CHARACTERISTICS
ADJUSTMENTS
CHECKS

n° 812

1

A

REPAIR MANUAL N° 812

VOLUME I

AFTER-SALE TECHNICAL DEPARTMENT

A VEHICLES

ALL TYPES

PRODