect when 1st. gear is engaged.

c) *Forced acceleration, vehicle moving :*

If the vehicle is moving at a speed of less than 63 to 66 mph (100 to 150 km/h) in 3rd. gear (or less than 31 to 34 mph (50 to 55 km/h) in 2nd. gear) and if the accelerator is sharply depressed to the «KICK-DOWN» position the gear will be changed down automatically. This device thus makes it possible to obtain the maximum acceleration necessary on certain occasions (overtaking, for example).

NOTE : If the vehicle is travelling at a speed of less than 31 mph (50 km/h) it is possible to change directly from 3rd. to 1st.

	POSITION « D »			
	Speed of vehicle on changing gear			
	1st → 2nd.	2nd. → 3rd.	3rd. → 2nd	2nd → 1st.
Speeds varying with pedal positions BEFORE «KICK-DOWN»	6 to 28 mph (10 to 45 km/h)	10 to 53 mph (15 to 85 km/h)	6 to 34 mph (10 to 55 km/h)	3 to 6 mph (5 to 10 km/h)
Pedal completely depressed at «KICK-DOWN»	38 to 41 mph (60 to 65 km/h) *max*	72 to 75 mph (115 to 120 km/h) *max*	63 to 66 mph *(100 to 105 km/h)* *(changing down during acceleration)*	31 to 34 mph *(50 to 55 km/h)*

6. POSITION «2» : Automatic changing of the first two forward gears.

This position is used for town traffic or motoring in mountainous areas.
In this position the operation is identical to that of position «D», but only the first two gears are used.
When the second gear is engaged, the speed of the vehicle is not limited : never exceed the maximum engine speed (6000 rpm)

NOTE : In this position the engine no longer has any braking effect when 1st. gear is engaged.

N.B : *Changing down by moving the lever from position «D» to position «2» :*
In this case the engagement of the 2nd. gear is not restricted. It can occur at any speed.

CAUTION : *In order to avoid excessive speeds, which are harmful to the engine, never perform this operation at a speed higher than 81 mph (130 km/h).*

7. POSITION «1» : Locking of the first gear

This position is used for exceptional driving conditions : travelling up or down steep gradients (mountainous areas, garage ramps).
In this position the vehicle normally starts in 1st. gear, but the latter remains locked, whatever the speed of the vehicle : never exceed the maximum speed of the engine (6000 rpm).

NOTE : This position of the lever is the only one in which the braking effect of the engine is used in 1st. gear.

N.B : *Changing down by moving the lever from positions «D» or «2» to position «1».*
In this case the engagement of first gear is restricted to avoid excessive speeds which are harmful to the engine: it can never take place at a speed above the appropriate speed limit. The latter can have two values according to the position of the accelerator pedal :
- all positions, except at «KICK-DOWN». . . . . : maximum speed = 31 - 34 mph (50 - 55 km/h)
- pedal fully depressed at «KICK-DOWN» . . . . : maximum speed = about 50 mph (80 km/h)

If this operation is carried out at a higher speed, the 2nd gear will be engaged : first gear will not mesh until the vehicle has sufficiently slowed down and will then remained locked.

8. Starting the engine :

The starting motor can only be operated, using the ignition switch, when the selector lever is in positions «N» or «P».
IMPORTANT :
- It is impossible to start the engine by towing the vehicle.
- Never operate the starter motor relay (on the battery) *before ensuring that the selector lever is in position «N» or «P».*

9. Towing the vehicle :

As a general rule, the front of the vehicle should always be raised for towing.

Exceptionally, however, and over very short distances, the vehicle can be towed **slowly** after putting the selector lever in position «N» (provided that, however, the gearbox is working normally and that the oil-levels are correct).

IV. CHARACTERISTICS

1. Gears :

Vehicles fitted with 180-380 XAS, 180 HR 380 XAS and 185 HR 380 XAS whose rolling circumference is 2.07 m (81.4 ins)

Gear	Gearbox ratio	Crownwheel and pinion	Total demultiplication	Speed at 1000 rpm in mph
1	2.08 : 1	8/35 (4.375 : 1)	9.09 : 1	8.492 mph (13.667 km)
2	1.26 : 1		5.52 : 1	14.008 mph (22.544 km)
3	6.62 : 1		3.80 : 1	20.312 mph (32.689 km)
REV	1.82 : 1		7.94 : 1	9.725 mph (15.650 km)
Speed pinion ratio : 10/21 (2.1 : 1)				

2. Lubrication of transmission

IMPORTANT : *The crownwheel and pinion/differential assembly is situated in a separate casing because the lubricating of this assembly is of a different type.*

a) **Lubrication of the gearbox/convertor assembly :**

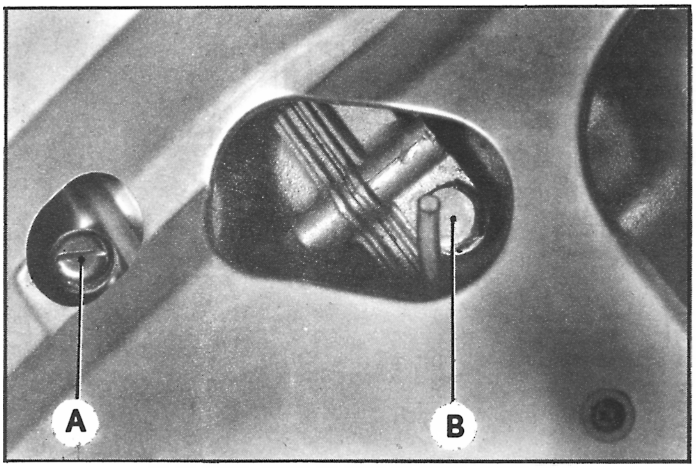
- A pump driven by the impellor of the convertor puts the lubricating oil of the gearbox under pressure. This pump feeds the convertor and the selector block as well as lubricating the epicyclic gear train.
- Type of oil : This **MUST** be . . . . **TOTAL ATF 33**
- Capacity of gearbox/convertor/circuits assembly (when filled at factory). . . . . 6 L($10\frac{1}{2}$ pts) Approx.
- Volume of oil changed when draining . . . . 2.5 L ($4\frac{3}{8}$ pts) Approx.
- **Topping up : through the front dipstick tube .**
- Reading oil level : *This should carried out with the engine turning and the selector lever in position «P» :*
  - engine cold : between lower marks
  - engine hot : between upper marks.

If necessary, top up the level under the same conditions.

b) **Lubrication of crownwheel and pinion/differential housing :**

- Oil type : . . . . **TOTAL EP 80**
- Capacity : . . . . 1.2 L (2.1 pt)
- **Topping up : through rear dipstick tube.**
- Reading oil level : rear dipstick.

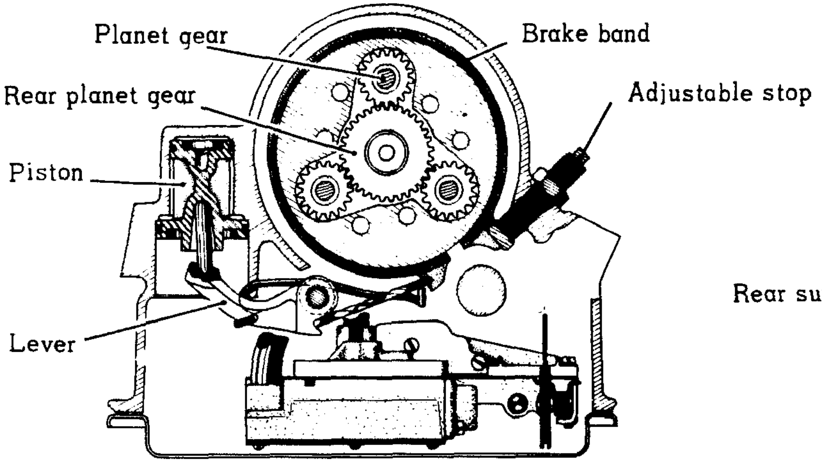
10 161



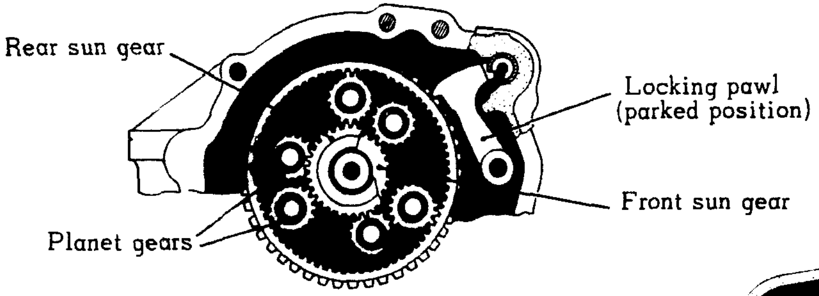
A : Drain plug for gearbox/convertor assembly.

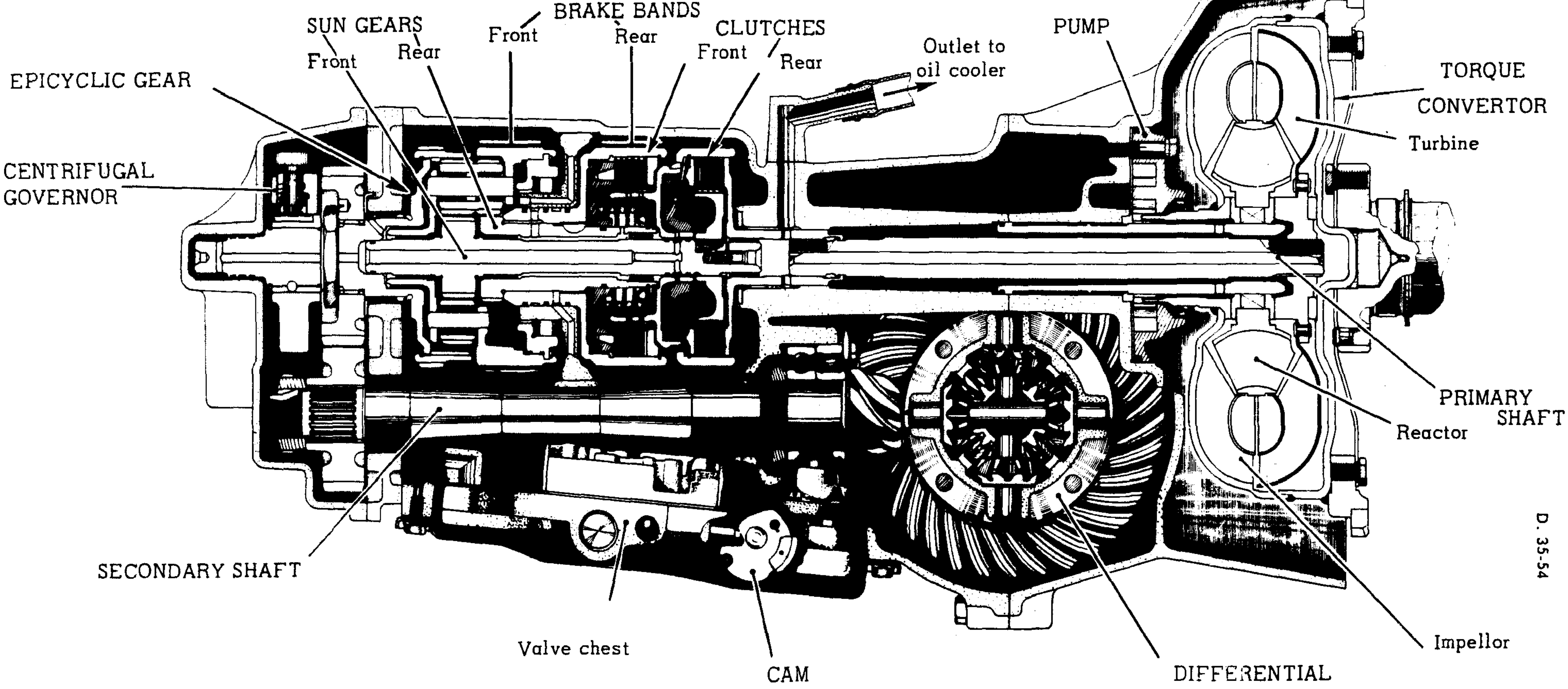
B : Drain plug for crownwheel and pinion/differential assembly.

FRONT BRAKE



EPICYCLIC GEAR





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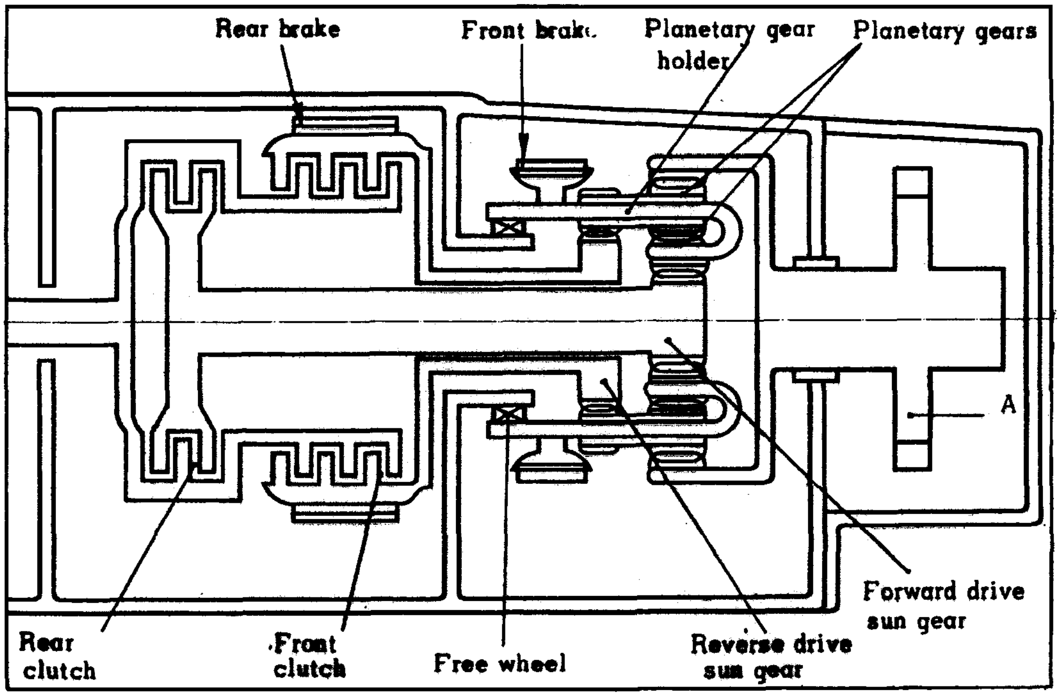
V. DESCRIPTION OF GEARBOX

D. 35-49



The gearbox comprises
- A train of epicyclic pinions giving three forward gears and one reverse gear.
- Two multi-disc clutches, each controlled by a hydraulic piston.
- Two brake bands each operated by a hydraulic servo mechanism.
- A free wheel locking the sun gears so that 1st gear can be obtained.
- A pair of pinions A (ratio = 38/33), situated at the outlet of the epicyclic gear train, returns the movement to the bevel pinion.
- A hydraulic gear selector situated on the lower part of the casing : it ensures the automatic control of the clutches and the brakes when changing gear.
- A centrifugal governor which functions in conjunction with the hydraulic selector.
- The crownwheel and pinion/differential assembly in a separate casing.

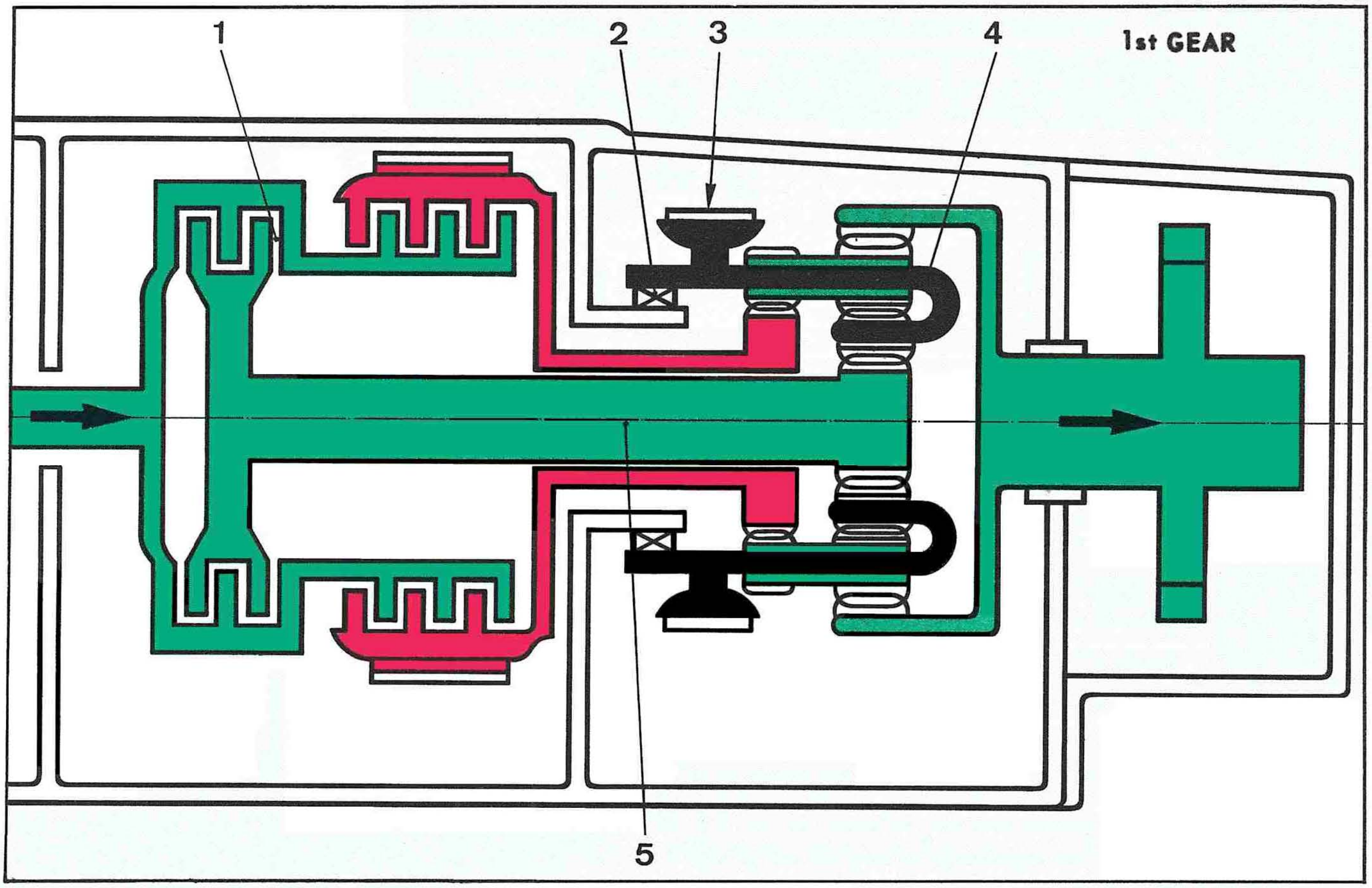
Manual 814-1

ENGAGEMENT OF VARIOUS PARTS OF EPICYCLIC TRAIN

Position of selector lever	Gear	Rear clutch	Front clutch	Rear brake	Front brake	Free wheel
«**1**»	1st	X			X	
«**2**» or «**D**»	1st	X				X
«**1**», «**2**», or «**D**»	2nd	X		X		
«**D**»	3rd	X	X			
«**N**» Neutral						
«**R**»			X		X	
«**P**» Parking					X	

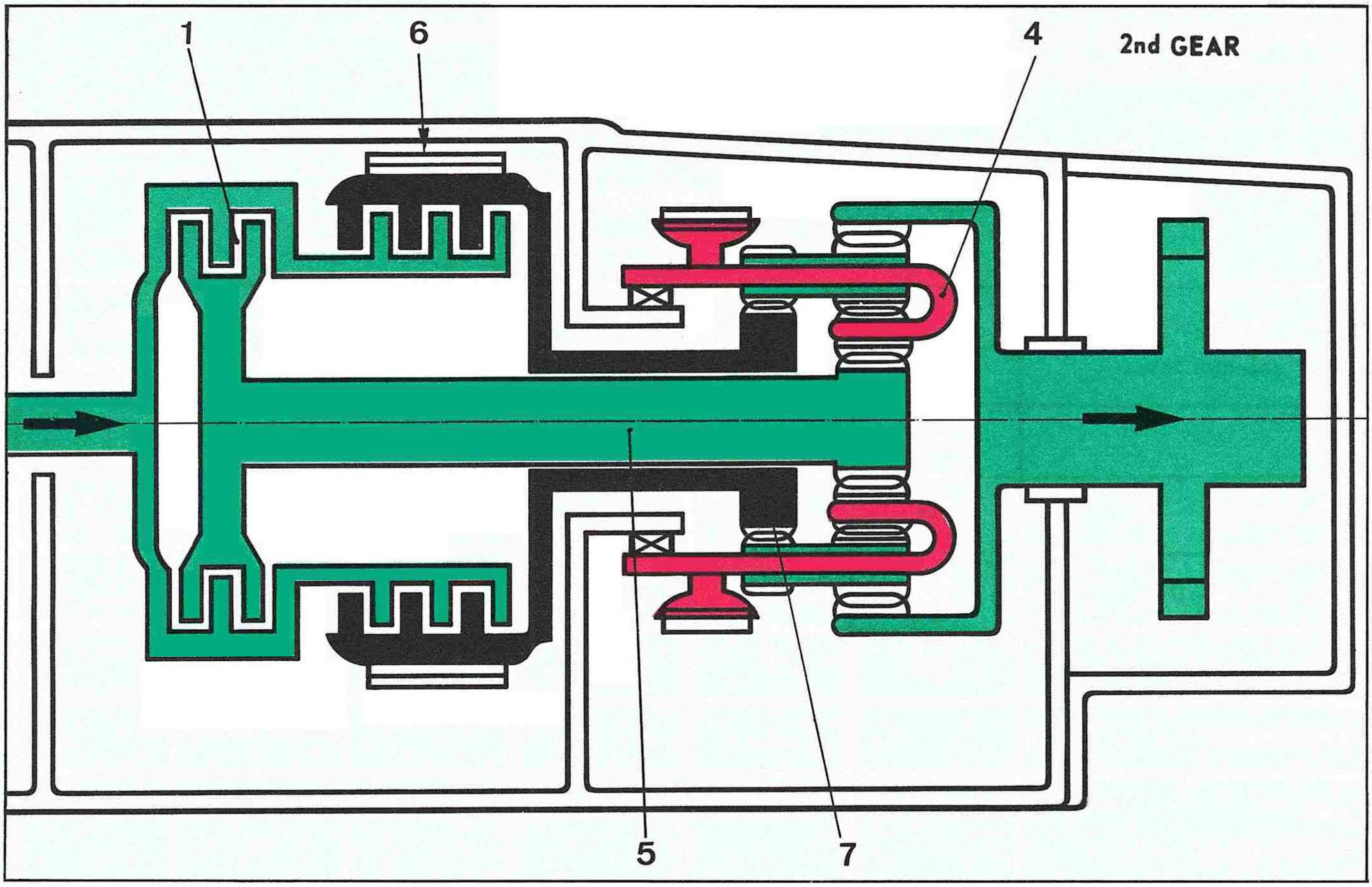
VI. DIAGRAMATIC VIEW OF GEAR TRAIN

D. 35-49



COMPONENTS : 🟩 Conductors ⬛ Fixed 🟥 Loose

D. 35-49.



1st GEAR (Positions «**1**», «**2**», or «**D**»)

- Rear clutch (1) operating : it connects the forward movement sun gear (5) and the torque convertor.
- When the selector lever is in position «1» the front brake (3) immobilizes the planetary gear holder (4) which thus becomes a «reaction» element.
- When the selector lever is in position «2» or «D», the front brake (3) is freed : the free wheel (2) immobilizes the planetary gear holder (4) when the engine starts to drive the vehicle («pulling»). However, when there is deceleration and the engine tends to have a braking effect on the vehicle, the movement reverses and the free wheel allows the planetary gear holder to turn. In this case there is an «engine brake» (decelerating effect on the engine).

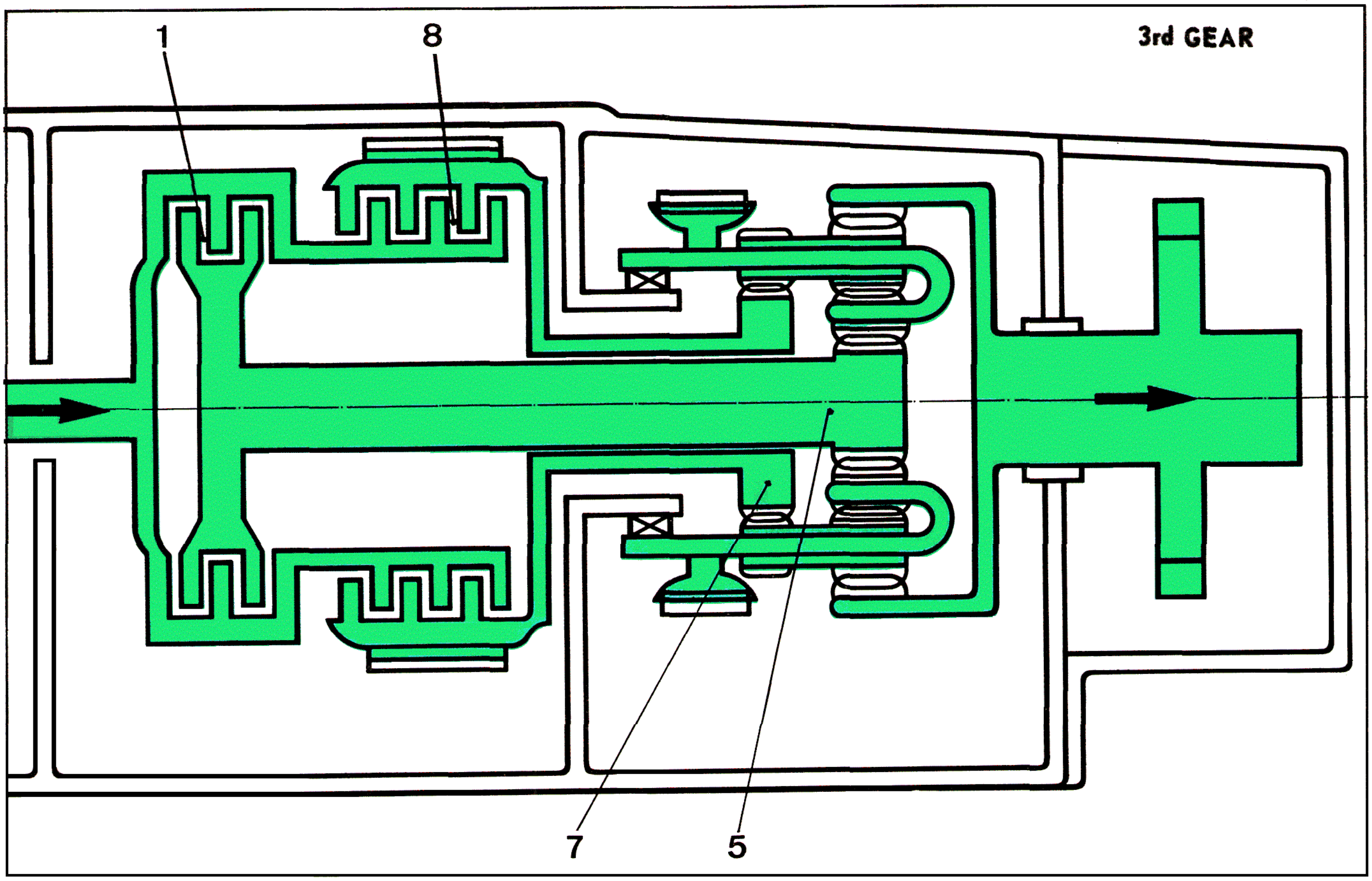
- **The reduction ratio is : 2.39 : 1**

2nd GEAR (Positions «**2**» or «**D**»)

- Rear clutch (1) operating : it connects the forward movement sun gear (5) and the torque converter.
- The rear brake (6) immobilizes the reverse movement sun gear (7) which thus becomes a «reaction» element.
- The planetary gear holder (4) turns «loose».

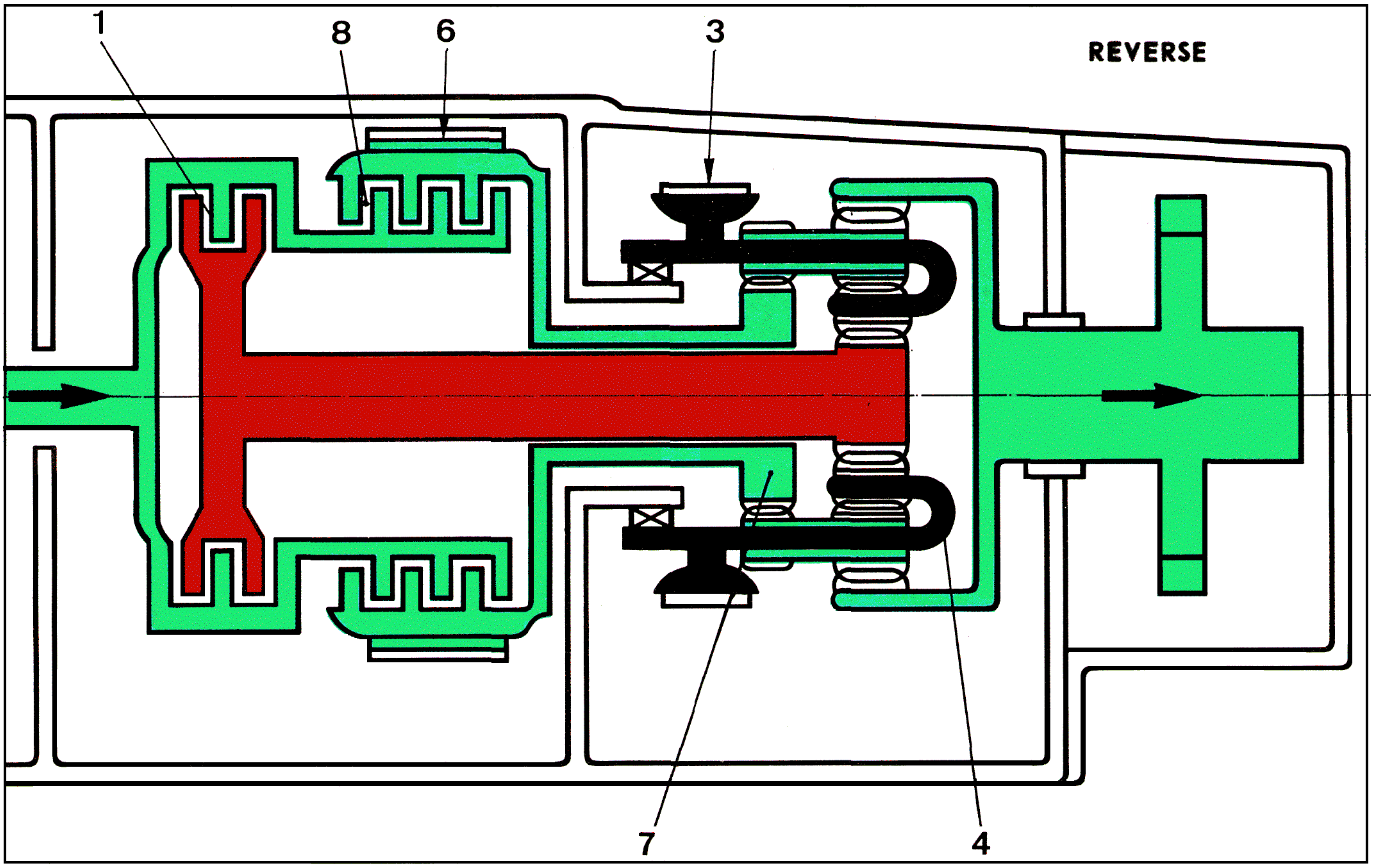
- **The reduction ratio is : 1.45 : 1**

D. 35-49



COMPONENTS : 🟩 **Conductors** ⬛ **Fixed** 🟥 **Loose**

D. 35-49



THIRD GEAR (Position « D »)

- Rear clutch (1) operating, it connects the forward movement sun gear (5) and the torque convertor.
- Front clutch (8) operating, it joins the two sun gears (5) and (7), thus locking the epicyclic gear train which turns as a single unit.

- **The reduction ratio is 1.**

REVERSE GEAR (Position « R »)

- Front clutch (8) operating, it connects the forward movement sun gear (7) and the torque convertor.
- The front brake (3) immobilizes the planetary gear holder (4).
- The movement of the sun gear (7) is transmitted to the crownwheel by one set of planetary gears only. Therefore the crownwheel turns in the opposite direction to the engine.

- **The reduction ratio is : 2.09 : 1.**

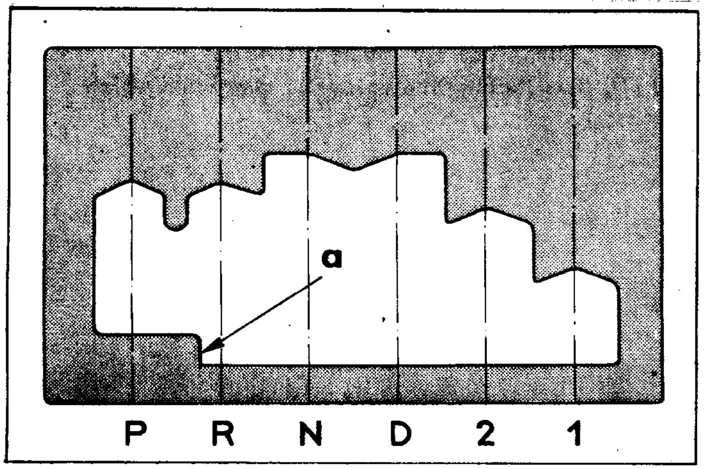
NEUTRAL (Position « N » or « P »)

- The two clutches (1) and (8) are not operating, thus there is no mechanical connection between the engine and the epicyclic gear train.
- In position « N » the brake bands (3) and (6) are released.
- In position « P » the front brake band (3) is engaged, but the clutches are not operating so there is no mechanical connection between the engine and the wheels.
- By selecting position « P », a dog which locks the outlet crownwheel of the epicyclic gear train, thus immobilizing the vehicle, is mechanically operated.

VII. PARTICULAR FEATURES

1. **Selection lay-out of ranges of operation** : It is this which, in conjunction with the locking mechanism of the hydraulic selector, holds the lever in each of its positions.

D. 33-14



To change from one position to another, pull the lever backwards, then move it sideways.

However, to go from position "R" (reverse) to position "P", the lever should not be pulled out fully in order to prevent it striking the shoulder "a".

2. **Tightening torques**

- Nut on primary shaft	150-180 mΛN (15-18 mkg, 108-130 ft Ibs)
- Speedo wheel	200-220 mΛN (20-22 mkg, 144-158 ft Ibs)
- Securing bolt of central bearing	20 mΛN (2 mkg, 14-44 ft Ibs)
- Front casing securing bolts	17 mΛN (1.7-2 mkg, 12.3-14-44 ft Ibs)
- Lower casing securing bolts	10 mΛN (1 mkg, 7.22 ft Ibs)
- Securing bolts for oil pump	15-20 mΛN (1.5-2 mkg, 10-84-14-44 ft Ibs)
- Securing bolts for hydraulic selector	10 mΛN (1 mkg, 7.22 ft Ibs)
- Bolt for conical pinion retaining plate	15 mΛN (1.5 mkg, 10.84 ft Ibs)
- Assembly bolts of casings ($\phi = 7$mm)	11 mΛN (1.1 mkg, 7.96 ft Ibs)
- Assembly bolts of casings ($\phi = 9$ mm)	25 mΛN (2.5 mkg, 18.08 ft Ibs)

3. **Crown wheel and pinion, differential and gearbox outlets :**

The adjustment of these components is exactly the same as for the corresponding components on the standard gearbox.

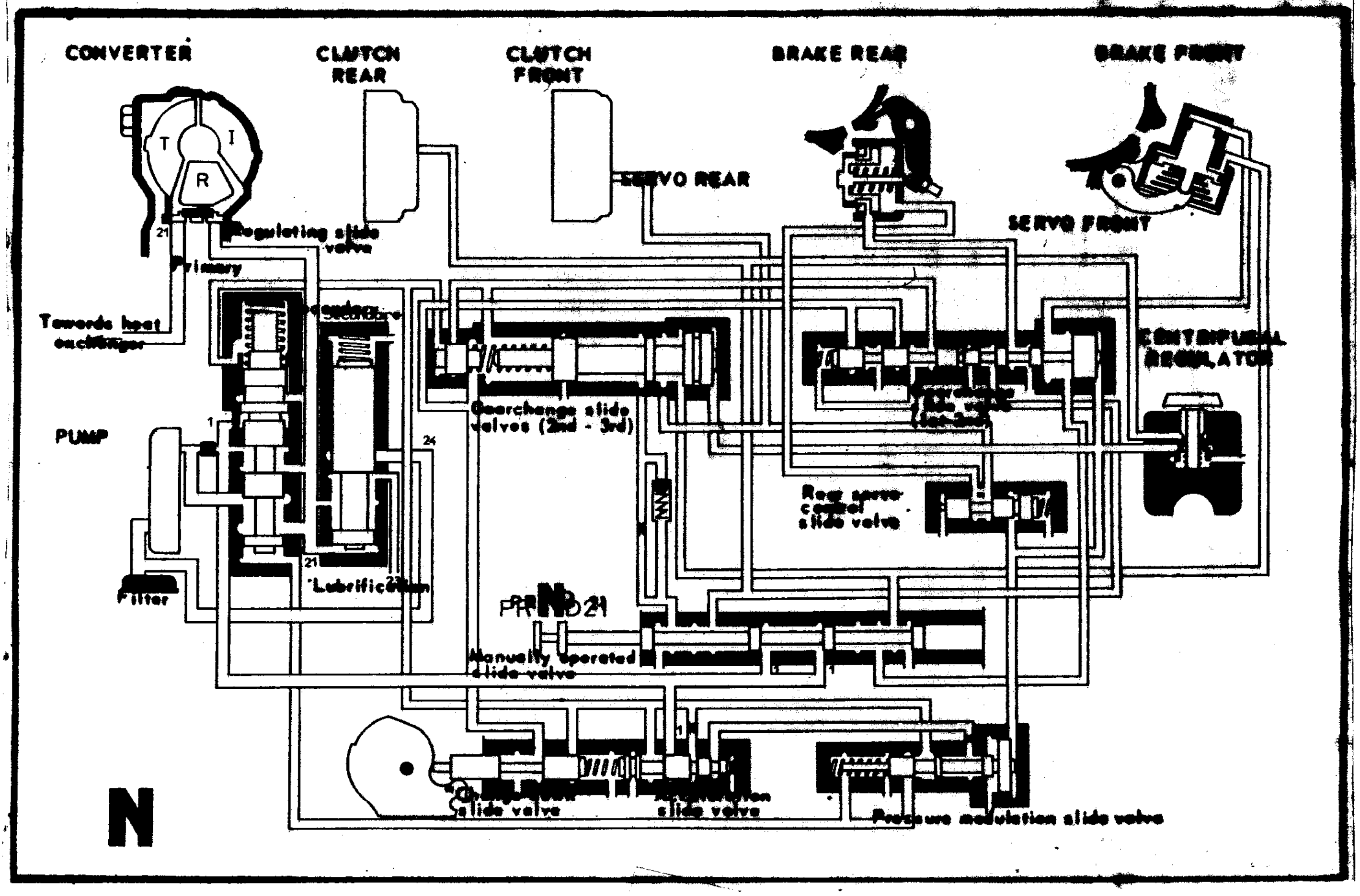
D. bw VEHICLES ALL TYPES

BORG-WARNER GEARBOX

HYDRAULIC GEARCHANGE CONTROL

I - BASIC DIAGRAM.

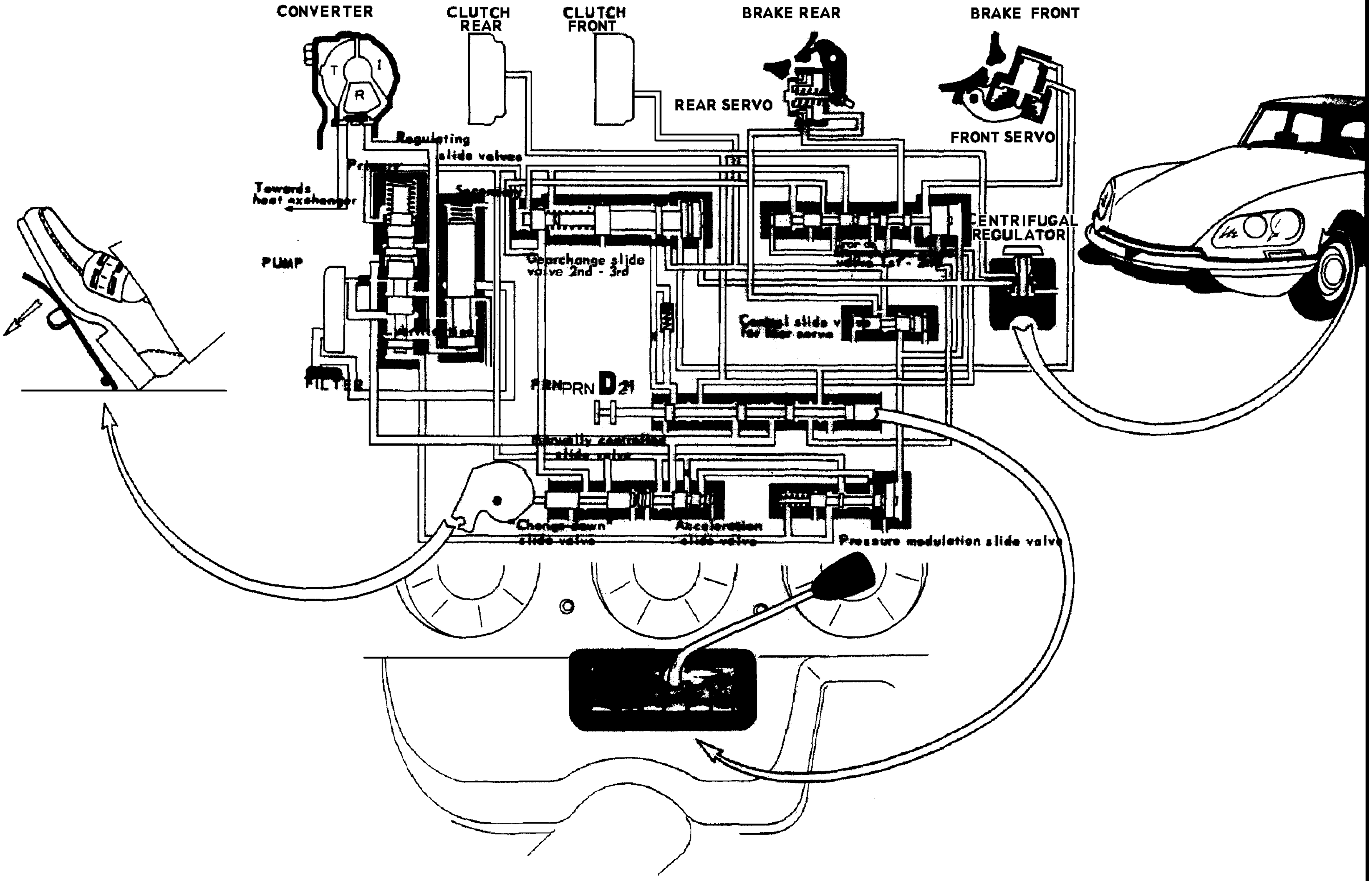
EMAC D. 11.



II - DESCRIPTION.

- Gearchanges are controlled by multiple disc clutches and brake bands. These components are hydraulically operated, hydraulic power being supplied by means of a pump driven by the engine of the vehicle.

- This hydraulic power is distributed by a slide valve assembly grouped in the selector block.


CONVERTER
T
I
R
CLUTCH REAR
CLUTCH FRONT
BRAKE REAR
BRAKE FRONT
REAR SERVO
FRONT SERVO
Regulating slide valves
Primary
Towards heat exchanger
Secondary
PUMP
FILTER
Gearchange slide valve 2nd - 3rd
CENTRIFUGAL REGULATOR
Control slide valve for rear servo
PRN PRN D 2 1
Manually controlled slide valve
Change-down slide valve
Acceleration slide valve
Pressure modulation slide valve

The hydraulic control unit consists of :

- *The primary and secondary regulator slide valves :*

  They control the pressure of the oil supplied by the pump and permit it to feed the converter and the lubrification circuit.

- *The manually operated control valve connected to the gear selector :*

  This allows the driver to choose the different gear ranges.

- *The acceleration and "change-down" slide valves :*

  These valves are connected to the accelerator control; they make it possible to control the automatic gearchange according to the engine load.

- *The centrifugal regulator fitted on the outlet of the epicyclic gear train :*

  This makes it possible to control the hydraulic unit according to the vehicle speed

- *The pressure modulation slide valve :*

  This modifies the pressure in the main circuit according to the position of the accelerator and the speed of the vehicle.

- *The gearchange slide valves (1st - 2nd and 2nd - 3rd)*

  These directly control the front clutch and one of the brake bands according to the position of the accelerator and the speed of the vehicle.

- *The control slide valve for the rear servo :*

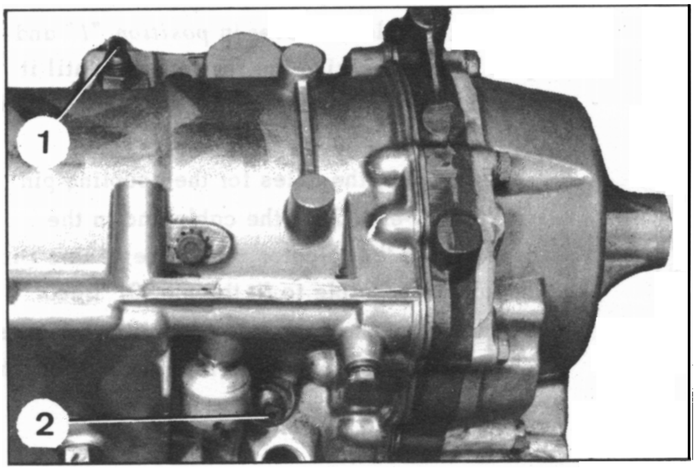
  This makes possible progressive gearchanges from 2nd to 3rd or from 3rd to 2nd, depending on vehicle speed.

OPERATION No. Dbw 354-0 : *Checking and adjusting the gear controls*

DBW VEHICLES All types

I. ADJUSTMENT OF BRAKE BANDS

10 107



1. Loosen the lock-nuts.

2. Tighten the screws (1) and (2) to 7 mΛN (0,7 mkg), then loosen then 3/4 of a turn.

3. Hold the screws, and tighten the lock-nuts to 45 mΛN (4,5 mkg).

II. ADJUSTMENT OF KICK-DOWN CABLE

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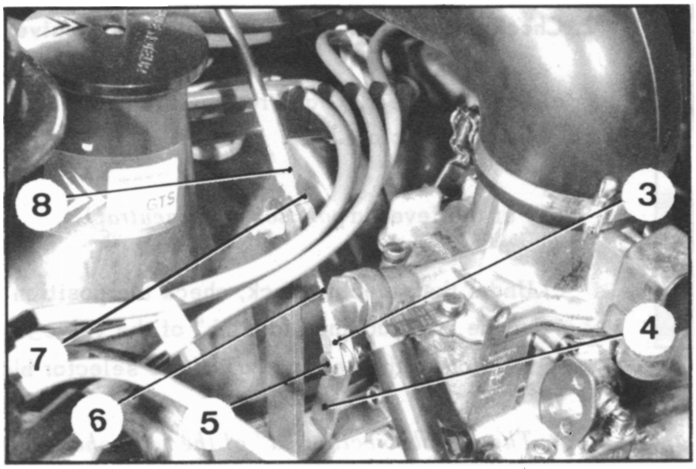
10 096



1. Make sure that height of the accelerator pedal is correct and that the butterflies of the carburettor (or the air valve on *D.IE vehicles)* are closed.

2. Pull the cable (6), then allow it to return slowly to its position.

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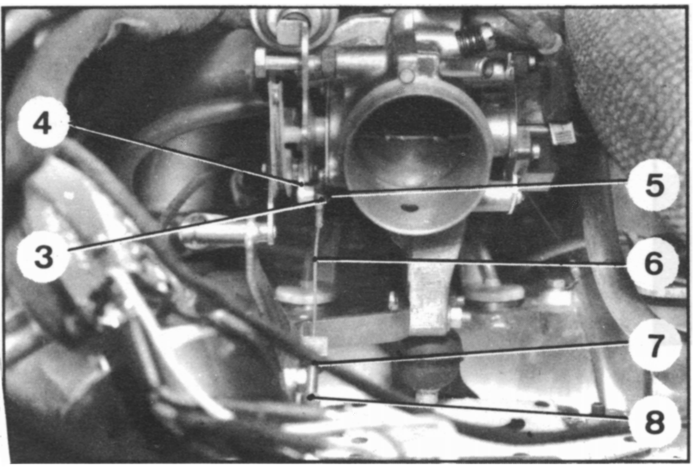
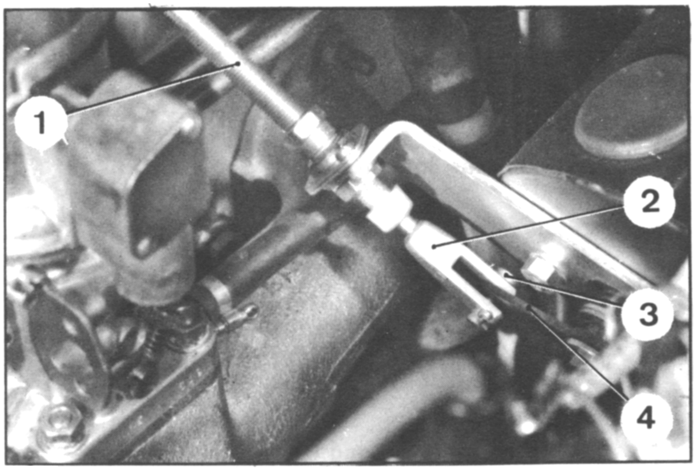


3. At this point, *with the cable under tension but not stretched*, the holes for the coupling pin (5) in the fork-end (3) of the cable and in the lever (4) should be in line : the pin (5) should be "free".

If this is not the case release the lock nut (7) and adjust the endpiece (8) in the appropriate direction.

III. ADJUSTING THE SELECTOR



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1. Adjust the selector cable :

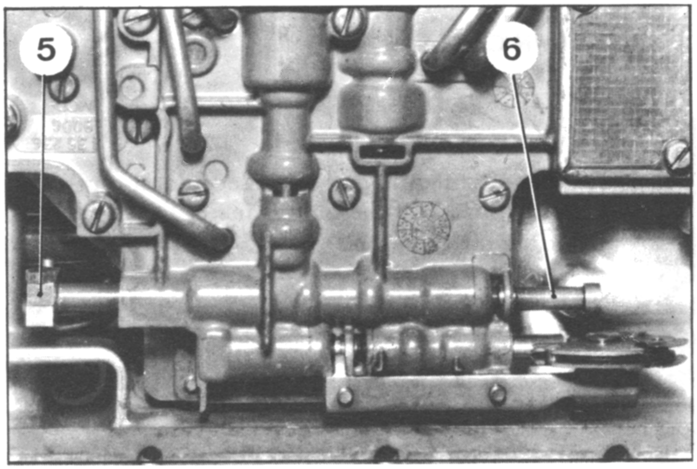
a) Remove the coupling pin (3).

b) Place the selector lever in *position "1"* and pull the cable using the fork end (2) until it reaches the last notch of the locking mechanism.

c) At this point, the holes for the coupling pin (3) in the fork-end (2) of the cable and in the lever (4) of the selector should be in line : it should be possible to fit the pin (3) 'free"
If this is not the case, turn the adjusting nuts of the sheath (1) endpiece in order to bring this about.

d) Fit the pin (3) and a split pin.

e) Make sure that the selector lever can be moved to *position "P"*.



10 265

2. Check the position of the manual control valve :

a) Drain the gearbox and remove the lower inspection plate.

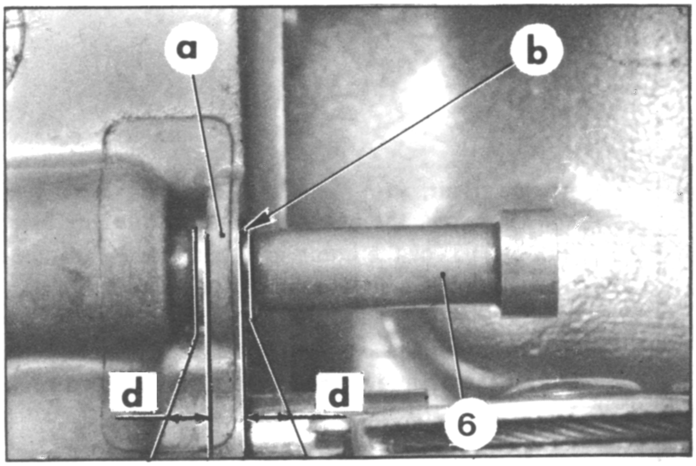
b) Put the lever in *position "N" (neutral).*

c) Under the selector block, check the position of the 2nd machined face "b" of the valve (6) in relation to the bearing "a" of the selector bloc :

The visible section "d" of the face should be equal on both sides of the bearing.

d) If not, loosen the fork-end (5) and fit the valve (6) correctly in place. Re-tighten the fork-end.

c) Fit the lower inspection plate. Fill the gearbox/ torque converter assembly with the correct amount of oil.



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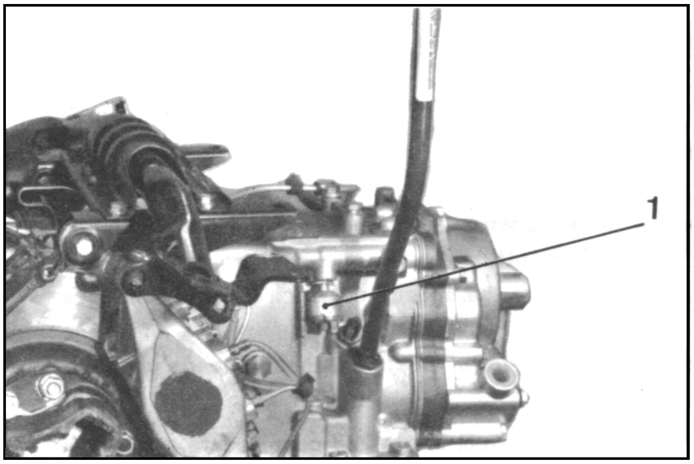
IV. ADJUSTING THE SWITCH FOR THE STARTER MOTOR AND THE REVERSING LIGHTS.



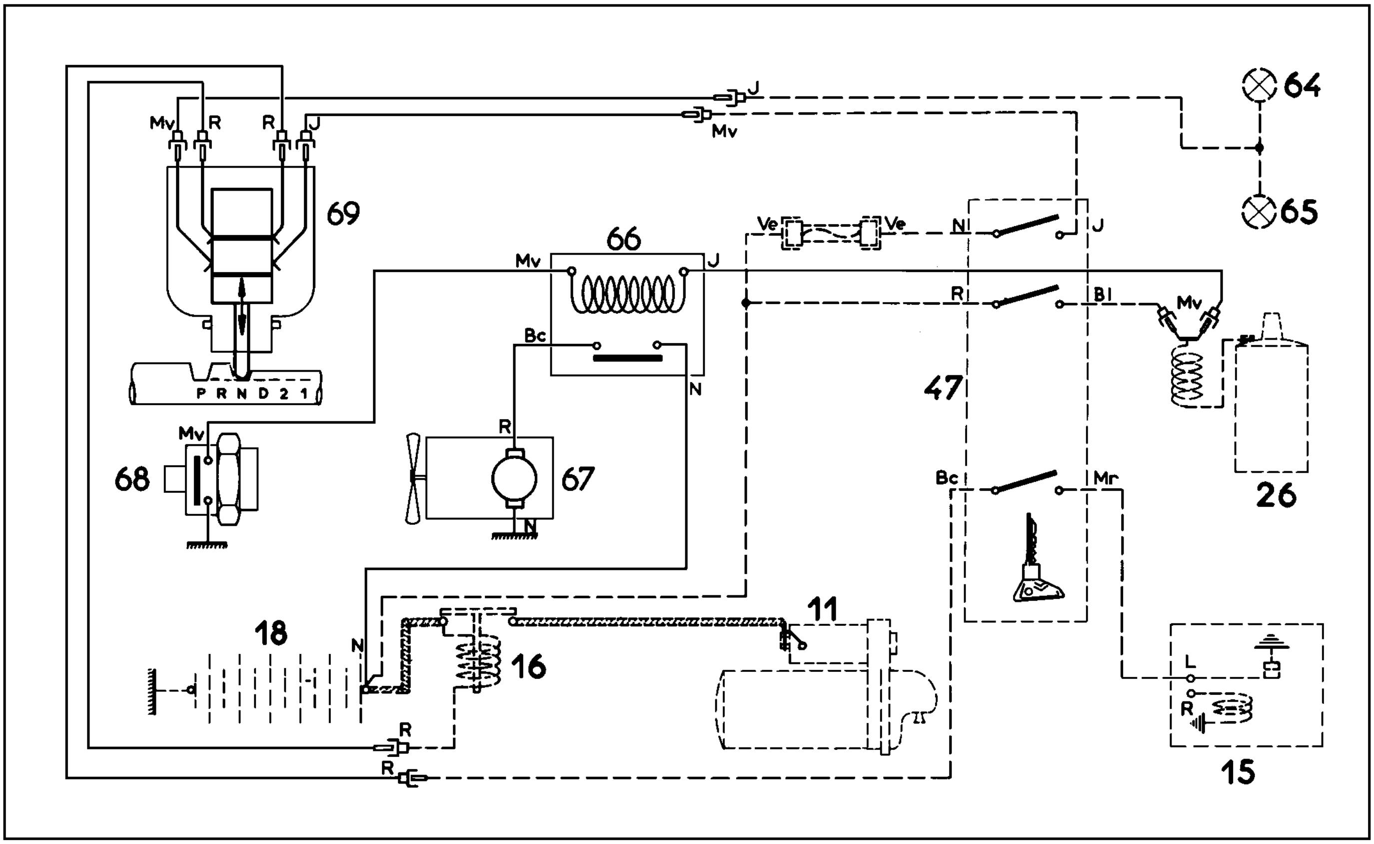
Use an ohmmeter or a check lamp.

1. Place the selector lever in position "D" "2" or "1'

2. Tighten the switch (1) until the current no longer passes between the two narrowest terminals of the switch :
   - When this point has been reached, tighten the switch by $\frac{1}{2}$ turn.
   - Tighten the lock nut.

3. **Checking the adjustment :**
   a) Place the selector lever in *position 'R"* (reverse) : the current should pass between the two widest terminals (reversing lights illuminated).
   b) Place the selector lever in *position "P"* (parked) or "N" (neutral) : the current should pass between the two narrowest terminals of the switch (starter solenoid activated).
   c) Place the selector lever in *position "D"* "2" or "1" : the current should not pass between any of the terminals of the switch.

D. 35-53 b



V. ROAD CHECKS

A) Checking switch on gearbox. Place the selector lever in the following positions :

- In positions "P" or "N" : the starter motor can be operated.
- In positions "R, D, 2 or 1" : the starter motor cannot be operated
- In position "R" : the reversing lights should illuminate.

B) Checking gear selection in the different ranges of use.

1°/ Place the lever in position "D" :

a) When the accelerator is slightly depressed, the engagement of 1st - 2nd gears and 2nd - 3rd gears should take place at low speeds without any jolting.
The more the accelerator is depressed, the higher are the speeds at which the gear changes should take place.
When the pedal is completely depressed in the "kick-down" position, these speeds should be :

- 60 - 65 km/h (37 - 40 mph) when the change from 1st to 2nd gear occurs.
- 115 - 120 km/h (72 - 75 mph) when the change from 2nd to 3rd gear occurs.

b) With the car travelling at constant speed, check the speed at which a change-down provoked by using the kick-down device, takes place (accelerator pedal fully depressed.) Depending on the gear, this speed should be less than :

- 100 - 105 km/h (62 - 65 mph) when the change from 3rd to 2nd gear occurs.
- 50 - 55 km/h (31 - 33 mph) when the change from 2nd to 1st gear occurs.

c) With the car travelling at 80 km/h (50 mph), release the accelerator pedal and move the selector lever to position "2" : the gearbox should change down automatically to 2nd gear (engine brake)

d) With the car travelling at 80 km/h (50 mph), release the accelerator and move the selector lever to position "1" : the gearbox should change down to second gear (engine brake). On continuing to slow down, it should change down automatically to 1st gear when the speed drops below 50/55 km/h (31 - 33 mph) (engine brake).
Accelerate again : 1st gear should remained locked if the selector lever is left in position "1".

2°/ Place lever in position "2" :

The gearbox should function as for position "D" (see § 1) : the only difference being that it is limited to gears 1 and 2.

3°/ Place lever in position "1" :

The vehicle should start in 1st. gear, the latter will remain engaged whatever the speed of the vehicle (do not exceed maximum engine speed : 6000 rpm).

4°/ Place lever in position "P" :

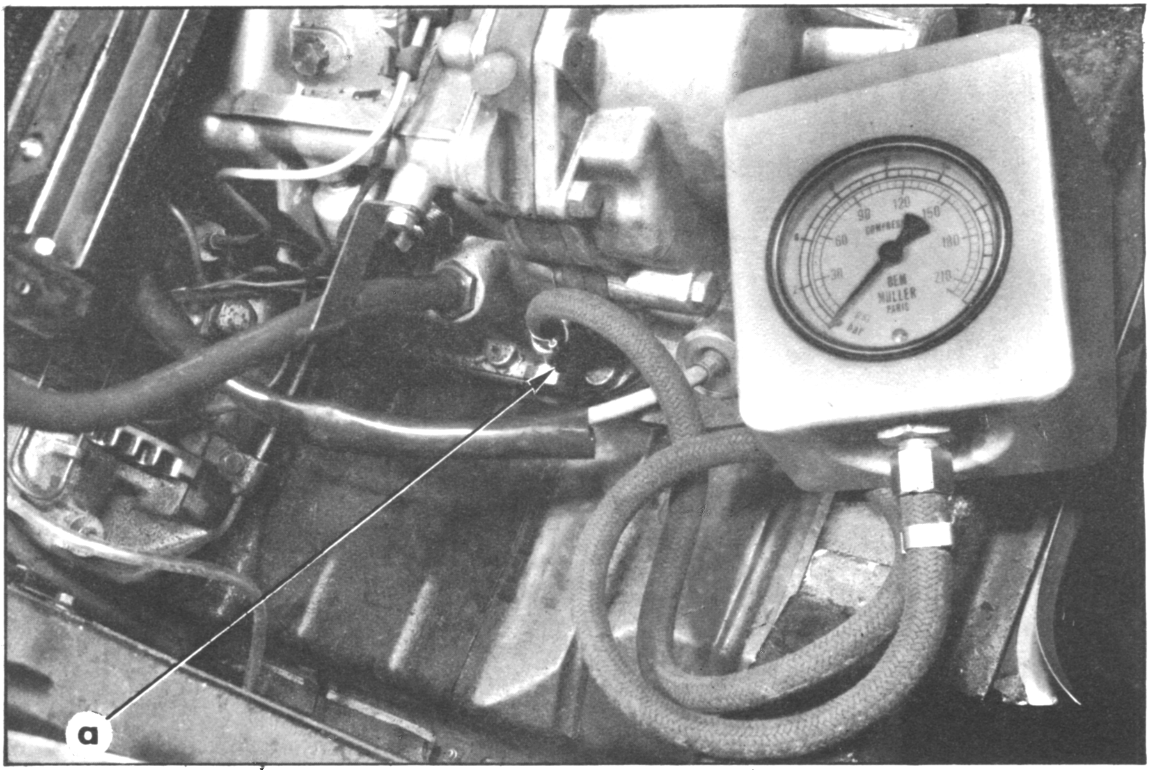
Stop the vehicle on a steep slope and place the selector lever in position "P" : the gearbox should be mechanically locked thus immobilizing the vehicle.

5°/ Place the lever in position "R" :

Vehicle stopped, place selector lever in position "R" : the vehicle should start without jolts (no "judder").

VI. CHECKING THE OIL PRESSURE IN THE GEAR CHANGE CIRCUIT

10 433



REMOVAL.

1. Remove the spare wheel
2. Disconnect the headlamp control
3. Remove the spare wheel support bar and radiator ventilation duct assembly.
4. Remove the plug of the hydraulic circuit (at "a").

   Use a 3/16" Allen key (3658-T-C) which is included in the necessary set 3658-T)

PRESSURE CHECK

5. To do this, use the bolt and the union from set 3658-T.

   Connect the union to a pressure gauge graduated from 0-16 bars (0-230 psi).

6. IMPORTANT : *During all the following operations the wheels of the vehicle should be chocked and the parking brake engaged.*

7. **Check the pressure with engine idling :**
   - Place the selector lever *in position "D"*
   - Let the engine idle.

   Under these conditions the pressure should be :

   3.5- 5 bars (51 - 73 psi)

8. **Check the pressure at the converter "drag" speed :**
   - Leave the selector lever *in position "D"*
   - Depress the main brake.
   - Accelerate the engine until its speed stabilizes.
     At this speed, the pressure should be :
     12.5 - 15.5 bars (181 - 225 psi)

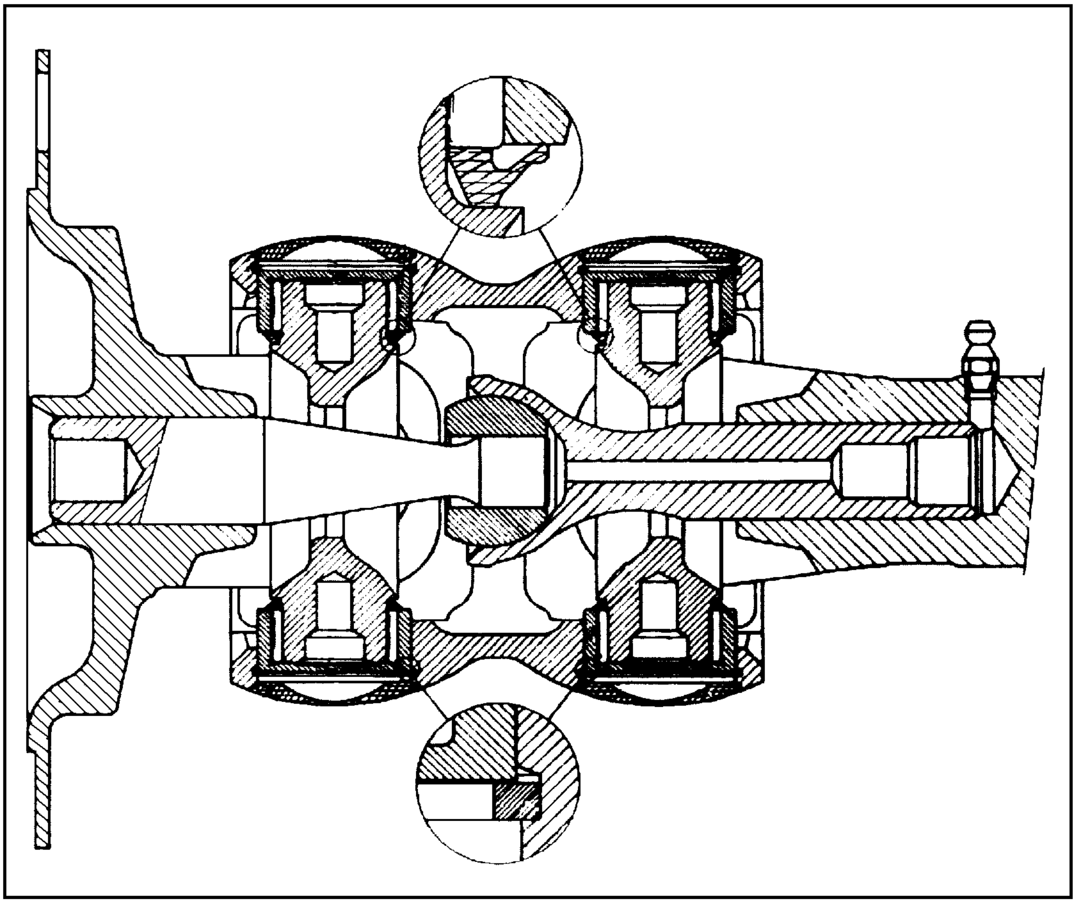
   IMPORTANT : *Do not prolong this operation for more than 10 secondes, in order to avoid over-heating the transmission.*

RE-FITTING.

9. Fit the plug of the hydraulic circuit (at "a").
10. Fit the spare wheel support bar/radiator ventilation duct assembly.
11. Connect and adjust the headlamp control.
12. Fit the spare wheel.

OPERATION N° D. 372-00 : *Characteristics and particular features of driveshafts*

VEHICLES OF ALL TYPES



PARTICULAR FEATURES

1. Tri-axe

a) vehicles ⟼ 3/1971. A shim of 2.5 mm is placed between the protection plate and the tri-axe housing

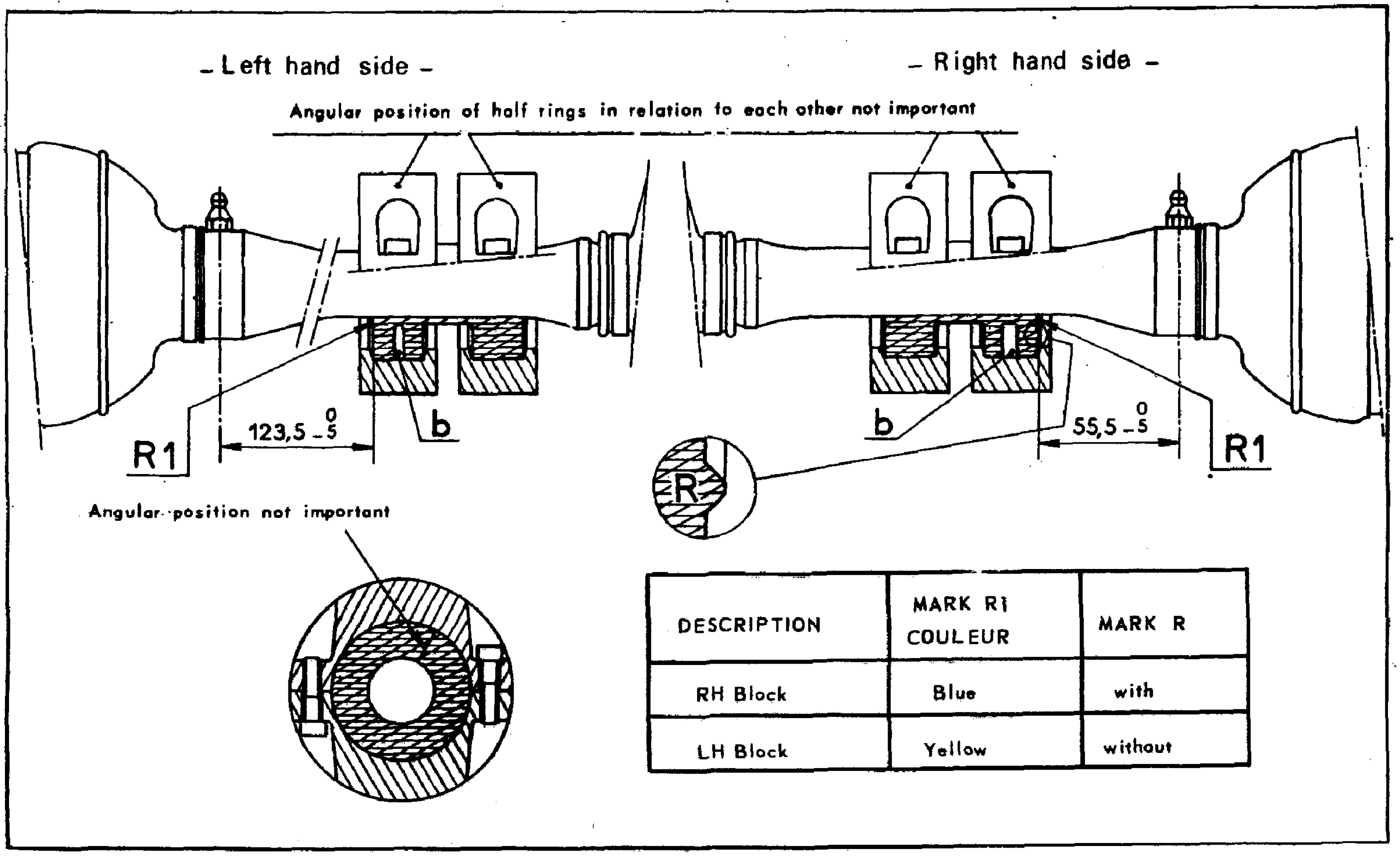
Note : When carrying out a repair on a vehicle produced between March 1970 and March 1971, the fitting of a shim of 2.5 mm between the brake disc and the protection plate is recommended ⟼ 6/1971. The body of the housing has been extended (L = 68 mm (2.67).

b) Spread 200 g (7oz) of TOTAL, Multis, bearing grease on ball joints and the tri-axe (300 g (10 $\frac{1}{2}$ oz) on vehicles ⟼ 6/1971)

c) Tightening torques :

- nuts securing housing : - aluminium tri-axe . . . . . 85 to 110 mΛN (8.5 to 11 mkg) (61 - 79 ft. lbs)
  - steel tri-axe . . . . 105 to 135 mΛN (10.5 to 13.5 mkg) (76 - 98 ft. lbs)
- nut for track rod ball pin . . . . 70 mΛN (7 mkg) (51 ft. lbs)
- nuts for swivel ball pin. . . . . 100 mΛN (10 mkg) (72 ft. lbs)

D.37-2



DESCRIPTION	MARK R1 COULEUR	MARK R
RH Block	Blue	with
LH Block	Yellow	without

2. Vibration dampers : *(on DX, DJ, DXF, DJF ⟼ 10/1968)*

- Mounted on driveshafts

- Distance between centre line of grease nipple and outer face of block ;

Left hand side . . . . 55.5 $-{}^{0}_{5}$ mm

Right hand side . . . . .123 $-{}^{0}_{5}$ mm

Left and Right blocks are different

Marking :

R H. Block - with outer ring (welded) . . . . marked blue

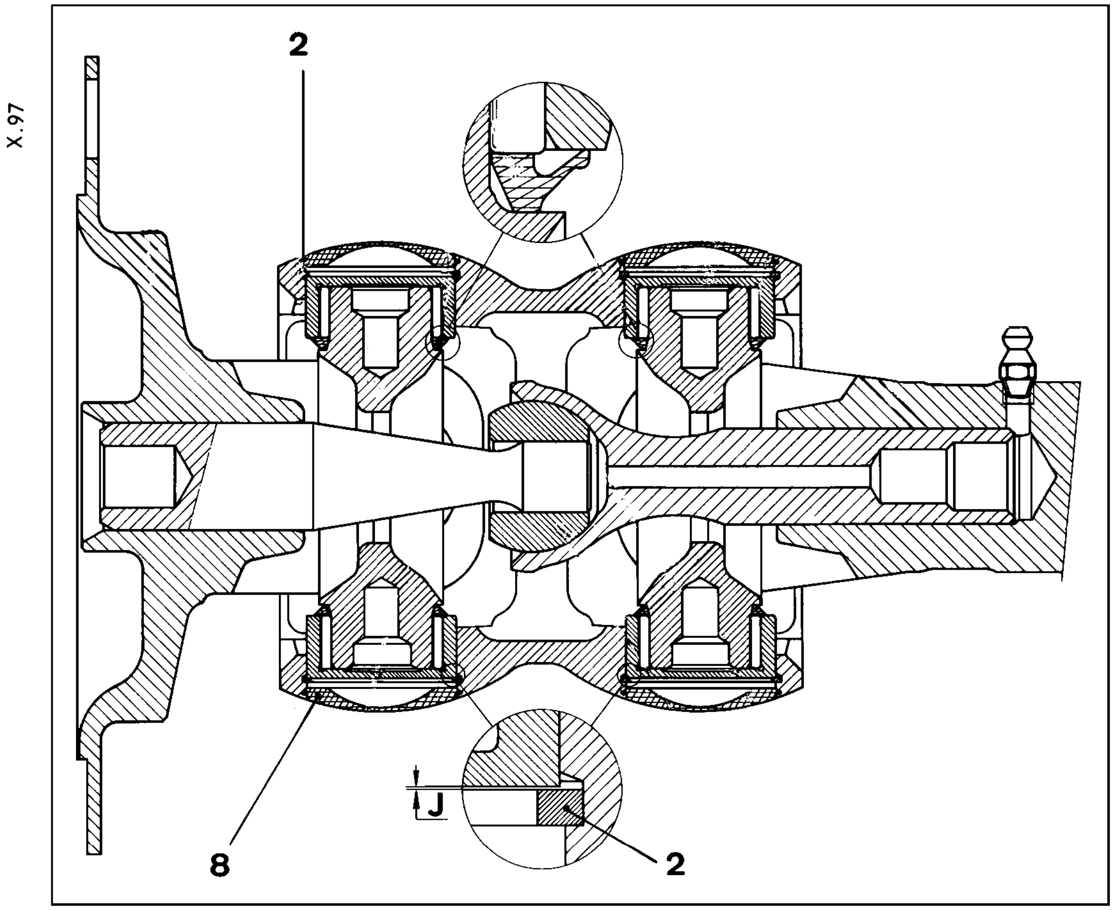
L. H. Block - no ring . . . . marked yellow

Tightening torque :

Screw securing damper half rings . . . . 13 mΛN (1.3m. kg) (9.4 ft ibs)

VEHICULES ALL TYPES

I - ADJUSTING THE CROSS-HEAD END-FLOAT



NOTE : ⟼ *April 1967.* The cross-head end-float is adjusted by using needle-cup circlips (2)

The spare parts department supplies circlips of seven different thicknesses indicated by cuts engraved on the curved end piece (total up the number of cuts)

N°	Thickness $^{0}_{-0,05}$	Number of cuts
DX. 372-6f	1,70	6
DX. 372-6e	1,65	5
DX. 372-6d	1,60	4
DX. 372-6c	1,55	3
DX. 372-6b	1,50	2
DX. 372-6a	1,45	1
DX. 372-6	1,40	without

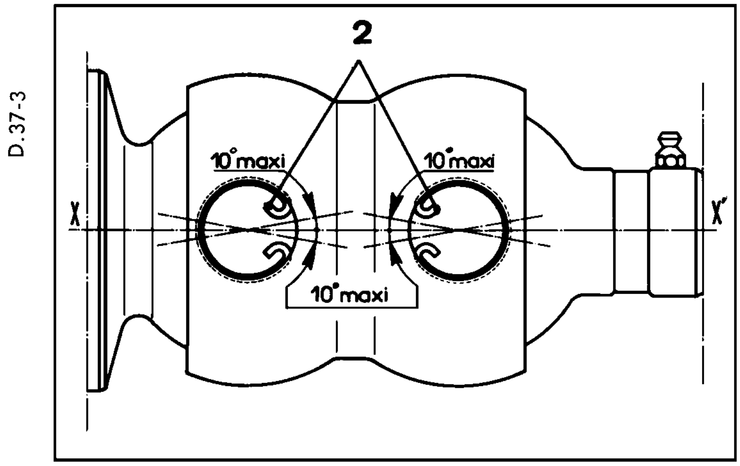
1. Remove the four plugs (8) by means of a punch or a scriber.
   NOTE : On one side of the double universal housing, both circlips originally fitted bear the mark 3 (DX 372-6C 1,55 mm thick)

Do not remove them.

2. Remove the two other circlips fitted on the opposite side of the double universal housing.

   Replace them if required by thicker circlips to obtain a cross-head end-float.
   J = 0,08 mm maxi.

   TAKE CARE
   The circlips must be symmetrically fitted within 10° in relation to drive shaft centre line, the end-pieces (2) positioned as shown below. The circlip must not be under stress and clearance should be measured with a feeler gauge.
3: Fit the four plugs (8) They must be renewed after each dismantling.



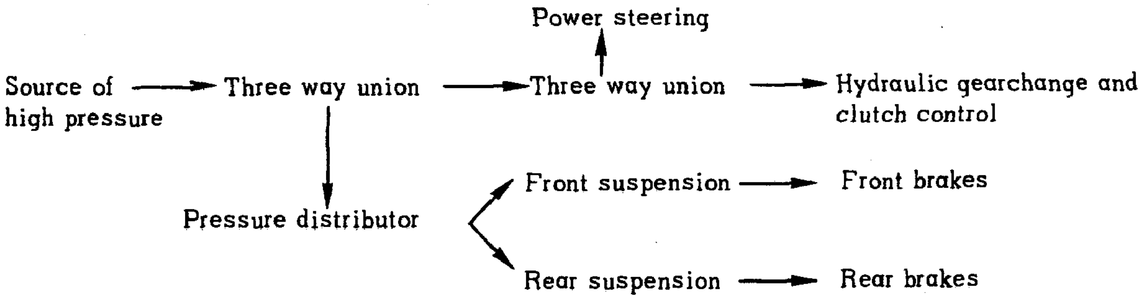
SOURCE AND RESERVE OF PRESSURE

OPERATION N° D. 390-00 : *Characteristics and particular features of source and reserve of pressure for the hydraulic circuit.*

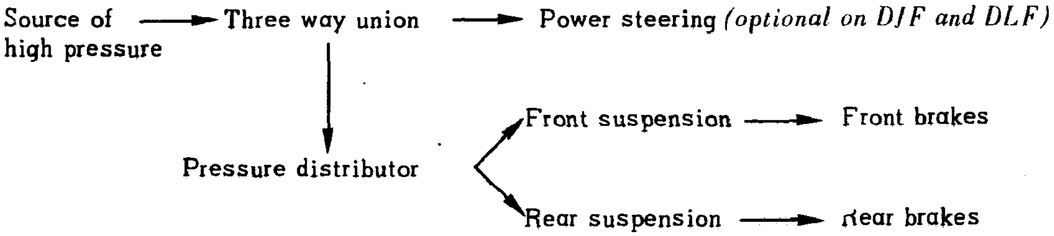
VEHICLES ALL TYPES

I. HYDRAULIC CIRCUITS - BASIC DIAGRAMS.

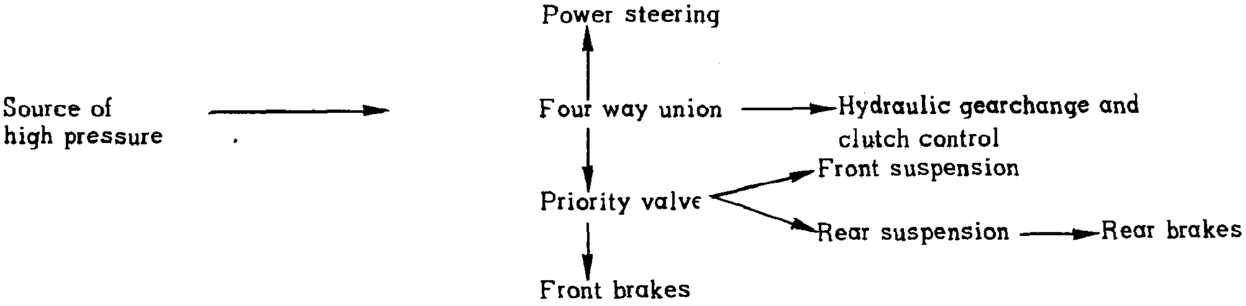
1. DX / DY vehicles (⟶ *12/1967)*



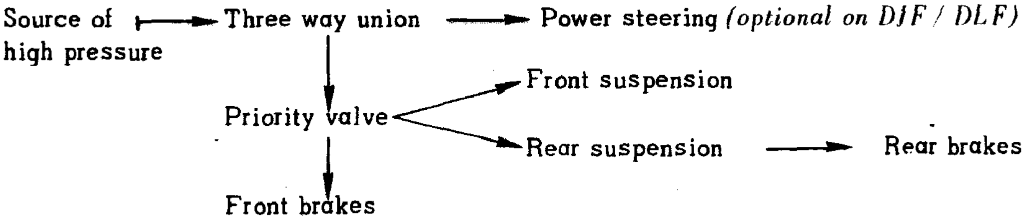
2. DJ / DL / DJF / DLF vehicles (⟶ *12 / 1967)*



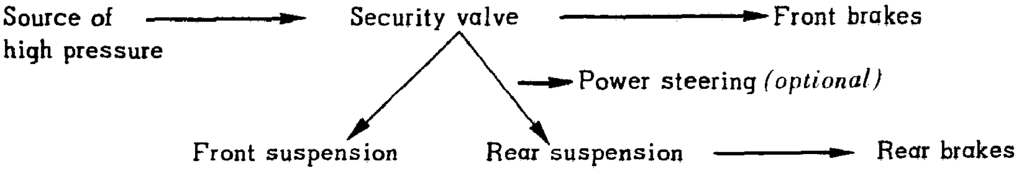
3. DX / DY / DXF / DYF vehicles (⟶ *12 / 1967)*



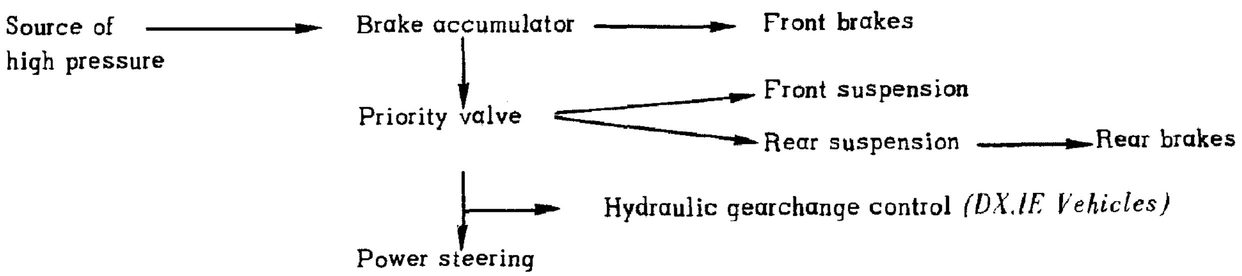
4. DJ / DL / DJF / DLF (⟼ *12 / 1967)*



5. DV / DT/DP

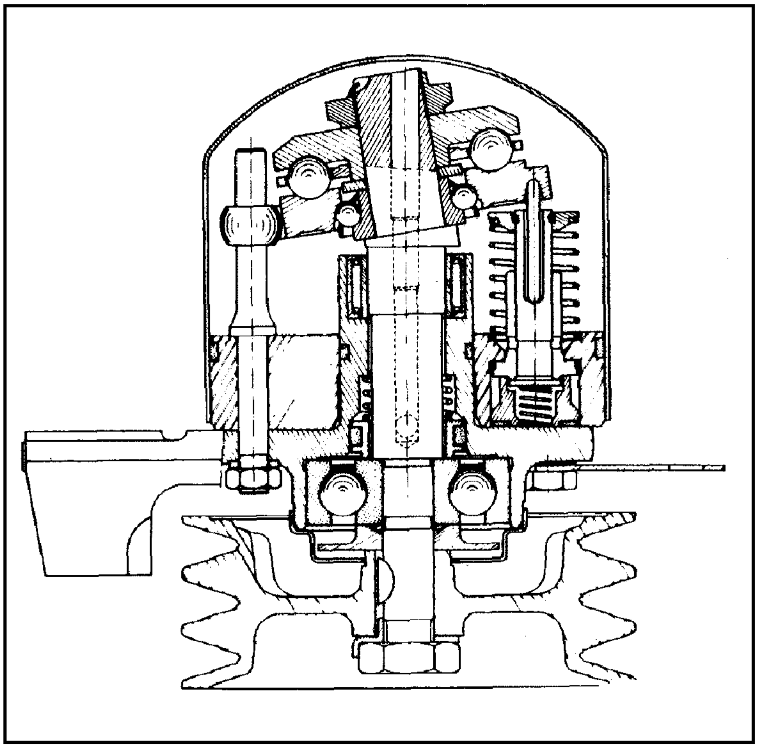


6. I.E. vehicles



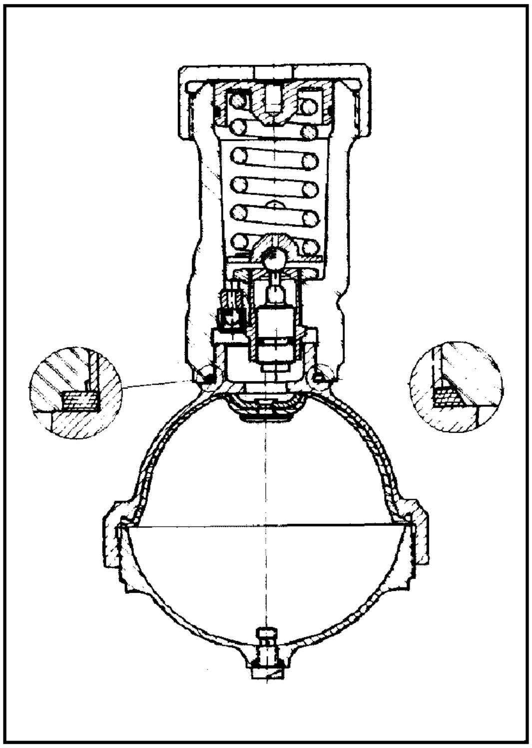
Seven - cylinder H.P. pump.

D. 39-6



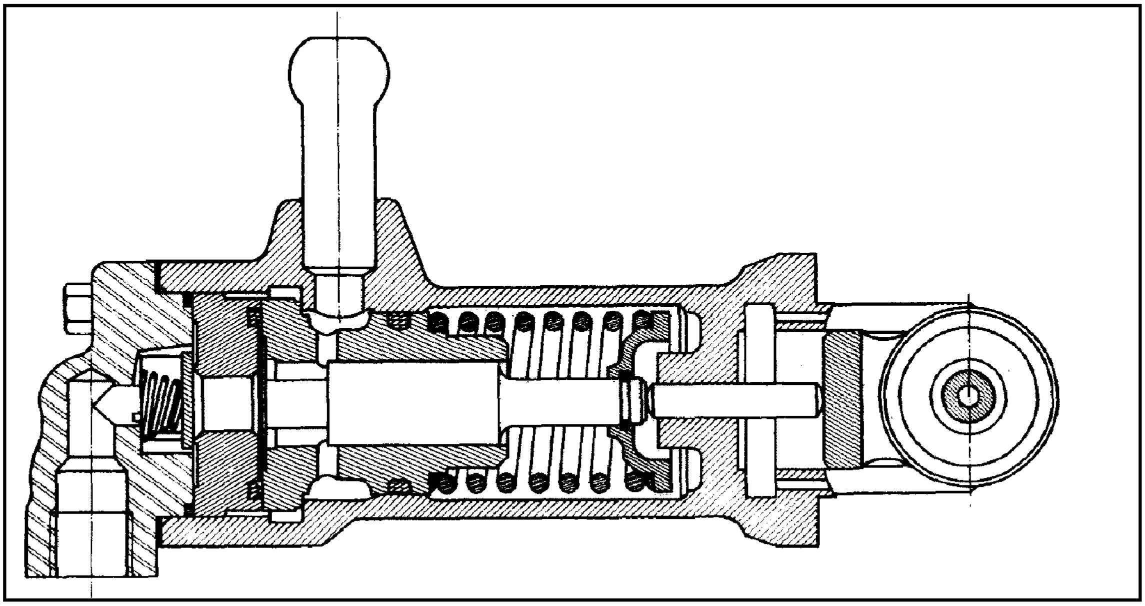
Pressure regulator and sphere.

D. 39-1



Single - cylinder H.P. pump.

D. 39-11



II. CHARACTERISTICS.

1. Hydraulic circuit :

→| *9 / 1966 red fluid L.H.S. 2*
|→ *9 / 1966 green fluid L.H.M.*
- Capacity of circuit . . . . 6 litres (10,5 pts)

2. Reservoir :

- Capacity . . . . 5,2 litres (9,25 pts)
  Between mini and maxi . . . . 1 litre (1,75 pts)

3. Seven cylinder high pressure pump *(Vehicles of all types with power assisted steering)*
- The pump turns at half the speed of the engine :
- Output : 2,8 cc per turn of pump = 840 cc per min for 600 rpm of engine
- Sealing for pump body . . . . 150 bars (2130 psi)

4. Single cylinder high pressure pump *(Vehicles with non-assisted steering)*
- This pump is operated directly by the camshaft.

5. Pressure regulator :
- For single cylinder H.P. pump *(→| 2 / 1969)*
  Marking no groove in lower part of plug
  Pressures : - cut-in . . . . 100-110 bars (1420-1560 psi)
  - cut-out . . . . 130-140 bars (1850-1990 psi)

- For 7 cylinder H.P. pump *(|→ 2 / 1969)* and for single cylinder H.P. pump :
  Marking : a circular groove in lower part of plug . . . .
  Pressures : cut-in . . . . 125-140 bars (1775-1990 psi)
  cut-out . . . . 150-175 bars (1850-1990 psi)

- Pilot valve pressure regulator *(Progressively replacing former ones |→ 4 / 1969)*
  Pressures: cut-in . . . . 140-150 bars (1990-2130 psi)
  cut-out . . . . 165-175 bars (2280-2490 psi)

6. Main accumulator :

NOTE : |→ *1/1969 on certain vehicles the accumulator in machined forged steel has been replaced by an accumulator in pressed steel.*

- Opening and closing :
  DV/DT/DP →| *3/1973* . . . . 40 $^{+2}_{-10}$ bars (569 $^{+30}_{-150}$ psi)
  DV/DT/DP |→ *3/1973* . . . . 60 $^{+2}_{-10}$ bars (853 $^{+30}_{-150}$ psi)
  Pressure : all types exept *DV/DT/DP*. . . . . 65 $^{+2}_{-10}$ bars (925 $^{+30}_{-150}$ psi)

7. Pressure distributor *(→| 12 / 1967 all types exept DV / DT)*

	Hydraulic gear change		*Manual gear change*
	Front suspension	Rear suspension	Front and rear suspension
- Valve opening for a pressure between :	4 to 7 bars 57 to 98 psi	25 to 42 bars 360 to 580 psi	4 to 7 bars 57 to 98 psi

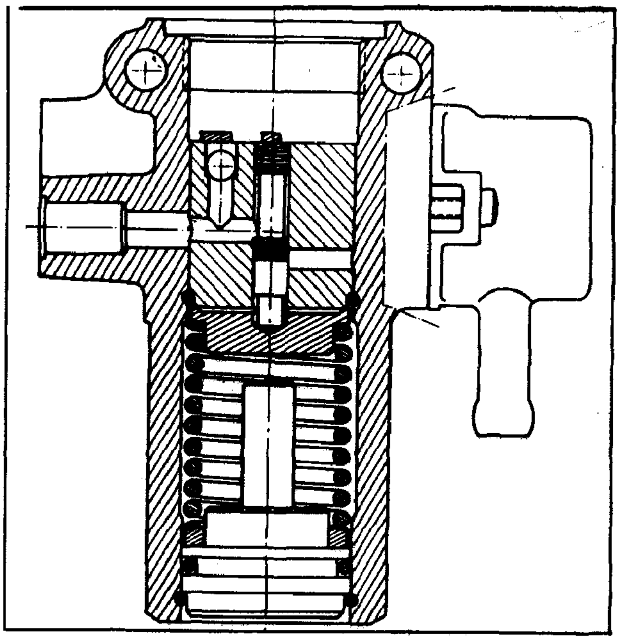
- Valve sealing at : . . . . 175 bars (2490 psi)

8. Priority valve *(|→ 12 / 1967 except DV / DT / DP)*
- Calibration of slide valve return spring . . . . 110-130 bars (2560-1850)
- Sealing of slide valve . . . . 175 bars (2490psi)

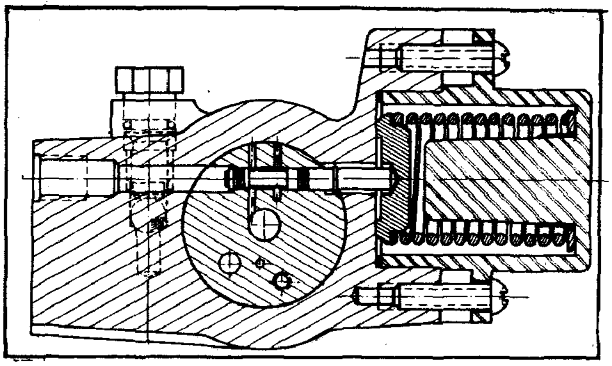
9. Security valve *(DV / DT/DP)*
- Calibration of slide valve return spring . . . . 70-90 bars (995-1280)
- Calibration of pressure switch →| *3/1973* . . . . 55-85 bars (795-1280 psi)
  |→ *3/1973* . . . . 75-95 bars (1067-1351 psi)
- Sealing of slide valve . . . . 175 bars (2490 psi)

Pilot Valve pressure regulator.

D. 39-53

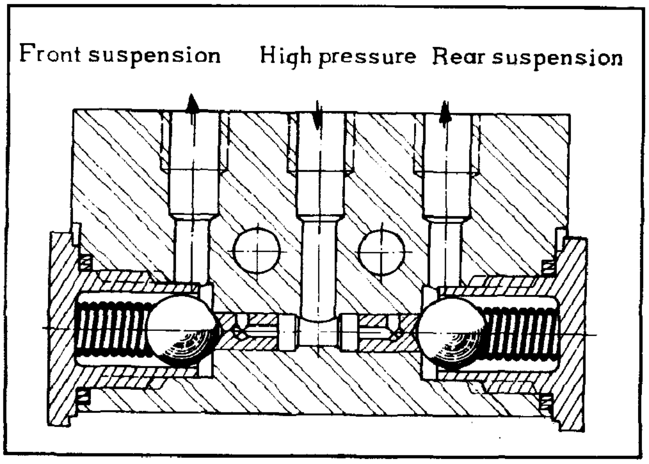


D. 39-54

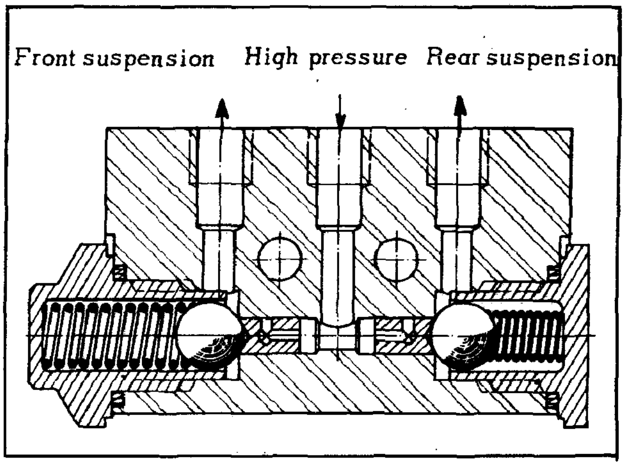


Pressure distributor.

Vehicles with hydraulic gear change D. 39-7

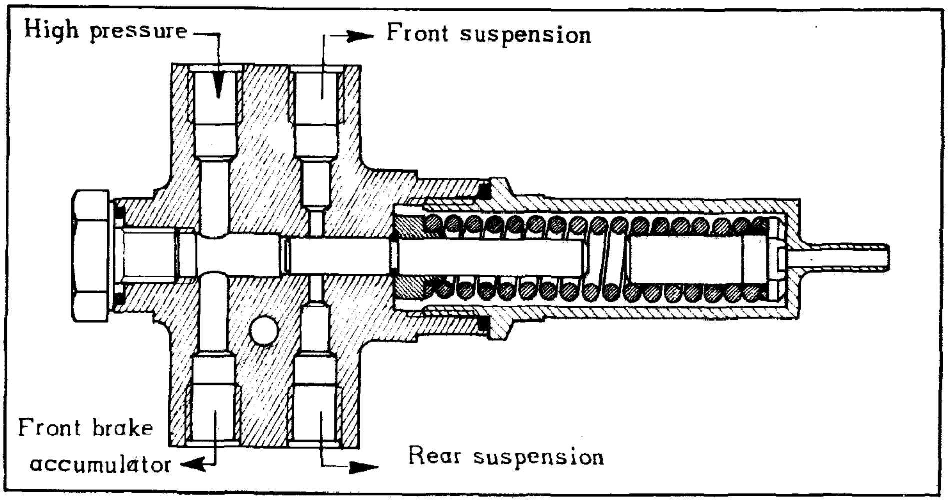


Vehicles with manual change D. 39-8



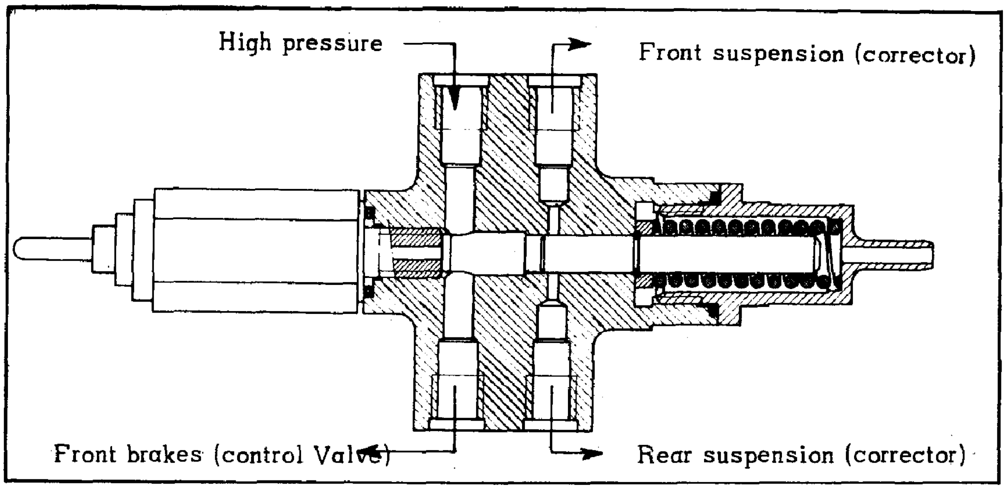
Priority Valve

D. 39-10



Security valve

D. 39-5



III. PARTICULAR FEATURES.

1. Seven cylinder high pressure pump :

- tension for belts	40 kg. (88 lbs)
- piston push rods : (lenghs : in steps of 0,1 mm.)	28,8 to 30,5 mm.
- clearance between piston crown (TDC) and valve	0,5 mm.
- tightening of nut on drive pulley	40 mAN (4 m.kg) (29 ft. lbs)
- tightening of nuts and screws securing bearing to pump body	35 mAN (3,5 m.kg) (25,3 ft. lbs)
- tightening of securing nuts on gearbox housing	35-40 mAN (3,5-4 m. kg)(25,3 to 29 ft lbs)

Renew all seals after each dismantling.

2. Single cylinder high pressure pump :

- clearance between pump body and plug (before tightening)	0,05 to 0,09 mm.
- tightening of screws securing plug	17 to 19 mAN (1,7 to 1,9 m.kg) (12,3 to 13,7 ft. lbs)

3. Pressure regulator :

- shims adjusting pressure regulator : thicknesses	0,25 and 1 mm.

NOTE : *A thickness of 1 mm brings about a change in pressure of* . . 10 bars (150 psi)

- clearance between cup and cut-in ball	0,3 to 0,4 mm.
- tightening of nut securing control piston cylinder	30 mAN (3 m.kg) (22 ft. lbs)
- tightening of nut supporting plug	170 to 200 mAN (17 to 20 m.kg) (122 to 144 ft. lbs)

- *lubricate threads with hydraulic fluid.*

4. Pilot valve pressure regulator.

- - adjusting shims : thickness	cut in . . .	0,30 and 0,70 mm
	cut out . .	0,30 mm

- cut in chamber : 1 0,30 mm shim brings about a change in pressure of . . . . 3 bars (43 psi) approx.

- cut out chamber : 1 0,70 mm shim brings about a change in pressure of . . . 7 bars (100 psi) approx.

Manual 814-1

5. Priority valve :

Thickness of adjusting shims . . . . 0,9 mm

Tightening of plug screw . . . . 12 mΛN (1,2 m.kg) (8,68 ft. lbs)

Tightening of plug . . . . 17 to 23 mΛN (1,7 to 2,3 m.kg) (12,3 to 16,6 ft. lbs)

6. Security valve :

Thickness of adjusting shims . . . . 2,9 - 3,8 - 4,7 mm

7. Pressure distributor :

	Hydraulic gear change		*Manual gear change*
	Front	Rear	Front and Rear
Plug	Short	Long	Long

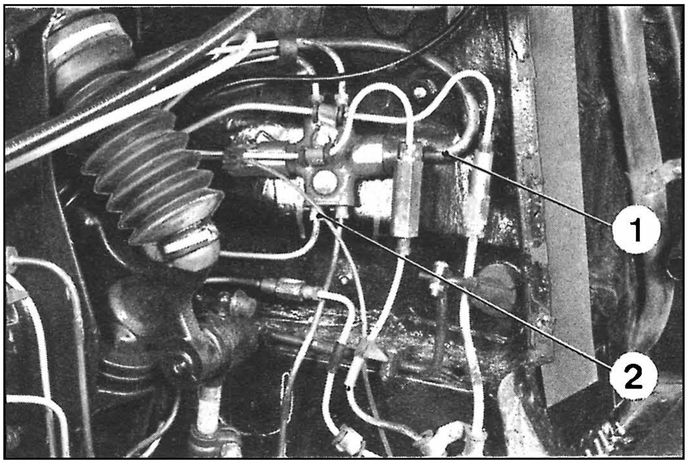
CHECKING HYDRAULIC COMPONENTS ON THE VEHICLE

VEHICLES DV-DT-DP

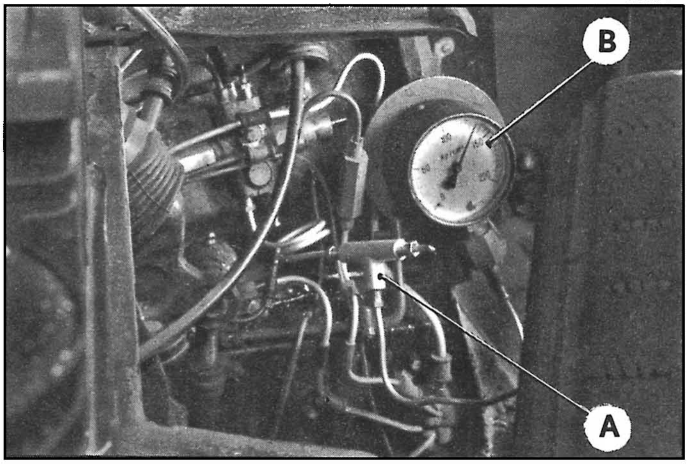
In order to carry out these checks, the following must be used:

- 2-3-way unions (HY 453-134)
- 2 link pipes (DV 394-122)
- (ALD) rubber seals (NN 394-87a)
- (green marking for LHM fluid)
- 1 pressure gauge graduated from 0-200 bars (0-3000 psi)
- 6 plugs (male and female)

2418



3261



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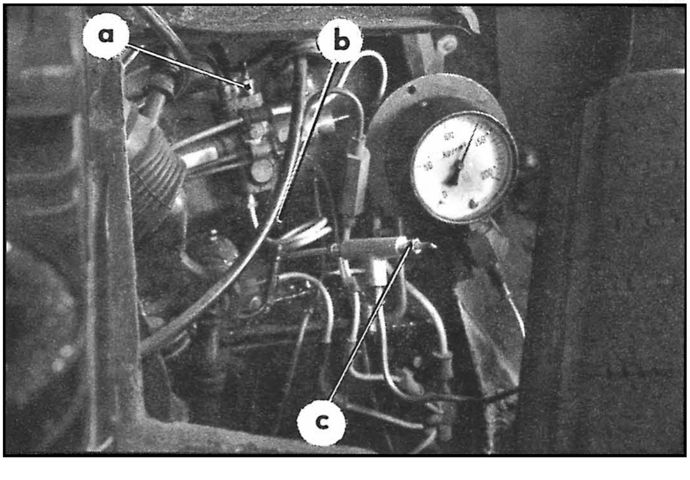


IMPORTANT :

It is essential to carry out the checking operations observing the greatest possible degree of cleanliness. The components and the areas surrounding connections must be carefully cleaned before dismantling.

The operations are to be carried out with :

- The vehicle in *low* position
- The pressure regulator bleed screw open.
- Engine stopped.

unless otherwise instructed.

PREPARATION.

1. Make sure that :
  - The H.P. pump belts are at the correct tension
  - The hydraulic fluid reservoir filter is clean
  - The hydraulic fluid is at the correct temperature (carry out a preliminary road test if the vehicle is cold)

2. Remove :
  - Front left wing
  - Plate protecting suspension mechanism

3. Put height control lever in *low* position :

4. Loosen the pressure regulator bleed screw.

5. Disconnect :
  - Rubber overflow return pipe (1) from security valve
  - Font brake feed pipe (2) from security valve

6. In the place of front brake feed pipe (2) connect a 3-way union A equipped with a pressure gauge B on to security valve. The union and pressure gauge remain in this position throughout all the various checks.

CHECKS

7. Checking the main accumulator.

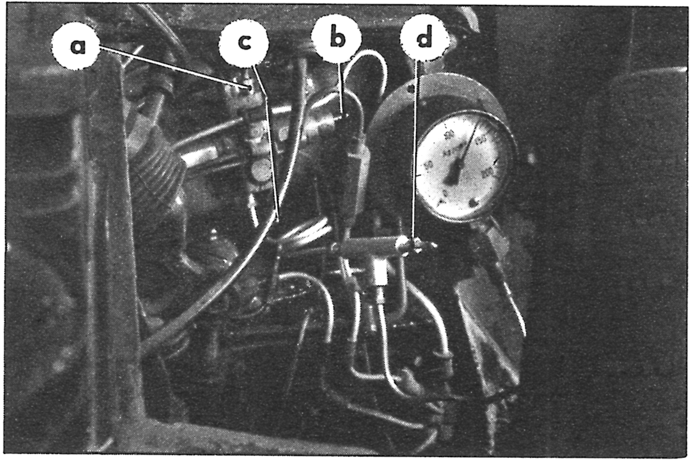
a) Disconnect feed pipes for front suspension «a» and rear suspension «b»
By means of the plugs, block :
- end piece «c» of 3-way union.
- openings «a» and «b» on front and rear suspension feed pipes.

b) - Put gear lever in neutral position.
Put on handbrake and tighten pressure regulator bleed screw

c) - Without switching on ignition, activate the starter.
Observe the pressure gauge needle. It rises steadily, then seems to stabilize before rising again. Take a reading when the needle comes to rest. This is the inflation pressure of the main accumulator and must be between :

- $40^{+\ 5}_{-\ 10}$ bars ($569^{+\ 30}_{-\ 150}$ psi)
for vehicles ⟶| 3/1973
- $60^{+\ 5}_{-\ 10}$ bars ($853^{+\ 30}_{-\ 150}$ psi)
for vehicles |⟶ 3/1973

3261



8. Checking pressure regulator :

Block end-piece «d» of 3-way union and openings «a» and «c» of front and rear suspension feed pipes.

a) **Cut-out.**
Start the engine, with the pressure regulator bleed screw tightened and the vehicle in *low* position.

Observe the pressure gauge needle . When it ceases to rise, it indicates the maximum cut-out pressure.

Switch off the engine.

Observe the pressure gauge needle and note the drop in pressure in the next 3 minutes.

If the fall in pressure is greater then 10 bars (150 psi), check again. If the result is the same, the pressure regulator is faulty.

Replace it or repair it.

b) **Cut-in**
Start the engine.

When the cut-out operates, slightly open the pressure regulator bleed screw. The pressure gauge needle drops slightly, then rises again when the high pressure pump begins to work.

The minimum value shown by the pressure gauge needle corresponds to the cut-in pressure.

9. Checking security valve.

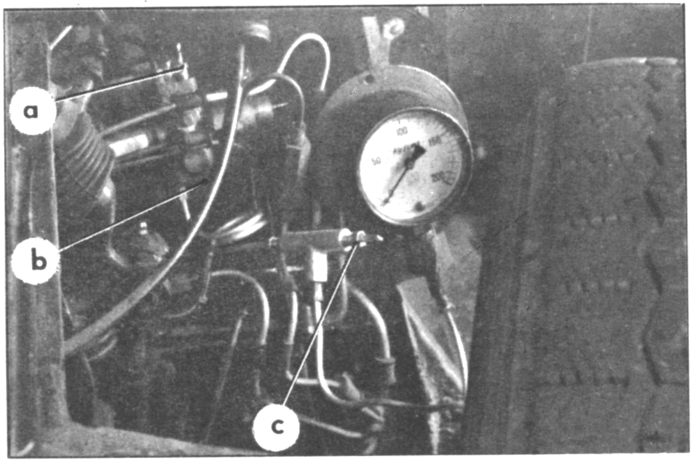
By means of the plugs, block the end-piece «d» of the 3-way union and openings «a» and «c» of front and rear suspension feed pipes.
Start the engine.

When cut-out pressure has been reached, observe end-piece «b» of overflow return pipe from security valve.

If there is a slight amount of seepage, the security valve is working properly.

If there is a heavy discharge of fluid, the security valve must be replaced.

3259



10. Checking the slide-valve of the security valve.

By means of plugs block :

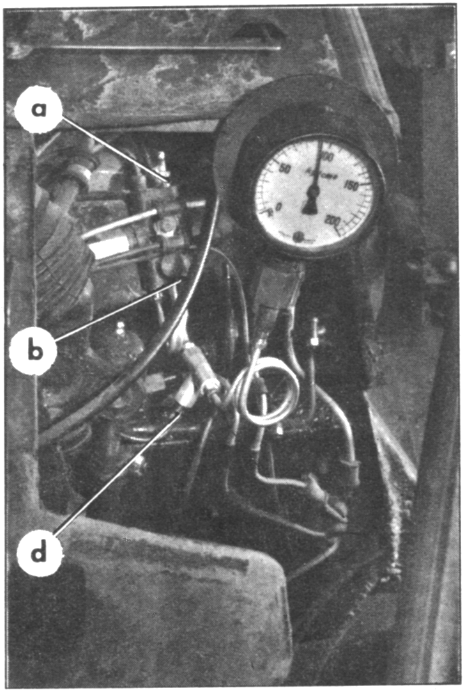
- the end piece «c» of the three way union
- an opening «a» of the suspension feed pipe

Tighten the pressure regulator bleed-screw

Switch on and activate the starter to allow the engine to turn.

Fluid must begin to escape by the free opening «b» when pressure rises between 70 and 90 bars (995 and 1280 psi)

3267



11. Checking the brake control valve.

By means of plugs, block :

- Both openings «a» and «b» of the feed pipes for front and rear suspension.

Connect the brake feed pipe to the end piece «d» of the three-way union.

Start the engine.
Tighten the pressure regulator bleed screw.

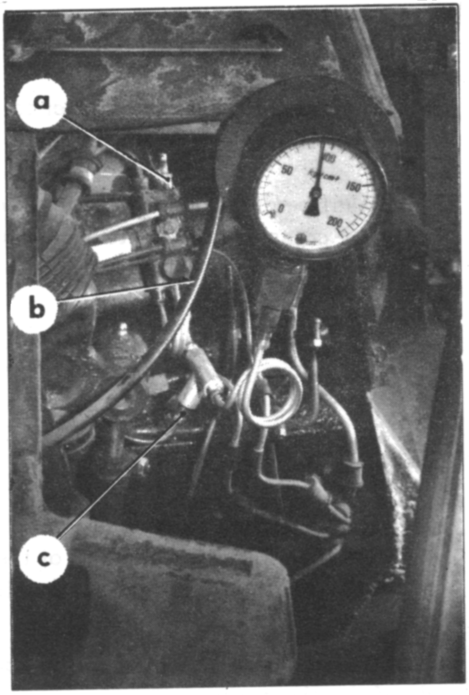
After the cut out wait 10 seconds for the pressure to stabilize then switch off the engine.

Note the pressure drop on the dial gauge in the next three minutes.

If pressure drop exceeds 10 bars (150 psi) check a second time. If the result is the same the control valve is faulty.

Repair it or replace it.

3267



12. Checking a brake pressure switch.

a) By means of plugs stop the openings of the feed pipes for front suspension «a» and rear suspension «b».
Connect the brake control valve feed pipe to end piece «c» of the three-way union.
Tighten the pressure regulator bleed screw.

Start the engine to obtain the cut-in pressure then switch off.

Operate the brake pedal until the pressure warning lamp remains illuminated.

b) At the same time pressure gauge reading must be between :
- 55 and 75 bars (783 and 1351 psi) *for vehicles* →| *3/1973*
- 75 and 95 bars (1067 and psi) *for vehicles* |→ *3/1973*

If the lamp does not come on between these readings, change the pressure switch.

13. Checking the front suspension

a) Stop by means of plugs :
- Opening «b» of the rear suspension feed pipe
- End-piece «c» of the three way union

connect the front suspension feed pipe to the security valve.
Tighten the bleed screw
Put height control lever in normal running position
Allow the engine to turn until front of vehicle rises and cut out occurs wait 10 seconds for the pressure to stabilize then switch off.

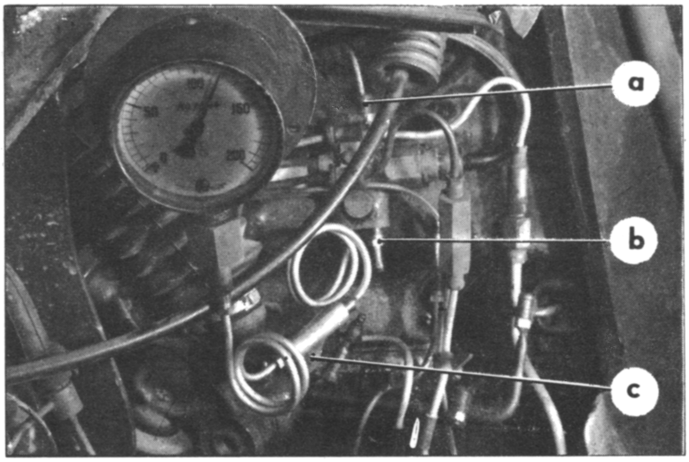
b) Observe the pressure drop on the dial gauge. If it exceeds 10 bars (150 psi) within the next three minutes, a new check is necessary.
If need be, check the following components to determine which one is leaking:
- the front suspension cylinders (one or both)
- the front height corrector.

Find out which component is faulty by process of elimination.

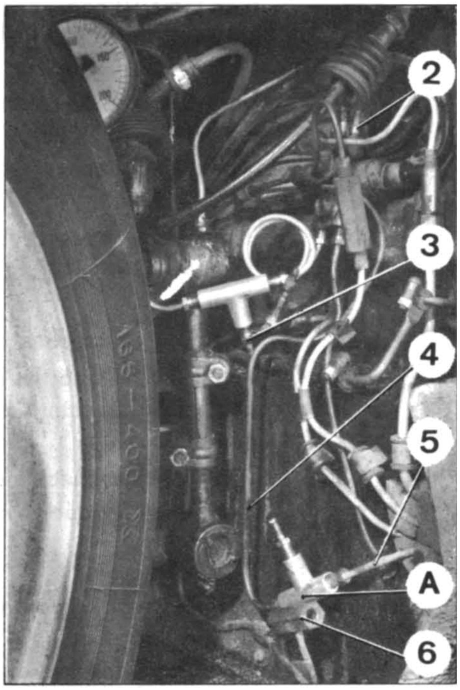
c) To check a suspension cylinder, stop its feed pipe by means of a plug and check as described above. Note the pressure drop on the gauge.

The leakage from the cylinder is calculated by taking the difference between the total leakage (noted in paragraph 13 b) when the whole front suspension is under pressure and the leakage of the cylinder alone.
It must not bring about a pressure drop exceeding 10 bars (150 psi) within three minutes. If it does, the cylinder is faulty.

3268



d) To check the height corrector block the suspension cylinder feed pipes by means of plugs. The leakage observed is that of the height corrector, and should not bring about a drop in pressure of more than 10 bars (150 psi) in three minutes.



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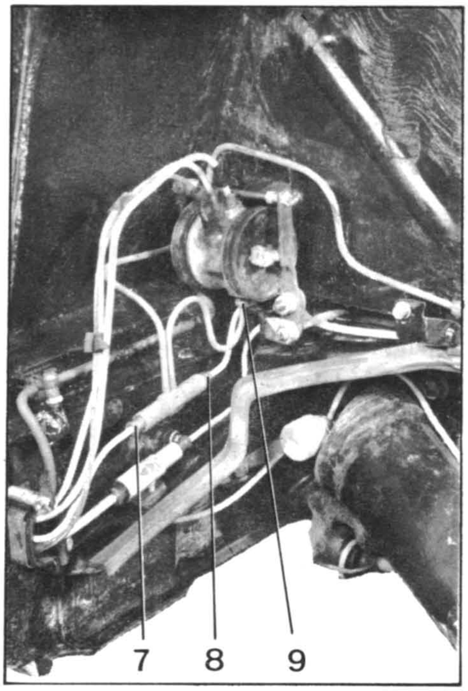

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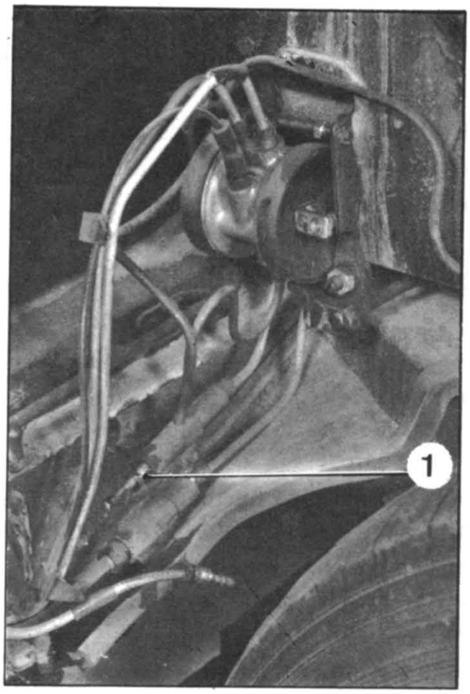


3266

14. Checking the rear suspension.

a) Block by means of plugs
- opening (2) feeding front suspension
- end-piece (3) on 3-way union, feeding brake control valve.
- union feeding rear brake (1).

Eliminate the power assisted steering by inserting a foil between the sealing plate and flange, thus blocking the feed openings. Disconnect rear suspension feed pipes (4) and (5) from power assisted steering union (6)

Connect the feed pipes to a 3-way union A, and block the third opening with a plug.

Tighten the bleed screw.

Put the height control lever in normal running position allow the engine to turn until the front of the vehicle rises and cut-out occurs. Wait ten seconds for the pressure to stabilize then stop the engine.

b) Observe the drop in pressure on the dial gauge. If it exceeds 10 bars (150 psi) in 3 minutes, check again. If the result is the same, find out which component is faulty by using the following method.

1°) On vehicles ⟶| *2/ 1967.*

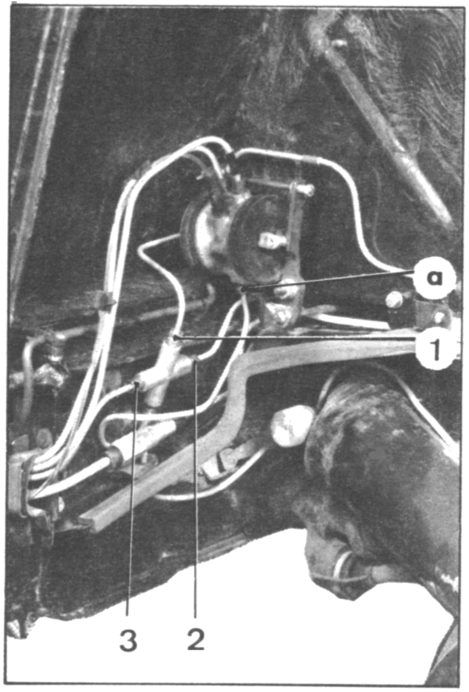
Block rear brake feed union (7).

To check rear right cylinder, block union (8)

To check corrector, block opening (9) on corrector.

The leakage from rear left cylinder cannot be measured, but must be calculated by taking the difference between the total leakage (corrector and cylinder) and the leakage from the corrector alone.

3083



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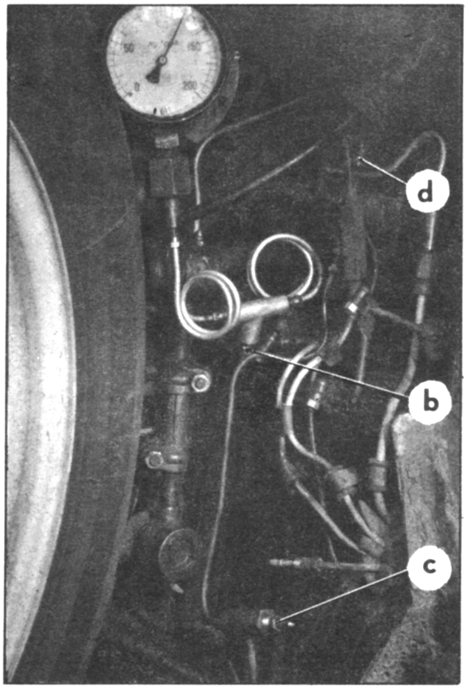


2°) *On vehicles ⟼ 3/1967.*

Block rear brake feed union (3)
To check rear right cylinder, block union (2)
To check rear left cylinder, block union (1)
To check height corrector, block opening «a»

15. Checking the power assisted steering.

a) Block, by means of plugs :

- End-piece «b» on 3-way union
- Opening «d» feeding the front suspension
- End piece «c» on 3-way union feeding the rear suspension.

Connect the feed pipe for the rear suspension and the security valve on to the security valv

Tighten the pressure regulator bleed-screw and put the height control lever in normal running position.

Allow the engine to turn until cut-out occurs then wait 10 seconds for the pressure to stabilize before stopping the engine.

b) Note the drop in pressure on the dial gauge. If it exceeds 10 bars (150 psi) in 3 minutes, repeat the check.

c) If repair is necessary, find out whether the leak is in the rotating union on the rack control

Do this by a process of elimination :

Block the feed to the rack control by inserting a foil between the housing and the sealing plate.

Carry out the check again. If there is a leak it can only be due to a faulty rotating union.

16. Simplified check of control valve.

a) Disconnect the brake rubber return pipe from the hydraulic reservoir.

Attach a transparent plastic tube to the end of the pipe.

Start the engine and put the height control lever in normal running position.

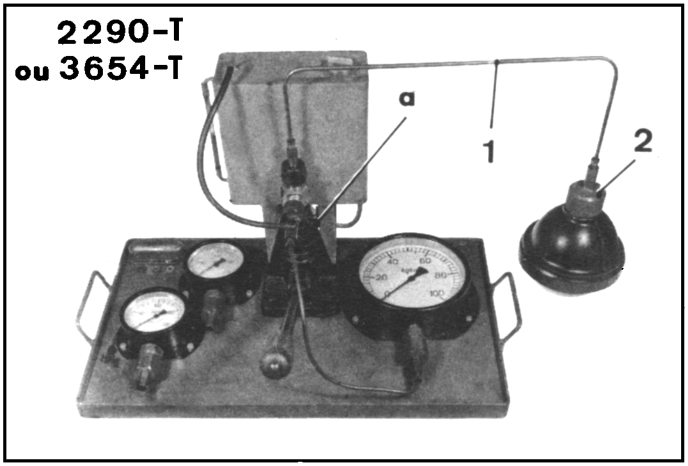
b) When the vehicle has reached *normal* height, depress the brake pedal until fluid appears in the transparent tube.

Release the pedal and observe the fluid level which should remain pratically stable. If there is a rapid rise in the level, the control valve must be replaced.

VEHICLES ALL TYPES

CHECKING THE INITIAL PRESSURE OF A SUSPENSION SPHERE OR A BRAKE ACCUMULATOR

NOTE : *To carry out this operation make use of test bench 2290T for vehicles using synthetic hydraulic fluid LHS2 (Red marking) and bench 3654T for vehicles using mineral fluid LHM (green marking)*



1. Fit union (2) on to the sphere by inserting a ring seal (*marked white*)
This union is supplied as a part of the test bench kit.

2. Connect union (2) on to test bench pump by means of a pipe (1) (without marking for LHS2. With green marking for LHM)

TAKE CARE : *Make use of accessories and gauges corresponding to each hydraulic fluid specification.*

3. Read the figure stamped on the sphere plug which indicates the inflation pressure.

4. Tighten the pump bleed screw «a». Operate the pump to build up the pressure while observing the gauge : the pressure will not rise appreciably at first but will then rise rapidly and remain steady at a figure which is the inflation pressure.

NOTE :
At a temperature of 20° C (68° F) the pressure should be :

a) **Suspension spheres :**

- *Saloons*

Front spheres 59^{+2}_{-15} bars (840^{+30}_{-220} psi)

Rear spheres 26^{+2}_{-10} bars (370^{+30}_{-150} psi)

- *Safaris*

Front spheres 59^{+2}_{-15} bars (840^{+30}_{-220} psi)

Rear spheres 37^{+2}_{-10} bars (526^{+30}_{-150} psi)

b) **Main accumulator :**

Vehicles all types... 65^{+5}_{-15} bars (924^{+71}_{-220} psi)
(except DV-DT-DP)
DV-DT-DP →| *3/1973 :* 40^{+2}_{-10} bars (569^{+30}_{-150} psi)

|→ *3/1973 :* 60^{+2}_{-10} bars (853^{+30}_{-150} psi)

c) **Brake accumulator :**

Vehicles all types 40 ± 2 bars (569 ± 30 psi)
(Except DV-DT-DP)

5. Allow the pressure to drop by unscrewing the pump bleed screw «a» remove test pipe (1) and union (2)

OPERATION No D 410-00 : *Characteristics and particular features of front axle* **Op. D 410-00**

VEHICLES ALL TYPES

1. CHARACTERISTICS *(on vehicles)*

1. Caster

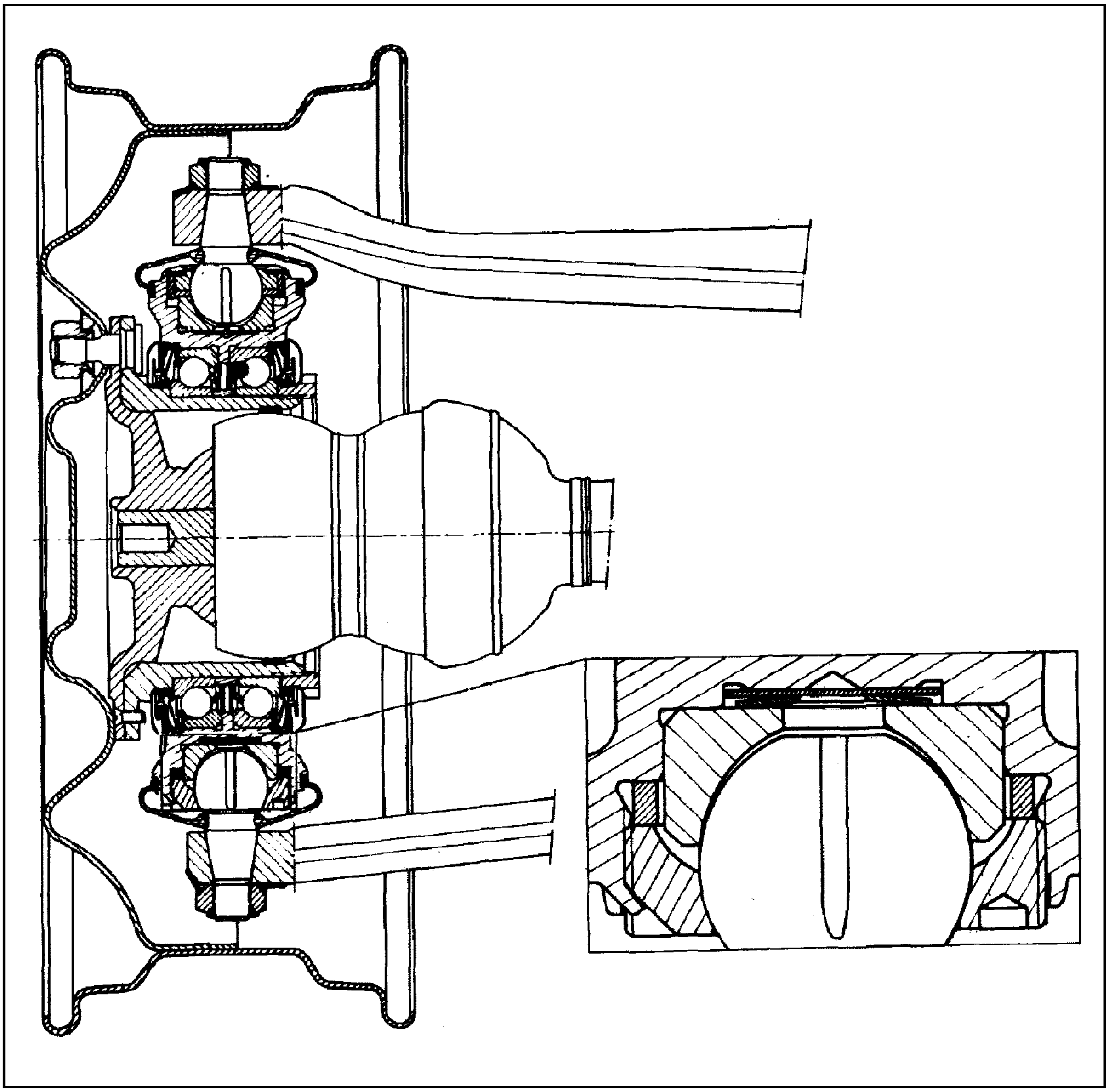
Caster angle	1° 30'

2. Camber

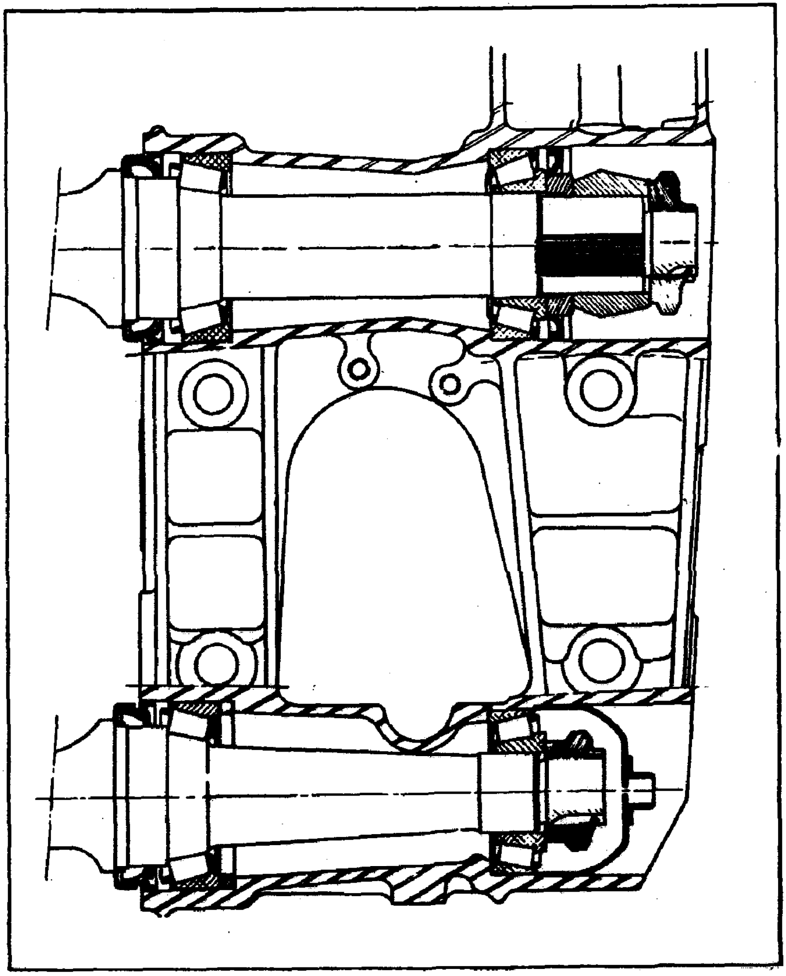
Difference between left side and right side	15' MAX.
Distance between anti-roll bar bearing and suspension control lever bearing :	
- L.H. side	199 mm
- R.H. side	198 mm

3. Wheel alignment

Toe-in	2 to 4 mm



D. 41.1



II. PARTICULAR FEATURES.

PIVOT

Do not clean the pivot assembly by immersion

The pivot bearings can only be replaced by using a special tool.

Tightening torque for nut of upper pivot ball on arm :....... 85 to 100 mΛN (10 m.kg) (72 ft.lbs)
Tightening torque for nut of lower pivot ball on arm :....... 100 mΛN (10 m.kg) (72 ft.lbs)
Tightening torque of nut locking pivot bearings :............ 980 $^{+390}_{-0}$ mΛN (100 $^{+40}_{-0}$ m.kg) (720 $^{+290}_{-0}$ ft.lbs.)
Tightening torque for lower ball pin nut on pivot :........... 390 mΛN (40 m.kg.) (290 ft.lbs)

Because of the high tightening torque, it is not possible to refit the ball joint on the vehicle without destroying the pivot and linkage.

Select the thickness of the adjusting shim for the lower pivot ball with precision.

The adjusting shim for the upper pivot is sold paired with the bearing assembly and races.

Do not fit the upper ball cup under a press or by blows, to avoid damaging the pivot.

HALF AXLE

1. Removal

The suspension piston rod can only be freed when the pin holes in the rod and the lever are in line. To bring them in line it is necessary to press on the arm.

2. Assembly

Tighten the screws holding the half-axle to between .... 70 and 90 mΛN (7 to 9 m.kg) (50 to 65 ft.Ibs.)

Anti-roll bar : lateral position is obtained by moving the right hand stop to 110 ± 0,5mm between the outer face of the boss holding the anti-roll bar knuckle on the right-hand side.

Tighten the anti-roll bar bearings to .... 12 mΛN (1,2 m.kg) (8,68 ft.Ibs.)

The bar should be able to turn without an effort greater than : 40 to 60 mΛN (4-6 m.kg) (29-43 ft.Ibs.)

End float of the bar .... 0,5 to 1 mm

To connect the anti-roll bar to the suspension cylinders, proceed as indicated in the corresponding operation to obtain a centre distance between the lever ball and the anti-roll bar of 198 mm on the right-hand side and 199 mm on the left-hand side.

3. Fitting

The outer face of the rear joint of the upper arm should be at $6,25^{+0}_{-0,5}$ mm from the outer face of the bearing inner cup.

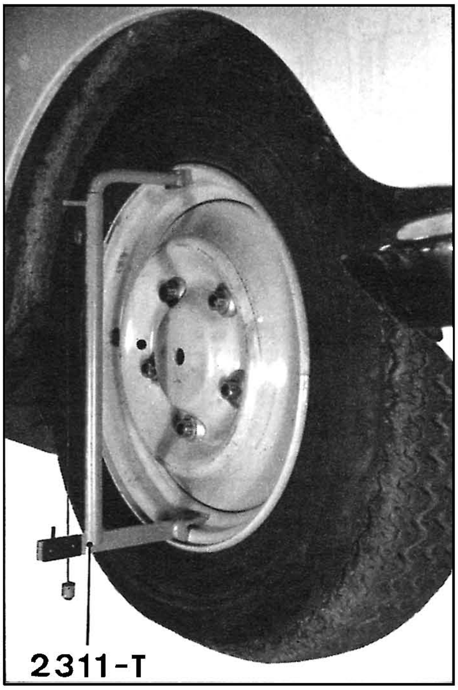
The outer face of the front joint of the upper arm should be at 2,5 ± 0,25 mm from the outer face of the support bracket.

Tighten the nuts securing the upper and lower arms to :....... 90 mΛN (9 m.kg) (65 ft.Ibs.)

Then loosen by 1/12 th of a turn.

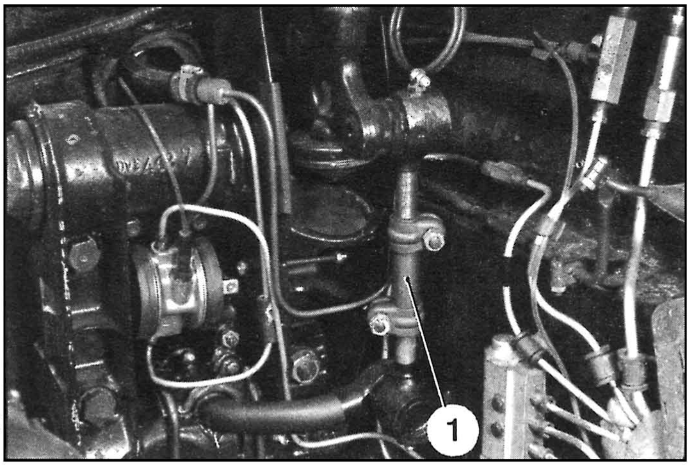
Adjust the caster angle using gauge 2321-T. The reading on this gauge should be between 24.75 and 25.25 mm (on the half axle which was removed).

VEHICLES ALL TYPES



1. ADJUSTING THE CAMBER

1. Check the heights (see the corresponding operation)
2. Put the vehicle on a flat, horizontal surface.
   Put the height control in the normal road position.
   Start the engine and keep it running for the whole operation.
3. Put the tool 2311 T in position
   Note the position indicated by the plumb on the scale of the tool.
4. Perform the same operation on the opposite wheel rim.
   The difference must not exceed 15 graduations on the scale.
5. Should this not be the case :
   Remove the front, left wing and the height corrector mudshield.
   Adjust the sleeve (1) to equalise the camber between the 2 wheels.



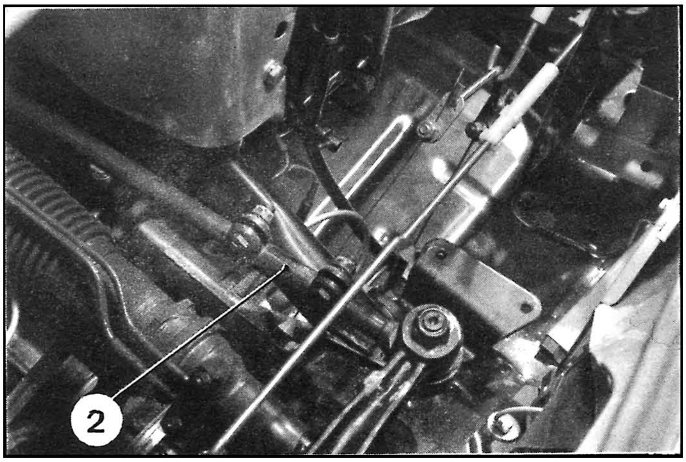
II. ADJUSTING THE ALIGNMENT

1. Put the vehicle on a flat horizontal surface.
   Put the height control in the normal road position.
   Start the engine and keep it running for the whole operation.

2. Use an ordinary commercial track-gauge.
   Measure at wheel centre height, the distance between the wheels rims, at the rear. Turn the wheels half a turn and measure at the front on the points previously marked.

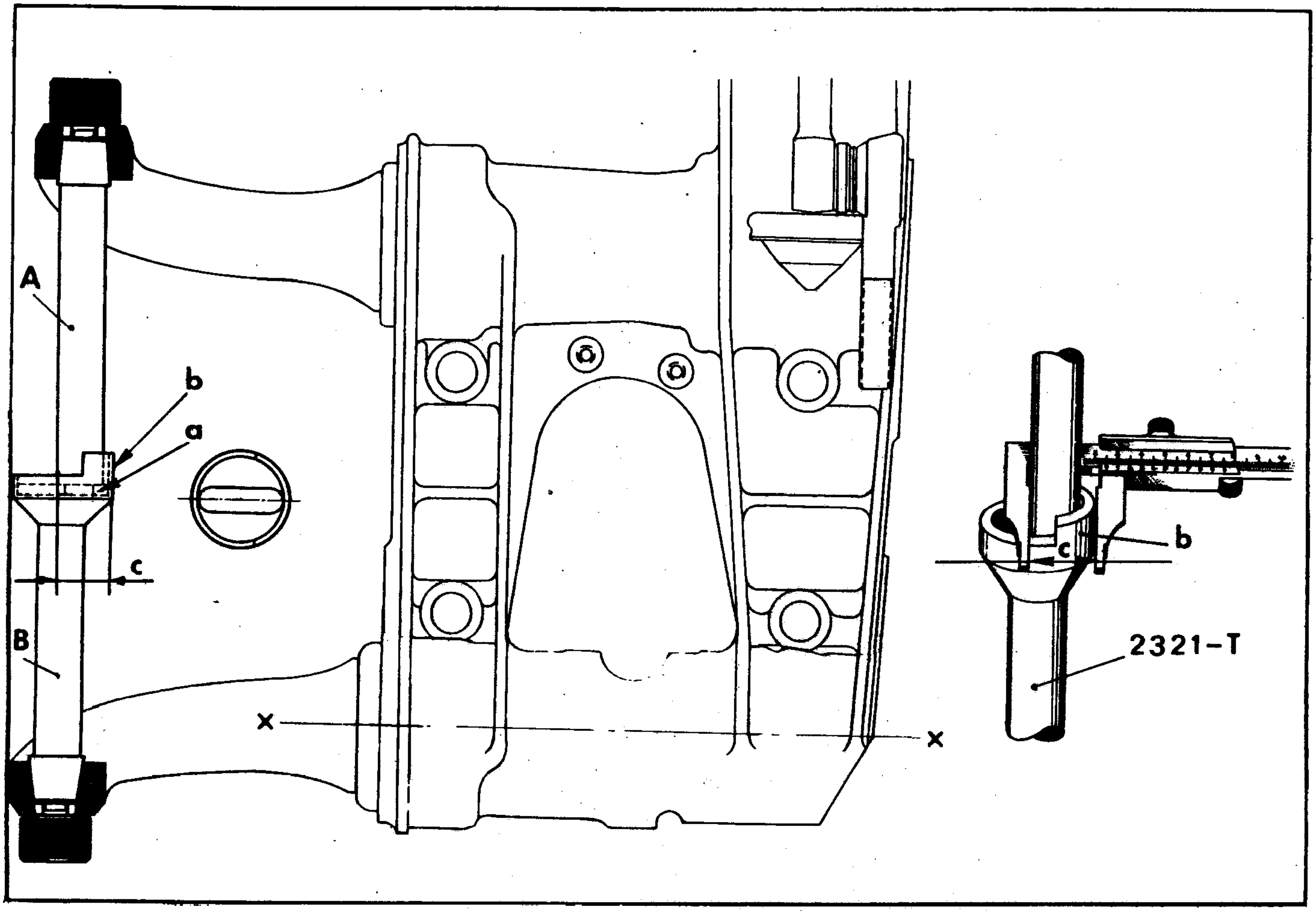
3. *There must be a toe-in of between 2 and 4 mm.*
   If not operate the track-rod sleeve (2) first raising the front of the vehicle.
   Loosen the sleeve clamp securing screws.
   Work by fractions of turns (a quarter of a turn corresponds to variation in the alignment of 1 mm)

4. Check the alignment again. Tighten the clamp screws to 1 mkg. (7,22 ft.lbs)
   Turn the steering to full right-lock and left lock to ensure that there is sufficient clearance between the clamp screws, the front cross member and the radiator fan cowl.



NOTE : Should the vehicle be equipped with direcdirectionally controlled long range lamps, a check of this device must be carried out as well.

III. CHECKING THE CASTER



D. 41-5 a

1. **Case 1** : using luminous projection or level tool :
   Follow the makers instructions;
   the caster should be : 1°30'

2. **Case 2** : using tool 2321-T
   a) Fix the two track gauges A and B onto the arms of the axle in such a way that the machined dovetail at "a" on the gauge B is parallel to the axis xx' of the arms, the shoulder (b) towards the rear.

   b) Using a caliper square, measure "c" parallel to the axis of the arms : to check this, pivot the caliper square, the dimension "c'' is the smallest of the measurements read from the sliding gauge.
   This measurement should be 25 ± 0.25 mm

OPERATION No D . 420-00 :*Characteristics and particular features of rear axle*

VEHICLES OF ALL TYPES

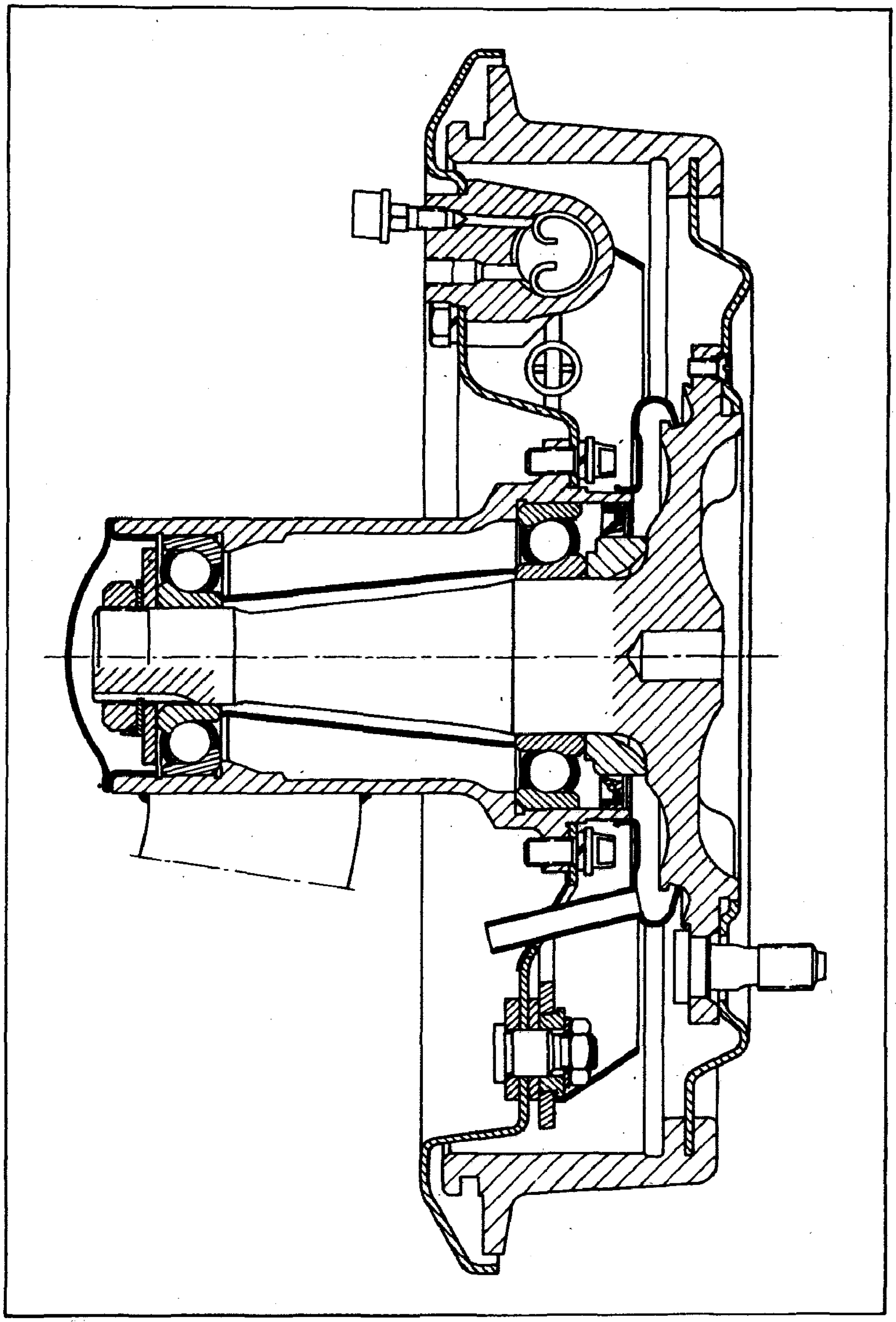
1. CHARACTERISTICS

1. Camber (not adjustable)
- Difference between L.H. Side and R.H. Side 1mm
- Angle .... 0° to 0° 15

2. Wheel alignment
- Toe-in (not adjustable) .... 0 to 2mm

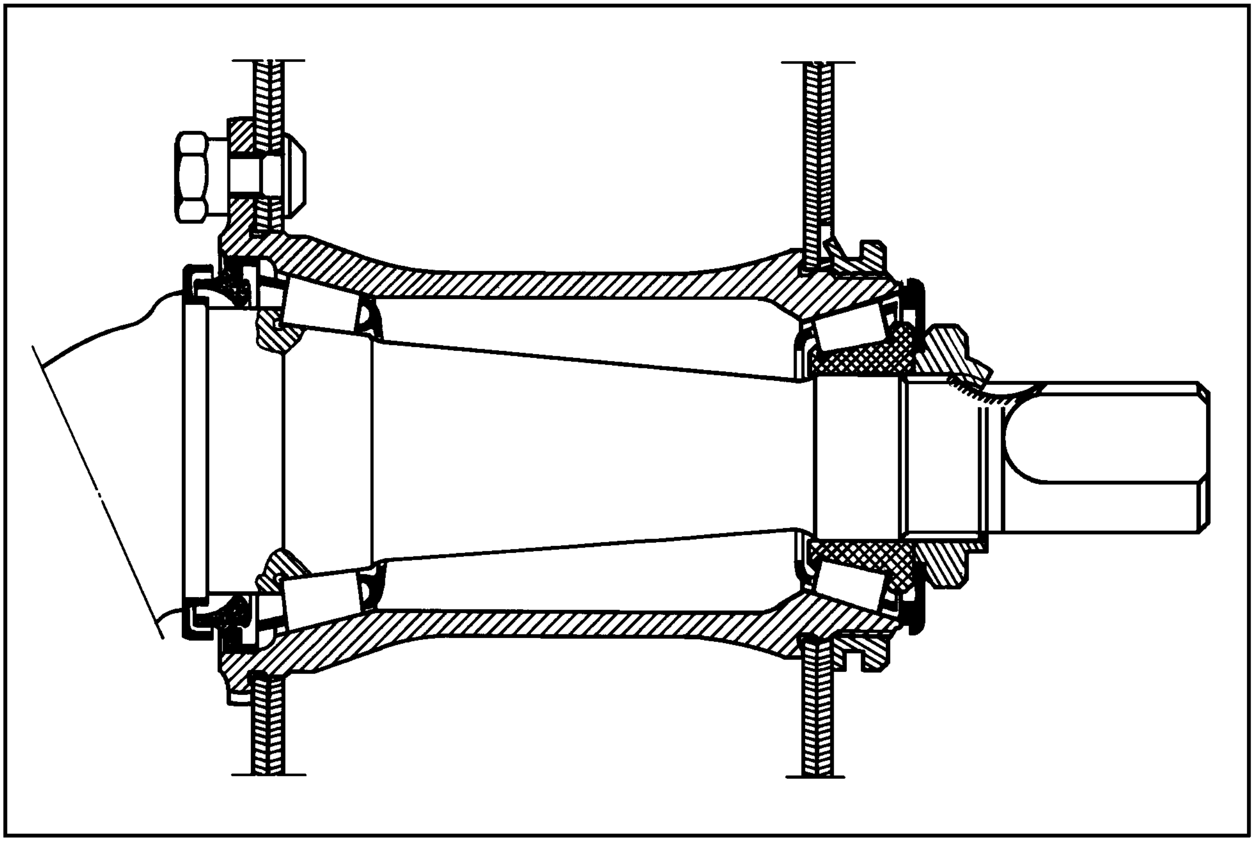
3. Hub

D. 42-2



4. Wheel arm bearing housing

D. 42-1



II. PARTICULAR FEATURES :

1. Hub :

- Length of conical spacer for hub bearing	72.78 ± 0,02mm
- Adjusting shims for hub bearings (25.1×31.8). thickness in steps of 0,04mm	1,98 to 3,70mm
- Outer face of bearing seal recessed in its bore	4,5mm
- Special bearing grease in housing	50grammes

2. Arm :

- Minimum clearance between arm and metal buffer on chassis	0,5mm

3. Tightening torques :

- Hub nut	100mΛN (10m.kg) (72 ft.lbs)
- Nut for wheel arm pivot after tightening, slacken by 1/6 of a turn	80 to 90mΛN (8 to 9m.kg) (57 to 65 ft.lbs)
- Screw securing brake back plate	25mΛN (2.5m.kg) (18 ft.lbs)
- Wheel fixing nuts	80 to 100mΛN (8 to 10m.kg) (57 to 72 ft.lbs)

OPERATION N°. D. 430-00 : *Characteristics and particular features of suspension*

D VEHICLES OF ALL TYPES

1. CHARACTERISTICS.

1. Spheres

a) Inflation pressure :

Saloon : front = 59^{+2}_{-15} bars (860^{+28}_{-220} psi) rear = 26^{+2}_{-10} bars (380^{+28}_{-150} psi)

Safari : front = 59^{+2}_{-15} bars (860^{+28}_{-220} psi) rear = 37^{+2}_{-10} bars (540^{+28}_{-150} psi)

b) Securing of dampers :

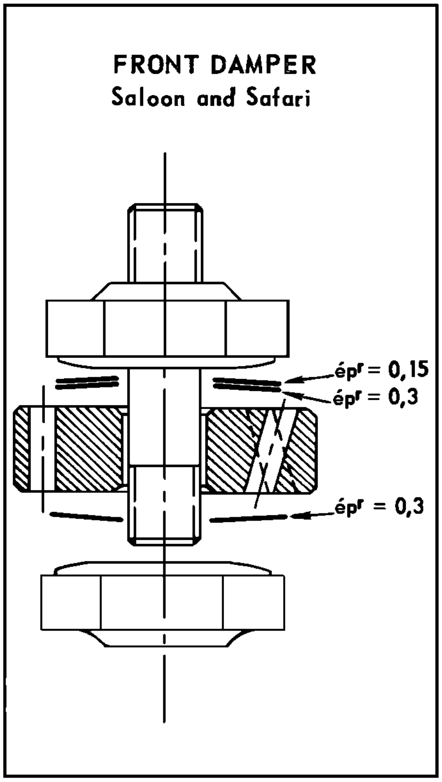
- *Vehicles produced up to December 1970:* The central shaft of the damper is screwed into the body of the sphere.
- *Vehicles produced since December 1970:* The damper is sealed in the sphere: these two components cannot be separated.

2. Dampers :

a) Vehicles produced up to December 1970 : These dampers can be removed and repaired

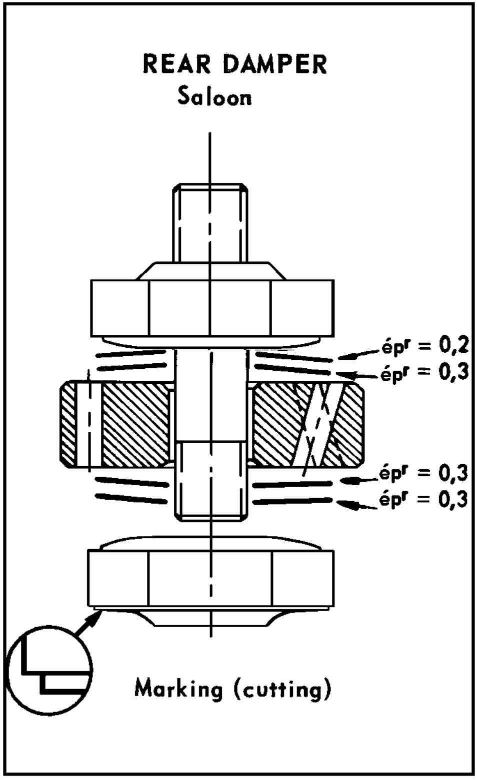
Manual 814-1

D. 43-2



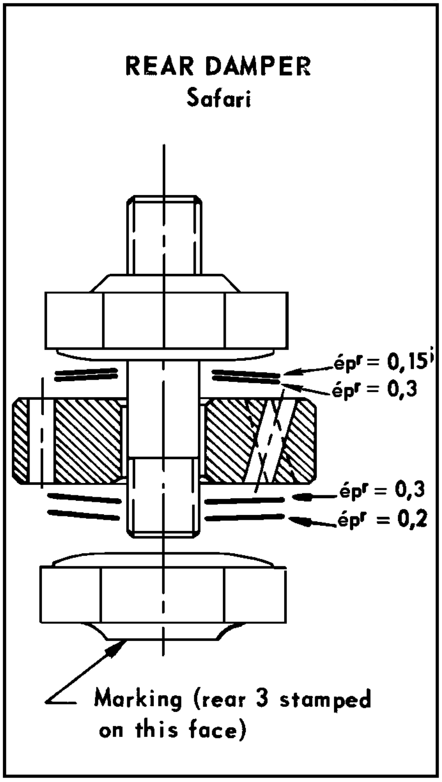
FRONT DAMPER
Saloon and Safari

D. 43-3



REAR DAMPER
Saloon

D. 43-4



REAR DAMPER
Safari

b) Vehicles produced since December 1970 : The damper is sealed in the sphere and cannot be repaired : if it is defective, the damper-sphere unit must be replaced.
The new components are interchangeable with the old ones, on condition that two identical spheres are fitted to the same axle.

3. Cylinders :

a) Diameter of cylinders and pistons :

- front (all types) and rear (saloon) . . . . 35 mm
- rear (safari) . . . . 40 mm

b) Sealing check pressure of cylinders . . . . 40 bars (580 psi)

4. Tyre pressure : *See Op. D.000*

Tightening torque of wheel nuts : . . . . 43-58 ft lbs (6-8 mkg)

5. Adjusting the heights :

NOTE : *The heights are measured between the under-face of the anti-roll bars and the plane on which the wheels are resting.*

Vehicles	Front Height	Rear Height
D. all types	235 ± 3 mm	335^{+10}_{0} mm
Safari	235 ± 3 mm	350^{+10}_{0} mm

II - PARTICULAR FEATURES

1. Pre-ajustment of the heights :

At the front, use gauges MR 630-51/3

At the rear, position the two arms so that there is a distance of 35 mm between the upper face of the cup and the rubber stop.

2. Adjusting of the anti-roll bar

Distance between stop clamp and inner face to pivot boss, R.H. end. . . . . . 110 ± 0,5 mm

Clearance between L.H. stop clamp and lower bearing when R.H. stop . . . .
clamp is in contact with R.H. bearing . . . . 0,5 to 1 mm

Tightening the bearings of the anti-roll bar : remove 0.2 mm of the specified thickness of the shims

Tightening torque for anti-roll bar clamp u-bolt nuts . . . . 12 mΛN (1,2 mkg) 9ft lbs)

Force required to turn anti-roll bar . . . . 4 to 6 kg (9 to 13 lbs) applied on ball joint

3. Suspension spheres :

Tightening torque for front L.H. spacer . . . . 50 mΛN (5 mkg) (36 ft lbs)

Tightening torque for screw securing suspension cylinder . . . . Hand tight

Tightening torque for corresponding lock nuts. . . . . 19 mΛN (1,9 mkg) (14 ft lbs)

Tightening torque for dampers (torque wrench) ⟶| *Dec./1970.* . 15 to 17 mΛN (1,5 to 1,7 mkg) (11 to 12 ft lbs)

OPERATION N° D.IE 430-00 : *Characteristics and particular features of the suspension* **Op. D.IE 430-00**

D.IE VEHICLES - ALL TYPES

The suspension of the cars equipped with electronic fuel injection system is similar to that of the other vehicles with the exception of the following points ;

1°) Size of tyres :

Front and rear	185 HR 380 XAS
Inflation pressures front wheel	2 bars (29 psi)
rear wheel	1,8 bars (26 psi)

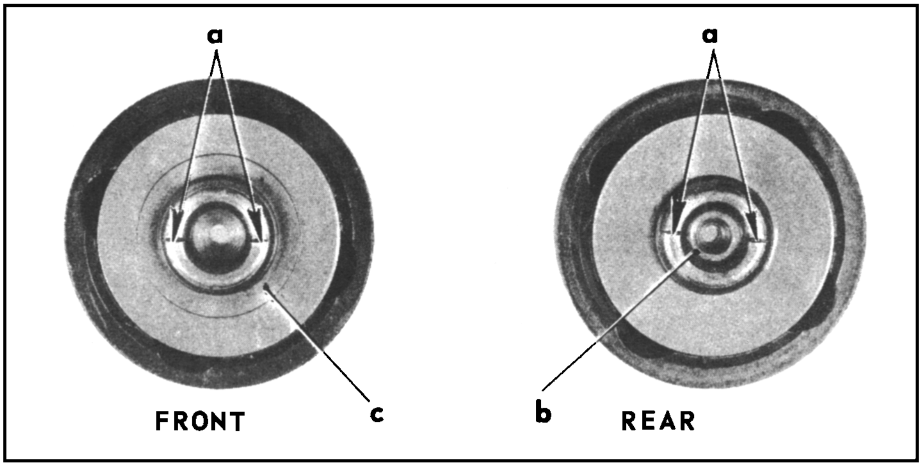
2°) Suspension Spheres and Dampers :

a) *Vehicles produced up to December 1970*

The spheres and dampers are modified :

- the dampers cannot be repaired : the central shaft is sealed
- the dampers are fixed to the spheres by threaded rings

7048



NOTE : These dampers are distinguished by 2 marks at «a», diametrically opposed.
The front dampers are distinguished from the rear ones by :

- an additional washer valve «c», of smaller diameter on the front dampers
- a shoulder «b» in the central hole of the rear damper

b) *Vehicles produced since December 1970*

The dampers are sealed in the spheres : these two components cannot be separated.

The sealed damper-sphere units are interchangeable with the old parts on condition that two identical spheres are fitted on the same axle.

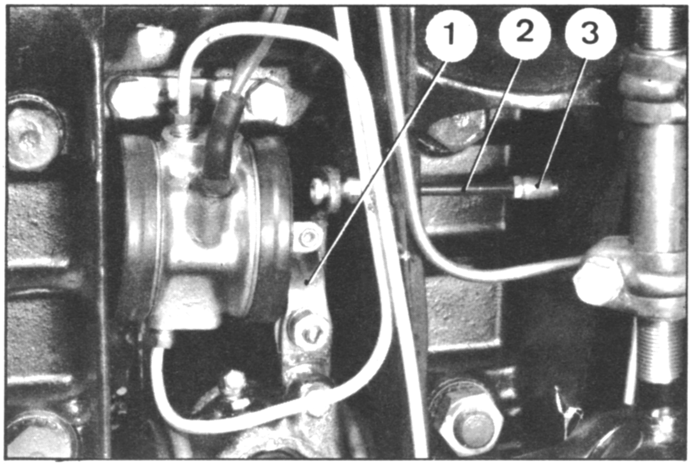
3°) Adjusting of heights :

NOTE : The heights are measured between the under-face of the anti-roll bars and the plane on which the wheels are resting :

Front height = 235 ± 3 mm - Rear height = $355 {}^{+10}_{0}$ mm

I - PRE-ADJUSTMENT OF THE FRONT HEIGHTS

1625

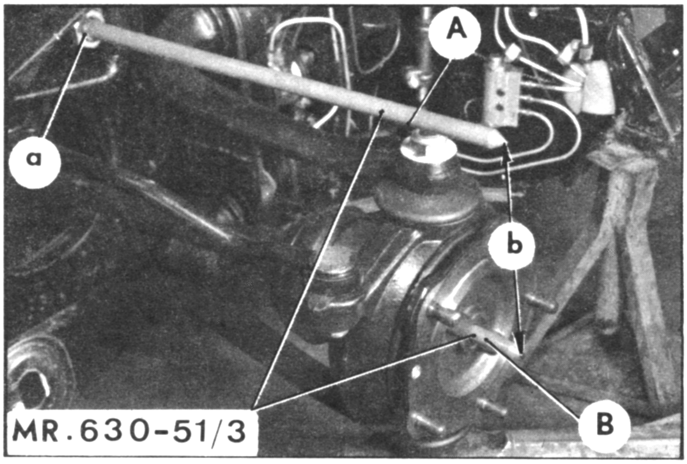


1. Connect the height control rod (2) to lever (1) and to fork end (3) on the corrector control bar, the manual height control lever being in the low position.

2. Place the manual height control lever in the *high* position. Make sure that the corrector valve is fully open and check this by trying to push it forwards with a screw driver levering against the wheel arm bracket rib.

   NOTE : *Never lever against the corrector as this would cut the rubber cup.*

1533



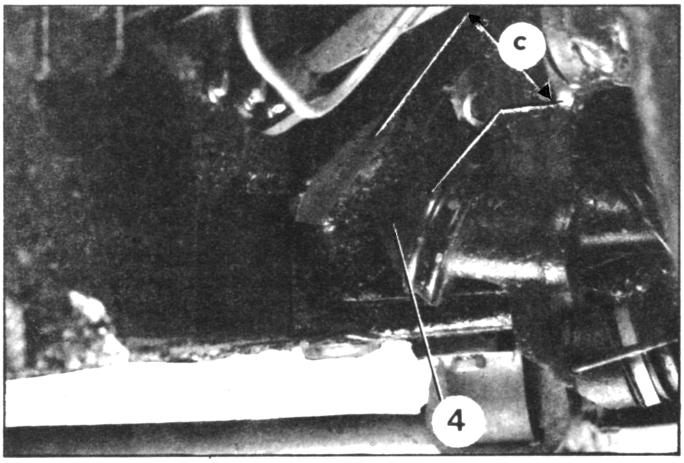
3. Put the gauges MR 630-51/3 in position. The shorter gauge B in the wheel hub; the longer one A in the bore «a» of the steering relay.

   By means of two jacks (one under each lower arm) raise the arm assembly to bring the shorter gauge to a distance «b» of 185 mm from gauge A.

   Ensure that there is a clearance of about 1 mm between the bottom of the fork on the control lever and the corrector ball-pin; if not, move the control rod on the anti-roll bar (spanner : 1677-T).
   Remove gauges MR 650-51/3.

II- PRE-ADJUSTMENT OF THE REAR HEIGHTS

1790



4. Position the two arms so as to obtain a distance «c» of 35 mm between the upper edge of the cup for the rubber stop (4) and the thrust face of the steel stop.

5. By means of the control rod, put the height corrector in the fully open position.
   Tighten the clamp (spanner 1677-T for the screws with flats).

III - ADJUSTMENT OF THE HEIGHTS

In order to carry out this operation, the vehicle must be in running order.
Place the height control lever in "normal" posiposition.

6. Check the tyre pressures : *See Op. D. 000*

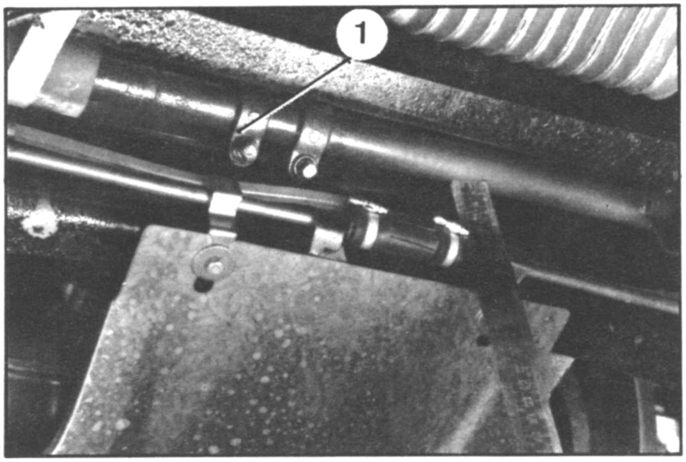
7. Place the car on a lift or over a pit. Allow the engine to idle. Release the parking brake. Do not chock the wheels.

8. Adjust the front heights
Slightly loosen the clamp screw (1) securing the height corrector control rod. Operate the clamp in the required direction to obtain an average height of :

235 ± 3 mm

This measure is taken from the underside of the anti-roll bar to the surface on which the wheels are resting. The height of the car is increased or decreased as the clamp is turned turned either towards the front or the rear. Tighten the clamp screw (1) (spanner 1677 (spanner 1677-T).

1444



9. Check the front heights

a) Place a straight rod resting on the edges of of the lift or pit exactly below and parallel to the anti-roll bar. The lower part of the rod must be exactly level with the surface on which the wheels are resting.

b) By taking the front bumper in both hands lift the front of the car until the weight prevents any further raising. Let go when this point is reached. The car lowers then rises and stabilizes. At this moment measure, on both sides of the vehicle, the distance between the underside of the anti-roll bar and the surface on on which the wheels rest. The difference between these two measurements must not exceed 3 mm. If it does, operate the threaded sleeve of the anti-roll bar.
Take the average of the two distances which may be, for example , 236 mm.

c) Lower the car by pressing on the front bumpers. Let go when resistance is felt.
The car rises then lowers and stabilizes
Measure on both sides of the vehicle the distances between the underside of the anti-roll bar and the plane on which the wheels are resting. Take the average of the two measures.
For example : 232 mm.
Take the average of the figures determined in paragraphs b and c :
For instance, in the example chosen :

$$\frac{236 + 232}{2} = 234 \text{ mm}$$

This average must be between :

232 and 238 mm

If it is not,repeat the operations described in paragraph 8.

10 - Adjust the rear heights :

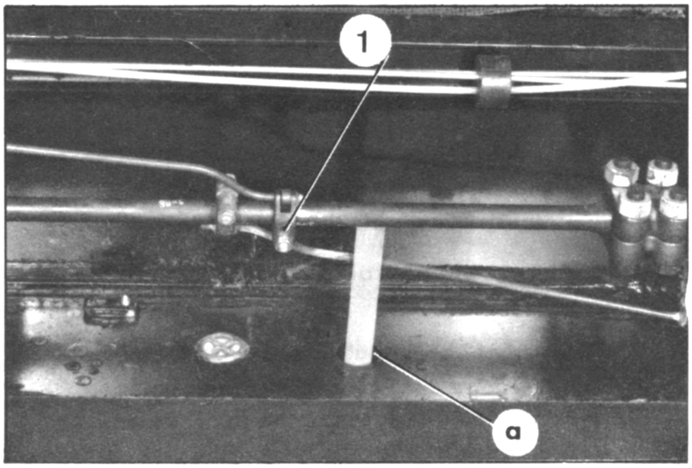
Proceed as for adjusting the front heights (see paragraph 8) after having removed the corrector control shield (inside the boot).

Operate on the clamp (1)

The height to obtain from the underside of the anti-roll bar to the ground is :

- *D Saloon all types (except IE) :* 335^{+10}_{0} *mm*
- *D.IE all types :* 355^{+10}_{0} *mm*
- *D Safari :* 350^{+10}_{0} *mm*

1791



11- Check the rear heights :

a) Place the straight rod resting on the edges of the lift or pit exactly below and parallel to the anti-roll bar.

b) Remove the rubber plug from the floor

c) Raise the car by taking the rear bumper in both hands. Let go when the weight prevents any further raising.
The vehicle lowers then rises and stabilizes
At this moment measure the distance between the underside of the anti-roll bar and the plane on which the wheels are resting. (Insert the locating rod through the hole «a» in the floor, the end resting on the anti-roll bar).
Let this distance be,e.g. 347 mm.

d) Lower the car by pressing on the rear bumper.
Let go when resistance is felt.
The vehicle rises then lowers and stabilizes.

Note the distance between the underside of anti-roll bar and the plane on which the wheels stand, for example : 342 mm.
Take the average of the figures :

e.g. $\frac{347 + 342}{2} = 344{,}5$ mm

This measurement must lie between:

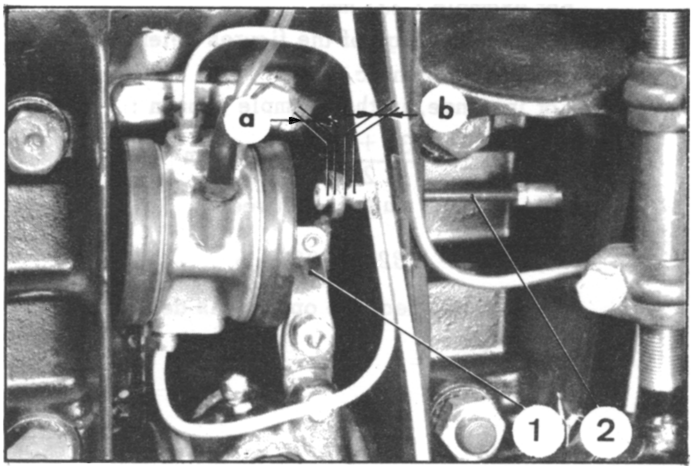
- *335 and 345 mm*
  for D vehicles all types (except IE)

- *355 and 365 mm*
  for D.IE vehicles all types

- *350 and 360 mm*
  for Safari all types.

e) Refit the rubber plug and the corrector control shield. Check again the front heights and adjust them if necessary.
Check the camber of the front wheels. The difference between the two wheels must not exceed 1 mm.

1625



12. Adjusting the manual height control rods.

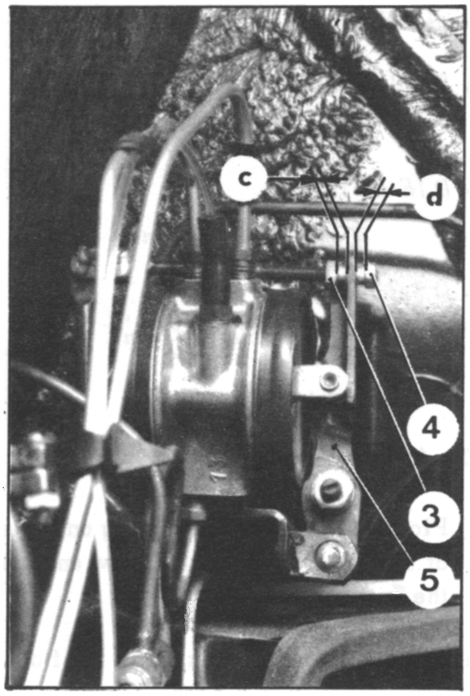
Place the manual control in normal running position.

a) At the front check that there is a clearance «a» with the corrector valve in full inlet position (lever (1) pushed towards the front) as well as a clearance «b» with the corrector valve fully open in the exhaust position, lever (1) pushed rearwards). Clearance measured between the lever (5) (5) and the nut.
Operate the control rod (2) if necessary.

b) At the rear, make sure that there is a clearance «c», with the corrector valve in full inlet position (lever (5) pushed forwards) and a clearance «d» with the corrector valve fully open in the exhaust position (lever (5) pushed towards the rear) clearance measured between the lever (5) and the nut.
If necessary, adjust the nuts (3) and (4).

c) Check the functioning of the manual height control. Ensure in particular that the control levers do not touch the body. If they do, adjust the position of the control bearings.

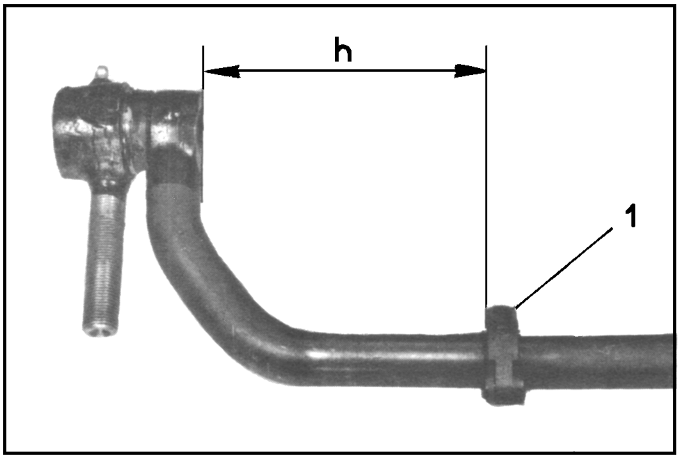
1626



NOTE :
If it is not possible to adjust the heights by operating the control rods, carry out the pre-adjustment of the heights (as explained in paragraphs 1 to 3 of same operation for the front and 4 to 5 for the rear).

IV - ADJUSTING THE FRONT ANTI-ROLL BAR

1686

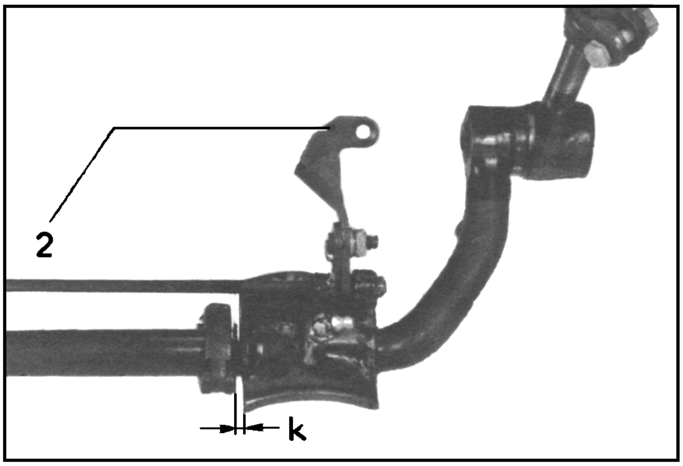


13. Adjust the lateral position of the anti-roll bar

a) Remove the lateral and lower mudshields.

b) Measure the distance (h) between the stop clamp (1) and the inner face of the right hand ball pin securing boss.
This distance can be measured by placing a straight rod on the boss, holding it in the hand, while checking the distance (h) by means of a rule (between the stop clamp and the outer face of straight rod).
If necessary, operate the stop in the apropriate direction to obtain distance (h) = 110± 0,5 mm..Tighten the clamp securing screw.

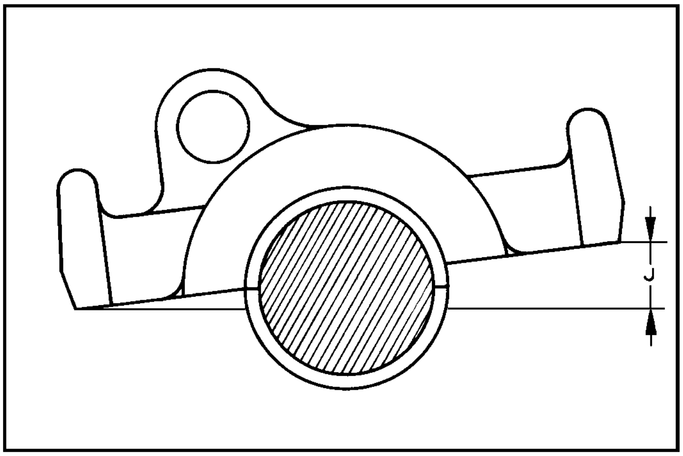
1687



14. Adjust the end float of the anti-roll bar

Push the bar to bring the right hand clamp into contact with the right hand half shell.
Position the left hand clamp to obtain a clearance «k» = 0,5 to 1 mm between it and the lower left hand half shell.
To do this, remove the front height corrector.

X 51



15. Adjust the half shells on the anti-roll bar

a) Place the half shell on the bar as shown in the illustration. Holding it in this position, measure clearance (j) using a set of feelers let j = 1,80 mm. (for example).
NOTE : the half shells are assembled so that they grip the bar lightly. Choose amongst the shims sold by the spare parts department those which give a thickness equal to :
$\frac{j - 0,2}{2}$ that is, in the above example :

$$\frac{1,80 - 0,2}{2} = 0,8 \text{ mm}$$

b) Smear the half shells with graphite grease and fit the bearing caps.
Insert the two above mentioned shims between cap and bearing.

c) Tighten the R.H. bearing cap nuts to 12 mΛN (1,2 mkg - 8,7 Ft lbs). Check the leverage required to rotate the anti-roll bar which should turn under a force of 2 to 3 kg (4 1/2 to 6 1/2 lbs) exerted upon the ball-joint. If it does not, change the shims for some of suitable thickness.

d) Tighten the nuts on L.H. bearing caps to 12 mΛN (1,2 mkg - 8,7 Ft lbs). Check the leverage so that the anti-roll bar turns as in (c) under a force of 4 to 6 kg (9 to 13 lbs). If necessary, change the shims as above.

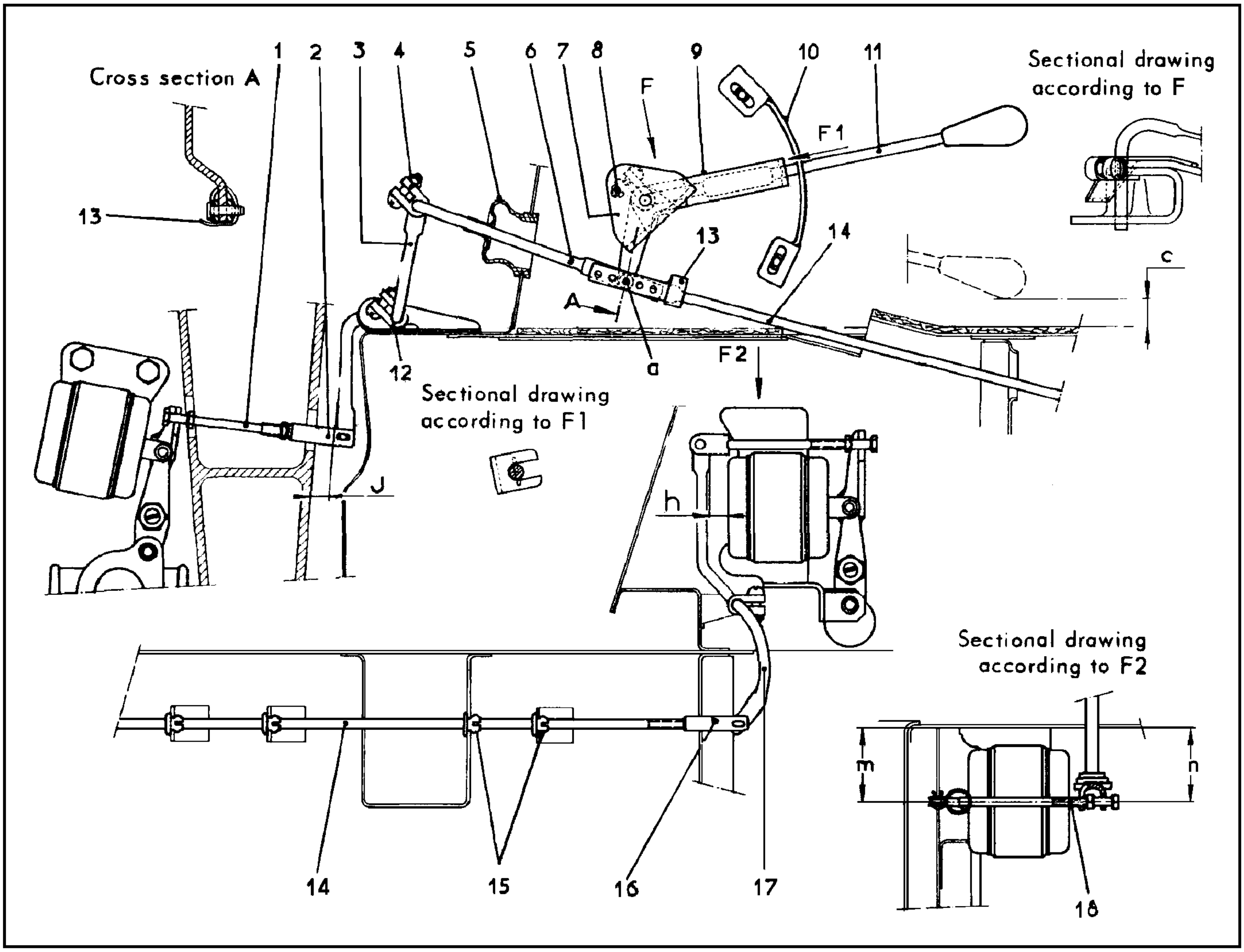
16. Fit the height corrector

17. Fit the lower mudshield

Manual 814-1

V - ADJUSTING THE MANUAL HEIGHT CONTROL

X. 55



18. Position front linkage rod (6) correctly in relation to relay lever (9).

    Determine in the rod the corresponding hole «a» to obtain a clearance $j = 7{,}5\ ^{+1{,}5}_{-0}$ mm

    If no adjustment is possible by using the holes in the rod (6) move the quadrant adequately in its slots.

19. Position rear linkage rod (14) in relation to relay lever (9)

    Find out which hole «a» will give clearance «h» $= 8\ ^{+1{,}5}_{-0}$ mm

    If this measure cannot be obtained with the holes in the rod (14), screw up or unscrew the fork (16).

20. Fit the connecting pin for the rods (6) and (14) to lever (9). Turn over the lock as shown in cross section A.

21: Lubricate the pivoting points and bearings (15) of the rod (14) (universal joint areas).

22. Adjust the lateral position of the front torsion rods. The end piece (1) of the rod must be within 1 mm approximately in the centre of the holes in the arm body.
    If necessary, move the rod after loosening clamp (12)

23. Adjust the lateral position of the rear torsion rods end-piece (18) must be parallel to the body

    $$m = n \pm 1 \text{ mm}$$

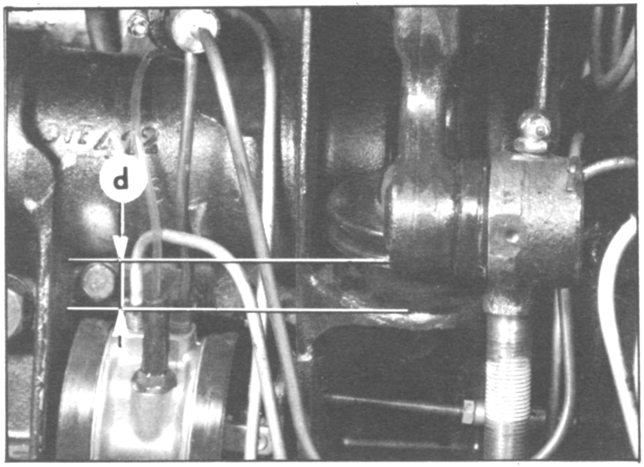
    Move the rod, if need be after loosening clamp (4)

24. Adjust the control lever
    With control lever (11) in the low position, distance c must be $10\ ^{+5}_{-0}$ mm between control lever ball and the side-member trimming.
    If not, set the lever (11) to obtain this measure.

25. Check that nothing prevents the front and rear torsion rods from being placed in low or high position.

26. Check the adjustment of the corrector control levers (1) and (17).

1523



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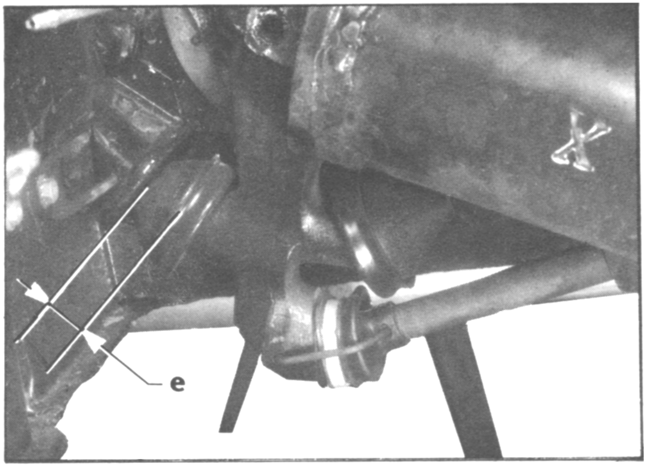


NOTE : In the low position the suspension spheres must be free.

In the high position the rubber stops are compressed.

The distance between the base of rubber stop and thrust face of sheet- metal buffer must be :

d = 6 mm maximum at the front

e = 8 mm maximum at the rear.

OPERATION N° D. 440-00 : *Characteristics and particular features of the steering*

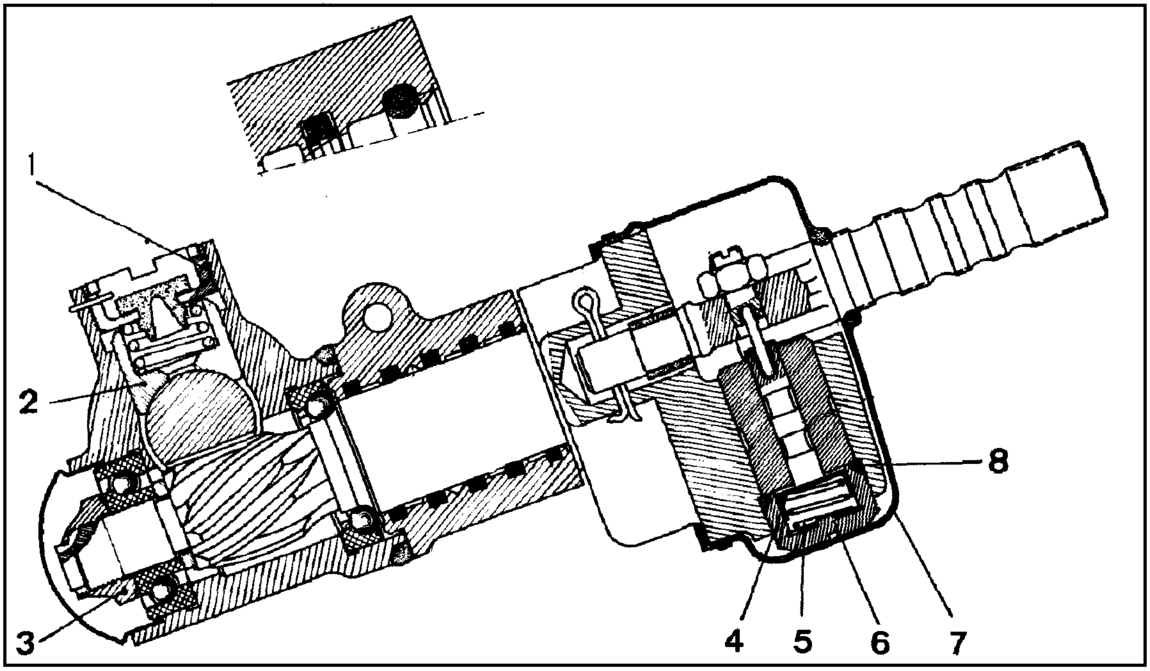
VEHICLES ALL TYPES

A. STEERING WITH HYDRAULIC RACK CONTROL

Vehicles all types (optional on DV and DT vehicles

1. CHARACTERISTICS

- Toe-in .... 2 to 4 mm
- Steering reduction ratio 1/15
- Steering radius .... approx. 5.50 m (18 ft)
- Lock angle .... 42° $^{0}_{-1°}$
- Number of turns of steering wheel from centre position .... 1 1/2 turns



II. PARTICULAR FEATURES

Adjustments on the vehicle :

Lateral position: distance between the L.H relay centre line and the centre line of the rack pressure plug measured perpendicular to the centre line of the vehicle : a = 122,5 ± 2,5 mm

Adjusting the alignment : toe-in = 2 to 4 mm.

Adjusting the straight ahead steering position : this operation is carried out on the road.

Adjusting the lock angle : 42°

Distance between the centre line of the ball pin on steering lever and centre line of track rod flexible bush : c = 402 mm. (see illustration page 3)

Tightening torque for nut securing ball pin on steering lever :

40 mΛN (4 mkg - 29 ft lbs)

Tightening torque for nut (3) of steering pinion bearing :

50 mΛN (5 mkg - 36 ft lbs)

Tightening torque for control rod on the rack :

70 mΛN (7 mkg - 50 ft lbs)

Tighten plug (1) of plunger (2) then unscrew by 1/6 of a turn using tool MR 630-16/7.

Distance between rubber anti-rattle bush on rack control rod and centre line of pin :

140 ± 5 mm

Tightening torque of yoke securing nut :

40 mΛN (4 mkg - 29 ft lbs)

Tightening torque for nuts securing track rods to yoke :

35 mΛN (3,5 mkg - 25 ft lbs)

Tightening torque for lock nut on the housing end-piece :

100 mΛN (10 mkg - 72 ft lbs)

Distance between tyre and mudshield :

10 mm maxi.

Distance of the steering rack concertinas in relation to centre line of plunger (2)

LH = 56 ± 2.5 mm
RH = 574 ± 2.5 mm

Length of rack control rod

→| 7/1967 ..... 460 mm
|→ 7/1967 ..... 464 mm

Diameter of control piston rod :

→| 7/1967 ..... 21 mm
|→ 7/1967 ..... 19 mm

III - IMPORTANT POINTS

1. Before doing any work on the hydraulic control of the steering, make sure that the steering track rod ball joints are in good condition.

   To do this :

   Disconnect the outer track rod ball pins from the pivot levers (use ball pin extractor 1964-T). The ball pins (on pivot lever and relay shaft) must move freely without any binding or tight point, even at the limit of their movement.

   If a ball pin binds it is necessary to replace either the pivot lever or the lower relay lever and track rod assembly or the track rod with ball pins as appropriate.

2. **If the steering shows any sign of leakage**

   This may be due to :

   1) A leakage definable by sound similar to an escape of gas.
   Disconnect the rack feed pipe assembly from the end piece on steering housing. Close the flange openings with a sheet metal plate, inserting a seal plate.

      a) If the leak persists, it comes from the rotating union which must be repaired or renewed.

      b) If the leak disappears it came from the hydraulic rack control which must be repaired or renewed.

   2) A leak causing inflation of the rubber dust cover and consequently an external leakage of fluid. This necessitates overhaul of the steering.

3. **If the steering is hard in operation or when starting to turn the steering wheel to one lock or the other**

   1) Check that the steering alignment is correct in the
   Lateral position and
   Angular position

   2) Adjust the crossover pressure

4: **If the steering «knocks» the crossover pressure must be adjusted**

   The knocking may come from any of the followings :

   - Excessive play of the piston and rack control rod coupling pin
   - Excessive clearance of the rack plunger guide
   - A tight spot in the slide valves or the dash-pots.

   In these cases, overhaul of the steering must be carried out.

5. **If the steering «flicks» in straight line running :** *(see illustration page 1)*

   1) Check the crossover pressure

   2) Check the assembly of plugs (6) and cups (4)
   Remove the battery and its tray
   Disengage the dust cover (7) from rotating union to gain access to the plugs (6).
   Release the pressure
   Remove plugs (6) do not mix up the parts : each cup (4) is paired with its plug (6)
   Disengage the cup and its spring (5) Check that there is no binding in the plug bore. If need be, remove any possible burr in the plug by means of a small scraper.

   In the case of light scratches on the cup, a very light rubbing with abrasive paper N° 600 is permitted.
   Carefully clean the parts.
   Should the cup (4) be worn out, renew plugs and cups assembly.
   Fit plug and cup assemblies together with springs. Insert a seal (8).
   Tighten the plugs moderately to 10 mΛN (1mkg - 7 ft lbs) and adjust the crossover pressure.

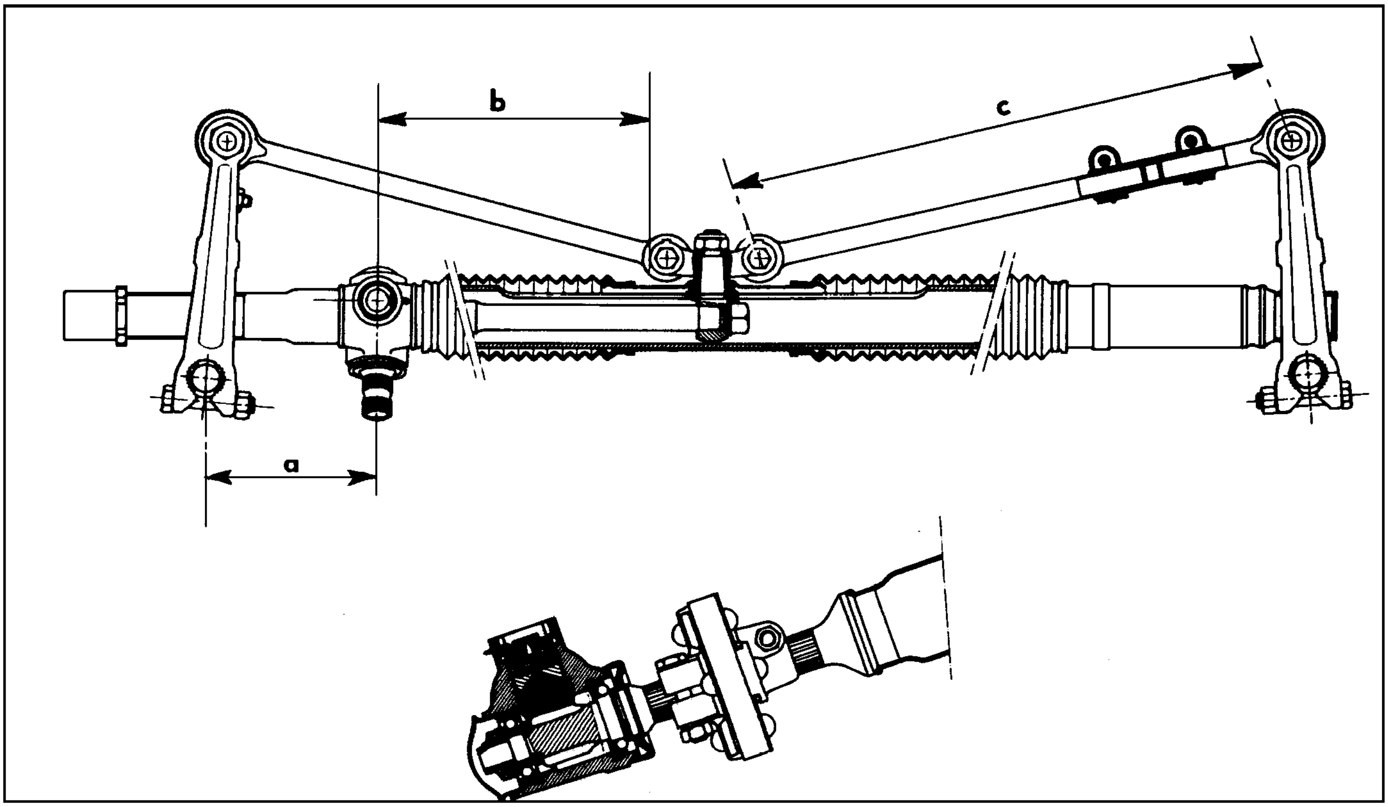
VEHICLES DV - DT
(without option)

B. STEERING WITH MECHANICAL RACK CONTROL

I. CHARACTERISTICS

- Wheel alignment	toe-in 2 to 4 mm
- Steering reduction ratio	1/20
- Steering radius	Approximately 5.50 m (18 ft)
- Angle of lock	$42^\circ \pm {}^{0^\circ}_{1^\circ}$
- Number of turns from centre position	2 turns

D. 44-40



II. PARTICULAR FEATURES

1 - Adjustments on the vehicle

Lateral position : distance between the L.H relay centre line and the centre line of the rack pressure plug measured perpendicular to the centre line of the vehicle :

a = 122.5 ± 2.5 mm

When the steering wheel spoke is at 30° below the horizontal on the L.H side, the distance between the centre line of the pressure plug and the outer edge of the flexible bush should be :

b = 275 mm

Toe-in . . . . 2 to 4 mm
Lock adjustment . . . . $42 {}^{+0^\circ}_{-1^\circ}$

Tightening torque for screws securing steering levers to relay spindle : 25 mΛN (2.5 mkg - 18 ft lbs)

2 - Repairing

Length of track rods between centre line of ball pin and centre line of flexible bush : c = 402 mm

Tightening torque for nut securing lever on track rod ball pin : = 40 mΛN (4 mkg - 29 ft lbs)

Tightening torque for nut on rack plunger
= 50 mΛN (5 mkg - 36 ft lbs)

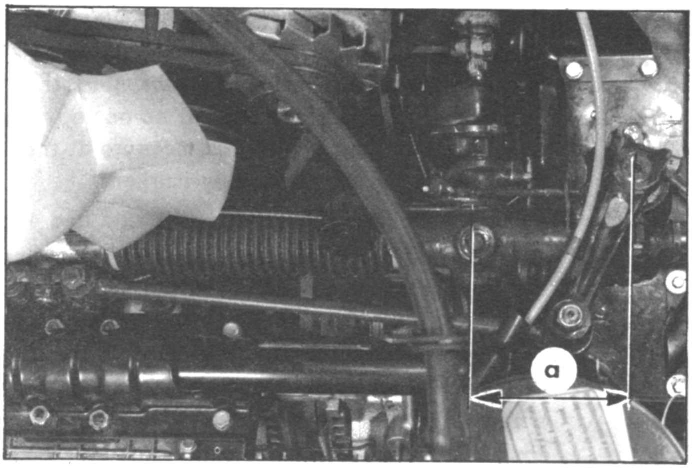
Then slacken by 1/6 th of a turn.
Tightening torque for nut of steering pinion bearing : = 50 mΛN (5 mkg - 36 ft lbs)

Tightening torque for nut securing centre yoke
= 40 mΛN (4 mkg -29 ft lbs)

Tightening torque for nuts securing track rods to centre yoke = 35 mΛN (3.5 mkg - 25 ft lbs)

VEHICLES ALL TYPES

Manual 814-1



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I. ADJUSTING THE LATERAL STEERING POSITION.

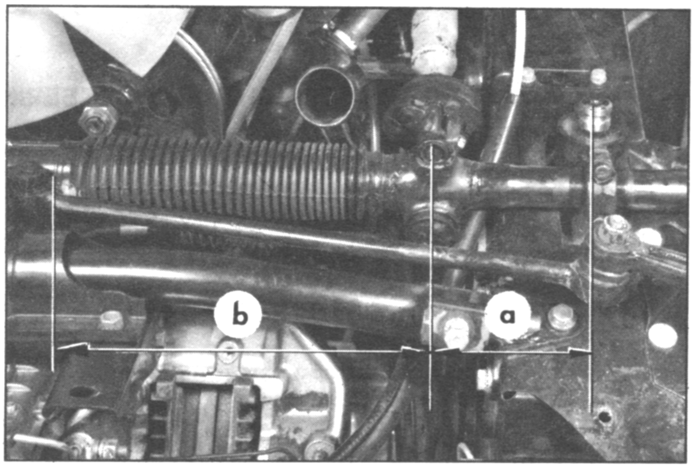
1. Put the front of the vehicle on stands. (Support 2505-T)
   Disconnect the negative battery terminal.

2. Remove :
   - the spare wheel
   - the front wings
   - if the battery is on the left, remove the battery, the tray and its support.

3. Slacken the screws securing the bearing caps;, move the steering in its bearings so that distance:

   «*a*» = *122,5 ± 2,5 mm*

   (Distance between the L.H. relay centre line and the centre line of the plug for the rack plunger measured perpendicular to the centre line of the vehicle).
   Tighten the screws securing the bearing caps.

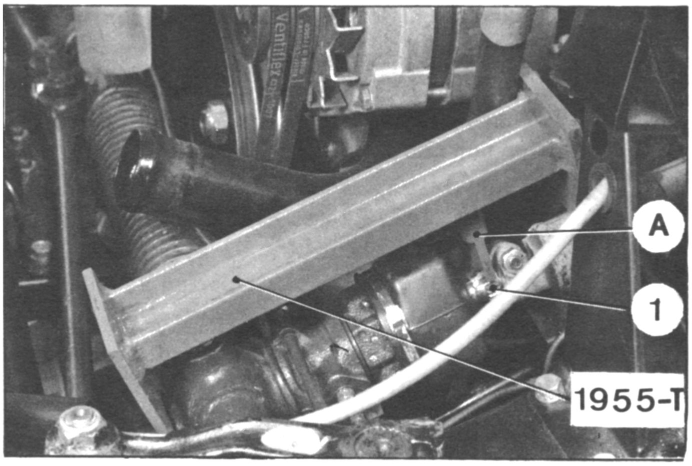


2383

4. Check the position of the steering wheel ; turn the steering wheel until distance :

   «*b*» = *275 mm*

   (Distance between the centre line of the plug for the rack plunger and the outer bush on the L.H. track rod)
   In this position, the steering wheel spoke should be at 30° below the horizontal on the L.H. side. If it is not, adjust the position of the steering wheel.



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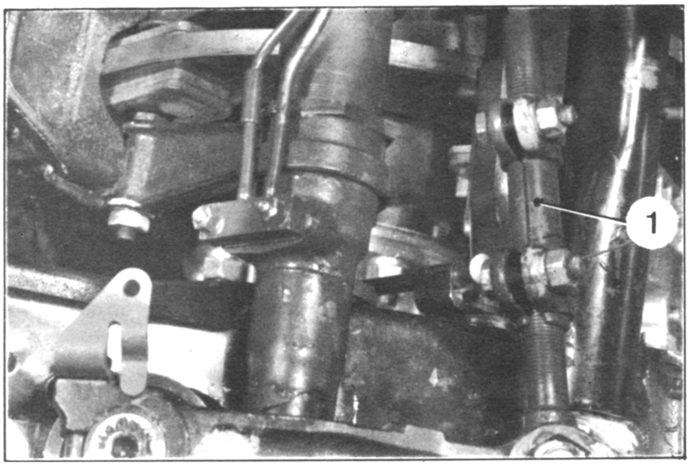
II. ADJUSTING THE ANGULAR POSITION OF THE STEERING. *(Power assisted steering only)*

5. When the vehicle has been placed on stands and the screws securing the bearing caps slackened, fit fixture 1955-T.

6. Move the steering in its bearings to bring the control pinion (1) in contact with the central pin «a» of the fixture.

7. Tighten the screws for the bearing caps.
   Remove the fixture.



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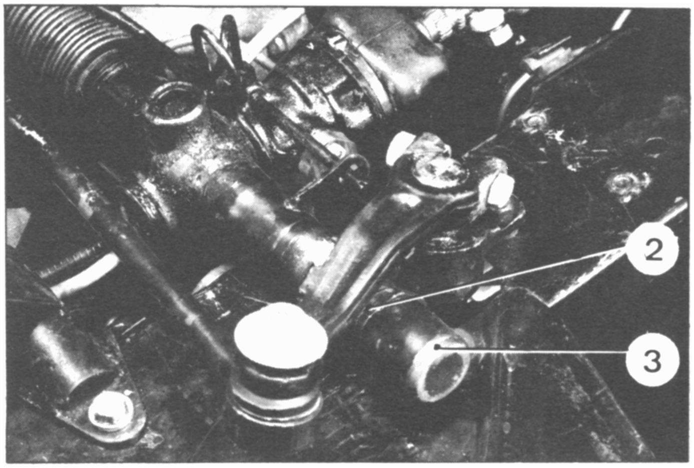

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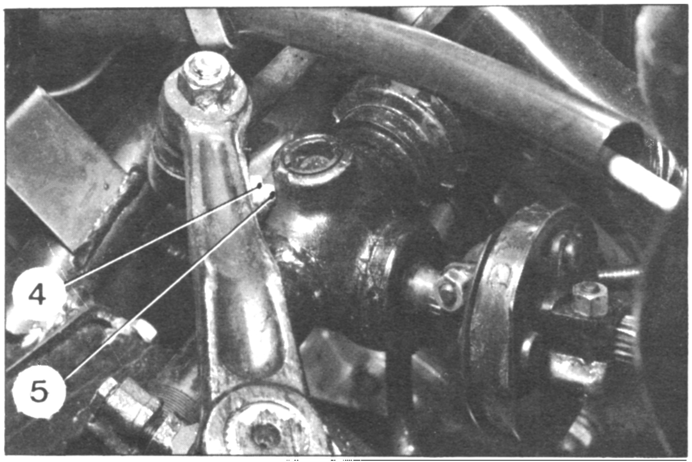

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III. ADJUSTING THE WHEEL ALIGNMENT.

8. Put the vehicle *in normal running position* with the engine running.

9. Use an ordinary commercial track gauge. Measure at wheel-centre height the distance between the wheel rims at the rear. Mark the points with chalk. Move the car so as to turn the wheels by half a turn and measure at the front on the points previously marked.

10. There must be a toe-in of between 2 and 4 mm. If not adjust the track-rod sleeve (1), first raising the front of the vehicle. Loosen the screws in the clamps of the sleeve. Work by fractions of a turn (1/4 of a turn corresponds to a variation in the alignment of 1 mm). Check the alignment again; tighten the screws on the clamps to 10mΛN (1 m.kg) (7.2 ft lbs). Turn the steering to full right-lock and left lock to ensure that there is sufficient clearance between the clamp screws, the front crossmember and the air intake.

NOTE : To obtain a suitable toe-in adjustment, the track rods must be in good condition.

IMPORTANT : The headlamps must be adjusted after this operation.

IV. ADJUSTING THE STRAIGHT AHEAD STEERING.

(Power assisted steering only)

11. There are two possible methods : see the corresponding operation.

V. ADJUSTING THE STEERING LOCK.

12. Put the front of the vehicle on stands. Remove the front right wing.

13. Place the wheels as for running in a straight line (after the straight ahead steering has been adjusted.)

14. Turn the steering wheel 1½ turns exactly *to the left if the steering is power assisted.* If it is not, turn the steering wheel 2 turns. Screw up the stop cap (3) until it contacts the rack, and tighten the locknut (2). Return the wheels as for running in a straight line.

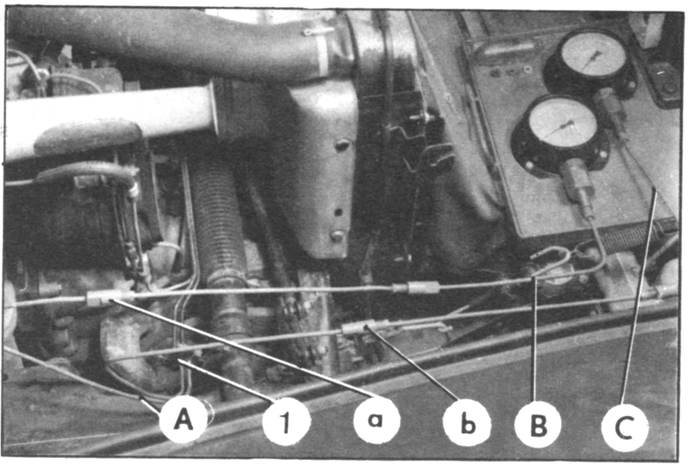
15. *If the steering is power assisted,* turn the steering wheel 1½ turns exactly to the right. Screw up the stop cap and tighten the locknut.

16. *If the steering is not power assisted,* turn the steering wheel 2 turns exactly to the right. Slacken the locknut (4). Unscrew the stop screw (5) until it contacts the steering housing, then tighten the locknut (4).

17. Replace the front right wing and lower the car to the ground.

NOTE : When the wheels are at maximum lock, there must be a clearance between the tyre and the lateral protection shields for the suspension mechanism. If necessary reduce the lock angle.

2338



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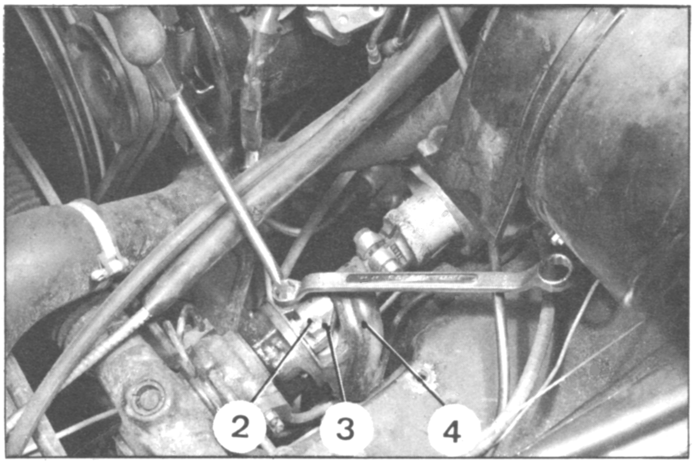


VI. ADJUSTMENT OF THE CROSSOVER PRESSURE.

(Power assisted steering only)

NOTE : Use test bench 3654-T and its accessories 3655-5 (green LHM fluid) or 2290-T (red LHS 2 fluid).

Use pressure gauges calibrated from 0 to 200 bars (0-3000 psi)

18. Release the pressure by loosening the bleed screw in the pressure regulator.

19. Place a cloth under the steering pipe assembly flange (1) R.H. side, in order to avoid spilling fluid on the brake unit. Remove the hydraulic connecting pipe assembly from the end-piece side of the casing.

20. Fit pipe assembly «A» to the connecting pipe assembly flange (1) (inserting a seal plate). Connect the ends «a» and «b» of the pipe assembly «A» by means of the tubes «B» and «C» to the two pressure gauges on the test bench.

21. Start up the engine and tighten the bleed screw on the pressure regulator. Turn the steering from left to right in order to bleed the pipes on the pressure gauges.

22. Position the wheels as for running in a straight line, the straight-ahead steering position having been adjusted.

23. Turn the steering wheel very slowly to the right or left in order to obtain a difference in pressure of about 60 bars (850 psi) between the two pressure gauges.

e.g. : - 20 bars and 80 bars (290 psi and 1137 psi)

Slowly turn the steering wheel in the opposite direction and note the pressure when the two gauges show the same reading.

This pressure should be : 65 ± 5 bars (920 ± 70 psi)

24. If the pressure does not read 65 ± 5 bars (920 ± 70 psi), the pressure distributor must be adjusted. Stop the engine. Remove the battery and its support if these are on the L.H. side. Withdraw the rubber protector (4) from the pressure distributor to gain access to the adjusting screws (2) for the slide valves. Loosen the locknut (3) of one of the screws (2)

NOTE : Do not turn the adjusting screw during the unscrewing of the locknut.

If the crossover pressure is too high, unscrew one of the adjusting screws (2) or tighten it if it is too low. (Adjust the screw by about 1/12 of a turn at a time)

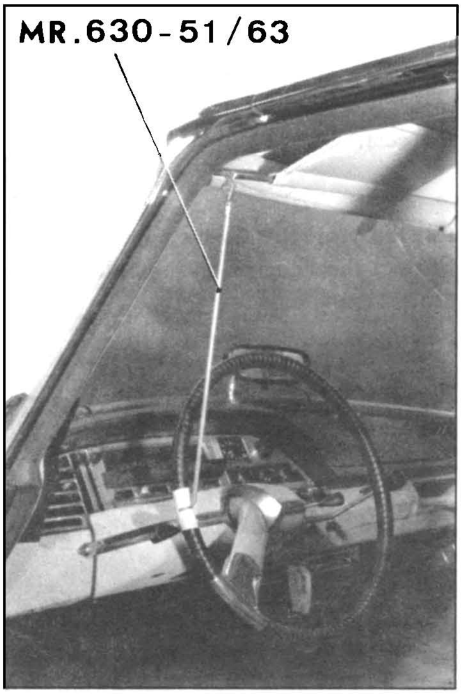
NOTE : Do not release the steering wheel until the pressures are stabilized, otherwise an oscillation may be set up at the steering wheel, which could ruin the pressure gauges.

OPERATION N° D. 445-0 : *Adjusting the straight-ahead steering position for vehicles with power assisted steering*

ADJUSTING THE STRAIGHT AHEAD STEERING POSITION

VEHICLES ALL TYPES
with power assisted steering

3918



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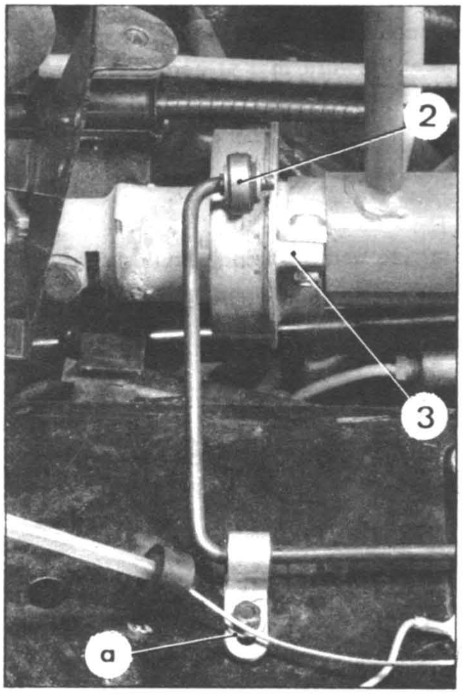

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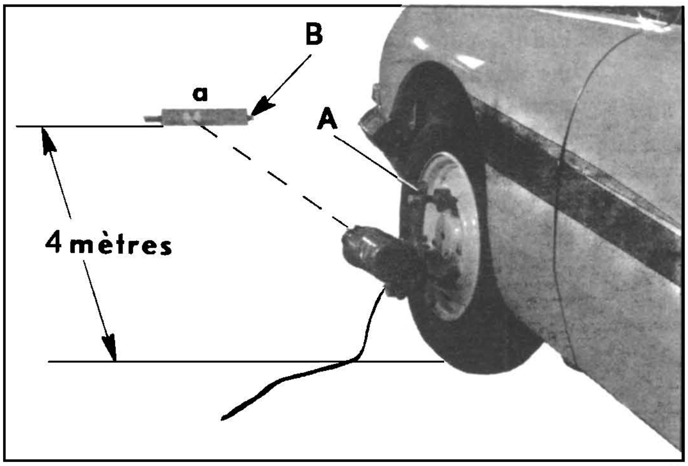


NOTE : Before adjusting, check that the tyre pressures are correct.

I. ON THE ROAD

1. Determine the position of the steering wheel for running in a straight line :
   - Travel on a straight level road.
   - Attach the clamp of measuring rod MR. 630-51/63 to the L.H. sun visor spindle and stick a piece of adhesive paper on the steering wheel rim at the point of contact with the end of the measuring rod. Mark with a straight line on the adhesive paper the exact point of contact of the end of the measuring rod.
2. Stop the car.
3. Adjust the position of the cam :
   - Align the marks made in § 1.
   - Loosen the securing clamp (3) of the cam and turn it until the roller (2) is in the hollow of the cam.
   - Tighten the clamp to : 4 mΛN (0,4 m.kg) (3 FT.LBS.) Note : The roller must be parallel with the cam and in the centre of it to within 2 mm approximately. The slot « a » allows for moving the cam.
4. Check the adjustment by a second road test.

II. IN THE WORKSHOP

5. For this operation, use a light projecting device as usually used for front and axle checks.

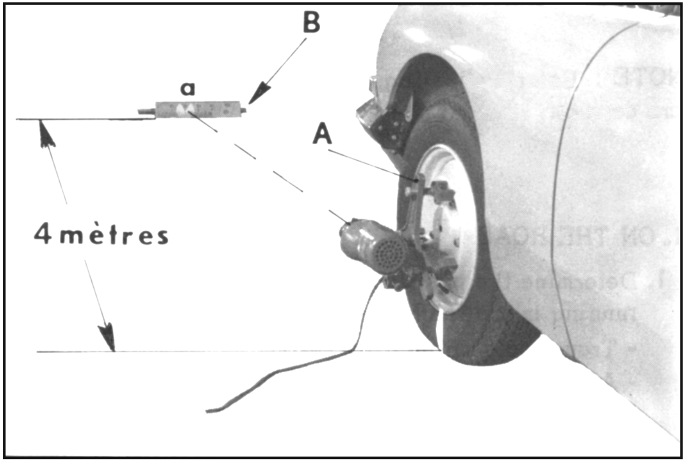
REMARKS :
- This process takes into account that each vehicle has its own characteristics concerning positioning of axles, toe-in, tyre drift etc. . .
- The vehicle must be in good working order, without excessive play in the front axle and steering.

6. Put the vehicle on a level horizontal surface, with the wheels as straight as possible.

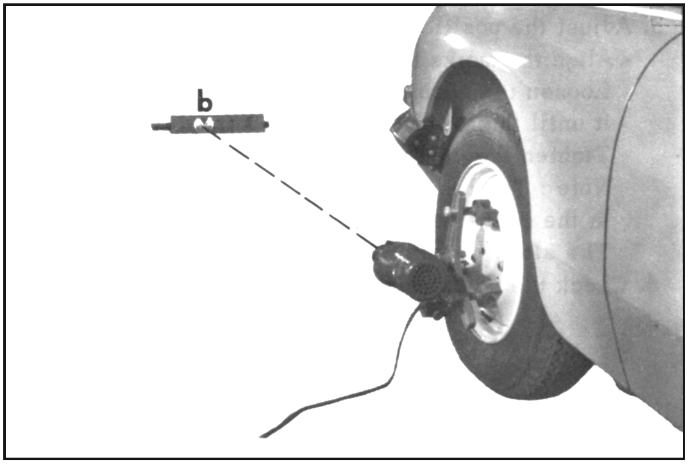
VERY IMPORTANT :*It is imperative that the surface be absolutely level and horizontal; otherwise false results will be obtained from the operation.*

7. Attach the clamp of measuring rod MR. 630-51/63 to the L.H. sun visor spindle, and stick a piece of adhesive paper on the steering wheel rim at the point of contact with the end of the measuring rod.
8. Put a projector support « A » on each of the front wheels. These supports must not be moved again until the end of the operation.
9. Place 2 graduated rulers « B » 4 meters in front of the vehicle.

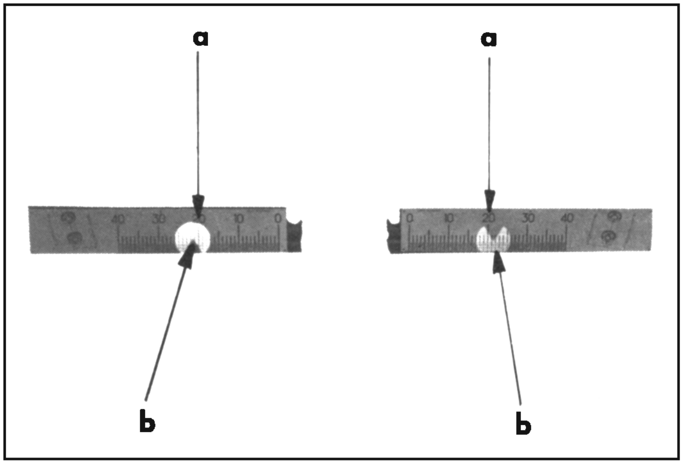
3743 -1



3743 -1



4180



10. Start the engine to put the circuits under pressure.

11. Put a chock (a screw driver handle, for example) under the spring rod of the steering centralising cam roller, so that the roller is no longer in contact with the cam.

12. Put the projector on its support on the left-hand wheel. Project the beam on to the ruler, and mark the point of projection « a ».

13. Repeat for the right hand wheel, marking the point of projection « a ».

14. Then make a chalk mark on the tyre, as shown in the illustration.

15. Put in the path of the wheels, and approximately 2 meters in front of their centre line, 2 units, each made up of 2 metal sheets 400 × 400 × 1 mm placed on top of each other. (put a layer of grease between the plates). Creep forward in 1 st gear and stop the vehicle when the wheels have completed 1 revolution.

NOTE :

Starting and stopping should be as smart as possible. Especially if there is play in the various front axle and steering bearings.

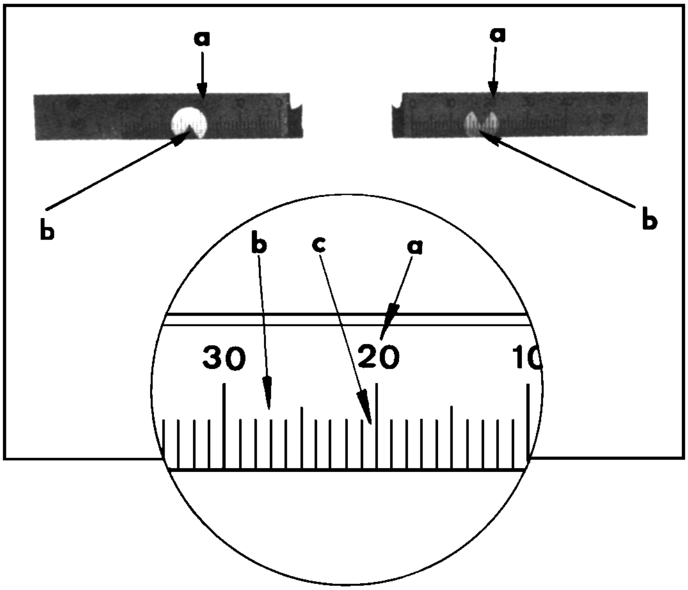
16. On the right hand side, make a projection on the ruler (which must not have been moved). And mark the point of projection « b ».

17. Repeat for the left hand side.

18. *Various results can be obtained :*

a) If the distances « ab » are approximately 7 mm (positioning clearance for straight-ahead steering). and the points « b » are outside the points « a »: the wheels are in the straight-ahead steering position.
Mark on the steering wheel rim the position for straight ahead steering.

4180-1



b) If the distances « ab » are equal but both points « b » are on the left or the right of both points « a » : the vehicle deviated while moving forward. The steering must therefore be corrected by a certain angle which corresponds to a distance « bc » which is equal to the average of the two distances « ab ».

e.g. : the vehicle has deviated towards the left, and the distance « ab » on the right hand side is 30 mm.
the distance « ab » on the left hand side is 35 mm.
the distance « bc » should be :

$$bc = \frac{30 + 35}{2} = 32{,}5 \text{ mm}$$

Turn the steering wheel (alternating from right to left to take up the play) and bring the point of projection to « c ».

NOTE : *Each division on the ruler in the illustration corresponds to 5 mm.*

Reverse the vehicle so that the wheels make at least 1 1/2 revolutions, then drive forwards and stop when the wheels are in the position they were in at the start of the 1st projection.Check by repeating the operation. If necessary, change the position of the steering wheel so as to satisfy the conditions in paragraph « a ».

c) In very rare cases, if the distances « ab » are equal but the points « b » are inside both points « a », the wheels are in the straight ahead steering position, but their alignment is faulty (toe-out instead of toe-in), or there is too much play in the various bearings, or both are true. The vehicle must be repaired before adjustment can be made.

NOTE :
By means of indication, the distance « ab » (the points « b » being outside the points « a ») should be between 5 and 10 mm for a vehicle with correct toe-in and no play in the various bearings.

19. Adjust the position of the cam as indicated in § 3.

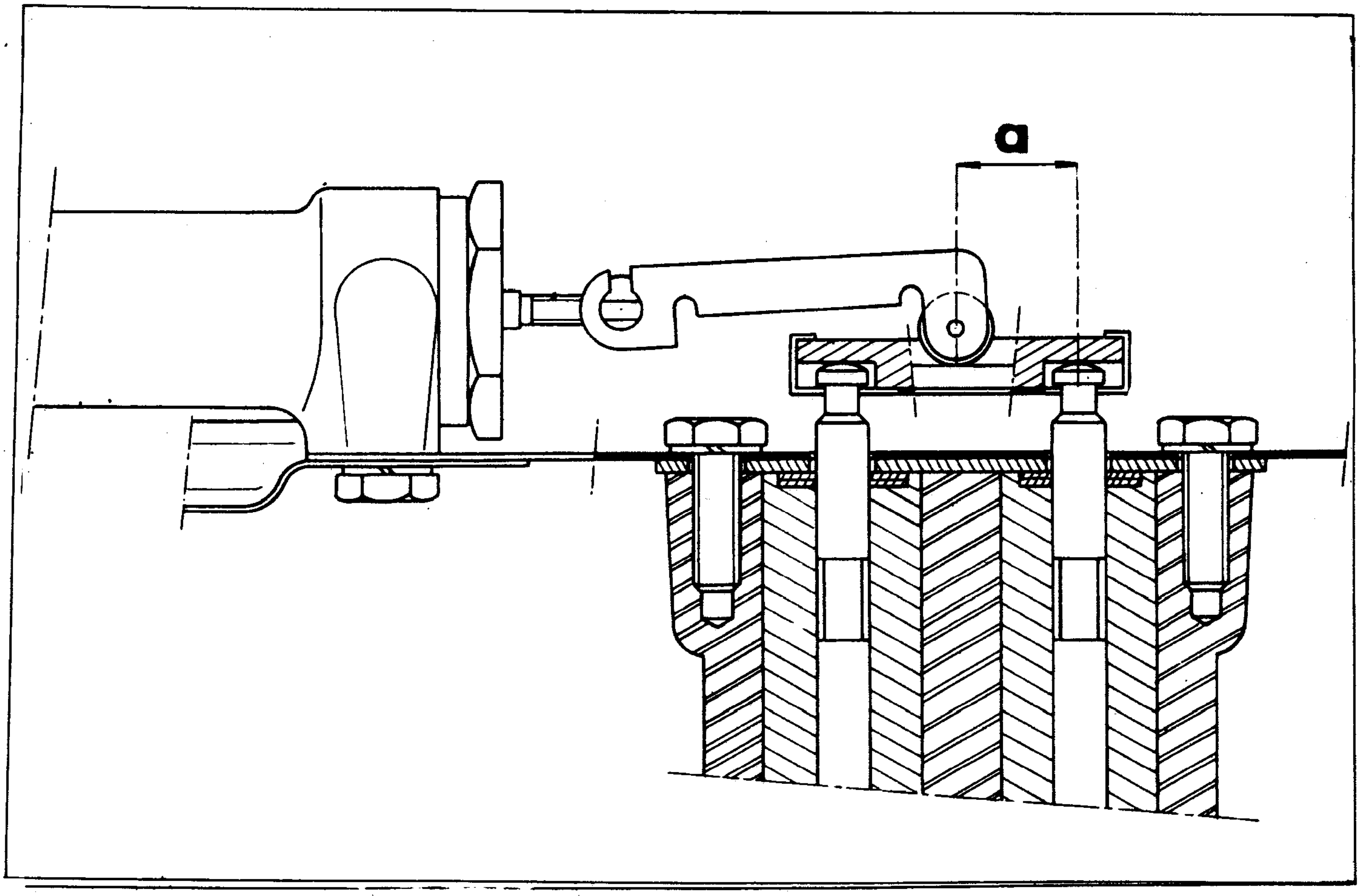
VEHICLES ALL TYPES
EXCEPT DV-DT and DP

I. CHARACTERISTICS

Brake accumulator :	
Inflation pressure :	40 $^{+2}_{-10}$ bars (569 $^{+28}_{-142}$ psi)
Sealing of valve :	50 bars (730 psi)
- Front brake pads :	FERODO 623
- Parking brake pads :	FERODO 583
- Rear brake shoes :	FERODO SM
- Rear brake drums	
Saloon :	not finned
Safari	finned
- Calibration of pressure switch :	60 to 70 bars (880 to 1020 psi)
- Sealing of brake control :	150 bars (2190 psi)
- Sealing of brake pressure : distributor piston	175 bars (2555 psi)

II. BRAKE PRESSURE DISTRIBUTOR PISTON.

D. 45-2



Manual 814-1

VEHICLES DV, DT, DP

I. CHARACTERISTICS :

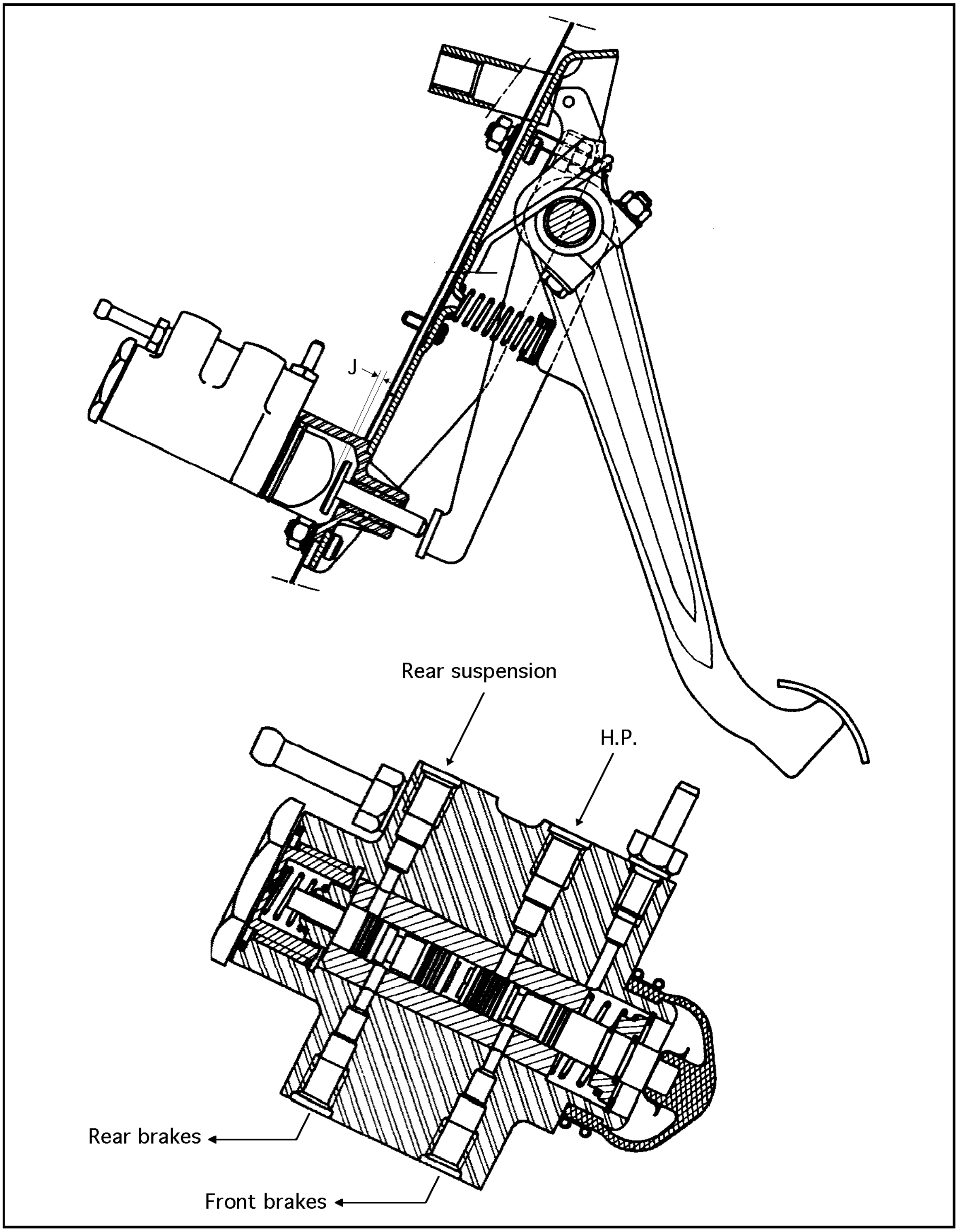
- Front brake pads : .... FERODO 623
- Parking brake pads : .... FERODO 583
- Rear brake shoes : .... FERODO S M

Rear brake drums : .... not finned.

- Calibration of pressure switch .... 55 to 85 bars (800 to 1240 psi) —→|3/73
- 75 to 95 bars (1067 to 1351 psi)|—→3/73
- Sealing of brake control :
  From a pressure drop in 1 minute of 140 bars : .... 20 bars (580 psi) maxi
  (2040 osi) pressure drop in 1 minute

II. BRAKE CONTROL

D. 45-1



I. PARTICULAR FEATURES .

1. Discs :

- Maximum run out : 0,15 mm
- Diameter : 300 mm
- Original thickness : 12 ± 0,1 mm
- Minimum thickness after grinding (0,5 mm max. each side) : 11 ± 0.1 mm
- Maximum variation of thickness at outer edge : 0,015 mm maxi
  - Maximum out of flat at outer edge : 0 to 0.025 mm approximately

2. Original thickness of front brake pads : 11,4 mm

3. Diameter of front brake pistons : $60^{-0.023}_{-0.036}$ mm

4. Parking brake :

- Clearance between disc and shoe : 0,l mm
- Clearance between caliper and disc : 4 mm
- Cable tension : clearance at adjustable cable guide stop. 0,3 to 0,5 mm

5. Rear brake drums :

- Maximum regrind on diameter : 2 mm
- Original diameter : $255^{+0.21}_{0}$ mm
- Maximum out of round : 0,03 mm

6. Rear brake shoes :

- Length
  - Front lining : 175^{+4}_{-0} mm
  - Rear lining : 132^{+4}_{-0} mm
- Width
  - Safaris : $45^{+0}_{-0.5}$ mm
  - Saloons : $35^{+0}_{-0.5}$ mm
- Original thickness : $5^{+0.3}_{-0}$ mm
- Centralizing of shoes; clearance between lining and drum
  - upper : 0,25 mm
  - lower : 0,15 mm
- Adjust linings to just contact the drum.

7. Vehicles all types except DV, DT and DP :

- Brake pressure distributor : AT 60 bars (480 psi) the distance from the roller centre line to the rear slide valve centre line should be : 14 ± 0,25 mm
- Stop lamp switch :
- When the stop lamps just go out, tighten the adjusting screw by : 1 turn.
- Clearance : 0,4 to 0,6 mm

8. Vehicles DV, DT and DP :

- Stop lamp switch :
  when the stop lamps just light, unscrew the adjusting screw by : 2 turns.
- Brake pedal gear :
  - Rear brakes applied when front brake pressure reaches : 5 bars (70 psi)
  - Clearance at control knob : 0,1 à 0,5 mm

II. TIGHTENING TORQUES.

1. Front brake units :

- Tighten bolts securing units on gearbox outlets to.:	130 to 140 mΛN (13 to 14 mkg) (94 to 101 ft.lbs)
- Tighten screws securing brake units on cross member to :	40 to 45 mΛN (4 to 4,5 mkg.) (29 to 32.5 ft lbs)
- Tighten screws assembling l/2 housing to :	45 to 55 mΛN (4,5 to 5,5 mkg.) (32,50 to 40 ft.lbs)
- Tighten bleed screw (manual gear change) to :	6 to 7 mΛN (0,6 to 0,7 mkg.) (4,34 to 5,06 ft.lbs)

2. Parking brake :

- Tighten the screws securing the brake calipers to the clutch housing :	100 to 110 mΛN (10 to 11 mkg.) (72 to 79 ft.lbs)

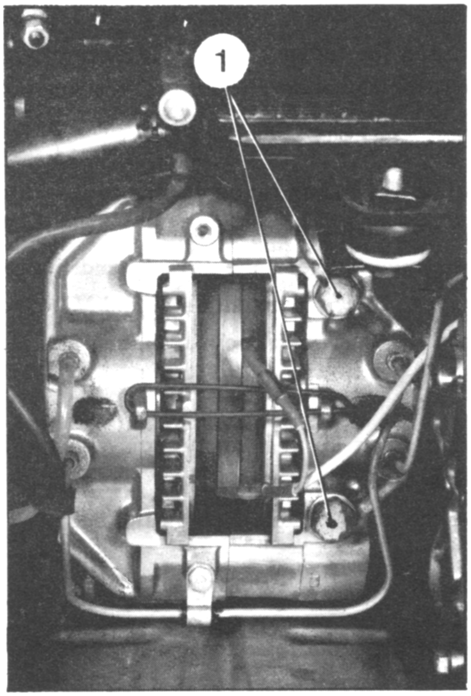
3. Vehicles all types except DV, DT and DP :

- Brake pressure distributor : Tighten guide plug to :	20 to 25 mΛN (2 to 2,5 mkg.) (14,4 to 18,l ft.lbs)
- Pressure switch : Tighten the union nut to :	6 to 8 mΛN (0,6 to 0,8 mkg.) (4,34 to 5,8 ft.lbs)
- Brake pedal gear : Tighten the bolts to :	20 to 25 mΛN (2 to 2,5 mkg.) (14,4 to 18,l ft.lbs)
- Brake pedal : Tighten nut securing pedal plate to :	25 to 30 mΛN (2,5 to 3 mkg.) (18,1 to 22 ft.lbs)

VEHICLES ALL TYPES

I. ADJUSTING THE FRONT BRAKES

1132



ADJUSTING THE HYDRAULICALLY CONTROLLED BRAKE UNIT

1. Remove
- The spare wheel
- The headlamp control cross-bar
- The spare wheel crossmember
- The air intake

2. Loosen screw (1)

3. If the pads must be replaced, fit new ones

4. Get an assitant to depress the hydraulic brake pedal.

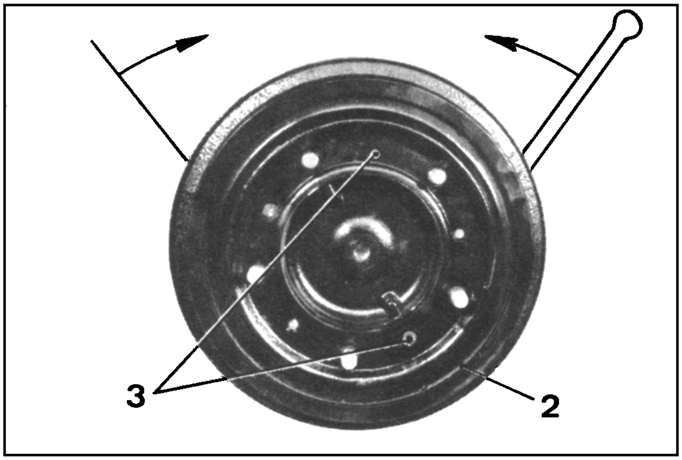
5. Tighten screw (1) to 130 to 140mΛN (13 to 14m.kg) (93-6 to 101 ft lbs).

6. Release the brake pedal.

7. Replace
- The air intake
- The spare wheel crossmember
- The headlamp control cross-bar
- The spare wheel

II. ADJUSTING THE REAR BRAKES

1433



Centring the brake shoes.

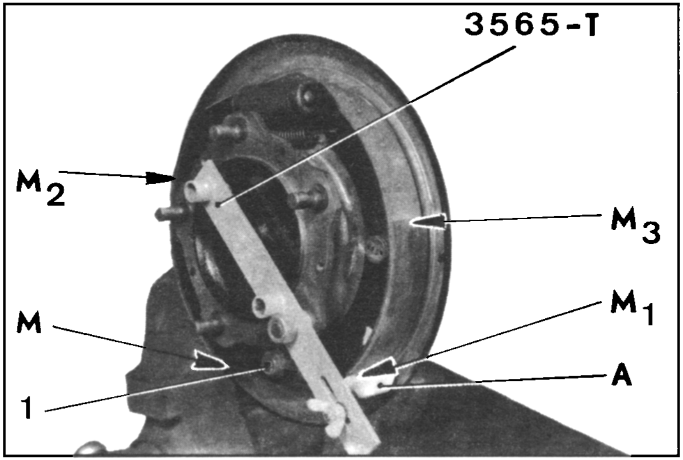
Removal :

8. Raise the rear of the vehicle on stands (stand 2505-t)
Remove the wing and wheel on the side to be adjusted

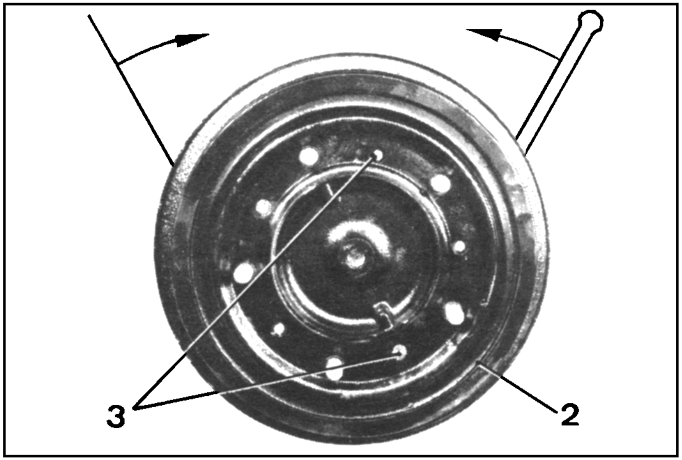
9. Bring the shoes into contact with the drum by turning the adjusting cams in the direction shown by the arrows.
It must still be possible to turn the drum by hand

10. Remove the two screws (3) and remove the drum (2)

1434



1433



FITTING

11. Fit the gauge 3565 - T (see illustration)
Turn the apparatus and note the point at which the diameter of the shoes is greatest by means of arm « A ». Tighten the wing nut to secure the arm in this position.

12. Loosen the locknut (1) on the eccentric bushes
Position the eccentric so that the smallest «throw» is downwards.

13. Adjust the shoes by operating on the cams and the eccentrics together, so as to obtain a clearance between the arm «A» and the shoes of:
- 0,15mm at points M and M1
and - 0,25mm at points M2 and M3
Measure this clearance with feelers.

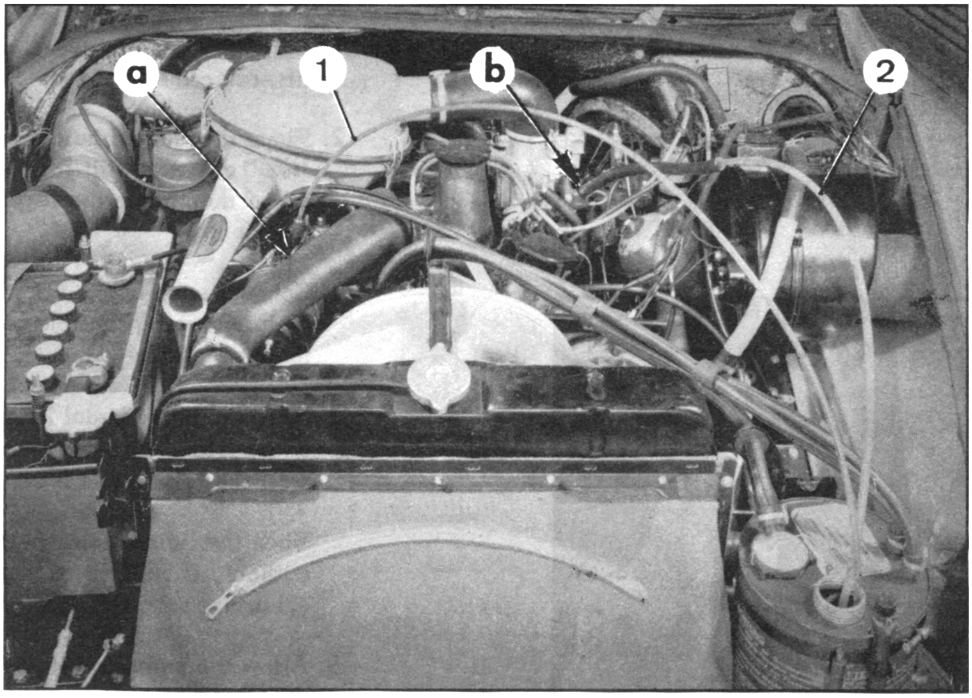
14. Tighten the nuts (1) and knock over the lock washer
Fit the drum (2) and tighten the screws (3)

15. Fit the wheel and the wing.

16. Lower the vehicle to the ground.

VEHICLES ALL TYPES

A. BLEEDING THE BRAKE SYSTEM



1 BLEEDING THE FRONT BRAKES.

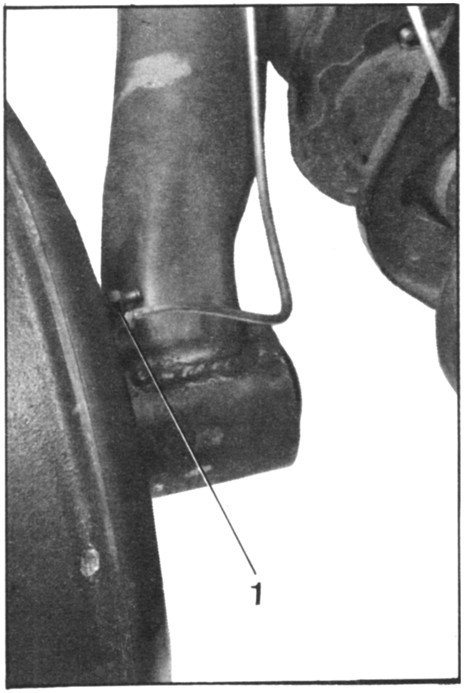
Do not bleed the brake system under pressure. This prevents the formation of small bubbles in the fluid which could eventually produce air pockets in the system.

1. With the engine stopped, slacken the pressure regulator bleed screw.
2. Place the manual height control lever in the «*low*» position.
   (This operation is not necessary on vehicles produced since December 1967 nor on any DV, DT or DP vehicles).
3. *On vehicles fitted with manual gearchange :*
   Disengage the flexible tube from brake unit bleed screws.
   Connect these bleed screws to the reservoir by means of a flexible tube.
4. *On vehicles fitted with hydraulic gearchange :*
   Fit a flexible bleed tube on to :
   - the rear bleed screw of the centrifugal regulator at «a» (to bleed the front R.H. side) (tube n° 1)
   - the accelerated idling control at «b» (to bleed the front L.H. side) (tube n° 2)
5. *On DX.IE produced since 2/1971 and DX.DY vehicles produced since 9/1971*
   Remove the flexible piping from the bleed screw of the R.H. brake block.
   Fit a flexible bleed pipe on :
   - the bleed screw of the R.H. brake block (to bleed front R.H.)
   - the rear bleed screw of the centrifugal governor at «a» (to bleed front L.H.)
6. Insert the ends of tubes (1) and (2) in the hydraulic reservoir.
7. Hold the brake pedal depressed. Slacken both front bleed screws (the fluid under pressure flows out of the brake accumulator).
8. Place the manual height control lever in the «*high*» position.
   (this operation is not necessary on vehicles produced since December 1967 nor on any DV or DT vehicles)
9. With the brake pedal depressed, start the engine. Tighten the pressure regulator bleed screw. Allow the fluid to flow through the flexible tubes until it is free from air bubbles, then tighten the bleed screws.
10. Release the brake pedal and remove the flexible tubes (1) and (2).
11. Check the bleed screws for leakage by depressing fully the brake pedal.
12. Stop the engine.
13. Replace the rubber protecting caps or the flexible tubes onto the bleed screws.

Manual 814-1

II. BLEEDING THE REAR BRAKES

4431



1. Place the vehicle over a pit or on an autolift, raise the front wheels of the vehicle.

2. Place the manual height control in the "*low*" position wait for the vehicle to settle down, then place the lever in the "*high*" position.

3. Connect each bleed screw (1) to a clean recipient using flexible bleed pipes. Loosen the bleed screw (1).

4. Have the brake pedal held down in the depressed position by an assistant.
   Start the engine and let it idle.

   When the liquid flows in the flexible pipes without air bubbles, tighten the bleed screws (1) and remove the pipes.

5. Allow the pedal to return to the raised position.

   Place the manual height control lever in the normal "*road*" position.

   Rev the engine to re-establish the pressure in the suspension circuit.

6. Depress the brake pedal completely and check that the bleed screws are not leaking. Place the rubber protecting caps on to the bleed screws.

7. With the engine still running :
   Top up the level of fluid in the reservoir of the hydraulic circuit (manual height control lever in the high position)

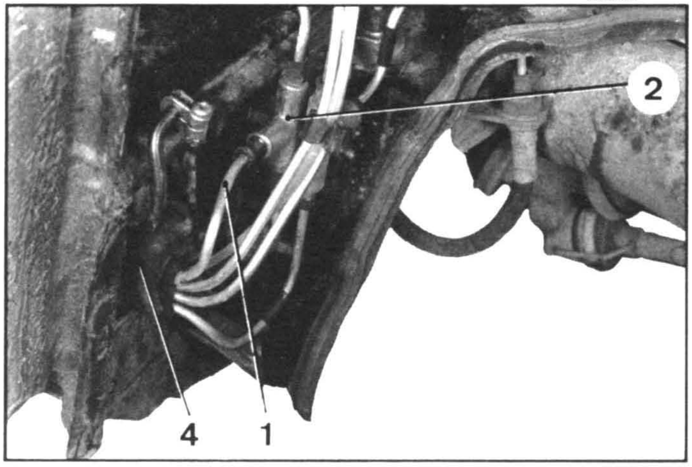
synthetic fluid LHS 2	9/1966
mineral fluid LHM	9/1966

8. Place the manual height control lever in the normal "*road*" position.

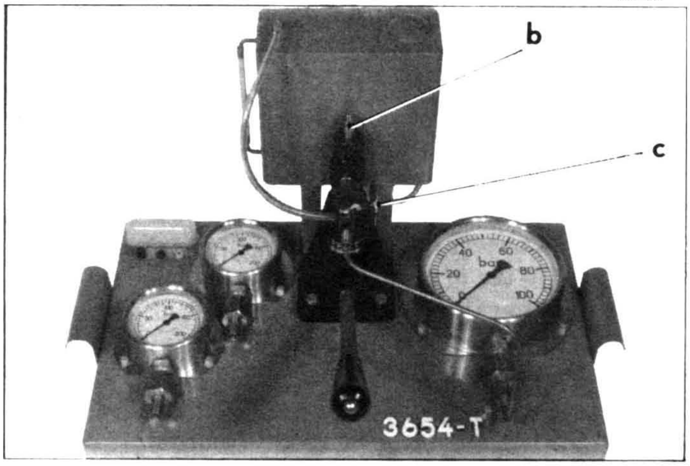
   Stop the engine.

VEHICLES ALL TYPES EXCEPT DV-DT

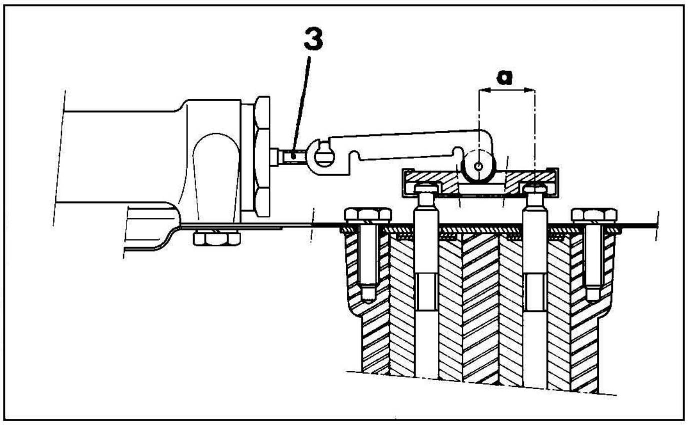
8820



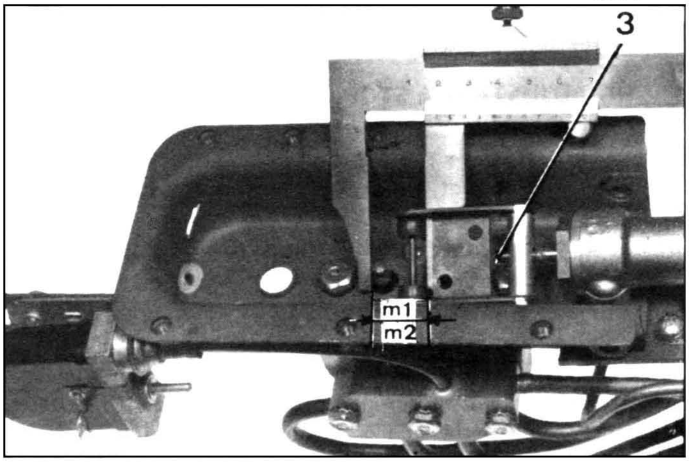
4745



D. 45-2



3171



B. BRAKE PEDAL CONTROL.

1. Adjusting the brake pressure distribution.

NOTE : Use test bench 2290-T *(for vehicles using synthetic LHS 2 coloured red)* or test bench 3654-T *(for vehicles using LHM fluid coloured green)*. Connect the pressure gauge calibrated from 0 to 100 bars. (0 to 1450 psi.)

1. Remove the rear left wing. Remove the mudshield protecting the suspension mechanism. Place the manual height control lever in the « *low* » position.
2. Remove the pipe assembly fixing lug (4) Disconnect the upper pipe (1) (towards the brake pedal gear) from the 4-way union (2) and connect it with a tube to union « b » on the pump.
   Plug the opening of union (2).
   Remove the pedal panel and the pedal.
3. Operate the pump to build up the pressure to approximately 100 bars (1450 psi). Loosen slowly the pump bleed screw « c » in order to bring the pressure back to 60 bars (860 psi.). Measure distance «m1» using a caliper square (m1 = distance between the edge of the slide-valve and the roller.)
4. Release the pressure.
5. Operate the pump again to bring the pressure to 60 bars (860 psi)
   Measure the new distance « m2 ».
6. a) Take the average of the two distances
   $$m3 = \frac{m1 + m2}{2}$$
   b) Measure « a » corresponds to the distance between the centre line of the roller and the centre line of the slide valve and is obtainable by deducting from distance m3.
   - The half-diameter of the slide valve :
   $\frac{6,35}{2} = 3,175$ mm
   - Plus the half-diameter of the roller :
   $\frac{11}{2} = 5,5$ mm
   - That is, on the whole 8,675 mm
   a = m3 - 8,675 mm

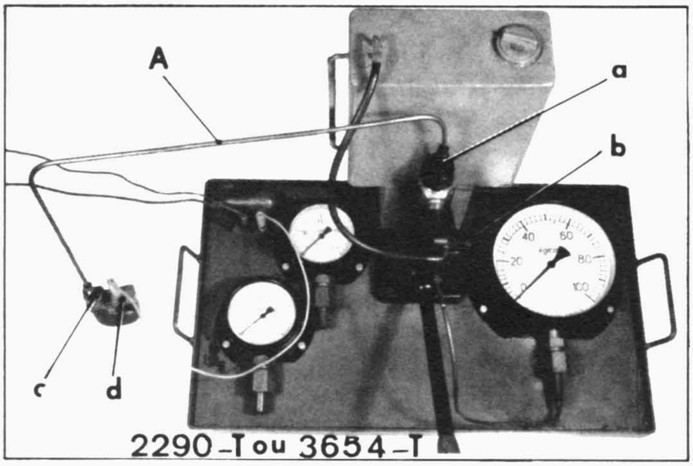
   c) If the measure « a » is not equal to 14 ± 0,25 mm operate screw (3)
7. Release the pressure by loosening the test bench bleed screw « c ».
8. Refit the pedal panel, the pedal and the trimming.
9. Remove the tube connecting the pump to the brake pedal gear feed pipe. Remove the sealing plug from the four way union (2) and connect pipe (1) to the union (2). Fit the pipe assembly fixing lug (4).

10. Fit the mudshield protecting the suspension mechanism.

11. Start the engine and place the manual height control lever in «*high*» position.

12. Bleed the brakes (see same operation Chap. A) fit the rear left wing.

2110



II. CHECKING THE PRESSURE SWITCH.

Use test bench 2290 - T *(vehicles with LHS 2. coloured red)* or test bench 3654 - T *(vehicles using LHM fluid coloured green)*.
Connect the pressure gauge graduated from 0 to 100 bars (1450 psi.)

13. Connect the openings «c» on the pressure switch and «a» on the pump, using a tube A.

Connect the green and blue plugs of the wires supplied with the test bench to the corresponding coloured terminals.

Connect the «crocodile» clips of these wires to the terminals on a 12 - volts battery. Using the yellow wire, connect terminal «d» on the pressure switch to the vacant terminal on the test bench.

The warning lamp must illuminate, if it does not the pressure switch is faulty.

14. Tighten the bleed screw «b» and operate the pump in order to build up the pressure progressively to 100 bars (1450 psi.).

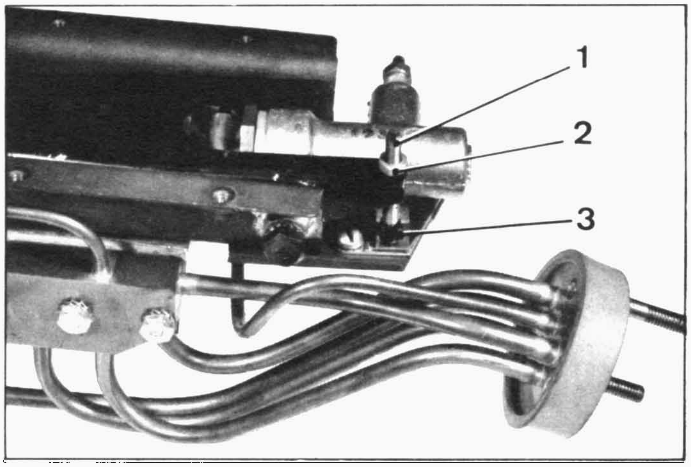
The lamp must go out between 60 and 70 bars (860 - 995 psi.).

Release the pressure by very slowly loosening bleed screw «b». The lamp must light between 70 and 60 bars. If not, the pressure switch must be renewed.

15. Release the pressure by loosening the bleed screw «b».
Disconnect the battery.
Disconnect the wiring harness and the tube A.

NOTE : This operation can be carried out on the car.

2091



III. ADJUSTING A STOP LAMP SWITCH.

16. Remove the pedal panel.
Connect a test lamp between stop switch and earth.
Operate the adjusting screw «1» until test lamp goes out.
Tighten the screw «1» by exactly one turn and lock the lock nut «2».
NOTE : The screw «1» must be perpendicular and in the centre of the blade «3». If necessary bend the end of the blade.

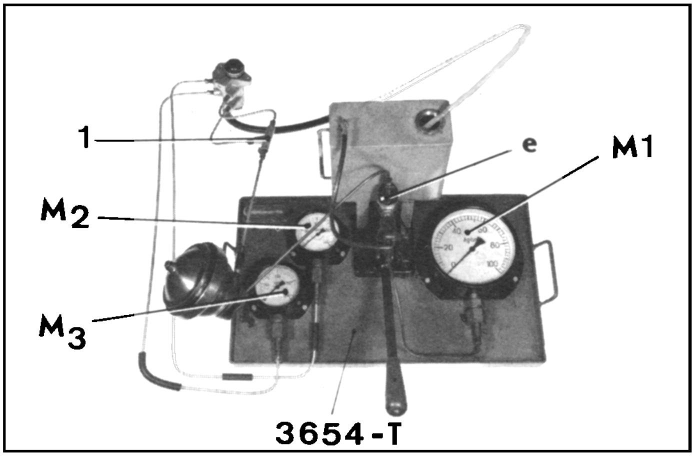
17. Fit the pedal panel.

VEHICLES DV - DT

C. THE BRAKE CONTROL VALVE.

NOTE : These vehicles use «*mineral L.H.M.*» hydraulic fluid. The main reservoir is painted *green* and the components are painted or marked in *green*.

2390



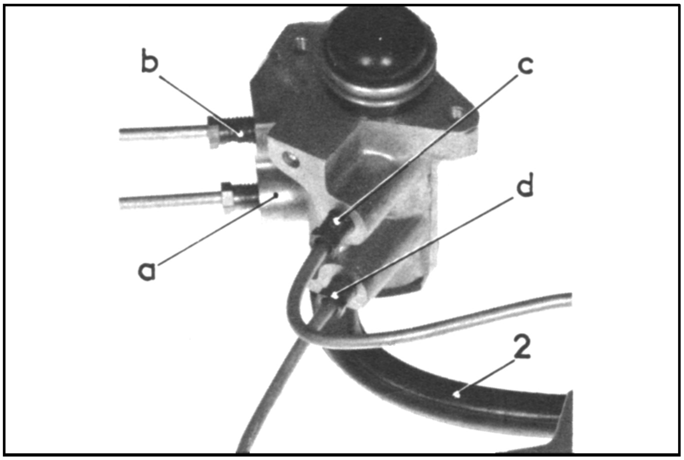
I. CHECKING THE BRAKE CONTROL VALVE.

IMPORTANT NOTE :
Only use test bench 3654-T intended for the mineral LHM fluid *(this bench is painted green)* and its accessories 3655-T *(the tubes and pressure gauges bear a green marking)*.

1. Connect the bench pump opening «e» to a brake accumulator feed opening « safari type ». Connect the supply opening of this accumulator to the 3-way union (1).
2. Connect the other two outlets of the 3-way union (1) to the feed openings «c» and «d» of the brake control. Connect the control outlet opening to the bench reservoir by means of tube (2), preferably transparent. Connect the front brake feed opening «b» to pressure gauge (M2) and the rear brake feed opening «a» to pressure gauge (M3).
3. Tighten the bleed screw on the bench and bring the pressure to 100 bars (1450 psi.) On pressure gauge (M1)
4. Press on the control and observe the pressure gauges (M2) and (M3). The pressure should rise first on pressure gauge (M2) and should be constantly greater than that on pressure gauge (M3) by approximately 5 bars (73 psi.) Stop pressing on the control, the pressure should return to zero.

NOTE : After a certain period of use, the pressure gauges (M2) and (M3) may lose their sensitivity.

It is advisable to take a second reading after interchanging the tubes on pressure gauges (M2) and (M3). Take the average of the two readings.

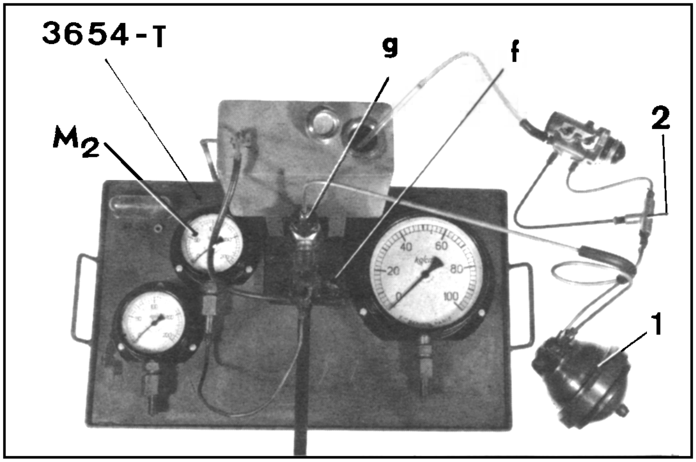


Manual 814-1

II. CHECKING THE BRAKE CONTROL VALVE FOR LEAKS.

IMPORTANT NOTE : Only use test bench 3654 - T intended for mineral LHM fluid *(this bench is painted green)* and its accessories 3655 - T *(the tubes and pressure gauges bear a green marking)*

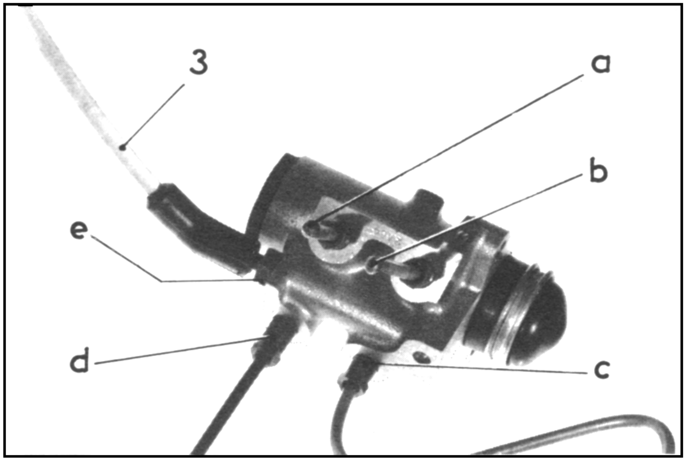
2389



5. Connect bench pump opening « a » to a brake accumulator (1) feed opening (safari type). Connect the supply opening of the accumulator (1) to the 3 - way union (2).

6. Connect the other two openings of the 3 - way union (2) to openings « c » and « d » of the brake control.
Block openings « a » and « b » of the control by means of plugs.
Connect the outlet opening « e » of the control, to the bench reservoir, by means of a transparent tube (3).

7. Tighten bleed screw « f » on the bench and pump until the pressure reaches approximately 100 bars (1450 psi.) (on pressure gauge M2)



8. Press several times on the control to bleed it.
Remove tube (3).

9. Pump until the pressure reaches 140 bars (2030 psi.) (on pressure gauge M2) observe this pressure gauge.

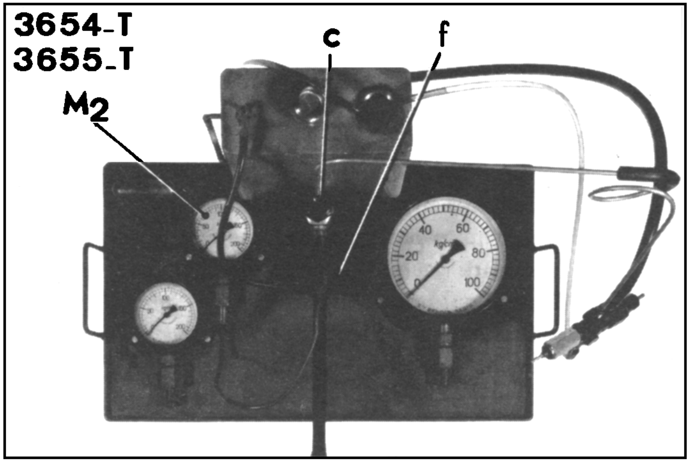
After one minute has elapsed, the pressure should still be 120 bars (1740 psi.) or more.

There should be no escape through outlet opening « e » or through the overflow return opening.

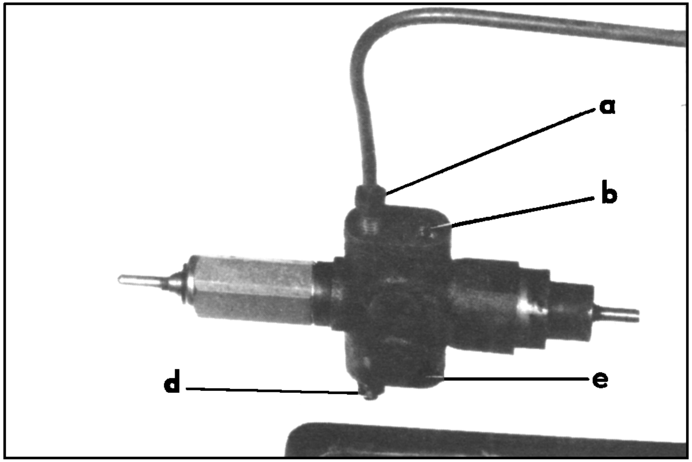
If there is, the control must be replaced.

III. CHECKING THE FUNCTIONING OF THE SECURITY VALVE.

2388



2388 bis



IMPORTANT NOTE : Use exclusively test bench 3654 - T intended for mineral fluid LHM. *(This bench is painted green)* and its accessories 3655 - T *(pipes and pressure gauges bear a green marking)*

10. Connect the security valve feed opening (a) to bench pump opening (c)
Plug the opening (d)

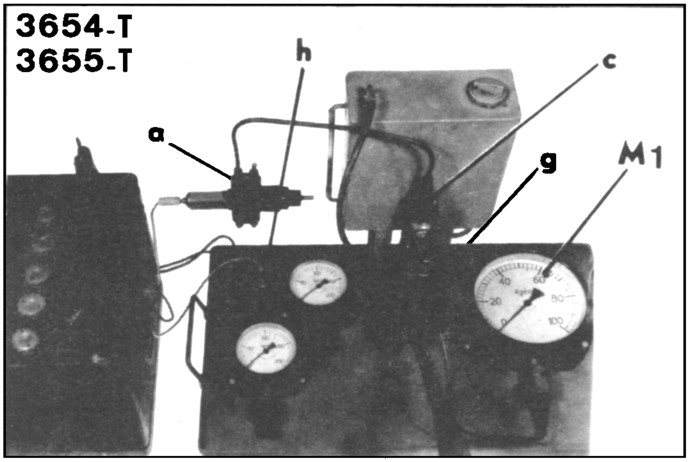
11. Tighten bench bleed screw (f) and operate the pump to build up the pressure progressively. (Pressure gauge M2) the fluid should escape through the openings (b) and (c) when the pressure is below or equal to 90 bars (1280 psi.)

12. Slightly loosen bleed screw (f) to release the pressure progressively.
The fluid escape must stop when the pressure is above 70 bars (1000 psi).

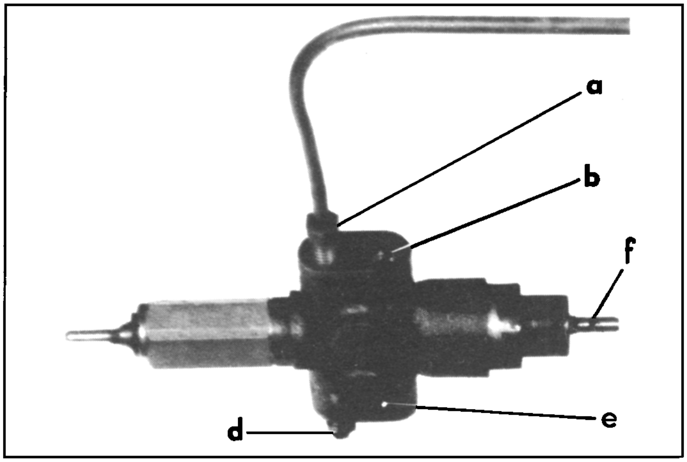
13. If the measure obtained in § 11 is greater than 90 bars (1280 psi), the thickness of the spring thrust washer must be reduced.

14. If the measure obtained in § 12 is below 70 bars (1000 psi), the thickness of the spring thrust washer must be increased.

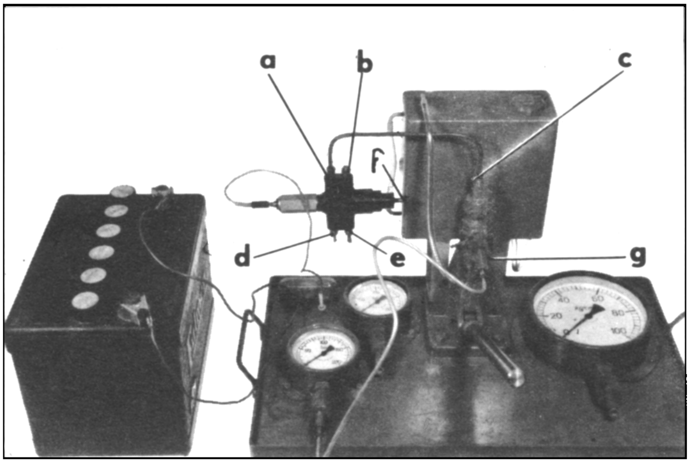
IV. CHECKING THE SECURITY VALVE PRESSURE SWITCH.



2388 bis



2386



IMPORTANT NOTE : Use exclusively test bench 3654 - T intensed for mineral fluid LHM. *(this bench is painted green)* and its accessories 3655 - T *(pipes and pressure gauges bear a green marking)*

15. Connect the security valve feed opening (a) to bench pump opening (c).
Seal the three other valve openings (b, d, e) by means of plugs.

16. Connect the pressure switch plug to bench terminal (h) and the two other bench leads to the terminals of a battery. The bench test lamp must illuminate.

17. Tighten bench bleed screw (3) and operate the pump to build up the pressure progressively (pressure gauge M1) until the test lamp goes out.
This should occur between :
- 55 and 85 bars (800 and 1230 psi)
  for vehicles →| *3/ 1973*
- 75 and 95 bars (1067 to 1351 psi)
  for vehicles |→ *3/ 1973*

18. Build up the pressure to 100 bars (1420 psi) approximately, then slowly loosen the bleed screw in order to release the pressure progre progressively,
The test lamp must illuminate when the pressure is between (pressure gauge M1) :
- 85 and 55 bars (1230 and 800 psi)
  for vehicles →| *3/ 1973*
- 95 and 75 bars (1351 and 1067 psi)
  for vehicles |→ *3/ 1973*

If the measures obtained are beyond these limits, the pressure switch must be renewed,

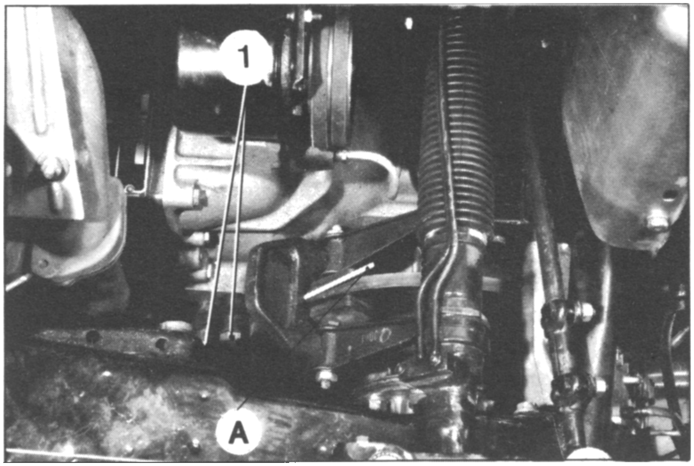
V. CHECKING THE SECURITY VALVE FOR LEAKS

19. Connect the security valve feed opening (a) to bench pump opening (c).
Seal the openings (b, d, e) by means of plugs.
Tighten bench bleed screw (g) and build up the pressure to 175 bars (2490 psi) This pressure is to be maintained for 1 minute, after this time has elapsed, there must be no leakage from opening (f) if there is, the security valve must be renewed.

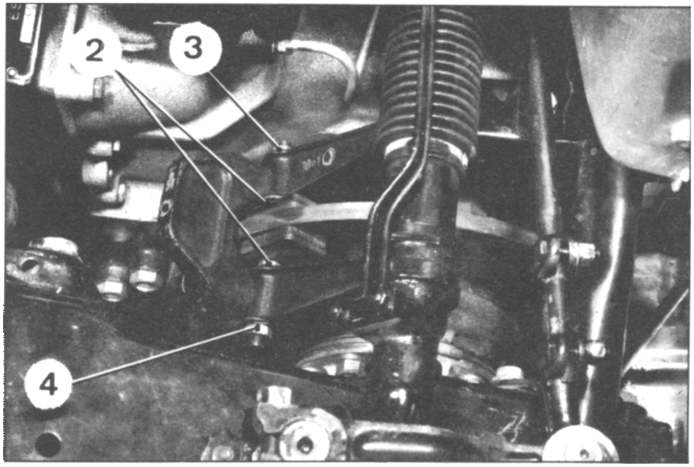
OPERATION No D. 454-0 : *Checking and adjusting the parking brake*

VEHICLES ALL TYPES

1273



1099



1. ADJUSTING THE CLEARANCE BETWEEN CALIPER AND DISC.

NOTE : Access to the L.H. caliper can be gained from under the vehicle

1. Put the front of vehicle on stands
2. Loosen the screws (1) and insert a 4mm shim between caliper and disc
3. Tighten the screws (1) to 100-110mΛN (10 to 11mkg. -72 to 79 ft.lbs)
4. Lower the vehicle to the ground.

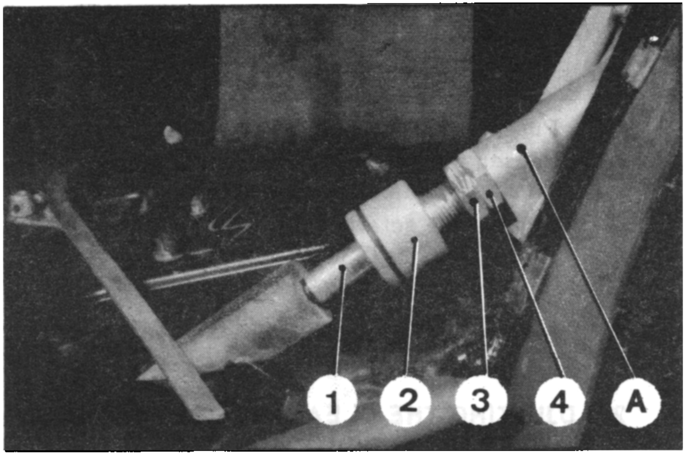
2. ADJUSTING THE CLEARANCE BETWEEN BRAKE PADS AND DISC.

NOTE : Access to the L.H. caliper can be gained from under the vehicle.

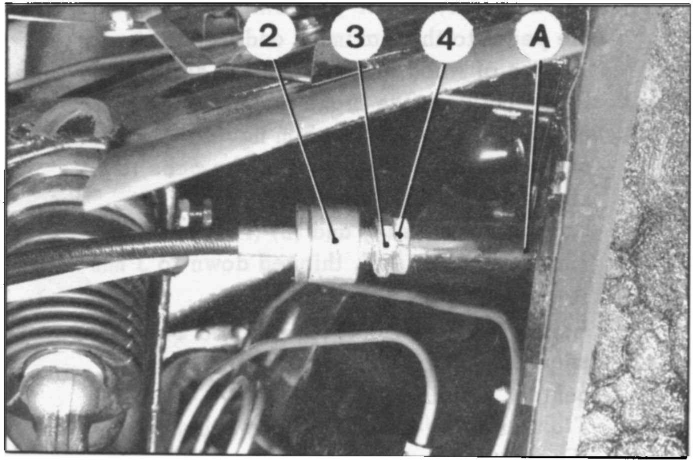
5. Put the front of vehicle on stands
6. With the brake completely off *on vehicles fitted with hydraulic gear change raise* the pedal to the maximum and wedge it with a piece of wood of about 210mm high.
   Place between the brake pads and the disc on each side a 0,1mm shim having a surface equivalent to that of the pads to prevent them from rocking.
   Loosen the nuts (4) and (3) (ring spanner 12 sided 16mm A.F. thinned down to 3 mm or spanner 3559-5)
   Adjust the screws (2) (thin-jawed 14mm O.E. spanner) to bring the brake pads just in contact with the shim
   Tighten nuts (4) and (3) (ring spanner 12 sided 16mm a/f thinned down to 3mm or spanner 3559-5)
   Remove the shims
   Make sure that the wheel turns freely
7. Carry out the same adjustement on the other brake caliper.
8. Remove the wooden wedge from under the pedal *on vehicle fitted with hydraulic gear change*
   Lower the vehicle to the ground

III. ADJUSTING THE SHEATH TENSION

1812



1536



9. *On vehicles fitted with mechanical gear change*
Put the front of vehicle on stands

9a. *On vehicle fitted with hydraulic gear change*
Remove the front left wing and the mudshield protecting the suspension mechanism. Put front of vehicle on stands

10. With the brakes released as indicated in §6 loosen locknut (3) and nut (4) bring the threaded sleeve (2) in contact with the sheath. Screw nut (4) to bring it to within : 0,3 - 0,5mm from the end of the tube (a). Tighten the locknut (3). Remove the wooden wedge from underneath the pedal and check that the wheels turn freely.

11. *On vehicle fitted with mechanical gear change*
Lower the vehicle to the ground

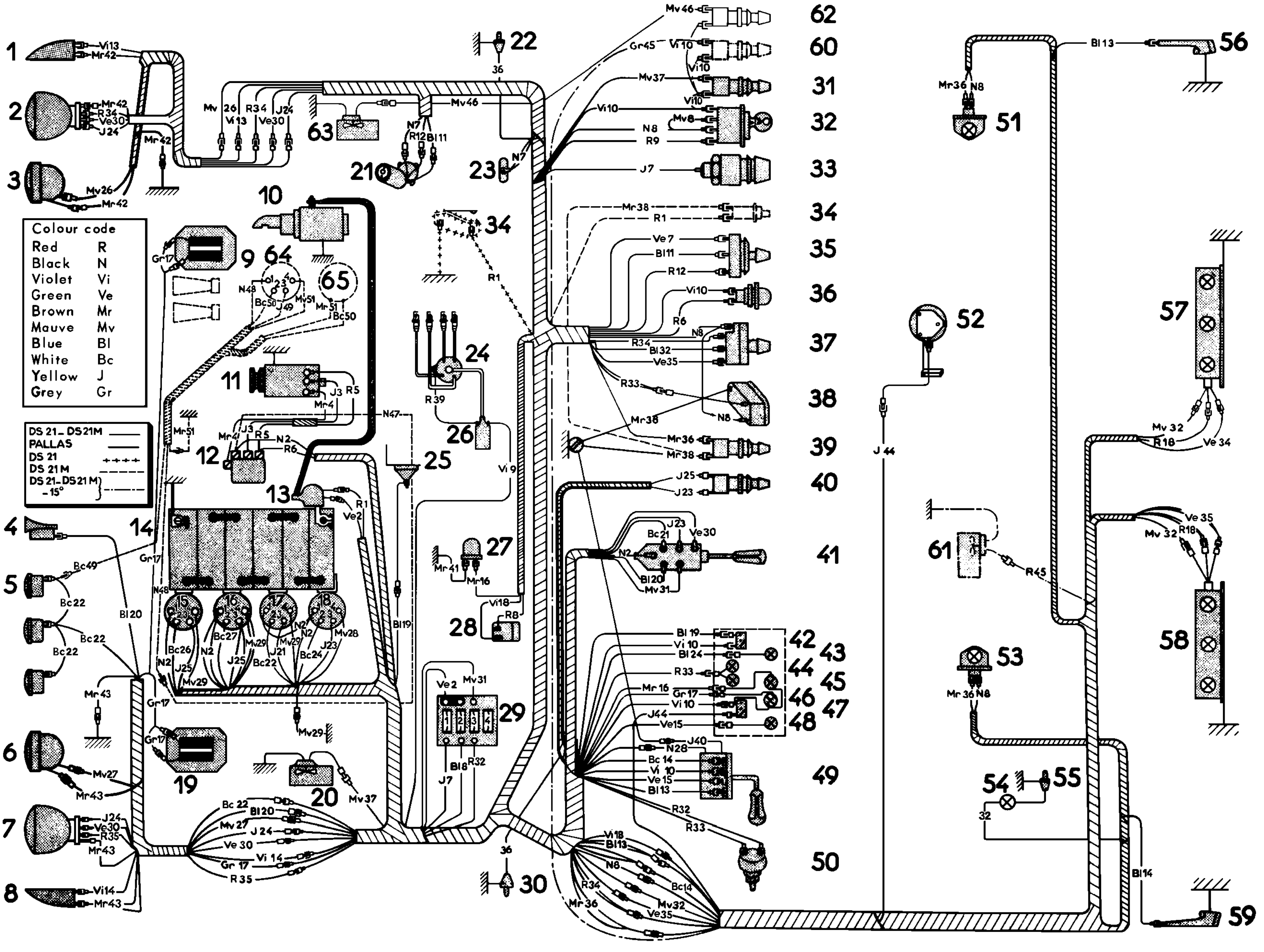
11a. *On vehicle fitted with hydraulic gear change*
- Remove the wooden wedge from underneath the pedal
- Lower the vehicle to the ground
- Fit the mudshield protecting the suspension mechanism and the front left wing

DX - DJ
|→ *Sept. 1965* →| *Sept. 1966*

BULB TABLE

Description	Quantity	Type of bulb
Headlamp - Dip	2	European P 45 t 41(yellow selective) 12 V - 45/40 W
Front direction indicators Rear direction indicators Stop lamp	6	BA - 15s - single contact - 12 V - 15 W (large bulb) *On Pallas vehicles :* single contact 12 V - 7 W (large bulb)
Rear lamps Number plate lamp Spare bulbs	6	BA - 15s - single contact - 4 W Philips Holland 12.821
Front parking lamps	2	BA 9s - 12 V - 4 W - Tube 10 mm diameter
Front interior lamps (*on PALLAS*)	2	BA 15s - 12 V - 15 W (large bulb)
Front Rear interior lamps	4	Festoon 12 V - 7 W
Panel lamp Brake warning lamp Brake pad wear warning lamp	4	BA 9s - 12 V - 2 W - tube 8,8 mm dia. Max. (NORMA 1529)
Charge warning lamp Clock lamp	2	BA 9s - 12 V - 1.5 W
Flashing indicator warning lamp Headlamp main beam warning lamp	2	BA 9s - 24 V - 3 W
Boot lamp	1	Festoon 12 V - 4 W
Q.I. Headlamp (option)	2	Q.I. Bulb - 12 V - 55 W (NORMA 112)

WIRING DIAGRAM



Colour code	
Red	R
Black	N
Violet	Vi
Green	Ve
Brown	Mr
Mauve	Mv
Blue	Bl
White	Bc
Yellow	J
Grey	Gr

DS 21_DS21M
PALLAS
DS 21
DS 21M
DS 21_DS21M – 15°

MARKING OF PARTS

1. Front right direction indicator.
2. Front right headlamp.
3. Front right QI headlamp.
4. Town horn.
5. Country horns.
6. Front left QI headlamp.
7. Front left headlamp.
8. Front left direction indicator.
9. Front right brake unit.
10. Starter motor.
11. Dynamo.
12. Voltage regulator.
13. Starter motor relay.
14. Battery,
15. SANOR relay for front right QI headlamps.
16. SANOR relay for front left QI headlamps.
17. SANOR relay for country horns.
18. SANOR relay for headlamp flasher.
19. Front left brake unit.
20. Blower for front heating.
21. Windscreen wiper motor.
22. Switch for interior lamps, operated by front right-hand door.
23. Terminal for accessories.
24. Distributor.
25. Thermal sensor.
26. Ignition coil.
27. Brake pressure switch.
28. Stop lamp switch.
30. Switch for interior lamps, operated by front L.H. door.
32. Ignition switch.
33. Cigar lighter.
34. Switch for starter motor relay.
35. Windscreen wiper switch.
31. Switch for front heating.
36. Charge warning lamp.
37. Switch for parking lamps.
38. Electric clock.
39. Switch for interior lumps.
40. Switch for QI headlamps.
41. Switch for lighting and horns.
42. Thermometer.
43. Warning lamp for headlamp main beam.
44. Bulbs lighting instrument panel.
45. Warning lamp for brake pressure switch.
46. Warning lamp for wear on front brake pads.
47. Fuel gauge.
48. Warning lamp for direction indicators.
49. Switch for direction indicators with switch for headlamp flasher.
50. Rheostat for instrument and clock lighting.
51. Front right interior lamp.
52. Rheostat for fuel (gauge) unit.
53. Front left interior lamp.
54. Boot lamp.
55. Switch for boot lamp.
56. Rear right direction indicator.
57. Lamps for number plate,-rear and stop lamps, R.H.
58. Lamps for number plate,-rear and stop lamps , L.H.
59. Rear left direction indicator.
60. Switch for rear heater. (heating 15° C (59° F)
61. Blower for rear heater. (heating 15° C (59° F)
62. Switch for fresh air blower.
63. Fresh air blower.

optional

64. SANOR compressor relay.
65. Compressor for horns.

Harness	Wire No	Colour of ends	Wiring schedule
Front	1	Red	Starter motor relay (13)
		Red	to starter motor relay switch (34)
Front	2	Green	Starter motor relay (13)
		Black	to regulator terminal « BAT » (12)
		Green	to fusebox (29) (N° 1 and 2 fuses)
		Black	to switch for lighting and horns (41)
		Black	to front right QI headlamp relay (15)
		Black	to front left Ql headlamp relay (16)
		Black	to country horn relay (17)
		Black	to headlamp flasher relay (18)
Dynamo	3	Yellow	Dynamo (11)
		Yellow	to terminal « EXC » of regulator (12)
Dynamo	4	Brown	Dynamo (11)
		Brown	to regulator earth (12)
Dynamo	5	Red	Dynamo (11)
		Red	to terminal « DYN » of regulator (12)
Front	6	Red	Terminal « DYN » of regulator (12)
		Red	to charge warning lamp (36)
Front	7	Yellow	Fuse box (29) (fuse N° 1)
		Green	to windscreen wiper switch (35)
		Black	to terminal for accessories (23)
		Black	to windscreen wiper motor (21) (automatic stop)
		Yellow	to cigar lighter (33)
Front	8	Blue	Fusebox (29) (fuse No 2)
		Black	to rear junction
		Red	to stop lamp switch (28)
		Black	to parking lamp switch (37)
		Black	to clock (38)
		Black + Mauve	to ignition switch (32)
Front	9	Red	Ignition switch (32)
		Violet	to ignition coil (26)
Front	10	Violet	Ignition switch (32)
		Violet	to heater switch (31)
		Violet	to fuel gauge (47)
			to pressure switch warning lamp (45)
			to front brake pad wear warning lamp (46)
		Violet	to charge warning lamp (36)
		Violet	to direction indicator switch (49)
		Violet	to thermometer (42)
		Violet	to switch (60) for rear heating (- 15° C (59° F))
Front	11	Blue	Windscreen wiper switch (35)
		Blue	to windscreen wiper motor (21)
Front	12	Red	Windscreen wiper switch (35)
		Red	to windscreen wiper motor (21)
Front	13	Blue	Direction indicator switch (49)
		Violet	to front R.H. junction
		Blue	to rear junction
Front	14	White	Direction indicator switch (49)
		Violet	to front L.H. junction
		White	to rear junction

Harness	Wire No	Colour of ends	Schedule of Wiring
Front	15	Green Green	Direction indicator switch (49) to direction indicator warning lamp (48)
Front	16	Brown Brown	Front brake pressure switch warning lamp (45) to pressure switch (27) for hydraulic brake unit
Front	17	Grey Grey	Warning lamp (46) for front brake pads to front L.H. harness
Front	18	Violet Violet	Stop lamp switch (28) to rear junction
Front	19	Blue Blue	Thermometer (42) to supply lead (18) for thermal sensor (25)
Front	20	Blue Blue	Switch (41) for lighting and horns to front L.H. junction
Front	21	White Yellow	Switch (41) for lighting and horns to country horn relay (17)
Front	22	White White	Country horn relay (17) to front L.H. junction
Front	23	Yellow Yellow Yellow	Switch (41) for lighting and horns ü to QI headlamp switch (40) ý on PALLAS to headlamp flasher relay (18) þ
Front	24	White Yellow Yellow Blue	Headlamp flasher relay (18) to front L.H. junction to front R.H. junction to main - beam warning lamp (43)
Front	25	Yellow Yellow Yellow	Switch (40) for QI headlamps to relay (15) for front R.H. QI headlamp (3) to relay (16) for front L.H. QI headlamp (6)
Front	26	White Mauve	Relay (15) for front R.H. QI headlamp to front R.H. junction
Front	27	White Mauve	Relay (16) for front L.H. QI headlamp to front L.H. junction
Front	28	Mauve Black	Relay (18) for headlamp flasher to switch for direction indicators (49)
Front	29	 Mauve Mauve Mauve	Earth : to relay (15) for front R.H. QI headlamp to relay (16) for front L.H. QI headlamp to relay (17) for country horns
Front	30	Green Green Green	Switch (41) for lighting and horns to front R.H. junction to front L.H. junction
Front	31	Mauve Mauve	Switch (41) for lighting and horns to fuse box (29) (fuse N° 3)
Front	32	Red Mauve Red Blue	Fuse box (29) (fuse N° 3) to rear junction to rheostat (50) for lighting instrument panel to switch for parking lamps (37)
Front	33	Red Red Red	Rheostat for lighting instrument panel (50) to lamps lighting instrument panel (44) to clock lamp (38)

Harness	Wire No	Colour of ends	Schedule of Wiring
Front	34	Red	Switch (37) for parking lamps
		Red	to front R.H. junction
		Red	to rear junction
Front	35	Green	Switch (37) for parking lamps
		Red	to front L.H. junction
		Green	to rear junction
Front	36	Brown	Interior lamp switch (39)
		Brown	to rear junction
			to switch on front R.H. door pillar (22)
			to switch on front L.H. door pillar (30)
Front	37	Mauve	Switch (31) for front heating
		Mauve	to heater blower motor (20)
Flying lead	38		Earth :
		Brown	to switch (34) for starter motor relay
		Brown	to switch (39) for interior lamps
		Brown	to clock (38)
Flying lead	39	Red	Ignition coil (26)
			to distributor (25)
Flying lead	40	Yellow	Earth :
		Yellow	to switch (49) for direction indicators
Flying lead	42		Earth :
		Brown	to brake pressure switch (27)
Front R.H.	13	Violet	Front R.H. junction
		Violet	to R.H. direction indicator (1)
Front R.H.	24	Yellow	Front R.H. junction
		Yellow	to front R.H. headlamp (2) (main beam)
Front R.H.	26	Mauve	Front R.H. junction
		Mauve	to R.H. QI headlamp (3)
Front R.H.	30	Green	Front R.H. junction
		Green	to front R.H. headlamp (2) (dipped)
Front R.H.	34	Red	Front R.H. junction
		Red	to front R.H. headlamp (2) (sidelamp - parking lamp)
Front R.H.	42		Earth :
		Brown	to front R.H. direction indicator (1)
		Brown	to front R.H. headlamp (2)
		Brown	to R.H. QI headlamp (3)
Front L.H.	14	Violet	Front L.H. junction
		Violet	to front L.H. direction indicator (8)
Front L.H.	17	Grey	Front L.H. junction
		Grey	to harness for front brake pads (9) and (19)
Front L.H.	20	Blue	Front L.H. junction
		Blue	to town horn (4)
Front L.H.	22	White	Front L.H. junction
		White	to country horns (5)
Front L.H.	24	Yellow	Front L.H. junction
		Yellow	to front L.H. headlamp (7) (main beam)
Front L.H.	27	Mauve	Front L.H. junction
		Mauve	to L.H. QI headlamp (6)

Harness	Wire No	Colour of ends	Schedule of Wiring
Front L.H.	30	Green Green	Front L.H. junction to front L.H. headlamp (7) (dipped)
Front L.H.	35	Red Red	Front L.H. junction to front L.H. headlamp (7).(sidelamp- parking lamp)
Flying lead	43	 Brown Brown Brown	Earth : to front L.H. direction indicator (8) to front L.H. headlamp (7) to L.H. QI headlamp (6)
Rear	8	Black Black	Rear junction to front R.H. (51) and L.H. (53) interior lamps
Rear	13	Blue Blue	Rear junction to front R.H. direction indicator (56)
Rear	14	White Blue	Rear junction to rear L.H. direction indicator (59)
Rear	18	Violet Red Red	Rear junction to rear R.H. stop lamp (57) to rear L.H. stop lamp (58)
Rear	32	Mauve Mauve Mauve	Rear junction to R.H. number plate lamp (57) to L.H. number plate lamp (58) to boot lamp (54)
Rear	34	Red Green	Rear junction to rear R.H. parking lamp (or rear lamp) (57)
Rear	35	Green Green	Rear junction to rear L.H. parking lamp (or-rear lamp) (58)
Rear	36	Brown Brown	Rear junction to front R.H. (51) and L.H. (53) interior lamps.
Rear	44	Yellow Yellow	Petrol gauge (47) to rheostat for petrol gauge (52)
Rear	45	Grey Red	Switch (60) for rear heating (- 15° C (59° F)) to blower motor (61) for rear heating (- 15° C (59°F))
			OPTIONAL FITTINGS :
  Flying lead	 46	 Violet Mauve	1) on request a fresh air blower (63) is fitted. jumper lead Vi 10 feeds the switch (62) flying lead Mv 46 feeds the fresh air blower (63)
 Flying lead	 47	 Black Black	2) on request an air horn (65) is fitted. regulator (12) terminal « BAT » to junction on horn harness
Horn harness to compressor	48	Black Black	Junction on horn harness to « SANOR » relay (64) (terminal 1)
-do-	49	White Yellow	Country horns (5) to « SANOR » relay (64) (terminal 3)
-do -	50	White White	« SANOR » relay (64) (terminal 2) to compressor (65)
-do-	51	Brown Mauve Brown	Earth : to « SANOR » relay (64) (terminal 4) to compressor (65)

DY - DL - DE

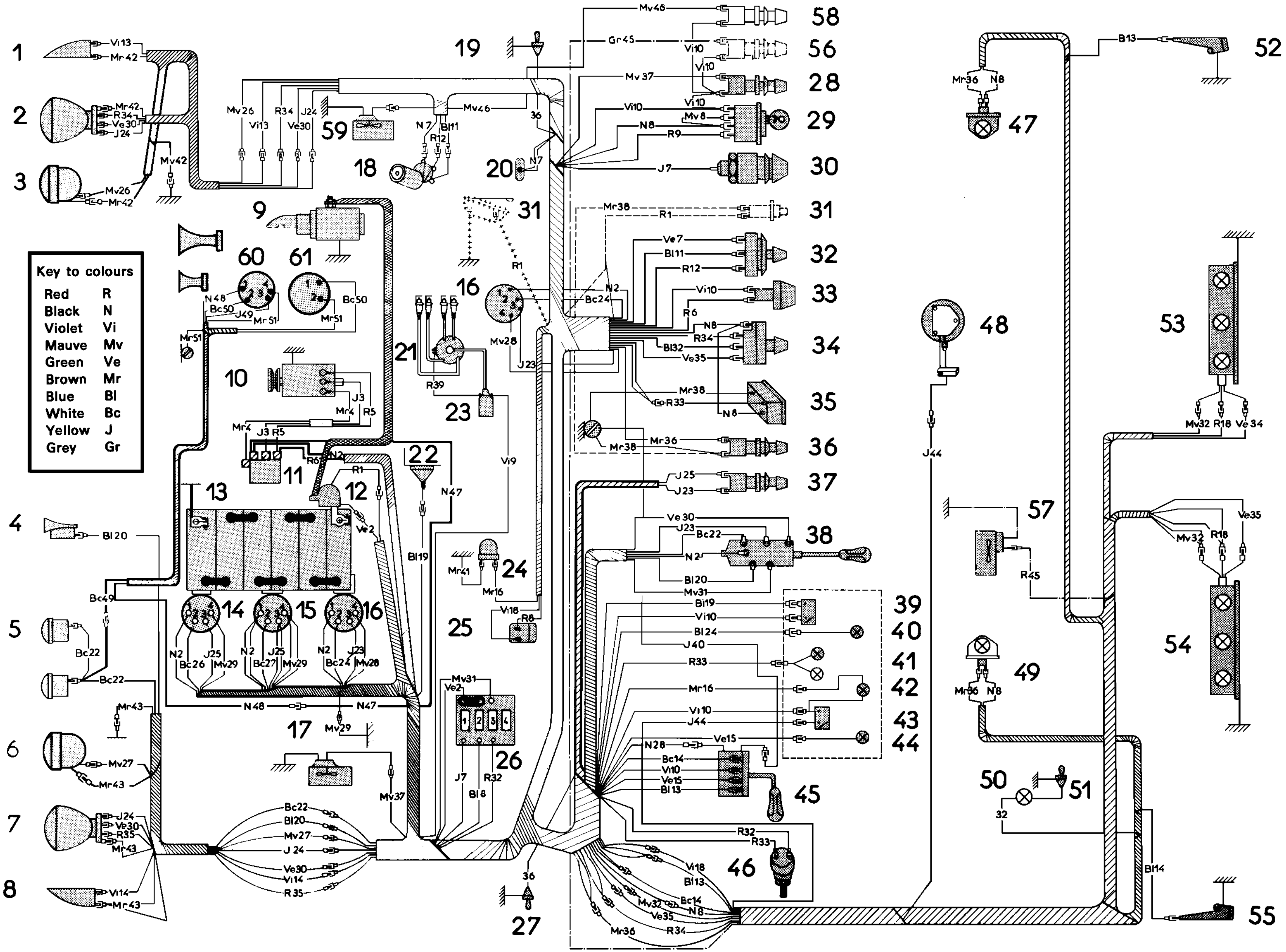
|→ ***September 1965*** →| ***September 1966***

BULB TABLE

Description	Quantity	Type of bulb
Headlamp-main/dipped	2	European P.45 E 41 (yellow selective) 12 v 45/40 w.
Front flashers Rear flashers Stop lamp	6	B.A. - 15 s - single contact 12 v - 15 w (large bulb) ***On « Pallas » vehicles-single contact - 12v - 7w (large bulb)***
Rear lamps Number plate lamp Spare bulbs	6	B.A. - 15 s - single contact 12 v - 4 w Philips Hollande 12.821
Front parking lamps	2	B.A. 9 s - 12 v - 4 w tube diameter 10 mm
Front interior lamps on « PALLAS »	2	B.A. - 15 s - 12 v - 15 w (large bulb)
Front Rear Interior lamps	4	Festoon 12 v - 7 w
Dashboard lamp Brake pressure warning lamp Brake pad warning lamp	4	B.A. - 9 s - 12 v - 2 w tube diameter 8,8 maxi (norma 1529)
Charge warning lamp Clock lamp	2	B.A. - 9 s - 12 v - 1.5 w
Flasher warning lamp Headlamp warning lamp	2	B.A. 9 s -24v-3w
Boot lamp	1	Festoon 12 v - 4 w
Optional Q.I. headlamp	2	Q.I. bulb 12 v - 55 w (norma 112)

ELECTRICITY

WIRING DIAGRAM



Key to colours

Red	R
Black	N
Violet	Vi
Mauve	Mv
Green	Ve
Brown	Mr
Blue	Bl
White	Bc
Yellow	J
Grey	Gr

SCHEDULE OF PARTS

1. Front RH direction indicator
2. Front RH headlamp
3. Front RH Q.I. headlamp
4. Town horn
5. Country horns
6. Front LH Q.I. headlamp
7. Front LH headlamp
8. Front LH direction indicator
9. Starter motor
10. Dynamo
11. Voltage regulator
12. Starter motor relay
13. Battery
14. «SANOR» relay for front RH Q.I. headlamp
15. «SANOR» relay for front LH Q.I. headlamp
16. «SANOR» relay for headlamp flasher
17. Front heating blower motor
18. Windscreen wiper motor
19. Front RH door pillar switch
20. Accessory terminal
21. Distributor
22. Thermal sensor
23. Ignition coil
24. Brake pressure switch
25. Stop lamp switch
26. Fuse box
27. Front LH door pillar switch
28. Front heating switch
29. Ignition switch .
30. Cigar lighter
31. Starter motor relay switch
32. Windscreen wiper switch
33. Charge warning lamp
34. Parking lamp switch
35. Electric clock
36. Interior lamp switch
37. Q.I. headlamp switch
38. Lighting and horn switch
39. Thermometer
40. Headlamp warning lamp
41. Dashboard lamp
42. Brake pressure switch warning lamp
43. Fuel gauge
44. Direction indicator warning lamp
45. Switch for direction indicators and headlamp flasher
46. Rheostat for dashboard and clock lamps
47. Front RH interior lamp
48. Rheostat for fuel gauge
49. Front LH interior lamp
50. Boot lamp
51. Boot lamp switch
52. Rear RH direction indicator
53. Rear RH number plate and stop lamps
54. Rear LH number plate and stops lamps
55. Rear LH direction indicator
56. Rear heating switch (15° C) (- 59° F)
57. Rear heating blower (15° C) (- 59'F)
58. Fresh air blower switch fittings
59. Fresh air blower
60. «SANOR » relay for air horn

} optional fittings

61. Compressor

NOTE : On DS 19 Pallas vehicles the headlamp flasher relay on the scuttle (in the case of the DS 19) is on the battery with the Q.I. headlamp relay.

On Safaris and ID 19 A, there is no headlamp flasher

Harness	Wire No	Colour of ends	Wiring Schedule
Front	1	Red	Starter motor relay (12)
		Red	To starter motor relay switch (31)
Front	2	Green	Starter motor relay (12)
		Black	To « BAT » terminal of voltage regulator (11)
		Green	To fuse box (26) (fuse n° 1 and 2)
		Black	To lighting and horn switch (38)
		Black	To front RH Q.I. headlamp (14)
		Black	To front LH Q.1 headlamp (15)
		Black	To headlamp flasher relay (16)
Dynamo	3	Yellow	Dynamo (10)
		Yellow	To « EXC » terminal of voltage regulator (11)
Dynamo	4	Brown	Dynamo (10)
		Brown	To earth on voltage regulator (11)
Dynamo	5	Red	Dynamo (10)
		Red	To « DYN » terminal on voltage regulator (11)
Front	6	Red	« DYN » terminal on voltage regulator
		Red	To charge warning lamp (35)
Front	7	Yellow	Fuse box (26) (fuse n° 1)
		Green	To windscreen wiper motor switch (32)
		Black	To accessory terminal (20)
		Black	To windscreen wiper motor (18) (automatic stop)
		Yellow	To cigar lighter (30)
Front	8	Blue	Fuse box (26) (fuse no 2)
		Black	To rear junction
		Red	To stop lamp switch (25)
		Black	To parking lamp switch (34)
		Black	To clock (35)
		Black/ mauve	To ignition switch (29)
Front	9	Red	Ignition switch (29)
		Violet	To ignition coil (23)
Front	10	Violet	Ignition switch (29)
		Violet	To heater switch (28)
		Violet	To fuel gauge (43)
			To brake pressure switch warning lamp (42)
		Violet	To charge warning lamp (33)
		Violet	To direction indicator switch (45)
		Violet	To thermometer (39)
		Violet	To front heater switch (56) (cold - 59°F)
Front	11	Blue	Windscreen wiper switch (32)
		Blue	To windscreen wiper motor (18)
Front	12	Red	Windscreen wiper switch (32)
			To windscreen wiper motor (18)
Front	13	Blue	Direction indicator switch (45)
		Violet	To front RH junction
		Blue	To rear junction

Harness	Wire No	Colour of ends	Wiring Schedule
Front	14	White Violet White	Direction indicator switch (45) To front LH junction To rear junction
Front	15	Green Green	Direction indicator switch (45) To direction indicator warning lamp (44)
Front	16	Brown Brown	Brake pressure switch warning lamp (42) To hydraulic brake unit pressure switch (24)
Front	18	Violet Violet	Stop lamp switch (25) To rear junction
Front	19	Blue Blue	Thermometer (39) To feed wire for thermal sensor
Front	20	Blue Blue	Lighting and horn switch (38) To rear junction LH
Front	22	White White	Lighting and horn switch (38) To rear junction LH
Front	23	Yellow Yellow Yellow	Lighting and horn switch (38) To Q.L headlamp switch (37) (Pallas) To headlamp flasher relay (16) (terminal 3)
Front	24	White Yellow Yellow Blue	Headlamp flasher relay (16) (terminal 2) To front LH junction To front RH junction To headlamp warning lamp (40)
Front	25	Yellow Yellow Yellow	Q.I. headlamp switch (37) To front RH headlamp (3) relay (14) (terminal 3) To front LH headlamp (6) relay (15) (terminal 3)
Front	26	White Mauve	Front RH Q.I. headlamp relay (14) (terminal 2) To front RH junction
Front	27	White Mauve	Front LH Q.I. headlamp relay (15) (terminal 2) To front RH junction
Front	28	Mauve Black	Headlamp flasher relay (17) (terminal 4) To direction indicator switch (45 j
Front	29	Mauve Mauve Mauve	Earth To front RH Q.I. headlamp relay (14) (terminal 4) To front LH Q.I. headlamp relay (15) (terminal 4)
Front	30	Green Green Green	Lighting and horn switch (38) To front RH junction To front LH junction
Front	31	Mauve Mauve	Lighting and horn switch To fuse box (26) (fuse Nº 3)
Front	32	Red Mauve Red Blue	Fuse box (26) (fuse No 3) To rear junction To rheostat (46) for dashboard lamp To parking lamp switch (34)

Harness	Wire No	Colour of ends	Wiring Schedule
Front	33	Red	Rheostat (46) for dashboard lamp
		Red	To dashboard lamp (41)
		Red	To clock lamp (35)
Front	34	Red	Parking lamp switch (34)
		Red	To front RH junction
		Red	To rear junction
Front	35	Green	Parking lamp switch (34)
		Red	To front LH junction
		Green	To rear junction
Front	36	Brown	Interior lamp switch (36)
		Brown	To rear junction
			To RH door pillar switch (19)
			To LH door pillar switch (27)
Front	37	Mauve	Front heating switch (28)
		Mauve	To heating unit motor (17)
Flying lead	38	Brown	Earth
		Brown	To starter motor relay switch (31)
		Brown	To interior lamp switch (36)
			To clock (35)
Flying lead	39	Red	Ignition coil (23)
		Red	To distributor (21)
Flying lead	40	Yellow	Earth
		Yellow	To direction indicator switch (45)
Flying lead	41		Earth
		Brown	To brake pressure switch (24)
Front RH	13	Violet	Front RH junction
		Violet	To RH direction indicator (1)
Front RH	24	Yellow	Front RH junction
		Yellow	To front RH headlamp (2) main beam
Front RH	26	Mauve	Front RH junction
		Mauve	To front Q.I. headlamp (3)
Front RH	30	Green	Front RH junction
		Green	To front RH headlamp (2) dipped beam
Front RH	34	Red	Front RH junction
		Red	To front RH headlamp (sidelamp - parking lamp) (2)
Front RH	42		Earth
		Brown	To front RH direction indicator (1)
		Brown	To front RH headlamp (2)
		Brown	To RH Q.I. headlamp (3)
Front LH	14	Violet	Front LH junction
		Violet	To front LH direction indicator (8)

Harness	Wire No	Colour of ends	Wiring Schedule
Front LH	20	Blue Blue	Front LH junction To town horn (4)
Front LH	22	White White	Front LH junction To country horns (5)
Front LH	24	Yellow Yellow	Front LH junction To front LH headlamp (7) (main beam)
Front LH	27	Mauve Mauve	Front LH junction To front LH Q.I. headlamp (6)
Front LH	30	Green Green	Front LH junction To front LH headlamp (7) (dipped beam)
Front LH	35	Red Red	Front LH junction To front LH headlamp (7) (side lamp - parking lamp)
Flying lead	43	 Brown Brown Brown	Earth To front LH direction indicator (8) To front LH headlamp (7) To front LH Q.I. headlamp (6)
Rear	8	Black Black	Rear junction To front RH (47) and front LH (48) interior lamps
Rear	13	Blue Blue	Rear junction To rear RH direction indicator (52)
Rear	14	White Blue	Rear junction To rear LH direction indicator (55)
Rear	18	Violet Red Red	Rear junction To rear RH stop lamp (53) To rear LH stop lamp (54)
Rear	32	Mauve Mauve Mauve	Rear junction To RH number plate lamp (53) To LH number plate lamp (54) To boot lamp (50)
Rear	34	Red Green	Rear junction To rear RH parking lamp (or rear lamp) (53)
Rear	35	Green Green	Rear junction To rear LH parking lamp (or rear lamp) (54)
Rear	36	Brown Brown	Rear junction To front RH (47) and front LH (49) interior lamps
Rear	44	Yellow Yellow	Fuel gauge To fuel gauge (48) rheostat
Rear	45	Grey Red	Rear heating switch (56) (- 59°F) To rear heating blower motor (57) (- 59° F)

Harness	Wire No	Colour of ends	Wiring Schedule
			OPTIONAL FITTINGS.
		Violet Mauve	1. On request a fresh air blower (59) is fitted. A jump lead Vi 10 feeds the switch (58). A flying lead Mv 46 feeds the blower motor (59)
Flying lead	47	Black Black	Voltage regulator (11) (terminal « BAT ») To junction on the air horn harness
Air horn	40	Black Black	Junction on the flying feeder lead To terminal (1) on « SANOR » relay (60)
Air horn	49	Yellow White	Terminal (3) on « SANOR » relay (60) To country horn (5)
Air horn	50	White White	Terminal (2) on « SANOR » relay (60) To compressor (61)
Air horn	51	Mauve Brown Brown	Terminal (4) on « SANOR » relay (60) To compressor (61) To chassis earth

OPERATION N° DX. 510-00 a: *Assembly of electrical equipment.*
(battery on the R.H. side)

DX, DJ, DY, DL

|→ *September 1967* →| *September 1967*

DS 21 AND DS 21 M VEHICLES

MARKING OF PARTS

1. Front right direction indicator
2. Front right headlamp
3. Front right Ql headlamp
4. Town horn
5. Country horns
6. Front left QI headlamp
7. Front left headlamp
8. Front left direction indicator
9. Voltage regulator
10. Front right brake unit
11. Starter motor relay
12. Battery
13. Starter motor
14. Dynamo
15. Front left brake unit
16. Blower for front heating
17. Windscreen wiper motor
18. Terminal for accessories
19. R.H. fuse box
20. « SANOR » relay for headlamp flasher
21. « SANOR » relay for R.H. QI headlamp
22. « SANOR » relay for L.H. QI headlamp
23. Thermal sensor
24. Distributor
25. Brake pressure switch
26. Stop lamp switch
27. Ignition coil
28. L.H. fuse box
29. Switch for interior lamp, operated by front R.H. door
30. Switch for interior lamp, operated by front L.H. door
31. Switch for front heating
32. Ignition switch
33. Cigar lighter
34. Switch for starter motor relay
35. Windscreen wiper switch
36. Charge warning lamp
37. Switch for parking lamps
38. Electric clock
39. Switch for interior lamps
40. Switch for QI headlamps
41. Switch for lighting and horns
42. Thermometer
43. Warning lamp for headlamp main beam
44. Lamps lighting instrument panel
45. Warning lamp for brake pressure switch
46. Warning lamp for front brake pad wear
47. Fuel gauge
48. Warning lamp for direction indicators
49. Switch for direction indicators with switch for headlamp flasher
50. Rheostat for instrument and clock lighting
51. Fuel gauge unit rheostat
52. Front interior light R.H.
53. Front interior light L.H.
54. Boot lamp
55. Boot lamp switch
56. Rear right direction indicator.
57. Lamp for number plate, rear lamp and stop lamp - R.H
58. Lamp for number plate, rear lamp and stop lamp - L.H
59. Rear left direction indicator.
60. Switch for rear heating -15°C (59°F)
61. Blower motor for rear heating -15°C(59°F)

} optional

62. Switch for fresh air blower motor
63. Fresh air blower

} optional

64. « SANOR » compressor horn relay
65. Horn compressor

} optional

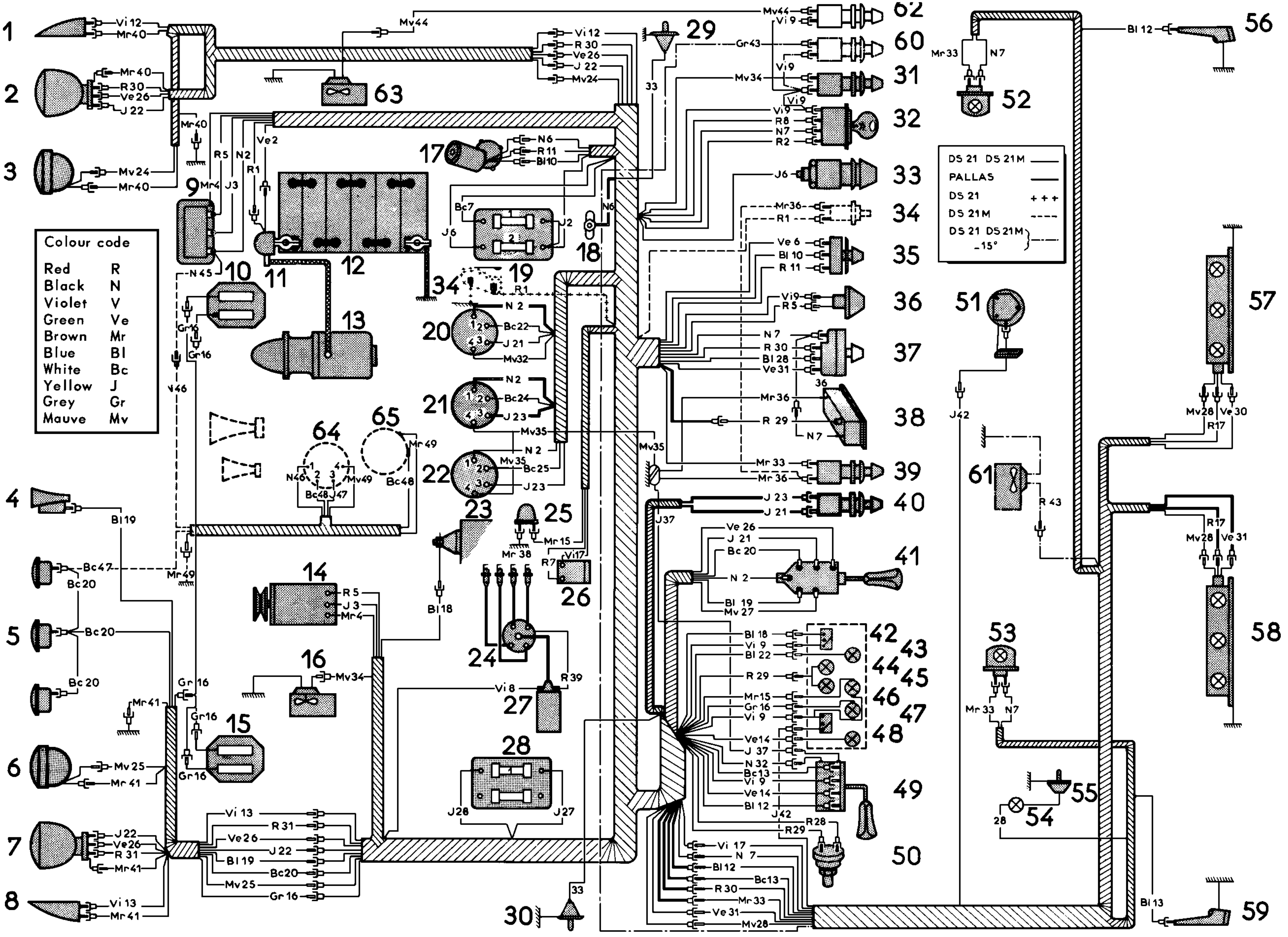
NOTE : DS 19 and DS 19 MA VEHICLES

The assembly of the electrical equipment for the DS 19 A and DS 19 MA is slightly different from that of the DS 21 and DS 2 1 A in that :

1°) There is no front brake pad wear warning lamp.

2°) There is only one country horn.

WIRING DIAGRAM



Colour code

Red	R
Black	N
Violet	V
Green	Ve
Brown	Mr
Blue	Bl
White	Bc
Yellow	J
Grey	Gr
Mauve	Mv

Harness	Wire No	Colour of ends	Schedule of Wiring
Front	1	Red	Starter motor relay (11)
		Red	to starter motor switch (34)
Front	2	Green	Starter motor relay (11)
		Black	to regulator (9) terminal « BAT »
		Yellow	to R.H. fuse box (19) (fuse Nº 2)
		White	to R.H. fuse box (19) (fuse Nº 1)
		Red	to ignition switch (32)
		Black	to switch (41) for lighting and horns
		Black	to headlamp flasher relay (20) (terminal 1)
		Black	to relay for R.H. QI bulb (21) (terminal 1)
		Black	to relay for L.H. QI bulb (22) (terminal 1)
Front	3	Yellow	Dynamo (14)
		Yellow	to regulator (9) (« EXC » terminal)
Front	4	Brown	Dynamo (14)
		Brown	to regulator earth (9)
Front	5	Red	Dynamo (14)
		Red	to regulator (9) (« DYN » terminal)
		Red	to charge warning lamp (36)
Front	6	Yellow	R.H. fuse box (19) (fuse Nº 2)
		Black	to windscreen wiper motor (1’7) (automatic stop)
		Black	to terminal for accessories (18)
		Yellow	to cigar lighter (33)
		Green	to windscreen wiper switch (35)
Front	7	White	R.H. fuse box (19) (fuse Nº 1)
		Black	to rear junction
		Red	to stop lamp switch (26)
		Black	to ignition switch (32)
		Black	to switch (37) for parking lamps
		Black	to clock (38)
Front	8	Red	Ignition switch (32)
		Violet	to ignition coil (27)
Front	9	Violet	Ignition switch (32)
		Violet	to charge warning lamp (36)
		Violet	to switch (31) for front heating
		Violet	to thermometer (42)
		Violet	to fuel gauge (47)
			to front brake pad wear warning lamp (46)
			to brake pressure switch warning lamp (45)
		Violet	to switch (49) for direction indicators
		Violet	to switch (60) for rear heating (-15° C -59° F)
Front	10	Blue	Windscreen wiper switch (35)
		Blue	to windscreen wiper motor (17)

Harness	Wire No	Colour of ends	Schedule of Wiring
Front	11	Red Red	Windscreen wiper switch (35) to windscreen wiper motor (17)
Front	12	Blue Violet Blue	Switch (49) for direction indicators to front R.H. wing junction to rear junction
Front	13	White Violet White	Switch (49) for direction indicators to front L.H. wing junction to rear junction
Front	14	Green Green	Switch (49) for direction indicators to warning lamp (48) for direction indicators
Front	15	Brown Brown	Warning lamp (45) for front brake pressure switch to brake pressure switch (25)
Front	16	Grey Grey	Warning lamp (46) for brake pad wear to front L.H. wing junction
Front	17	Violet Violet	Stop lamp switch (26) to rear junction
Front	18	Blue Blue	Thermometer (42) to feed wire for thermal sensor (23)
Front	19	Blue Blue	Switch (41) for lighting and horns to front L.H. wing junction
Front	20	White White	Switch (41) for lighting and horns to front L.H. wing junction
Front	21	Yellow Yellow Yellow	Switch (41) for lighting and horns to switch (40) for QI headlamps to headlamp flasher relay (20) (terminal 3)
Front	22	White Yellow Yellow Blue	Headlamp flasher relay (20) terminal 2) to front L.H. wing junction to front R.H. wing junction to headlamp warning lamp (43)
Front	23	Yellow Yellow Yellow	Switch (40) for QI headlamps to relay (22) for L.H. QI headlamp (6) (terminal 3) to relay (21) for R.H. QI headlamp (3) (terminal 3)
Front	24	White Mauve	Relay (21) for R.H. QI headlamp (terminal 2) to front R.H. wing junction
Front	25	White Mauve	Relay (22) for L,.H. QI headlamp (terminal 2) to front L.H. wing junction
Front	26	Green Green Green	Switch (41) for lighting and horns to front L.H. wing junction to front R.H. wing junction

Harness	Wire No	Colour of ends	Schedule of Wiring
Front	27	Mauve	Switch (41) for lighting and horns
		Yellow	to L.H. fuse box 28 (fuse Nº 1)
Front	28	Yellow	L.H. fuse box (28) (fuse Nº 1)
		Mauve	to rear junction
		Red	to rheostat (50) for lighting instrument panel and clock
		Blue	to parking lamp switch (37)
Front	29	Red	Rheostat (50).for lighting instrument panel and clock
		Red	to lamps lighting instrument panel (44)
		Red	to clock lamp (38)
Front	30	Red	Switch for parking lamps (37)
		Red	to R.H. wing junction
		Red	to rear junction
Front	31	Green	Parking lamp switch (37)
		Red	to L.H. wing junction
		Green	to rear junction
Front	32	Mauve	Head lamp flasher relay (20) (terminal 4)
		Black	to switch (49) for direction indicators
Front	33	Brown	Switch for interior lamp (39)
		Brown	to rear junction
			to switch for interior lamp operated by front L.H. door (30)
			to switch for interior lamp operated by front R.H. door (29)
Front	34	Mauve	Switch for front heating (31)
		Mauve	to blower motor (16)
Flying lead	35	Mauve	Earth
		Mauve	to relay (21) for R.H. QI headlamp (terminal 4)
		Mauve	to relay (22) for L.H. QI headlamp (terminal 4)
Flying lead	36	Brown	Earth
		Brown	to switch (34) for starter relay
		Brown	to switch (39) for interior lamps
		Brown	to clock (38)
Flying lead	37	Yellow	Earth
		Yellow	to switch for direction indicators (49)
Flying lead	38		Earth
		Brown	to brake pressure switch (25)
Flying lead.	39	Red	Ignition coil (27)
			to distributor (24)
Front R.H.	12	Violet	Front junction R.H.
		Violet	to R.H. direction indicator (1)
Front R.H	22	Yellow	Front junction R.H.
		Yellow	to front R.H. headlamp (2) (main beam)

(battery on the R.H. side)

Harness	Wire No	Colour of ends	Schedule of Wiring
Front R.H.	24	Mauve Mauve	Front R.H. junction to R.H. QI headlamp (3)
Front R.H.	26	Green Green	Front R.H. junction to front R.H. headlamp (2) (dip)
Front R.H.	30	Red Red	Front R.H. junction to front R.H. headlamp (2) (parking lamp-side lamp)
Front R.H.	40	Brown Brown Brown Brown	Earth to front R.H. direction indicator (1) to front R.H. headlamp (2) to front R.H. QI headlamp (3)
Front L.H	13	Violet Violet	Front L.H. junction to front L.H. direction indicator (8)
Front L.H.	16	Grey Grey	Front L.H. junction to harness for front brake pads (10) and (15)
Front L.H.	19	Blue Blue	Front L.H. junction to town horn (4)
Front L.H.	20	White White	Front L.H. junction to country horns (5)
Front L.H.	22	Yellow Yellow	Front L.H. junction to front L.H. headlamp (7) (main beam)
Front L.H.	25	Mauve Mauve	Front L.H. junction to L.H. QI headlamp (6)
Front L.H.	26	Green Green	Front L.H. junction to front L.H. headlamp (7) (dip)
Front L.H.	31	Red Red	Front L.H. junction to front L.H. headlamp (7) (parking lamp - side lamp)
Front L.H.	41	Brown	Earth : to front L.H. direction indicator (8) to front L.H. headlamp (7) to QI headlamp (6)
Flying lead	16	Grey Grey	Front R.H. brake unit (10) to front L.H. brake unit (15)
Rear	7	Black Black	Rear junction to front L.H. (53) and R.H. (52) interior lamps
Rear	12	Blue Blue	Rear junction to rear R.H. direction indicator (56)

Harness	Wire No	Colour of ends	Schedule of Wiring
Rear	13	White Blue	Rear junction to rear L.H. direction indicator (59)
Rear	17	Violet Red Red	Rear junction to rear R.H. stop lamp (57) to rear L.H. stop lamp (58)
Rear	28	Mauve Mauve Mauve	Rear junction to R.H. number plate lamp (57) to L.H. number plate lamp (58) to boot lamp (54)
Rear	30	Red Green	Rear junction to rear R.H. parking lamp (or rear lamp) (57)
Rear	31	Green Green	Rear junction to rear L.H. parking lamp (or rear lamp) (58)
Rear	33	Brown Brown	Rear junction to front R.H. (52) and L.H. (53) interior lamps
Rear	42	Yellow Yellow	Fuel gauge (47) to rheostat for fuel gauge (51)
Rear	43	Grey Red	Switch (60) for rear heating (- 15° C (- 59° F)) to blower motor (61) for rear heating (- 15° C (- 59° F))
			OPTIONAL FITTINGS :
Flying lead	44	Violet Mauve	1) A fresh air blower (63) is fitted by request A jumper lead Vi 9 feeds switch (62) A flying lead Mv 44 feeds cold air blower (63)
Flying lead	45	Black Black	2) A compressor horn (65) is fitted by request Regulator terminal « BAT » (9) to horn harness junction
Horn Harness to compressor	46	Black Black	Horn harness junction to « SANOR » relay (64) (terminal 1)
	47	White Yellow	Country horns (5) to « SANOR » relay (64) (terminal 3)
	48	White White	« SANOR » relay (64) (terminal 2) to compressor (65)
	49	Brown Mauve Brown	Earth to « SANOR » relay (64) (terminal 4) to compressor (65)

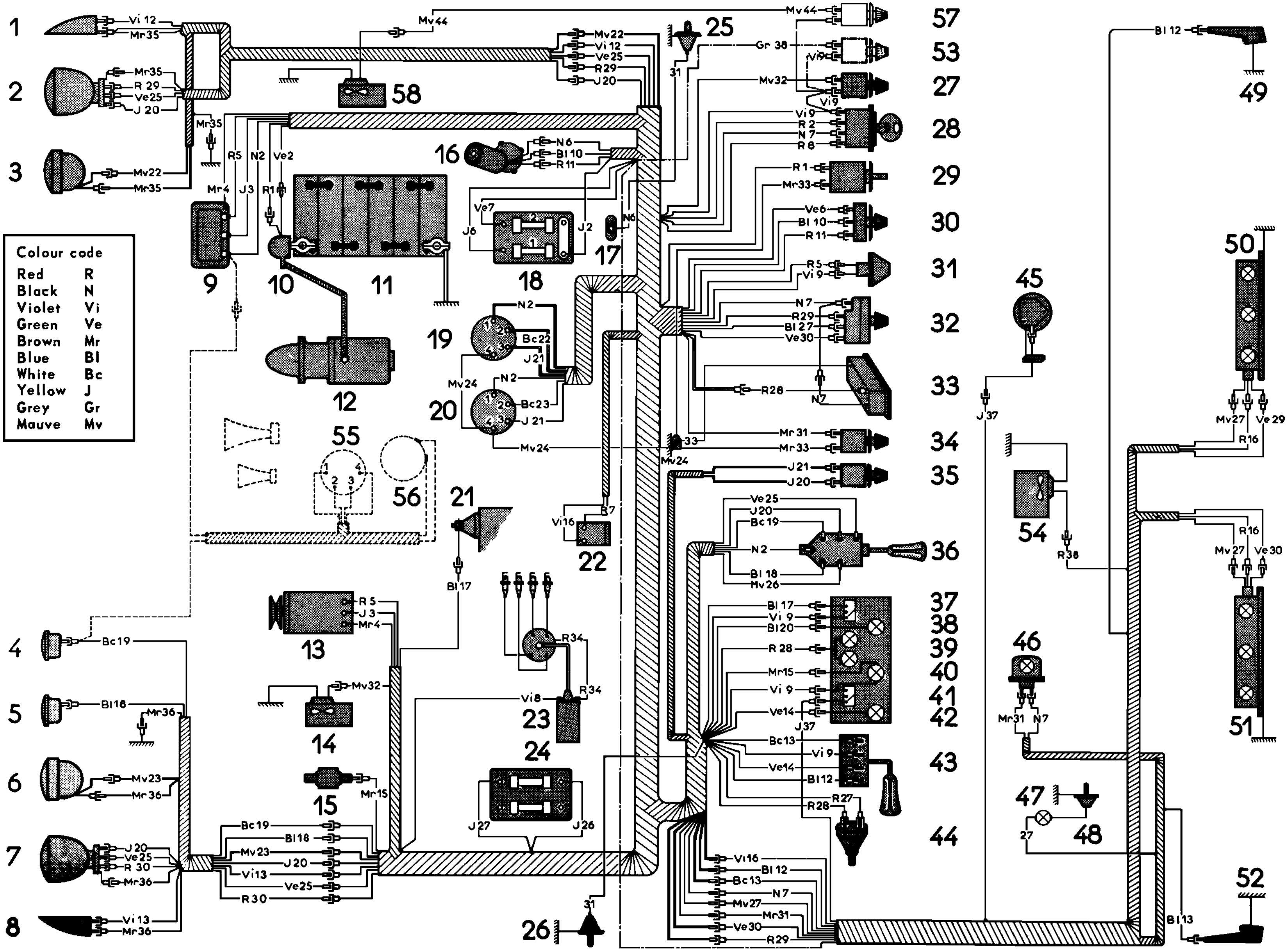
DV

|⟶ ***Sept. 1966*** ⟶| ***Sept. 1967***

BULB TABLE

Description	Quantity	Type of bulb
Main beam / dip	2	European P 45 t 41 (yellow selective) 12V - 45/40W
Front direction indicators Rear direction indicators Stop lamps	6	BA - 155 - single contact 12V - 15W (large bulb)
Rear lamps Number plate lamp Spare bulb,:	6	BA - 15 s-single contact 12V - 4W Philips Holland 12 821
Front parking lamps	2	BA 9s - 12V - 4W - tube diameter = 10 mm
Interior lamp Panel lighting	1	BA 15s - 12V - 15W (large bulb)
Brake warning lamp	4	BA 9s - 12V - 2W -tube diameter = 8,8 mm maxi (NORMA 1529)
Charge warning lamp Clock lighting	2	BA 9s - 12V - 1,5W
Direction indicator warning lamp Main beam warning lamp	2	BA 9s - 24V - 3W
Boot lamp	1	Festoon 12V - 4W
QI headlamp (optional)	2	QI bulb 12V - 55W (NORMA 112)

WIRING DIAGRAM



Colour code	
Red	R
Black	N
Violet	Vi
Green	Ve
Brown	Mr
Blue	Bl
White	Bc
Yellow	J
Grey	Gr
Mauve	Mv

MARKING OF PARTS

1. Front R.H. direction indicator
2. Front R.H. headlamp
3. Front R.H. QI headlamp (optional)
4. 2 nd country horn
5. 1 st country horn
6. Front L.H. QI headlamp (optional)
7. Front L.H. headlamp
8. Front L.H. direction indicator
9. Voltage regulator
10. Starter motor relay
11. Battery
12. Starter motor
13. Dynamo
14. Blower for front heating
15. Pressure switch for security valve (brakes)
16. Windscreen wiper motor
17. Terminal for accessories
18. R.H. side fuse box
19. « SANOR » relay for front R.H. QI headlamp
20. « SANOR » relay for front L.H. QI headlamp
21. Thermal sensor
22. Stop lamp switch
23. Ignition coil
24. L.H. side fuse box
25. Switch on front R.H. door pillar
26. Switch on front L.H. door pillar
27. Switch for front heating
28. Ignition switch
29. Switch for starter relay
30. Windscreen wiper switch
31. Charge warning lamp
32. Switch for parking lamp
33. Electric clock
34. Switch for interior lamp
35. Switch for QI headlamps (optional)
36. Switch for lighting and horns
37. Thermometer
38. Main beam warning lamp
39. Lamps lighting instrument panel
40. Warning lamp for brake pressure switch
41. Fuel gauge
42. Warning lamp for direction indicators
43. Switch for direction indicators
44. Rheostat for lamps lighting instrument panel and for clock
45. Rheostat for fuel gauge unit
46. Interior lamp
47. Boot lamp
48. Switch for boot lamp
49. Rear R.H. direction indicator
50. Number plate lamp, rear lamp and stop lamp, R.H. side
51. Number plate lamp. rear lamp and stop lamp, L.H. side
52. Rear L.H. direction indicator
53. Switch for rear heating (- 15° C) (59° F)
54. Blower for rear heating (- 15° C),(59° F)

Optional

55. « SANOR » relay for horn compressor
56. Horn compressor

Optional

Harness	Wire No	Colour of ends	Schedule of Wiring
Front	1	Red	Starter motor relay (10)
		Red	to switch (29) for starter relay
Front	2	Green	Starter motor relay (10)
		Black	to voltage regulator terminal (9) « BAT »
		Yellow	to fuse box (18) (fuses N” 1 and 2)
		Black	to switch (36) for lighting and horns
		Black	to relay (19) for front R.H. QI headlamp
		Black	to relay (20) for front L.H. QI headlamp
		Red	to lighting switch (28) (mauve marking)
Dynamo	3	Yellow	Dynamo (13)
		Yellow	to voltage regulator terminal (9) « EXC »
Dynamo	4	Brown	Dynamo (13)
		Brown	to voltage regulator earth (9)
Dynamo	5	Red	Dynamo
		Red	to voltage regulator terminal (9). « DYN »
			to charge warning lamp (31)
Front	6	Yellow	Fuse box (18) (fuse Nº 1)
		Green	to windscreen wiper switch (30)
		Black	to windscreen wiper motor (16) (automatic stop)
		Black	to accessories terminal (17)
Front	7	Green	Fuse box (18) (fuse Nº 2)
		Black	to rear junction
		Red	to stop lamp switch (22)
		Black	to parking lamp switch (32)
		Black	to clock (33)
		Black	to lighting switch (28)
Front	8	Red	Lighting switch (28) (red marking)
		Violet	to ignition coil (23)
Front	9	Violet	Lighting switch (28)
		Violet	to switch (27) for front heating
		Violet	to fuel gauge (41)
			to warning lamp (40) for brake pressure switch
		Violet	to charge warning lamp (31)
		Violet	to switch for direction indicators (43)
		Violet	to thermometer (37)
		Violet	to switch (53) for rear heating (heating- 15° C)-(59°F)
Front	10	Blue	Windscreen wiper switch (30)
		Blue	to windscreen wiper motor (16)
Front	11	Red	Windscreen wiper switch (30)
		Red	to windscreen wiper motor (16)
Front	12	Blue	Direction indicator switch (43)
		Violet	to front junction R.H.
		Blue	to rear junction

Harness	Wire No	Colour of ends	Schedule of Wiring
Front	13	White	Switch (43) for direction indicators
		Violet	to front L.H. junction
		White	to rear junction
Front	14	Green	Switch (43) for direction indicators
		Green	to warning lamp (42) for direction indicators
Front	15	Brown	Warning lamp (40) for brake pressure switch
		Brown	to security valve pressure switch (15)
Front	16	Violet	Stop lamp switch (22)
		Violet	to rear junction
Front	17	Blue	Thermometer (37)
		Blue	to feed wire for thermal sensor (21)
Front	18	Blue	Switch (36) for lighting and horns
		Blue	to front L.H. junction
Front	19	White	Switch (36) for lighting and horns
		White	to front L.H. junction
Front	20	Yellow	Switch (36) for lighting and horns
		Yellow	to switch (35) for QI headlamps
		Yellow	to front R.H. junction
		Yellow	to front L.H. junction
		Blue	to main beam warning lamp (38)
Front	21	Yellow	Switch (35) for QI headlamps
		Yellow	to relay (19) for front R.H. QI headlamp (terminal 3)
			to relay (20) for front L.H. QI headlamp (terminal 3)
Front	22	White	Relay (19) for front R.H. QI headlamp (terminal 2)
		Mauve	to front R.H. junction
Front	23	White	Relay (20) for front L.H. QI headlamp (terminal 2)
		Mauve	to front L.H. junction
Flying lead	24	Mauve	Earth
		Mauve	to relay (19) for front R.H. QI headlamp (terminal 4)
		Mauve	to relay (20) for front L.H. QI headlamp (terminal 2)
Front	25	Green	Switch (36) for lighting and horns
		Green	to front R.H. junction
		Green	to front L.H. junction
Front	26	Mauve	Switch (36) for lighting and horns
		Yellow	to fuse box (24)
Front	27	Yellow	Fuse box (24)
		Mauve	to rear junction
		Red	to rheostat (44) for instrument panel lighting
		Blue	to switch (32) for parking lamps

Harness	Wire No	Colour of ends	Schedule of Wiring
Front	28	Red	Rheostat (44) for instrument panel lighting
		Red	to lamps (39) lighting instrument panel
		Red	to clock lamp (33)
Front	29	Red	Switch (32) for parking lamp
		Red	to front R.H. junction
		Red	to rear junction
Front	30	Green	Switch (32) for parking lamps
		Red	to front L.H. junction
		Green	to rear junction
Front	31	Brown	Switch (34) for interior lamps
		Brown	to rear junction
			to switch (25) on front R.H. door pillar
			to switch (26) on front L.H. door pillar
Front	32	Mauve	Switch (27) for front heating
		Mauve	to blower motor (14)
Flying lead	33	Brown	Earth
		Brown	to switch (29) for starter motor relay
		Brown	to switch (34) for interior lamps
			to clock (33)
Flying lead	34	Red	Ignition coil (23)
		Red	to distributor
Front R.H.	12	Violet	Front R.H. junction
		Violet	to R.H. direction indicator (1)
Front R.H.	20	Yellow	Front R.H. junction
		Yellow	to front R.H. headlamp (2) (main beam)
Front R.H.	22	Mauve	Front R.H. junction
		Mauve	to R.H. QI headlamp (3)
Front R.H.	25	Green	Front R.H. junction
		Green	to front R.H. headlamp (2) (dip)
Front R.H.	29	Red	Front R.H. junction
		Red	to front R.H. headlamp (2) (sidelamp - parking lamp)’
Front R.H.	35	Brown	Earth
		Brown	to R.H. direction indicator (1)
		Brown	to front R.H. headlamp
		Brown	to QI headlamp (3)
Front L.H.	13	Violet	Front L.H. junction
		Violet	to L.H. direction indicator (8)
Front L.H.	18	Blue	Front L.H. junction
		Blue	to first country horn (5)
Front L.H.	19	White	Front L.H. junction
		White	to second country horn (4)

Harness	Wire No	Colour of ends	Schedule of Wiring
Front L.H.	20	Yellow Yellow	Front L.H. junction to front L.H. headlamp (7) (main beam)
Front L.H.	23	Mauve Mauve	Front L.H. junction to QI headlamp (6)
Front L.H.	25’	Green Green	Front L.H. junction to front L.H. headlamp (7) (dip)
Front L.H.	30	Red Red	Front L.H. junction to front L.H.. headlamp (7) (sidelamp - parking lamp)
Front L.H.	36	Brown	Earth to L.H. direction indicator (8) to front L.H. headlamp (7) to QI headlamp (6)
Rear	7	Black Black	Rear junction to interior. lamp (46)
Rear	12	Blue Blue	Rear junction to rear R.H. direction indicator (49)
Rear	13	White Blue	Rear junction to rear L.H. direction indicator (52)
Rear	16	Violet Red Red	Rear junction to rear R.H. stop lamp (50) to rear L.H. stop lamp (51)
Rear	27	Mauve Mauve Mauve	Rear junction to R.H. number plate lamp (50) to L.H. number plate lamp (51) to boot lamp (47)
Rear	29	Red Green	Rear junction to rear R.H. parking lamp (or rear lamp) (50)
Rear	30	Green Green	Rear junction to rear L.H. parking lamp (or rear lamp) (51)
Rear	31	Brown Brown	Rear junction to interior lamp (46)
Rear	37	Yellow Yellow	Fuel gauge (41) to rheostat (45) for fuel gauge
Rear	38	Grey Red	Switch (53) for rear heating (- 15° C) (59° F) to blower motor (54) for rear heating (- 15° C) (59° F)
			OPTIONAL FITTINGS :
			1) A compressor horn is fitted on request
Flying lead	39	Black Black	Voltage regulator (9) (« BAT » terminal) to horn harness junction

Harness	Wire Nº	Colour of ends	Schedule of Wiring
Horn to compressor	40	Black Black	Horn harness junction to « SANOR » relay (55) (terminal 1)
Horn to compressor	41	White Yellow	Second country horn (4) to « SANOR » relay (55) (terminal 3)
Horn to compressor	42	White White	« SANOR » relay (55) (terminal 2) to compressor (56)
Horn to compressor	43	Brown Mauve Brown	Earth to « SANOR » relay (55) (terminal 4) to compressor (56)
		Violet	1) A fresh air blower is fitted on request a jumper lead Vi (9) feeds switch (57)
Flying lead	44	Mauve Mauve	Switch (57) for fresh air blower to fresh air blower (58)

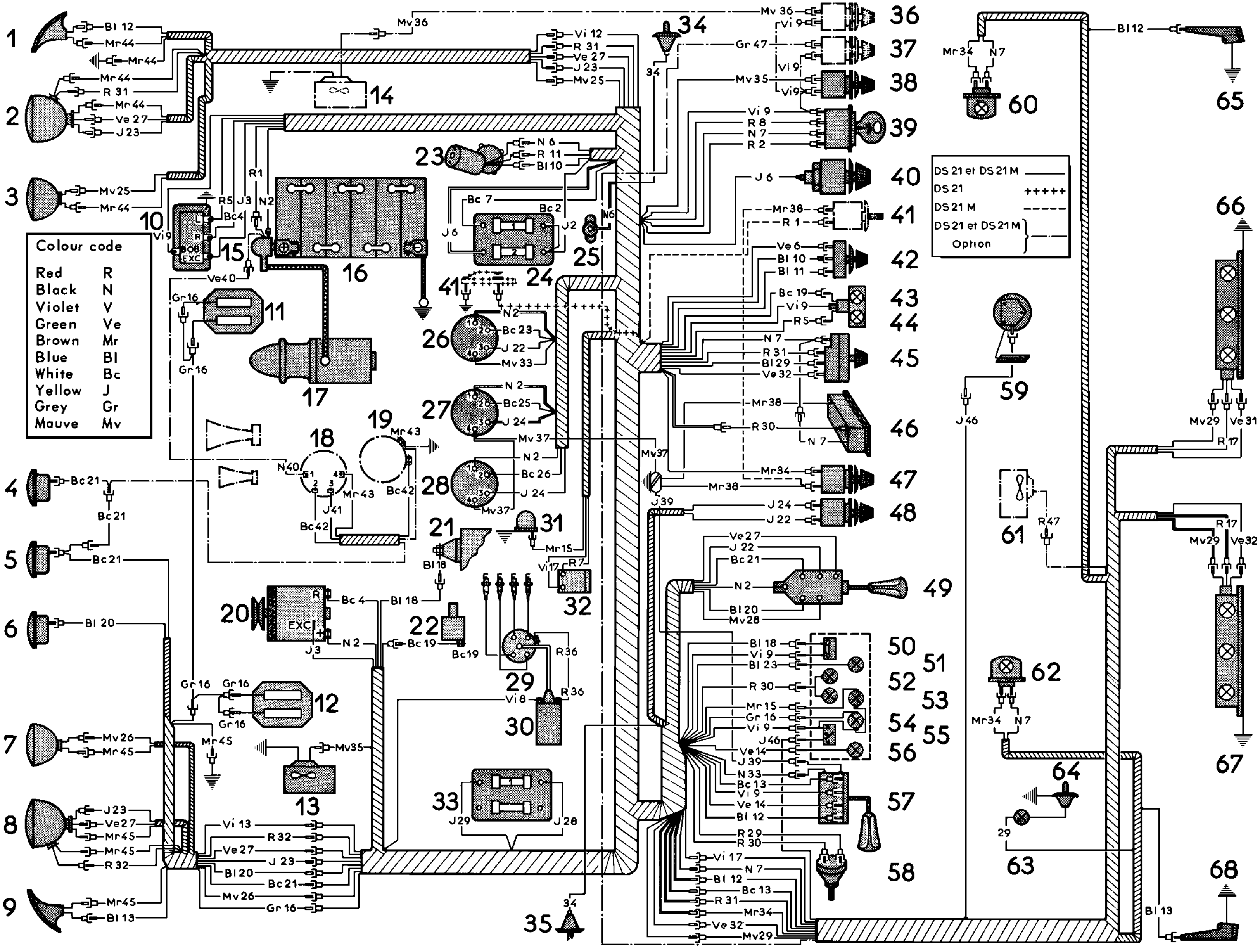
DX - DJ - DY - DL

|→ ***Sept. 1967*** →| ***Dec. 1967***

BULB TABLE

Description	Quantity	Type of bulb.
Main beam / dip	2	European P45t 41 (yellow selective) 12V - 45/40 W.
Q.I. headlamp	2	Q.1. bulb 12V- 55W (Norma 112)
Auxiliary headlamp	2	European P45t 41 (yellow selective) 12V - 45/40 W. (Main beam only)
Front direction indicators	2	BA 155 - single contact - 12V - 15W (pear-shaped bulb) MAZDA 1073
Rear direction indicators Stop lamps	4	BA 155 - single contact - 12V - 15W (large bulb) On Pallas models : 2 stop lamp bulbs - single contact 12V - 7W (large bulb)
Rear lamps Number plate lighting Spare bulbs	6	BA-15S- single contact - 12V - 4W - Philips Holland 12-821
Front parking lamps	2	BA 9S - 12V - 4W - tube diameter 10
Front interior lamps (on Pallas)	2	BA 155 - 12V - 15W (large bulb)
Front Rear Interior lamps	4	Festoon 12V - 7W
Instrument panel lighting Brake warning lamp Brake pad wear warning lamp	4	BA 95 - 12V - 2W - tube diameter 8,8 maxi (Norma 1529)
Charge warning lamp Oil pressure warning lamp	2	BA 95 - 12V - 2W - base diameter 7.
Direction indicator warning lamp Main beam warning lamp	2	BA 95 - 24V - 3W
Boot lamp	1	Festoon 12V - 4W
Clock lamp	1	BA 95 12V - 1,5W

WIRING DIAGRAM



Colour code	
Red	R
Black	N
Violet	V
Green	Ve
Brown	Mr
Blue	Bl
White	Bc
Yellow	J
Grey	Gr
Mauve	Mv

VEHICLES DS 21 AND DS 21 M

MARKING OF PARTS.

1. Front R.H. direction indicator
2. Front R.H. headlamp
3. Auxiliary headlamp or Q.I. headlamp
4. R.H. country horn
5. L.H. country horn
6. Town horn
7. Auxiliary headlamp or Q.I. headlamp
8. Front L.H. headlamp
9. Front L.H. direction indicator
10. Relay for voltage regulator
11. Front R.H. brake unit
12. Front L.H. brake unit
13. Blower for front heating
14. Fresh air blower (optional)
15. Starter motor relay
16. Battery
17. Starter motor
18. « SANOR » relay for horn compressor (Optional)
19. Horn compressor (optional)
20. Alternator
21. Thermal sensor
22. Engine oil pressure switch
23. Windscreen wiper motor
24. R.H. fuse box
25. Terminal for accessories
26. « SANOR » relay for headlamp flasher
27. « SANOR » relay for front R.H. auxiliary headlamp
28. « SANOR » relay for front L.H. auxiliary headlamp
29. Distributor
30. Ignition coil
31. Brake pressure switch
32. Stop lamp switch
33. L.H. fuse box
34. Switch on front L.H. door pillar
35. Switch on front L.H. door pillar
36. Switch for fresh air blower (optional)
37. Switch for rear heating (-15°C - 59°F) (optional)
38. Switch for front heating
39. Ignition switch
40. Cigar lighter
41. Switch for starter motor relay.
42. Windscreen wiper switch
43. Engine oil pressure warning lamp
44. Charge warning lamp
45. Switch for parking lamps
46. clock
47. Switch for interior lamps
48. Switch for auxiliary or Q.I. headlamps
49. Switch for lighting and horns
50. Thermometer
51. Main beam warning lamp
52. Lamps lighting instrument panel
53. Brake pressure switch warning lamp
54. Front brake pad wear warning lamp
55. Fuel gauge
56. Warning lamp for direction indicators
57. Switch for direction indicators with switch for headlamp flasher
58. Rheostat for fuel gauge unit.
59. Rheostat for fuel gauge unit
60. R.H. interior lamp
61. Rear heating unit (- 15°C - 59° F) (optional)
62. L.H. interior lamp
63. Boot lamp
64. Switch for boot lamp
65. Rear R.H. direction indicator
66. Rear R.H. number plate lamp, rear lamp and stop lamp
67. Rear L.H. number plate lamp, rear lamp and stop lamp
68. Rear L.H. direction indicator

NOTE : Vehicles DS. 19A and DS. 19MA

The assembly of electrical equipment for the DS. 19A and DS. 19MA is slightly different from that of the DS. 21 and DS. 21A in that :

1) There is no front brake pad wear warning lamp

2) There is only one country horn

Harness	Wire No	Colour of ends	Wiring schedule
Front	1	Red	Starter relay (15)
		Red	To switch for starter relay (41)
Front	2	Black	Starter relay (15) (not disconnectible)
		Black	To voltage regulator + terminal (20)
		Yellow	To fuse box R.H. (24) (fuse n°2)
		White	To fuse box R.H. (24) (fuse n°1)
		Red	To ignition switch (39)
		Black	To switch for lighting and horns (49)
		Black	To headlamp flasher relay (26) (terminal 1)
		Black	To SANOR relay (27) for R.H. Q.I. headlamp (terminal 1)
		Black	To SANOR relay (28) for L.H. Q.I. headlamp (terminal 1)
Front	3	Yellow	Alternator (20) (terminal « EXC »)
		Yellow	To voltage regulator relay (10) (terminal « EXC »)
Front	4	White	Alternator (20) (terminal R)
		White	To voltage regulator relay (10) (terminal R)
Front	5	Red	Voltage regulator relay (10) (terminal L)
		Red	To charge warning lamp (44)
Front	6	Yellow	Fuse box R.H. (24) (fuse n° 2)
		Black	To windscreen wiper motor (23) (automatic stop)
		Black	To terminal for accessories (25)
		Yellow	To cigar lighter (40)
		Green	To windscreen wiper switch (42)
Front	7	White	Fuse box R.H. (24) (fuse n° 1)
		Black	To rear junction
		Red	To stop lamp switch (32)
		Black	To ignition switch (39)
		Black	To parking lamp switch (45)
		Black	To clock (46)
Front	8	Red	Ignition switch (39)
		Violet	To ignition coil (30)
Front	9	Violet	Ignition switch (39)
		Violet	To charge warning lamp (44)
		Violet	To engine oil pressure warning lamp (43)
		Violet	To switch for front heating (38)
		Violet	To thermometer (50)
		Violet	To fuel gauge (56)
			To front brake pad wear warning lamp (54)
			To brake pressure switch warning lamp (53)
		Violet	To direction indicator switch (57)
		Violet	To switch for rear heating (37)
		Violet	To switch for fresh air blower (36)
		Violet	To voltage regulator relay (10) (terminal « BOB »)

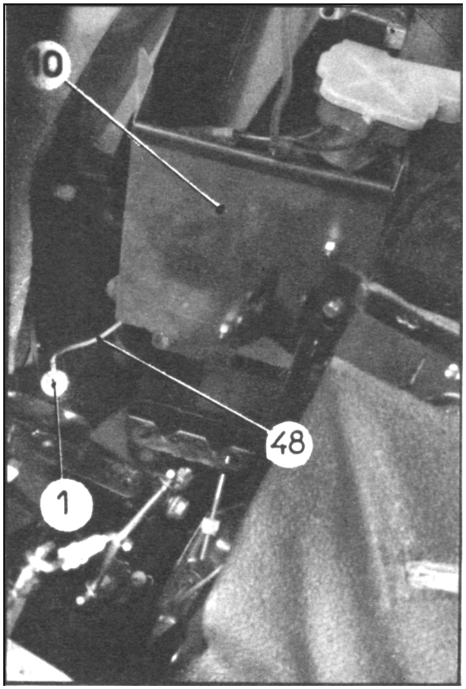
Harness	Wire Nº	Colour of ends	Wiring schedule
Front	10	Blue Blue	Switch (42) for windscreen wiper To windscreen wiper motor (23)
Front	11	Red Red	Switch (42) for windscreen wiper To windscreen wiper motor (23)
Front	12	Blue Violet Blue	Switch (57) for direction indicators To front R.H. wing junction To rear junction
Front	13	White Violet White	Switch (57) for direction indicators To front L.R. wing junction To rear junction
Front	14	Green Green	Switch (57) for direct/on indicators To direction indicator warning lamp (56)
Front	15	Brown Brown	Brake pressure switch warning lamp (53) To brake pressure switch (31)
Front	16	Grey Grey	Front brake pad wear warning lamp (54) To front L.H. wing junction
Front	17	Violet Violet	Stop lamp switch (32) To rear junction
Front	18	Blue Blue	Thermometer To feed wire for thermal sensor (21)
Front	19	White White	Engine oil pressure warning lamp (43) To feed wire for engine oil pressure switch (22)
Front	20	Blue Blue	Switch (49) for lighting and horns To front L.H. wing junction
Front	21	White White	Switch (49) for lighting and horns To front L.H. wing junction
Front	22	Yellow Yellow Yellow	Switch (49) for lighting and horns To switch (48) for auxiliary headlamps To headlamp flasher relay (26) (terminal 3)
Front	23	White Yellow Yellow Blue	Headlamp flasher relay (26) (terminal 2) To front L.H. wing junction To front R.H. wing junction To main beam warning lamp (51)
Front	24	Yellow Yellow Yellow	Switch (48) for auxiliary headlamps To R.H. auxiliary headlamp relay (27) (terminal 3) To L.H. auxiliary headlamp relay (28) (terminal 3)

Harness	Wire N°	Colour of ends	Wiring schedule
Front	25	White Mauve	R.H. auxiliary headlamp relay (27) (terminal 2) To front R.H. wing junction
Front	26	White Mauve	L.H. auxiliary headlamp relay (27) (terminal 2) To front L.H. wing junction
Front	27	Green Green Green	Switch (49) for lighting and horns To front R.H. wing junction To front L.H. wing junction
Front	28	Mauve Yellow	Switch (49) for lighting and horns To L.H. fuse box (33) (fuse n°1)
Front	29	Yellow Mauve Red Blue	L.H. fuse box (33) (fuse no 1) To rear junction To rheostat (58) for instrument panel and clock lighting To parking lamp switch (45)
Front	30	Red Red Red	Rheostat (56) for instrument panel and clock lighting To lamps (52) lighting instrument panel To clock lamp (46)
Front	31	Red Red Red	Switch (45) for parking lamps To front R.H. wing junction To rear junction
Front	32	Green Red Green	Switch (45) for parking lamps To front L.H. wing junction To rear junction
Front	33	Mauve Black	Headlamp flasher relay (26) (terminal 4) To direction indicator switch (57)
Front	34	Brown Brown	Switch (47) for interior lamps To rear junction To switch (34) on front L.H. door pillar To switch (35) on front R.H. door pillar
Front	35	Mauve Mauve	Switch (38) for front heating To blower motor (13)
Flying lead	36	Mauve Mauve	Switch (36) for fresh air blower To blower motor (14)
Flying lead	36	Red Red	Ignition coil (30) To distributor (29)

Harness	Wire Nº	Colour of ends	Wiring schedule
Flying lead	37	Mauve	Earth
		Mauve	To front R.H. auxiliary headlamp relay (27) (terminal 4)
		Mauve	To front L.H. auxiliary headlamp relay (26) (terminal 4)
Flying lead	38	Brown	Earth
		Brown	To switch (41) for starter motor relay
		Brown	To switch (47) for interior lamps
		Brown	To clock (46)
Flying lead	39	Yellow	Earth
		Yellow	To switch (5’7) for direction indicators
Flying lead	40	Green	Starter motor relay (15)
		Black	To horn compressor relay (16) (terminal 1)
Horn to Compressor	41	White	R.H. country horn (4)
		White	To link wire
		Yellow	To « SANOR » relay (18) (terminal 3)
Horn to Compressor	42	White	« SANOR » relay (18) (terminal 3)
		White	To compressor (19)
Horn to Compressor	43	Brown	« SANOR » relay (16) (terminal 4)
		Brown	To compressor (19)
		Brown	To earth
Front R.H.	12	Violet	Front R.H. junction
		Blue	To R.H. direction indicator (1)
Front R.H.	23	Yellow	Front R.H. junction
		Yellow	To front R.H. headlamp (2) (main beam)
Front R.H.	25	Mauve	Front R.H. junction
		Mauve	To R.H. auxiliary headlamp (3)
Front R.H.	27	Green	Front R.H. junction
		Green	To front R.H. headlamp (2) (dip)
Front R.H.	31	Red	Front R.H. junction
		Red	To front R.H. headlamp (2) (sidelamp - parking lamp)
Front R.H.	44	Brown	Earth
			To front R.H. direction indicator (1)
			To front R.H. headlamp (2) (sidelamp)
			To front R.H. headlamp (2) (main beam-dip)
			To auxiliary headlamp (3)
Front L.H.	13	Violet	Front L.H. junction
		Blue	To front L.H. direction indicator (9)

Harness	Wire Nº	Colour of ends	Wiring schedule
Front L.H.	16	Grey	Front L.H. junction
		Grey	To harness for front brake pads (11) and (12)
Front L.H.	20	Blue	Front L.H. junction
		Blue	To town horn (6)
Front L.H.	21	White	Front L.H. junction
		White	To country horns (5) and (4)
Front L.H.	23	Yellow	Front L.H. junction
		Yellow	To front L.H. headlamp (8) (main beam)
Front L.H.	26	Mauve	Front L.H. junction
		Mauve	To L.H. auxiliary headlamp (7)
Front L.R.	27	Green	Front left hand junction
		Green	To front L.H. headlamp (dip) (8)
Front L.R.	32	Red	Front L.H. junction
		Red	To front L.R. headlamp (8) (sidelamp-parking lamp)
Front L.H.	45	Brown	Earth
		Brown	To front L.H. direction indicator (9)
		Brown	To front, L.H. headlamp (8) (sidelamp)
		Brown	To auxiliary headlamp (7)
		Brown	To front L.H. headlamp (main beam and dip) (8)
Flying lead	16	Grey	Front R.H. brake unit, (12)
		Grey	To front L.H. brake unit (11)
Rear	7	Black	Rear junction
		Black	To R.H. (60) and L.H. (62) interior lamps
Rear	12	Blue	Rear junction
		Blue	To rear R.H. direction indicator (65)
Rear	13	White	Rear junction
		Blue	To rear L.R. direction indicator (68)
Rear	17	Violet	Rear junction
		Red	To rear R.H. stop lamp (66)
		Red	To rear L.H. stop lamp (67)
Rear	29	Mauve	Rear junction
		Mauve	To R.H. number plate lamp (66)
		Mauve	To L.H. number plate lamp (67)
			To boot lamp (63)
Rear	31	Red	Rear junction
		Green	To rear R.H. parking lamp (or sidelamp) (66)

Harness	Wire N°	Colour of ends	Schedule of wiring
Rear	32	Green Green	Rear junction To rear L.H. parking lamp (or sidelamp) (67)
Rear	34	Brown Brown	Rear junction To R.H. (60) and L.H. (62) interior lamps
Rear	46	Yellow Yellow	Fuel gauge (55) To fuel gauge rheostat (59)
Rear	47	Grey Red	Switch (37) for rear heating (-15°C -59°F) To blower motor (61) for rear heating (-15°C 59° F)



NOTE :

The voltage regulator (10) is earthed by :

1) A flying lead (48) (coloured brown) joining upper R.H. securing screw on regulator to screw (1) on front R.H. sidemember.

2) A flying lead joining rear L.H. securing screw on battery support to upper R.H. securing stud on water pump.

DV

→ September 1967 → December 1967

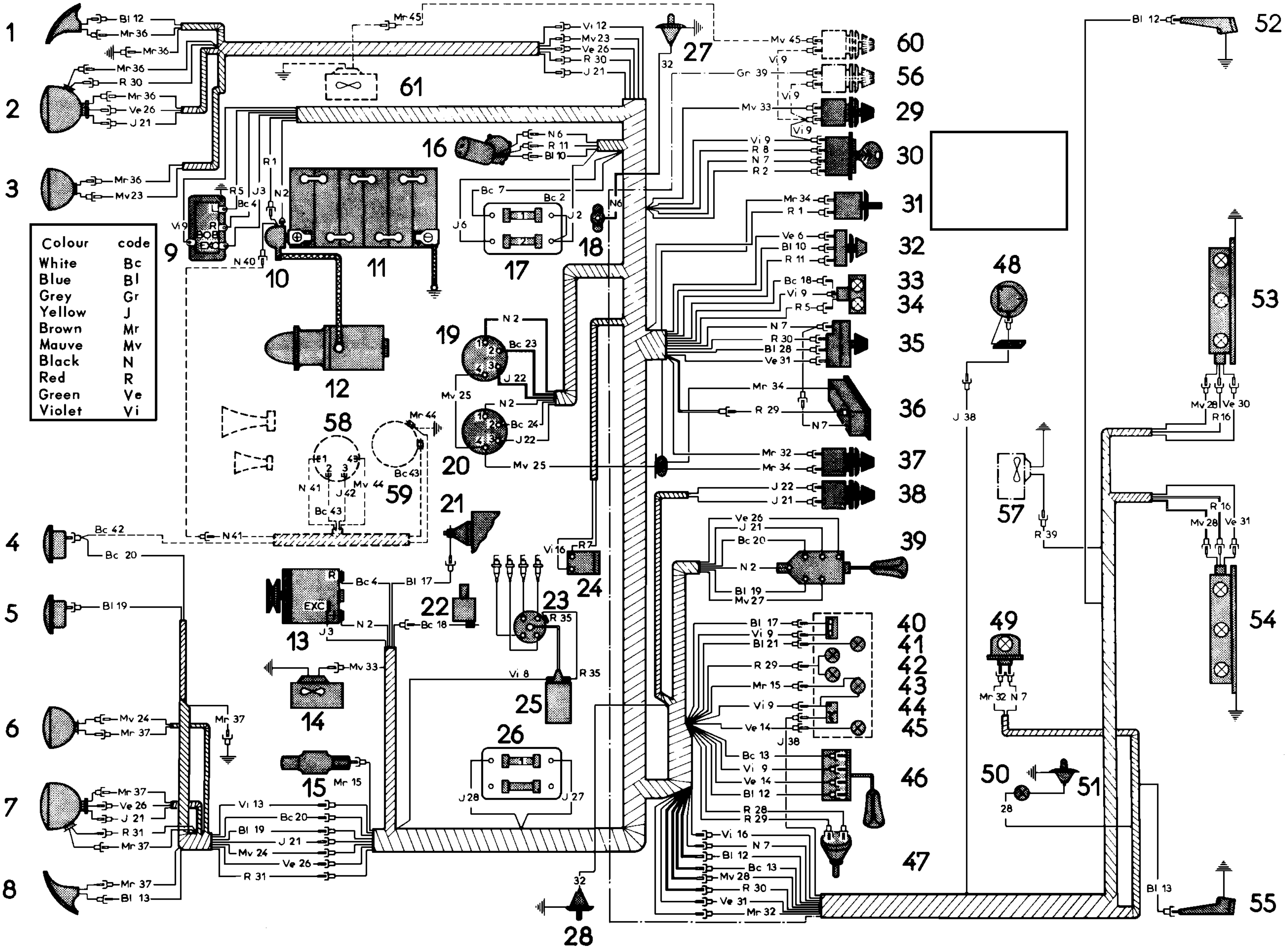
SCHEDULE OF PARTS

1. Front R.H. direction indicator lamp
2. Front R.H. headlamp
3. Front R.H. auxiliary Q.I. headlamp
4. Second country horn
5. First country horn
6. Front L.H. auxiliary Q.I. headlamp
7. Front L.H. Headlamp
8. Front L.H. direction indicator lamp
9. Voltage regulator relay
10. Starter motor relay
11. Battery
12. Starter motor
13. Alternator
14. Front heating blower motor
15. Security valve switch (brakes)
16. Windscreen wiper motor
17. R.H. fuse box
18. Terminal for accessories
19. Front R.H. Q.I. headlamp relay
20. Front L.H. Q.I. headlamp relay
21. Thermal sensor
22. Engine oil pressure switch
23. Distributor
24. Stoplamp switch
25. Ignition coil
26. L.H. fuse box
27. Switch for interior lamp operated by front R.H. door
28. Switch for interior lamp operated by front L.H. door
29. Front heating switch
30. Ignition switch
31. Starter motor relay switch
32. Windscreen wiper motor
33. Engine oil pressure warning lamp
34. Charge warning lamp
35. Parking lamp switch
36. Clock
37. Interior lamp switch
38. Q.I. headlamp switch
39. Lighting and horns switch
40. Water thermometer
41. Headlamp main beam warning lamp
42. Dashboard illumination lamp
43. Brake pressure switch warning lamp
44. Fuel gauge
45. Direction indicator warning lamp
46. Direction indicator commutator
47. Rheostat for dashboard and clock
48. Rheostat for fuel gauge unit
49. Interior lamp
50. Boot lamp
51. Boot lamp switch
52. Rear R.H. direction indicator lamp
53. R.H. number plate lamp, rear lamp and stop lamp
54. L.H. number plate lamp, rear lamp and stop lamp
55. Rear L.H. direction indicator
56. Rear heating switch
57. Rear heating blower motor } optional heating -59°F (15°C)

58 « SANOR » relay for horn compressor
59 Horn compressor optional } optional

60. Switch for fresh air blower motor
61. Fresh air blower motor } optional

WIRING DIAGRAM



Colour	code
White	Bc
Blue	Bl
Grey	Gr
Yellow	J
Brown	Mr
Mauve	Mv
Black	N
Red	R
Green	Ve
Violet	Vi

Harness	Wire Nº	Colour of ends	Wiring schedule.
Front	1	Red	Starter relay (10)
		Red	To switch (31) for starter relay
Front	2	Black	Starter relay (10) (not disconnectible)
		Black	To voltage regulator + terminal (13)
		Yellow	To R.H. fuse box (17) (fuse box nº2)
		White	To R.H. fuse box (17) (fuse nº1)
		Red	To ignition switch (30)
		Black	To switch for lighting and horns (39)
		Black	To relay (19) for R.H.. Q.I. headlamp (terminal 1)
		Black	To relay (20) for L.H. Q.I. headlamp (terminal 1)
Front	3	Yellow	Alternator (13) (terminal « EXC »)
		Yellow	To voltage regulator relay (9) (terminal « EXC »)
Front	4	White	Alternator (13) (terminal R)
		White	To voltage regulator relay (9) (terminal R)
Front	5	Red	Voltage regulator relay (9) (terminal L)
		Red	To charge warning lamp (34)
Front	6	Yellow	R.H. fuse box (17) (fuse nº2)
		Black	To windscreen wiper motor (16) (automatic stop)
		Black	To accessories terminal (18)
		Green	To windscreen wiper switch (32)
Front	7	White	R.H. fuse box (17) (fuse nº 1)
		Black	To rear junction
		Red	To stop lamp switch (24)
		Black	To ignition switch (30)
		Black	To switch (35) for parking lamp
		Black	To clock (36)
Front	8	Red	Ignition switch (30)
		Violet	To ignition coil (25)
Front	9	Violet	Ignition switch (30)
		Violet	To charge warning lamp (34) and engine oil pressure warning lamp (33)
		Violet	To front heating switch (29)
		Violet	To thermometer (40)
		Violet	To fuel gauge (44)
			To brake pressure switch warning lamp (43)
		Violet	To direction indicator switch (46)
		Violet	To rear heating (- 59ºF) switch (56)
		Violet	To fresh air blower motor switch (60)
		Violet	To voltage regulator relay (9) (terminal « BOB »)
Front	10	Blue	Windscreen wiper switch (32)
		Blue	To windscreen wiper motor (16)
Front	11	Red	Windscreen wiper switch (32)
		Red	To windscreen wiper motor (16)
Front	12	Blue	Direction indicator switch (46)
		Violet	To front R.H. wing junction

Harness	Wire Nº	Colour of ends	Schedule of Wiring
Front	13	White	Switch (46) for direction indicators
		Violet	To front L.H. wing junction
		White	To rear junction
Front	14	Green	Switch (46) for direction indicators
		Green	To warning lamp (45) for direction indicators
Front	15	Brown	Brake pressure switch warning lamp (43)
		Brown	To pressure switch (15) for security valve
Front	16	Violet	Stop lamp switch (24)
		Violet	To rear junction
Front	17	Blue	Thermometer (40)
		Blue	To feed wire for thermal sensor (21)
Front	18	White	Engine oil pressure warning lamp (33)
		White	To feed wire for engine oil pressure switch (22)
Front	19	Blue	Switch (39) for lighting and horns
		Blue	To front L.H. wing junction
Front	20	White	Switch (39) for lighting and horns.
		White	To front L.H. wing junction
Front	21	Yellow	Switch (39) for lighting and horns
		Yellow	To switch (38) for auxiliary headlamps
		Yellow	To front R.H. junction
		Yellow	To front L.H. junction
		Blue	To main beam warning lamp (41)
Front	22	Yellow	Switch (38) for auxiliary headlamps
		Yellow	To front R.H. auxiliary headlamp relay (19) (terminal 3)
		Yellow	To front L.H. auxiliary headlamp relay (20) (terminal 3)
Front	23	White	Front R.H. auxiliary headlamp relay (19) (terminal 2)
		Mauve	To front R.H. junction
Front	24	White	Front L.H. auxiliary headlamp relay (20) (terminal 2)
		Mauve	To front L.H. junction
Flying lead	25	Mauve	Earth (on scuttle panel)
		Mauve	To front R.H. auxiliary headlamp relay (19) (terminal 4)
		Mauve	To front L.H. auxiliary headlamp relay (20) (terminal 4)
Front	26	Green	Switch (39) for lighting and horns
		Green	To front R.H. junction
		Green	To front L.H. junction
Front	27	Mauve	Switch (39) for lighting and horns
		Yellow	To L.H. fuse box (26)
Front	28	Yellow	L.H. fuse box (26)
		Mauve	To rear junction
		Red	To rheostat (47) for instrument panel lighting
		Blue	To switch (35) for parking lamps
Front	29	Red	Rheostat (47) for instrument panel lighting
		Red	To lamps (42) lighting instrument panel
		Red	To clock lamp (36)

Harness	Wire Nº	Colour of ends	Schedule of Wiring
Front	30	Red Red Red	Switch (35) for parking lamps. To front R.H. junction To rear junction
Front	31	Green Red Green	Switch (35) for parking lamps To front L.H. junction To rear junction
Front	32	Brown Brown	Switch (37) for interior lamps To rear junction To switch (27) on front R.H. door pillar To switch (28) on front L.H. door pillar
Front	33	Mauve Mauve	Switch (29) for front heating To blower motor (14)
Flying lead	34	Brown Brown Brown	Earth To starter motor relay switch (31) To interior lamp switch (37) To clock (36)
Flying lead	35	Red Red	Ignition coil (25) To distributor (23)
Front R.H.	12	Violet Blue	Front R.H. junction To R.H. direction indicator (1)
Front R.H.	21	Yellow Yellow	Front R.H. junction To front R.H. headlamp (2) (main beam
Front R.H.	23	Mauve Mauve	Front R.H. junction To auxiliary headlamp (3)
Front R.H.	26	Green Green	Front R.H. junction To front R.H. headlamp (2) (dip)
Front R.H.	30	Red Red	Front R.H. junction To front R.H. headlamp (2) (sidelamp - parking lamp)
Front R.H.	36	Brown Brown Brown Brown	Earth To R.H. direction indicator (1) To front R.H. headlamp (2) To auxiliary headlamp (3)
Front L.H.	13	Violet Blue	Front L.H. junction To L.H. direction indicator (8)
Front L.H.	19	Blue Blue	Front L.H. junction To first country horn (5)
Front L.H.	20	White White	Front L.H. junction To second country horn (4)
Front L.H.	21	Yellow Yellow	Front L.H. junction To front L.H. headlamp (7) (main beam)
Front L.H.	24	Mauve Mauve	Front L.H. junction To auxiliary headlamp (6)
Front L.H.	26	Green Green	Front L.H. junction To front L.H. headlamp (7) (dip)
Front L.H.	31	Red	Front L.H. junction To front L.H. headlamp (7) (sidelamp - parking lamp)

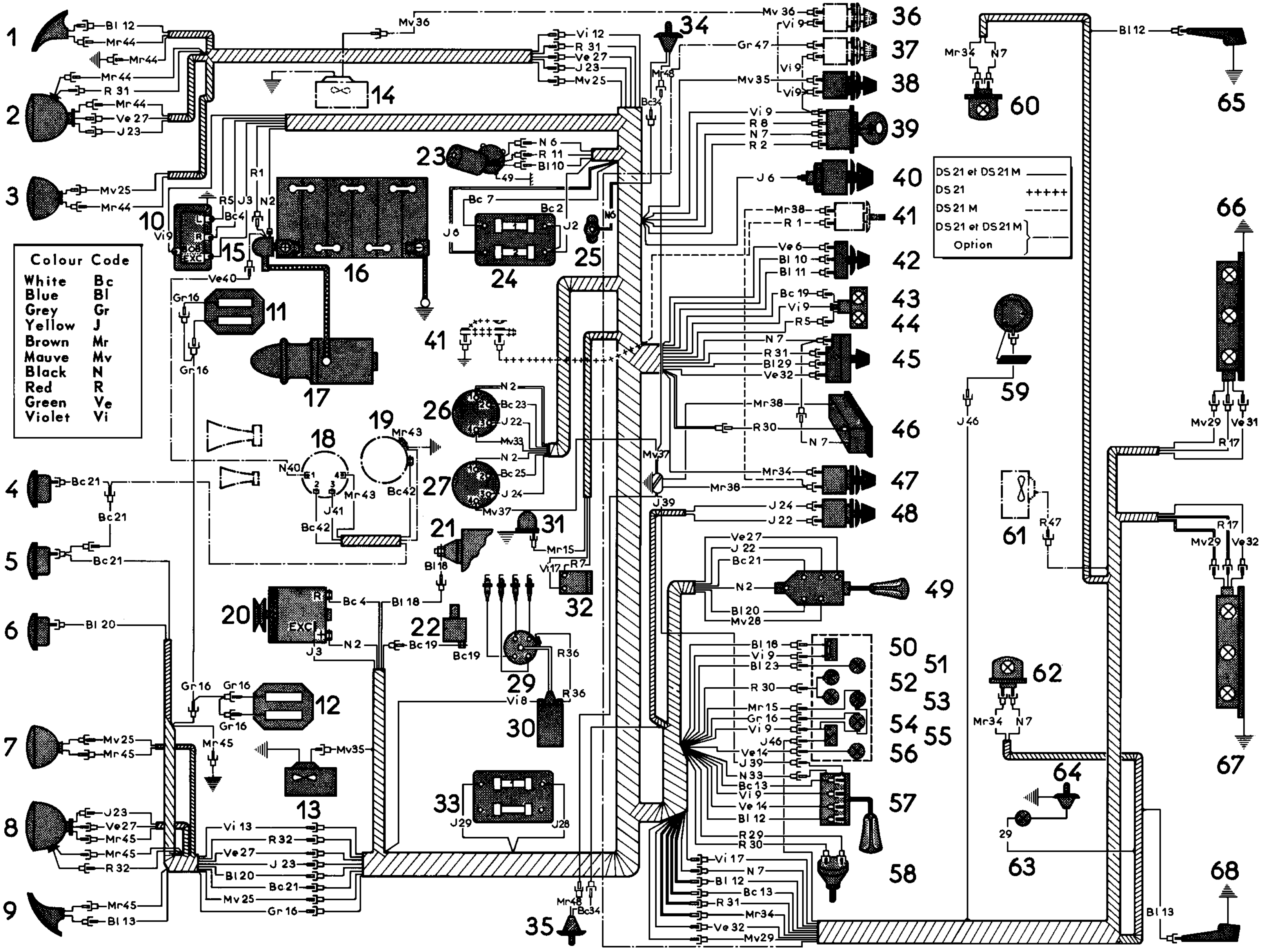
Harness	Wire Nº	Colour of ends	Wiring Schedule
Front L.H.	37	Brown	Earth To L.H. direction indicator (8) To front L.H. headlamp (7) To secondary headlamp (6)
Rear	7	Black Black	Rear junction To interior lamp (49)
Rear	12	Blue Blue	Rear junction To rear R.H. direction indicator light (52)
Rear	13	White Blue	Rear junction To rear L.H. direction indicator light (55)
Rear	16	Violet Red Red	Rear junction To rear R.H. stoplamp (53) To rear L.H. stoplamp (54)
Rear	28	Mauve Mauve Mauve	Rear junction To L.R. number plate lamp (53) To R.H. number plate lamp (54) To boot lamp (50)
Rear	30	Red Green	Rear junction To parking .lamp or rear R.H. lamp (53)
Rear	31	Green Green	Rear junction To parking lamp or rear L.H. lamp (54)
Rear	32	Brown Brown	Rear junction Interior lamp (49)
Rear	38	Yellow Yellow	Fuel gauge (44) To fuel gauge rheostat (48)
Rear	39	Grey Red	Rear heating (-59º F) switch (56) To blower motor (57) for rear heating (-59º F) } Option
			OPTIONAL FITTINGS 1) An air horn is fitted if desired
Flying lead	40	Black Black	Voltage regulator (9) (terminal « BAT ») To horn harness junction
Compressor Horn	41	Black Black	Horn harness junction To relay « SANOR » (58) (terminal 1)
Compressor Horn	42	White Yellow	Second road horn (4) To relay « SANOR » (58) (terminal 3)
Compressor Horn	43	White White	Relay « SANOR » (58) (terminal 2) To compressor (59)
Compressor Horn	44	Brown Mauve Brown	Earth To relay « SANOR » (58) (terminal 4) To compressor (59)
			2) A fresh air blower is fitted if desired
	9	Violet	A violet jumper lead (9) feeds switch (60)
Flying lead	45	Mauve Mauve	Fresh air blower switch (60) To fresh air blower (61)

DX - DJ - DY - DL - DV

|→ *December 1967* →| *October 1968*

ARRANGEMENT OF THE ELECTRICAL INSTALLATION

WIRING DIAGRAM



Colour Code

White	Bc
Blue	Bl
Grey	Gr
Yellow	J
Brown	Mr
Mauve	Mv
Black	N
Red	R
Green	Ve
Violet	Vi

The assembly of electrical equipment of the DX 510-00 c differs from that of the DX 510-00 b in that :

1 - The relay (27) for the RH (3) and LH (7) auxiliary headlamps replaces the two relays (27) and (28).
The feeds leads Mv 25 for the RH (3) and LH (7) auxiliary headlamps replace leads Mv 25 and Mv 26.

2 - The switches (34) and (35) on the front RH and LH door pillars have been modified.
- Feed leads Bc 34 replace feed leads 34.
- The two earth leads Mr 48 did not exist before.

3 - Since February 1968 an earth lead 49 has been fitted to the windscreen wiper motor (23). One end is fixed to the windscreen wiper motor flange assembly screw, and the other end to the LH securing stud on the windscreen washer reservoir support.

OPERATION N° DX. 510-00 d: *Arrangement of the electrical installation*.

DX - DJ

|→ ***October 1968*** →| ***January 1969***

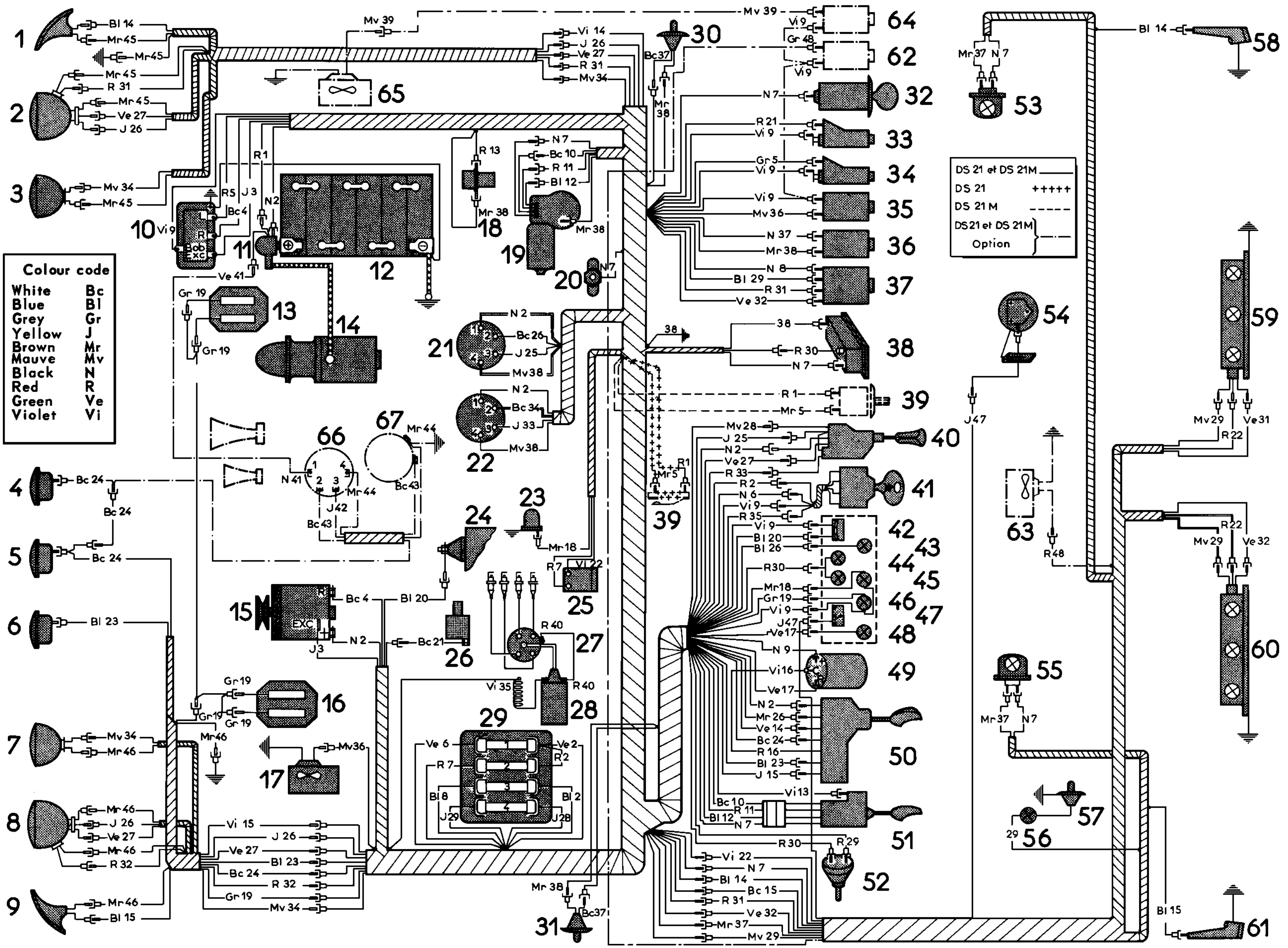
SCHEDULE OF PARTS

1. Front RH direction indicator
2. Front RH headlamp
3. Auxiliary RH QI headlamp
4. RH country horn
5. LH country horn
6. First country horn
7. Auxiliary LH QI headlamp
8. Front LH headlamp
9. Front LH direction indicator
10. Voltage regulator relay
11. Starter motor relay
12. Battery
13. RH brake unit
14. Starter motor
15. Alternator
16. LH brake unit
17. Front heating blower motor
18. Screen washer pump
19. Windscreen wiper motor
20. Accessories terminal
21. Headlamp relay
22. QI headlamp relay
23. Brake pressure switch
24. Thermal sensor
25. Stoplamp switch
26. Engine oil pressure switch
27. Distributor
28. Ignition coil
29. Fuse box
30. Front RH door switch for interior lamp
31. Front LH door switch for interior lamp
32. Cigar lighter
33. Engine oil pressure warning lamp
34. Charge warning lamp
35. Front heating switch
36. Interior lamps switch
37. Parking lamps switch
38. Clock
39. Starter motor relay switch
40. Switch for lighting and QI headlamps
41. Ignition switch with anti-theft lock
42. Water thermometer
43. Headlamp warning lamp
44. Dashboard lighting switch
45. Brake pressure switch warning lamp
46. Brake pad wear warning lamp
47. Fuel gauge
48. Direction indicator warning lamp
49. Flasher unit
50. Switch for direction indicators, headlamp flasher, and horn
51. Switch for windscreen wipers and screenwasher
52. Rheostat for dashboard lamps and clock
53. RH interior lamp
54. Rheostat for fuel gauge
55. LH interior lamp
56. Boot lamp
57. Boot lamp switch
58. Rear RH direction indicator
59. Number plate lamp, rear and stop lamps, RH
60. Number plate lamp, rear and stop lamps, LH
61. Rear LH direction indicator

OPTIONAL FITTINGS

62. Rear heating switch (FR-- 59°F)
63. Rear heating blower motor (FR - 59° F)
64. Air blower switch
65. Air ‘blower motor
66. Compressor horn relay
67. Horn compressor

WIRING DIAGRAM



Colour code

White	Bc
Blue	Bl
Grey	Gr
Yellow	J
Brown	Mr
Mauve	Mv
Black	N
Red	R
Green	Ve
Violet	Vi

Harness	Wire Nº	Colour of ends	Wiring schedule
Front	1	Red	Starter motor relay (11)
		Red	to starter motor (39) relay switch
Front	2	Black	Starter motor relay (11) (non-disconnectible terminal)
		Black	to « + » terminal of alternator (15)
		Green	fo fuse box (29) (fuse nº 1)
		Red	to fuse box (29) (fuse nº 2)
		Blue	to fuse box (29) (fuse nº 3)
		Red	to ignition switch (41)
		Black	to lighting switch (40)
		Black	to headlamp relay (21)
		Black	to QI headlamp relay (22)
		Black	to switch (50) for headlamp flasher and horn
Front	3	Yellow	Alternator (15) (terminal «EXC»)
		Yellow	to voltage regulator relay (10) (terminal R)
Front	4	White	Alternator (15) (terminal R)
		White	to voltage regulator relay (10) (terminal R)
Front	5	Red	Voltage regulator relay (10) (terminal L)
		Grey	to charge warning lamp (34)
		Brown	to starter motor relay switch (39)
Front	6	Green	Fuse box (29) (fuse nº 1)
		Black	to ignition switch (41)
Front	7	Red	Fuse box (29) (fuse nº 2)
		Black	to windscreen wiper motor (19)
		Black	to cigar lighter (32)
		Black	to accessory terminal (20)
		Black	to windscreen wiper switch (51)
		Black	to rear junction
		Black	to clock (38)
		Red	to stop lamp (25) switch
Front	8	Blue	Fuse box (29) (fuse nº 3)
		Black	to parking lamp switch (37)
Front	9	Violet	Ignition switch (41)
		Viol et	to Voltage regulator relay (10) (terminal BOB)
		Violet	to engine oil pressure warning lamp (33)
		Violet	to charge warning lamp (34)
		Viol et	to front heating switch (35)
		Violet	to thermometer (42)
		Violet	to fuel gauge (47)
			to front brake pad wear warning lamp (46)
			to brake pressure switch warning lamp (45)
		Black	to flasher unit (49) « + » terminal
		Violet	to switch (62) for rear heating (FR - 59º F)
		Violet	to fresh air blower switch (64)

Harness	Wire Nº	Colour of ends	Wiring schedule
Front	10	White White	Windscreen wiper switch (51) to windscreen wiper motor (19)
Front	11	Red Red	Windscreen wiper switch (51) to windscreen wiper motor (19)
Front	12	Blue Blue	Windscreen wiper switch (51) to windscreen wiper. motor (19)
Front	13	Violet Red	Screen washer switch (51) to screen washer pump (18)
Front	14	Green Violet Blue	Direction indicator switch (50) to front right wing junction to rear junction
Front	15	Yellow Violet White	Direction indicator switch (50) to front LH wing junction to rear junction
Direction indicator switch	16	Violet	Flasher unit (49) to direction indicator switch (50)
Front	17	Green Green	Flasher unit (49) to direction indicator warning lamp (48)
Front	18	Brown Brown	Brake pressure switch warning lamp (45) to brake pressure switch (23)
Front	19	Grey Grey	Front brake Fad Wear warning lamp (46) to front left wing junction
Front	20	Blue Blue	Thermometer (42) to feed wire for thermal sensor (24)
Front	21	Red Whit-	Engine oil pressure warning lamp (33) to feed wire for engine oil pressure switch (26)
Front	22	Violet Violet	Stop lamp switch (25) to rear junction
Front	23	Blue Blue	Horn switch (50) to front left wing junction
Front	24	White White	Horn switch (50) to front left wing junction
Front	25	Yellow Yellow	Lighting switch (40) to headlamp relay (21) (terminal 3)

Harness	Wire Nº	Colour of ends	Wiring schedule
Front	26	White	Headlamp relay (21) (terminal 2)
		Yellow	to front right wing junction
		Yellow	to front left wing junction
		Brown	to headlamp flasher switch (50)
		Blue	to headlamp warning lamp (43)
Front	27	Green	Lighting switch (40)
		Green	to front right wing junction
		Green	to front left wing junction
Front	28	Mauve	Lighting switch (40)
		Yellow	to fuse box (29) (fuse nº 4)
Front	29	Yellow	Fusebox (29) (fuse nº 4)
		Mauve	to rear junction
		Red	to dashboard lighting and clock rheostat (52)
		Blue	to parking light switch (37)
Front	30	Red	Dashboard lighting and clock rheostat (52)
		Red	to dashboard lamps (44)
		Red	to clock lamp (38)
Front	31	Red	Parking lamp switch (37)
		Red	to front right wing junction
		Red	to rear junction
Front	32	Green	Parking lamp switch (37)
		Red	to front left wing junction
		Green	to rear junction
Front	33	Red	QI headlamp switch (40)
		Yellow	to QI headlamp relay (22) (terminal 3)
Front	34	White	QI headlamp relay (22) (terminal 2)
		Mauve	to front left junction
		Mauve	to front right junction
Front	35	Red	Ignition switch (41)
		Violet	to ignition coil (28)
Front	36	Mauve	Front heating switch (35)
		Mauve	to heater blower (17)
Front	37	Brown	Rear junction
		Black	to interior lamp switch (36)
		White	to front left door pillar switch (36)
		White	to front right door pillar switch (30)
Front	38	Brown	Joint earth
		Brown	to screen washer pump (18)

Harness	Wire Nº	Colour of ends	Wiring schedule
Front	38	Brown	to windscreen wiper motor (19)
		Brown	to front RH door pillar switch (30)
		Brown	to front LH door pillar switch (31)
		Brown	to interior lamp (36)
			to clock (38)
		Mauve	to headlamp relay (21) (terminal 4)
		Mauve	to QI headlamp relay (22) (terminal 4)
Flying lead	39	Mauve	Fresh air blower motor (64)
		Mauve	to blower motor (65)
Flying lead	40	Red	Ignition coil (28)
		Red	to distributor (27)
Flying lead	41	Green	Starter motor relay (11)
		Black	to horn compressor (66) (terminal 1)
Air horn	42	White	RH road horn (4)
		White	to link wire
		Yellow	to « Sanor » relay (66) (terminal 3)
Air horn	43	White	« Sanor » relay (66) (terminal 2)
		White	to compressor (67)
Air horn	44	Brown	« Sanor » relay (66) (terminal 4)
		Brown	to compressor (67)
		Brown	to earth
RH Front	14	Violet	Front RH junction
		Blue	to RH direction indicator (1)
RH Front	26	Yellow	Front RH junction
		Yellow	to RH front headlamp (4) (main beam)
RH Front	27	Green	Front RH junction
		Green	to RH front headlamp (2) (dipped beam)
RH Front	31	Red	Front RH junction
		Red	to RH front headlamp (2) (side lamp - parking lamp)
RH Front	34	Mauve	Front RH junction
		Mauve	to RH auxiliary headlamp (3)
RH Front	45	Brown	Earth
		Brown	to front RH direction indicator (1)
		Brown	to front headlamp (2) (side lamp)
		Brown	to front RH headlamp (2) (main and dipped beam)
		Brown	to RH auxiliary headlamp (3)

Harness	Wire Nº	Colour of ends	Wiring schedule
LH Front	15	Violet Blue	Front LH junction to front LH direction indicator (9)
LH Front	19	Grey Grey	Front LH junction to front brake pad harness (13) and (16)
LH Front	23	Blue Blue	Front LH junction to town horn (6)
LH Front	24	White White	Front LH junction to country horn (5) and (4)
LH Front	26	Yellow Yellow	Front LH junction to front LH headlamp (8) (main beam)
LH Front	27	Green Green	Front LH junction to front LH headlamp (8) (dipped beam)
LH Front	32	Red Red	Front LH junction to front LH headlamp (8) (sidelamp - parking lamp)
LH Front	34	Mauve Mauve	Front LH junction to auxiliary LH headlamp (7)
LH Front	46	Brown Brown Brown Brown Brown	Earth to front LH direction indicator (9) to front LH headlamp (8) (sidelamp) to front LH headlamp (8) (main and dipped beam) to auxiliary headlamp (7)
Flying lead	19	Grey Grey	Front RH brake unit (13) to front LH brake unit (16)
Rear	7	Black Black	Rear junction to RH (53) and LH (58) interior lamps
Rear	14	Blue Blue	Rear junction to rear RH direction indicator (58)
Rear	15	White Blue	Rear junction to rear LH direction indicator (61)
Rear	22	Violet Red Red	Rear junction to rear RH stoplamp (59) to rear LH stoplamp (60)
Rear	29	Mauve Mauve Mauve	Rear junction to RH number plate lamp (59) to LH number plate lamp (60) to boot lamp (56)

Harness	Wire Nº	Colour of ends	Wiring schedule
Rear	31	Red Green	Rear junction to rear RH parking lamp (or tail lamp) (59)
Rear	32	Green Green	Rear junction to rear LH parking lamp (or tail lamp) (60)
Rear	37	Brown Brown	Rear junction to RH (53) and LH (55) interior lamps
Rear	47	Yellow Yellow	Fuel gauge (47) to fuel gauge rheostat (54)
Rear	48	Grey Red	Rear heating (FR - 59º F) switch (62) to blower motor (63) for rear heating (FR - 59º F)

OPERATION N° DY. 510-00 d: *Arrangement of the electrical installation.* *(fixed auxiliary headlamps)*

DY - DL - DV

|→ ***September 1968*** →| ***January 1969***

PART SCHEDULE

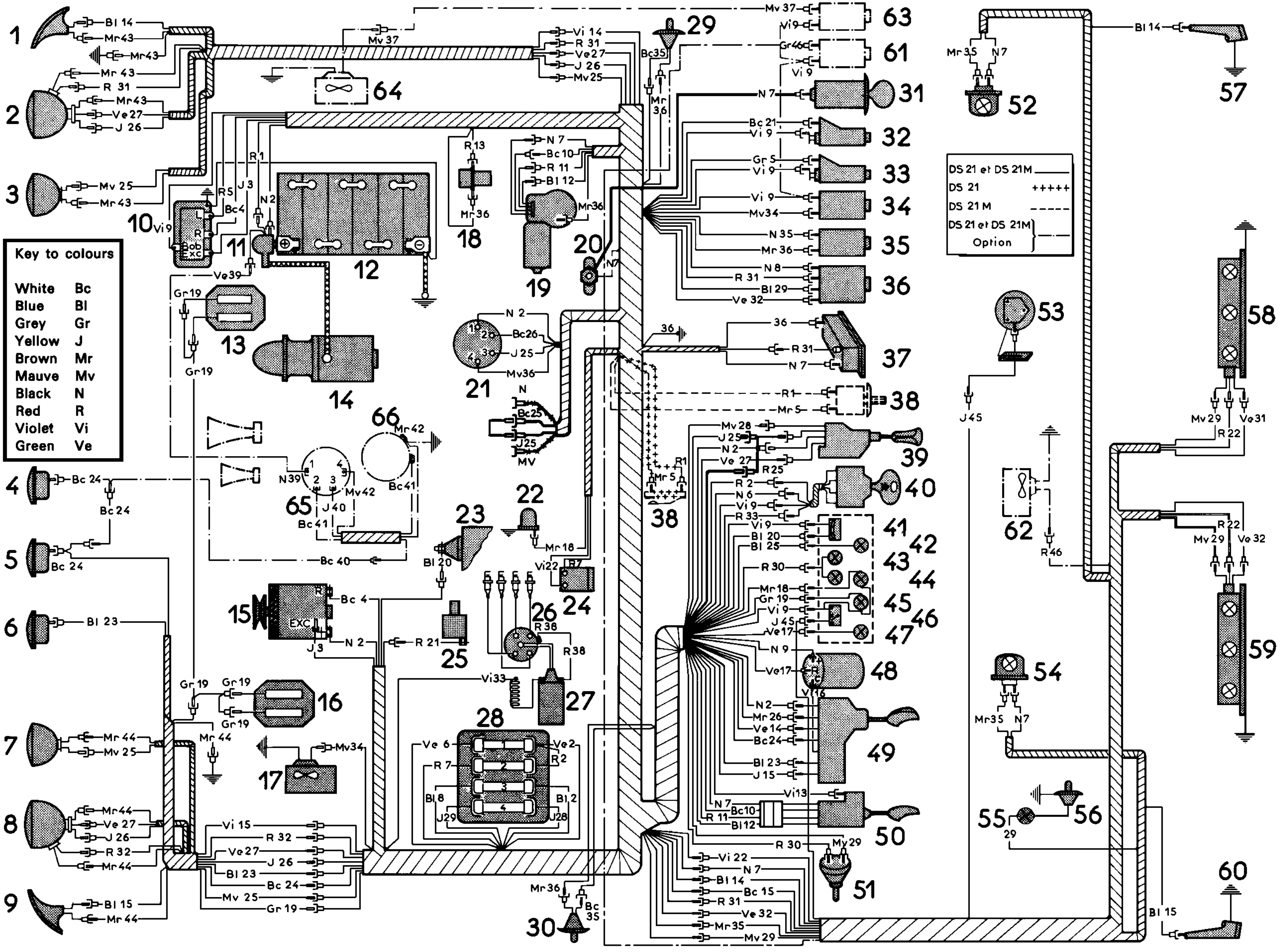
1. Front RH direction indicator
2. Front RH headlamp
3. Auxiliary RH Q.I. Headlamp
4. RH country horn
5. LH country horn
6. First country horn
7. Auxiliary LH Q.I. headlamp
8. Front LH headlamp
9. Front LH direction indicator
10. Voltage regulator relay
11. Starter motor relay
12. Battery
13. Right brake unit
14. Starter motor
15. Alternator
16. Left brake unit
17. Front heating blower motor
18. Screen washer pump
19. Windscreen wiper motor
20. Accessory terminal
21. Auxiliary headlamp relay 22
22. Brake pressure switch
23. Thermal sensor
24. Stop lamp switch
25. Engine oil pressure switch
26. Distributor
27. Ignition coil
28. Fuse box
29. Front RH door pillar switch
30. Front LH door pillar switch
31. Cigar lighter
32. Engine oil pressure warning lamp
33. Charge warning lamp
34. Front heating switch
35. Interior lamp switch
36. Parking lamp switch
37. Clock
38. Starter motor relay switch
39. Lighting switch
40. Ignition switch with anti-theft
41. Water thermometer
42. Headlamp warning lamp
43. Dashboard lamp
44. Brake pressure switch warning lamp
45. Front brake pad wear warning lamp
46. Fuel gauge
47. Direction indicator warning lamp
48. Flasher unit
49. Switch for direction indicators with headlamp flasher and horn
50. Switch for windscreen wiper and screenwasher
51. Rheostat for dashboard and clock lamps
52. R.H. interior lamp
53. Rheostat for fuel gauge
54. LH interior lamp
55. Boot lamp
56. Boot lamp switch
57. Rear RH direction indicator
58. Number plate lamp, rear and stop lamp R.H.
59. Number plate lamp, rear and stop lamp R.H.
60. Rear LH direction indicator

OPTIONAL FITTINGS

61. Rear heating switch (FR - 59°F)
62. Rear heating blower (FR - 59° F)
63. Air blower switch
64. Air blower
65. Horn compressor relay
66. Horn compressor

ELECTRICITY

WIRING DIAGRAM



Key to colours

White	Bc
Blue	Bl
Grey	Gr
Yellow	J
Brown	Mr
Mauve	Mv
Black	N
Red	R
Violet	Vi
Green	Ve

Harness	Wire Nº	Colour of ends	Wiring schedule
Front	1	Red	Starter motor relay (11)
		Red	To starter motor relay switch (38)
Front	2	Black	Starter motor relay (11) (non-disconnectible terminal)
		Black	To +^{ve} terminal of alternator (15)
		Green	To fuse box (28) (fuse nº 1)
		Red	To fuse box (28) (fuse nº 2)
		Blue	To fuse box (28) (fuse nº 3)
		Red	To ignition switch (40)
		Black	To lighting switch (39)
		Black	To auxiliary headlamp relay (21)
		Black	To headlamp flasher and horn switch (49)
Front	3	Yellow	Alternator (15) (terminal « EXC »)
		Yellow	To voltage regulator (10) (terminal « EXC »)
Front	4	White	Alternator (15) (terminal R)
		White	To voltage regulator (10) (terminal « R »)
Front	5	Red	Voltage regulator relay (10) (terminal « L »)
		Grey	To charge warning lamp (33)
		Brown	To starter motor relay switch (38)
Front	6	Green	Fuse box (28) (fuse nº 1)
		Black	To ignition switch (40)
Front	7	Red	Fuse box (28) (fuse nº 2)
		Black	To wind screw wiper motor (19)
		Black	To cigar-lighter (31)
		Black	To accessory terminal (20)
		Black	To windscreen wiper switch (50)
		Black	To rear junction
		Black	To clock (37)
		Red	To stop lamp switch (24)
Front	8	Blue	Fuse box (28) (fuse nº 3)
		Black	To parking lamp switch (36)
Front	9	Violet	Ignition switch (40)
		Violet	To voltage regulator relay (10) (terminal « BOB »)
		Violet	To engine oil pressure warning lamp (32)
		Violet	To charge warning lamp (33)
		Violet	To front heating switch (34)
		Violet	To thermometer (41)
		Violet	To fuel gauge (46)
			To front brake pad wear warning lamp (45)
			To brake pressure switch warning lamp (44)
		Black	To flasher unit (48) (+^{ve} terminal)
		Violet	To rear heating switch (61) (FR - 59ºF)
		Violet	To fresh air blower switch (63)

Harness	Wire Nº	Colour of ends	Wiring schedule
Front	10	White White	Windscreen wiper switch (50) To windscreen wiper motor (19)
Front	11	Red Red	Windscreen wiper switch (50) To windscreen wiper motor (19)
Front	12	Blue Blue	Windscreen wiper switch (58) To windscreen wiper motor (19)
Front	13	Violet Red	Screen washer switch (50) To screen washer pump (18)
Front	14	Green Violet Blue	Direction indicator switch (49) To front left wing junction To rear junction
Front	15	Yellow Violet White	Direction indicator switch (49) To front right wing junction To rear junction
Direction indicator switch	16	Violet	Flasher unit (48) (terminal c) To direction indicator switch (49)
Front	17	Green Green	Flasher unit (48) (terminal R) To direction indicator warning lamp (47)
Front	18	Brown Brown	Brake pressure switch warning lamp (44) Brake pressure switch (22)
Front	19	Grey Grey	Front brake pad wear warning lamp (45) To front left wing junction
Front	20	Blue Blue	Thermometer (41) To feed wire for thermal sensor (23)
Front	21	White Red	Engine oil pressure warning lamp (32) To feed wire for engine oil pressure switch (25)
Front	22	Violet Violet	Stop lamp switch (24) To rear junction
Front	23	Blue Blue	Horn switch (49) To front left wing junction
Front	24	White White	Horn switch (49) To front left wing junction.

Harness	Wire Nº	Colour of ends	Wiring schedule
Front	25	Yellow	Lighting switch (39)
		Yellow	To auxiliary headlamp relay (21) (terminal 3)
		Yellow	To front right wing junction
		Yellow	To front left wing junction
Front	26	White	Secondary headlamp relay (21) (terminal 2)
		Brown	To headlamp flasher (49)
		Mauve	To front right wing junction
		Mauve	To front left wing junction
		Blue	To headlamp warning lamp (42)
Front	27	Green	Lighting switch (39)
		Green	To front right wing junction
		Green	To front left wing junction
Front	28	Mauve	Lighting switch (39)
		Yellow	To fusebox (28) (fuse nº 4)
Front	29	Yellow	Fuse box (28) (fuse no 4)
		Mauve	To rear junction
		Mauve	To dashboard and clock lamp rheostat (51)
		Blue	To parking lamp switch (36)
Front	30	Red	Dashboard and clock lamp rheostat (51)
		Red	To dashboard lamp (43)
		Red	To clock lamp (37)
Front	31	Red	Parking lamp switch (36)
		Red	To front right wing junction
		Red	To rear junction
Front	32	Green	Parking lamp switch (36)
		Red	To front right wing junction
		Green	To rear junction
Front	33	Red	Ignition switch (40)
		Violet	To ignition coil (27)
Front	34	Mauve	Front heating switch (34)
		Mauve	To blower motor (17)
Front	35	Brown	Rear junction
		Black	To interior lamp switch (35)
		White	To front RH door pillar switch (29)
		White	To front LH door pillar switch (30)

(*fixed auxiliary headlamps*)

Harness	Wire Nº	Colour of ends	Wiring schedule
Front	36	Brown	Joint earth
		Brown	To screen washer pump (18)
		Brown	To windscreen wiper motor (19)
		Brown	To front RH door switch (29)
		Brown	To front LH door switch (30)
			To clock (37)
		Mauve	To auxiliary headlamp relay (21) (terminal 4)
Flying- lead	37	Mauve	Fresh air blower switch (63)
		Mauve	To blower motor (64)
Flying lead	38	Red	Ignition coil (27)
		Red	To ignition (26)
Flying lead	39	Green	Starter motor relay (11)
		Black	To horn compressor relay (65) (terminal 1)
Air Horn	40	White	Road horn RH (4)
		White	To link wire
		Yellow	To relay (65) (terminal 3)
Air Horn	41	White	Relay (65) (terminal 2)
		White	To compressor (66)
Air Home	42	Mauve	Relay (65) (terminal 2)
		Brown	To compressor (66)
			To earth
RH Front	14	Violet	RH front junction
		Blue	To RH direction indicator (1)
RH Front	25	Yellow	RH front junction
		Yellow	To front RH headlamp (2) (main beam)
RH Front	26	Mauve	RH front junction
		Mauve	To auxiliary RH headlamp (3)
RH Front	27	Green	RH front junction
		Green	To RH front headlamp (2) (dipped beam)
RH Front	31	Red	RH front junction
		Red	To front RH headlamp (2) (sidelamp - parking lamp)
RH Front	43	Brown	Earth
		Brown	To RH front direction indicator (1)
		Brown	To RH front headlamp (2) (sidelamp)
		Brown	To RH front headlamp (2) (main and dipped beam)
		Brown	To auxiliary RH headlamp

Harness	Wire Nº	Colour of ends	Wiring schedule
LH Front	15	Violet Blue	LH front junction To front LH direction indicator (9)
LH Front	19	Grey Grey	LH front junction To front brake pad harness (13) and (16)
LH Front	23	Blue Blue	LH front junction To main country horn (6)
LH Front	24	White White	LH front junction To secondary country horns (4) and (5)
LH Front	25	Yellow Yellow	LH front junction To front LH headlamp (8) (main beam)
LH Front	26	Mauve Mauve	LH front junction To secondary LH headlamp (7)
LH Front	27	Green Green	LH front junction To front LH headlamp (8) (dipped beam)
LH Front	32	Red Red	LH front junction To front LH headlamp (8) (sidelamp - parking lamp)
LH Front	44	Brown Brown Brown Brown Brown	Earth To front LH direction indicator (9) To front LH headlamp (8) (sidelamp) To front LH headlamp (8) (main and dipped beam) To secondary LH headlamp (7)
Flying lead	19	Grey Grey	Front RH brake unit (13) To front LH brake unit (16)
Rear	7	Black Black	Rear junction: To RH (52) and LH (54) interior lamps
Rear	14	Blue Blue	Rear junction. To rear RH direction indicator (57)
Rear	15	White Blue	Rear junction To rear LH direction indicator (60)
Rear	22	Violet Red Red	Rear junction To RH rear stop lamp.(58) To LH rear stop lamp (59)
Rear	29	Mauve Mauve Mauve	Rear junction To RH number plate lamp (58) To LH number plate lamp (52) To boot lamp (55)

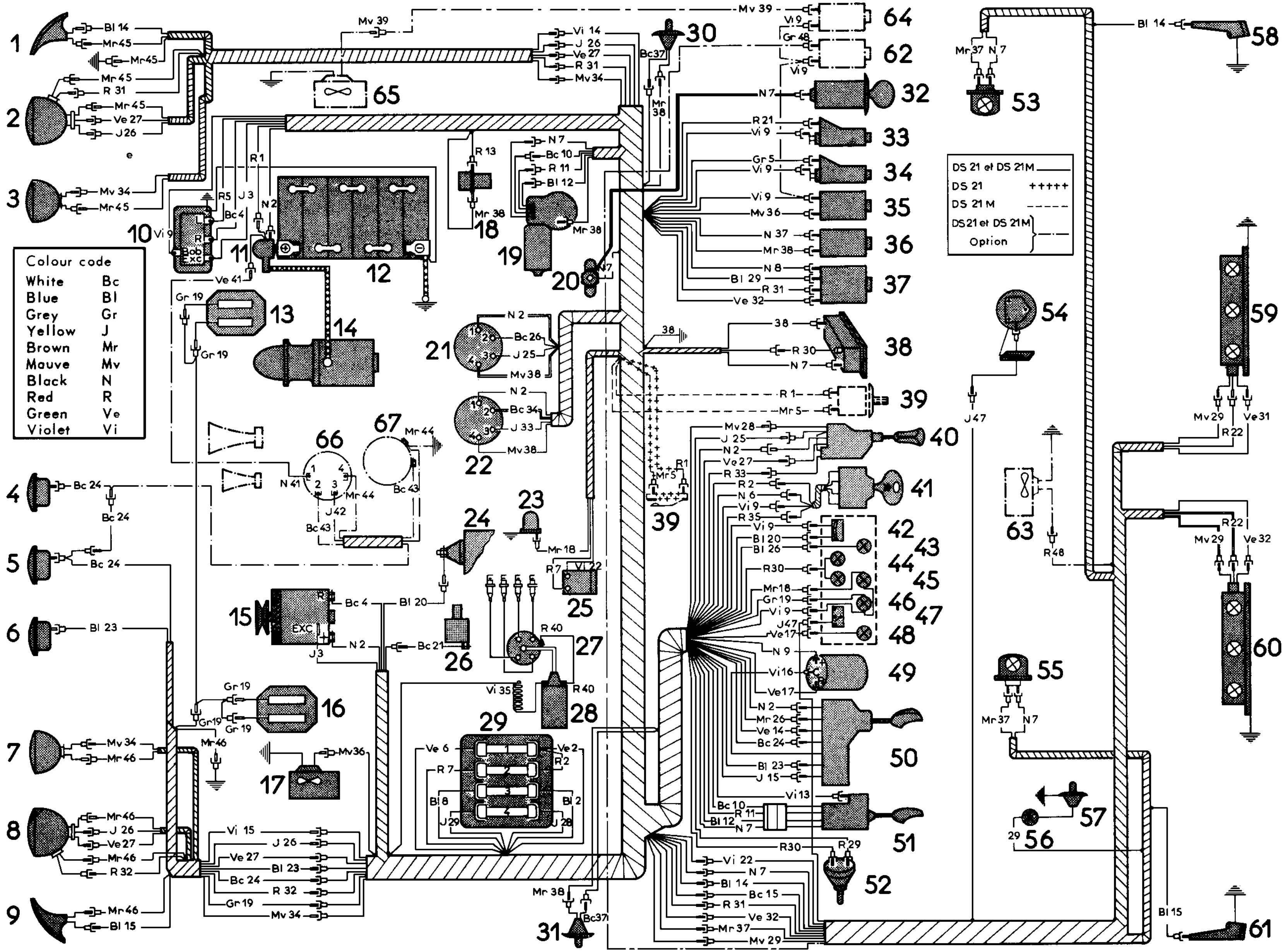
Harness	Wire Nº	Colour of ends	Wiring schedule
Rear	31	Red Green	Rear junction To rear RH parking (or tail) lamp (58)
Rear	32	Green Green	Rear junction To rear LH parking (or tail) lamp (59)
Rear	35	Brown Brown	Rear junction To RH (52) and LH (54) interior lamps
Rear	45	Yellow Yellow	Fuel gauge (46) To fuel gauge rheostat (53)
Rear	46	Grey Red	Rear heating switch (61) (FR -59°F) To rear heating blower motor (62) (FR -59°F)

DX - DJ

|—→ *Jan 1969* —→| *Sept 1969*

ARRANGEMENT OF THE ELECTRICAL INSTALLATION

WIRING DIAGRAM



Colour code

White	Bc
Blue	Bl
Grey	Gr
Yellow	J
Brown	Mr
Mauve	Mv
Black	N
Red	R
Green	Ve
Violet	Vi

DS 21 et DS 21M	———
DS 21	+++++
DS 21 M	-----
DS 21 et DS 21M Option	-·-·-

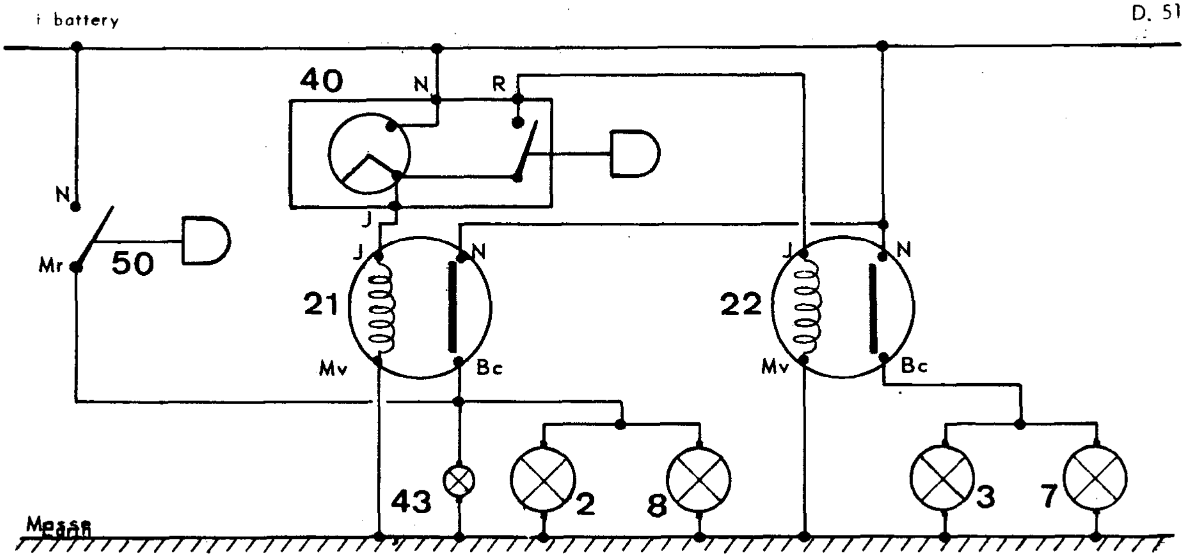
The assembly of electrical equipement of the DX. 510-00 e only differs from that of the DX. 510-00 d in that :

There is a flying lead (N7) feeding the cigar lighter (32), connected to the terminal for accessories (20) (this lead is heavily outlined in the diagram opposite).

BASIC DIAGRAM

of the main and QI auxiliary headlamp circuit

(since October 1968).



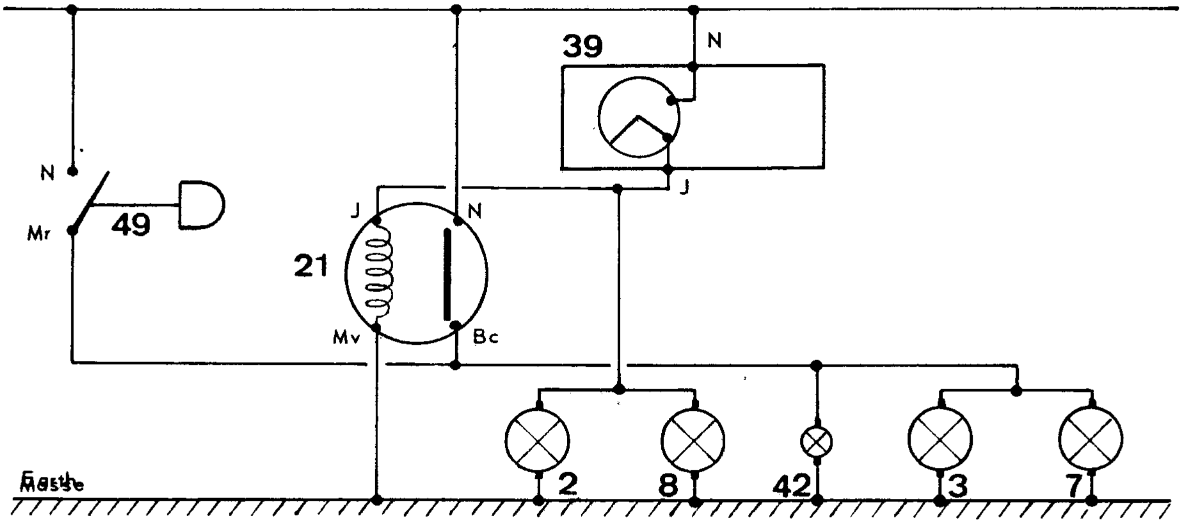
DY - DL
January 1969 → September 1969

BASIC DIAGRAM

of circuit for main and auxiliary fixed headlamps (not Q.I.)

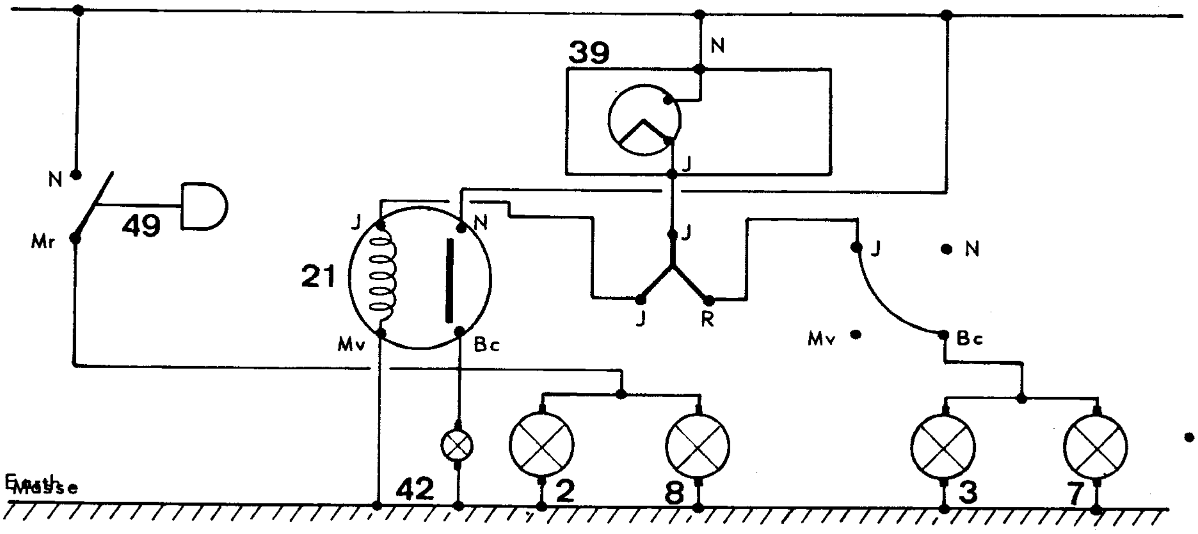
1) *Vehicles produced between October 1968 and January 1969*
(see diagram DY. 510-00 d).

D. 51-61



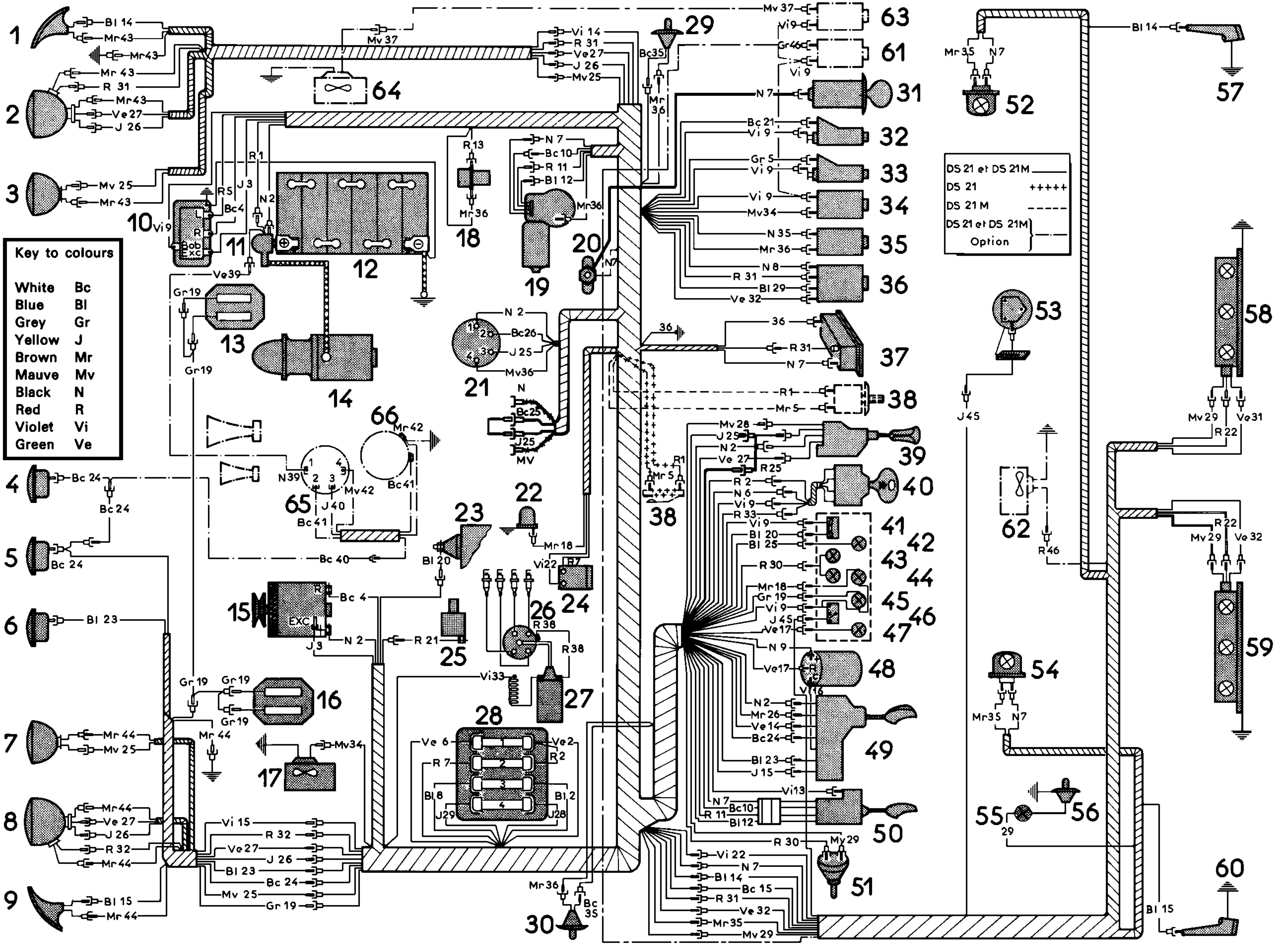
2) *Vehicles produced since January 1969.*
(see diagram DY. 510-1 f).

D. 51-61



ELECTRICITY

WIRING DIAGRAM



Key to colours

White	Bc
Blue	Bl
Grey	Gr
Yellow	J
Brown	Mr
Mauve	Mv
Black	N
Red	R
Violet	Vi
Green	Ve

DS 21 et DS 21M	———
DS 21	+++++
DS 21 M	- - - -
DS 21 et DS 21M Option	-·-·-

Since January 1969, vehicles equipped with fixed secondary headlamps have been fitted with the same cable system as those equipped with secondary Q.I headlamps.

The assembly of electrical equipment differs from previous models in the following ways :

1° - Fitting of a flying lead (marked N7 (black 7)) to feed the cigar-lighter.

2° - Use of a relay (21) to control the main headlamps (2 and 8) instead of auxiliary headlamps (3 and 7).

The assembly diagram is different (wires heavily outlined in diagram overleaf).

a) Affixation of a wire (marked R (Red) 25) connected by a « Y » union at the switch terminal (39), receiving the wire (marked J (yellow) 25).

b) Connection of wires for feeding the second relay, used for Q.I. headlamps

- The wires marked N (black) and Mv (mauve) are not used.

NOTE : The wire marked N (Black) is connected to the positive terminal of the battery; it is carefully isolated to avoid short circuits.

- The wires marked Bc (White) and J (yellow) are connected to each other (these wires are marked Bc (white) 25 and J (yellow) 25 on the diagram).

The assembly series DY. 510-00e differs from the previous series DY. 510-00d in the following ways corresponding with page 7 of the latter.

Harness	Wire Nº	Colour of ends	Wiring schedule
Front	25	Yellow and Red	Lighting switch (39) Lighting switch (39)
		Yellow	to main headlamp relay (21) (terminal 3)
		Yellow White	to relay (21)
		Blue	to headlamp warning lamp (42)
		Mauve	to front right wing junction
		Mauve	to front left wing junction
Front	26	White	Main headlamp relay (21) (terminal 2)
		Brown	to headlamp flasher switch (49)
		Yellow	to front right wing junction
		Yellow	to front left wing junction
RH Front	25	Mauve	RH front junction
		Mauve	to RH auxiliary headlamp (3)
RH Front	26	Yellow	RH front junction
		Yellow	to RH front headlamp (2) (main beam)
LH Front	25	Mauve	LH front junction
		Mauve	to LH auxiliary headlamp (7)
LH Front	26	Yellow	LH front junction
		Yellow	to LH front headlamp (8) (main beam)

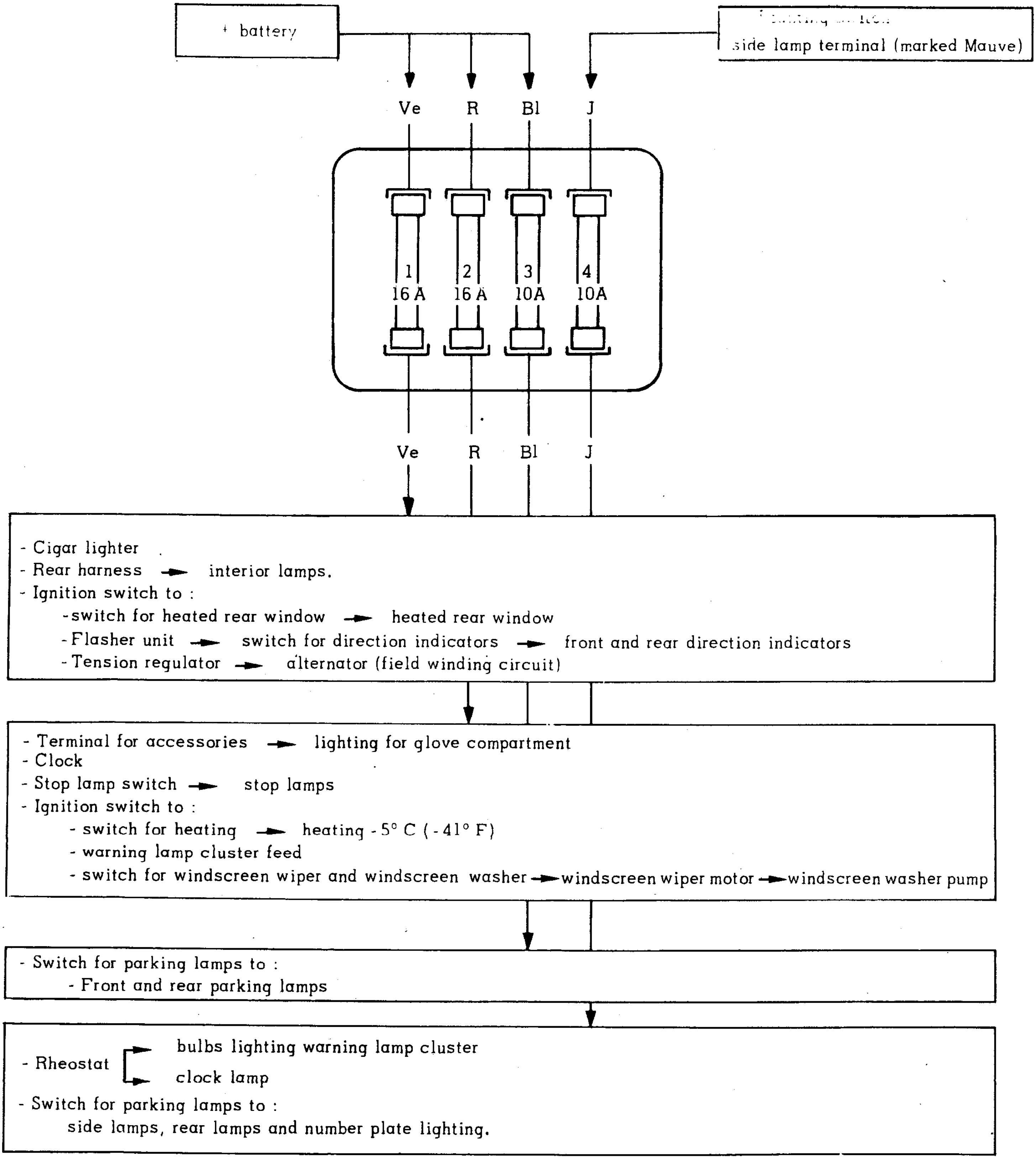
DX - DJ - DY - DT - DV

⟼ *Sept 1969*

BULB TABLE

Description	Quantity	Type of bulb
Main beam / dip	2	European P 45 t 41 (yellow selective) 12 V - 45 / 40 W
Auxiliary headlamp	2 2	QI bulb 12 V - 55 W or European P 45 t 41 (yellow selective) 12 V - 45 / 40 W (main beam only)
Front direction indicators	2	BA 15 s - 12 V - 15 W
Rear direction indicators Stop lamp	4	BA 15 s - 12 V - 15 W (large bulb) *on Pallas models* : BA 15 s - 12 V - 7 W (large bulb)
Rear lamps Number plate lighting Spare bulbs	6	BA 15 s - 12 V - 4 W
Front parking lamps	2	BA 9 s - 12 V - 4 W tube diameter 10 mm
Front interior lamps *(oh Pallas)*	2	BA 15 s - 12 V - 15 W (large bulb)
Front and rear interior lamps	4	Festoon 12 V - 7 W
Warning lamp cluster		
instrument panel lighting	2	14 V - 3 W - type Wedge - Base, tube diameter 10
warning lamps	11	
Lighting of heating controls *(on Pallas)*	1	BA 9 s - 12 V - 2 W - type T 8/2
Lighting of glove compartment *(on Pallas)*	1	BA 9 s - 12 V - 2 W - type T 8/2
Clock lamp	1	BA 9 s - 12 V - 2 W - type T 8/2
Boot lamp	1	Festoon 12 V - 5 W

FUSE TABLE



- Cigar lighter
- Rear harness → interior lamps.
- Ignition switch to :
  - switch for heated rear window → heated rear window
  - Flasher unit → switch for direction indicators → front and rear direction indicators
  - Tension regulator → alternator (field winding circuit)

- Terminal for accessories → lighting for glove compartment
- Clock
- Stop lamp switch → stop lamps
- Ignition switch to :
  - switch for heating → heating - 5° C (- 41° F)
  - warning lamp cluster feed
  - switch for windscreen wiper and windscreen washer → windscreen wiper motor → windscreen washer pump

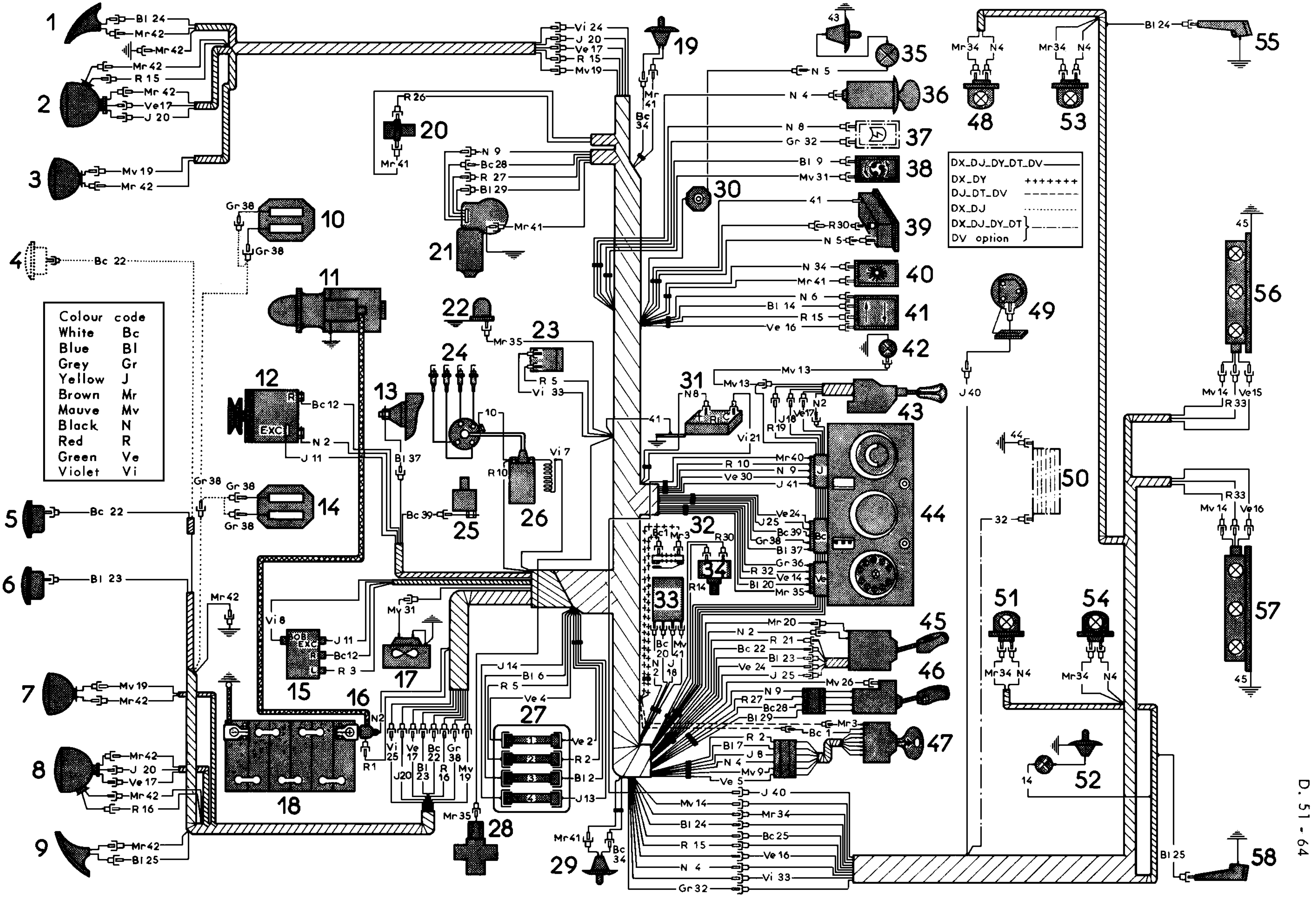
- Switch for parking lamps to :
  - Front and rear parking lamps

- Rheostat → bulbs lighting warning lamp cluster
  → clock lamp
- Switch for parking lamps to :
  side lamps, rear lamps and number plate lighting.

MARKING OF PARTS

l - Front R.H. direction indicator.
2 - Front R.H. headlamp.
3 - Front R.H. auxiliary headlamp.
4 - R.H. country horn.
5 - L.H. country horn.
6 - First country horn.
7 - Front L.H. auxiliary headlamp.
8 - Front L.H. headlamp.
9 - Front L.H. direction indicator.
10 - Front R.H. brake unit.
11 - Solenoid starter motor.
12 - Alternator.
13 - Coolant temperature thermal switch.
14 - Front L.H. brake unit.
15 - Relay -tension regulator unit.
16 - Starter motor relay.
17 - Heating (-5° C) (41° F)
18 - Battery.
19 - Switch on front R.H. pillar.
20 - Windscreen washer pump.
21 - Windscreen wiper motor.
22 - Brake pressure switch (DX - DJ - DY)
23 - Stop lamp switch.
24 - Distributor.
25 - Engine oil pressure switch.
26 - Ignition coil.
27 - Fuse box.
28 - Security valve pressure switch (DT - DV),
29 - Switch on front L.H. door pillar.
30 - Terminal for accessories.
31 - Flasher unit.
32 - Starter motor relay switch (DX - DY).
33 - Relay for headlamps.
34 - Rheostat for lamps lighting instrument panel.
35 - Glove compartment lighting (Pallas)
36 - Cigar lighter.
37 - Switch for heated rear window (optional).
38 - Switch for heating.
39 - Clock (except D.V.).
40 - Switch for interior lamps.
41 - Switch for parking lamps.
42 - Lighting for heating control (Pallas)
43 - Lighting switch.
44 - Warning lamp cluster.
45 - Switch for direction indicators.
46 - Switch for windscreen wiper and washer.
47 - Ignition switch.
48 - R.H. lateral interior lamp.
49 - Fuel gauge sender.
50 - Heated rear window (optional).
51 - L.H. lateral interior lamp.
52 - Boot lamp.
53 - Rear R.H. interior lamp (DX - DJ - DY except Pallas).
54 - Rear L.H. interior lamp (DX - DJ - DY except Pallas).
55 - Rear R.H. direction indicator.
56 - Rear R.H. number plate lamp, stop lamp and rear lamp.
57 - Rear L.H. number plate lamp, stop lamp and rear lamp.
58 - Rear L.H. direction indicator.

WIRING DIAGRAM



Colour	code
White	Bc
Blue	Bl
Grey	Gr
Yellow	J
Brown	Mr
Mauve	Mv
Black	N
Red	R
Green	Ve
Violet	Vi

Harness	Wire Nº	Colour of ends	Schedule of Wiring
Front	1	Red	Starter motor relay (16)
		White	to starter motor switch (32) or (47)
Front	2	Black	Starter relay (16) (non - disconnectable terminal)
		Black	to « + » alternator terminal (12)
		Green	to fuse box (27) (fuse Nº 1)
		Red	to fuse box (27) (fuse Nº 2)
		Blue	to fuse box (27) (fuse Nº 3)
		Red	to ignition switch (47)
		Black	to lighting switch (43)
		Black	to headlamp relay (33)
		Black	to switch (45) for direction indicators
Front	3	Brown	Starter switch (32) or (47)
		Red	to relay-tension regulator unit (15) (terminal L)
Front	4	Green	Fuse box (27) (fuse Nº 1)
		Black	to ignition switch (47)
		Black	to cigar lighter (36)
		Black	to rear harness junction
Front	5	Red	Fuse box (27) (fuse Nº 2)
		Green	to ignition switch (47)
		Black	to terminal for accessories (30)
		Black	to clock (39)
		Red	to stop lamp switch (23)
Front	6	Blue	Fuse box (27) (fuse Nº 3)
		Black	to switch (41) for parking lamps
Front	7	Blue	Ignition switch (47)
		Violet	to ignition coil (26)
Front	8	Yellow	Ignition switch (47)
		Black	to switch (37) for heated rear window (optional)
		Violet	to relay-tension regulator unit (15) (terminal « BOB »)
		Black	to flasher unit (31) (terminal « + »)
Front	9	Mauve	Ignition switch (47)
		Blue	to heating switch (38)
		Block	to windscreen wiper switch (46)
		Black	to feed lead for warning lamp cluster (44) (yellow housing)
		Black	to windscreen wiper motor (21) (automatic stop)
Front	10	Red	Ignition switch (26)
		Red	to warning lamp cluster (44) (tachometer) (yellow housing)
Front	11	Yellow	Relay-tension regulator unit (15) (terminal « EXC »)
		Yellow	to alternator (12) (terminal « EXC »)

Harness	Wire Nº	Colour of ends	Schedule of Wiring
Front	12	White	Alternator (12) (terminal R)
		White	to relay -voltage regulator unit (15) (terminal R)
Front	13	Mauve	Lighting switch (43)
		Yellow	to fusebox (27) (fuse Nº 4)
		Mauve	to lighting for heating controls (42)
Front	14	Yellow	Fuse box (27) (fuse Nº 4)
		Blue	to switch (41) for parking lamps
		Red	to rheostat (34) for lamps lighting instrument panel
		Green	to warning lamp cluster (44) (green housing) (warning lamps)
		Mauve	to rear harness
Front	15	Red	Switch (41) for parking lamps
		Red	to front R.H. wiring harness
		Red	to rear harness
Front	16	Green	Switch (41) for parking lamps
		Red	to front L.H. wing harness
		Green	to rear harness
Front	17	Green	Lighting switch (43)
		Green	to front L.H. junction
		Green	to front R.H. wing junction
Front	18	Yellow	Lighting switch (43)
		Yellow	to headlamp relay (33)
Front	19	Red	Lighting switch (43)
		Mauve	to front L.H. wing junction
		Mauve	to front R.H. wing junction
Front	20	White	Headlamp relay (33)
		Blue	to warning lamp cluster (44) (green housing) (main beam warning lamp)
		Yellow	to front L.H. wing harness
		Yellow	to front R.H. wing harness
		Brown	to direction indicator switch (45)
Front	21	Violet	Flasher unit (31)
		I?ed	to direction indicator switch (45)
Front	22	White	Switch for direction indicators (45)
		White.	to front L.H. wing harness
Front	23	Blue	Switch (45) for direction indicators
		Blue	to front L.H. wing harness
Front	24	Green	Switch (45) for direction indicators
		Green	to warning lamp cluster (44) (white housing) (R.H. indicator warning lamp)
		Violet	to front R.H. wing harness
		Blue	to rear harness

Harness	Wire Nº	Colour of ends	Schedule of Wiring
Front	25	Yellow	Switch (45) for direction indicators
		Yellow	to warning lamp cluster (44) (white housing) (L.H. indicator warning lamp)
		Violet	to front L.H. wing harness
		White	to rear harness
Front	26	Mauve	Windscreen wiper switch (46)
		Red	to windscreen washer pump (20)
Front	27	Red	Windscreen wiper switch (46)
		Red	to windscreen wiper motor (21)
Front	28	White	Windscreen wiper switch (46)
		White	to windscreen wiper motor (21)
Front	29	Blue	Windscreen wiper switch (46)
		Blue	to windscreen wiper motor (21)
Front	30	Red	Rheostat (34) for lamps lighting instrument panel
		Green	to warning lamp cluster lighting (44) (yellow housing)
		Red	to clock lamp (39)
Front	31	Mauve	Switch (38) for heating
		Mauve	to heating -5°C (-41° F) (17)
Front	32	Grey	Switch (37) for heated rear window (optional)
		Grey	to rear harness
		Red	to warning lamp cluster (44) (green housing) (warning lamp for heated window)
Front	33	Violet	Stop lamp switch (23)
		Violet	to rear harness
Front	34	Brown	Rear harness junction
		White	to switch on R.H. door pillar (19)
		White	to switch on L.H. door pillar (29)
		Black	to switch (40) for interior lamps
Front	35	Brown	Warning lamp cluster (44) (white housing) (brake warning lamp)
		Brown	to pressure switch (22) or (28)
Front	36	Grey	Warning lamp cluster (44) (green housing) (charge warning lamp)
	3	Red	to relay -voltage regulator unit (15) (terminal L)
Front	37	Blue	Warning lamp cluster (44) (white housing) (water temperature warning lamp)
		Blue	to thermal switch (13) flying lead
Front	38	Grey	Warning lamp cluster (44) (white housing) (brake pad wear warning lamp)
			to front L.H. wing harness
		Grey	
Front	39	White	Warning lamp cluster (44) (white housing) (oil pressure warning lamp)
		White	to flying lead for oil pressure switch (25)

Harness	Wire Nº	Colour of ends	Schedule of Wiring
Front	40	Brown Yellow	Warning lamp cluster (44) (yellow housing) (fuel gauge receiver) to rear harness
Flying lead	10	Red	Coil (26) (« RUP » terminal) to distributor (24)
Flying lead	37	Blue	Front harness junction (water temperature warning lamp) to thermal switch (13)
Flying lead	39	White	Front harness junction (oil pressure warning lamp) to pressure switch (25)
Flying lead	5	Black Black	Terminal for accessories (30) to glove compartment lighting (35) (Pallas)
Flying lead	43		Earth for glove compartment lighting
Front	41		Joint earth (secured to flasher unit) (31)
		Yellow	to warning lamp cluster earth (44) (yellow housing).
		Bare-galvanized	to clock earth (39)
		Brown	to earth for windscreen wiper motor (21)
		Brown	to earth for windscreen washer pump (20)
		Mauve	to earth for headlamp relay (33)
		Brown	to earth for interior lamp switch (40)
		Brown	to earth for switch on R.H. door pillar (19)
		Brown	to earth for switch on L.H. door pillar (29)
Front R.H.	15	Red Red	Front harness to front R.H. headlamp (2) (sidelamp)
Front R.H.	17	Green Green	Front harness to front R.H. headlamp (2) (dip)
Front R.H.	19	Mauve Mauve	Front harness to R.H. auxiliary headlamp (3)
Front R.H.	20	Yellow Yellow	Front harness to front R.H. headlamp (2) (main beam)
Front R.H.	24	Violet Blue	Front harness to front R.H. direction indicator (1)
Front R.H.	42	Brown Brown Brown Brown	Small unit joint earth to front R.H. direction indicator (1) to front R.H. headlamp (2) to R.H. auxiliary headlamp (3)
Front L.H.	16	Red Red	Front harness to front L.H. headlamp (8) (sidelamp)

Harness	Wire Nº	Colour of ends	Schedule of Wiring
Front L.H.	17	Green Green	Front harness to front L.H. headlamp (8) (dip)
Front L.H.	19	Mauve Mauve	Front harness to auxiliary L.H. headlamp (7)
Front L.H.	20	Yellow Yellow	Front harness to front L.H. headlamp (8) (main beam)
Front L;H.	22	White White	Front harness to horns (4) and (5)
Front L.H.	23	Blue Blue	Front harness to first horn (6)
Front L.H.	25	Violet Blue	Front harness to front L.H. direction indicator (9)
Front L.H.	38	Grey Grey	Front harness to flying lead for brake pads (DX-DJ)
Flying lead	38	Grey Grey	Front L.H. harness to brake pads (10) and (14)
Front L.H.	42	Brown Brown Brown Brown	Small unit joint earth to L.H. auxiliary headlamp (7) to front L.H. headlamp (8) to front L.H. direction indicator (9)
Rear	4	Black Black	Front harness junction to interior lamps (48), (51), (53) and (54)
Rear	14	Mauve	Front harness junction to boot lamp (52)
Rear	15	Red Green	Front harness junction to rear R.H. number plate lamp (56)
Rear	16	Green Green	Front harness junction to rear L.H. number plate lamp (57)
Rear	24	Blue Blue	Front harness junction to rear R.H. direction indicator (55)
Rear	25	White Blue	Front harness junction to rear L.H. direction indicator (58)
Rear	32	Grey	Front harness junction to heated rear window (50) (optional)

Harness	Wire Nº	Colour of ends	Schedule of Wiring
Rear	33	Violet Red Red	Front harness junction to rear R.H. stop lamp (56) to rear L.H. stop lamp (57)
Rear	34	Brown Brown	Earth for interior lamps (48), (51), (53) and (54) to front harness junction
Rear	40	Yellow Yellow	Front harness junction to fuel gauge transmitter (49)
Flying lead	44		Earth for heated rear window (50)
Flying lead	45		Earth for R.H. (56) and L.H. (57) number plate lamps

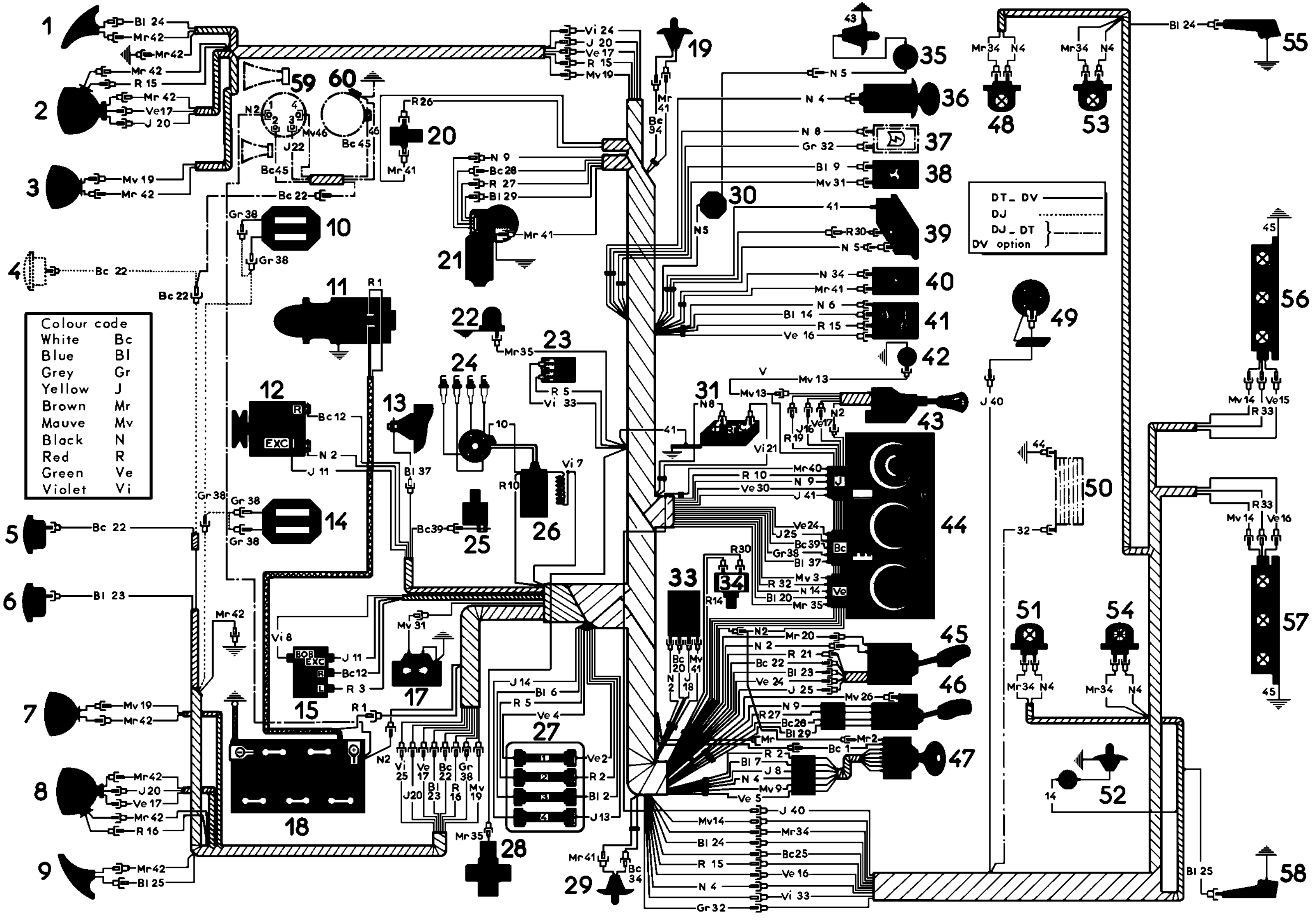
VEHICLES WITH MANUAL GEARCHANGE
DJ, DJ.IE,- DV, DT → ***April 1971***

BULB TABLE

DESCRIPTION		Quantity	Base	Type	Voltage	Power	Norm	
							French	Intern.
Headlamp-Dip		1	P 45 t 41	Yellow selective	12 V	45/40 w	R 136.15	
Auxiliary headlamps		2 or	P 45 t 41	Yellow selective	12 V	45/40 w	R 136.15	
		2	P 14.5 s	Quartz iodine	12 V	55 w	R 136.16	
Front indicators Rear indicators Stop lights		6	BA l5s/19	P 25/l Pear-shaped bulb	12 V	21 w	R 136.12	P 25/l
Rear side-lights Number plate lamp Spare bulb		6	BA l5s/19	R 19.5	12 v	5 w	R 136.13	R 19/5
Front side-lights		2	BA 9s	T 8/4	12 v	4w	R 136.33	T 8/4
Interior lights	DJ DV-DT	4 2	Festoon		12 v	7w	R 136.05	
	Pallas	2	BA 15s		12 v	15 w		
Boot light			Festoon	C 11	12 v	5w	R 136.14	C 11
On Pallas : lighting - Heating control - Glove box		2	BA 9s	T 8/2	12 v	2w	R 136.34	
Clock lamp		1						
Warning lamp cluster Headlamp check light Sidelight check light Heated rear window		3						
Warning lamp cluster Other check lights		8	Wedge base	Ø 10mm	14 v	3w		
Dashboard lighting		2						

WIRING DIAGRAM

DJ - DT - DV since April 1971



Colour code	
White	Bc
Blue	Bl
Grey	Gr
Yellow	J
Brown	Mr
Mauve	Mv
Black	N
Red	R
Green	Ve
Violet	Vi

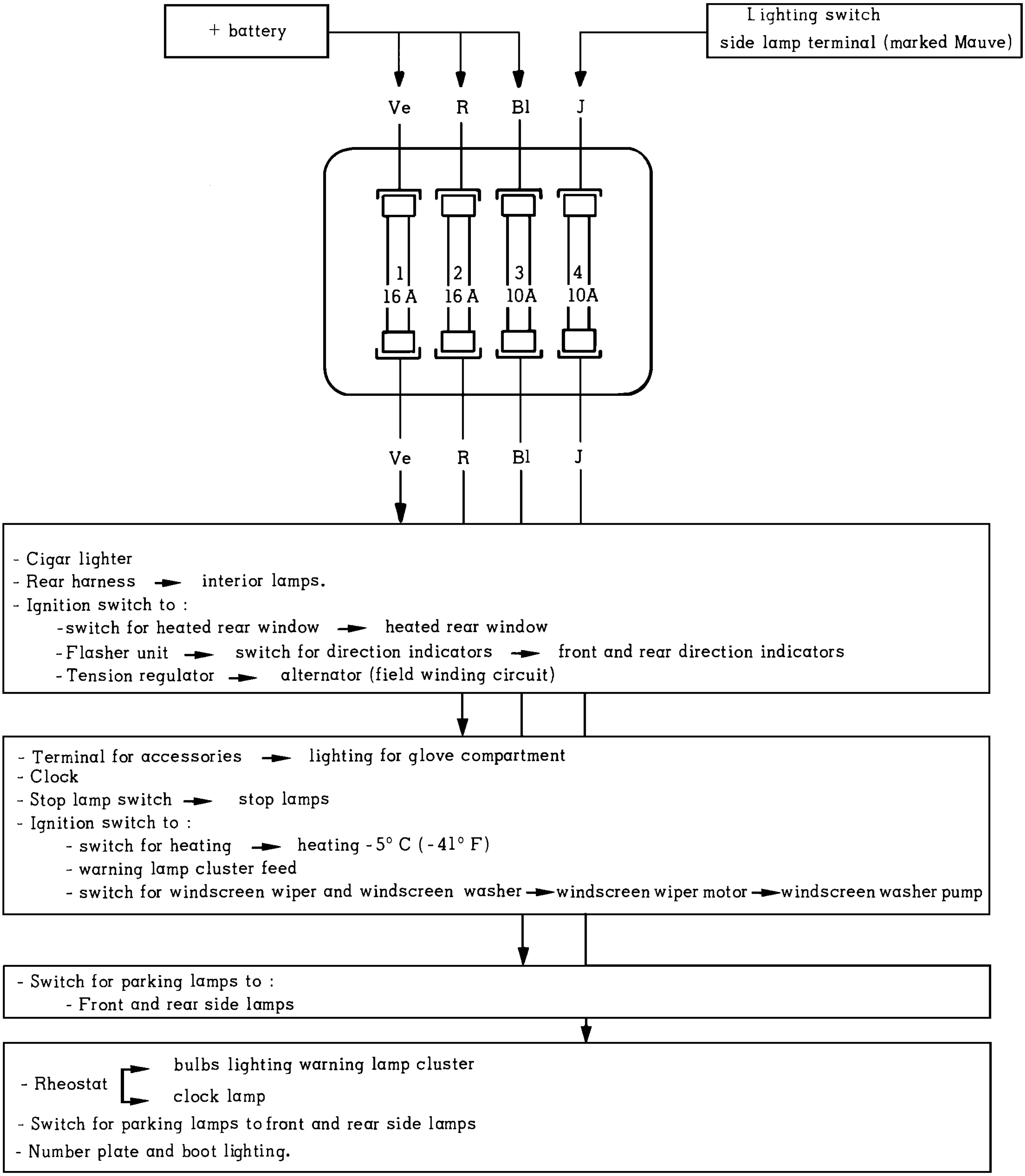
DT _ DV ————

DJ ··········

DJ _ DT } —·—·—

DV option

FUSE TABLE



- Cigar lighter
- Rear harness → interior lamps.
- Ignition switch to :
  - switch for heated rear window → heated rear window
  - Flasher unit → switch for direction indicators → front and rear direction indicators
  - Tension regulator → alternator (field winding circuit)

- Terminal for accessories → lighting for glove compartment
- Clock
- Stop lamp switch → stop lamps
- Ignition switch to :
  - switch for heating → heating -5° C (-41° F)
  - warning lamp cluster feed
  - switch for windscreen wiper and windscreen washer → windscreen wiper motor → windscreen washer pump

- Switch for parking lamps to :
  - Front and rear side lamps

- Rheostat → bulbs lighting warning lamp cluster → clock lamp
- Switch for parking lamps to front and rear side lamps
- Number plate and boot lighting.

MARKING OF PARTS

1 - Front R.H. direction indicator.
2 - Front R.H. headlamp.
3 - Front R.H. auxiliary headlamp.
4 - R.H. country horn. (DJ)
5 - L.H. country horn.
6 - First country horn.
7 - Front L.H. auxiliary headlamp.
8 - Front L.H. headlamp.
9 - Front L.H. direction indicator.
10 - Front R.H. brake unit.
11 - Solenoid starter motor.
12 - Alternator.
13 - Coolant temperature thermal switch.
14 - Front L.H. brake unit.
15 - Relay-tension regulator unit.
16 - Starter motor relay.
17 - Heating (-5° C) (-41° F)
18 - Battery.
19 - Switch on front R.H. pillar.
20 - Windscreen washer pump.
21 - Windscreen wiper motor.
22 - Brake pressure switch (DX-DJ -DV).
23 - Stop lamp switch.
24 - Distributor.
25 - Engine oil pressure switch.
26 - Ignition coil.
27 - Fuse box.
28 - Security valve pressure switch (DT -DV),
29 - Switch on front L.H. door pillar.
30 - Terminal for accessories.
31 - Flasher unit.
32 - Starter motor relay switch (DX-DY).
33 - Relay for headlamps.
34 - Rheostat for lamps lighting instrument panel.
35 - Glove compartment lighting (Pallas)
36 - Cigar lighter.
37 - Switch for heated rear window (optional).
38 - Switch for heating.
39 - Clock (except D.V.).
40 - Switch for interior lamps.
41 - Switch for parking lamps.
42 - Lighting for heating control (Pallas)
43 - Lighting switch.
44 - Warning lamp cluster.
45 - Switch for direction indicators.
46 - Switch for windscreen wipers and washers
47 - Ignition switch.
48 - R.H. lateral interior lamp.
49 - Fuel gauge sender.
50 - Heated rear window (optional).
51 - L.H. lateral interior lamp.
52 - Boot lamp.
53 - Rear R.H. interior lamp (DJ except Pallas)
54 - Rear L.H. interior lamp (DJ except Pallas)
55- Rear R.H. direction indicator.
56 - Rear R.H. number plate lamp, stop lamp and rear lamp.
57 - Rear L.H. number plate lamp, stop lamp and rear lamp.
58 - Rear L.H. direction indicator.
59 - Horn compressor relay (optional)
60 - Horn compressor (optional)

Harness	Wire No	Colour of ends	Schedule of Wiring
Front	1	White	Starter motor switch (47)
		Red	to starter motor lead
Front	2	Black	“+ve ” terminal of the battery (18)
		Black	to « + » alternator terminal (12)
		Green	to fuse box (27) (fuse No 1)
		Red	to fuse box (27) (fuse No 2)
		Blue	to fuse box (27) (fuse No 3)
		Red	to ignition switch (47) (connector)
		Black	to flying lead junction (2) (near 45)
		Black	to lighting switch (43)
		Black	to headlamp relay (33)
		Black	to switch (45) for direction indicators
Front	3	Brown	Single lead (near 47)
		Red	to relay-tension regulator unit'(15) (terminal L)
		Mauve	to warning lamp cluster (44) (green casing) battery charge light
Front	4	Green	Fuse box (27) (fuse Nº 1)
		Black	to ignition switch (47) (connector)
		Black	to cigar lighter (36)
		Black	to rear harness junction
Front	5	Red	Fuse box (27) (fuse No 2)
		Green	to ignition switch (47) (connector)
		Black	to terminal for accessories (30)
		Black	to clock (39)
		Red	to stop lamp switch (23)
Front	6	Blue	Fuse box (27) (fuse No 3)
		Black	to switch (41) for parking lamps
Front	7	Blue	Ignition switch (47) (connector)
		Violet	to ignition coil (26)
Front	8	Yellow	Ignition switch (47) (connector)
		Black	to switch (37) for heated rear window (optional)
		Violet	to relay-tension regulator unit (15) (terminal « BOB »)
		Black	to flasher unit (31) (terminal (« + »)
Front	9	Mauve	Ignition switch (47) (connector)
		Blue	to heating switch (38)
		Black	to windscreen wiper switch (46) (connector)
		Black	to feed lead for warning lamp cluster (44) (yellow housing)
		Black	to windscreen wiper motor (21) (automatic stop)
Front	10	Red	Ignition coil (26)
		Red	to warning lamp cluster (44) (tachometer) (yellow housing)
Front	11	Yellow	Relay voltage regulator unit (15) (terminal «EXC»)
		Yellow	to alternator (12) (terminal « EXC »)

Harness	Wire No	Colour of ends	Schedule of Wiring
Front	12	White White	Alternator (12) (terminal R) to relay-voltage regulator unit (15) (terminal R)
Front	13	Mauve Yellow Mauve	Lighting switch (43) to fusebox (27) (fuse No 4) to lighting for heating controls (42) (Pallas)
Front	14	Yellow Blue Red Black Mauve	Fuse box (27) (fuse No 4) to switch (41) for parking lamps to rheostat (34) for lamps lighting instrument panel to warning lamp cluster (44) (green housing) (warning lamps) to rear harness
Front	15	Red Red Red	Switch (41) for parking lamps to front R.H. wing harness to rear harness
Front	16	Green Red Green	Switch (41) for parking lamps to front L.H. wing harness to rear harness
Front	17	Green Green Green	Lighting switch (43)(dipped) to front L.H. wing harness to front R.H. wing harness
Front	18	Yellow Yellow	Lighting switch (43) to headlamp relay (33)
Front	19	Red Mauve Mauve	Lighting switch (43) (auxiliary headlamps) to front L.H. wing harness to front R.H. wing harness
Front	20	White Blue Yellow Yellow Brown	Headlamp relay (33) to warning lamp cluster (44) (green housing) (main beam warning lamp) to front L.H. wing harness to front R.H. wing harness to direction indicator switch (45)
Front	21	Violet Red	Flasher unit (31) to direction indicator switch (45)
Front	22	White White	Switch for direction indicators (45) to front L.H. wing harness
Front	23	Blue Blue	Switch (45) for direction indicators to front L.H. wing harness
Front	24	Green Green Violet Blue	Switch (45) for direction indicators to warning lamp cluster (44) (white housing) (R.H. indicator warning lamp) to front R.H. wing harness to rear harness

Harness	Wire No	Colour of ends	Schedule of Wiring
Front	25	Yellow	Switch (45) for direction indicators
		Yellow	to warning lamp cluster (44) (white housing) (L.H. indicator warning lamp)
		Violet	to front L.H; wing harness
		White	to rear harness
Front	26	Mauve	Windscreen wiper switch (46)
		Red	to windscreen washer pump (20)
Front	27	Red	Windscreen wiper switch (46) (connector)
		Red	to windscreen wiper motor (21)
Front	28	White	Windscreen wiper switch (46) (connector)
		White	to windscreen wiper motor (21)
Front	29	Blue	Windscreen wiper switch (46)(connector)
		Blue	to windscreen wiper motor (21)
Front	30	Red	Rheostat (34) for lamps lighting instrument panel
		Green	to warning lamp cluster lighting (44) (yellow housing)
		Red	to clock lamp (39)
Front	31	Mauve	Switch (38) for heating
		Mauve	to heating -5° C (-41° F) (17)
Front	32	Grey	Switch (37) for heated rear window (optional)
		Grey	to rear harness
		Red	to warning lamp cluster (44) (green housing) (warning lamp for heated window)
Front	33	Violet	Stop lamp switch (23)
		Violet	to rear harness
Front	34	Brown	Rear harness junction
		White	to switch on R.H. door pillar (19)
		White	to switch on L.H. door pillar (29)
		Black	to switch (40) for interior lamps
Front	35	Brown	Warning lamp cluster (44) (green housing) (brake warning lamp)
		Brown	to brake pressure switch (DJ) (22) or (28) security valve (DT,DV)
Front	37	Blue	Warning lamp cluster (44) (white housing) (water temperature warning lamp)
		Blue	to thermal switch (13) flying lead
Front	38	Grey	Warning lamp cluster (44) (white housing) (brake pad wear warning lamp)
		Grey	to front L.H. wing harness
Front	39	White	Warning lamp cluster (44) (white housing) (oil pressure warning lamp)
		White	to flying lead for oil pressure switch (25)

Harness	Wire No	Colour of ends	Schedule of Wiring
Front	40	Brown	Warning lamp cluster (44) (yellow housing) (fuel gauge receiver)
		Yellow	to rear harness
Front L	41		Joint earth (securing of indicator light cluster 31)
		Yellow	to warning lamp cluster (44) (yellow housing)
		stripped - galvanized	to clock earth (39)
		Brown	to wiper motor earth (21)
		Brown	to washer pump earth (20)
		Mauve	to headlamp relay earth (33)
		Brown	to interior light switch relay earth (40)
		Brown	to RH door switch earth (19)
		Brown	to LH door switch earth (29)
Flying lead	10	Red	Coil (26) ("RUP" terminal)
			to distributor (24)
Flying lead	37	Blue	Front harness (water temperature warning light)
			to thermal switch (13)
Flying lead	39	White	Front harness (oil pressure warning light)
			to pressure switch (25)
Flying lead	5	Black	Accessories terminal (30)
		Black	to glove box light (35) (Pallas)
Flying lead	43		Glove box light (35) (Pallas)
			to earth
Front R.H.	15	Red	Front harness junction
		Red	to front R.H. headlamp (2) (sidelight)
Front R.H.	17	Green	Front harness junction
		Green	to front R.H. headlamp (2) (dip)
Front R.H.	19	Mauve	Front harness junction
		Mauve	to R.H. auxiliary lamp (3).
Front R.H.	20	Yellow	Front harness junction
		Yellow	to front R.H. headlamp (2) (main beam)
Front R.H.	24	Violet	Front harness junction
		Blue	to front R.H. direction indicator (1)
Front R.H.	42	Brown	Small unit joint earth
		Brown	to front R.H. direction indicator II)
		Brown	to front R.H. headlamp (2)
		Brown	to R.H. auxiliary headlamp (3)
Front L.H.	16	Red	Front harness
		Red	to front L.H. headlamp (8) (sidelight)

Harness	Wire No	Colour of ends	Schedule of Wiring
Front L.H.	17	Green Green	Front harness to front L.H. headlamp (8) (dip)
Front L.H.	19	Mauve Mauve	Front harness to auxiliary L.H. headlamp (7)
Front L.H.	20	Yellow Yellow	Front harness to front L.H. headlamp (8) (main beam)
Front L.H.	22	White White White	Front harness to left horn (5) to right horn (4) (DJ)
Front L.H.	23	Blue Blue	Front harness to first horn (6)
Front L.H.	25	Violet Blue	Front harness to front L.H. direction indicator (9)
Front L.H.	38	Grey Grey	Front harness to flying lead for brake pads (DJ)
Flying lead	38	Grey Grey	Front L.H. harness to brake pads (10) and (14) (DJ)
Front L.H.	42	Brown Brown Brown Brown	Small unit joint earth to L.H. auxiliary headlamp (7) to front L.H. headlamp (8) to front L.H. direction indicator (9)
Rear	4	Black Black	Front harness junction. to interior lamps (48). (51), (53) and (54) (DJ except PA)
Rear	14	Mauve Mauve Mauve	Front harness junction to boot lamp (52) to rear R.H. number plate lamp (56) to rear L.H. number plate lamp (57)
Rear	15	Red Green	Front harness junction to rear R.H. sidelight (56)
Rear	16	Green Green	Front harness junction to rear L.H. sidelight (57)
Rear	24	Blue Blue	Front harness junction to rear R.H. direction indicator (55)
Rear	25	White Blue	Front harness junction to rear L.H. direction indicator (58)
Rear	32	Grey	Front harness junction to heated rear window (50) (optional)

Harness	Wire No	Colour of ends	Schedule of Wiring
Rear	33	Violet Red Red	Front harness junction to rear R.H. stop light (56) to rear L.H. stop light (57)
Rear	34	Brown Brown	Front harness junction to each interior light (48), (Sl), and (53), (54) (DJ except PA)
Rear	40	Yellow Yellow	Front harness junction to fuel gauge transmitter (49)
Flying lead	44		Earth for heated rear window (50) (screw on R.H. panel)
Flying lead	2	Black Black	Battery (18) to compressor relay (59)
Horn harness	22	Yellow White	Compressor relay (59 to horn wire junction (4)
	45	White White	Compressor relay (59) to compressor (60)
	46	Mauve	Compressor relay (59) to compressor (60) and earth (fixing screw)
Flying lead	2	Black Black Brown	Lighting switch(43) to front harness junction (near 45) to starter motor switch (47)

MANUAL GEARCHANGE VEHICLE
DV-DT-DJ-DJ.IE → *September 19*

FITTING THE ELECTRICAL INSTALLATION

New presentation of the "fitting the electrical installation" Operations :

Henceforth these operations will consist of two parts :
- **a basic diagram and list of parts** replacing the list of wires used beforehand.
- **an installation diagram** identical to the previous wiring diagram.

Advantages of the basic diagram :

- It clearly indicates the circuits constituting the different functions of the installation.
- It facilitates the location of faults.

Manual 814-1

PRESENTATION OF THE DIAGRAMS

1. BASIC DIAGRAM

a) **Details** : The different circuits are represented in a functional way. Certain parts used in several circuits are therefore "exploded" into several parts placed on different lines.

b) **References** : Three kinds of references are used :

- the figures which refer to single parts (and not the wires)
- the letters AD, AG, AR . . . . . . which refer to the harnesses
- the other letters (Bc, F.Gr, FN.Bl. . .) indicate the colour of the wire sleeves.

NOTE : For these last references there are 4 possible cases :

- *Coloured sleeve on a wire whose colour is not used as a reference marker :* reference on diagrams : Bc, Bl, Ve, GR . . . .
- *No sleeve on a wire of which only the colour serves as a reference marker :* reference on diagrams : F.Gr, F.Ve, F.Bc . . . .
- *Coloured sleeve on a wire whose colour also serves as a reference marker :* reference on diagrams : FN-Bl, F.Ve-Bc . . . .
- *Wire without a reference marker :* This is a wire whose position cannot give rise to any confusion.

IMPORTANT : The references for the parts and harnesses are arbitrary : they are selected solely to enable the diagrams to be used.

In reality the colours of the endpieces and wires are the only references used on the wires making up the electrical installation of the vehicle.

2. INSTALLATION DIAGRAM.

This illustrates the real installation of the vehicle. It indicates the lay-out of the wires and the approximate position of the parts.

The method of marking is identical to that used for the basic diagram.

3. EXAMPLE OF USE.

Problem : The headlamps do not work with the lighting switch, but work with the headlamp flasher.

Use :

a) Look for the headlamp references on the installation diagram and then in the list : reference :(2) and (8)

b) Read the position of the headlamps (2) and (8) in the list :
position = (74) and (73).

c) Refer to the basic diagram : mark the vertical lines (73) and (74) on which the lamps (8) and (2) are situated.

The diagram indicates that the lamps (yellow sleeves) form part of the L.H and R.H wing harnesses. These wires are connected to the relay (33) (wire with white sleeve) which is itself controlled by the lighting switch (43) (wire with yellow sleeve).

The lamps (2) and (8) can also be fed directly by the headlamp flasher from the signalling switch (45) (wire with brown sleeve, position (56)).

With the headlamp flasher working it is therefore necessary to check the relay (33), the lighting switch (43) and the different connections of the circuit, again using the installation diagram.

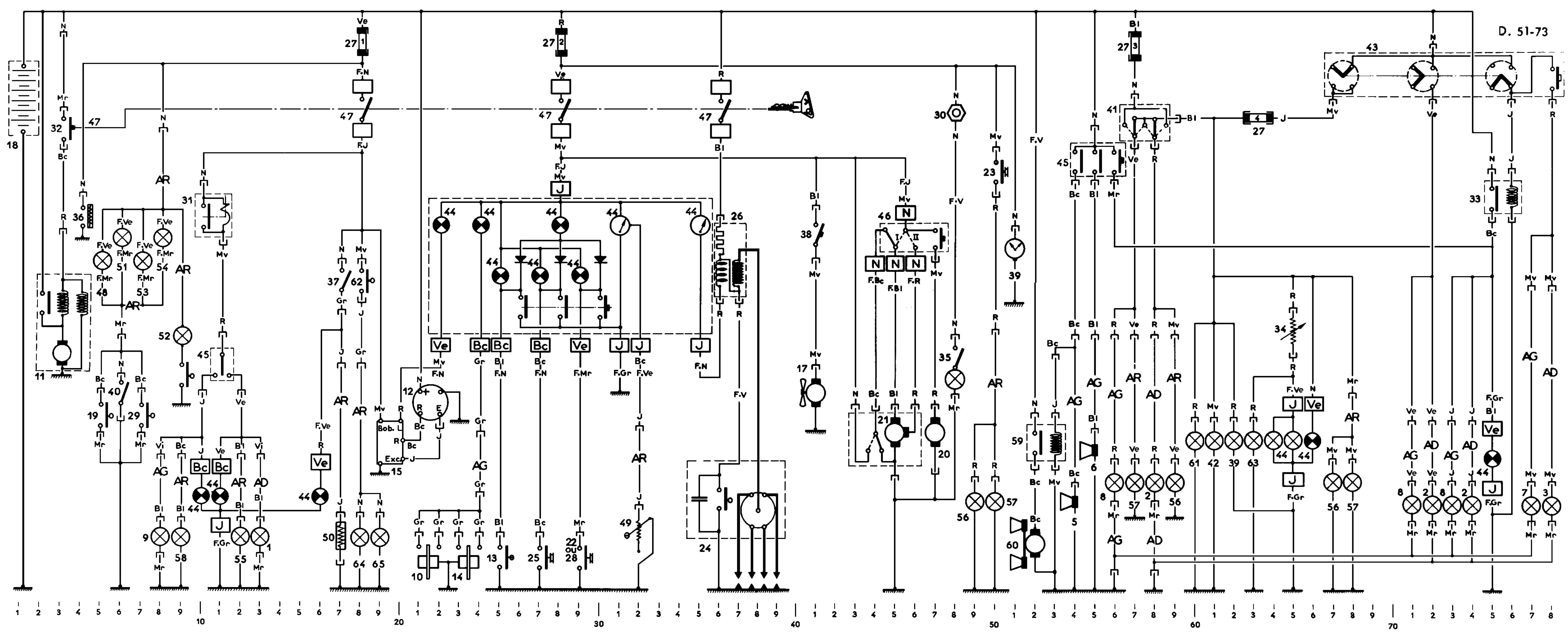
Key to colours

White	Bc
Blue	Bl
Grey	Gr
Yellow	J
Brown	Mr
Mauve	Mv
Black	N
Red	R
Violet	Vi
Green	Ve

BASIC DIAGRAM P.T.O.

BASIC DIAGRAM

(Vehicles DV -- DT - DJ DJ.IE since September 1971)



LIST OF PARTS

NOTE : *Ref* = reference number of parts on installation and basic diagrams.

Position = number of the vertical line on which the part is situated on the basic diagram.

Ref	Description and Position
1	Front R.H direction indicator. .13
2	R.H headlamp unit : Main Beam. 74
	- Dip 72
	- Sidelamp. 58
3	R.H auxiliary headlamp. 78
5	2nd. horn 54
6	1st. horn 55
7	L.H auxiliary headlamp. 77
8	L.H headlamp unit : Main Beam. 73
	- Dip 71
	- Sidelamp. 56
9	Front L.H direction indicator . . 8
10	R.H brake unit 21
11	Starter 3
12	Alternator 21
13	Thermal switch for water 25
14	L.H brake unit 23
15	Voltage regulator 20
17	Heating unit 41

Ref	Description and Position
18	Battery. 1
19	R.H door switch. 5
20	Windscreen washer pump. 47
21	Windscreen wiper motor. 45
22	Hydraulic switch (DJ) 29
23	Brake lamp switch 50
24	Distributor and sparking plugs .36
25	Engine oil pressure switch. . . .27
26	Ignition coil 37
27	Fuse box. 18.28 57 63
28	Hydraulic pressure switch *(DV.DT)*. 29
29	L.H door switch. 7
30	Accessory terminal 48
31	Warning cluster 10
33	Headlamp relay 75
34	Lighting rheostat. 65
35	Lighting for glove compartment .48
36	Cigarette lighter 4

Ref	Description and Position
37	Rear window heater switch *(except DV,DT)*. 17
38	Heating switch. 41
39	Clock *(except DV)* 51
	Lighting for clock. 62
40	Interior lighting switch. 6
41	Parking lamp rocker switch. . .57
42	Lighting for heater control *(except DV)* 61
43	Lighting switch 68.72.76.78
44	Warning cluster :
	Warning lamp for :
	- R.H and L.H indicator. . .10.11
	- Brake pad wear 24
	- State of charge 22
	- Rear heated window. 16
	- Sidelamps 66
	Headlamps 75
	- Hydraulic pressure 29
	- Engine oil 27
	- Water temperature 25

Ref	Description and Position
44	Control unit *(contd)* :
	- Tachometer 35
	- Fuel level. 31
	- Dashboard lighting 65
	- Emergency stop warning lamp. 28
	- Check button 26,28,30
45	Lighting switch 11,54
46	Windscreen washer/ wiper switch 45
47	Anti-theft switch 3.18,28,36
48	R.H side interior lamp 5
49	Petrol gauge transmitter. 32
50	Rear window heating *(option DV-DT)* 17
51	L.H side interior lamp. 6
52	Boot lighting. 9
53	Rear R.H interior lamp *(DJ except PA)*. 7
54	Rear L.H interior lamp *(DJ except PA)* 8
55	Rear R.H direction indicator. . 12
56	Rear R.H lighting unit : Stop lamp 49
	- Side and tail. 59
	- Number plate 67

Ref	Description and Position
57	Rear L.H lighting unit : Stop lamp. 50
	- Side and tail 57
	- Number plate 68
58	Rear L.H direction indicator . . . 9
59	Horn compressor relay *(DV option)* 52
60	Horn compressor. 52
61	Lighting for cigarette lighter *(except DV)*. 60
62	Switch for reversing lamps *(except DV)* 18
63	Ashtray lighting *(except DV)* . . .63
64	R.H reversing lamp *(except DV)*. . 18
65	L.H reversing lamp *(except DV)*. . 19

HARNESSES

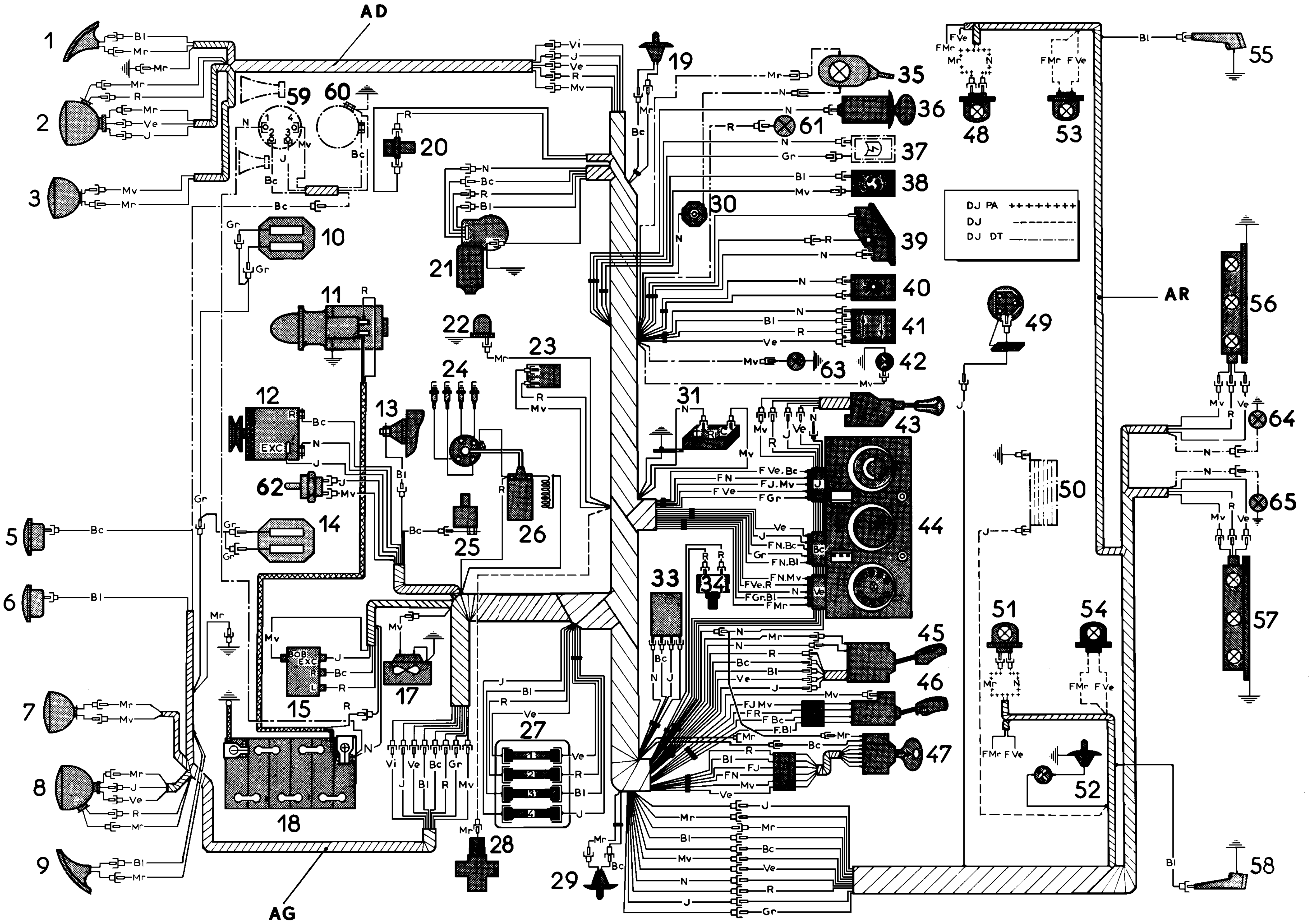
—	. . . . Front (main)
AG.	. . . . L.H wing
AD.	. . . . R.H wing
AR.	. . . . Rear
F.V	. . . . Free lead

Key to Symbols used in diagram

- Plug connection
- Connector
- Fuse
- Manually operated switch
- Mechanical switch
- Thermal switch
- Pressure switch
- Coil
- Resistance
- Variable resistance
- Condensor
- Diode (Rectifier)
- Motor
- Lighting lamp
- Warning lamp
- Indicator

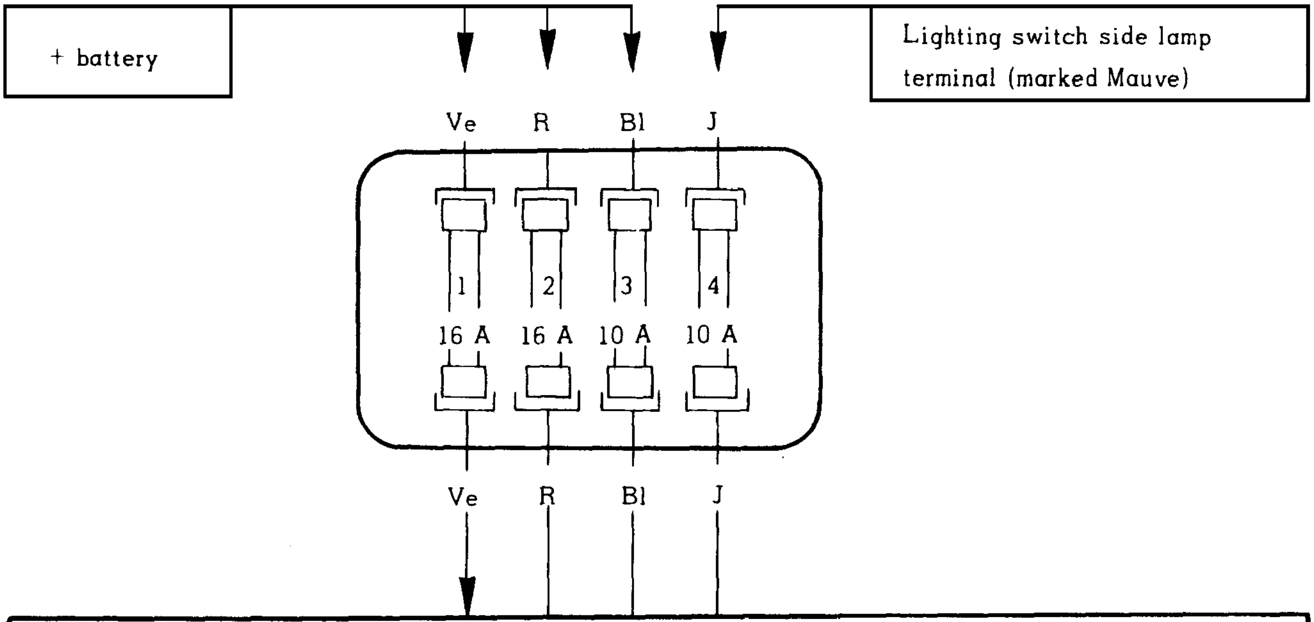
INSTALLATION DIAGRAM

(DV - DT - DJ IE vehicles since september 1971)



COLOUR CODE	Bc = White	Gr = Grey	Mr = Brown	N = Black	Ve = Green
	Bl = Blue	J = Yellow	Mv = Mauve	R = Red	Vi = Violet

FUSE TABLE



- Cigar lighter
- Rear harness → interior lamps.
- Ignition switch to :
  - Reversing lamp switch → reversing lamps (except DV)
  - Switch for heated rear window → heated rear window (option DV-DT)
  - Flasher unit → switch for direction indicators → front and rear direction indicators
  - Voltage regulator → alternator (field winding circuit)

- Terminal for accessories → lighting for glove compartment
- Clock (except DV)
- Stop lamp switch → stop lamps
- Ignition switch to :
  - Switch for heating heating - 5°C (-41°F)
  - Warning lamp cluster feed → windscreen washer pump
  - Switch for windscreen wiper and windscreen washer → windscreen wiper motor

- Switch for parking lamps to :
  - Front and rear parking lamps

- Rheostat → bulbs lighting dashboard → clock lamp *(except DV)*
- Switch for parking lamps to front and rear sidelamps
- Lighting for number plate and boot
- Lighting for heating control *(except DV)*
- Lighting for ashtray *(except DV)*
- Lighting for cigarette lighter *(except DV)*

P.T.O. **INSTALLATION DIAGRAM**

BULB TABLE

Use		Quantity	Socket	Type	Voltage	Power	Norm	
							French	Internat.
Headlamps-dip and main beam		2	P 45 t 41	Yellow selective	12 V	45/40 W	R 136.15	
Headlamps		2	P 45 t 41	Yellow selective	12 V	45/40 W	R 136.15	
auxiliary		or 2	P 14.5s	H 1 iodine	12 V	55 W	R 136.16	
Front indicators Rear indicators Stop lamps		6	BA 15s/19	P 25/1 Pear-shaped	12 V	21 W	R 136.12	P 25/1
Reversing lamps *(except DV)*		2						
Rear sidelamps No plate lighting Emergency lamp		6	BA 15s/19	R 19/1	12 V	5 W	R 136.13	R 19/5
Front sidelamps		2	BA 9s	T 8/4	12 V	4 W	R 136.33	T 8/4
Interior lighting	DJ DV - DT	4 2	Festoon		12 V	7 W	R 136.05	
	Pallas	2	BA 15s		12 V	15 W		
Boot lighting		1	Festoon	C 11	12 V	5 W	R 136.14	C 11
Lighting (DT - DJ) - Ashtray - Heating control - Glove compartment - Cigarette lighter - Clock		5	BA 9s	T 8/2	12 V	2 W	R 136.34	
Warning cluster Warning lamp for headlamps Warning lamp for sidelamps Heated rear window		3						
Warning cluster Other warning lamps		8	Wedge base	ϕ 10 mm	14 V	3 W		
Dashboard lighting		2						

HYDRAULIC GEARCHANGE VEHICLES
DX-DX.IE-DY ⟼ *September 1971*

FITTING THE ELECTRICAL INSTALLATION

New presentation of the "Fitting the electrical installation" operations :

Henceforth these operations will consist of two parts :
- **a basic diagram and list of parts** replacing the list of wires used beforehand.
- **an installation diagram** identical to the previous wiring diagram.

Advantages of the basic diagram :

- It clearly indicates the circuits constituting the different functions of the installation.
- It facilitates the location of faults.

PRESENTATION OF THE DIAGRAMS

1. BASIC DIAGRAM

a) **Details** : The different circuits are represented in a functional way. Certain parts used in several circuits are therefore "explcded" into several parts placed on different lines.

b) **References** : Three kinds of references are used :

- the figures which refer to single parts (and not the wires)
- the letters AD, AG, AR . . . . . . which refer to the harnesses
- the other letters (Bc, F.Gr, FN, BI. . .) indicate the colour of the wire sleeves.

NOTE : For these last references there are 4 possible cases :

- *Coloured sleeve on a wire whose colour is not used as a reference marker :* reference on diagrams : Bc, BI, Ve, Gr . . . . . .
- *No sleeve on a wire of which only the colour serves as a reference marker :* reference on diagrams : F.Gr, F.Ve, F.Bc.. . . . .
- *Coloured sleeve on a wire whose colour also serves as a reference marker :* reference on diagrams : FN-Bl, F.Ve-Bc
- *Wire without a reference marker :* This is a wire whose position cannot give rise to any confusion.

IMPORTANT : The references for the parts and harnesses are arbitrary : they are slected solecy to enable the diagrams to be used.

In reality the colours of the endpieces and wires are the only references used on the wires making up the electrical installation of the vehicle.

2. INSTALLATION DIAGRAM.

This illustrates the real installation of the vehicle. It indicates the lay-out of the wires and the approximate position of the parts.

The method of marking is identical to that used for the basic diagram.

3. EXAMPLE OF USE

Problem : The headlamps do not work with the lighting switch, but work with the headlamp flasher.

a) Look for the headlamp references on the installation diagram and on the list.
reference : (2) and (8)

b) Read the position of the headlamps (2) and (8) in the list : position = (74) and (73).

c) Refer to the basic diagram : mark the vertical lines (73) and (74) on which the lamps (8) and (2) are situated.

The diagram indicates that the lamps (yellow sleeves) form part of the L.H. and R.H. wing harnesses. These wires are connected to the relay (33) (wire with white sleeve) which is itself controlled by the lighting switch (43) (wire with yellow sleeve).

The lamps (2) and (8) can also be fed directly by the headlamp washer from the signalling switch (45) (wire with brown sleeve, position (56).

With the headlamp flasher working it is therefore necessary to check the relay (33), the lighting switch (43) and the different connections of the circuit, again using the installation diagram.

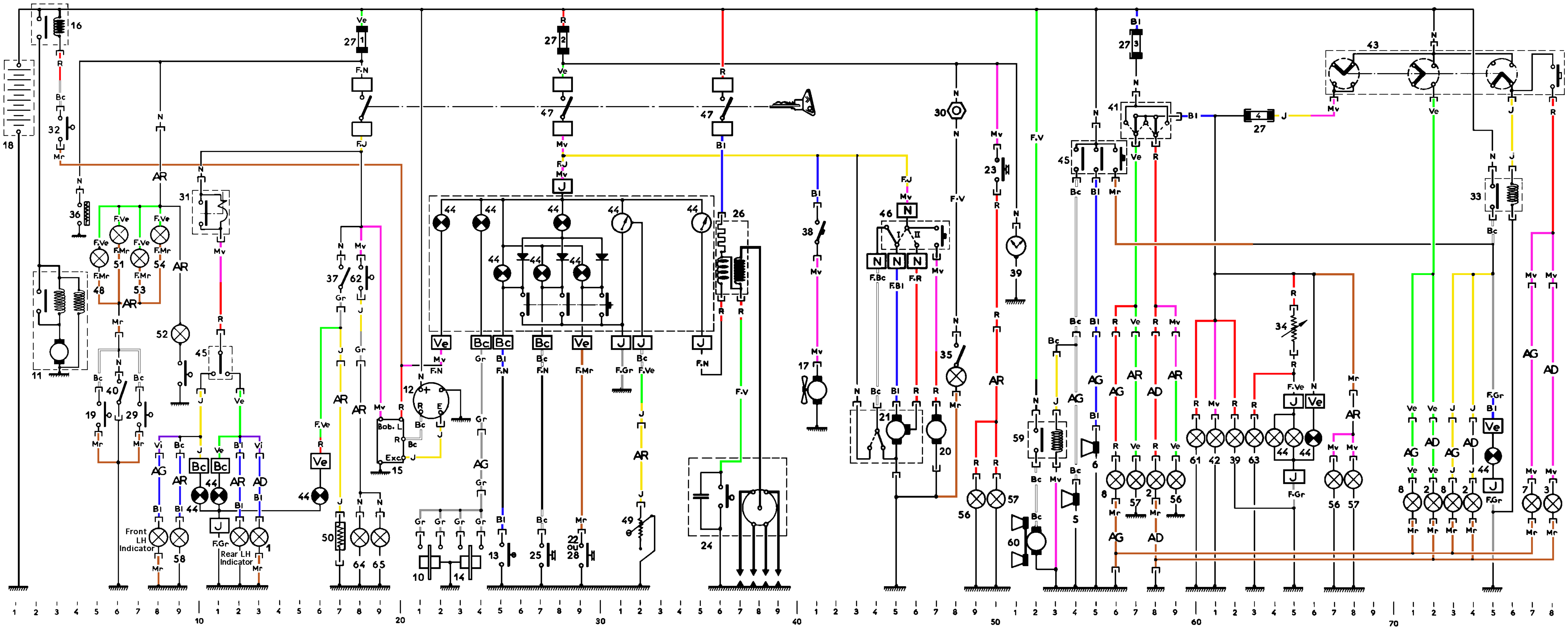
Key to colours

White	Bc
Blue	Bl
Grey	Gr
Yellow	J
Brown	Mr
Mauve	Mv
Black	N
Red	R
Violet	Vi
Green	Ve

BASIC DIAGRAM P.T.O.

BASIC DIAGRAM

(Vehicles DX - DX.IE - DY since september 1971)



LIST OF PARTS

NOTE : *Ref* = reference number of parts on installation and basic diagrams.

Position = number of the vertical line on which the part is situated on the basic diagram.

Ref	Description and Position
1	Front R.H. direction indicator. 13
2	R.H. headlamp unit : Main beam. 74
	- Dip 72
	- Sidelamp. 58
3	R.H. auxiliary headlamp 78
5	2nd. Horn. 54
6	1st. Horn 55
7	L.H. auxiliary headlamp 77
8	L.H. headlamp unit : Main beam 73
	- Dip 71
	- Sidelamp. 56
9	Front, L.H. direction indicator 8
10	R.H. brake unit. 21
11	Starter 3
12	Alternator 21
13	Thermal switch for water . . . 25
14	L.H. brake unit. 23
15	Voltage regulator 20
16	Starter relay. 2
17	Heating unit 41
18	Battery 1
19	R.H. door switch 5
20	Windscreen washer pump 47
21	Windscreen wiper motor 45
23	Brake lamp switch 50
24	Distributor and sparking plugs 36
25	Engine oil pressure switch . . .27
26	Ignition coil. 37
27	Fuse box. 18.28.57.63
28	Hydraulic pressure switch (DV.DT) 29
29	L.H. door switch. 7
30	Accessory terminal 48
31	Warning cluster. 10
32	Starter motor switch. 3
33	Headlamp relay. 75
34	Lighting rheostat 65
35	Lighting for glove compartment 48
36	Cigarette lighter 4
37	Rear window heater . . . . . . switch (except DV, DT) . . . 17
38	Heating switch 41
39	Clock 51
	Lighting for clock 62
40	Interior lighting switch. . . . 6
41	Parking lamp rocker switch . 57
42	Lighting for heater control . 61
43	Lighting switch 68.72.76. 78
44	Warning cluster :
	Warning lamp for :
	- R.H. and L.H. indicator . 10.11
	- Brake pad wear 24
	- State of charge 22
	- Rear heated window. 16
	- Sidelamps 66
	- Headlamps. 75
	- Hydraulic pressure 29
	- Engine oil. 27
	- Water temperature 25
44	Control unit *(contd)* :
	- Tachometer 35
	- Fuel level. 31
	- Dashboard lighting 65
	- Emergency stop warning lamp. 28
	- Check button 26,28,30
45	Lighting switch 11,54
46	Windscreen washer/wiper switch 45
47	Anti-theft switch 3.18,28,36
48	R.H side interior lamp 5
49	Petrol gauge transmitter. 32
50	Rear window heating *(option DV-DT)* 17
51	L.H side interior lamp 6
52	Boot lighting. 9
53	Rear R.H interior lamp *(DJ except PA)* 7
54	Rear L.H interior lamp *(DJ except PA)* 8
55	Rear R.H direction indicator. . 12
56	Rear R.H lighting unit : Stop lamp 49
	- Side and tail 59
	- Number plate 67
57	Rear L.H lighting unit : Stop lamp. 50
	- Side and tail 57
	- Number plate 68
58	Rear L.H direction indicator . . . 9
59	Horn compressor relay *(DV option)* 52
60	Horn compressor. 52
61	Lighting for cigarette lighter *(except DV)*. 60
62	Switch for reversing lamps *(except DV)*. 18
63	Ashtray lighting *(except DV)* . . .63
64	R.H reversing lamp *(except DV)*. . 18
65	L.H reversing lamp *(except DV)*. . 19

HARNESSES

—	. . . . Front (main)
AG.	. . . . L.H wing
AD.	. . . . R.H wing
AR.	. . . . Rear
F.V	. . . . Free lead

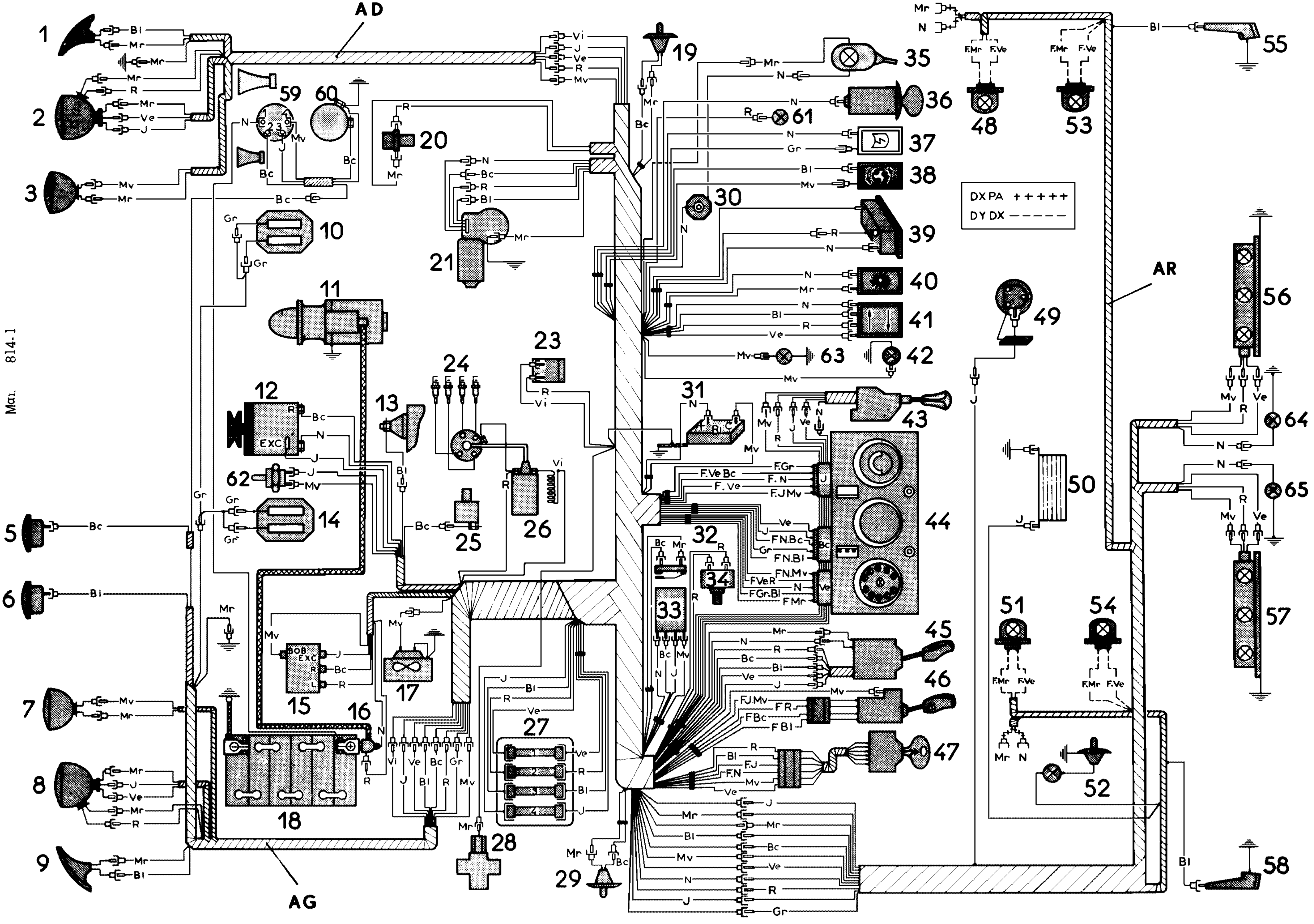
Key to Symbols used in diagram

Plug connection
Connector
Fuse
Manually operated switch
Mechanical switch
Thermal switch
Pressure switch
Coil
Resistance
Variable resistance
Condensor
Diode (Rectifier)
Motor
Lighting lamp
Warning lamp
Indicator

INSTALLATION DIAGRAM

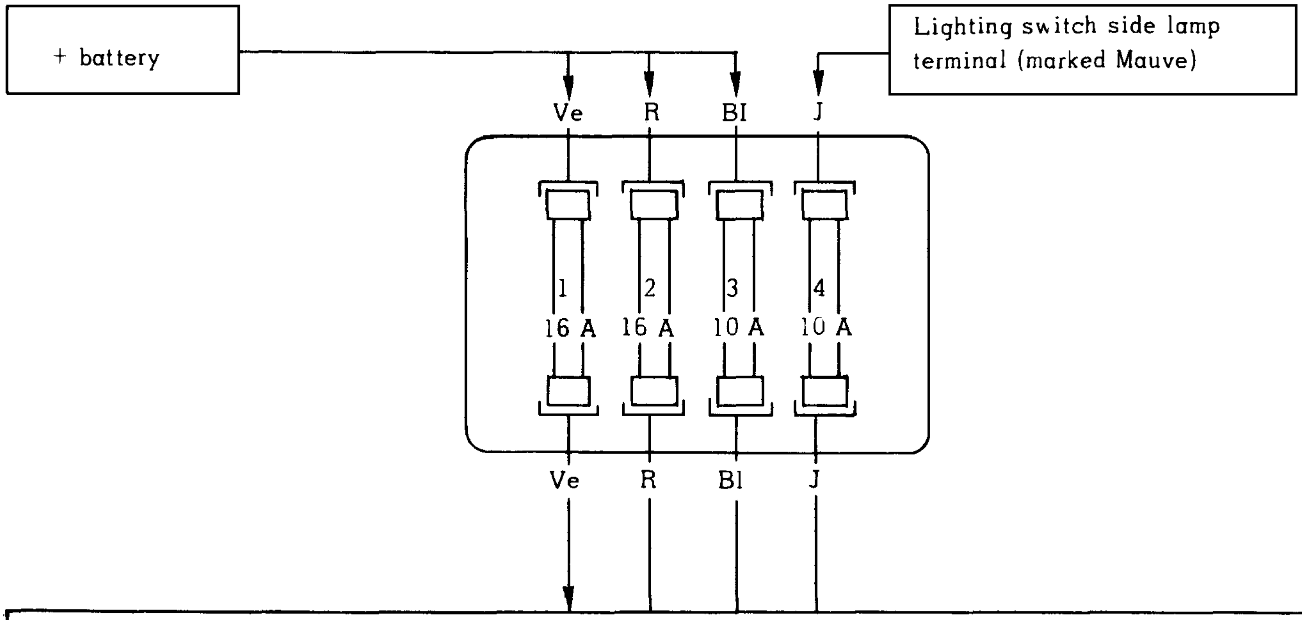
(Vehicles DX - DX.IE - DY since september 1971)

Man. 814-1



COLOUR CODE	Bc = White	Gr = Grey	Mr = Brown	N = Black	Ve = Green
	Bl = Blue	J = Yellow	Mv = Mauve	R = Red	Vi = Violet

FUSE TABLE



- Cigarette lighter
- Rear harness → interior lamps.
- Ignition switch to :
    - Reversing lamp switch → reversing lamps
    - Switch for heated rear window → heated rear window
    - Flasher unit → switch for direction indicators → front and rear direction indicators
    - Voltage regulator → alternator (field winding circuit)

- Terminal for accessories → lighting for glove compartment
- Clock
- Stop lamp switch → stop lamps
- Ignition switch to :
    - Switch for heating → heating - 5°C (- 41°F)
    - Warning lamp cluster feed
    - Switch for windscreen wiper and windscreen washer → windscreen washer pump → windscreen wiper motor

- Switch for parking lamps to :
    - Front and rear parking lamps

- Rheostat → bulbs lighting dashboard → clock lamp
- Switch for parking lamps to front and rear sidelamps
- Lighting for number plate and boot
- Lighting for heating control
- Lighting for ashtray
- Lighting for cigarette lighter

P.T.O. **INSTALLATION DIAGRAM**

BULB TABLE

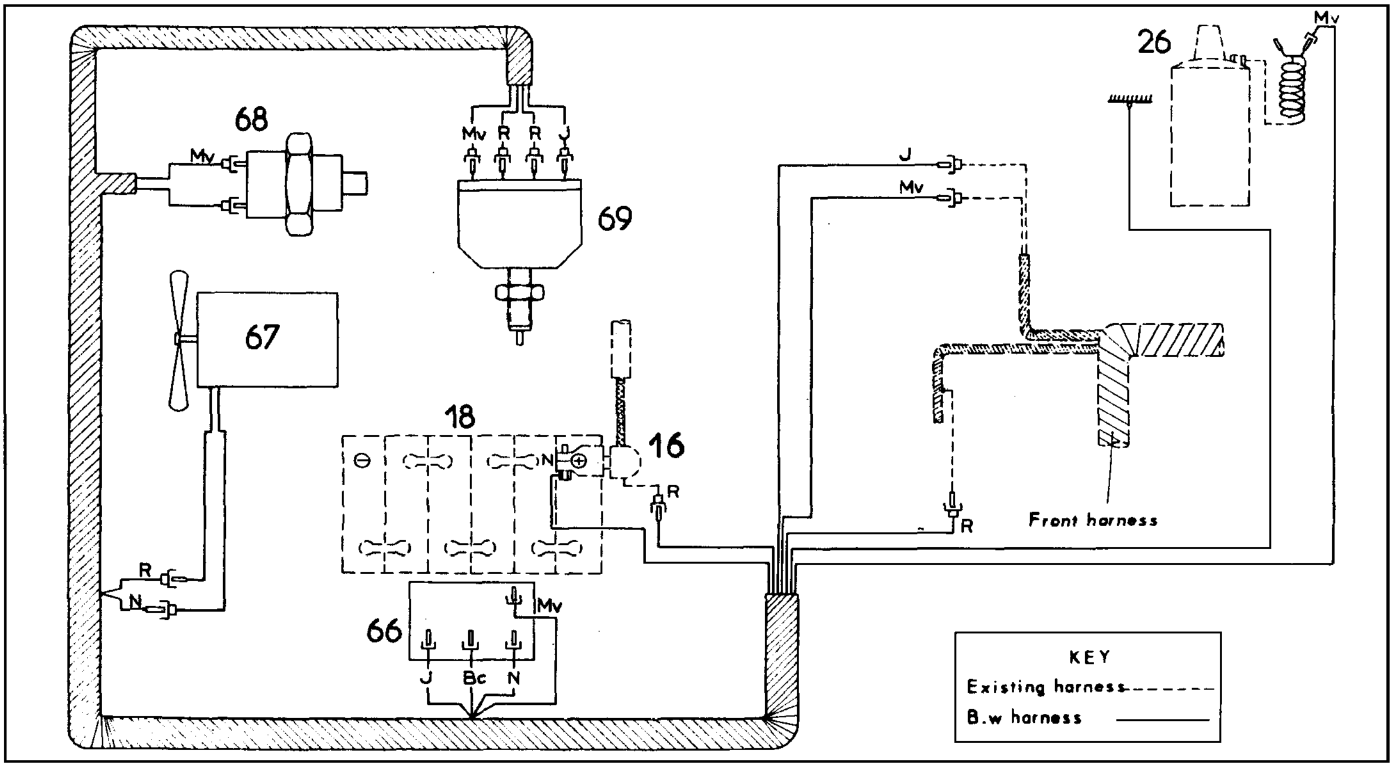
Use		Quantity	Socket	Type	Voltage	Power	Norm	
							French	Internat
Headlamps - Dip and main beam		2	P 45 t 41	Yellow Selective	12 V	45/40 W	R. 136.15	
Headlamps auxiliary		2	P 45 t 41	Yellow Selective	12 V	45/40 W	R. 136.15	
		or 2	P 14.5 s	H 1 iodine	12 V	55 W	R. 136.16	
Front indicators Rear indicators Stop lamps		6	BA 15s/19	P 25/1 Pear-shaped	12 V	21 W	R. 136.12	P 25/1
Reversing lamps		2						
Rear sidelamps No plate lighting Emergency lamp		6	BA 15s/19	R 19/5	12 V	5 W	R. 136.13	R 19/5
Front sidelamps		2	BA 9s	T 8/4	12 V	4 W	R. 136.33	T 8/4
Interior lighting	DX - DY	4	Festoon		12 V	7 W	R. 136.05	
	Pallas	2	BA 15s		12 V	15 W		
Boot lighting		1	Festoon	C 11	12 V	5 W	R. 136.14	C 11
Lighting : - Ashtray - Heating control - Glove compartment - Cigarette lighter - Clock		5	BA 9s	T 8/2	12 V	2 W	R. 136.34	
Warning cluster : Warning lamp for headlamps Warning lamp for sidelamps Heated rear window		3						
Warning cluster : Other warning lamps		8	Wedge Base	ϕ 10 mm	14 V	3 W		
Dashboard lighting		2						
Lighting for gear selector on Dbw		1	Incorporated in the lamp		24 V	5 W		

OPERATION No. Dbw. 510-00 : *Fitting the electrical system (vehicles fitted with an automatic gearbox).*

DBW. VEHICLES, ALL TYPES

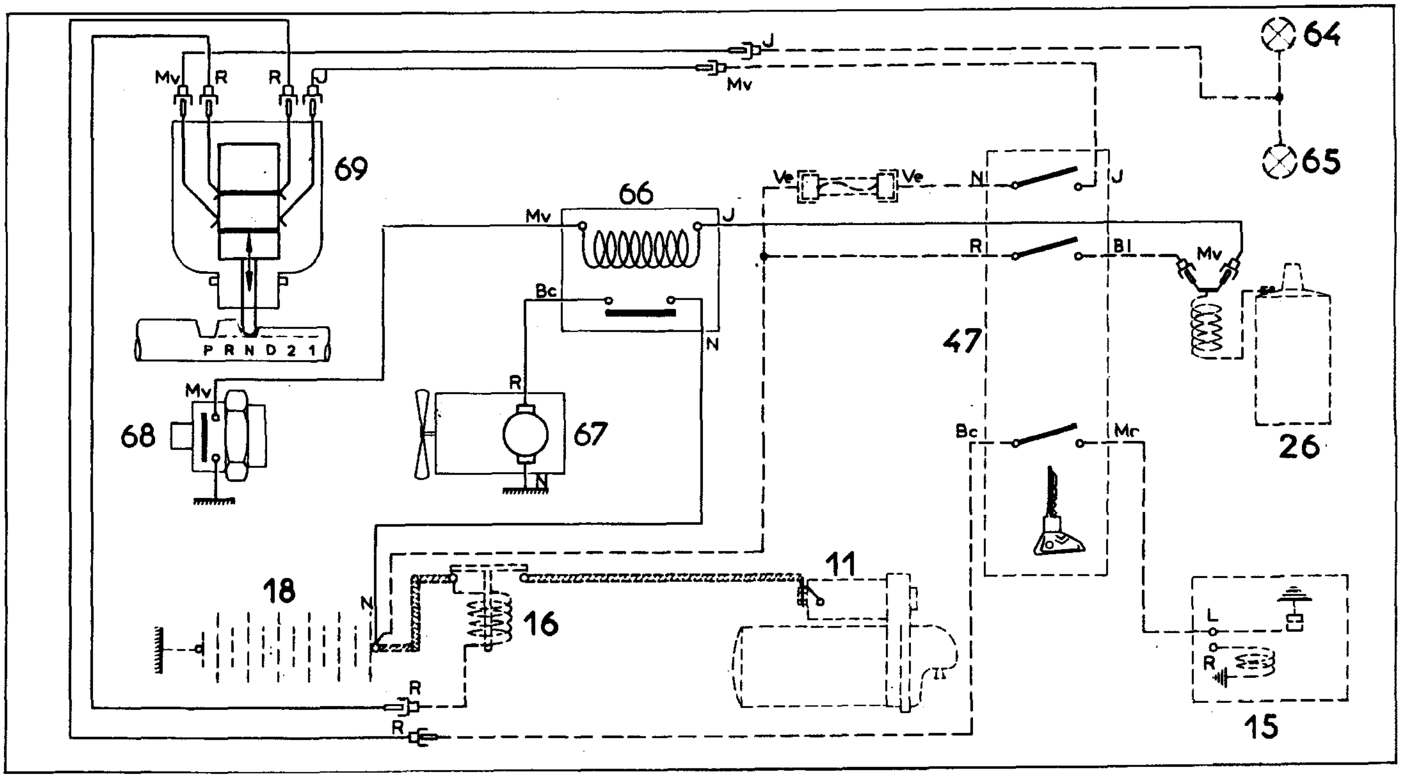
DIAGRAM OF THE SYSTEM

D. 35-52 a



Manual 814-1

BASIC DIAGRAM



D. 35-53 b

NOTE : - Dbw vehicles (i.e with BORG-WARNER gearboxes) are fitted with the basic harnesses of the hydraulic gearchange vehicles *produced since september 1971* (see Op. Dh. 510-00 a) and the additional harness above.

- In Dbw vehicles the starter control is on the anti-theft device, instead of being on the gear lever as on hydraulic gearchange vehicles.

REFERENCE NUMBERS OF THE PARTS.

The references for those parts common to both systems are identical to those indicated in the electronics diagram Dh. 510-00 a. The additional parts are as follows :

66. Fan relay (on battery frame)

67. Cooler fan

68. Thermal switch for radiator water

69. Switch for reversing lamps and starter motor safety device (on gearbox)

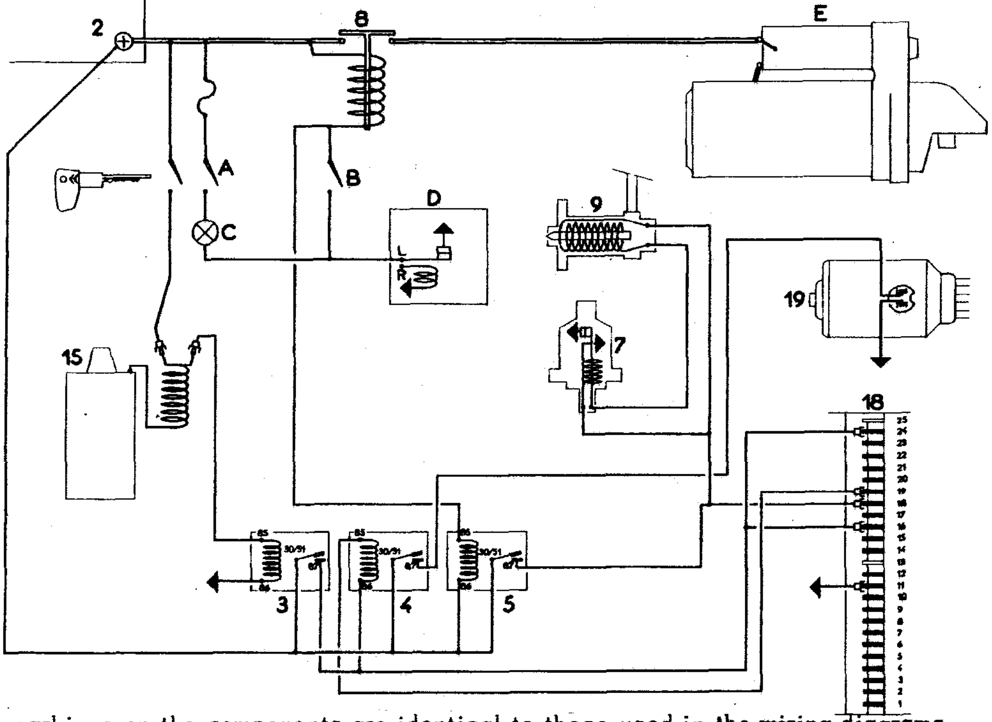
VEHICLES D. IE· ALL TYPES
→| *March 1970*

ARRANGEMENT OF THE ELECTRICAL INSTALLATION OF THE ELECTRONIC FUEL INJECTION SYSTEM

(Vehicles produced up to March 1970)

NOTE : For the arrangement of the general electrical installation : see Op. DX. 510-00 F

DIAGRAM SHOWING PRINCIPLES OF STARTER MOTOR CONTROL



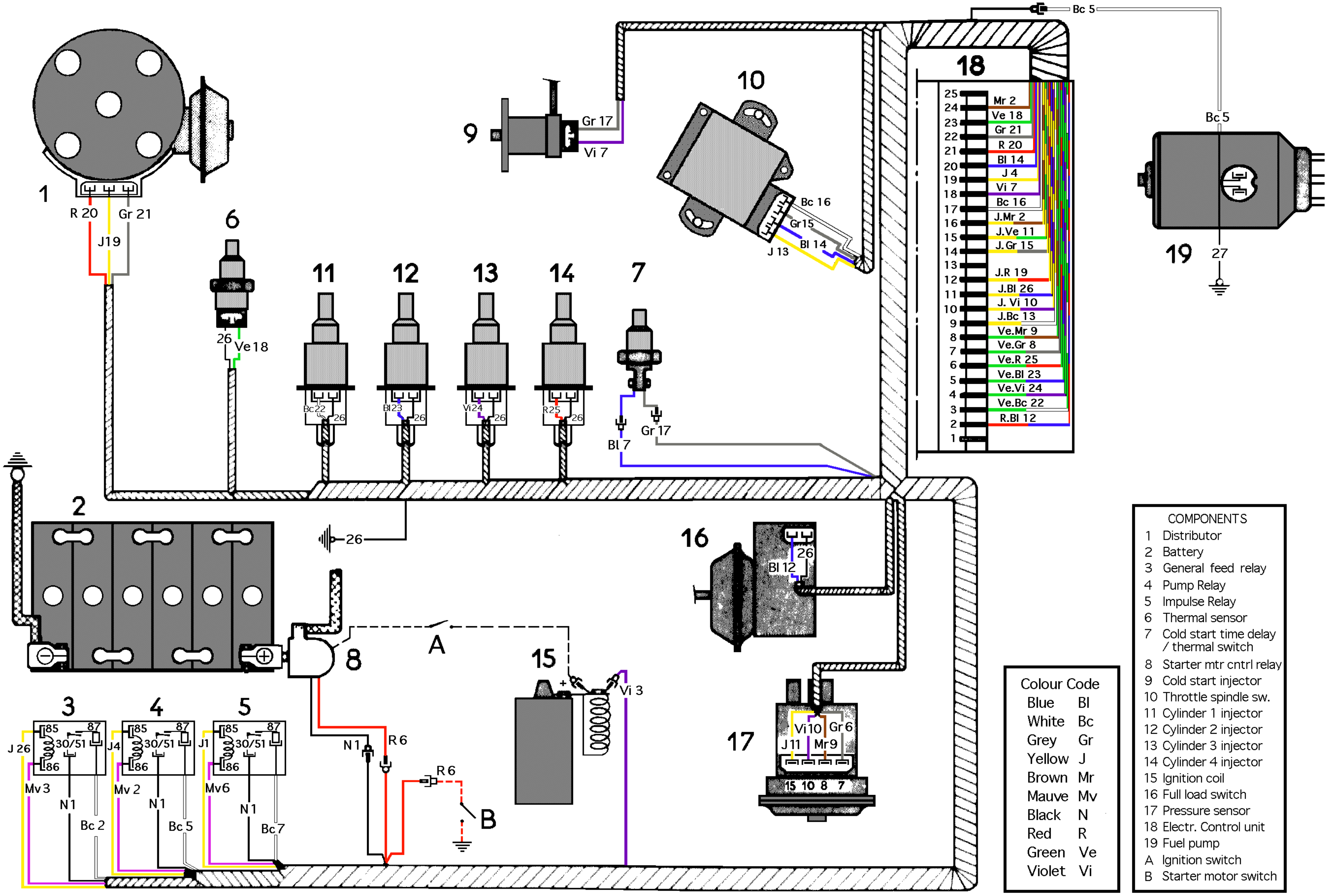
KEY

NOTE : The markings on the components are identical to those used in the wiring diagrams

- 2 : Battery
- 3 : General feed relay
- 4 : Fuel pump relay
- 5 : Impulsion relay
- 7 : Time delay thermal switch (cold start)
- 8 : Starter motor control relay
- 9 : Cold start injector
- 15 : Ignition coil
- 18 : Electronic control unit
- 19 : Fuel pump
- A : Ignition switch of vehicle
- B : Starter motor switch
- C : Charging warning light
- D : Relay voltage regulator relay
- E : Starter motor

WIRING DIAGRAM

Electronic fuel injection system



Colour Code

Blue	Bl
White	Bc
Grey	Gr
Yellow	J
Brown	Mr
Mauve	Mv
Black	N
Red	R
Green	Ve
Violet	Vi

COMPONENTS

1	Distributor
2	Battery
3	General feed relay
4	Pump Relay
5	Impulse Relay
6	Thermal sensor
7	Cold start time delay / thermal switch
8	Starter mtr cntrl relay
9	Cold start injector
10	Throttle spindle sw.
11	Cylinder 1 injector
12	Cylinder 2 injector
13	Cylinder 3 injector
14	Cylinder 4 injector
15	Ignition coil
16	Full load switch
17	Pressure sensor
18	Electr. Control unit
19	Fuel pump
A	Ignition switch
B	Starter motor switch

PART SCHEDULE

1. Ignition distributor and triggering contacts
2. Battery
3. General feeder relay
4. Pump relay
5. Impulse relay
6. Thermal sensor
7. Cold start time delay thermal switch
8. Starter motor control relay
9. Cold start injector
10. Throttle-spindle switch
11. Injector Nº 1 cylinder
12. Injector Nº 2 cylinder
13. Injector Nº 3 cylinder
14. Injector Nº 4 cylinder
15. Ignition coil
16. Full-load switch
17. Pressure sensor
18. Electronic control unit
19. Fuel pump

A. Vehicle ignition switch

B. Starter motor switch

Harness	Wire Nº	Colour of ends	Wiring schedule
Electronic control unit	1	Black	Starter motor control relay (8) (+ ve battery)
		Black	to general feeder relay (3) (terminal 30/51)
		Black	to pump relay (4) (terminal 30/51)
		Black	to impulse relay (5) (terminal 30/51)
		Yellow	to impulse relay (5) (terminal 85)
-do-	2	Yellow -brown	Electronic control unit (18) (terminal 16)
		Brown	Electronic control unit (18) (terminal 24)
		White	to general feeder relay (3) (terminal 87)
		Mauve	to pump relay (4) (terminal 86)
-do-	3	Mauve	General feeder relay (3) (terminal 86)
		Violet	to ignition coil (15) (+ve terminal) (vehicle ignition switch A)
-do-	4	Yellow	Pump relay (4) (terminal 85)
		Yellow	to electronic control unit (18) (terminal 19)
-do-	5	White	Pump relay (4) (terminal 87)
		White	to fuel pump feed wire (19)
-do-	6	Mauve	Impulse relay (5) (terminal 86)
		Red	to starter motor control relay (8)
		Red	to front cables of vehicle (starter motor switch B)
-do-	7	Violet	Electronic control unit (18) (terminal 18)
		White	to impulse relay (5) (terminal 87)
		Violet	to cold-start injector (9)
		Blue	to cold start time delay thermal switch (7)
-do-	8	Green -grey	Electronic control unit (18) (terminal 7)
		Grey	to pressure sensor (17) (terminal 7)
-do-	9	Green-brown	Electronic control unit (18) (terminal 8)
		Brown	to pressure sensor (17) (terminal 8)
-do-	10	Yellow-violet	Electronic control unit (18) (terminal 10)
		Violet	to pressure sensor (17) (terminal 10)
-do-	11	Yellow-green	Electronic control unit (18) (terminal 15)
		Yellow	to pressure sensor (17) (terminal 15)
-do-	12	Red-blue	Electronic control unit (18) (terminal 2)
		Blue	to full lead switch (16)
-do-	13	Yellow-white	Electronic control unit (18) (terminal 9)
		Yellow	to throttle spindle switch (10)
-do-	14	Blue	Electronic control unit (18) (terminal 20)
		Blue	to throttle spindle switch (10)

Harness	Wire Nº	Colour of ends	Wiring diagram
Electronic control unit	15	Yellow-grey Grey	Electronic control unit (18) (terminal 14) to throttle spindle switch (10)
-do-	16	White White	Electronic control unit (18) (terminal 17) to throttle spindle switch (10)
-do-	17	Grey Grey	Cold-start injector (9) to cold- start time delay thermal switch (7)
-do-	18	Green Green	Electronic control unit (18) (terminal 23) to thermal sensor (6)
-do-	19	Yellow-red Yellow	Electronic control unit (18) (terminal 12) to ignition distributor and triggering contacts (1)
-do-	20	Red Red	Electronic control unit (18) (terminal 21) to ignition distributor and triggering contacts (1)
-do-	21	Grey Grey	Electronic control unit (18) (terminal 22) to ignition distributor and triggering contacts (1)
-do-	22	Green-white White	Electronic control unit (18) (terminal 3) to injector (11) cylinder 1
-do-	23	Green-blue Blue	Electronic control unit (18) (terminal 5) to injector (12) cylinder 2
-do-	24	Green-violet Violet	Electronic control unit (18) (terminal 4) to injector (13) cylinder 3
-do-	25	Green-red Red	Electronic control unit (18) (terminal 6) to injector (14) cylinder 4
-do-	26	Yellow-blue	Electronic control unit (18) (terminal 11) to full load switch (16) to injector (11) cylinder 1 to injector (12) cylinder 2 to injector (13) cylinder 3 to injector (14) cylinder 4
		Yellow	to general feeder relay (3) (terminal 85) to thermal sensor (6) to earth (on voltage regulator-relay)
Flying lead	27		Fuel pump (19) to earth on side member

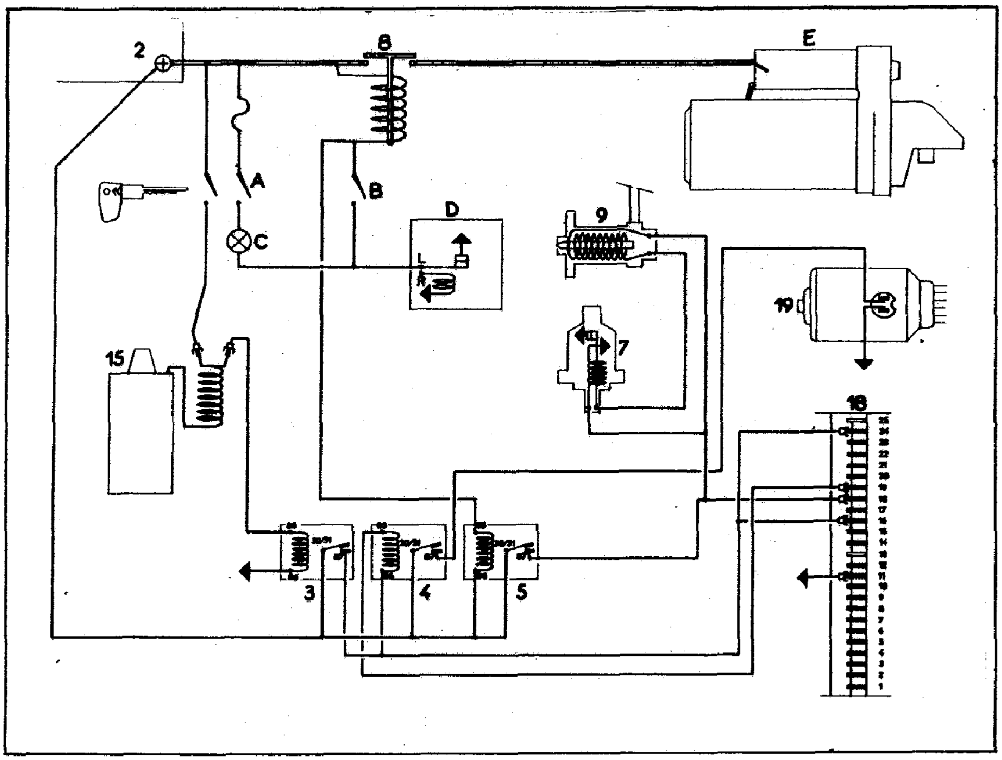
VEHICLES - D.IE ALL TYPES
March 1970 → April 1971

ARRANGEMENT OF THE ELECTRICAL INSTALLATION OF THE ELECTRONIC FUEL INJECTION SYSTEM

(Vehicles produced between March 1970 and April 1971)

NOTE : For the arrangement of the general electrical installation : see Op. DX. 510-00 f

DIAGRAM SHOWING PRINCIPLES OF STARTER MOTOR CONTROL



Manual 814-1

KEY

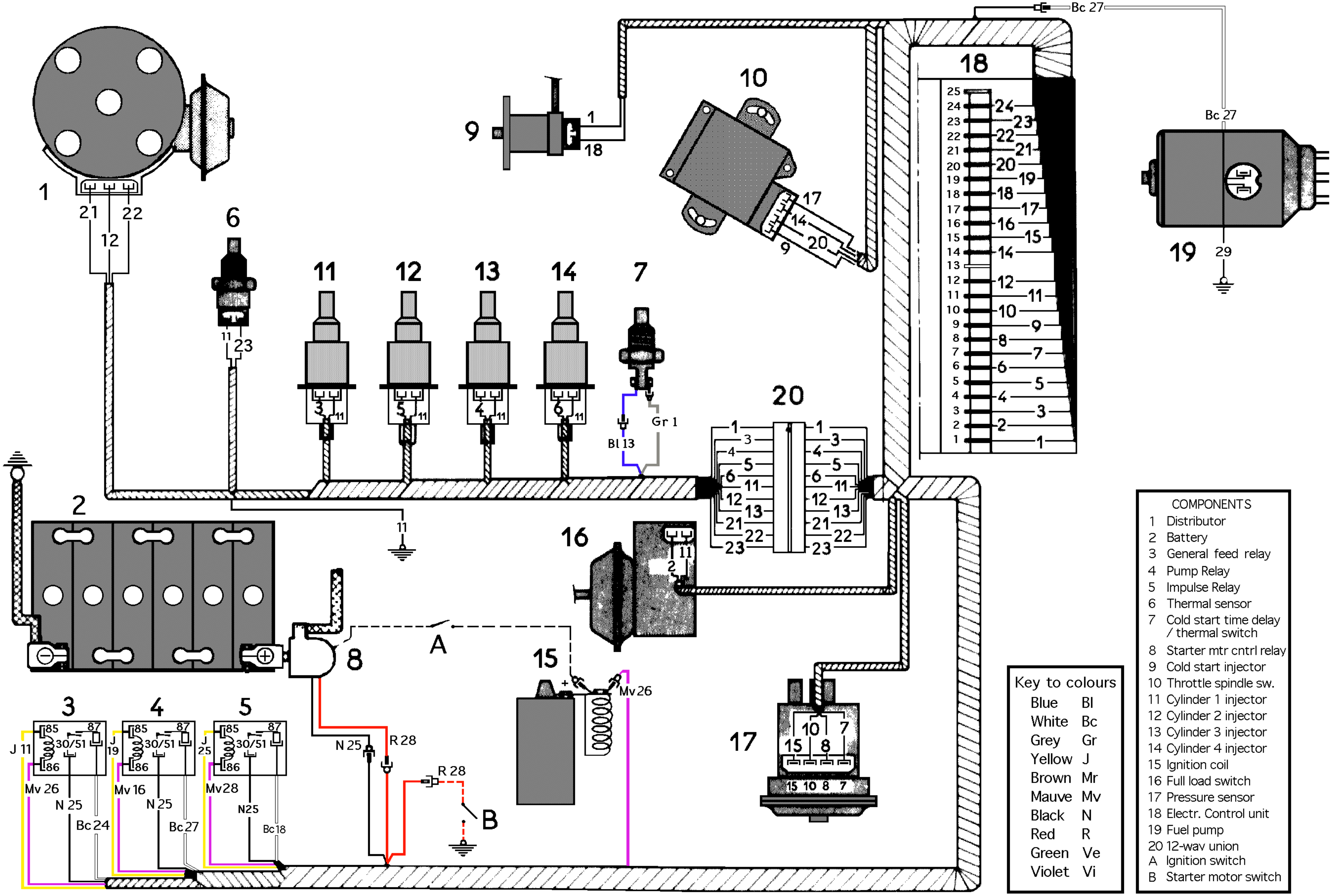
NOTE : The markings on the components are identical to those used in the wiring diagrams

- 2 : Battery
- 3 : General feed relay
- 4 : Fuel pump relay
- 5 : Impulsion relay
- 7 · Time delay thermal switch (cold start)
- 8 : Starter motor control relay
- 9 : Cold start injector
- 15 : Ignition coil
- 18 : Electronic control unit
- 19 : Fuel pump
- A : Ignition switch of vehicle
- B : Starter motor switch
- C : Charging warning light
- D : Relay voltage regulator relay
- E : Starter motor

WIRING DIAGRAM

D - 51-63 c

Electronic fuel injection system



Key to colours

Blue	Bl
White	Bc
Grey	Gr
Yellow	J
Brown	Mr
Mauve	Mv
Black	N
Red	R
Green	Ve
Violet	Vi

COMPONENTS

1	Distributor
2	Battery
3	General feed relay
4	Pump Relay
5	Impulse Relay
6	Thermal sensor
7	Cold start time delay / thermal switch
8	Starter mtr cntrl relay
9	Cold start injector
10	Throttle spindle sw.
11	Cylinder 1 injector
12	Cylinder 2 injector
13	Cylinder 3 injector
14	Cylinder 4 injector
15	Ignition coil
16	Full load switch
17	Pressure sensor
18	Electr. Control unit
19	Fuel pump
20	12-wav union
A	Ignition switch
B	Starter motor switch

PART SCHEDULE

1. Ignition distributor and triggering contacts
2. Battery
3. General feeder relay
4. Pump relay
5. Impulse relay
6. Thermal sensor
7. Cold start time delay thermal switch
8. Starter motor control switch
9. Cold start injector
10. Throttle spindle switch
11. Injector cylinder 1
12. Injector cylinder 2
13. Injector cylinder 3
14. Injector cylinder 4
15. Ignition coil
16. Full load switch
17. Pressure sensor
18. Electronic control unit
19. Fuel pump
20. 12-way union

A. Vehicle ignition switch

B. Starter motor switch

Harness	Wire Nº	Colour of ends or self-adhesive number	Wiring schedule
Electronic control unit	1	1	Cold start injector (9)
		1	to 12-way union (20)
-do-	2	2	Electronic control unit (18)‘(terminal 2)
		2	to full load switch (16)
-do-	3	3	Electronic control unit (18) (terminal 3)
		3	to ,12-way union (20)
-do-	4	4	Electronic control unit (1.8) (terminal 4)
		4	to la-way union (20)
-do-	5	5	Electronic control unit (18) (terminal 5)
		5	to 12-way union (20)
-do-	6	6	Electronic control unit (18) (terminal 6)
		6	to 12-way union (20)
-do-	7	7	Electronic control unit (18) (terminal 7)
		7	to pressure sensor (17) (terminal 7)
-do-	8	8	Electronic control unit (18) (terminal 8)
		8	to pressure sensor (17) (terminal 8)
-do-	9	9	Electronic control unit (18). (terminal 9)
		9	to throttle spindle switch (10)
-do-	10	10	Electronic control unit (18) (terminal 10)
		10	to pressure sensor (17) (terminal 10)
-do-	11	11	Electronic control unit (18) (terminal 11) earth
		11	to 12-way union (20)
			to full load switch (16)
		yellow	to general feeder relay (3) (terminal 85)
-do-	12	12	Electronic control unit (18) (terminal 12)
		12	to 12-way union (20)
-do-	13	13	12-way union (20)
-do-	14	14	Electronic control unit (18) (terminal 14)
		14	to throttle spindle switch (10)
-do-	15	15	Electronic control unit (18) (terminal 15)
		15	to pressure sensor (17) (terminal 15)
-do-	16	16	Electronic control unit (18) (terminal 16)
		mauve	to pump relay (4) (terminal 86)
			to junction on lead 24
-do-	17	17	Electronic control unit (18) (terminal 17)
		17	to throttle spindle switch (10)

Harness	Wire Nº	Colour of ends or self-adhesive number	Wiring schedule
Electronic control unit	18	18 18 White	Electronic control unit (18) (terminal 18) to cold start injector (9) to impulse relay (5) (terminal 87)
-do-	19	19 Yellow	Electronic control unit (18) (terminal 19) to pump relay (4) (terminal 85)
-do-	20	20 20	Electronic control unit (18) (terminal 20) to throttle spindle switch (10)
-do-	21	21 21	Electronic control unit (18) (terminal 21) to 12-way union (20)
-do-	22	22 22	Electronic control unit (18) (terminal 22) to 12-way union (20)
-do-	23	23 23	Electronic control unit (18) (terminal 23) to 12-way union (20)
-do-	24	24 White	Electronic control unit (18) (terminal 24) to general feeder relay (3) (terminal 87)
-do-	25	Black Black Black Black Yellow	Starter motor control relay (8) (+ ve battery) to general feeder relay (3) (terminal 30/51) to pump relay (4) (terminal 30/51) to impulse relay (5) (terminal 30/51) to impulse relay (5) (terminal 85)
-do-	26	Mauve Mauve	Ignition coil (15) (+ ve terminal) (ignition switch A of vehicle) to general feeder relay (3) (terminal 86)
-do-	27	White White	Pump relay (4) (terminal 87) to fuel pump feeder wire (19)
-do-	28	Mauve Red Red	Impulse relay. (5) (terminal 86) to starter motor control relay (8) to vehicle front cables (starter motor switch B)
Flying lead	29		Fuel pump (19) to earth on R.H. sidemember
Engine	1	1 Grey	12-way union (20) to cold start time delay thermal switch (7)
-do-	3	3 3	12-way union (20) to injector (11) cylinder 1
-do-	4	4 4	12-way union (20) to injector (13) cylinder 3
-do-	5	5 5	12-way union (20) to injector (12) cylinder 2

Harness	Wire Nº	Colour of ends or self-adhesive number	Wiring diagram
Engine	6	6 6	12-way union (20) to injector (14) cylinder 4
-do-	11	11	12-way union (20) to injector (11) cylinder 1 to injector (12) cylinder 2 to injector (13) cylinder 3 to injector (14) cylinder 4 to thermal sensor (6) to earth (on voltage-regulator relay)
-do-	12	12 12	12-way union (20) to ignition distributor and triggering contacts (1)
-do-	13	13 Blue	12-way union (20) to cold start time delay thermal switch (7)
-do-	21	21 21	12-way union (20) to ignition distributor and triggering contacts (1)
-do-	22	22 22	12-way union (20) to ignition distributor and triggering contacts (1)
-do-	23	23 23	12-way union (20) to thermal sensor (6)

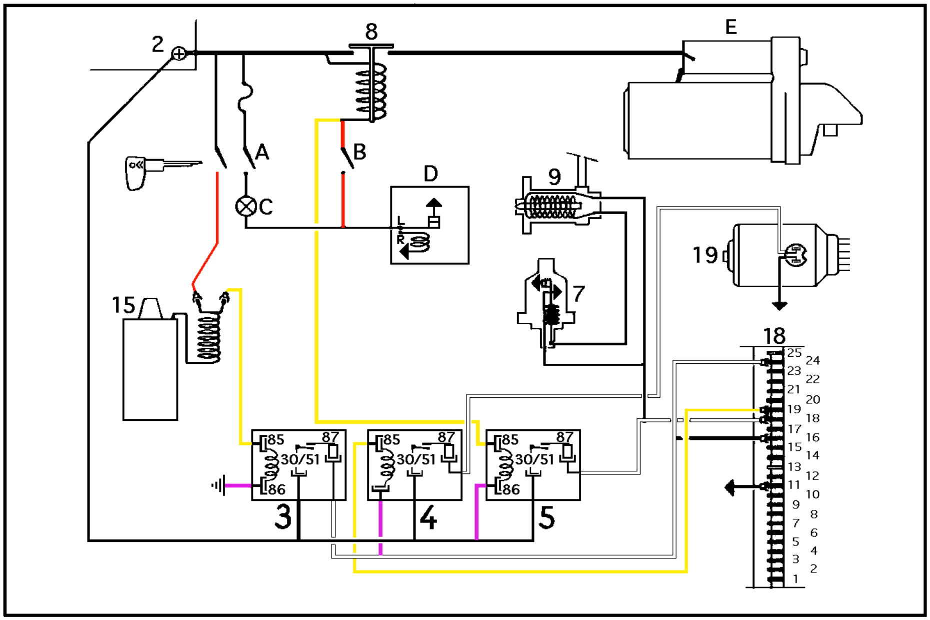
DX.IE VEHICLES
April 1971

ARRANGEMENT OF THE ELECTRICAL INSTALLATION OF THE ELECTRONIC FUEL INJECTION SYSTEM

(Vehicles DX.IE produced since April 1971)

NOTE : For the arrangement of the general electrical installation : see operation DX. 510-00 f

DIAGRAM SHOWING PRINCIPLES OF STARTER MOTOR CONTROL



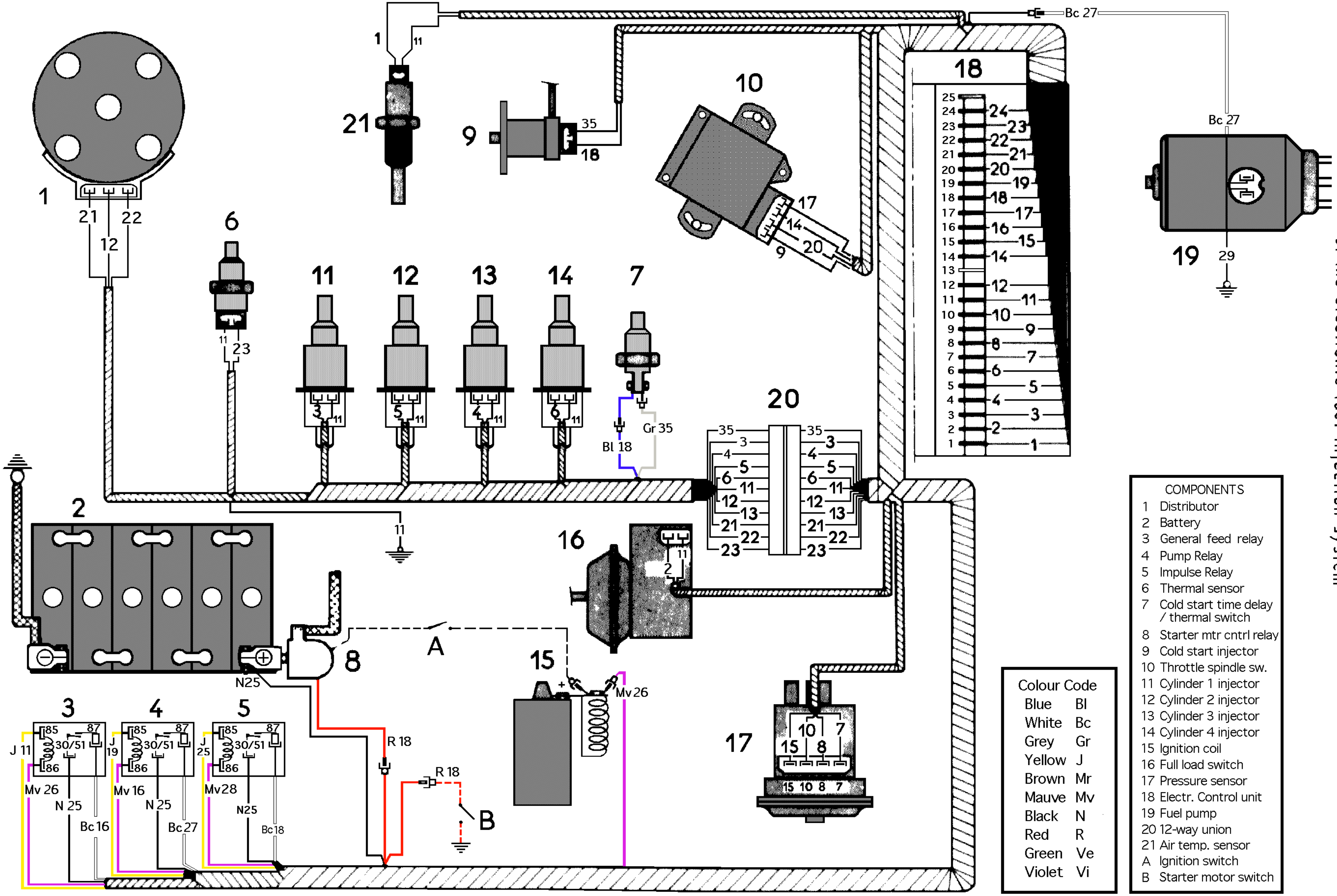
KEY :

NOTE : The markings on the components are identical to those used in the wiring diagrams

- 2 : Battery
- 3 : General feed relay
- 4 : Fuel pump relay
- 5 : Impulse relay
- 7 : Time delay thermal switch (cold start)
- 8 : Starter motor control relay
- 9 : Cold start injector
- 15 : Ignition coil
- 18 : Electronic control unit
- 19 : Fuel pump
- A : Vehicle ignition switch
- B : Starter motor switch
- C : Charge warning light
- D : Relay for voltage regulator relay
- E : Starter motor

WIRING DIAGRAM

of the electronic fuel injection system



Colour Code

Blue	Bl
White	Bc
Grey	Gr
Yellow	J
Brown	Mr
Mauve	Mv
Black	N
Red	R
Green	Ve
Violet	Vi

COMPONENTS

1	Distributor
2	Battery
3	General feed relay
4	Pump Relay
5	Impulse Relay
6	Thermal sensor
7	Cold start time delay / thermal switch
8	Starter mtr cntrl relay
9	Cold start injector
10	Throttle spindle sw.
11	Cylinder 1 injector
12	Cylinder 2 injector
13	Cylinder 3 injector
14	Cylinder 4 injector
15	Ignition coil
16	Full load switch
17	Pressure sensor
18	Electr. Control unit
19	Fuel pump
20	12-way union
21	Air temp. sensor
A	Ignition switch
B	Starter motor switch

PART SCHEDULE

1. Ignition distributor and triggering contacts
2. Battery .
3. General feed relay
4. Pump relay
5. Impulse relay
6. Thermal sensor
7. Cold start time delay thermal switch
8. Starter motor control switch
9. Cold start injector
10. Throttle spindle switch
11. Injector cylinder 1
12. Injector cylinder 2
13. Injector cylinder 3
14. Injector cylinder 4
15. Ignition coil
16. Full load switch
17. Pressure sensor
18. Electronic control unit
19. Fuel pump
20. 12-way union
21. Air temperature sensor

A. Vehicle ignition switch

B. Starter motor switch

electronic fuel injection system (since April 1971)

Harness	Wire Nº	Colour of ends or self-adhesive number	Wiring schedule
Electronic control unit	1	1 1	Electronic control unit (18) (terminal 1) to air temperature sensor (21)
-do-	2	2 2	Electronic control unit (18) (terminal 2) to full load switch (16)
-do-	3	3 3	Electronic control unit (18) (terminal 3) to 12-way union (20)
-do-	4	4 4	Electronic control unit (18) (terminal 4) to 12-way union (20)
-do-	5	5 5	Electronic control unit (18) (terminal 5) to 12-way union (20)
-do-	6	6 6	Electronic control unit (18) (terminal 6) to 12-way union (20)
-do-	7	7 7	Electronic control unit (18) (terminal 7) to pressure sensor (17) (terminal 7)
-do-	8	8 8	Electronic control unit (18) (terminal 8) to pressure sensor (17) (terminal 8)
-do-	9	9 9	Electronic control unit (18) (terminal 9) to throttle spindle switch (10)
-do-	10	10 10	Electronic control unit (18) (terminal 10) to pressure sensor (17) (terminal 10)
-do-	11	11 11 yellow	Electronic control unit (18) (terminal 11) earth to 12-way union (20) to air temperature sensor (21) to full load switch (16) to general feed relay (3) (terminal 85)
-do-	12	12 12	Electronic control unit (18) (terminal 12) to 12-way union (20)
-do-	14	14 14	Electronic control unit (18) (terminal 14) to throttle spindle switch (10)
-do-	15	15 15	Electronic control unit (18) (terminal 15) to pressure sensor (17) (terminal 15)
-do-	16	16 white mauve	Electronic control unit (18) (terminal 16) to general feed relay (3) (terminal 87) to pump relay (4) (terminal 86) to junction on lead 24
-do-	17	17 17	Electronic control unit (18) (terminal 17) to throttle spindle switch (10)

Harness	Wire Nº	Colour of ends or self-adhesive number	Wiring schedule
Electronic control unit	18	18	Electronic control unit (18) (terminal 18)
		18	to cold start injector (9)
		White	to impulse relay (5) (terminal 87)
			to 12-way union (20) lead 13
-do-	19	19	Electronic control unit (18) (terminal 19)
		Yellow	to pump relay (4) (terminal 85)
-do-	20	20	Electronic control unit (18) (terminal 20)
		20	to throttle spindle switch (10)
-do-	21	21	Electronic control unit (18) (terminal 21)
		21	to 12-way union (20)
-do-	22	22	Electronic control unit (18) (terminal 22)
		22	to 12-way union (20)
-do-	23	23	Electronic control unit (18) (terminal 23)
		23	to 12-way union (20)
-do-	25	Black	Starter motor control relay (8) (+ ve battery)
		Black	to general feed relay (3) (terminal 30/51)
		Black	to pump relay (4) (terminal 30151)
		Black	to impulse relay (5) (terminal 30/51)
		Yellow	to impulse relay (5) (terminal 85)
-do-	26	Mauve	Ignition coil (15) (+ ve terminal) (ignition switch A of vehicle)
		Mauve	to general feed relay (3) (terminal 86)
-do-	27	White	Pump relay (4) (terminal 87)
		White	to fuel pump feed wire (19)
-do-	28	Mauve	Impulse relay (5) (terminal 86)
		Red	to starter motor control relay (8)
		Red	to vehicle front cables (starter motor switch B)
	35		12-way union (20)
			to cold start injector (9)
	29		Fuel pump (19)
Flying lead			to earth on R.H. sidemember
Engine			
-do-	3	3	12-way union (20)
		3	to injector (11) cylinder 1
-do-	4	4	12-way union (20)
		4	to injector (12) cylinder 2
-do-	5	5	12-way union (20)
		5	to injector (13) cylinder 3
-do-	6	6	12-way union (20)
		6	to injector (14) cylinder 4

Harness	Nº of Wire	Colour of ends or self-adhesive number	Schedule of wires
Engine	11	11	12-way union (20) to injector (11), cylinder 1 to injector (12), cylinder 2 to injector (13), cylinder 3 to injector (14), cylinder 4 to thermal sensor (6) to earth (on relay voltage regulator)
	12	12 12	12-way union (20) to ignition distributor and triggering contacts (1)
	18	13 Blue	12-way union (20) to time delay thermal switch (cold start) (7)
	21	21 21	12-way union (20) to ignition distributor and triggering contacts (1)
	22	22 22	12-way union (20) to ignition distributor and triggering contacts (1)
	23	23 23	12-way union (20) to thermal sensor (6)
	35	Grey Grey	12-way union (20) to time delay thermal switch (7) (cold start)

VEHICLES DJ.IE
⟼ *April 1971*

ARRANGEMENT OF THE ELECTRICAL INSTALLATION OF THE ELECTRONIC FUEL INJECTION SYSTEM

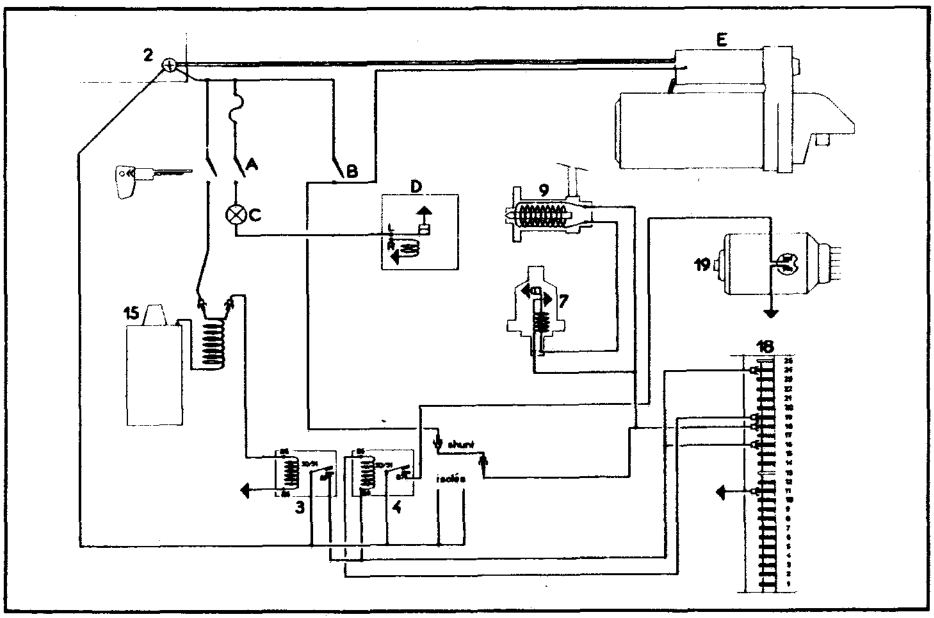
(DJ.IE vehicles produced since April 1971)

NOTE : For the arrangement of the general electrical installation : see Op. Dm 510-00
for vehicles : ⟼ 4/71 ⟶| 9/71
or Op. Dm. 510.00 a
for vehicles : ⟼ 9/71

DIAGRAM SHOWING THE PRINCIPLES OF THE STARTER MOTOR CONTROL

The starter motor and impulse relays are no longer fitted

D. 51-68

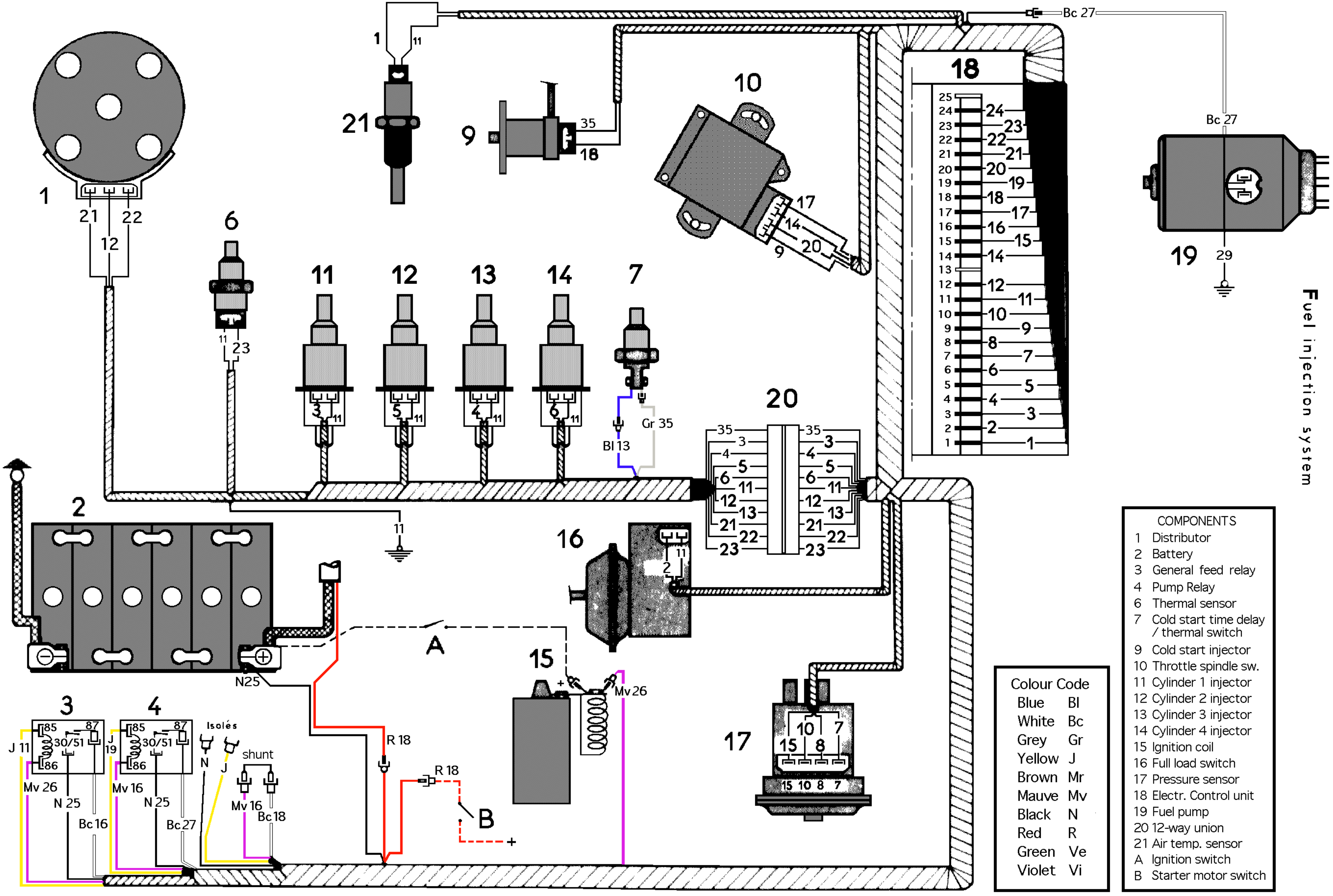


KEY :

NOTE : The markings of the components are identical to those used in the wiring diagram.

- 2 : Battery
- 3 : General feed relay
- 4 : Fuel pump relay
- 7 : Time delay thermal switch (cold start)
- 9 : Cold start injector
- 15 : Ignition coil
- 18 : Electronic control unit
- 19 : Fuel pump
- A : Ignition switch of vehicle
- B : Starter motor switch
- C : Charging warning light
- D : Relay voltage regulator
- E : Starter motor

WIRING DIAGRAM
of the electronic
Fuel injection system



Colour Code	
Blue	Bl
White	Bc
Grey	Gr
Yellow	J
Brown	Mr
Mauve	Mv
Black	N
Red	R
Green	Ve
Violet	Vi

COMPONENTS

1	Distributor
2	Battery
3	General feed relay
4	Pump Relay
6	Thermal sensor
7	Cold start time delay / thermal switch
9	Cold start injector
10	Throttle spindle sw.
11	Cylinder 1 injector
12	Cylinder 2 injector
13	Cylinder 3 injector
14	Cylinder 4 injector
15	Ignition coil
16	Full load switch
17	Pressure sensor
18	Electr. Control unit
19	Fuel pump
20	12-way union
21	Air temp. sensor
A	Ignition switch
B	Starter motor switch

PART SCHEDULE

1. Ignition distributor and triggering contacts
2. Battery
3. General feed relay
4. Pump relay
5. Impulse relay
6. Thermal sensor
7. Cold start time delay thermal switch
8. Starter motor control relay
9. Cold start injector
10. Throttle spindle switch
11. Injector Nº 1 cylinder
12. Injector Nº 2 cylinder
13. Injector Nº 3 cylinder
14. Injector Nº 4 cylinder
15. Ignition coil
16. Full load switch
17. Pressure sensor
18. Electronic control unit
19. Fuel pump
20. 12-way union
21. Air temperature sensor

A. Vehicle ignition switch

B. Starter motor switch

Harness	Wire Nº	Colour of ends or self-adhesive number	Wiring schedule
Electronic control unit	1	1 1	Electronic control unit (18) (terminal 1) to air temperature sensor (21)
-do-	2	2 2	Electronic control unit (18) (terminal 2) to full load switch (16)
-do-	3	3 3	Electronic control unit (18) (terminal 3) to 12-way union (20)
-do-	4	4 4	Electronic control unit (18) (terminal 4) to 12-way union (20)
-do-	5	5 5	Electronic control unit (18) (terminal 5) to 12-way union (20)
-do-	6	6 6	Electronic control unit (18) (terminal 6) to 12-way union (20)
-do-	7	7 7	Electronic control unit (18) (terminal 7) to pressure sensor (17) (terminal 7)
-do-	8	8 8	Electronic control unit (18) (terminal 8) to pressure sensor (17) (terminal 8)
-do-	9	9 9	Electronic control unit (18). (terminal 9) to throttle spindle switch (10)
-do-	10	10 10	Electronic control unit (18) (terminal 10) to pressure sensor (17) (terminal 10)
-do-	11	11 11 yellow	Electronic control unit (18) (terminal 11) earth to 12-way union (20) to air temperature sender (21) to full load switch (16) to general feeder relay (3) (terminal 85)
-do-	12	12 12	Electronic control unit (18) (terminal 12) to 12-way union (20)
-do-	13	13	12-way union (20) to junction on conductor 18
-do-	14	14 14	Electronic control unit (18) (terminal 14) to throttle spindle switch (10)
-do-	15	15 15	Electronic control unit (18) (terminal 15) to pressure sensor (17) (terminal 15)
-do-	16	16 white mauve	Electronic control unit (18) (terminal 16) to general supply relay (3) (terminal 87) to pump relay (4) (terminal 86) to junction on lead 24
-do-	17	17 17	Electronic control unit (18) (terminal 17) to throttle spindle switch (10)

Harness	Nº of Wire	Colour of ends or self-adhesive number	Schedule of wires
Electronic control unit	18	18	Electronic control unit (18) (terminal 18)
		18	to cold start injector
		white	to shunt with mauve wire
			to 12-way union (20) wire 13
		red	to front wiring harness of vehicle (starter motor switch 3)
		red	to flying feed lead for starter motor solenoid
-do-	19	19	Electronic control unit (18) (terminal 19)
		yellow	to pump relay (4) (terminal 85)
-do-	20	20	Electronic control unit (18) (terminal 20)
			to throttle spindle switch (10)
-do-	21	21	Electronic control unit (18) (terminal 21)
		21	to 12-way union (20)
-do-	22	22	Electronic control unit (18) (terminal 22)
			to 12-way union (20)
-do-	23	23	Electronic control unit (18) (terminal 23 I
		23	to 12-way union
-do-	25	black	Starter motor control relay (+ battery)
		black	to general feed relay (3) (terminal 30/51)
		black	to pump relay (4) (terminal 30 ‘51)
		black	insulated at level of relays
		yellow	insulated at level of relays
- do -	26	mauve	Ignition coil (15) (+ terminal) (ignition switch A of vehicle)
		mauve	to general feed relay (terminal 86)
- do -	27	white	Pump relay (4) (terminal 87)
		white	to fuel pump feed wire (19)
-do-	35		12-way union (20)
			to cold start injector (9)
Flying lead	23		Fuel pump (19)
			to earth on R.H side member
Engine	3		12-way union (20)
		3	to injector (11) cylinder 1
		3	
-do-	4		12-way union (20)
			to Injector (13), cylinder 3
-do-	5		12-way union (20)
			to injector (12), cylinder 2
-do-	6		12-way union (20)
			to injector (14) cylinder 4

Harness	Nº of Wire	Colour of ends or self-adhesive number	Schedule of wires
Engine	6	6 6	12-way union (20) to injector (14) cylinder 4
-do-	11	11	12-way union (20) to injector (11) cylinder 1 to injector (12) cylinder 2 to injector (13) cylinder 3 to injector (14) cylinder 4 to thermal sensor (6) to earth (on relay voltnge regulator)
-do-	12	12 12	12-way union (20) to ignition distributor and triggering contacts (1)
-do-	13	13 Blue	12-way union (20) to time delay thermal switch (cold start) (7)
-do-	21	21 21	12-way union (20) to ignition distributor and triggering contacts (1)
-do-	22	22 22	12-way union (20) to ignition distributor and triggering contacts (1)
-do-	23	23 23	12-way union (20) to thermal sensor (6)
-do-	35	 Grey	12-way union (20) to time delay thermal switch (7) (cold start)

D VEHICLES all types

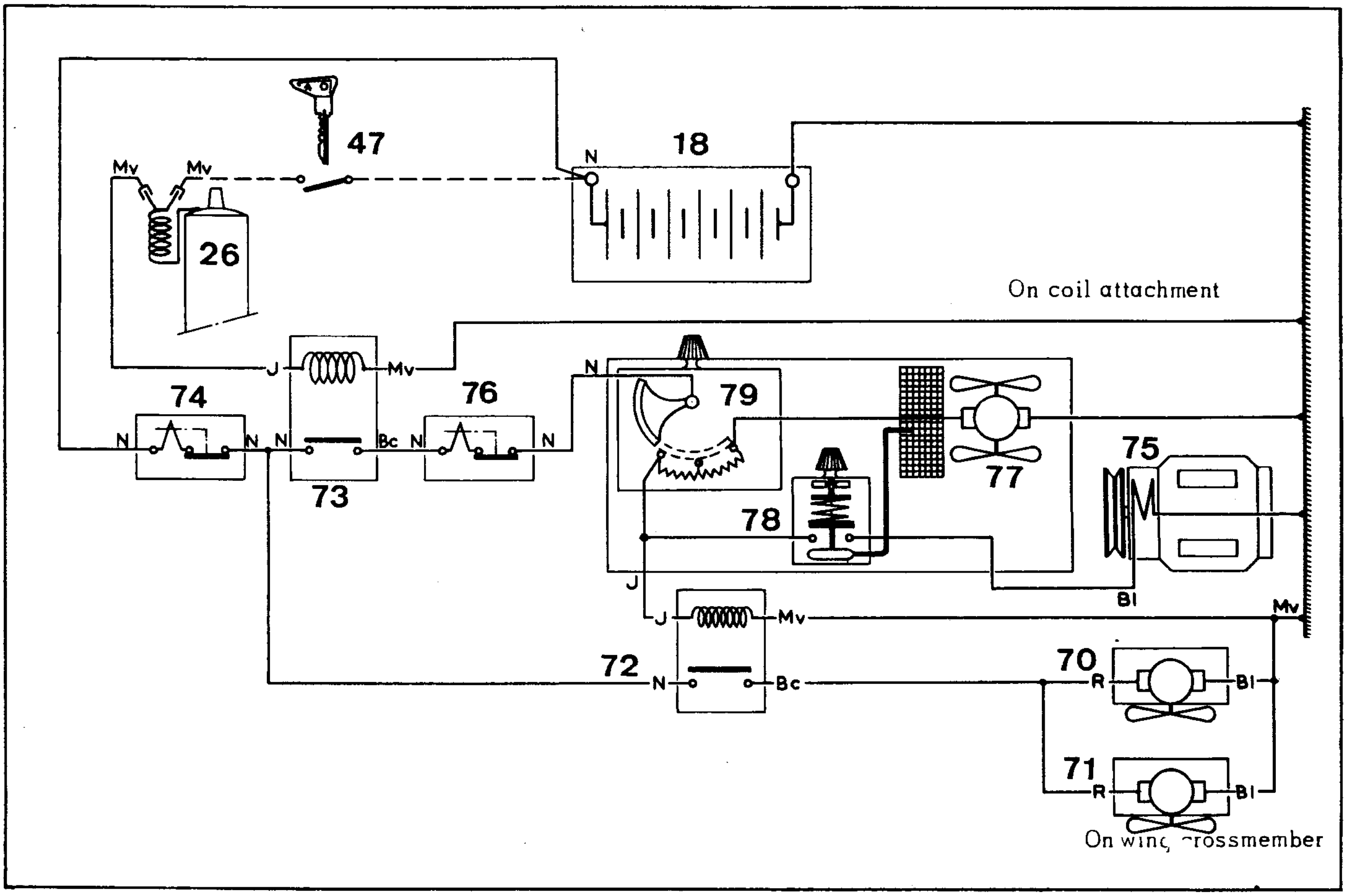
AIR CONDITIONING SYSTEM (COOLING SYSTEM)

FITTING THE ELÉCTRICAL INSTALLATION

P.T.O.

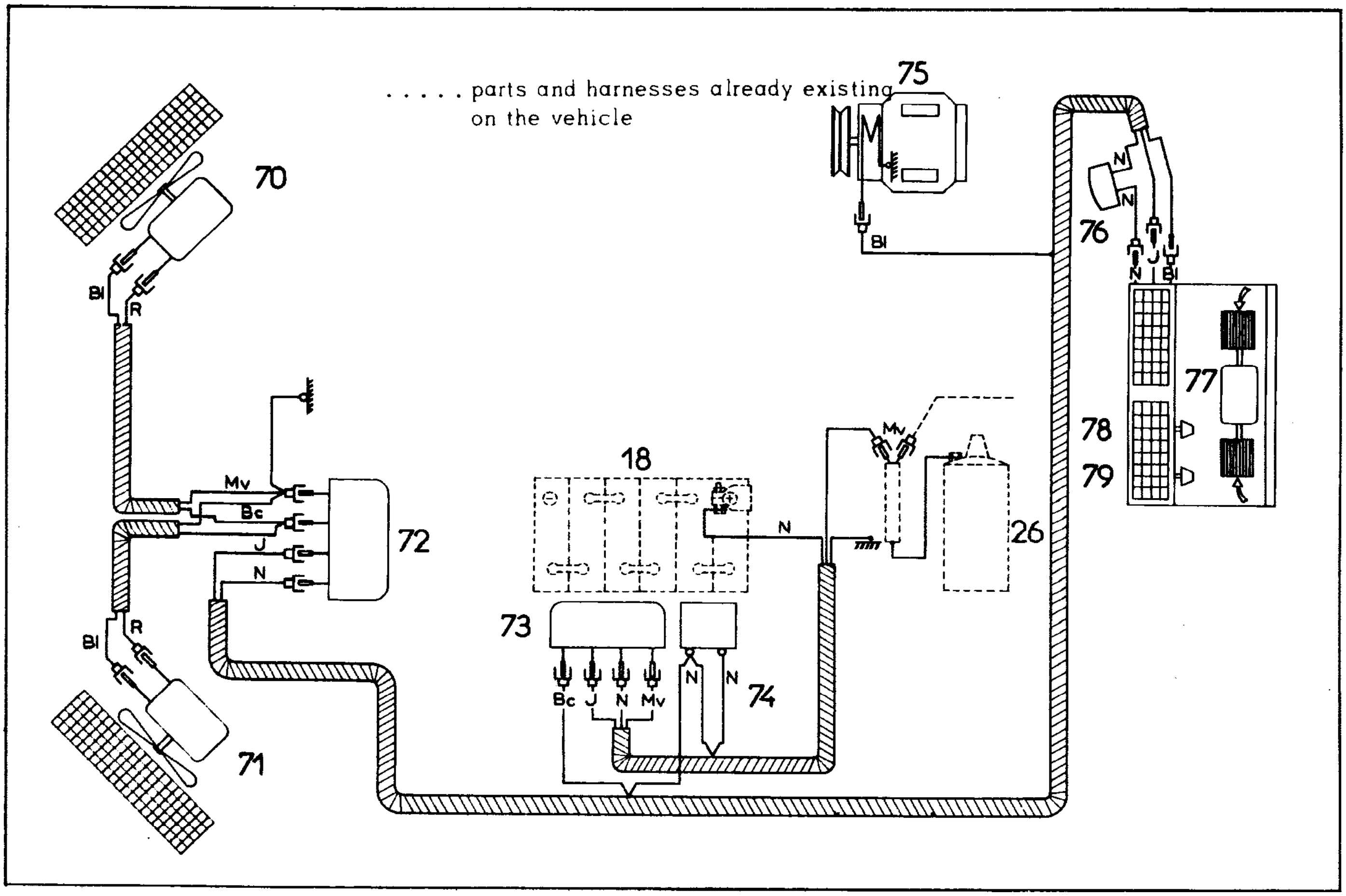
BASIC DIAGRAM

D. 64-53



INSTALLATION DIAGRAM

D. 64-54



The electrical installation for the cooling system consists of three extra harnesses.
The general electrical installation of the vehicle is identical to the standard installation of the corresponding type *(manual gearchange or hydraulic gearchange vehicles).*

REFERENCE NUMBERS FOR THE PARTS.

The references for those parts common to the general installation are identical to those used in the installation diagram of the corresponding vehicle type *(manual or hydraulic gearchange vehicles).*

18. Battery
26. Ignition coil
47. Ignition switch
70. R.H. condensor fan motor
71. L.H. condensor fan motor
72. Fan relay
73. Main relay
74. Main cut-out
75. Electromagnetic cut-in for compressor
76. Cut-out on console
77. Fan motor on console
78. Thermostat for surrounding air
79. General switch and rheostat for fan on console (77)

OPERATION.

The cooling will only operate when the engine is running : the main relay (73) is only controlled when the ignition switch (47) is closed, additionally the compressor must be driven by the engine.

The cooling system is operated by the rheostat switch (79)
This has 4 positions :
1st. position : completely non-operational.
- 2nd. position : - console fan feed (77) 1st. speed,
  - feed for fans (70) and (71) using relay (72)
  - feed for cut-in (75) control circuit
- 3rd. and 4th. position : 2nd or 3rd. speed of console air fan (77) which makes it possible to adjust the cool air output.

The surrounding air thermostat (78) makes it possible to adjust the temperature of the cool air. As soon as this temperature is reached the thermostat cuts off the electromagnetic cut-in (75) feed and the compressor stops.
The main cut-out (74) (30 amps) protects the installation assembly. It is fitted on the battery frame.

The cut-out (76) (15 amps) protects the console block and the compressor cut-in. This cut-out is placed under the lining of the engine recess near the console.

OPERATION N° D. 530-0 : *Characteristics and checks on electrical units*

VEHICLES ALL TYPES

I.- CHARACTERISTICS

1 - Batteries

- Battery 200/40 A.H. : *Vehicles all types →| Oct. 1966*
  Vehicles all types without QI headlamps and without heating - 20° C (68° F)
  |→ Oct. 1966 →| Sept. 1967
  Vehicles all types |→ Sept. 1967
- Battery 55 A.H. : : *Pallas vehicles plus all types fitted with QI. headlamps and heating - 20° C (68° F)*
  |→ Oct. 1966 →| Sept. 1967
- Battery 250/50 A.H.: *Vehicles all types (except DV) fitted with air conditoner*

2.- Dynamos

Type of vehicle	Vehicles without QI headlamps and without heating 20° C (68° F)	Vehicles all types	Vehicles with QI headlamps or heating - 20° C (68° F) Pallas vehicles
Period of use	|→ 10/66 →| 9/67	|→ 1/66 →| 5/66	|→ 5/66 →| 9/67
DUCELLIER dynamo	7327 A	7336 A	7336
PARIS-RHONE dynamo	G. 10 C - 39	G. 10 C - 44	G. 10 C - 48
External diameter of pulley		68.5 mm	60 mm DUCELLIER 60.7 mm PARIS-RHONE

3. Alternators

- *Vehicles A.T. →| 3/1971 :* PARIS-RHONE A 13 R 52, or DUCELLIER 7530 A and 7530 B
- *Vehicles A.T. |→ 3/1971 :* PARIS-RHONE A 13 R 109 and A 13 R 110, or DUCELLIER 7551 A and 7551 B
- *Vehicles A.T. (except DV) fitted with air-conditioner :* PARIS-RHONE A 13 R 119, or DUCELLIER 7558 A
- *Vehicles A.T. |→ 5/1972 :* PARIS-RHONE A 13 R 119, or DUCELLIER 7558 A.

4. Voltage regulators

Brand name of regulator and dynamo	DUCELLIER		PARIS-RHONE	
Type of dynamo	7327 A	7336 A	G 10 G - 39	G 10 C - 46 or G 10 C - 48
Type of corresponding regulator	8243 F	8346 A	YT 2113	YT 2116

Brand name of regulator and alternator	DUCELLIER	PARIS-RHONE
Type of alternator	7530 A - 7530 B - 7558 B 7551 A - 7551 B	A 13 R 52 - A 13 R 109 A 13 R 110 - A 13 R 119
Type of corresponding regulator	8360 A	AYD 212

5. Starter motors

- *Vehicles DX-DJ-DXF-DJF.*

Periode of use	→| 12/1957		|→ 12/1967 →| 9/1969	
Brand name of starter motor	DUCELLIER	PARIS-RHONE	DUCELLIER	PARIS-RHONE
Type of starter motor	6164 A	D 11 B 116	6182 A	D 11 E 123

Period of use	|→ 9/1969 →| 3/1972	|→ 3/1972
Brand name of starter motor	PARIS-RHONE	DUCELLIER
Type of starter motor	D 10 E 52 *(DX)* and D 10 E 55 *(DJ)*	6200 A *(DX)* and 6225 A *(DJ)*

- *Vehicles all types (except DX-DJ-DXF-DJF)*

Period of use	→| 9/1968		|→ 9/68 →| 9/69	|→ 9/1969
Brand name of starter motor	DUCELLIER	PARIS-RHONE	PARIS-RHONE	DUCELLIER
Type of starter motor	6166 A	D 10 B 45	D 10 E 49	6201 A *(DY)* 6215 A *(DV, DT)*

II - RE-SKIMMING

1 - Dynamos :

Brand name of dynamo	DUCELLIER		PARIS-RHONE	
Type of dynamo	7327 A	7336 A	G 10 C 39	G 10 C 44 or G 10 C 48
Minimum diameter after skimming of commutator	35 mm	36 mm	34,5 mm	34,5 mm

2 - Starter motors :

Brand name of starter motor	DUCELLIER		PARIS-RHONE		
Type of starter motor	6164 A - 6166 A 6182 A - 6200 A 6225 A	6201 A 6215 A	D 10 B 45 D 11 B 116 D 11 E 123	D 10 E 49	D 10 E 52 D 10 E 55
Minimum diameter after skimming of commutator	39,5 mm	31 mm	43 mm	39,5 mm	40 mm

III - TESTS ON A TEST BENCH OR ON THE VEHICLE

1. Dynamos

Dynamo without regulator : yellow wire «EXC» joined to red wire «DYN» and black wire to earth.

Brand name and type of dynamo	DUCELLIER 7327 A or PARIS-RHONE G 10 C 39	DUCELLIER 7336 A	PARIS-RHONE G 10 C 44 or G 10 C 48
Cold starting speed at 13 V	1200 rpm	1950 rpm	1700 rpm
Output when cold at 13 V	3,5 A to 1500 rpm 22 A to 2500 rpm	11 A to 2200 rpm 29 A to 3000 rpm	19,5 A to 2200 rpm 33 A to 3000 rpm

2. Alternators :

a) First case :

- *Vehicles A.T.* →| *3/1971 :* PARIS-RHONE A 13 R 52, or DUCELLIER 7530 A and 7530 B
- *Vehicles A.T.* |→ *3/1971 :* PARIS-RHONE A 13 R 109 and A 13 R 110, or DUCELLIER 7551 A and 7551
- Ratio of alternator/engine rotation speed :
  →| *3/1971* = 1.53/1 |→ *3/1971* = 1.75/1
- Trials on test-bench without regulator : join terminal «EXC» to «+» terminal.
- Output when cold at 14 V : 16 A 1650 r.p.m. and 35 A at 3600 r.p.m. alternator.

b) Second case :

- *Vehicles all types (except DV) with air conditioner and vehicles all types* |→ *5/1972*
- PARIS-RHONE A 13 R 119 or DUCELLIER 7558 A
- Ratio of alternator/engine rotation speed = 1.75/1
- Trials on test bench without regulator-join terminal «EXC» to «+» terminal
- Output when cold at 14 V : 17.5 A at 1750 r.p.m. and 43 A at 3900 r.p.m. alternator.

3. Démarreurs :

Brand name of starter motor	DUCELLIER				
Types of starter motor	6164 A	6166 A	6182 A	6201 A 6215 A	6200 A 6225 A
Testing on the vehicle					
a) Battery charged, intensity absorbed pinion blocked.	600 A	420 A	600 A	410 A	520 A
b) Starting current.	190 to 210 A	150 to 170 A	190 to 210 A	150 to 170 A	180 to 200 A
c) Starter motor removed, current running light.	50 to 85 A	30 to 50 A	50 to 85 A	35 A	50 to 60 A
Testing on test bench					
a) Maximum power.	2 HP	1,35 HP	2 HP	1,25 HP	1,48 HP
- Torque corresponding to this power.	10 mΛN 7.2 ft lbs	6.25 mΛN 4.5 ft lbs	10 mΛn 7.2 ft lbs	4.5 mΛN 3.3 ft lbs	9.8 mΛN 7 ft lbs
- Intensity absorbed by this torque	340 A	245 A	340 A	190 A	300 A
b) Average torque at 1000 r.p.m.	13.5 mΛN 9.8 ft lbs	8.5 mΛN 6.2 ft lbs	13.5 mΛN 9.8 ft lbs	7.5 mΛN 5.4 ft lbs	10.5 mΛN 7.6 ft lbs
- Intensity absorbed by this torque	410 A	285 A	410 A	290 A	310 A

Brand name of starter motor	PARIS-RHONE				
Types of starter motor	D 10 B 45	D 11 B 116	D 11 E 123	D 10 E 49	D 10 E 52 D 10 E 55
Testing on the vehicle					
a) Battery charged, intensity absorber pinion blocked.	470 A	630 A	630 A	470 A	425 A
b) Stating current	150 to 170 A	190 to 210 A	190 to 210 A	150 to 170 A	190 to 210 A
c) Starting motor removed, current running light	30 to 50 A	50 to 70 A	50 to 70 A	30 to 50 A	40 A
Testing on test bench					
a) Maximum power. . . . . a) Maximum power.	1,4 HP	2,2 HP	2,2 HP	1,4 HP	1,55 HP
- Torque corresponding to this power.	8 mΛN 5.8 ft lbs	8 mΛN 5.8 ft lbs	8 mΛN 5.8 ft lbs	8 mΛN 5.8 ft lbs	7 mΛN 5 ft lbs
- Intensity absorbed by this torque	220 A	250 A	250 A	220 A	200 A
b) Average torque at 1000 r.p.m.	9.5 mΛN 6.8 ft lbs	13.5 m ΛN 9.8 ft lbs	13.5 mΛN 9.8 ft lbs	9.5 mΛN 6.8 ft lbs	10 mΛN 7.2 ft lbs
- Intensity absorbed by this torque	260 A	380 A	380 A	260 A	255 A

IV - ADJUSTING THE VOLTAGE REGULATORS

1 - Regulator for dynamos :

a) DUCELLIER regulator - 12 volts - 8243 F and PARIS-RHONE regulator - 12 volts - YT 2113.

Cut in voltage = 12 to 13.5 volts (cold and hot).
Cut out voltage = at least 1 volt less than the cut in voltage.
Return current = 5 A maxi (cold).

REGULATION :

With the dynamo turning at 4000 rpm :

- Adjust the voltage to 12.5 volts, the intensity must be between 18 and 22 A.
- Adjust the voltage to 14 volts, the intensity must be between 18 and 22 A.
- Adjust the voltage to 15.5 volts, the intensity must be between 0 and 5 A.

b) DUCELLIER regulator - 12 volts - 8346 A and PARIS-RHONE regulator 12 volts - YT 2116.

Cut in voltage = 12 to 13.6 volts (cold and hot)
Cut out voltage = at least 1 volt less than the cut in voltage.
Return current = 5 A maxi for 13 volts.

REGULATION :

With the dynamo turning at 4000 rpm. :

- Adjust the voltage to 12.5 volts, the intensity must be between 30 and 33 A.
- Adjust the voltage to 13 volts, the intensity must be between 30 and 33 A.
- Adjust the voltage to 13.5 volts, the intensity must be between 18 and 33 A.
- Adjust the voltage to 14 volts, the intensity must be between 5 and 28 A.
- Adjust the voltage to 14.5 volts, the intensity must be between 0 and 15 A.

2. Regulators for alternators :

DUCELLIER regulator - 12 volts - 8360 A. PARIS-RHONE regulator - 12 volts - AYD 212.

With the alternator turning at 4000 rpm.

- Adjust the intensity to 8 A; the voltage must be between 13.40 and 14.40 volts.
- Adjust the intensity to 20 A; the voltage must be between 13 and 14 volts.

V - CHECKING A PARIS-RHONE ALTERNATOR (A 13 R 52, A 13 R 109, A 13 R 110, AND A 13 R 119) OR A DUCELLIER ALTERNATOR (7530 A, 7551 A, 7551 B and 7558 A) ON THE VEHICLE.

IMPORTANT REMARKS

Certain actions must be avoided at all costs because they could destroy the alternator

1°) *Do not allow the alternator to turn without being connected to the battery.*
2°) *Before connecting the alternator, make sure that the battery is correctly connected (negative earthed).*
3°) *The battery must be well charged when the alternator output is checked.*
4°) *Do not test the alternator by short-circuiting the positive and earth terminals, or the "EXC" and earth terminals. terminals.*
5°) *Do not reverse the leads connected to the regulator.*
6°) *Never try to energise an alternator : it is unnecessary and would damage the alternator and regulator.*
7°) *Do not connect a condensor either to the alternator or to the regulator "EXC" terminals.*
8°) *Do not connect the battery terminals to a charger and never carry out are or spot welding on the car chassis without having first disconnected both positive and negative battery leads.*

Checking the alternator output.

The alternator output must be measured when the alternator is working at maximum speed.

1. Disconnect the negative battery lead.

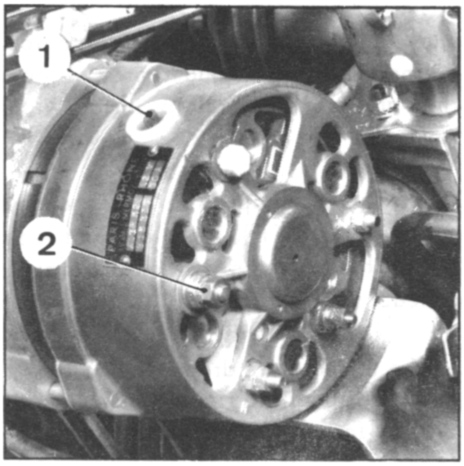
2. Disconnect the excitation lead (yellow end) from the «EXC» terminal (1) and the charge lead (black end) from «+» terminal (2) of the alternator (insulate the two earth leads)

3. By means of a lead of a least 0.12 mm diameter, join the «+» alternator terminal (2) to the «EXC» alternator terminal (1).

4. Connect an ammeter in series and a rheostat in parallel to the charge circuit.
   - Connect the «+» ammeter terminal to the «+» alternator terminal (2).
   - Connect the «—» ammeter terminal to the disconnected charge lead.
   - Connect the rheostat terminals between the «—» ammeter terminal and the earth.

5. Connect a voltmeter with a jumper lead to the charge circuit.
   - Connect the «+» voltmeter terminal to the «+» alternator terminal (2).
   - Connect the «—» voltmeter terminal to the earth.

3390



6. Connect the negative battery lead.

7. Start the engine and allow it to idle.
   a) *Let the alternator turn at 1650 rpm :* To do this slowly accelerate the engine to :
      - 1080 rpm with a PARIS-RHONE A 13 R 52 or DUCELLIER 7530 A and 7530 B alternator.
      - 940 rpm with a PARIS-RHONE A 13 R 110 and A 13 R 109, or DUCELLIER 7551 A and 7551 B alternator.

      Adjust the rheostat to obtain a voltage of 14 volts : the output current should be 16 amps.
   b) *Let the alternator turn at 3600 rpm :* To do this bring the engine speed to :
      - 2350 rpm with a PARIS-RHONE A 13 R 52, or DUCELLIER 7530 A and 7530 B alternator.
      - 2060 rpm with a PARIS-RHONE A 13 R 110 or A 13 R 109 alternator, and DUCELLIER 7551 A and 7551 B alternator.

      Adjust the rheostat to keep the voltage at 14 volts : the output current should be 35 amps. If this is not the case, the alternator should be overhauled.

8. Stop the engine.

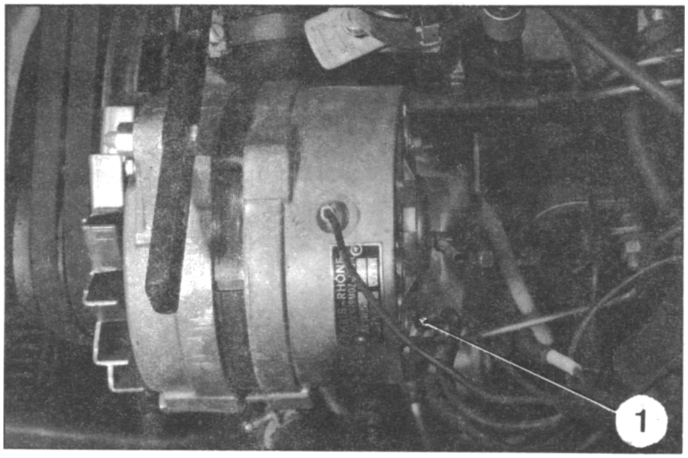
9. Disconnect the negative battery cable.

10. Disconnect the measuring apparatus and connect the two leads from the harness to the alternator :
    - lead with black end to «+» terminal (2).
    - lead with yellow end to «EXC» terminal (1).

11. Connect the negative battery terminal.

12. NOTE : Proceed in the same way for checking the alternator outputs 45 amps (PARIS-RHONE A 13 R 119, or DUCELLIER 7558 A)
    See chapter III, § 2 (page 2, same operation) where the different values of checks are indicated.

VI. CHECKING A VOLTAGE REGULATOR (PARIS-RHONE AYD 212 or DUCELLIER 8360 A) ON THE VEHICLE.



1. Disconnect the negative battery cable.

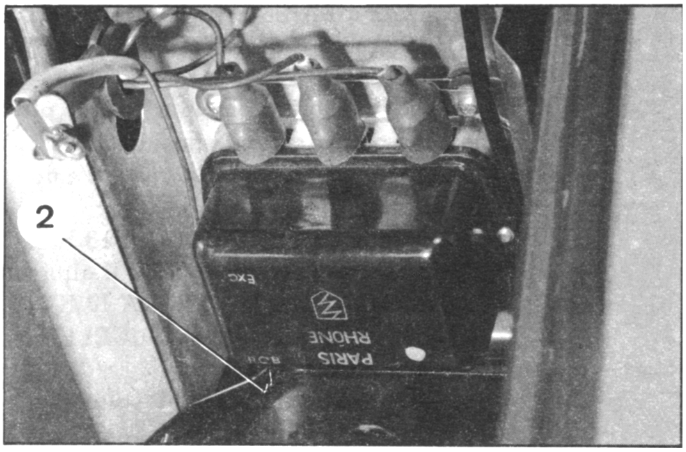
2. Disconnect the charge lead (coloured black) from the «+» alternator terminal (1).

3. Connect an ammeter in series and a rheostat in parallel to the charge circuit.
   - Connect the «+» ammeter terminal to the «+» alternator terminal (1).
   - Connect the «—» ammeter terminal to the disconnected charge lead (coloured black).
   - Connect the rheostat terminals between the «—» ammeter terminal and the earth.

4. Connect a voltmeter with a jumper lead to the excitation circuit.

   - Connect the «+» voltmeter terminal to the «+» regulator terminal (2) (coloured violet).

   - Connect the «–» voltmeter terminal to the earth



5. Connect the negative battery lead. Start the engine and allow it to idle.

   Switch off the ignition for a very short time in order to demagnetize the regulator.

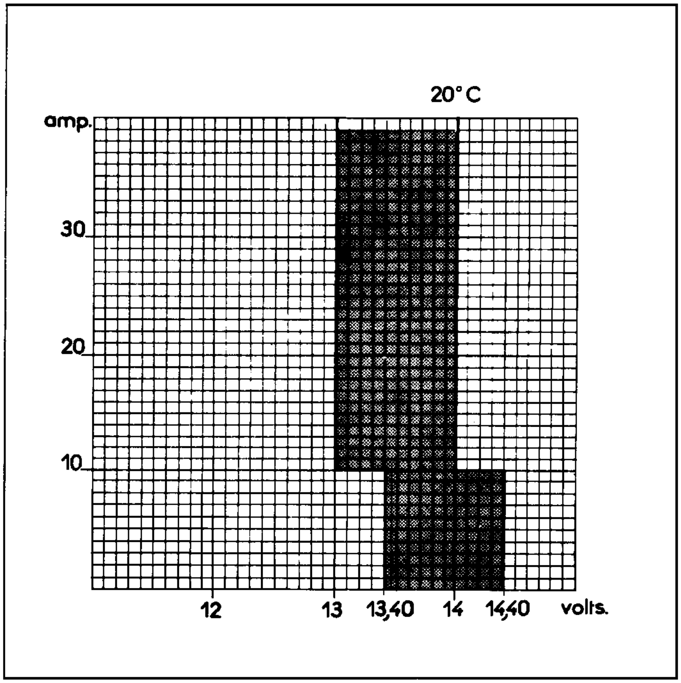
   Accelerate the engine to about 2600 rpm (4000 rpm of alternator).

   Adjust the rheostat to raise the current delivered by the alternator and read the corresponding voltage.

   Take various voltage readings for different amounts of current.

   Mark these measurements on the graph. They must be included in the shaded area of the graph. If they are not, the regulator is faulty and must be repaired.

NOTE : The graph opposite corresponds to readings taken at 20° C (68° F). If the ambient temperature is different, the values shown on the graph must be modified.



When the temperature drops, the voltage rises and when the temperature rises, the voltage drops by 0,15 volts for a difference of 10° C (50° F).

IMPORTANT NOTE :

The voltage readings must be taken while increasing the current. The current must never be decreased.

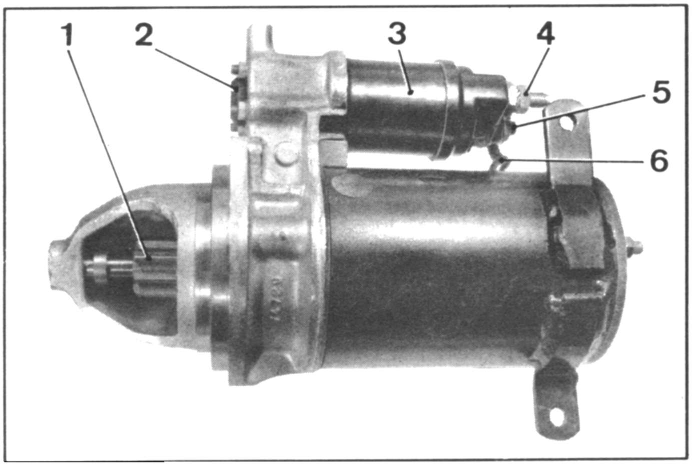
6. Stop the engine and disconnect the negative battery terminal.

7. Disconnect the measuring apparatus, connect the leads as usual, and connect the negative battery lead.

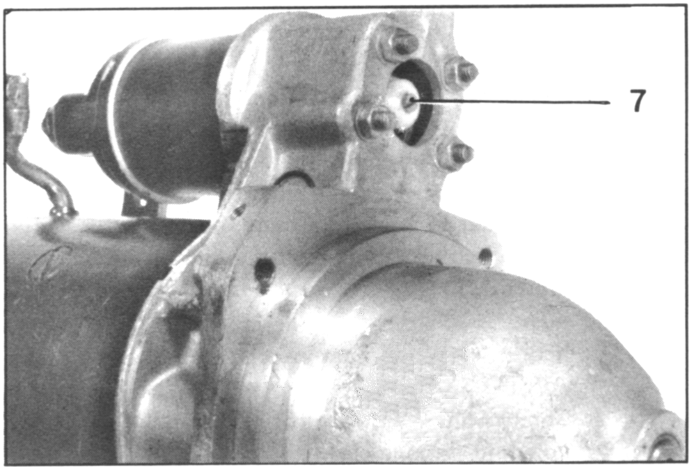
VIII - ADJUSTING THE CONTROL PINION OF A PARIS-RHONE STARTER MOTOR

(Starter motor removed)

7784



7783



1. Remove the rubber plug (2) of the solenoid.

2. Disconnect the feed wire (6) of the inductors from the solenoid terminal (5).

3. Remove the shunt connector between the positive terminal(4) of the starter motor feed terminal, and the solenoid (excitation) feed terminal.

4. Activate the solenoid (3), by connecting :
a) The positive terminal of a battery to the feed terminal (4) of the starter motor.
b) The negative terminal of a battery to the solenoid solenoid terminal (5) (inductor feed).

With the control pinion (1) in a forward position, measure the distance "b" between the end of the control pinion and the stop (8). *This distance "b" should be between 0.5 and 1 mm.*

If this is not the case, operate the adjusting screw (7) to bring this about.

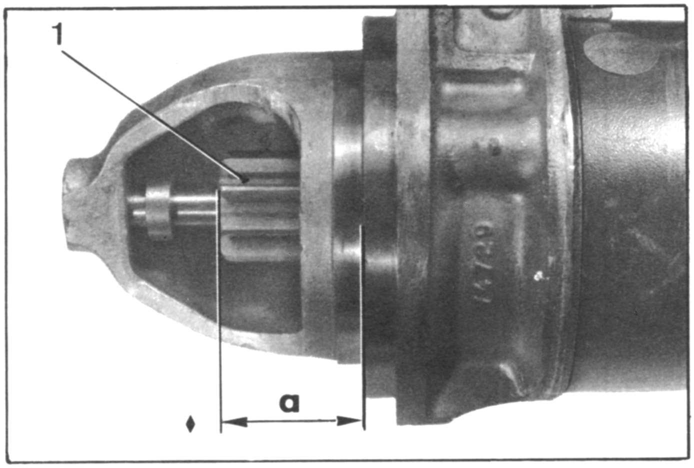
5. Disconnect the battery from the terminals (4) and (5) of the solenoid. The control pinion (1) moves back to occupy its rest position. Measure the distance "a" between the thrust face of the flange of the starter motor on the engine block and the end of the control pinion (1). *This measurement "a" should be 37.5 mm max.*

If this is not the case overhaul the starter motor.

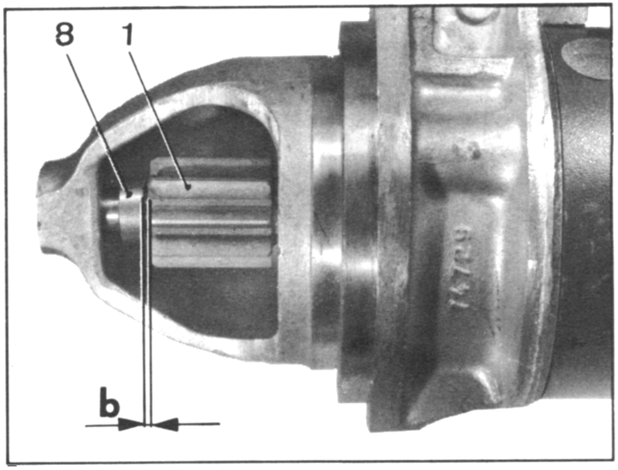
6. Connect the feed wire (6) of the inductors to the solenoid terminal (5).

7. Fit the rubber plug.(2).

7784



7785

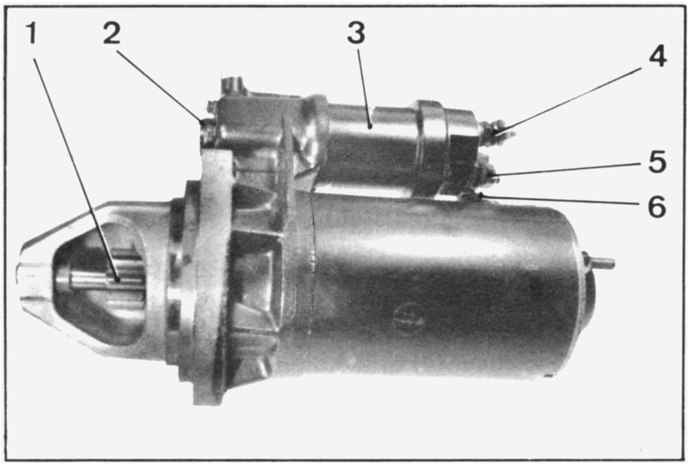


Manual 814-1

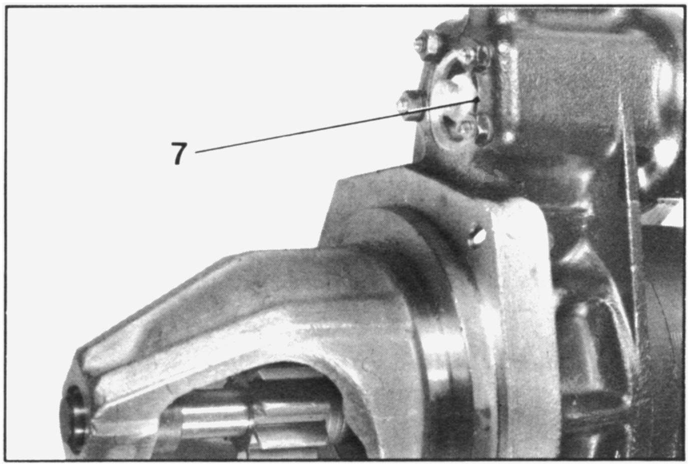
VIII - ADJUSTING THE CONTROL PINION OF A DUCELLIER STARTER MOTOR

(Starter motor removed)

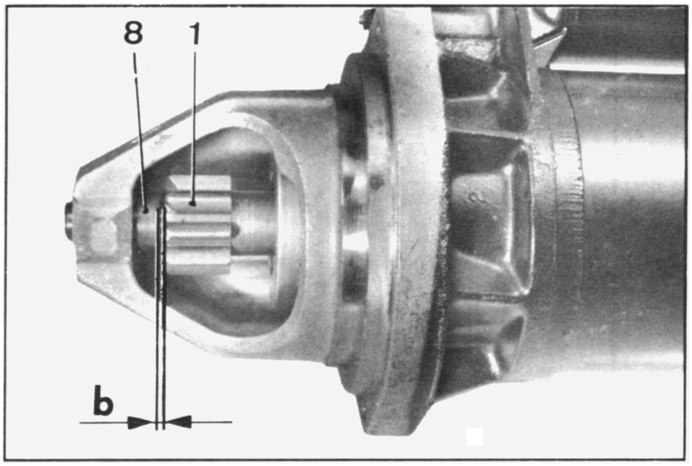
7797



7796



7798



1. Remove the plastic plug (2) of the solenoid (3).

2. Disconnect the feed wire (6) of the inductors from the solenoid terminal.

3. Remove the shunt connector between the positive terminal (4) of the starter motor feed terminal, and the solenoid (excitation) feed terminal.

4. Activate the solenoid (3), by connecting :

a) The positive terminal of a battery to the feed terminal (4) of the solenoid.

b) The negative terminal of a battery to the solenoid terminal (5) (inductor feed).

With the control pinion (1) in a forward position, measure the distance «b» between the end of the control pinion (1) and the stop (8). *This distance «b» should be between 0.5 and 1 mm.* If this is not the case operate the adjusting screws (7) to bring this about.

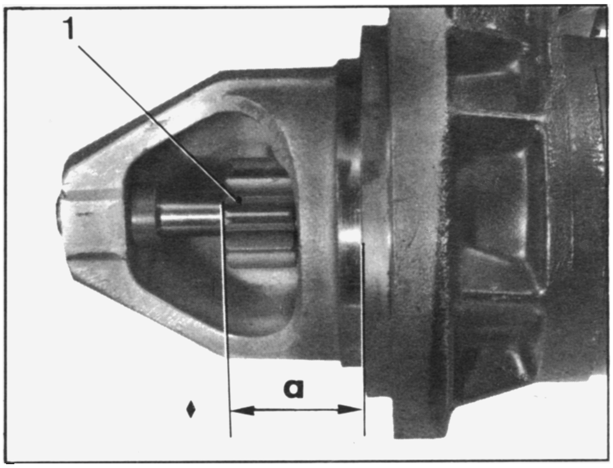
5. Disconnect the battery from the feed wire (4) of the solenoid and the feed wire (5) of the inductors. The control pinion (1) moves back to occupy its rest position. Measure the distance «a» between the thrust face of the flange of the starter motor on the engine casing and the end of the control pinion (1). *This measurement «a» should be 37.5 max.*

If this is not the case overhaul the starter motor.

6. Connect the feed wire (6) of the inductors to the solenoid terminal (5).

7. Fit the plastic plug (2).

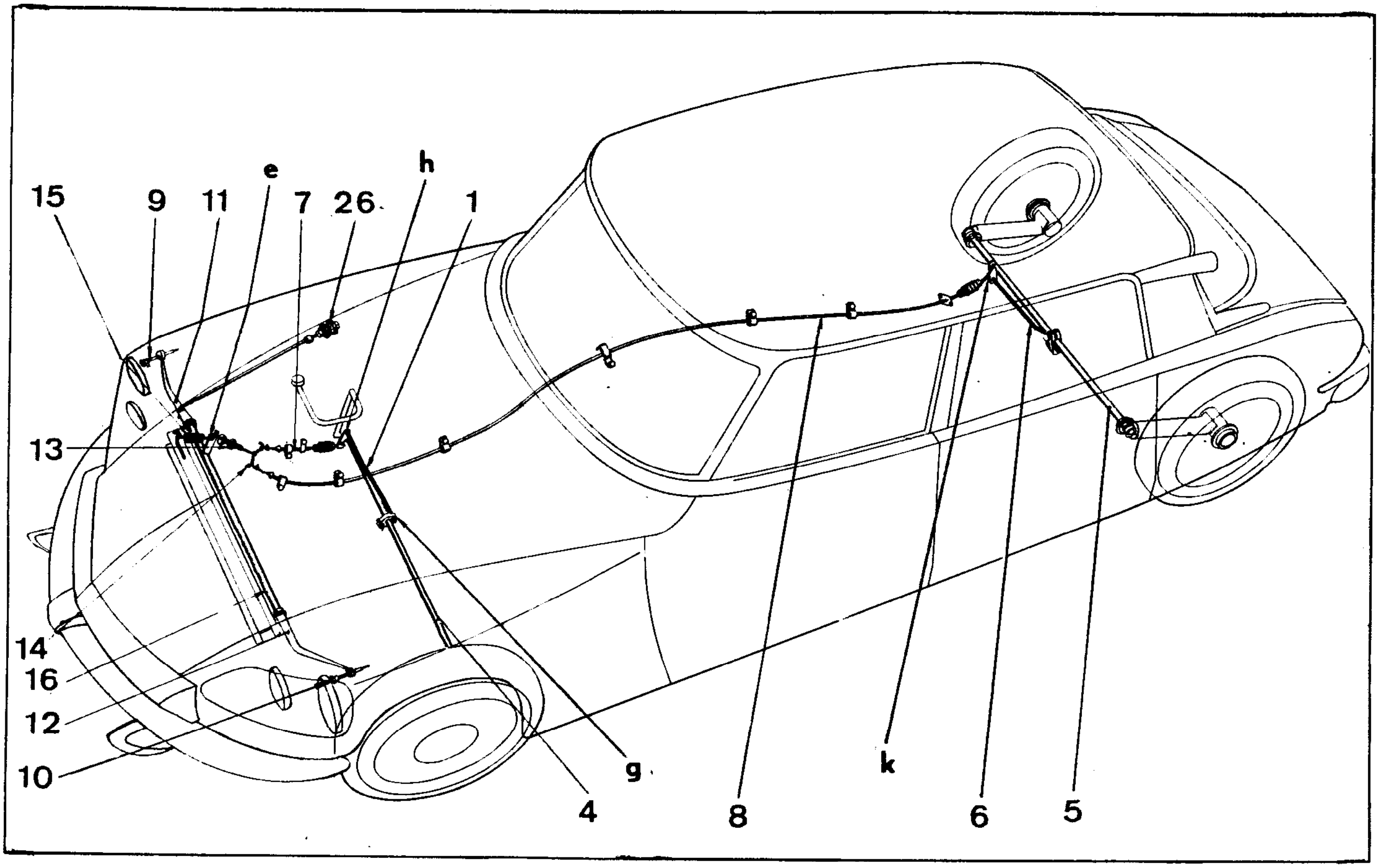
7797



VEHICLES ALL TYPES
⟼ *September 1967*

MAIN HEADLAMPS WITH SELF-LEVELLING DEVICE

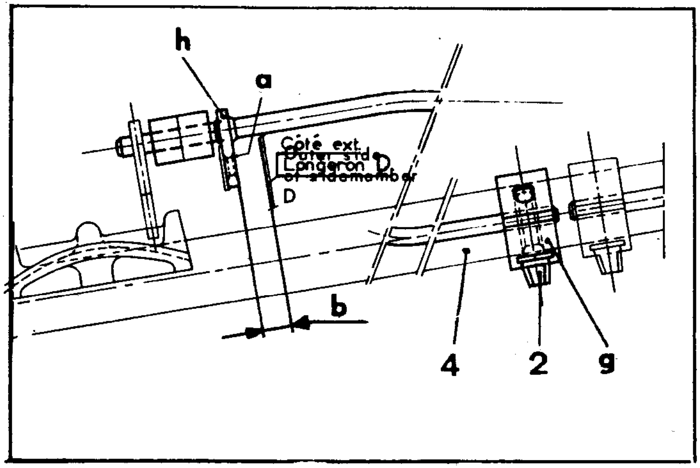
D. 54-6



Manual 814-1

1. Front torsion control rod.
g. Clamp for torsion control rod (1).
h. Lever with cable hook for torsion control rod (1).
4. Front anti-roll bar.
5. Rear anti-roll bar.
k. Lever with cable hook for control torsion rod (6).
6. Rear torsion control rod.
7. Front torsion control cable.
8. Rear torsion control cable.
9. R.H. control rod.
10. L.H. control rod.
11. R.H. control lever.
12. L.H. control lever.
13. Adjuster sleeve.
14. Integrator.
15. Return spring.
e. Lever for control rod.
16. Control bar.
26. Delay device.

D. 54-4



PRE-ADJUSTING THE HEADLAMP CONTROL.

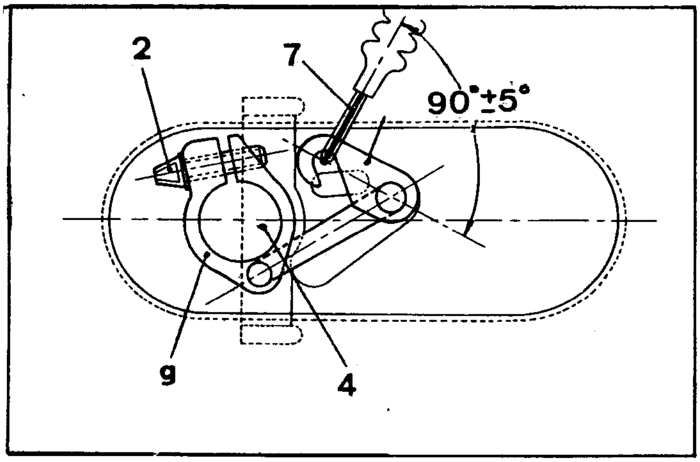
IMPORTANT NOTE : Ensure that the car is in running order, heights correctly adjusted and tyres inflated to the right pressures.

The manual height control lever should be in « normal » position.

1. Position the front control torsion rod on the front anti-roll bar (4).

a) Lateral positioning : Measure the distance « b » (between face « a » of cable-hook lever « h » and outer side of R.H. sidemember) This must be « b » = 8,5 to 10,5 mm. If necessary remove clamp « g » on anti-roll bar (4) after loosening screw (2) in clamp « g ».

D. 54-5



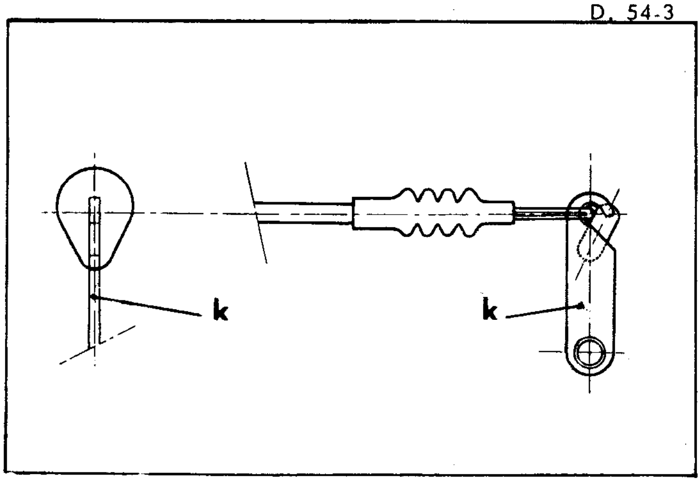
b) Angular position : Make an angle of 90° ± 5° between centre line of cable-hook lever « h » and cable (7) by moving, if necessary, clamp « g » on anti-roll bar.

c) Tighten screw (2) holding clamp on anti-roll bar (4).

2. Position the rear control torsion rod (6) on the rear anti-roll bar (5).
(see diagram on page 1 for part markings)

a) Remove panel protecting rear corrector control. (Inside the rear boot)

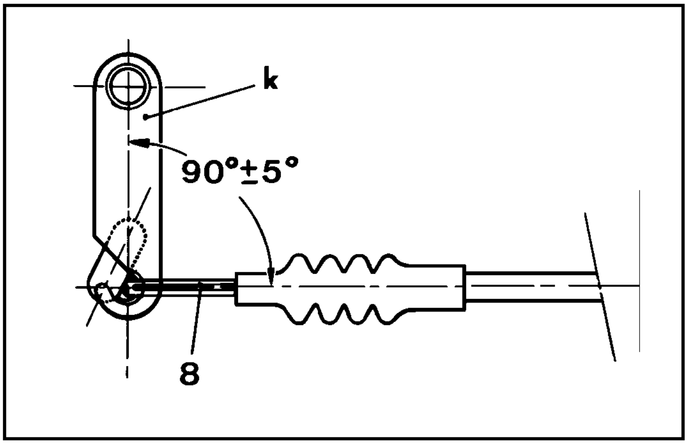
D. 54-3



b) Lateral positioning : Place cable hook lever « k » in centre of hole for passage of cable in rear unit.

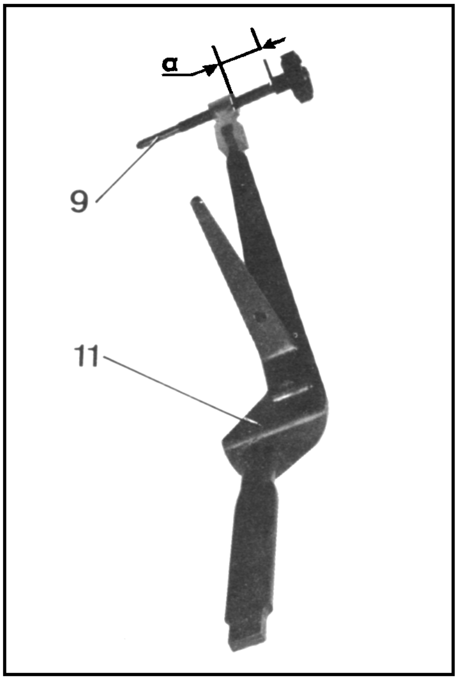
Without affecting the functioning, the lever « k » may be offset up to 2 mm to right or left of the centre of the hole.

D. 54-2



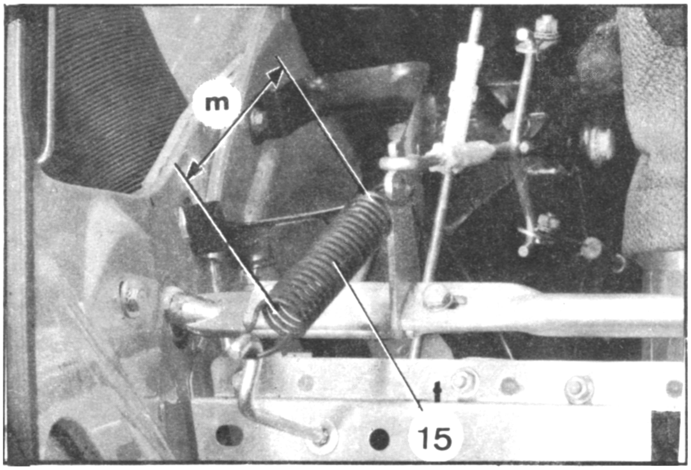
c) Angular position : Make an angle of 90° ± 5° between centre line of cable - hook lever (k) and cable (8).

3289



3. Adjust control rods (9) and (10) screwed into R.H. (11) and L.H. (12) so that they protrude (a) by 23 ± 1 mm. For items (10) and (12) see diagram on page 1 of this operation.

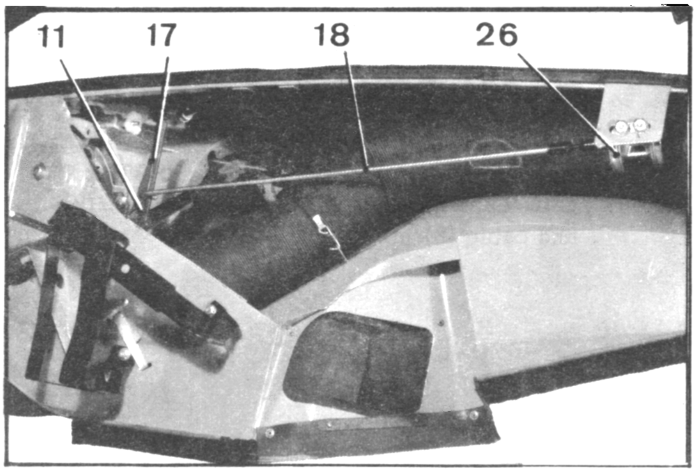
3272



4. Adjust the lengh of return spring (15). This should be m = 75 ± m measured as in photograph.

Manual 814-1

3286



To obtain this measurement, proceed as follows .

a) Disconnect control assembly.

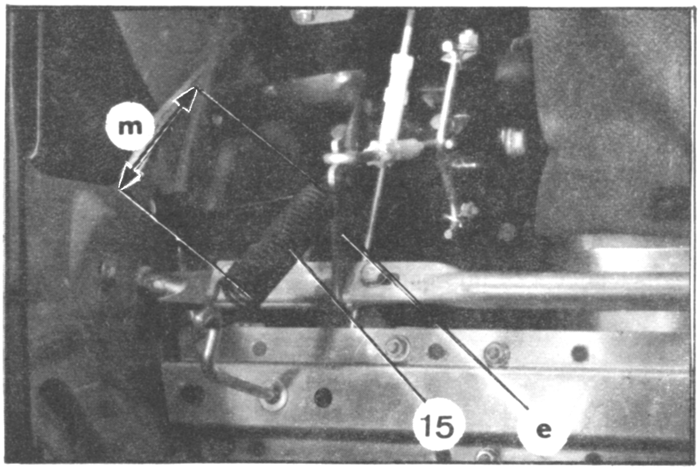
b) Position lever « e » so that main R.H. headlamp is correctly adjusted for height. For this :

Use apparatus of type « Reglolux » or « Regloscope ». Ensure that the car and apparatus are in in alignment. Disconnect delay device (26), to avoid affecting movement of controls.

Remove : pin (17),
rod (18),
of R.H. lever (11).

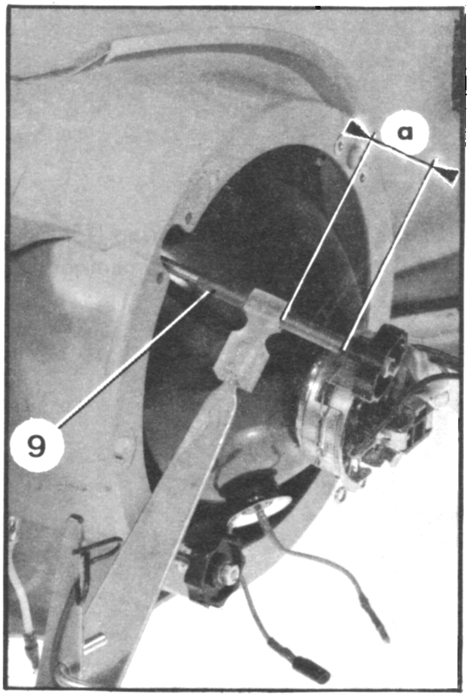
Compress circuit and run engine at idling speed during adjustment.
Position main R.H. headlamp so that the upper limit of dipped beam coïncides with the line on the screen of the apparatus (European code).

3272



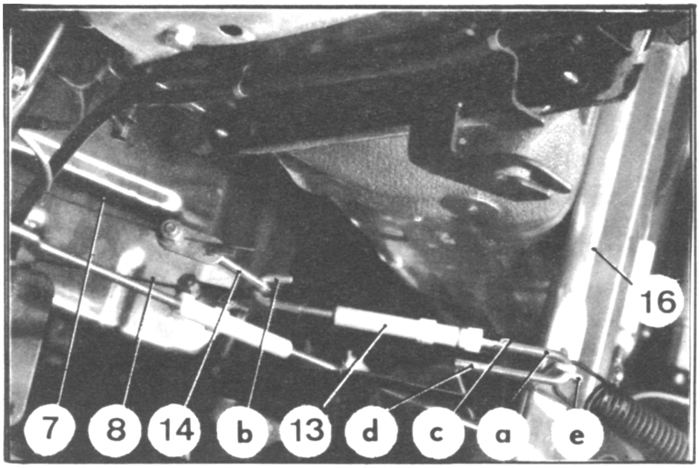
c) Reconnect lever(e) to return spring (15). Choose the hole in the lever allowing a measurement (m) nearest to 75 ± 5 mm.

3288



d) If necessary adjust control rod (9). After this operation, control rods should protude between 13 and 33 mm. («a»)

3279

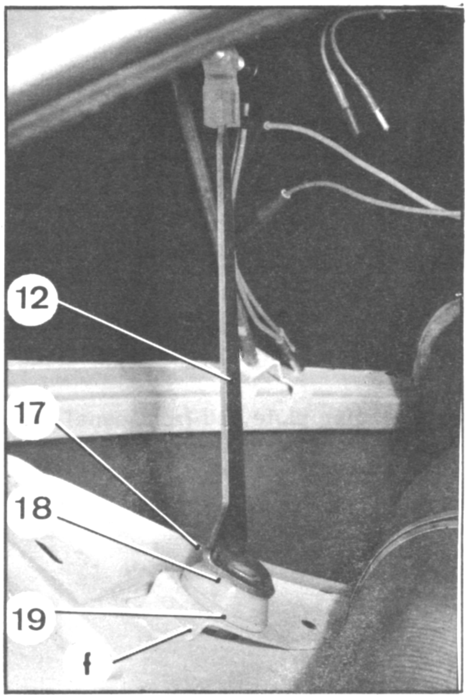


e) Position control rod (13).

- Turn curved part (a) of the front rod (13) towards the front R.H. wing.
- Turn curved part (b) of the front rod (13) towards the engine.
- Tighten the adjuster until the upper end (c) is at the same level as the section (d) of the front rod.

f) Adjust the length of the two cables (7) and (8) using cable-clamps so that control rod (13) is exactly perpendicular to centre line through fixing point of cable on integrator (14) and so that main headlamp is adjusted to correct height (see § 4-b).

3552



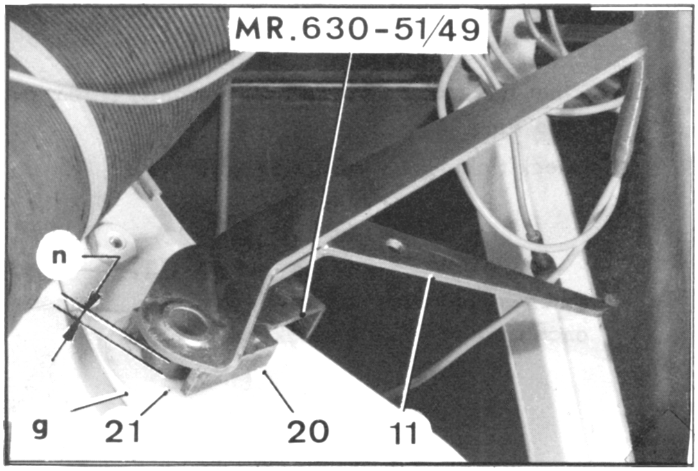
5. Adjust the end-float of the control bar (16) this clearance must be between 10 and 12 mm.
Before adjusting end-float, ensure that

- L.H. control lever (12) is correctly fitted in wing. to do this :
Check :
  - that bearing (19) is flush with plate « f »,
  - that L.H. spacer (18) is between the bearing (19) and the control lever (12),
  - that bearing (19) retainer pin (17) is uppermost and that the ends are towards plate « f »,
  - that R.H. control lever (11) is correctly fitted in wing. For that :

Check :

- that bearing (21) is flush with plate « g »,
- that bearing retainer pin (20) is uppermost, and that the ends are towards plate « g ».

3553



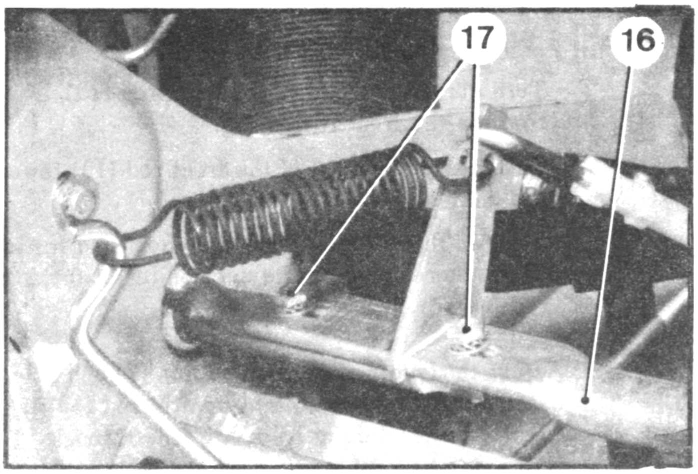
NOTE : It is necessary to grease control bar (16) in both bearings (19) and (21).

Push control bar well to the right and measure play « n » between bearing (21) and R.H. control lever (11) this must be between 10 and 12 mm.

NOTE : Distance « n » can be more easily measured using shim MR. 630-51/49.

Insert shim between bearing (21) and R.H. control lever (11). It should fit exactly.

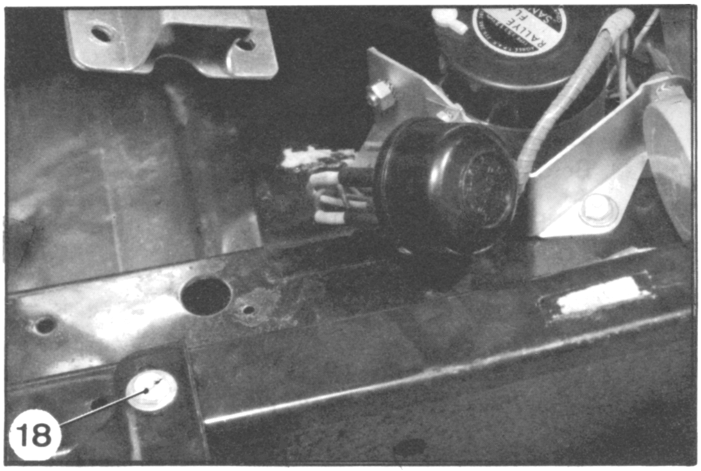
3280



If this is not the case, loosen fixing screws (17) on control bar (16).

Move the bar sideways, (there are slots in the bar for this purpose). Tighten screws (17) and readjust the play.

3287

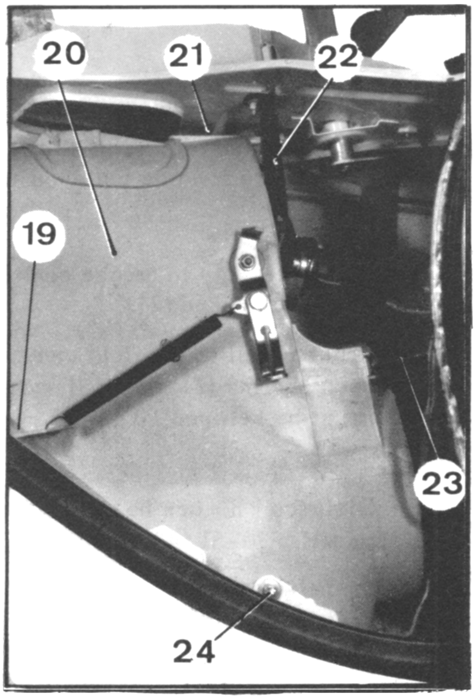


ADJUSTING THE MAIN HEADLAMPS.

6. Ensure :

- that the upper fixing screw (18) on the closing plate of the front panel is tight.
- that closing plate and front panel are well fixed.
- that the wing is tightly fitted.

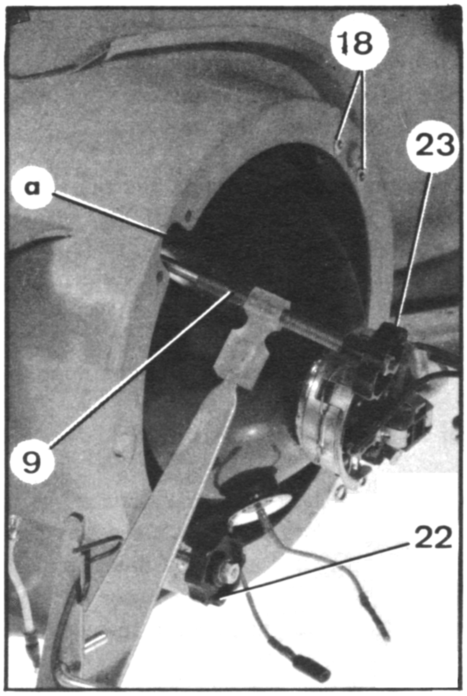
3303



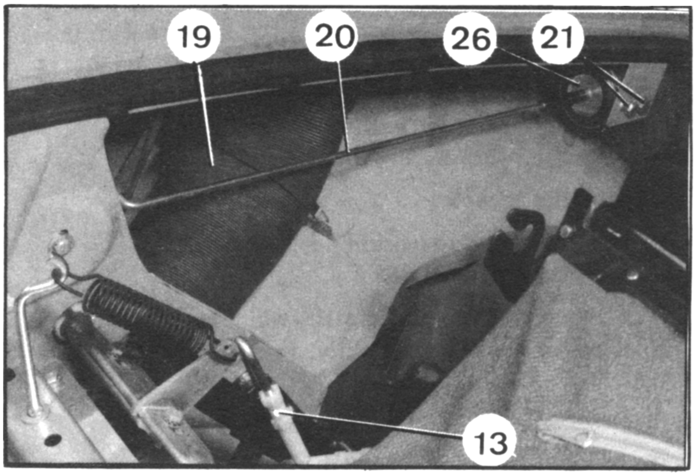
- that the headlamp case (20) is tightly fitted in the wing.

Check tightness : - of fixing screws (19), (21) and (24),
- of fixing lug (22),
- of tie-rod (23). Tighten until it touches both wing and case (20). Then turn screw once more and tighten lock nut.

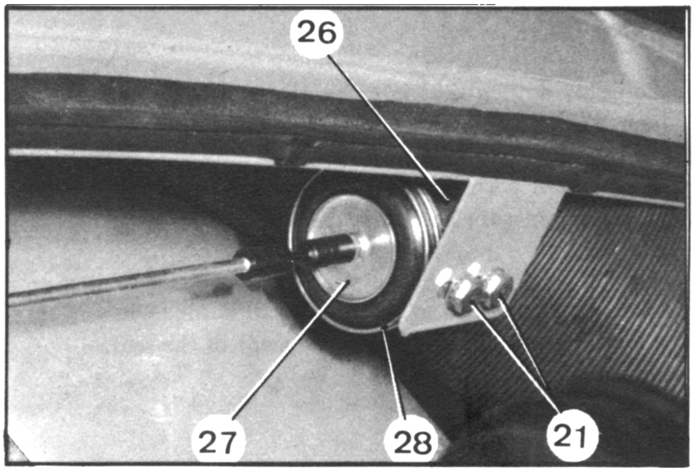
3288



3280



3280



- that the wires of the wing harness do not hinder the movement of the main headlamp.
- that the harness is held by the rubber collar on the lower part of the wing,
- that the rivets (18) are tight,
- that the rod (9) does not touch the sides of the slot (a) in the headlamp case,
- that there is a gap of at least 2 mm between the spare wheel and the control rod,
- that the ventilation pipe (19) does not touch the delay device rod (20). There must be at least 2 mm between them.

7. Put the circuit under pressure, and run the engine idling speed during adjustment.

8. Adjustment of main headlamps.
Use apparatus of type «Regolux» or «Regloscope». Ensure that the car and adjusting apparatus are in alignment.

a) Loosen, without removing, the two screws (21) securing the delay device (26) and make sure that during adjustment, the delay device does not restrict the movement of the controls.

b) To adjust the harness vertically, turn the control rod (9) by knob (23).

c) To adjust the harness horizontally, turn knob (22) the upper limit of the dipped beam should coïncide with the line on the screen (European code) of the apparatus (no tolerance).

d) If both headlamps are set too low or too high, adjust the lengh of the lengh of the rod (13) by means of its sleeve. This should not be moved more than 2 graduations from the centre.

NOTE : After each adjustment, tap the headlamp glass to stabilise its position by removing the inspection plate in the headlamp.

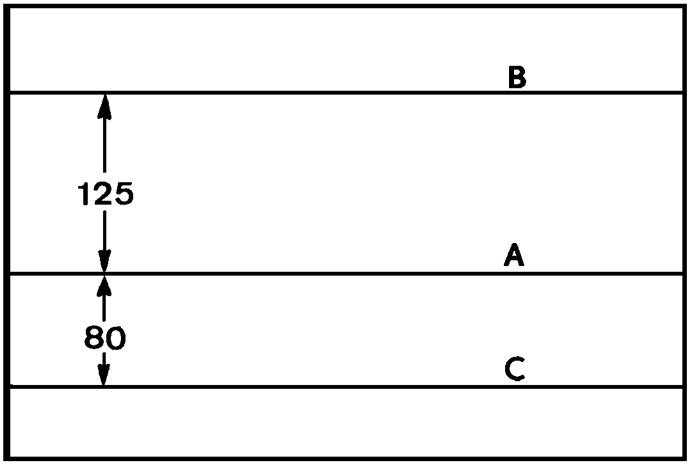
9. Adjust the position of the delay device (26). With the thumb and forefinger, hold the two cups (27) level with their retaining rings. The body of the delay device will position itself so that the slide-valve is in the middle of its stroke. Tighten the two screws (21).

10. Check torsion control of headlamps.

After adjusting the main headlamps, check the working of the headlamp torsion control. For this :

Place the car on a flat horizontal surface at right angles to a wall or other dull surface. The headlamps should be 6 m(20 ft) from the wall.

Put the car in the normal position and run the engine at idling speed. Switch on the headlamps, dipped and draw a horizontal line « A » on the wall, corresponding to the upper limit of the dipped beam of the main headlamps.

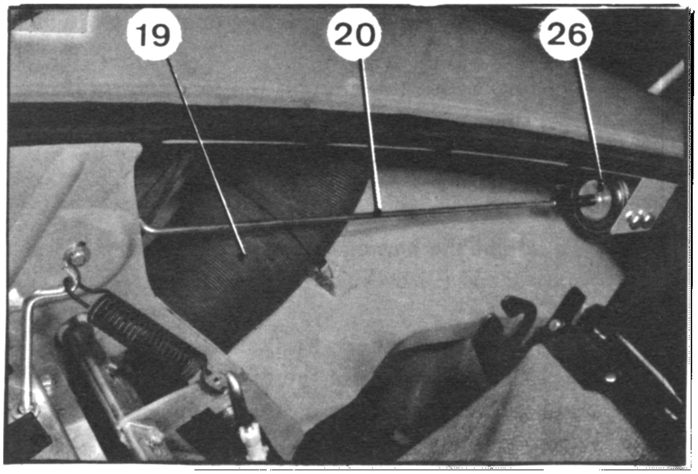


Draw lines « B » and « C » as in diagram opposite.

Put the car in the highest position.

Depress brake pedal hard and, with manual height control lever, let the car down as slowly as possible. The front goes down first until the lever is in the normal position. Then the front and rear go down together as the lever is put into the lowest position.

NOTE : If the manœuvre is too swift, the delay device (26) on the front R.H. wing shows the movement of the headlamps.
During this manœuvre, the upper limit of the dipped beam should remain within the limit of lines « B » and « C ».



If it does not, check :

- that the front and rear main headlamp controls are in working order.
- that the control is not too stiff, which makes the limit of the beam move jerkily. In this case ensure that :

- the R.H. ventilation pipe (19) is not touching the rod of the delay device (20). They must be at least 2 mm apart.

- the delay device (26) is correctly positioned (see § 9).

Find the stiff parts in the working of the torsion control of the main headlamps.

Check that the wires in the electrical harness in the wing do not obstruct the movement of the main headlamps.

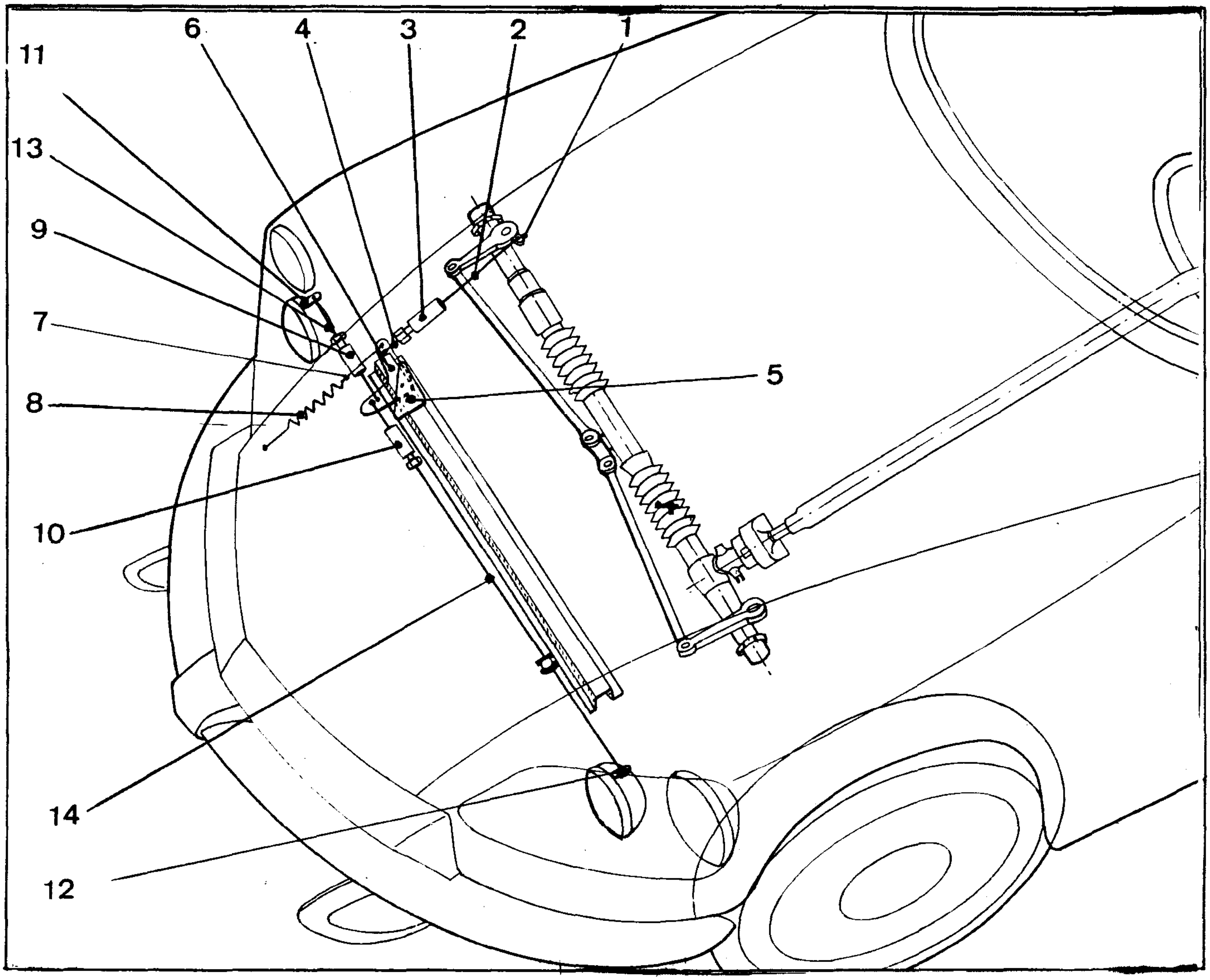
NOTE :

1) The torsion control of the main headlamps may also of controlled by rocking the car. to and fro by leaning on the bumpers.
The dipped beam should remain between lines « B » and « C ».

2) When driving at night, make sure that the limit of the dipped beam is around 80 m and varies by no more than 10 m (more or less).

DIRECTIONAL CONTROL OF AUXILIARY HEADLAMPS

D. 54.7



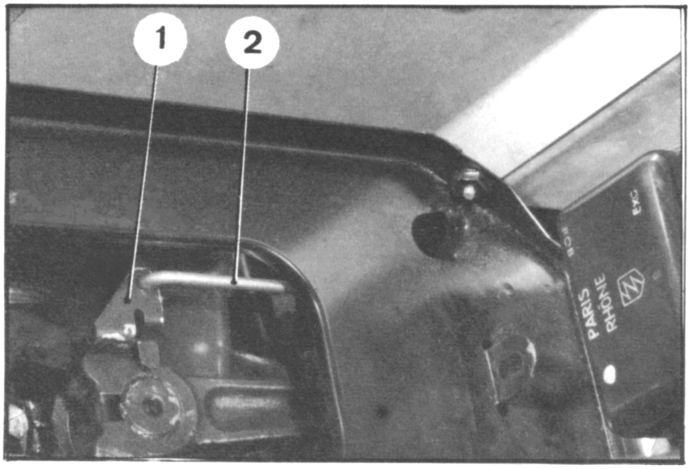
KEY

1. Control lever	8. Return spring
2. Rear control rod	9. R.H. adjusting sleeve
3. Sleeve	10. L.H. adjusting sleeve
4. Front control rod	11. R.H. auxiliary headlamp lever
5. Return lever plate	12. L.H. auxiliary headlamp lever
6. Return lever	13. R.H. control cable
7. Spacing rod	14. L.H. control cable

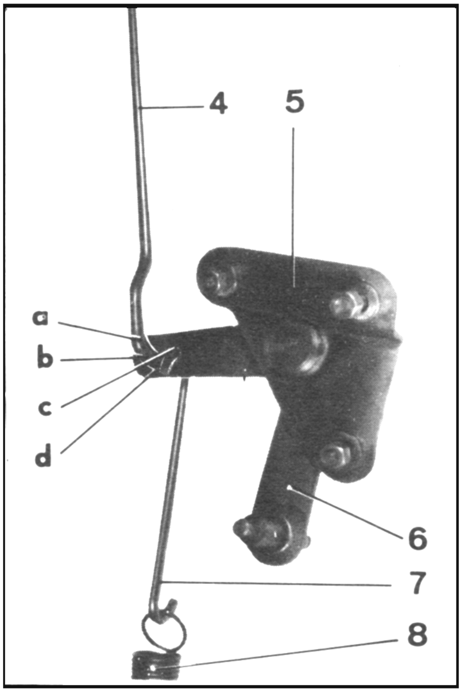
ADJUSTING THE DIRECTIONAL CONTROL.

(Auxiliary headlamps)

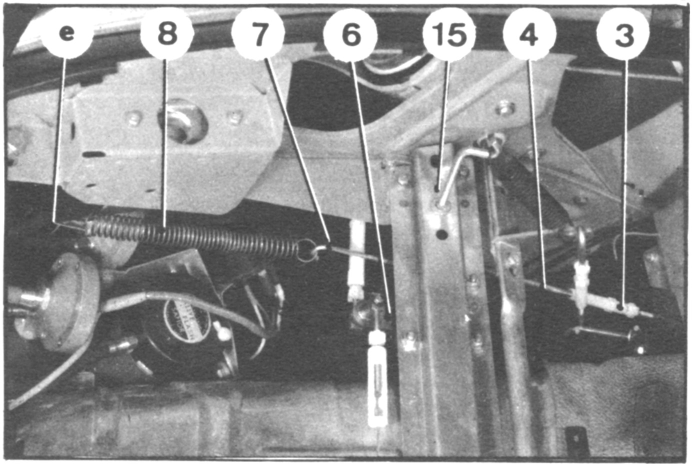
3276



3555



3558



11. Position the rear direction control rod (2) in the control lever (1) (the curved part of the rear rod (2) should point downwards). Pass the rear control rod (2) through the hole in the battery support.

Attach rear (2) and front (4) rods to sleeve (3).

Hook front rod (4) to return lever (6) in the hole « b » furthest from the centre line point the curved part « a » downwards.

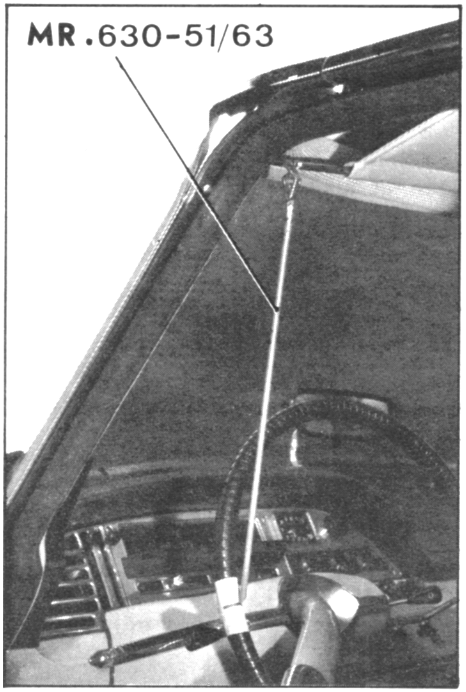
Hook the spacing rod (7) to return lever (6) in the hole « c » nearest to the centre line.

Point the curved part « d » upwards.

Fix the return lever plate (5) on to the spare wheel support crossmember.
(star washer under nut).

Hook the return spring (8) in the hole « e » in the fresh air intake.

3918



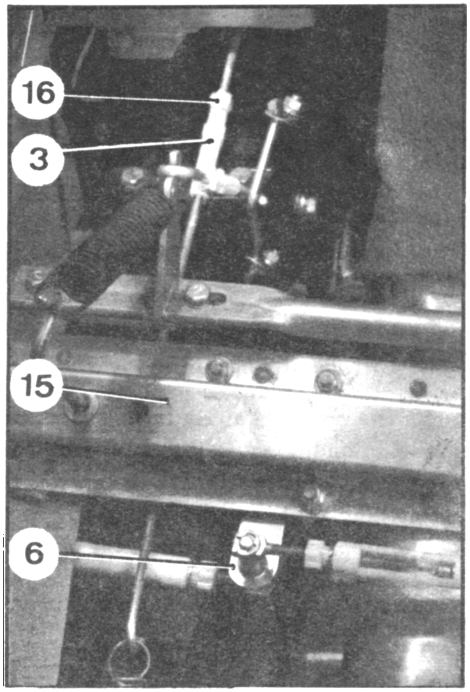
12. Position return lever (6).

a) Set the wheels for straight ahead steering.

(Roller in the hole of the cam).

NOTE : The straight ahead position must be correctly adjusted. To do this, two methods are possible :
- on the road
- in the workshop with optical equipment (see corresponding operation).

3559



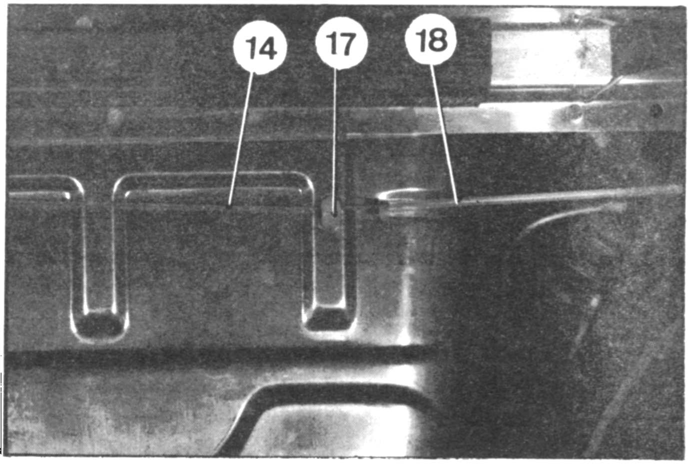
b) Turn the adjusting sleeve (3) until the return lever (6) is perpendicular to the spare wheel support crossmember (15).

c) Secure the adjusting sleeve (3) by tightening the lock-nut (16).

13. Attach the directional control cables.

a) Pass the cable and sheath assembly (14) and (18) into the guide (17), orienting it as in the diagram opposite.

3682



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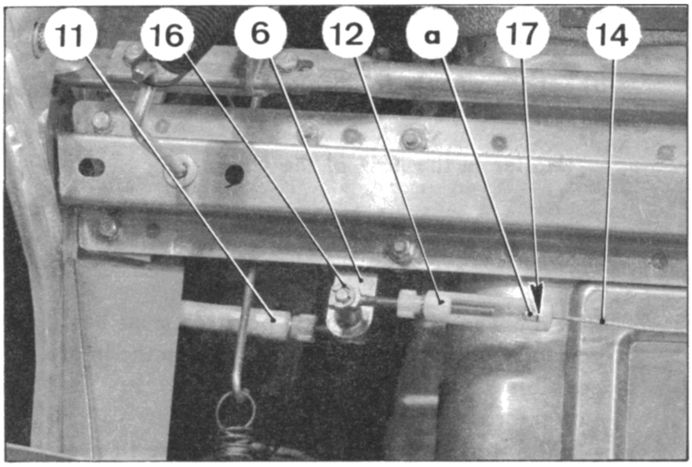

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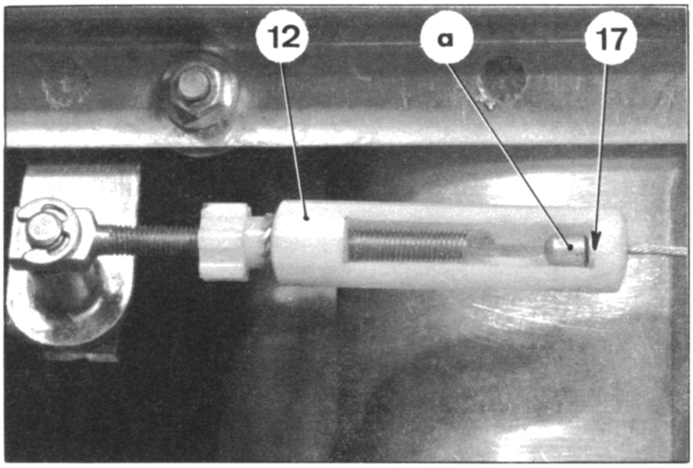
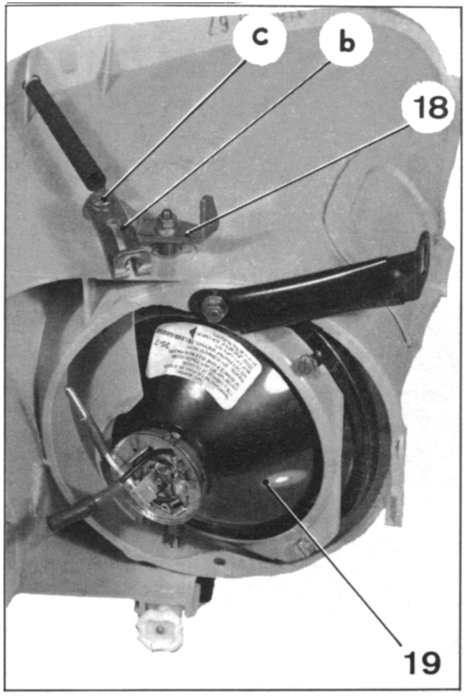


3713



b) Attach the R.H. adjuster sleeve (11) to the under side of the return lever (6).

c) Attach the L.H. adjuster sleeve (12) to the upper side of the return lever (6).

Keep the sleeves (11) and (12) in place with circlips (16).

d) Hook L.H. control cable (14) in the L.H. adjuster sleeve (12).

If necessary, unscrew the sleeve (12) to fit cable nipple « a ».

IMPORTANT NOTE :

Place thrust washer (17) between control cable nipple « a » and the inside of adjuster sleeve (12).

e) Hook the R.H. control cable in the R.H. adjuster sleeve (11) in the same way.

NOTE : Grease cable nipple « a » and thrust washer.

f) Hook control cables to auxiliary headlamp levers (18).

Turn the auxiliary headlamps (19) as far as they will go :

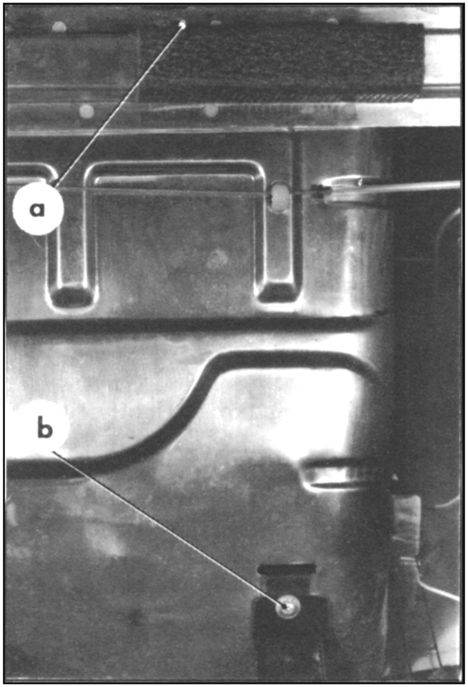
- the R.H. headlamp to the right.
- the L.H. headlamp to the left.

Pass the control cables through the holes in the wing and hook up the cables by passing nipple « a » and the thrust washer (17) through hole « b » in the lever (18) so that cable nipple « a » is against the washer (17).

NOTE :

Grease the movement of lever « c » as well as cable nipple « a » and thrust washer (17).

3682



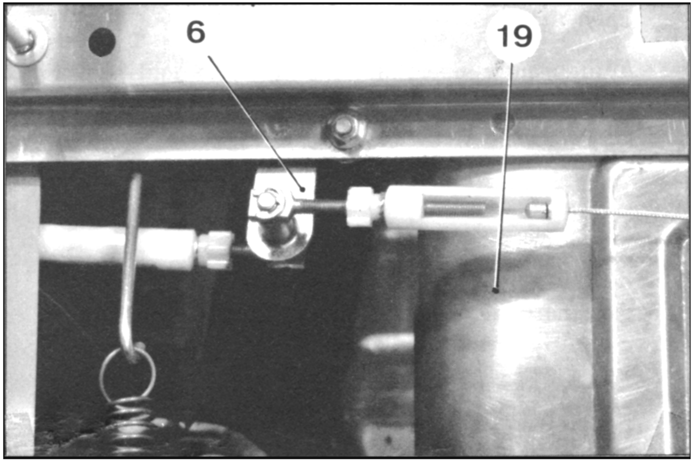
NOTE :

Turn the steering wheel fully to the right and make sure that the end of return lever (6) does not touch the radiator ventilation conduit (19).

If it does, move the conduit (19) to the left until the nearest point of return lever (6) and the conduit (19) are at least 2 mm apart.

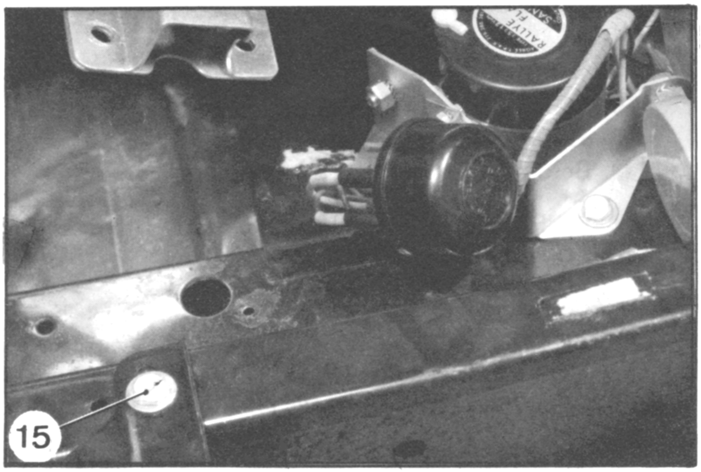
There are slots at « a » and « b » to allow this movement.

3559



ADJUSTING THE AUXILIARY HEADLAMPS.

3287

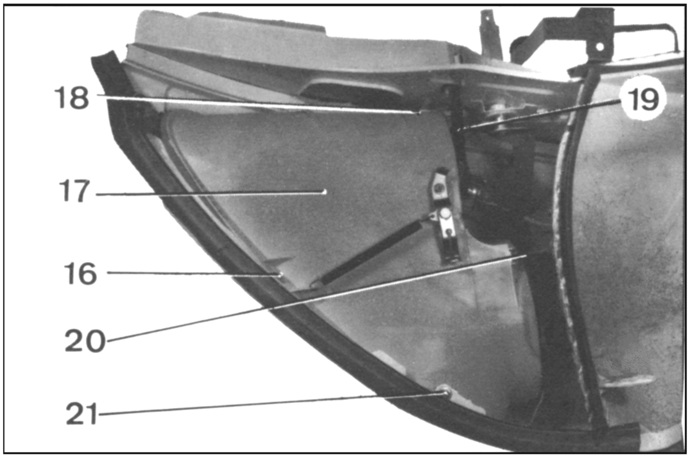


14. Make sure,

- that the upper fixing screw (15) of the front panel closing plate is tight,
- that the closing plate and panel are tightly fixed to the front unit,
- that the front wing fixing screws are tight.

Check that the headlamp box is tightly fitted in the wing.

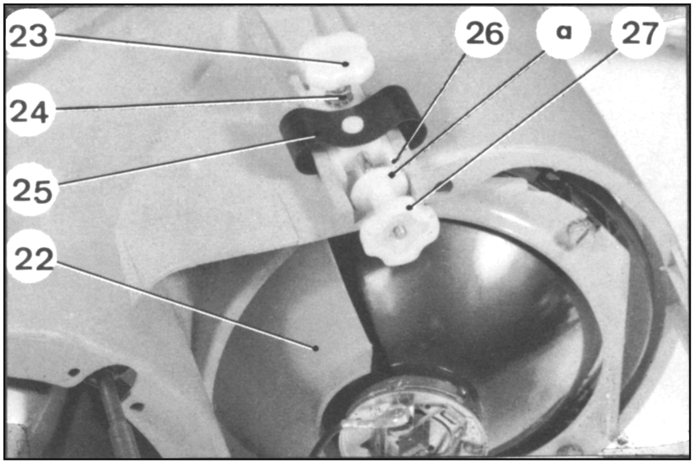
3715



Check the tightness of fixing screws (16-18 and 21) and of fixing lug (19) screws.

Tighten stay (20) until it touches both wing and box, then tighten one more turn and tighten lock nut.

3543



Check that the directional headlamp (22) turns freely. For this :

- Loosen nut (24) and tighten screw (23) until there is no play of the headlamp on its pivots.

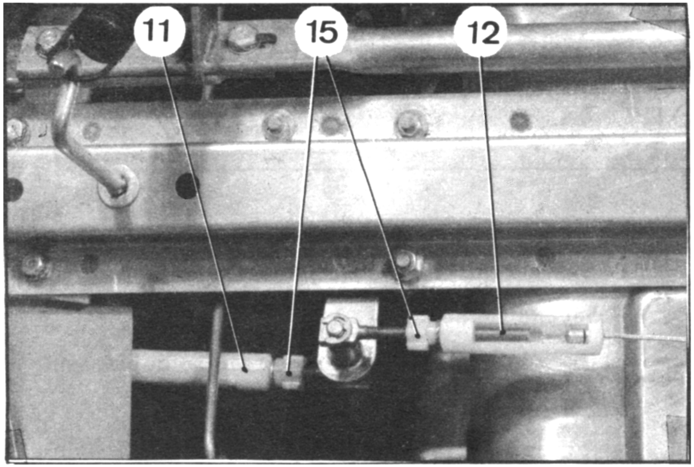
  Then tighten screw (23) one quarter turn.

  Adjustment support (26) should rise slightly from its slide, so that the spring (25) exerts a slight pressure.

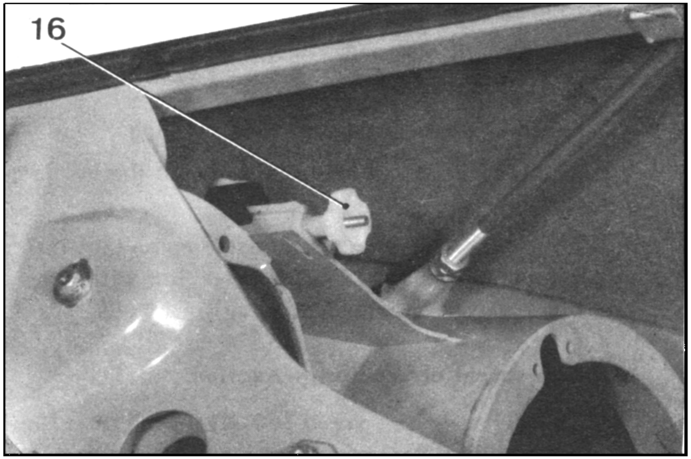
Check,

- that the conical part « a » of screw (27) lies correctly in the sleeve.
- that the wires of the electrical harness of the wing do not obstruct maximum rotation of the auxiliary headlamps.

3559



3304



15. Make sure that the car's engine is running, height adjusted, types correctly inflated.

Put the manual height control lever in the « normal » position.

Put the circuit under pressure and run the engine at idling speed during the adjustment.

Place the car on a level, horizontal surface.

Set the wheels in the straight ahead position (see § 12).

16. Adjustment of auxiliary headlamps.

First method.

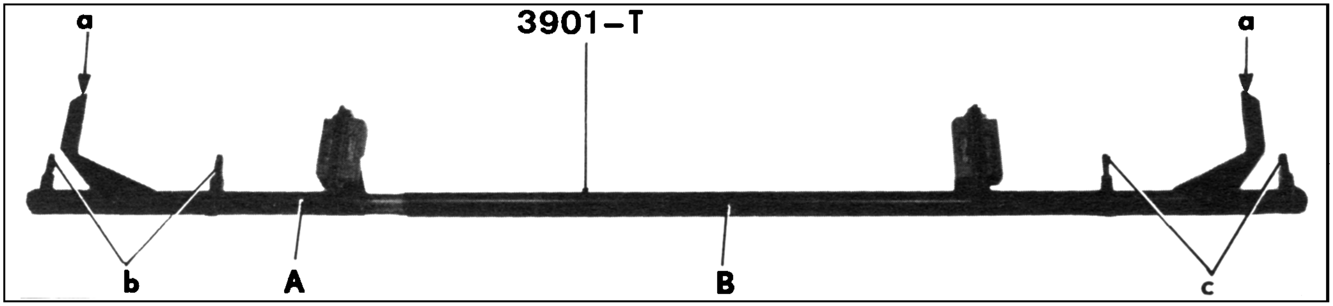
Use apparatus of the « Reglolux » or « Regloscope » type.

Ensure that car and apparatus are in alignment.

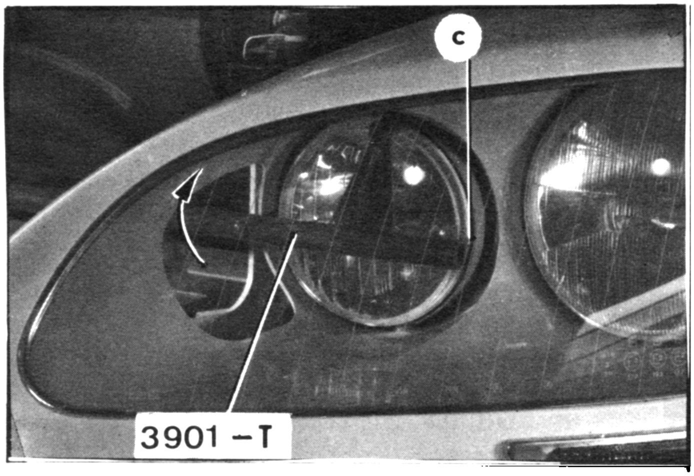
a) To adjust the unit laterally, turn :
the R.H. adjuster sleeve to adjust the R.H. directional headlamp,
the L.H. adjuster sleeve to adjust the L.H. directional headlamp,
until the main beam is centred on the apparatus' screen.
Tighten the two adjuster sleeve lock nuts (15).

b) To adjust the headlamps vertically, turn screw (16) until the main beam is centred on the apparatus' screen.

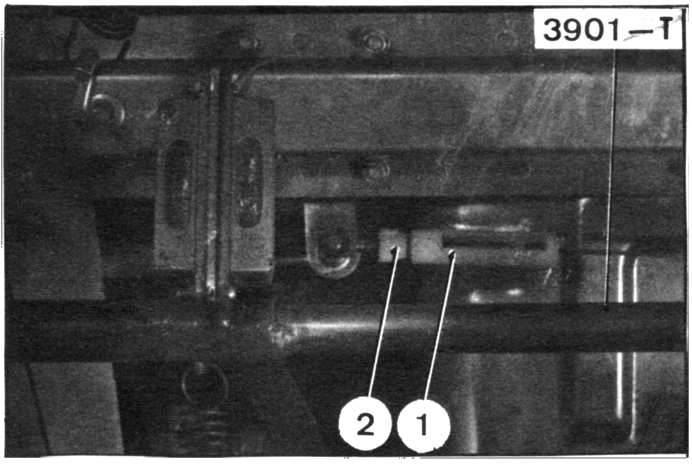
1007



3998



3999



17. Adjustment of auxiliary headlamps.

Second method.

Use tool 3901-T. This gives precise adjustment and makes the operation easier.

NOTE . The wheels must be set exactly in the straight ahead position.

a) Check and adjust straight ahead position. (see § 12 same operation).

b) Remove :
- spare wheel,
- inspection plates of R.H. and L.H. headlamp units.

c) Positioning of tool 390 - T.

Set the L.H. part « A » of the tool right in the R.H. part.

Set the ends of the gauge in each wing.

Place hook « a » behind the collar of the headlamp parabola.

Centre the gauge on each headlamp so that the guides « b » and « c » touch the collar without touching the headlamp glass.

d) Adjustment of headlamp direction.

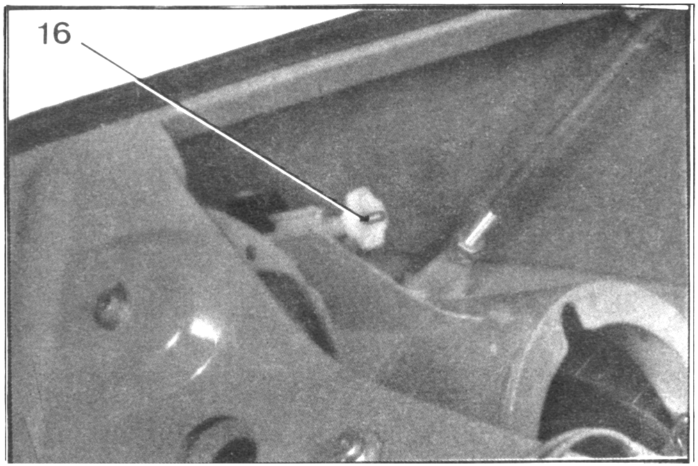
Slightly raise the gauge 3901 - T in the direction indicated by the arrow. Re - place the guides « b » and « c » against the parabola collars. The headlamps must be pivot.

If they do, turn the sleeves (1) to correct.

(Ensure that, during this operation, the hook « a » is always behind the parabola collar).

NOTE : Check after tightening the lock nuts (2) that the adjustment is still correct.

3999

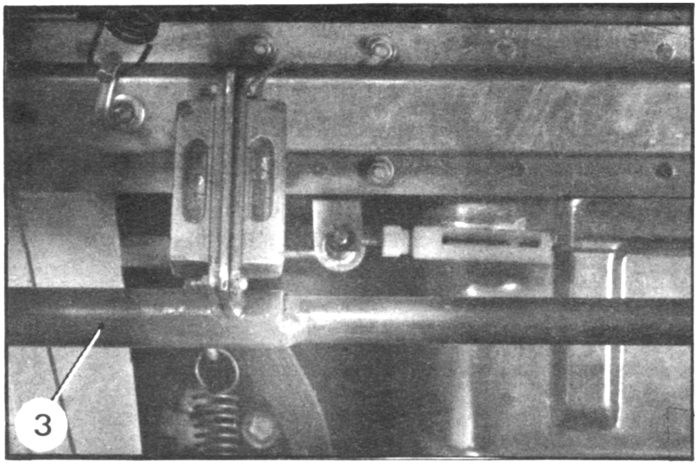


e) Adjustment of headlamp height.

Run the engine at idling speed, with the manual height control in the « normal » position, wait for the car to become stable.

Rotate in turn the adjuster screw (16) for each headlamp, to bring the bubble to the centre of the spirit levels.

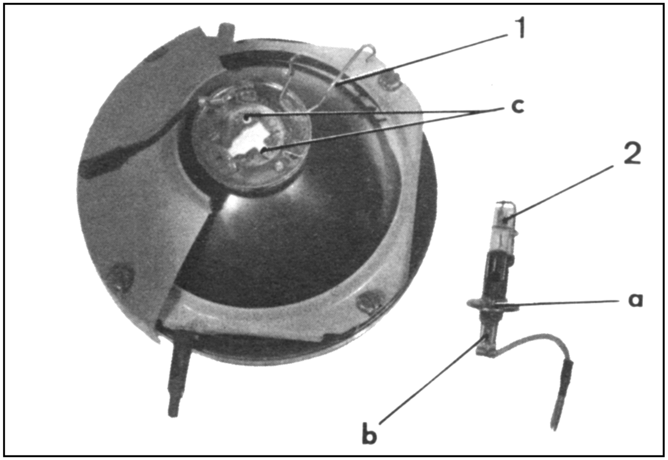
3304



NOTE : The apparatus contains two levels on each side.

- one is for adjusting MARCHAL headlamps (marked MARCHAL on the bar (3).
- the other is for adjusting CIBIE headlamps, (marked CIBIE on the bar).

3557



REPLACING A QUARTZ - IODINE BULB.

PRECAUTIONS.

This operation should only be carried out with the headlamp extinguished.

After switching off, it is advisable to allow 5 minutes for cooling before handling.

Do not touch the bulb with the fingers. If this is done inavertently, clean the bulb carefully with a little soapy water and dry with clean cloth free from fluff.

REMOVAL.

18. Lift the bonnet to reach the Q.I. bulb inside the wing.

19. Unhook the bulb retainer spring (1) and remove the bulb (2) holding it at « b ».

20. Disconnect the feed wire to the Q.I. bulb and the earth wire.

ASSEMBLY.

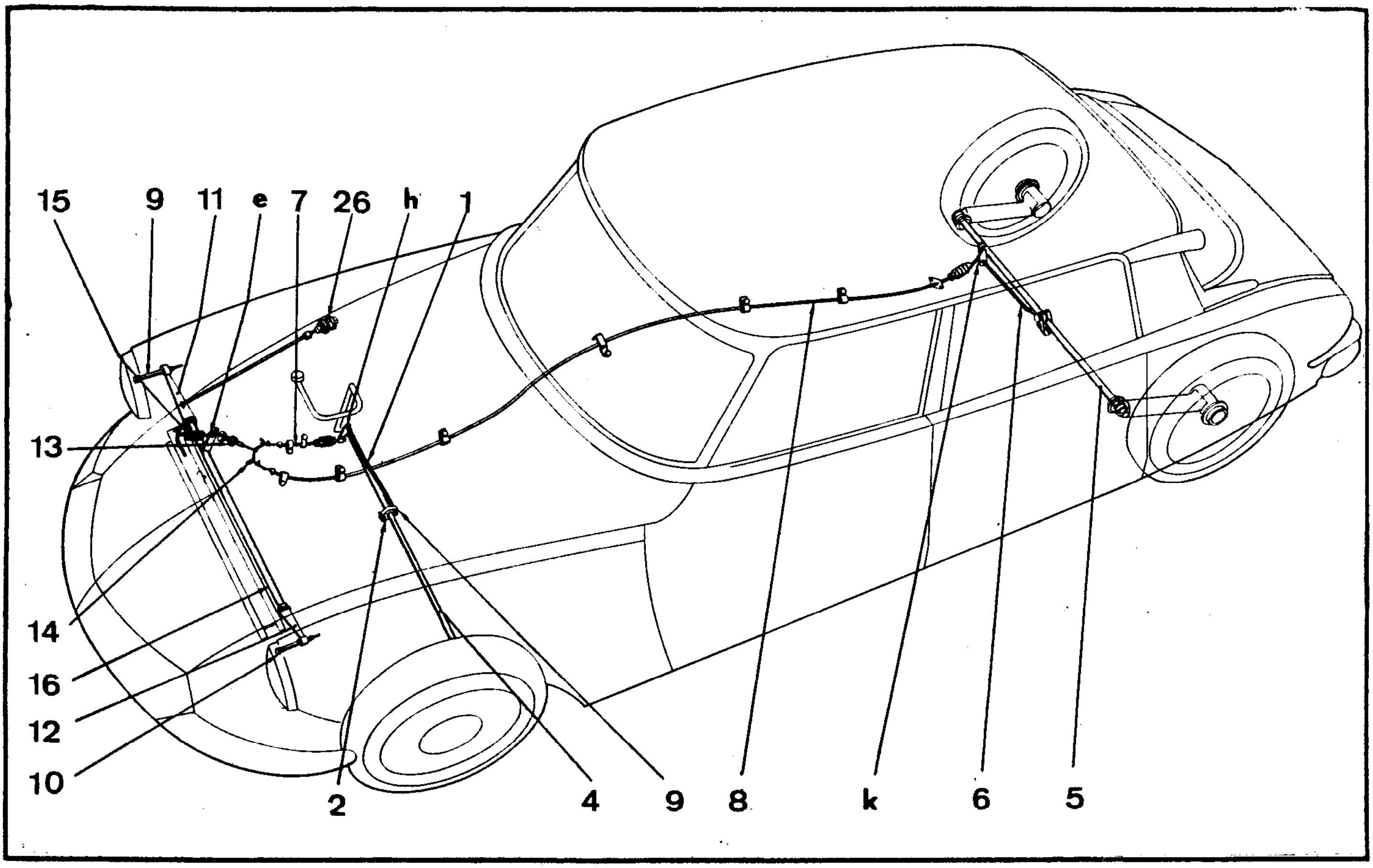
21. Connect the feeder wires (violet) to the Q.I. bulb.

22. Hold the Q.I. bulb at « b » and position it in the lamp with the locating dowels « a » in their slots « c ».

Re - hook the spring (1).

VEHICLES DX. DJ.
→| *Sept. 1967*

I. MAIN HEADLAMPS WITH SELF-LEVELLING DEVICE

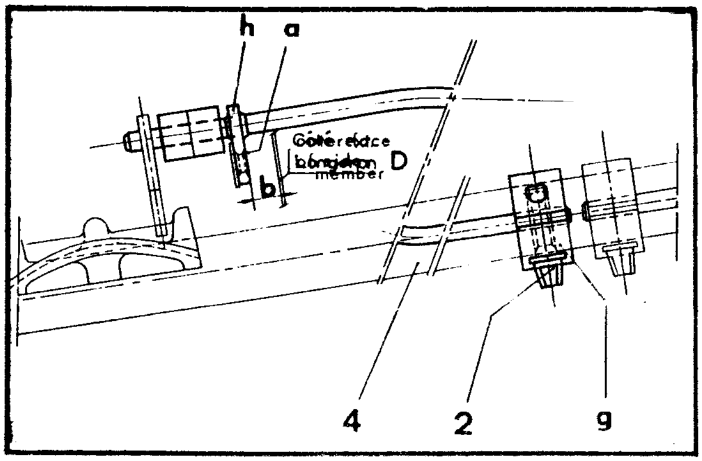


1. Front torsion control rod.
g. Clamp for control rod (1)
h. Lever with cable hook for control rod (1)
4. Front anti-roll bar.
5. Rear anti-roll bar.
6. Rear torsion control rod.
7. Front torsion control cable
8. Rear torsion control cable
9. R.H. control rod

10. L.H. control rod
11. R.H. control lever
12. L.H. control lever.
13. Adjusting sleeve
14. Integrator.
15. Return spring
e. Lever for control bar
16. Control bar
26. Delay device

II. PRE-ADJUSTING THE HEADLAMP CONTROL.

D. 54-4

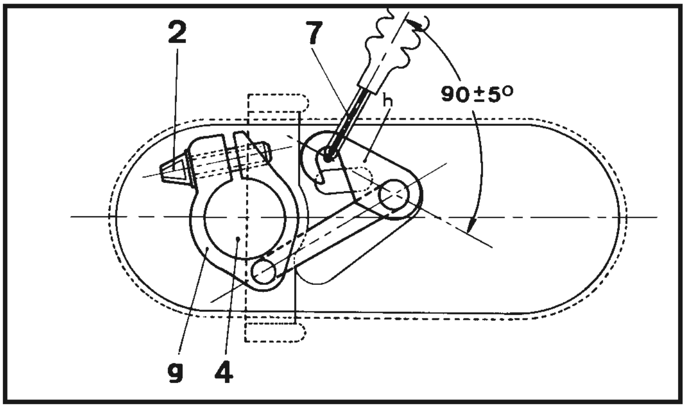


IMPORTANT NOTE : Make sure that the vehicle is in running order, with the heights correctly adjusted, and the tyres inflated to the correct pressures.
Put the manual height control lever in the normal running position.

1. Position the front torsion control rod on the front anti-roll bar (4).

a) Lateral positioning : Measure the distance « b » (between face « a » of the lever with cable hook « h » and the outer face of the R.H. sidemember). Distance « b » must be from 8,5 to 10,5 mm.
If necessary adjust clamp « g » on the anti-roll bar (4) after slackening screw (2) of clamp « g ».

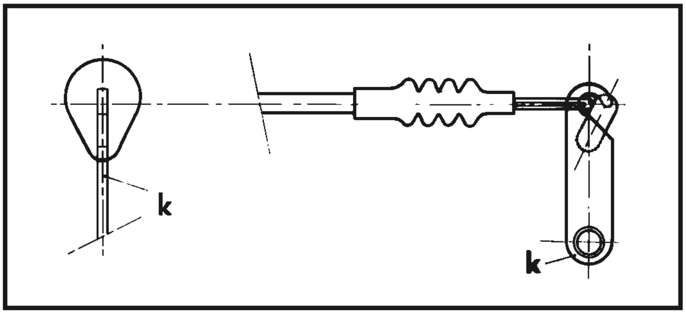
D. 54-5



b) Angular positioning : obtain an angle of 90 ± 5° between the centre line of the lever with the cable hook «h» and cable (7), adjusting clamp «g» on the anti-roll bar if necessary.

c) Tighten screw (2) of the clamp on the anti-roll bar (4).

D. 54-3



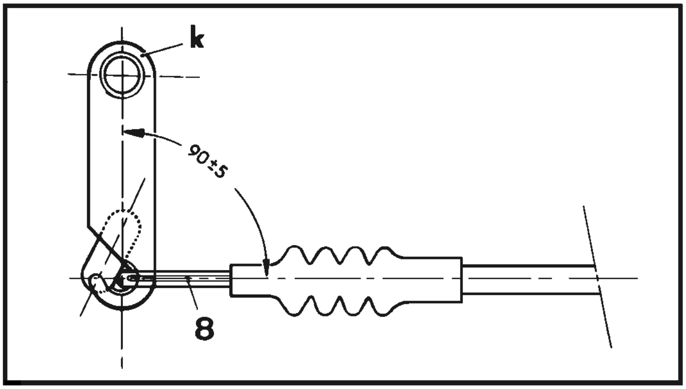
2. Positioning the rear torsion control rod (6) on the rear anti-roll bar (5).

a) Remove the rear height control protection plate.

b) Lateral positioning : put the lever « k » with the cable hook in the centre line of the cable aperture in the rear unit.

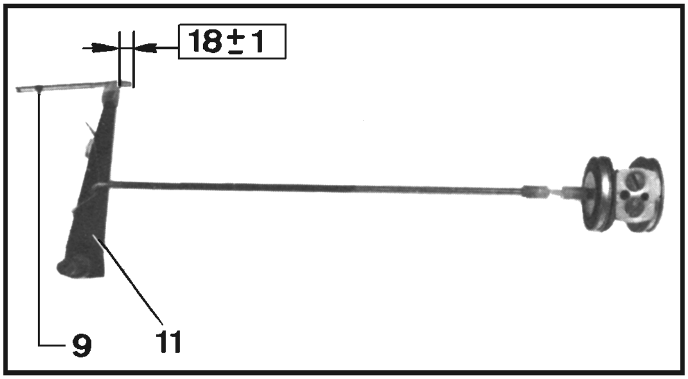
The lever « k » can be moved by 2 mm at the most to the right or the left of the centre line of the aperture without affecting the operation of the component.

D. 54-2



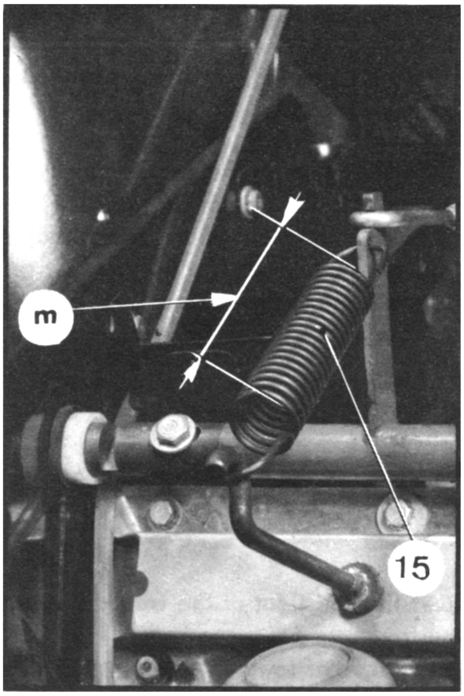
c) Angular positioning : Obtain an angle of 90° ± 5° between the centre line of lever (k) with the cable hook and the cable (8).

1396



3. Provisionally adjust control rods (9) and (10) screwed into the R.H. (11) and L.H. (12) levers so that they protrude by 18 ± 1 mm.
For (10) and (12), refer to the diagram on page 1, same operation.

1394



4. Adjust the length of the return spring (15).
This length m must equal = 70 ± $^{10}_{0}$ mm, measured as shown in the photograph.

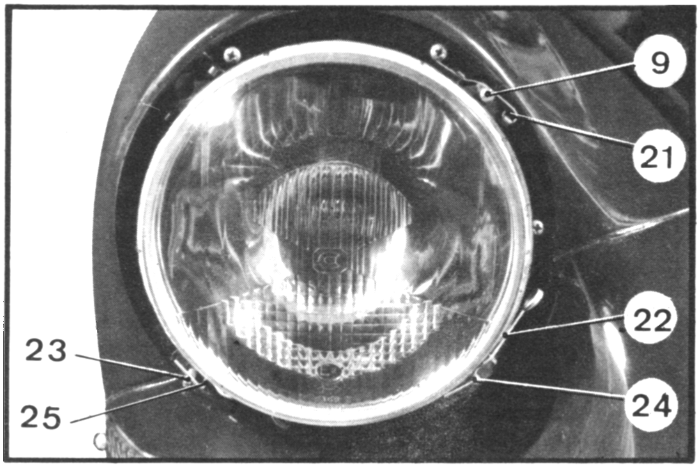
To obtain this distance :

a) Disconnect the control assembly.

b) Position the lever (e) of the headlamp control cross-bar so as to bring the headlamp light units approximately parallel to the edges of the headlamp bodies on the front wings.

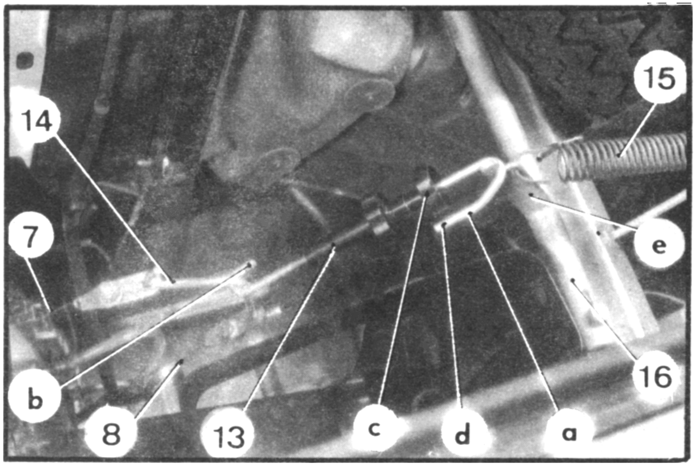
Hook the return spring (15) on the lever, choosing a hole in the lever to give distance « m » equal to 70 ± $^{10}_{0}$ mm.

1397



c) If necessary, re-adjust the control rods (9) and (10), pre-adjusted in § 3. After this operation, the control rods should protrude by between 8 and 28 mm.

1503

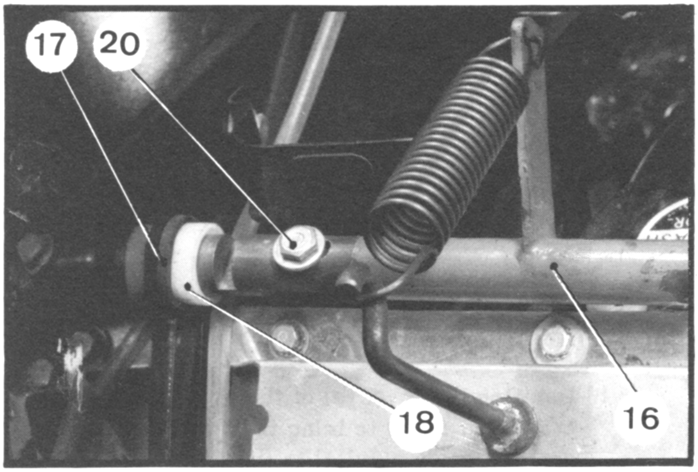


d) Positioning the control rod (13).
Turn the hook « a » of the front rod of the assembly (13) towards the front R.H. wing.

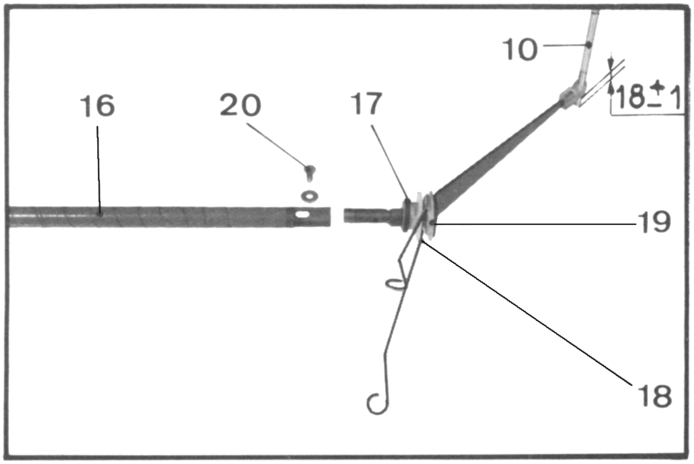
- Turn the hook « b » of the rear rod of the assembly (13) towards the engine.
- Screw the adjusting knob until the front edge of knob « c » is in line with the central mark « d » on the front hook.

e) Adjust the length of the two cables (7) and (8) by means of the cable-tightener screws, so that the control rod (13) is approximately perpendicular to the centre of the line going through the cable hooks on the integrator (14) and so that the R.H. headlamp light units are approximately parallel to the edge of the R.H. headlamp body on the front wing.

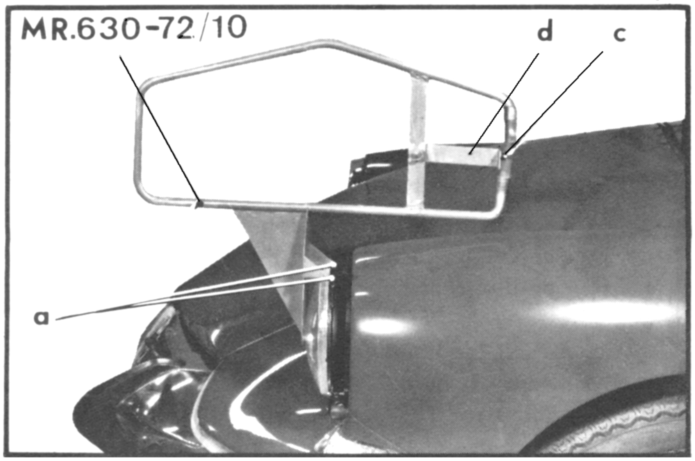
1394



1395



1816



5. Checking the operation of the control bar (16).

NOTE : So that this bar can rotate properly, it is necessary that :

- the bearings (18) lie against the inside of the wings correctly,
- the rubber joints (17) are correctly fitted to the bearings (18) on the engine side, and lie against the inside of the wings.
- the end-float of the bar is well adjusted,
- if the bar is moved to the right, it returns easily to the left of the vehicle, and the lever lies against the R.H. bearing correctly.

Adjust the end-float of the bar, the clearance must be from 2 to 4 mm.

a) Push the bar towards the right until the spring, the bearing (18) and the washer (19) all come into contact.

b) Measure the distance between the lever and the bearing on the R.H. side, it must be from 2 to 4 mm.

If it is not, slacken screw (20) securing the control bar (16). Move the bar laterally (by means of the slots in the bar). Tighten screw (20) and check the clearance again.

6. Checking the self-levelling device.

Before adjusting the headlamps themselves, it is advisable to check the operation of the self-levelling device.
In order to do that :

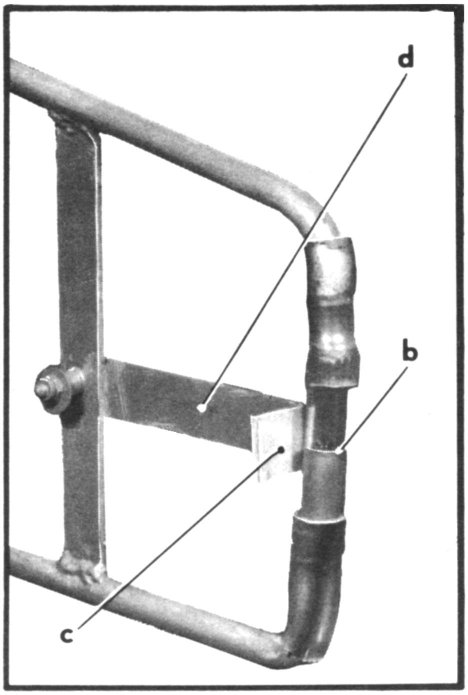
a) Put the vehicle in the *highest position*
b) Remove the L.H. headlamp rim.
c) Fit appliance MR. 630-72 / 10 to the headlamp unit (see photograph). This appliance must be perpendicular and vertical. Check that the two hooking lugs « a » are resting on the rear part of the headlamp unit.

Adjust indicator « d » so that mark « c » is opposite the level of the liquid in the plastic tube.

d) Proceed as follows. (during this operation, the level of the liquid must not move by more than 7 mm).

Press hard on the main brake pedal and, by means of the manual height control lever, lower the vehicle as slowly as possible. At first, only the front descends, until the height control lever is in the normal running position, after which both the front and the rear descend more or less simultaneously, until the lever is in the lowest position.

1817



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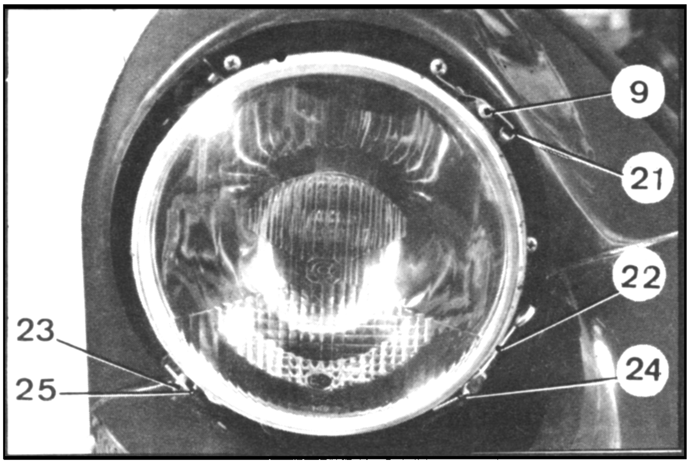

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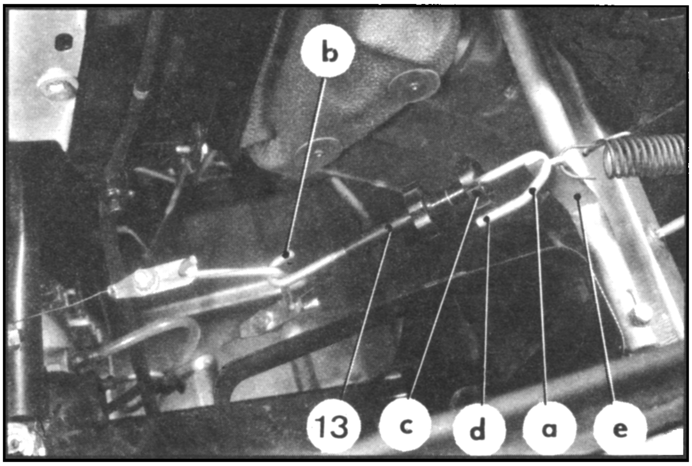


NOTE : If this is done too quickly, the timing device in the front R.H. wing will slow down the movement of the headlamp.

In this way, it is possible to check the front and rear headlamp controls. If one or the other is faulty, the liquid does not remain opposite the mark during the corresponding phase of descent.

If there are stiff points in the control, the level will fluctuate rapidly.

e) If the liquid moves by more than 7 mm in the tube, the stiff points hindering the self levelling device, and the positioning of the timing device must be checked (see § 10, same operation).

NOTE : If tool N° MR 630-72/10 is not available, proceed as indicated in D. 540-0 § 10 page 8.

III. ADJUSTING THE HEADLAMPS.

7. Ensure :
- that the upper spring pin (21) is in tension in the groove of the control rod (9)
- That the spring (22) embeds itself in the screw locating spring to prevent slip
- that the headlamp unit, when disconnected from the control rod, pivots freely. (if not, check the position of the leads and wiring connectors, which may foul the housing).
- that the points of the lower springs (22) and (25) press on the headlamp unit flange.
- that the lower pivot screws are correctly positioned in the bearing holes.
- that the leads pass through the hole at the bottom of the headlamp body.
- that the hole at the top of the headlamp body is fitted with a rubber plug (if not, the air pressure when travelling fast may raise the headlamp).
- that the plated headlamp rim is of the type designed for headlamps with self-levelling device.

8. Put the circuits under pressure and leave the engine idling during the adjustment.

9. Adjusting the headlamps.

Use a device such as « Reglolux » or « Regloscope ». Ensure that the vehicle and the adjusting device are on the same plane.

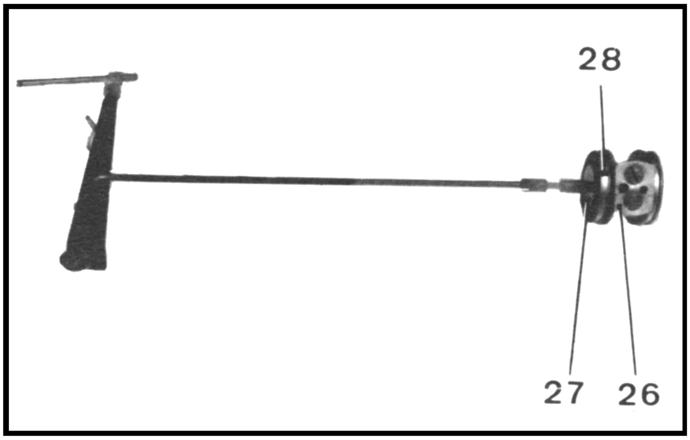
a) Loosen without removing, the 2 screws securing the delay device (26) on the front wing and make sure that during the adjustment the delay device (26) does not restrict the movement of the controls.

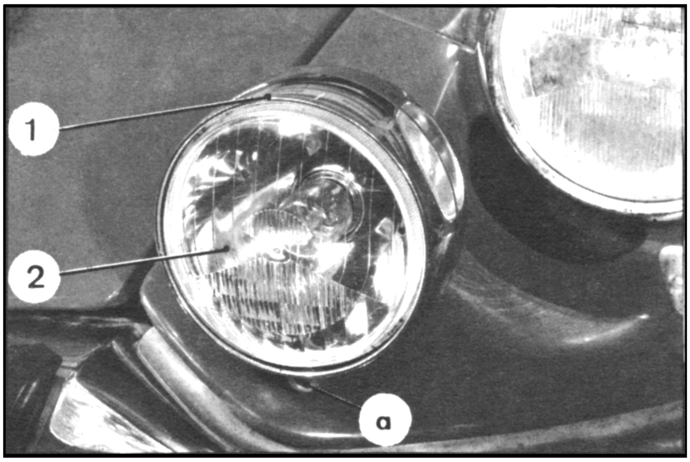
b) To adjust the unit laterally, turn the lower outer screw (23).

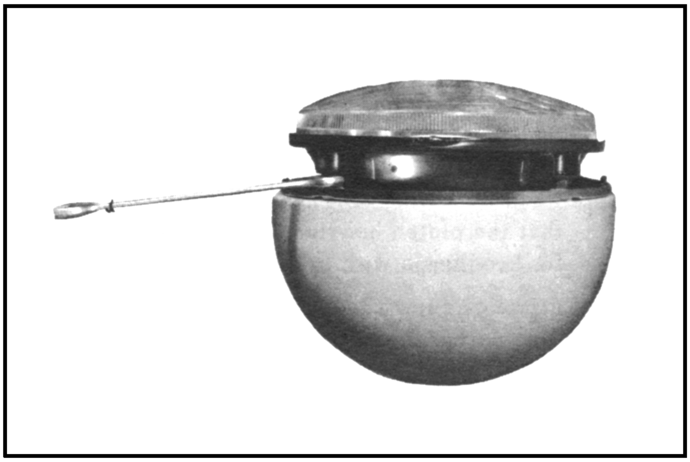
c) To adjust the unit vertically, use the control rod (9).

d) If both headlamps are set too high, adjust the length of the adjuster (13), by means of its sleeve. This should not be moved more than 2 graduations from the central graduation.

1396







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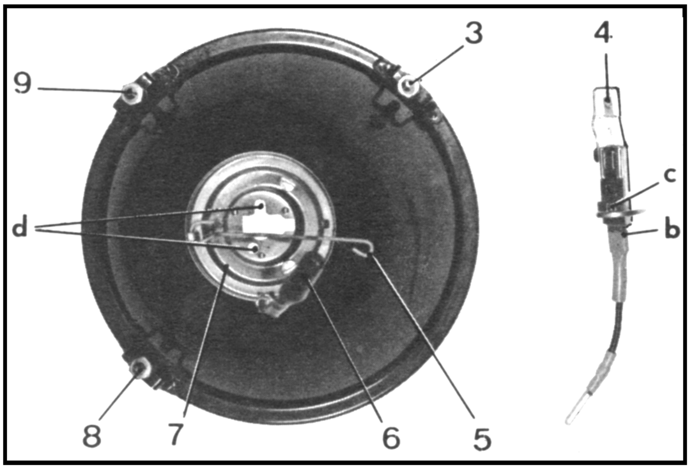


NOTE :

- Do not press on the adjusting screw with a screwdriver. After each adjustment tap the headlamp glass to stabilize its position.
- Do not interfere with the adjustment of the screw (24) locked with a hexagonal nut.

10. Adjust the position of the delay device.
With the thumb and index finger hold the two cups (27) level with their retaining rings (28). The body of the delay device will position itself so that the slide-valve is in the middle of its stroke.

IV. REPLACING A QUARTZ - IODINE HEADLAMP BULB.

PRECAUTIONS :

This operation must only be carried out with the headlamps switched off.
After switching off, it is advisable to let the headlamps cool for 5 minutes before proceeding to handle them.

Do not touch the bulb with the fingers . If this is done inadvertently, clean the bulb carefully with a little soapy water and dry with a clean non-fluffy cloth.

REMOVAL

11. REMOVE :

- the rim (1) by pulling the clip (a),
- the headlamp (2) by pulling until the 3 adjusting screws, (3), (8), and (9) for the headlamp are completely free from their plastic socket.

12. Disconnect the feed wire from the QI bulb, and the earth wire (6).

13. Unhook the spring (5) supporting the bulb. Remove the bulb .

ASSEMBLY.

14. Holding the QI bulb (4) at « b », position it in the projector with the locating dowels (C) in their housings (d).

15. Hook on the spring (3).

16. Fit the feed wire.

17. Put the headlamp unit (2) in position, engaging the 3 adjusting screws (3), (8) and (9) fully in their plastic sockets.

18. Engage the centre clip of the rim (1) in the slot, and push the rim on.

V. ADJUSTING THE HEADLAMP.

The QI headlamps must be adjusted so that the centre lines of the two beams are parallel to each other, horizontal and parallel to the longitudinal centre line of the car. (use a beam-setting device such as « Regloscope » or « Reglolux ».

19. To adjust the headlamp unit horizontally, turn screw (3).

20. To adjust the headlamp unit vertically, turn screw (8).

21. Screw (9) permits simultaneous adjustment laterally and vertically.

VEHICLES ALL TYPES EXCEPT DX-DJ

→| *September 1967*

ADJUSTING THE MAIN HEADLAMPS.

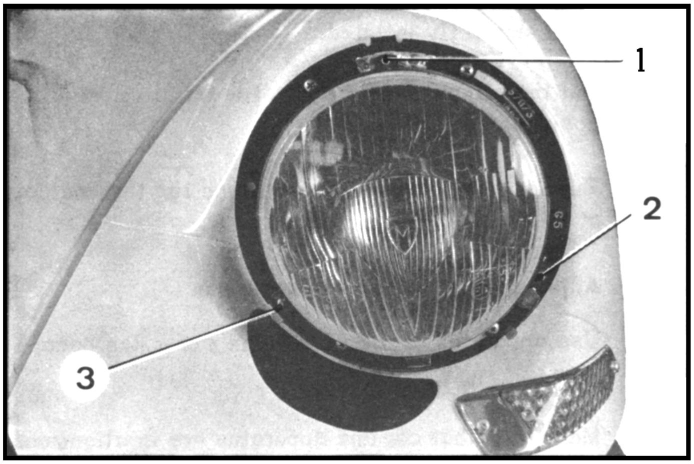
IMPORTANT NOTE.

1) Make sure that the engine is running, heights adjusted, tyres correctly inflated.

2) Put the manual height control in « normal » position and run the engine at idling speed during the adjustment.

3) Use apparatus of the « Reglolux » or « Regloscope » type.

4) Make sure that the car and apparatus are in alignment.



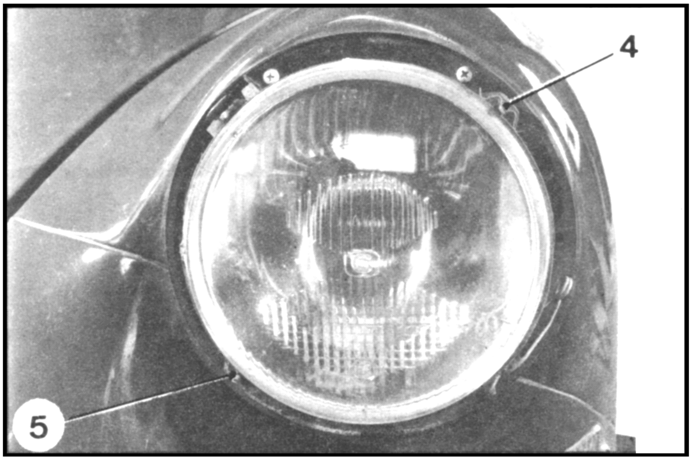
ADJUSTING AN SEV-MARCHAL HEADLAMP.

1. To adjust the unit laterally, turn the lower screws (2) and (3)

2. To adjust the unit vertically, turn the upper screw (4).

Manual 814-1

2304



ADJUSTING A CIBIE HEADLAMP.

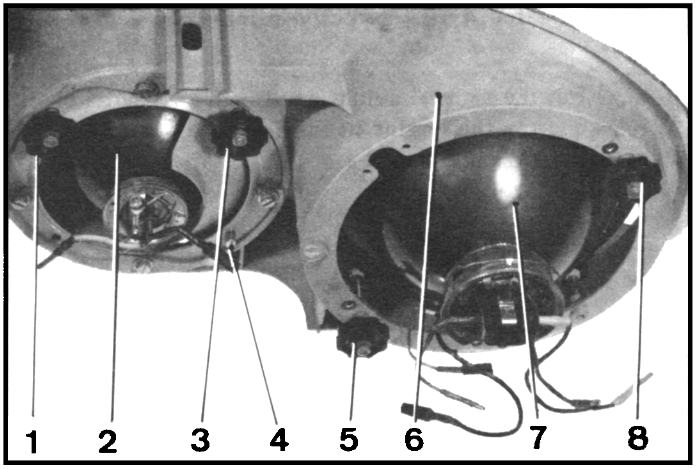
3. To adjust the unit laterally, turn the lower screw (5).

4. To adjust the unit horizontally, turn the upper screw (4).

NOTE : Adjust the height as precisely as possible. The upper limit of the dipped beam should coincide with the upper line of the adjustment area on the apparatus.

VEHICLES ALL TYPES

|——► *September 1967*



ADJUSTING THE MAIN HEADLAMPS AND FIXED AUXILIARY HEADLAMPS.

5. Make sure :
- that the panel and the panel closing plate are tightly fitted,
- that the wing is tightly fitted,
- that the headlamp unit support is tightly fitted in the wing.

6. IMPORTANT NOTE :

Make sure that the engine is running height adjusted, tyres correctly inflated.

Put the manual height control lever in « normal » position.

Put the circuit under pressure and run the engine at idling speed during adjustment.

7. Adjustment of fixed main headlamp (7).
Use apparatus of the « Reglolux » or « Regloscope » type.

Make sure that car and apparatus are in alignment.

Lift the bonnet to reach the adjustment screws inside the wing.

a) To adjust the unit laterally, turn the lower screw (5).

b) To adjust the unit vertically, turn the upper screw (8).

The upper limit of the dipped beam should coincide with the line on the screen « European code » (adjustment with no tolerance).

8. Adjustment of fixed auxiliary headlamp (2).
Use apparatus of the « Reglolux » or « Regloscope » type.

Make sure that car and apparatus are in alignment.

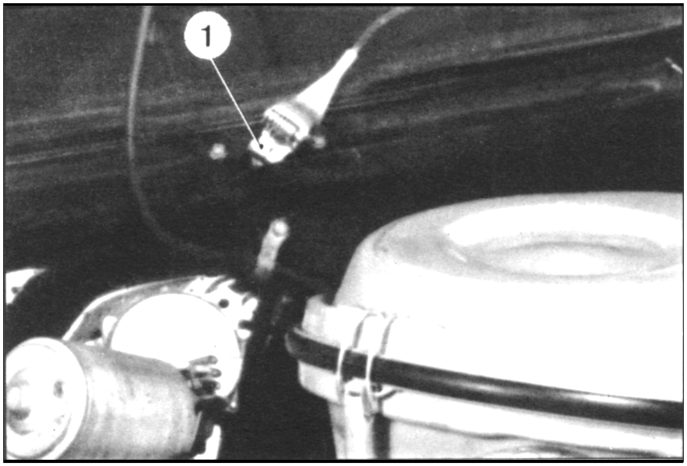
Lift the bonnet to reach the adjustment screws inside the wing.

a) To adjust the unit laterally turn screw (3) until the main beam is on the centre point of the sighting-mark of the screen.

b) To adjust the unit vertically turn screw (1) until the main beam is on the centre point of the sighting mark of the screen.

VEHICLES ALL TYPES

2270



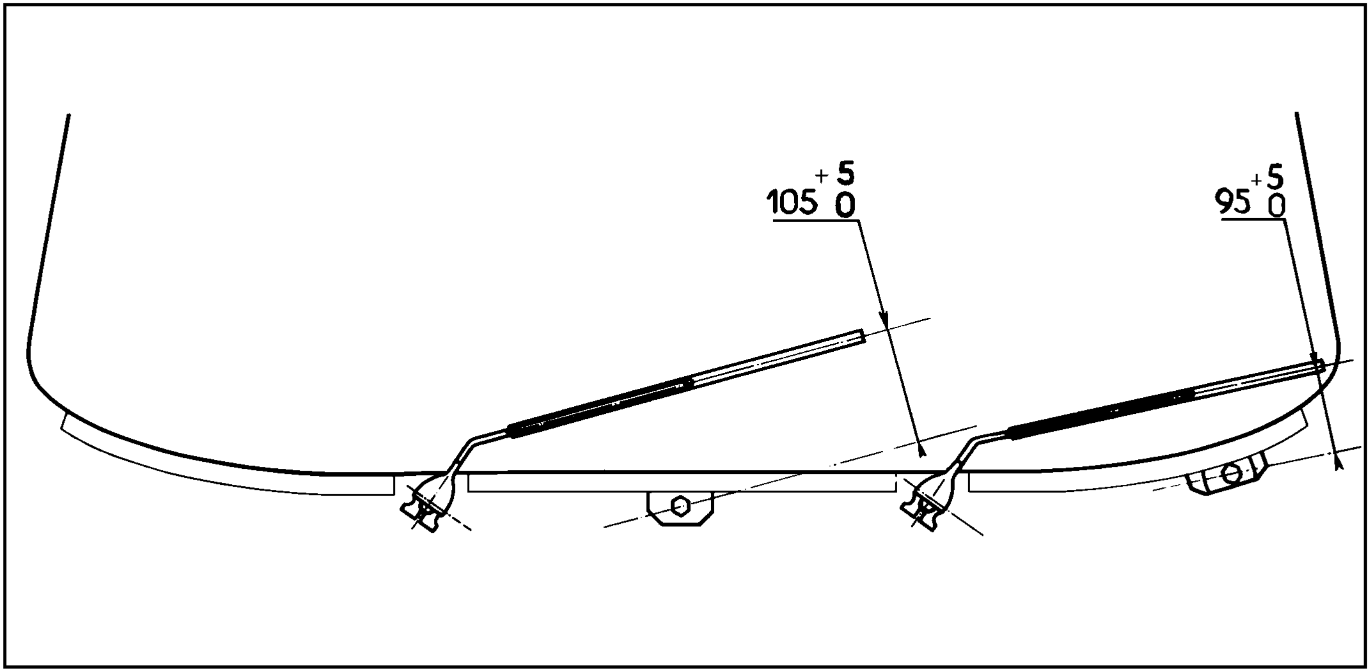
POSITION OF ARMS.

1. Loosen screws (1)

2. Position wiper arms on their axes as illustrated below.

3. Tighten screws (1) to 4 mΛN (0,4 m. kg) (2,9 FT LBS)

X. 85



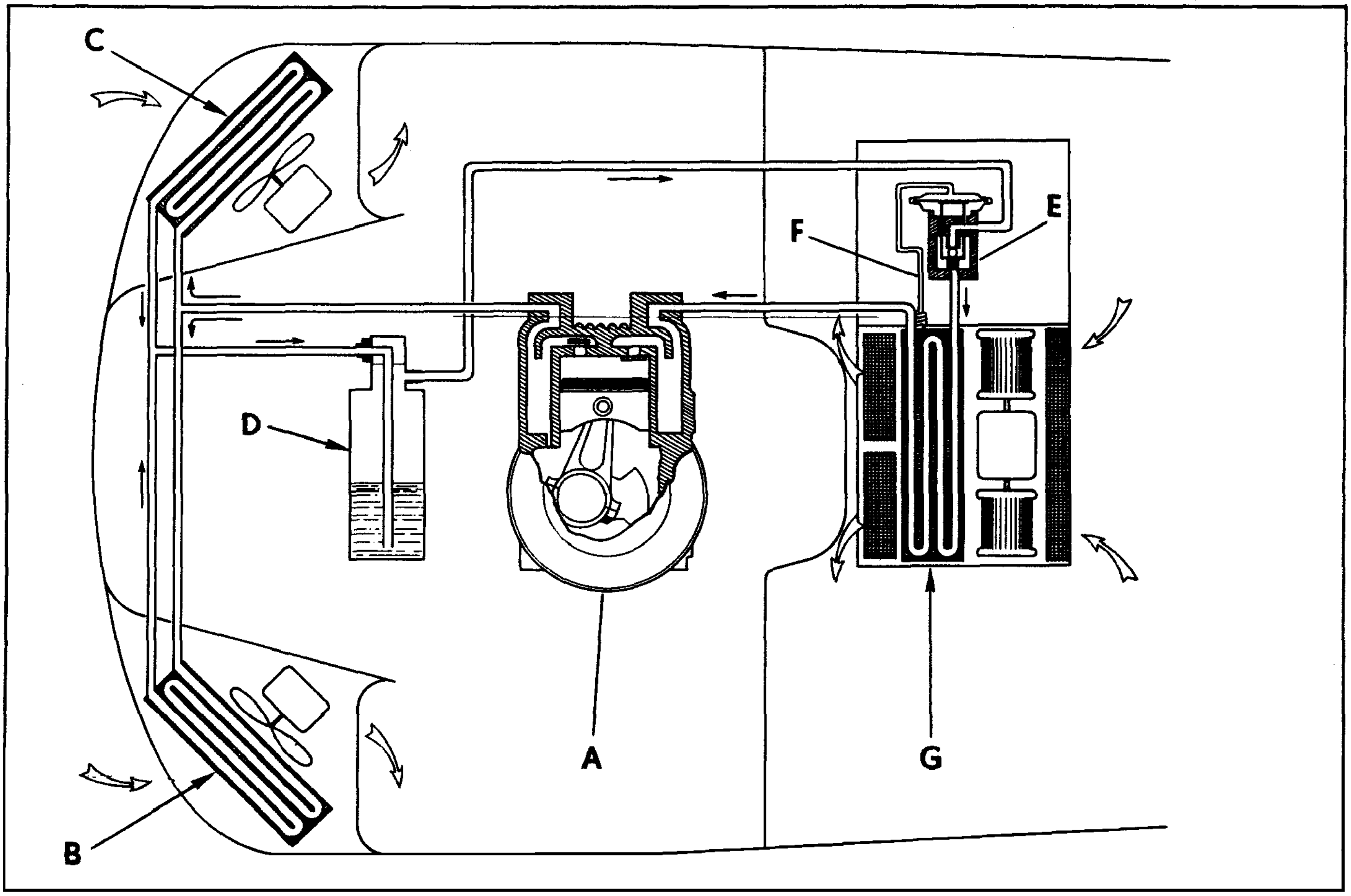
ALL TYPES OF VEHICLE
except DV

COOLING SYSTEM

This allows the air entering the passenger compartment to be cooled whilst at the same time extracting part of its moisture. (this reduces misting up)

1. DIAGRAM SHOWING WORKING PRINCIPLES OF SYSTEM

D. 64-52



A :	Compressor	E :	Expansion chamber
B :	LH condensor	F	Temperature sensor
C :	RH condensor	G :	Evaporator
D :	Dehydrating reservoir		

The compressor A sends the coolant along a hermetically sealed circuit. It sucks in the fluid as vapour at low pressure, compresses it (producing a rise in temperature) and re-circulates it to the condensers.

Condensers B and C allow the fluid to condense, giving up its stored heat to the outside air which circulates through the ribs. On leaving the condensors, the fluid, now a liquid at high pressure, crosses the dehydrating reservoir.

The dehydrating reservoir D stores the fluid and extracts the moisture from it.

The expansion chamber E controls the flow of fluid to the evaporator

The temperature sensor F is situated on the outlet pipe of the evaporator. It controls the expansion chamber. ensuring that all the fluid entering the evaporator is vaporized and that the compressor does not suck in any fluid in a liquid state which would cause immediate damage.

The evaporator G allows the fluid to evaporate. The heat necessary for this evaporation is taken from the passenger compartment by means of the walls, thus cooling the passenger compartment. The fluid at low pressure is consequently turned into vapour which is sucked in by the compressor and the cycle begins again.

II. COMPONENTS

Compressor :	YORK A. 206 (MITCHELL 7 039)
Lubricating oil :	TOTAL "LUNARIA 25"
Electro-magnetic cut-in :	POLYFLEX - 12 V (5" 5/8)
Belt :	POLYFLEX 11
Pulley ratio :	$\frac{\text{drive pulley}}{\text{drive pulley}} = \frac{108 \text{ mm}}{144 \text{ mm}} = 0.75$
Condenser :	CHAUSSON
Dehydrating reservoir :	MITCHELL Mark IV
Evaporator block :	SOFICA " CAPRI Console"
Coolant :	R. 12
Weight of coolant :	1 kg (2.2 lbs)
Flexible pipes :	STRATAFLEX 256

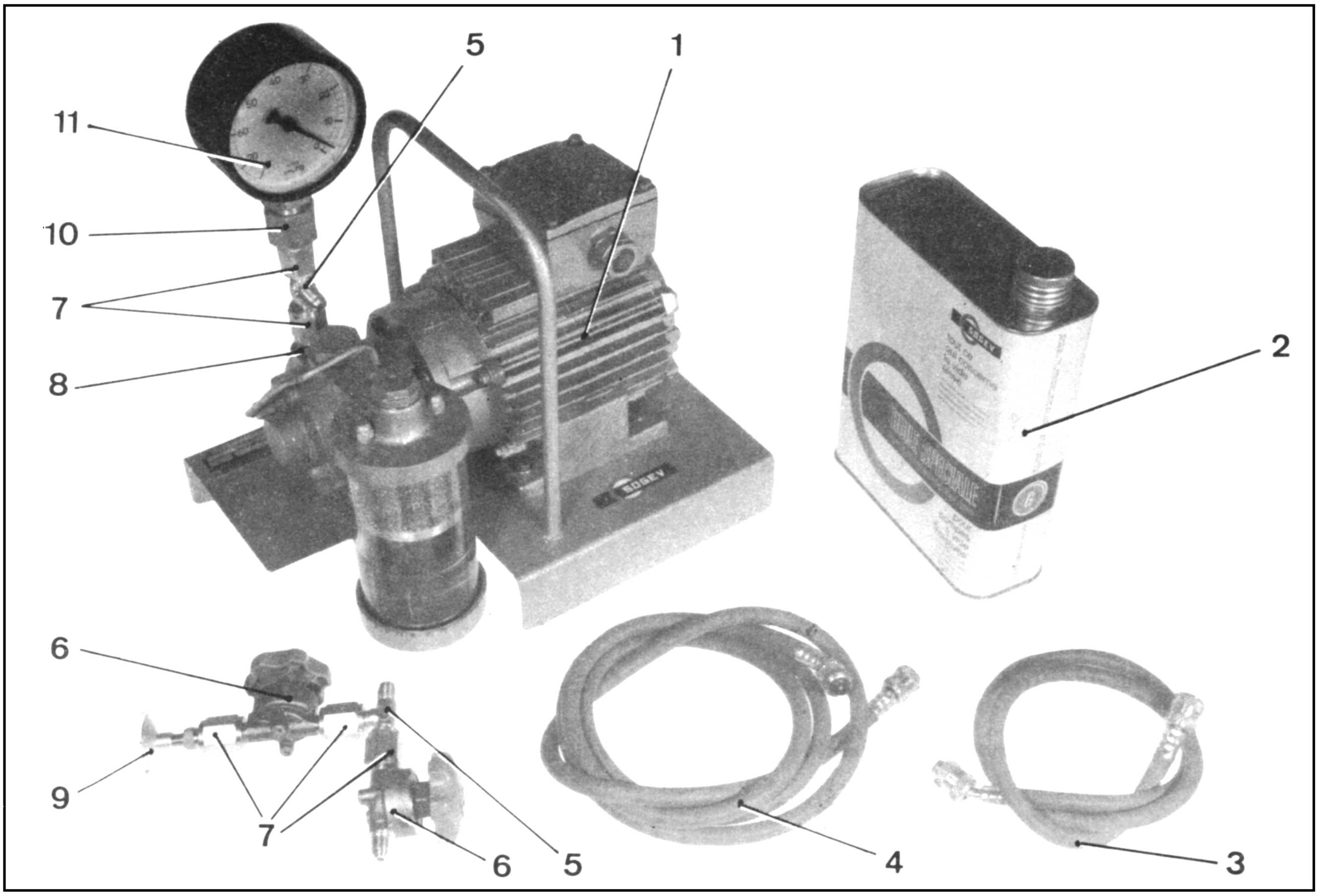
III CONTROLS

See operation D. 513-00

S.O.G.E.V. EQUIPMENT FOR FILLING THE COOLING CIRCUIT

sold under ref. No. B 01 1 409/2

9878



Replacement Parts : The parts listed below can be obtained directly from the relevant suppliers or via the S.O.G.E.V.

Marking on part	Number of parts in set	Description of material	Name and address of supplier
1	1	Vacuum pump ref. AG. 1300, spare gaskets, glass cylinder (level indicator) and operating instructions 7 407 400	S.O.G.E.V. 25, rue de Chony 26 - BOURG-LES-VALENCE Tel : 43-00-83 FRANCE
2	2 L (3 $\frac{1}{2}$ pts)	"G" oil for vacuum pump	
8	1	Double male union for welding ref : DM. 96	
3	1 = 0.900 m	Flexible pipe "Duo test robinair" ref : CH. 36 E 1	ROLESCO 58, avenue P.V Couturier 92 - LEVALLOIS FRANCE
4	1 = 1.800 m	Flexible pipe "Duo test robinair" ref : CH. 72 E 1	
5	2 L (3 $\frac{1}{2}$ pts)	Tee pipe R.I.F. ref. T 1.1/4 "Flare"	
7	5	Double female union ref : PF 1 1/4 "Flare"	
6	2	Valve B.M.L. 6	BRANCHET - 2, rue de Savoie 69 - SAINT-PRIEST FRANCE
9	1	Complete adapter for PRESTOGAZ R 12 spray	From refrigeration specialists
10	1	Reducer ref.: 64 64 31 (1/2" - 1/4")	S.E.R.S.E.G. 1, cours Albert Thomas 69 - LYON - 3 FRANCE
11	1	Vacuum meter (ϕ = 80) ref : 6303 Z 3	

IMPORTANT NOTE

The operating instructions (ref. 7 407 400) supplied with the S.O.G.E.V. vacuum pump must be consulted before starting up the latter, and for matters concerning its maintenance and repair.

The incorrect connecting up of the electric motor, or starting the vacuum pump without "G" oil would bring about rapid deterioration of the components.

1. FILLING THE COOLING CIRCUIT
using S.O.G.E.V. equipment and a PRESTOGAZ R.12 spray.

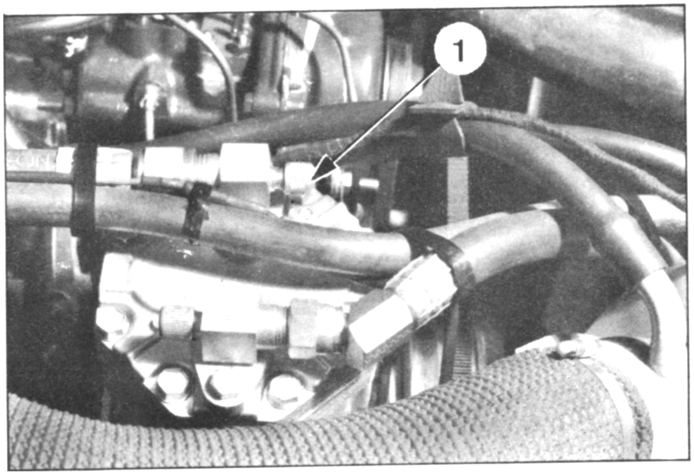
NOTE :

Equipment used in this operation :

a) *S.O.G.E.V. equipment* - Reference : B. 01 1409/2
- Supplier : Etablissements S.O.G.E.V. 25 rue de Chony
26 - BOURG-LES-VALENCE (Tel : 43-00-83) FRANCE

b) *PRESTOGAZ R. 12 sprays :* 1 kg (2.2 lb) sprays sold by the Replacement Parts Dept. under ref : N° ZC 9857 108 U

10316



IMPORTANT :

Precautions to be taken during this operation :

a) Protective goggles MUST be worn.
b) Do not smoke : in the presence of a flame, R.12 changes into a toxic gas.
c) Never heat any part of the cooling circuit
d) Never start up the cooling system with the two cooling fans disconnected

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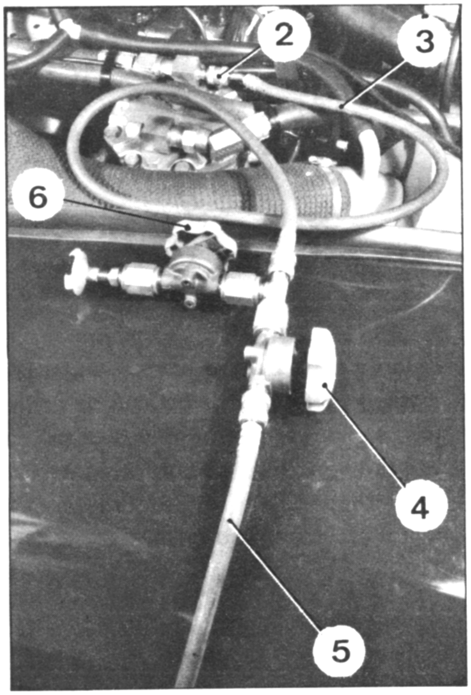


1. Drain the circuit :

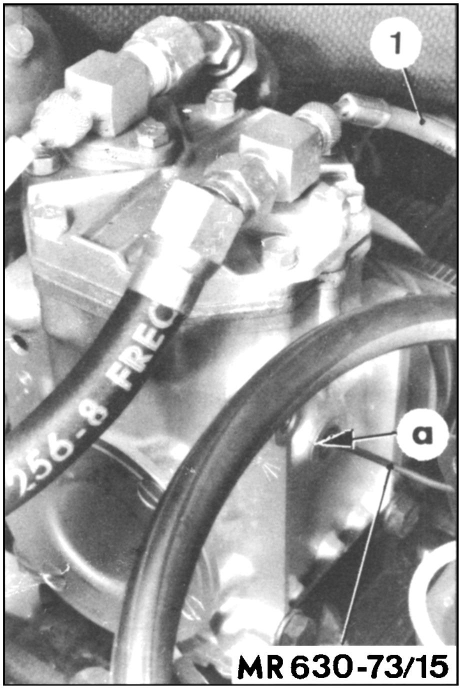
NOTES :

- This operation should be carried out in a well ventilated area.
- The cooling circuit must be drained before any repair can be carried out on it.

a) Make sure that the tap (4) marked "VIDE" (empty) and the tap (6) marked "FREON" are closed.

b) Remove the plug (1) of the compressor suction valve, and connect in its place the union (2) of the flexible pipe (3)

c) Dip the end of the flexible pipe (5) into an open receptacle in order to break up the fluid jet and prevent it turning into vapour.
Open the tap (4) marked "VIDE" (empty)
Close the tap (4) again when the circuit has been drained. (i.e when the gas jet ceases to make a hissing noise)



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2. Check the oil level in the compressor

NOTE : *This check can only be carried out after the circuit has been drained. If this is not done, dangerous spurts of oil and coolant will result.*

a) Remove the oil filler plug at "a" and insert the dipstick, MR. 630-73/15 in the hole until it touches the bottom of the casing. The oil level should be somewhere between the minimum and maximum marks on the dipstick (these correspond to oil levels of 22 and 29 mm respectively)

b) If necessary top up using exclusively *TOTAL «LUNARIA 25» OIL*

c) Withdraw the gauge MR. 630-73/15 and replace the plug and its gasket

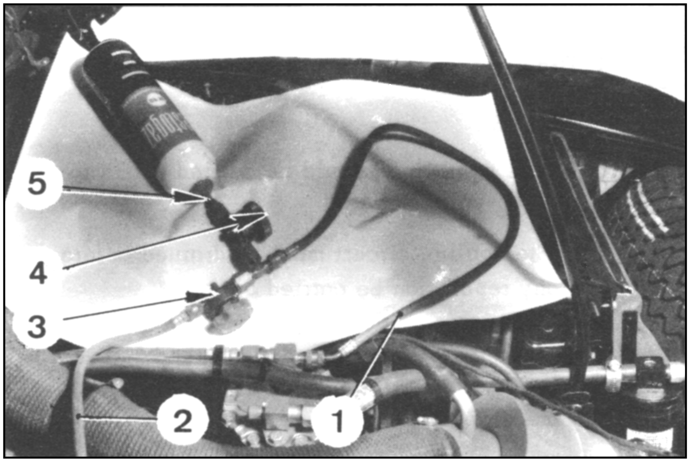
3. Empty the circuit :

NOTE : This operation consists of emptying the circuit as completely as possible in order to eliminate (by evaporation) all traces of water, which adversely affects the working of the cooling system.

a) Leaving the flexible pipe (1) of the taps connected to the suction pipe of the compressor, connect the flexible pipe (2) of the vacuum pump to the tap (3) marked "VIDE" (empty)

b) Open this tap (3) and start the vacuum pump, following the S.O.G.E.V. operations instructions

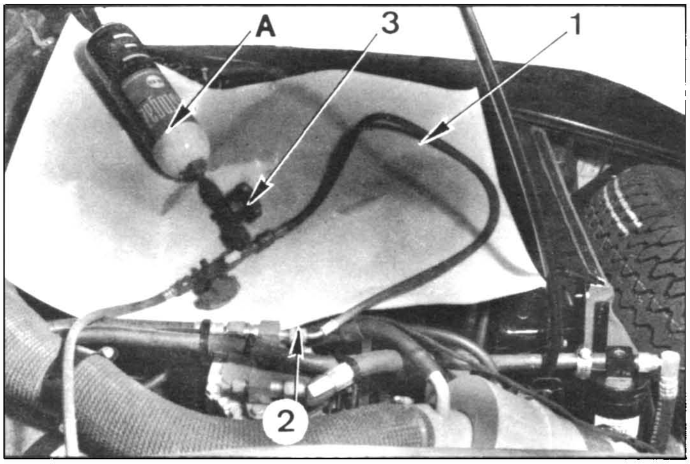
c) Operate the pump for 45 minutes at least. Close the tap (3) (marked "VIDE" (empty) and disconnect the pipe (2) from the tap.



10 317

4. Fill up the circuit :

a) Prepare the PRESTOGAZ spray :
Unscrew the "Presto-vanne" union (5) of the tap (4) (marked FREON) and connect it to the spray : to do this, slide the coupling dogs of the union (5) right into the neck of the spray, forcing them if necessary. The threaded hole of the "Presto-vanne" should be centred in the valve of the spray.



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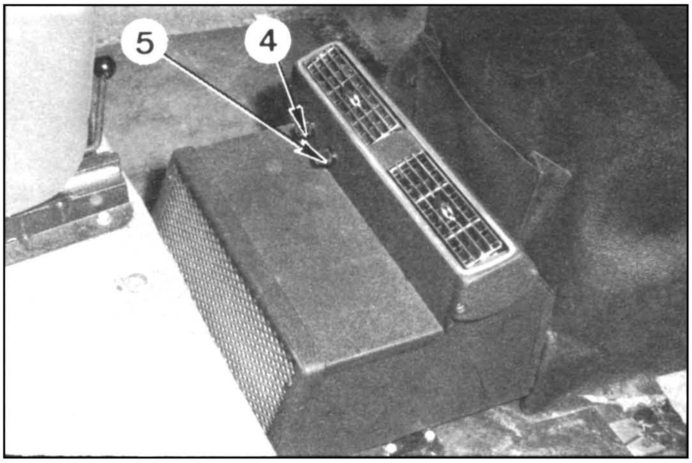
b) Connect the spray to the circuit :
Screw the spray A fitted with the "Prest-vanne" union, on to the tap (3) marked "FREON" ; *do not tighten fully*, but only until the end of the tap comes into contact with the valve; *do not turn the latter.*

c) Bleed the pipe (1)
Open the tap (3) (marked "FREON") and loosen the union (2) *which must be connected to the compressor suction valve.* Screw the spray on to the tap until the gas escapes through the union (2) and bleeds the pipe (1). Tighten the union (2).



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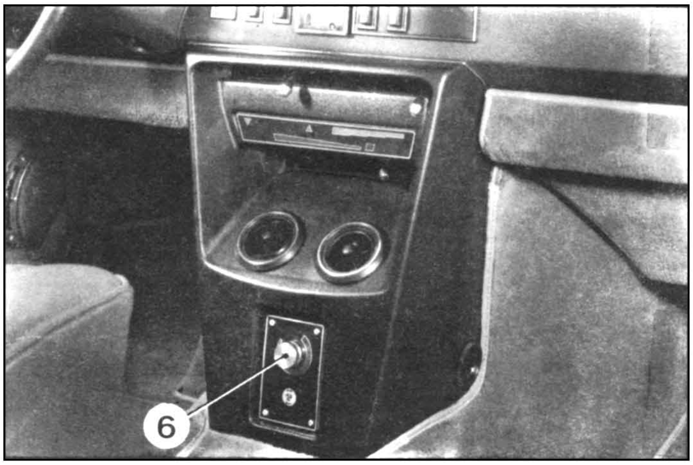
d) Fill the cooling circuit :
With the vehicle cold (as cold as possible), position the spray A upside down and hold it between the palms of the hands (which raises the fluid temperature sufficiently to fill the circuit with coolant in a liquid state).
It is possible to hear the flow of the fluid through the valve of the spray by placing one's ear against the bottom of the spray : it stops when the spray can is empty (shake the can to establish this)



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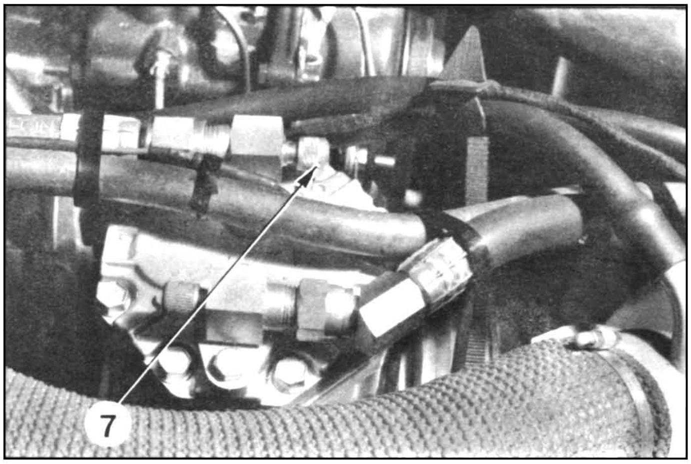
NOTE : In some cases, heating the spray with the palms may be insufficient. Should this be the case, top up the circuit with coolant in a gaseous state. To do this :

- Hold the spray right way up
- To adjust the cold and maximum ventilation :
  Vehicles →| *3/1972* : position the knobs (4) (5) fully to the right.
  Vehicles |→ *3/1972* : turn button (6) fully to the right
- Start the engine and accelerate slightly until the spray can is empty.
- Stop the engine.



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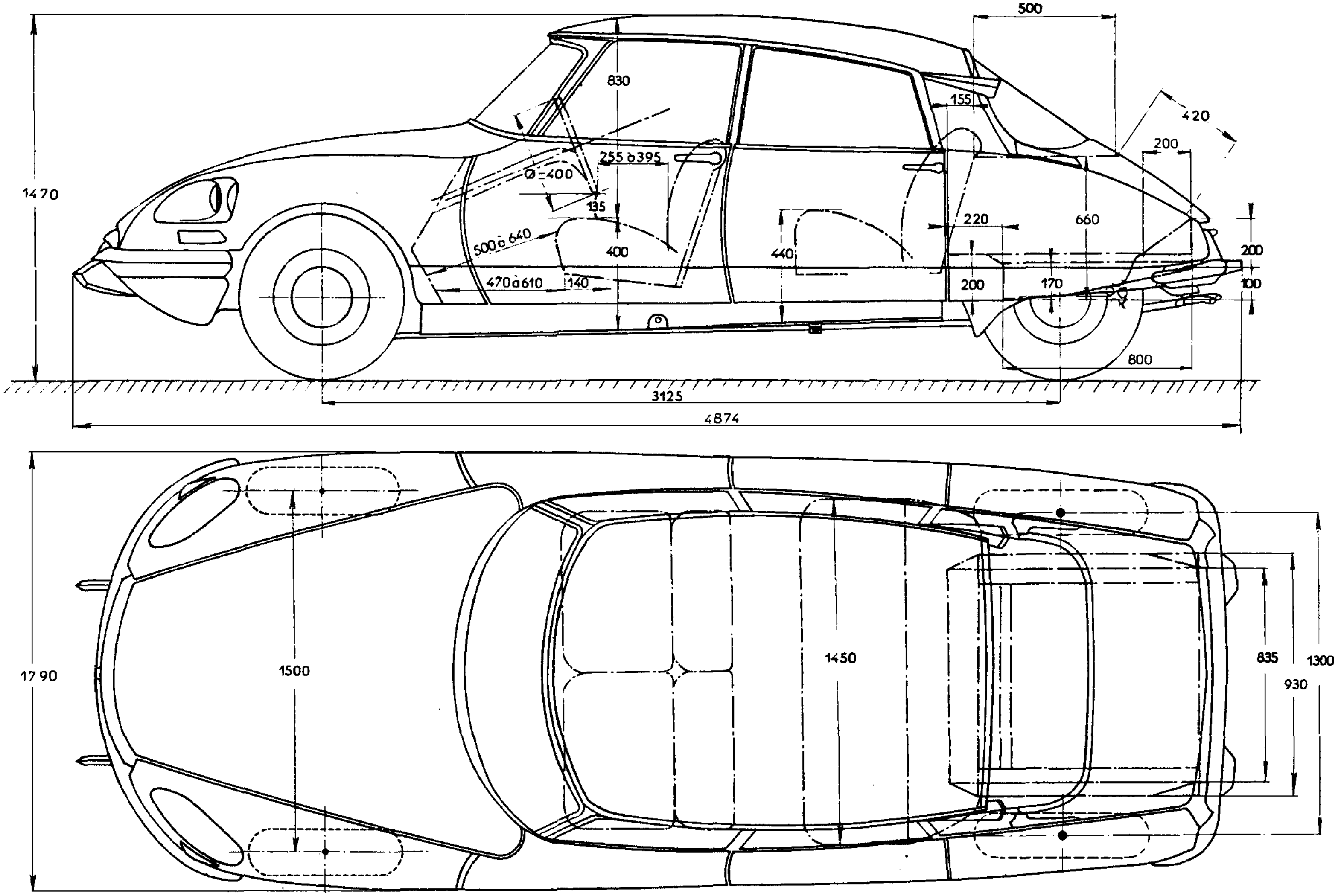
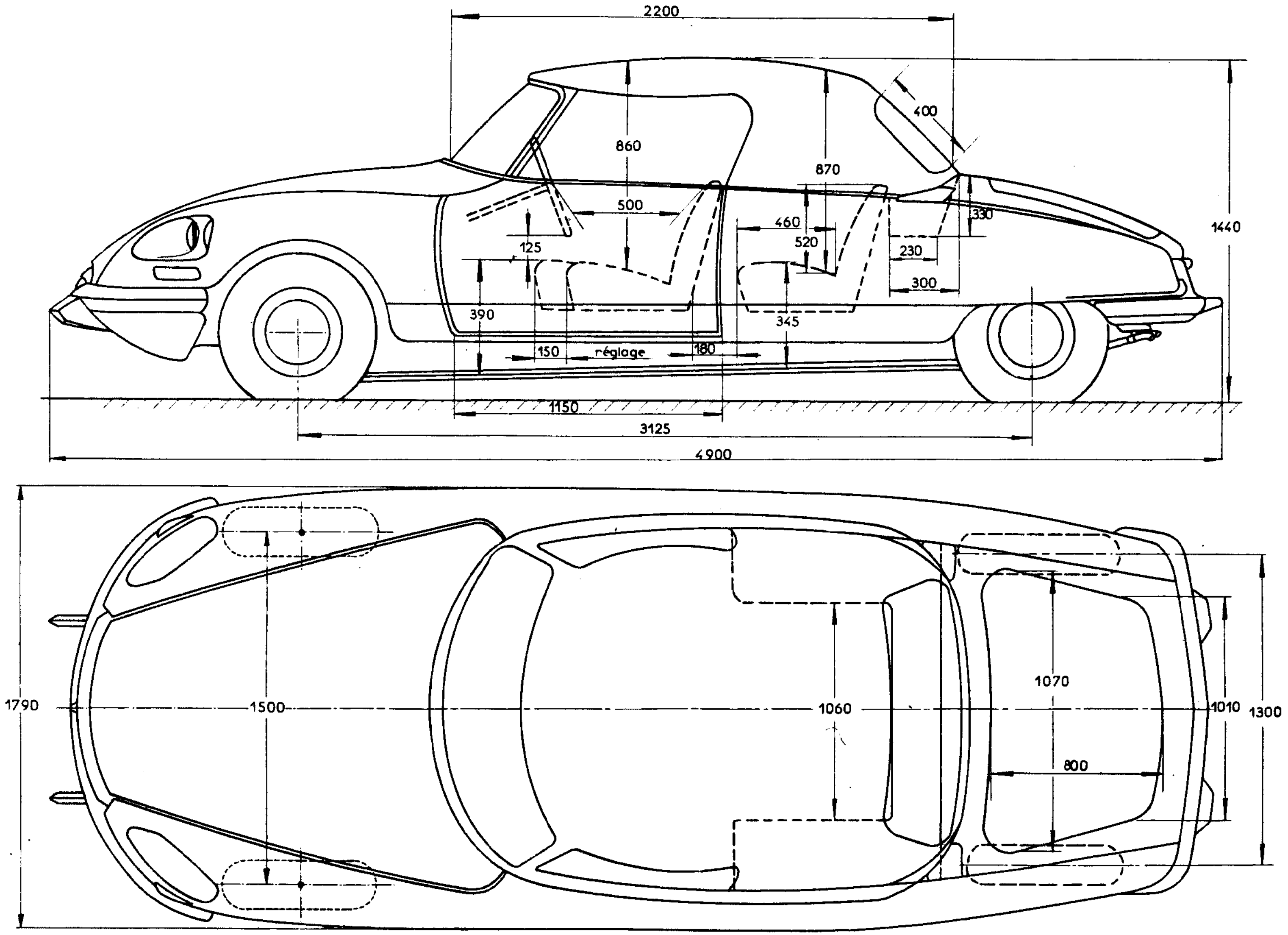
e) Unscrew the spray from the tap (3) and remove the "Presto-vanne" union. Disconnect the pipe pipe (1). Screw the plug (6) into the compressor suction valve.

VEHICLES ALL TYPES
→ *September 1967*



D. 80-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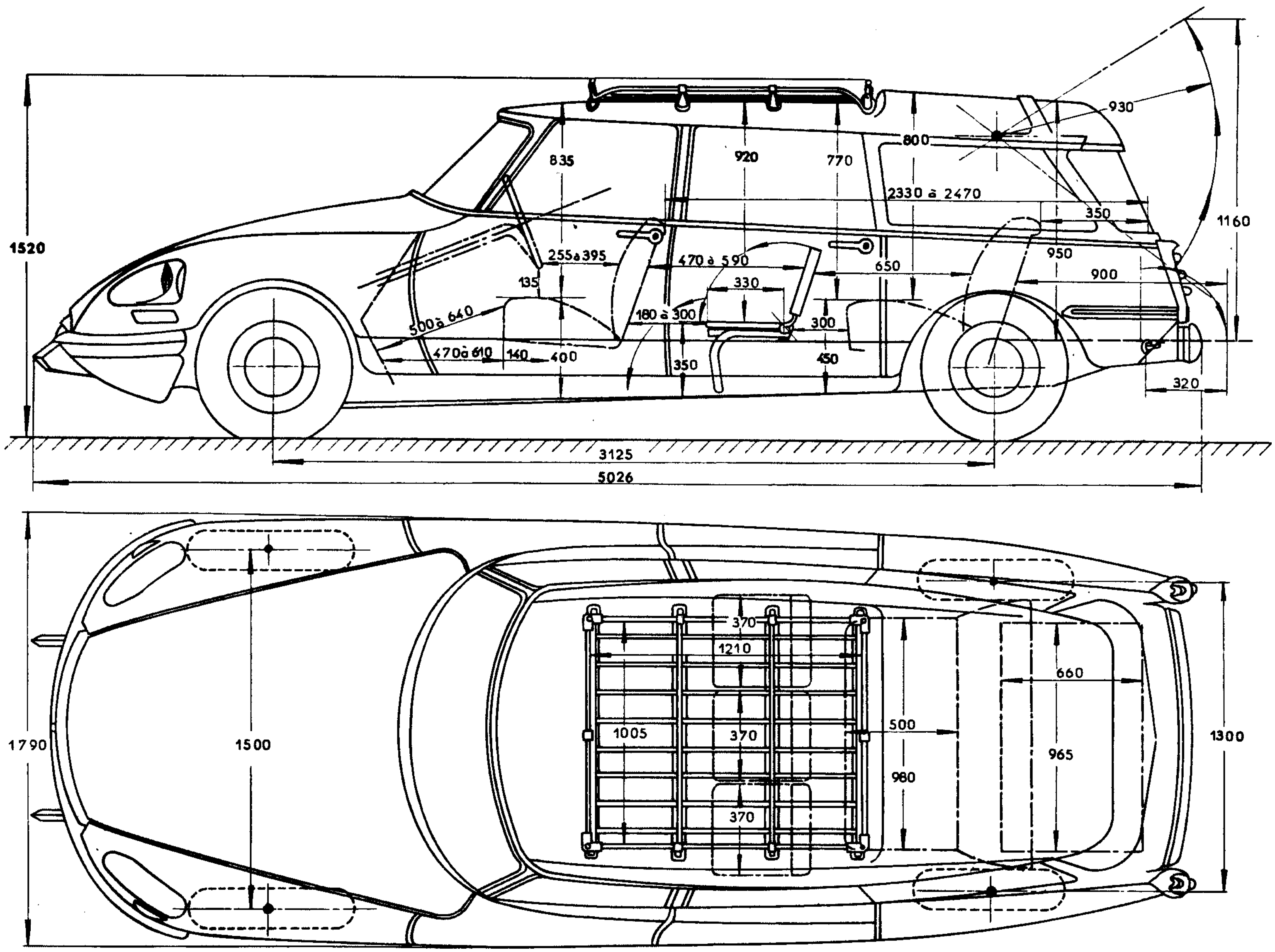
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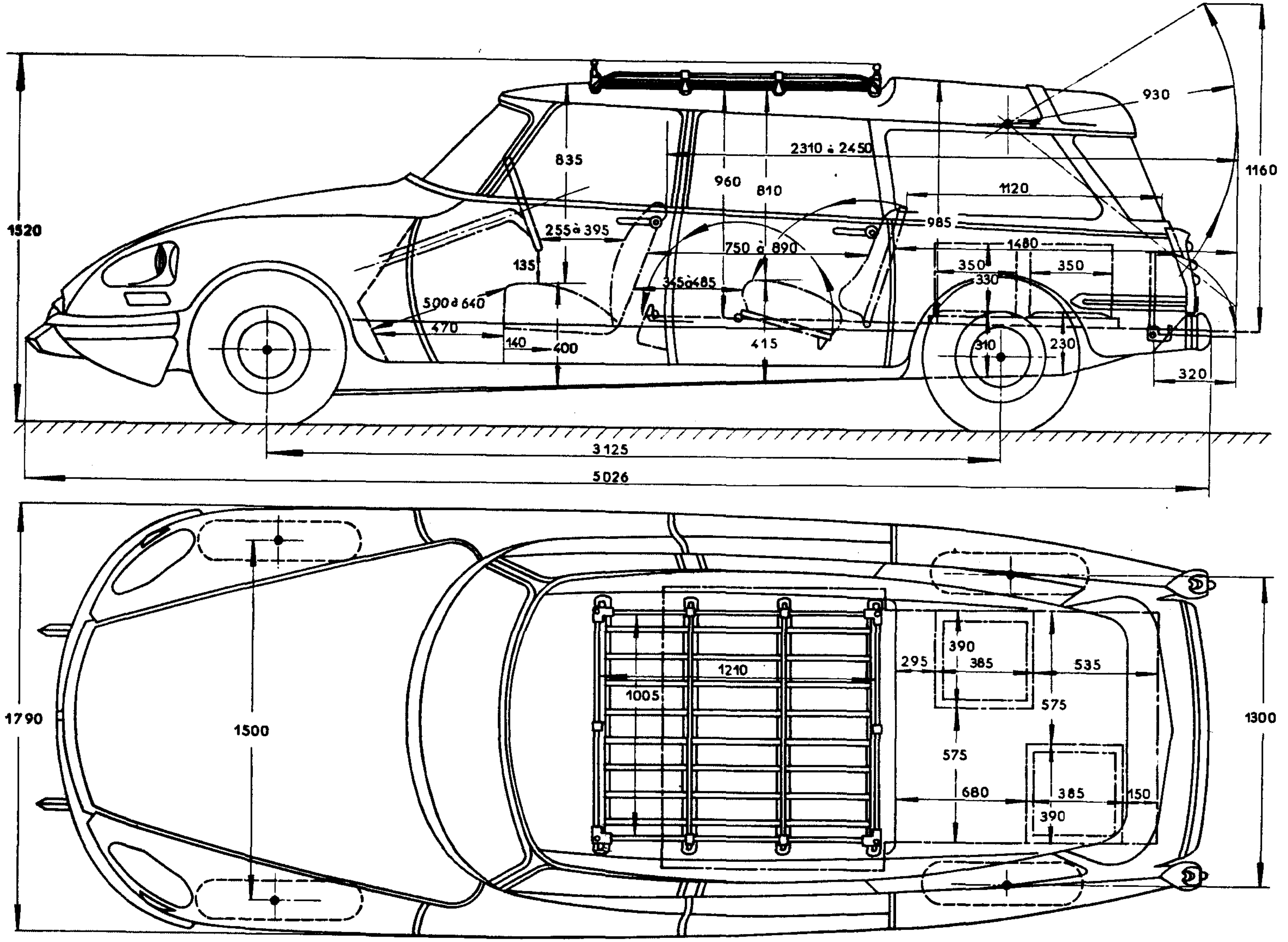
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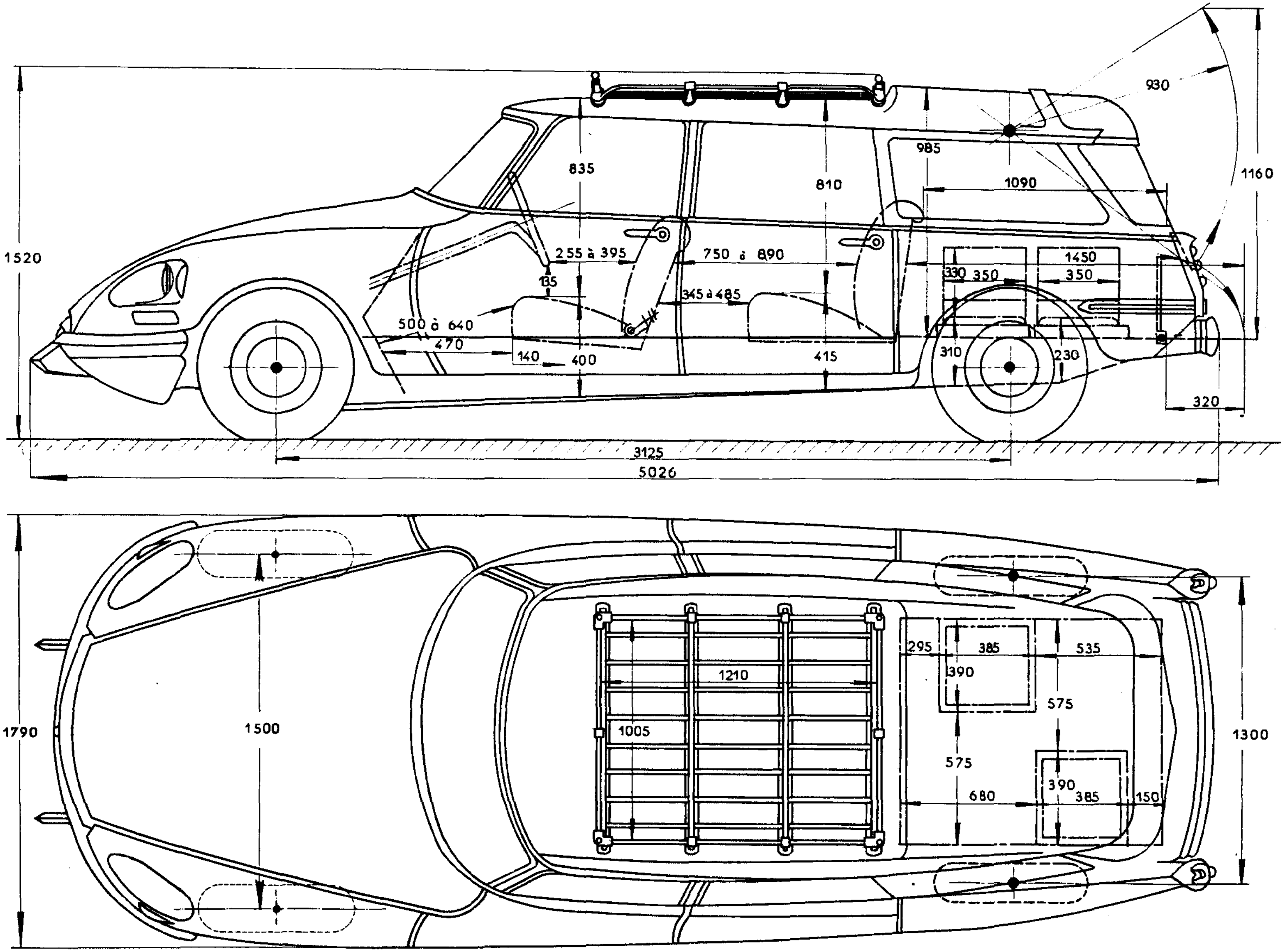
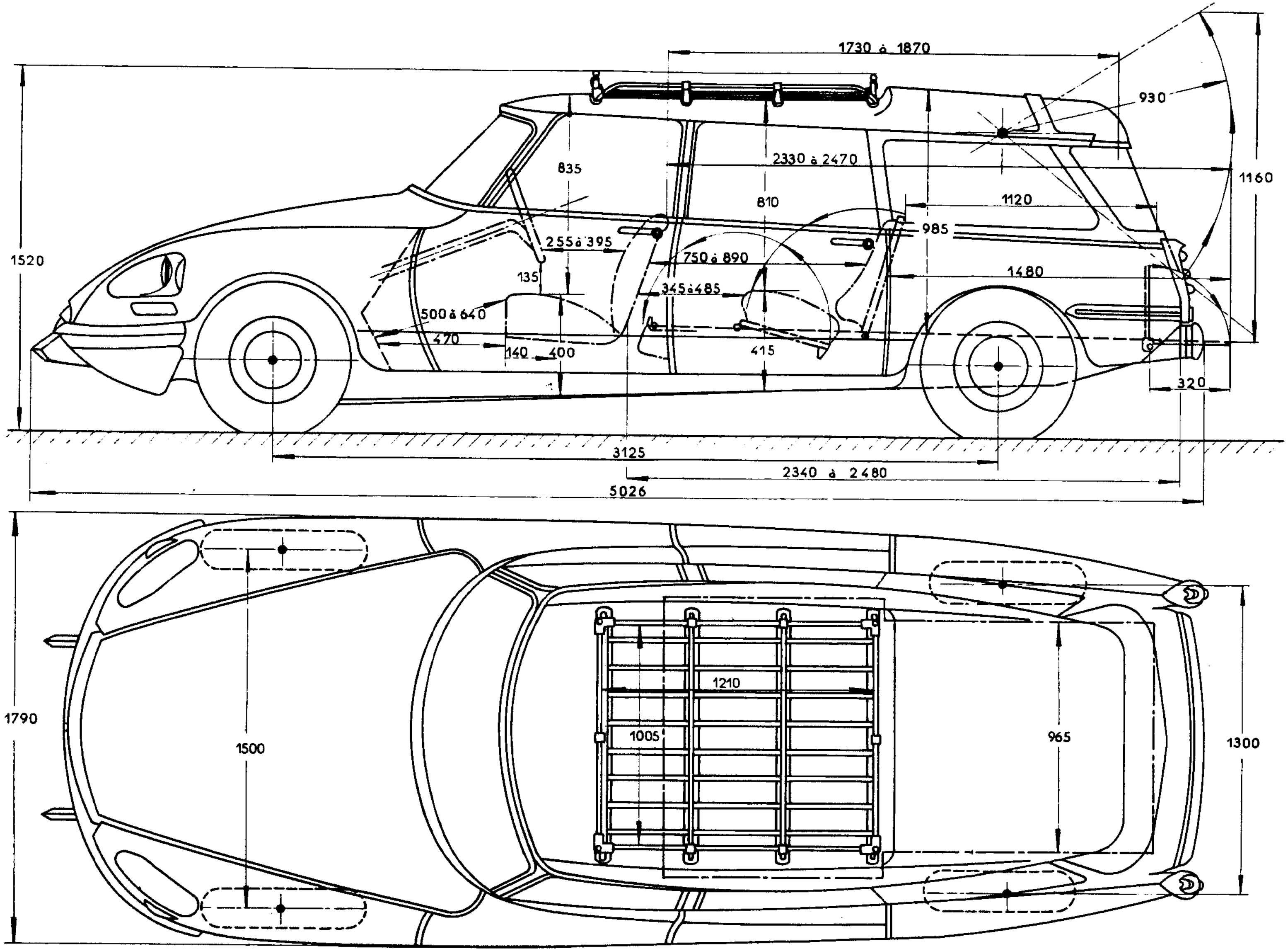
OPERATION No D. 800-00 : *Interior dimensions (safari-luxury interior)*



D. 80-1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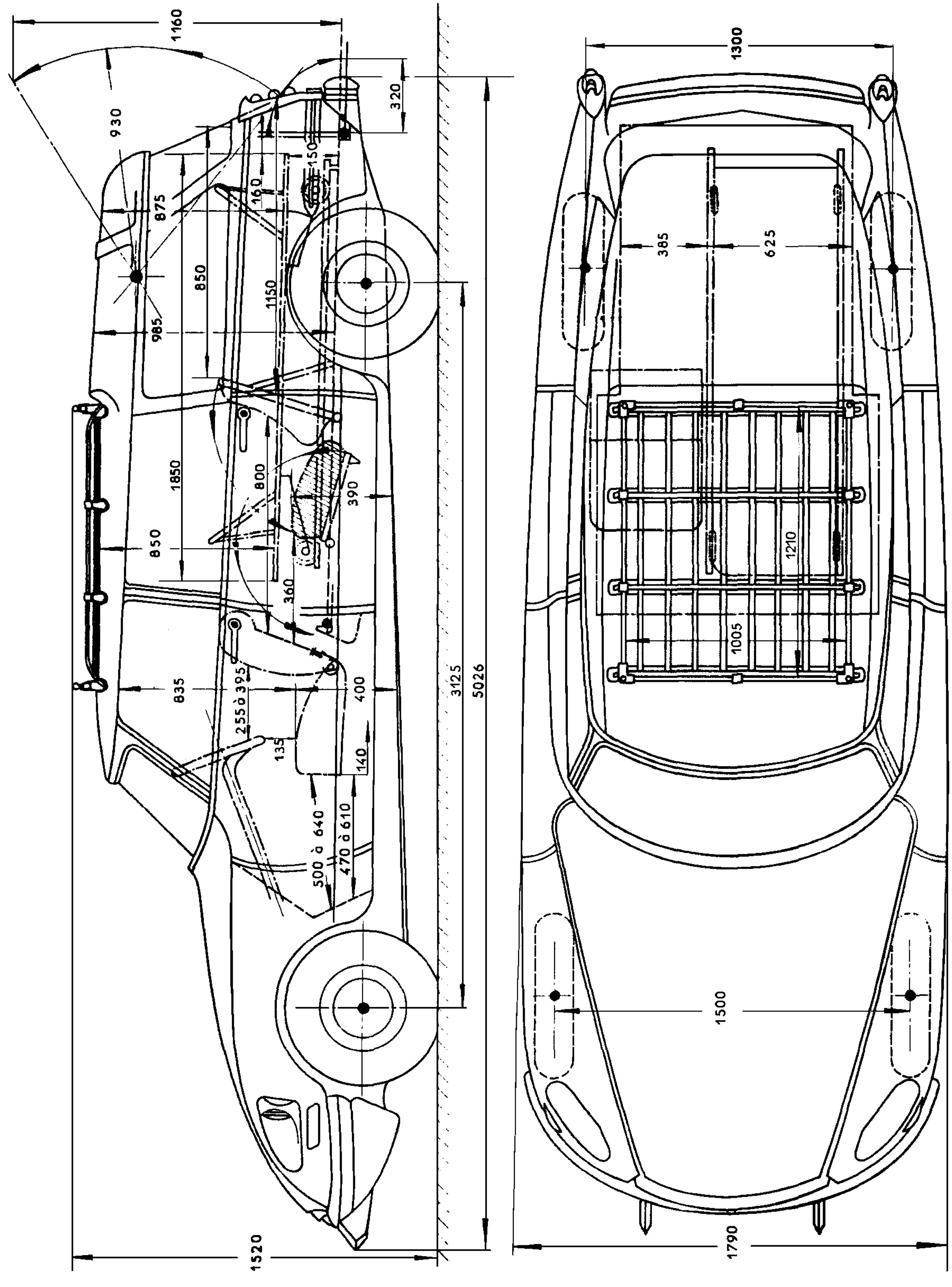
2340 à 2480
5026
1790
1500
1005
1210
965
1300

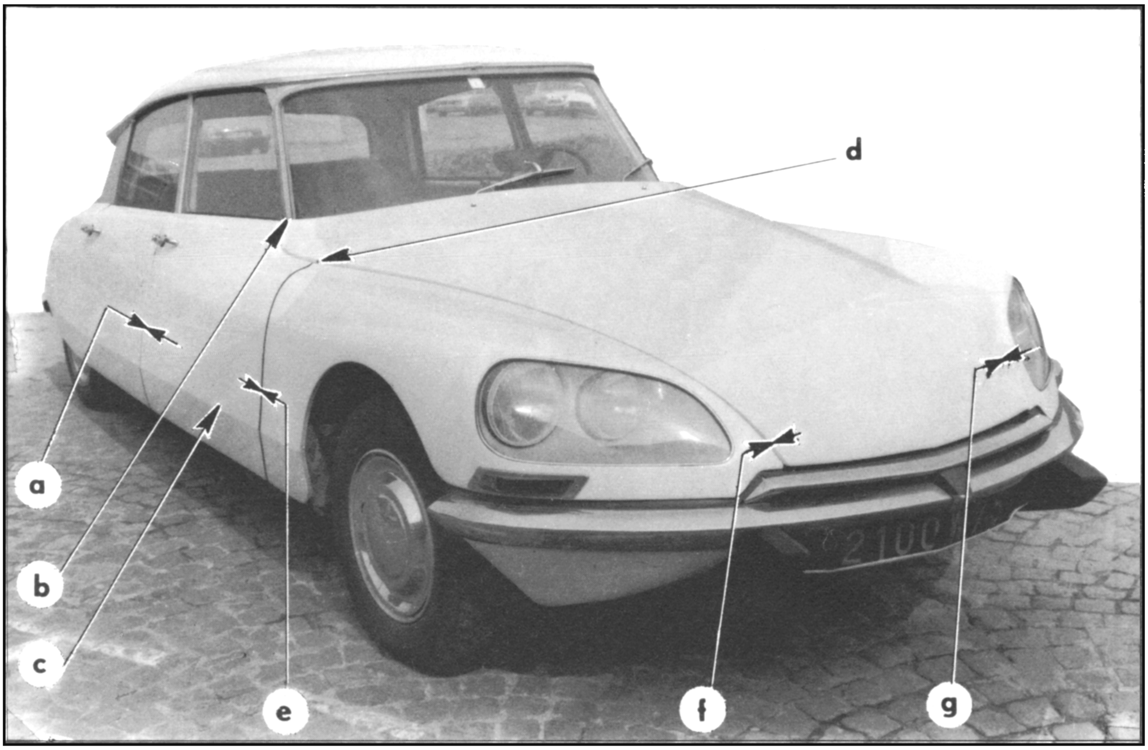
D. 80-5


1160
930
320
150
160
875
850
1150
985
1850
800
390
850
360
835
255 à 395
400
135
140
500 à 640
470 à 610
3125
5026
1520
1300
385
625
1210
1005
1500
1790

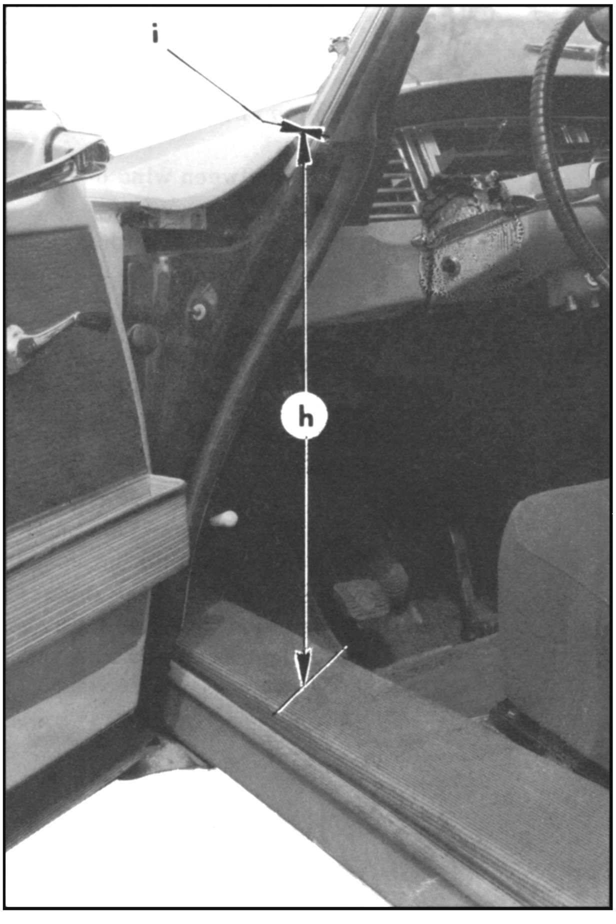
VEHICLES ALL TYPES
→ *September 1967*

ADJUSTING THE BONNET, FRONT WINGS AND DOORS.

8124



8140



« a » The edges of the doors should be parallel and within 2 mm.

« b » The top of the door should be at the same level as or slightly below (by 1 - 2 mm) the rear point of the bonnet.

« c » The « lignes de lumiere » should be aligned within 1 mm.

« d » The door should be level with or slightly below (by 1 - 2 mm) the rear of the wing.

« e » The rear edge of the wing should be parallel with the front edge of the door and within 2 mm.

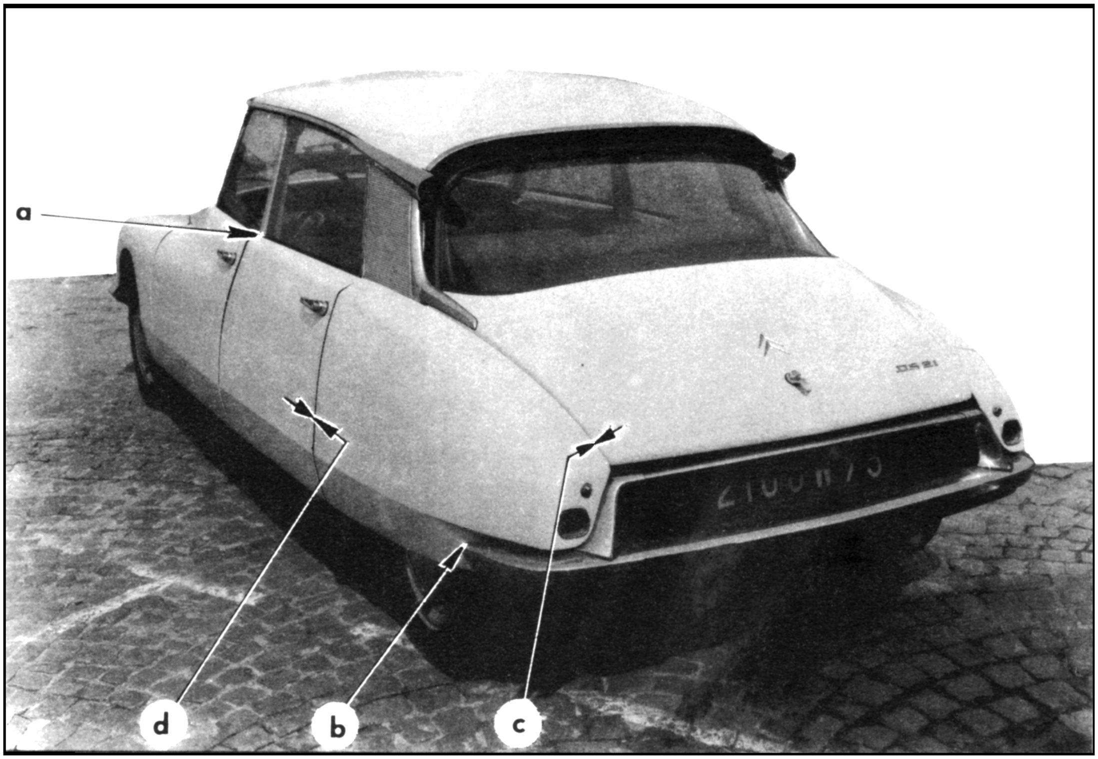
« f » « g » Within 2 mm (constant play between wings and bonnet).

« h » 580 - 582 mm on vehicles D of all types (except « *Pallas* »)
For « *Pallas* » vehicles : side - member trimming is of a different thickness this must be measured with for example a pin in order to determine the bonnet height. Call this thickness « a ». Given that the height taken to the panel is $587 \, ^{+2}_{\,0}$ mm, the height to trimming will be $587 \, ^{+2}_{\,0}$ mm - « a » -

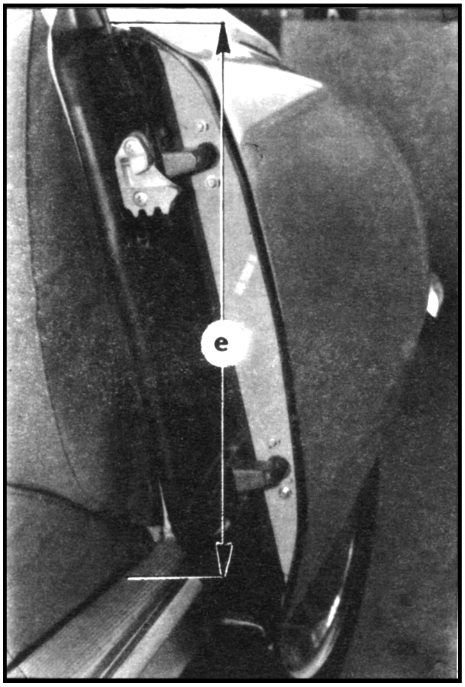
« j » Play between windscreen rubber and rear point of bonnet, within 1 - 2 mm.

ADJUSTING THE BOOT LID, REAR WINGS AND DOORS

8127



3832



«a» Top of front door level with or slightly above (by 1-2 mm) top of rear door.

«b» Play of 2-6 mm between wing and bumper.

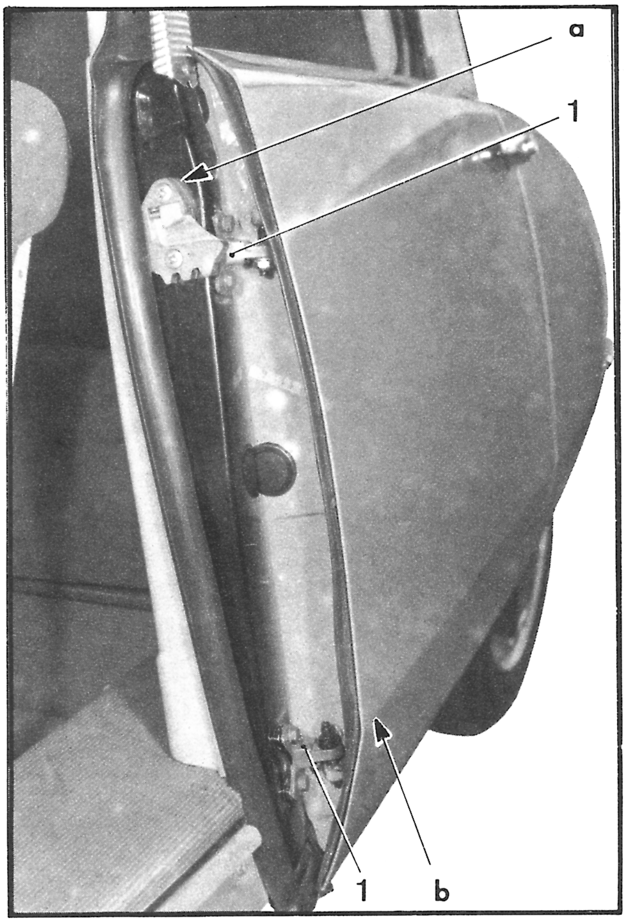
«c» The wing must be parallel with boot lid profile.

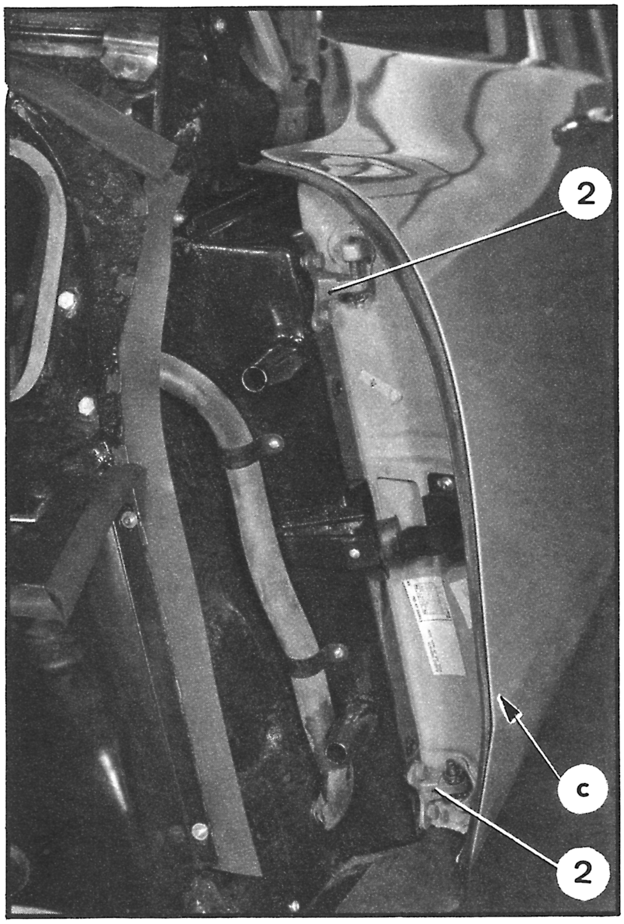
«d» Edge of the door parallel (within 2 mm) to edge of the wing.

«e» 500.5 . 504.5 mm on vehicles all types except « *Pallas* »
On « *Pallas* » vehicles the side member trimming is of a different thickness. This must be measured for example with a pin in order to determine the wing height. Call the thickness « a » Given that the height taken to the panel is 509 mm, the height measured from the trimming will be 509 mm - «a».

VEHICLES ALL TYPES
⟼ *September 1967*

ADJUSTING THE DOORS AND LOCKS.





I. ADJUSTING THE REAR DOORS.

NOTE : For this operation the rear wings should already have been adjusted.

1. The depth to which the latch is engaged in the the catch must be at least 4 mm, with clearance between door and body.

   To obtain this depth, move door supports (1) longitudinally. If this is not sufficient, place spacers under the catch at «a».

2. Adjustment of door height :
   Turn the pivot screws so that the top of the door is level with the rear doors with the «light line» aligned within 1 mm with that on the rear wing.

   The rear edge of the door should be parallel with the edge of the wing, and within 2 mm. If not move one of the pivots supports (1).

II. ADJUSTING THE FRONT DOORS.

3. The depth to which the latch is engaged in the catch must be at least 4 mm. With clearance between door and central door pillar.

   To obtain this depth, move door supports (2) longitudinally. If this is not sufficient, place adjusting shims under the catch.

4. Adjustment of door height :
   Turn pivot screws so that the top of the door is level with or slightly below (1-2 mm) the rear point of the bonnet and level with or slightly above (1-2 mm) the rear door : the «light line» «c» should be aligned with that on the rear door to within 1 mm. The rear edge of the door should be parallel with the edge of the front door and within 2 mm. If not move one of the pivot supports (2).

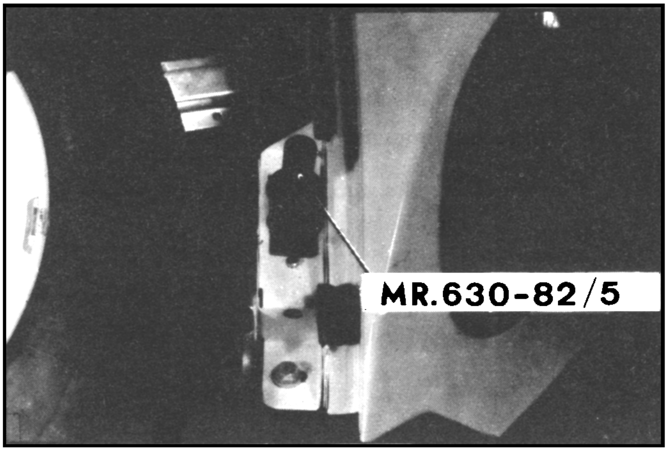
III. LATERAL ADJUSTMENT OF DOORS.

To avoid any whistling the front door must be flush with or slightly proud of the rear door (by 1-2 mm) To adjust the doors laterally, the number of spacers placed between the centre pillar and pivot support (1) must be modified.

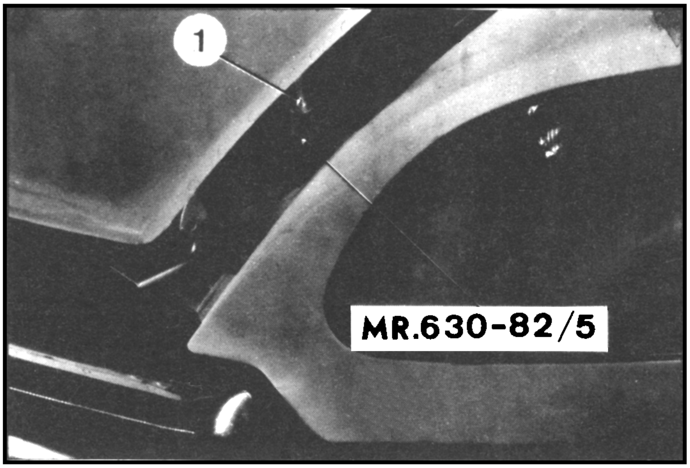
VEHICLES ALL TYPES
├──► *9/ 1967*

ADJUSTING THE BONNET

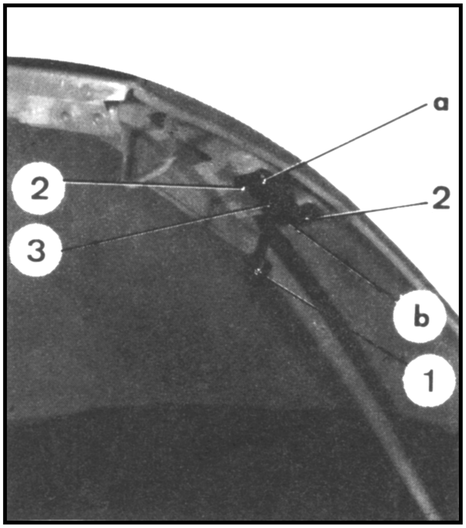
3650



3651



3652



VERY IMPORTANT NOTE :

When the bonnet is closed, it cannot be opened if the cables are not connected to the unlocking mechanism.

The mechanism is not accessible from the outside.

If, by mistake, the bonnet release has not been connected, proceed as shown in section 2.

ADJUSTMENT OF LOCK.

1. Fit tool (N° MR. 630-82/5) in the lock apertures

Lock it in them.

2. Lower the bonnet. The closing lugs should fall in the centre of the tool tube.

3. Adjust the lugs (1) :

a) *Longitudinally :* with slot « b » by loosening nut (3).

b) Laterally : with slot « a » by loosening screws (2).

Remove tool (N° MR. 630-82/5)

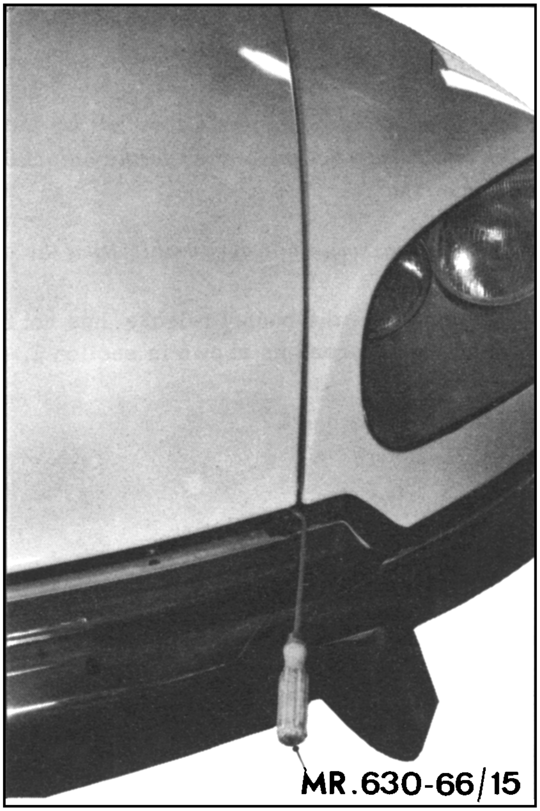
c) *Adjust depth to which lugs are engaged :*

Tighten (or loosen) the lugs (one turn alters the lengh by 1 mm) by releasing nut (3).

4. Check lock.

5. Tighten screws and nuts.

Manual 814-1



II - ADJUSTING THE BONNET

(In the event of the mechanism being disconnected)

NOTE :

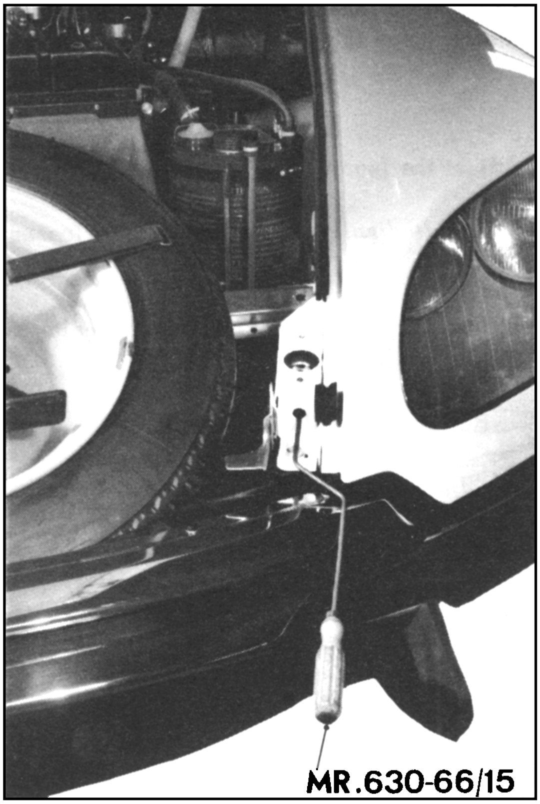
It is possible to open a bonnet of which the opening mechanism has become disconnected :

- either because the cables are not connected to the bolts
- or because the rollers have slipped from the cables due to insufficient tightening of the screws

1. Use tool MR. 630-66/15

Insert the tool at the junction of the bonnet and the wing, between the bonnet and the bumper. By feeling around, engage the end of the tool in the hole of the lock support and push the bolt until it releases

2. Repeat the operation for the other side



CHECKING AND REPAIRING OF A REAR WINDOW HEATING RESISTANCE.

I. CHECKING

Force of the heating resistance :

a) *Saloon :*	→|	*6 1972*	73 to 84 Watts under 13,5 ± 0.2 volts
	|→	*6/ 1972*	95 to 110 Watts under 13.5 ± 0.2 volts
b) *Safari :*			85 to 110 Watts under 13.5 ± 0.2 volts

To check the rear window heating resistance, measure :

1. Ither the current circulating in the resistance, by using a amphemeter, connected to the feed resistance wire. The current should be for :

a) *Saloon*	→|	*6/ 1972*	4.8 to 5.3 amps under 12 volts
	|→	*6/ 1972*	6.2 to 7.2 amps under 12 volts
b) *Safari :*			5.6 to 7.2 amps under 12 volts

2. Ither the resistance, using a ohmmeter. The resistance should be :

a) *Saloon*	→|	*6/ 1972*	2.17 to 2.5 Ω
	|→	*6/ 1972*	1.65 to 1.92 Ω
b) *Safari :*			1.65 to 2.14 Ω

Manual 814-1

II. REPAIRS.

NOTE : The two undementioned repairs can be carried out on a heated window fitted to the vehicle.

1. Replacing the terminals.

Tin the part of the terminal to be soldered. Solder it in the place provided (soldering iron).

2. Repairing an element.

a) Obtain from the Replacement Parts Department :

- 1 Kit .... ZC. 9 855 128 U

This kit "SECURIGLACE" contains :

- 1 Bottle of abrasive cleaning powder,
- 1 Sachet of conducting enamel,
- 1 Tube of adhesive
- 1 Tube of hardening product for the adhesive,
- 1 Bottle of metallic powder,
- 1 Roll of thick adhesive tape,
- 1 Warning light for detecting cuts,
- 1 Roll of adhesive for detecting cuts,
- 1 Plastic spatula,
- 1 Glass plate, for mixing the products,

b b) **Locating the cut :**

With resistance fed as normal :

- Locate the defective resisting wire by sticking the adhesive detecting tape in the centre of the rear window (on the inside), and on all the resistance lines so that the tape is perpendicular to the latter. The wires, when when the circuit is not broken, will turn the thermopaper blue when the temperature generated is raised.
- Onto the cut wire, slide the two pointed probes of the support of the warning light, used for detecting cuts. When the lamp lights up, the pointed probes are on both sides of the break in the resistance. By moving them slightly along the wire, one can determine the extent of the cut exactly.

c) Preparing the rear windows :

With the resistance no longer under voltage :

Clean out the area treated with the powder, contained in the bottle marked "Bimspulver". Sprinkle this powder on a small piece of rag and rub. Then wipe clean with a second piece of rag.

Place on each side of the resistance, a strip of thick adhesive tape 25 mm long, marking the length of repair to be carried out. The edges of the strip must be perfectly straight and clean, so as to avoid a cut during the repair.

d) Repairs :

First phrase :

Empty the complete contents of one of the sachets of conducting enamel onto the glass plate. Mix the contents well by using the spatula.

Apply the paste thus obtained, on the spot to be repaired, so as to completely fill the space between the two strips of tape. Only apply the paste to the cut.

Leave to dry for about 15 minutes, at atmospheric temperature.

Second phrase :

On the glass plate, prepare a mixture (of about the same size as a chestnut) containing equal amounts of the adhesive and U.H.U. hardening product.

To this paste, add an equal amount of the metallic powder, contained in the bottle marked " Metallpulver" mix well with the spatula.

Apply the paste thus obtained on the conducting enamel exceeding the edges of the deposit of the latter, on both sides, by 10 mm. But with the length still limited by the strips of tape. Use the spatula to regulate the thickness, using the tape as a support.

Leave to dry for an hour and a half, at atmospheric temperature, before removing the strips of tape. Move them aside parallel to the surface of the rear window, to avoid removing the film deposited.
The drying time can be reduced by charging the resistance for half an hour.

NOTE :
Wait 24 to 48 hours before proceeding to clean the inside of the rear window.

e) Checking :

Carry out the check, using the adhesive tape. Proceed as when locating the cut.

LIST OF SPECIAL TOOLS IN VOLUME No 1 OF MANUAL 583

DESCRIPTION	REPAIR METHOD NUMBERS		REF. Nos of tools on sale
	Old	New	
ENGINE			
Engine - gearbox assembly support			3083 - T a
Gearbox support	MR. 3301 - 260	MR. 630 - 42/ 13	
Engine support adjuster template	MR. 3725 - 110	MR. 630 - 51/ 38	
Electric tachometer			2436 - T
Graduated circuit for adjustment of automatic advance			3078 - T
Fuel pump pressure control gauge			3087 - T
Oil pressure adapter	MR. 3705	MR. 630 - 56/ 1	
Pulley alignment measuring rod			3082 - T
Belt tension hook	MR. 4208 - 20	MR. 630 - 66/ 11 B	
Belt tension lever	MR. 4208	MR. 630 - 66/ 11	
CLUTCH			
Clutch mechanism control apparatus (D. IE vehicles)		MR. 630 - 55/ 9	
Hydraulic test-bench *(LHS2 Fluid)*			2290 - T
Hydraulic test-bench *(LHS2 Fluid)*			3654 - T
Test-bench accessories *(LHS2 Fluid)*			3655 - 5
Clutch pedal spring adjuster		MR. 630 - 27/ 2	
GEARBOX			
Tool set for checking oil pressure on BW gearbox			3658 - T
Adjuster for reverse - neutral return			3188 - T Replaces 3183 - T ↦ 9/69
Clutch lock control apparatus	MR. 3301 - 240	MR. 630 - 43/ 20	
Hydraulic test - bench *(LHS2 Fluid)*			2290 - T
Hydraulic test - bench *(LHS2 Fluid)*			3654 - T
Test - bench accessories *(LHS2 Fluid)*			3655 - T
PRESSURE SOURCE AND RESERVE			
Hydraulic test - bench *(LHS2 Fluid)*			2290 - T
Hydraulic test - bench *(LHS2 Fluid)*			3654 - T
Test-bench accessories *(LHS2 Fluid)*			3655 - T
FRONT AXLE			
Wheel camber control apparatus			2311 - T
Caster control apparatus			2321 - T
SUSPENSION			
Front height adjuster gauges	MR. 1401 - 30	MR. 630 - 51/ 3	
Hydraulic test - bench *(LHS2 Fluid)*			2290 - T
Hydraulic test - bench *(LHS2 Fluid)*			3654 - T
Test - bench accessories *(LHS2 Fluid)*			3655 - T

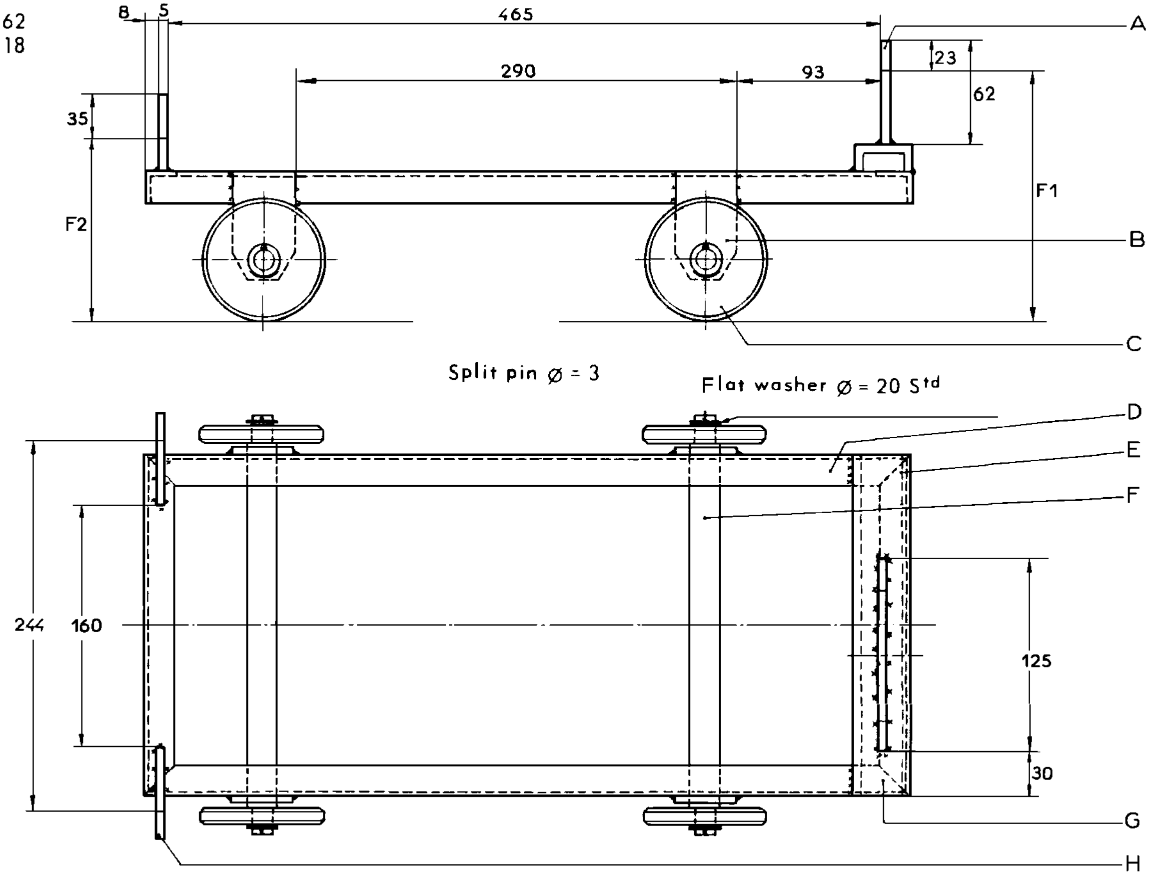
Manual 814-1

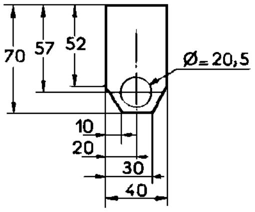
LIST OF SPECIAL TOOLS IN VOLUME N° 1 OF MANUAL 583.

DESCRIPTION	REPAIR Method numbers		REF Nos Of tools on sale
	Old	New	
STEERING			
Straight ahead position adjuster	MR. 4541	MR. 630-51/63	
Steering adjuster			1955-Ta
Hydraulic test-bench *(LHS2)*			2290-T
Hydraulic test-bench *(LHM)*			3654-T
Test-bench accessories *(LHM)*			3655-T
Straight ahead position gauge	MR. 4541	MR. 630-51/63	
BRAKES			
Stand			2505-T
Centring apparatus for rear brake shoes			3565-T
Hyfraulic test-bench *(LHS2)*			2290-T
Hydraulic test-bench *(LHM)*			3654-T
Test-bench accessories *(LHM)*			3655-T
ELECTRICS			
End-float adjustement spacer for headlamp torsion control rod	MR. 3756-60	MR. 630-51/49	
Headlamp beam distance adjuster			3901-T
Headlamp torsion control rod adjuster (→ 9/1967)	MR. 4531	MR. 630-72/10	
Dipstick for checking level of oil in compressor		MR. 630-72/15	
BODYWORK			
Bonnet release tool	MR. 4538	MR. 630-66/15	

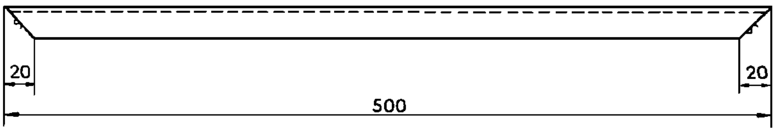
MR. 630-42/13
ex. MR. 3301-260

Dimensions
From F1 to ground 162
From F1 to ground 118

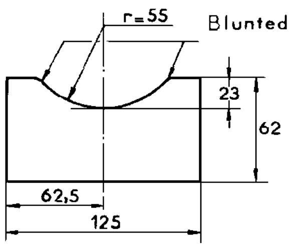




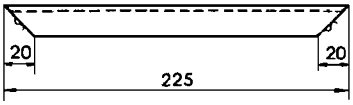
B - 4 pieces sheet metal thickness 5 mm



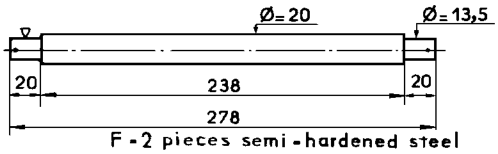
D - 2 angle-pieces 20 ×20 ×3



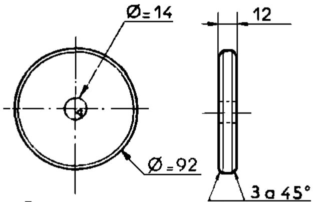
A - 1 piece sheet metal th = 5 mm



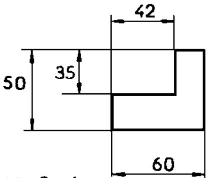
E - 2 angle-pieces 20 · 20 · 3



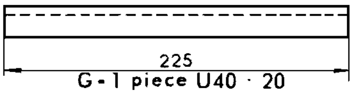
F - 2 pieces semi-hardened steel



C - 4 pieces semi-hardened steel

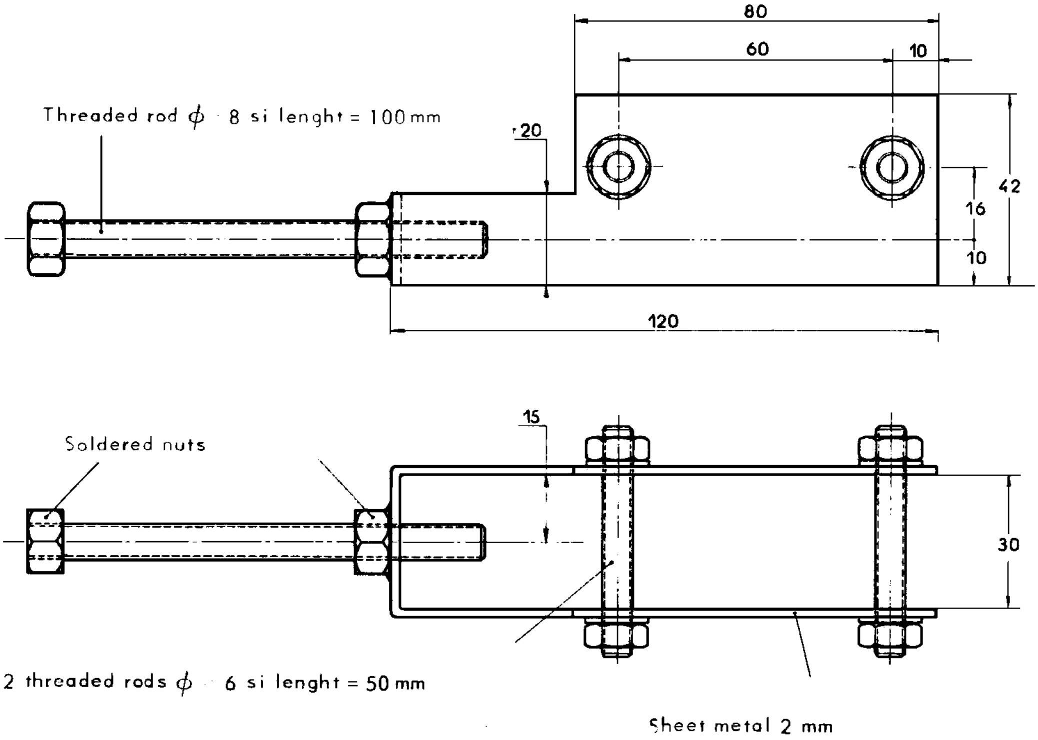


H - 2 pieces symmetrical sheet metal th = 5 mm

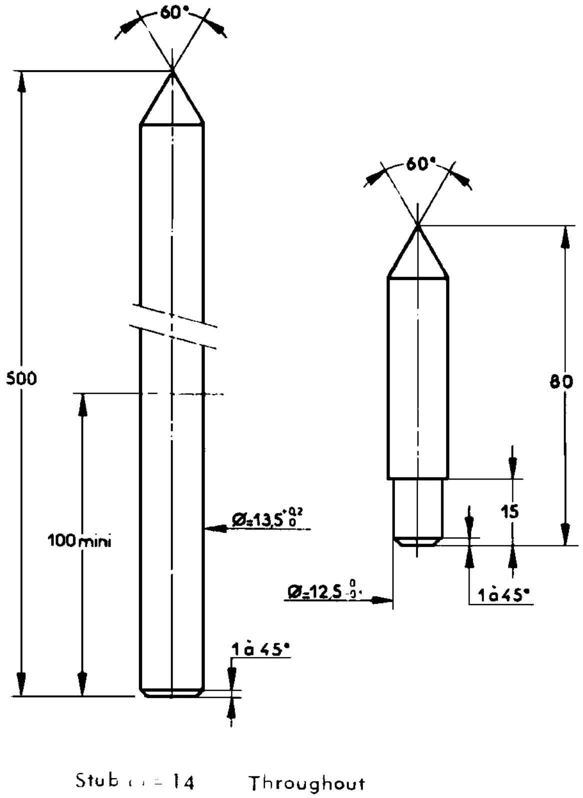


G - 1 piece U40 · 20

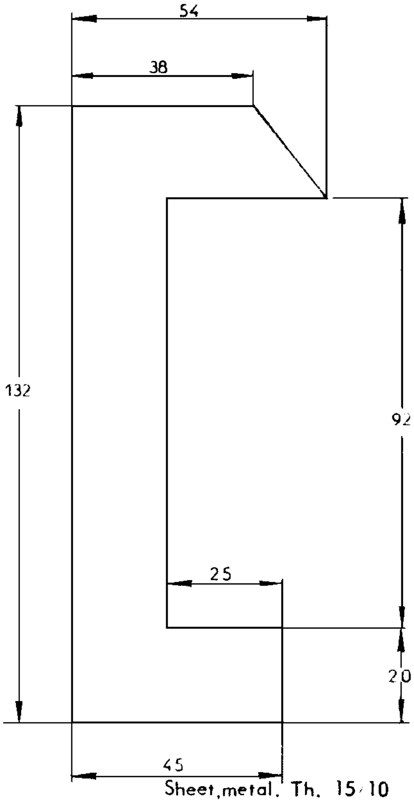
MR. 630-43/20
ex. MR. 3301-240



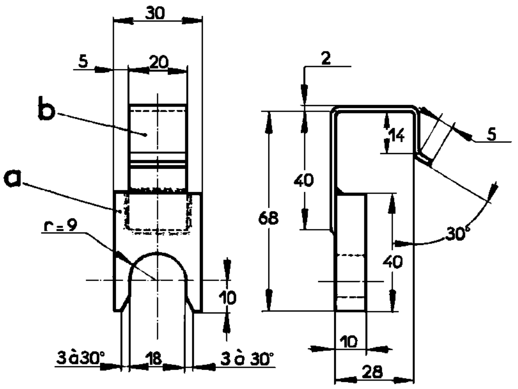
MR. 630-51/3
ex. MR. 1401-30



MR. 630-51/38
ex. MR. 3725-110

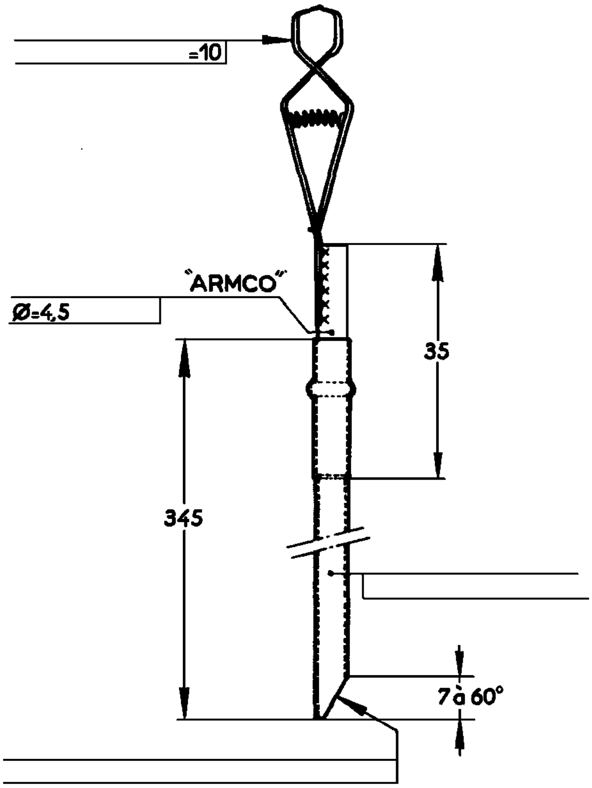


MR . 630-51/49
ex. MR . 3756-60

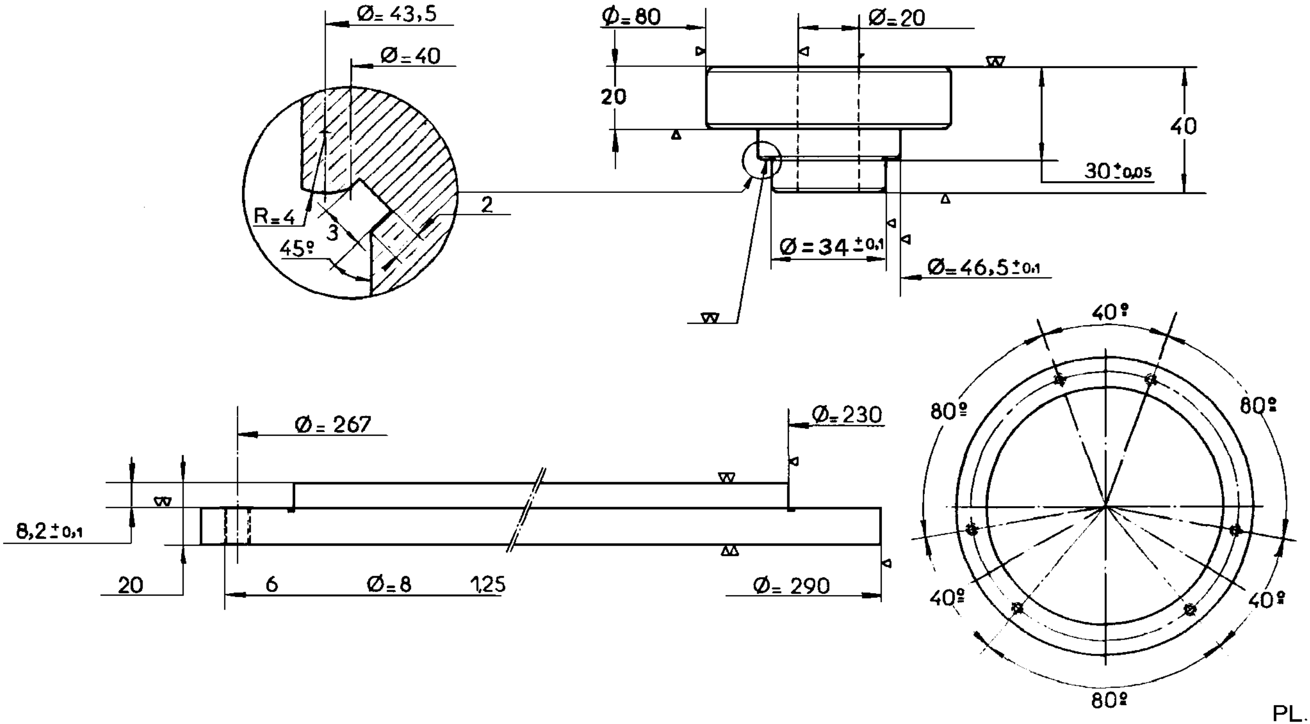


	Nb	
a	1	½
b	1	20/10

MR . 630-51/63
ex. MR . 4541



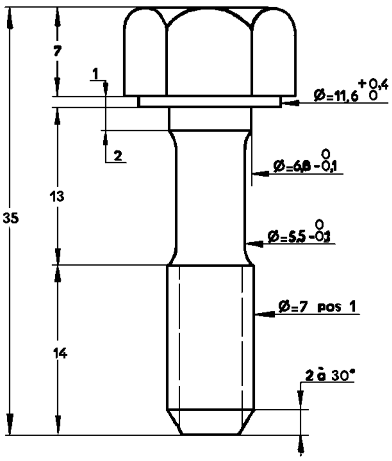
MR. 630-55/9



PL.2

MR. 630-56/1

ex. MR. 3705

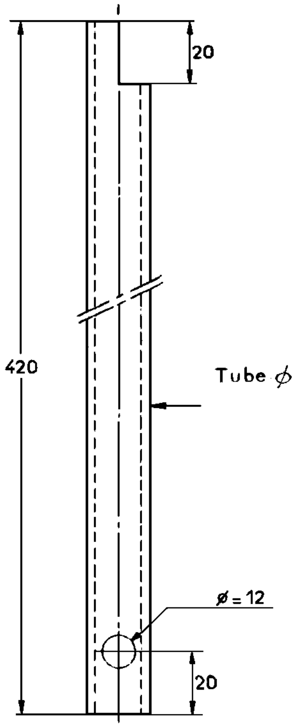


Hexagonal surface 12 A/F

Semi-hardened steel

MR. 630-66/11

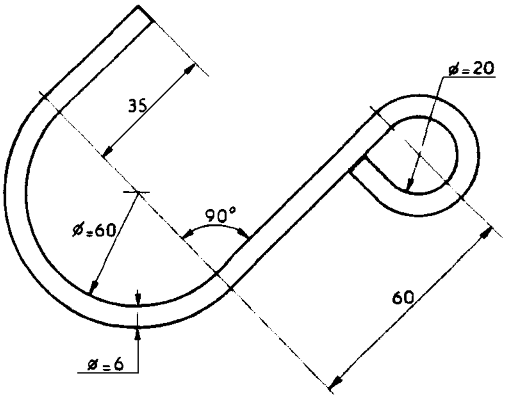
ex. MR. 4208



Tube ϕ 14 · 21

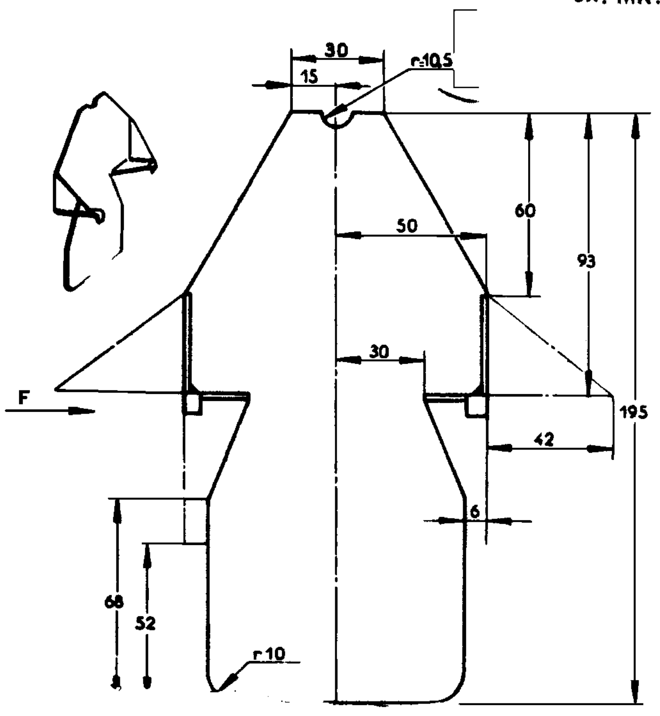
MR. 630-66/11 B

ex. MR. 4208-20



MR. 630 72/10

ex. MR. 4531



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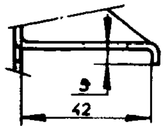
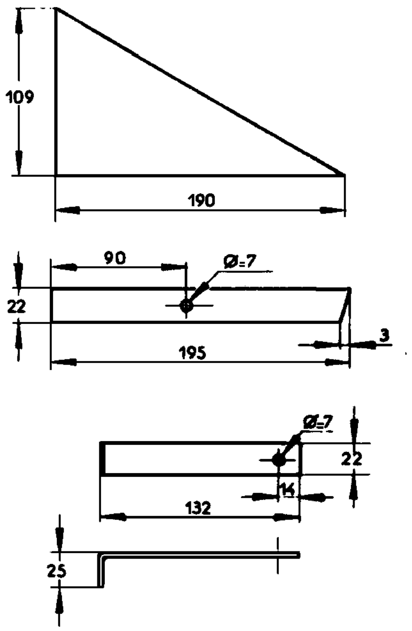
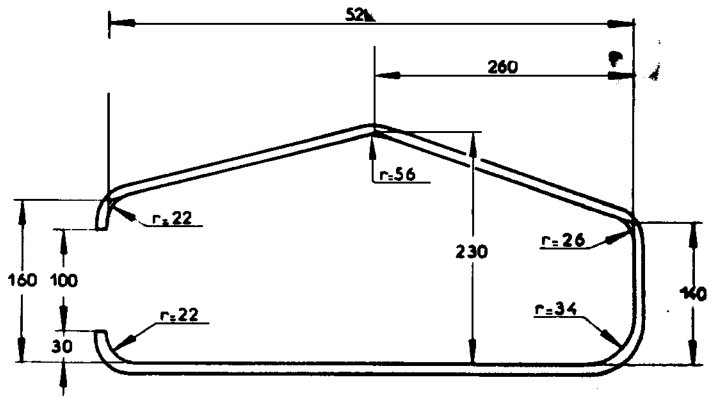
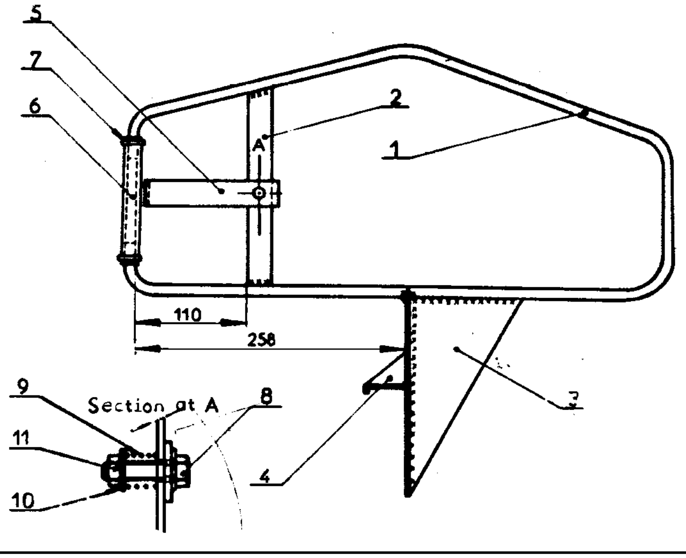


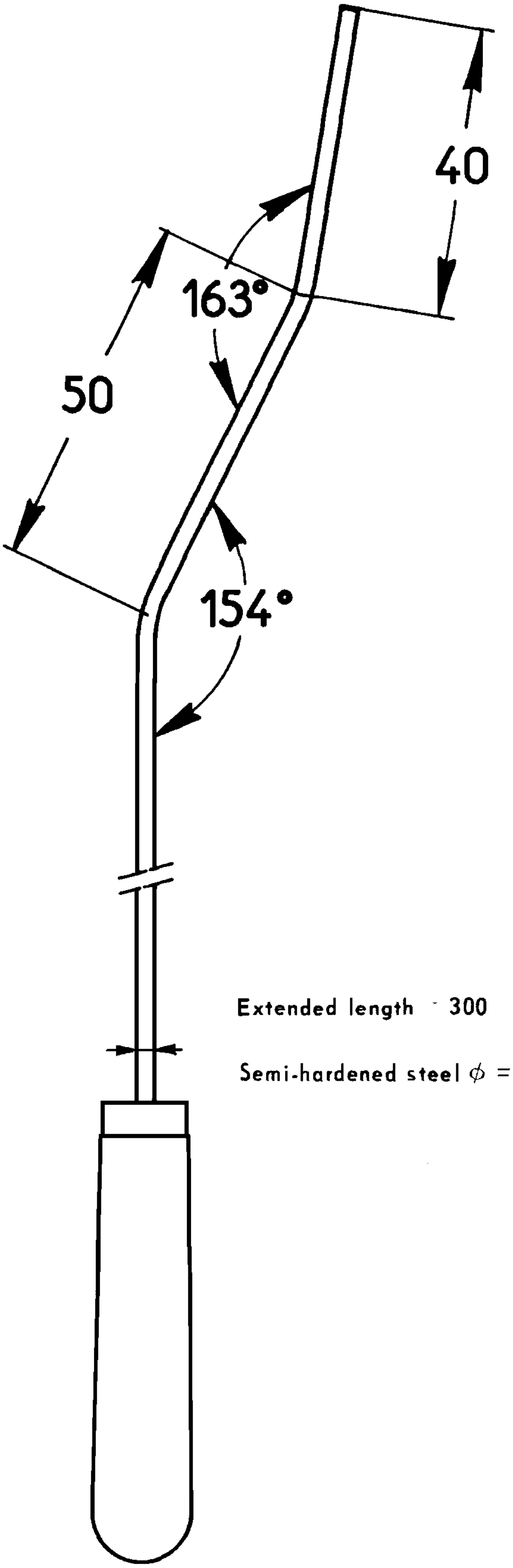




Nº	Qty	Description
1	1	Tube frame 5 × 10 developped length 1245
2	1	Spacer sheet metal 2 mm
3	1	Reinforcement Sheet metal 2 mm.
4	1	Thrust Sheet metal 2 mm.
5	1	Index Sheet metal 2 mm.
6	1	Plastic tube 18 × 10 length : 130
7	2	Collar
8	1	Screw ϕ = 6 S.I. length = 35
9	1	Spring
10	2	Washer 65 · 20 Thickness : 1 mm.
11	1	Nut ϕ 6 S.I.



MR. 630-66/15
ex MR. 4538

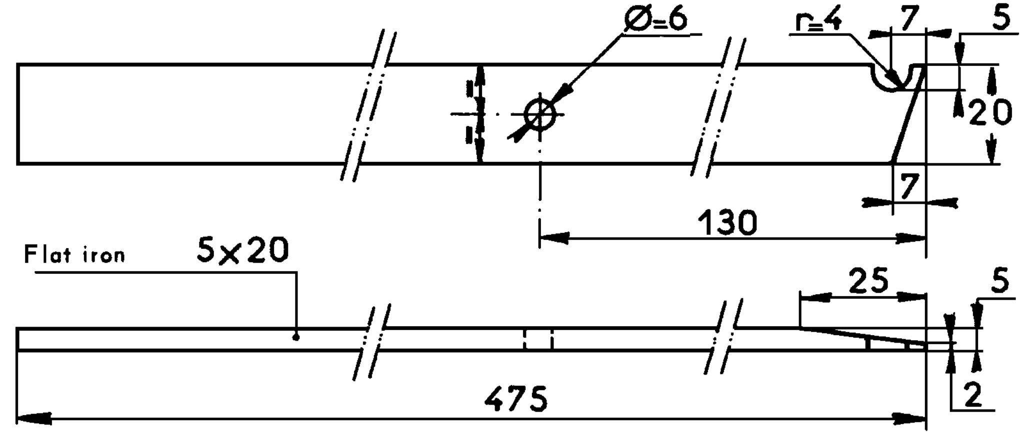


Extended length - 300

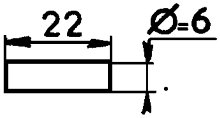
Semi-hardened steel ϕ = 5

MR 630 - 27/2

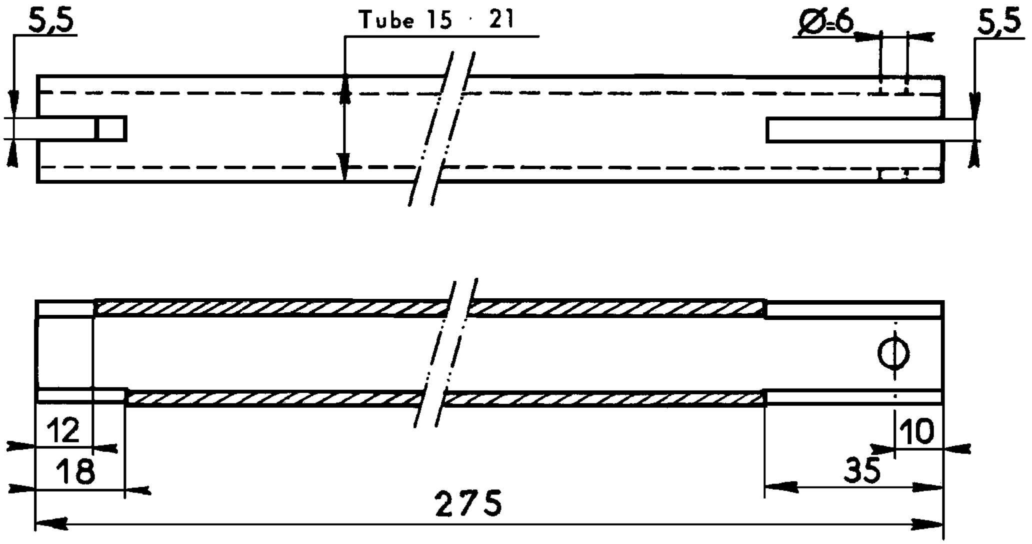
Lever



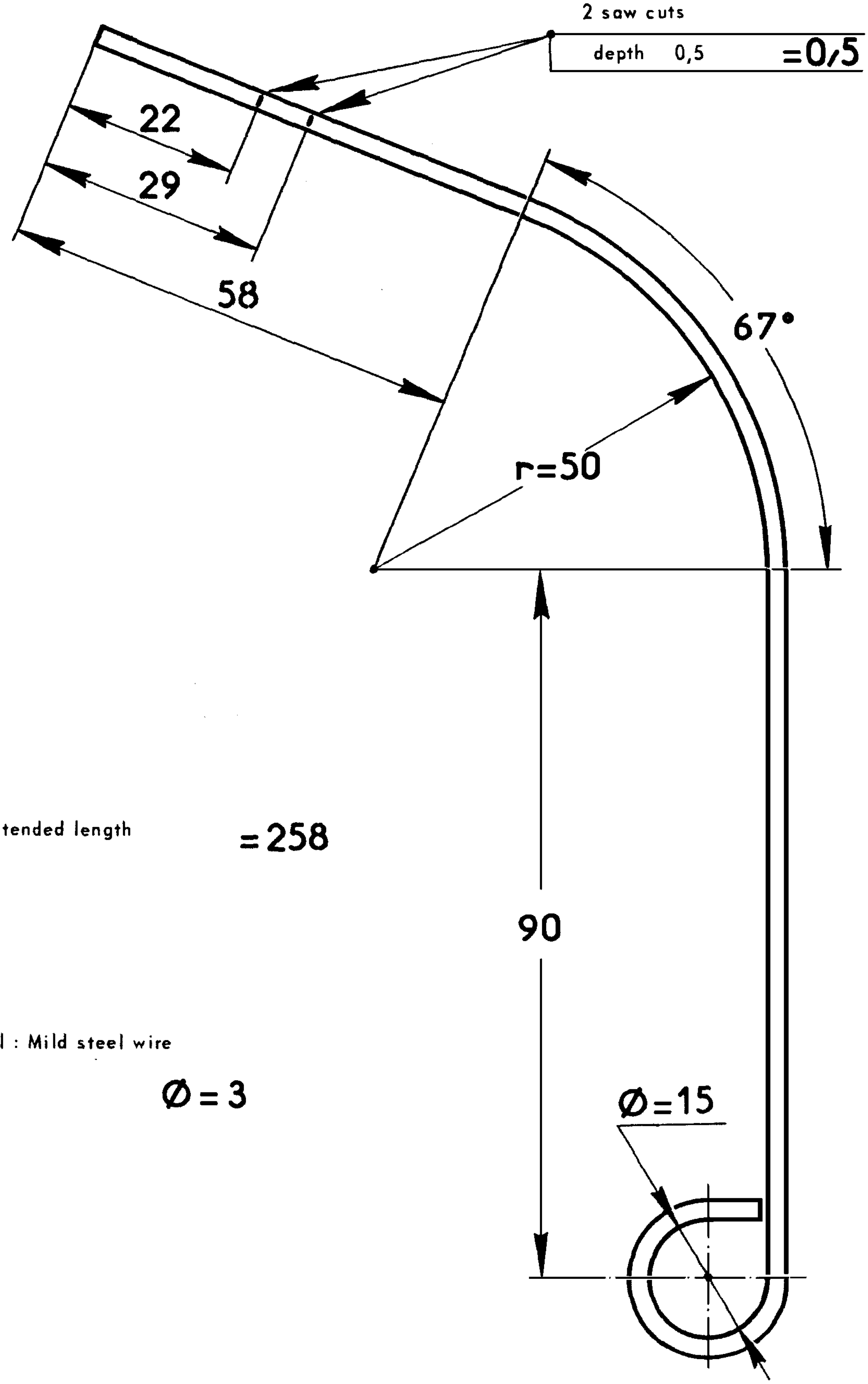
Pin to be riveted



Steel C 35



MR 630 - 73/15



Extended length =258

Material : Mild steel wire

Ø = 3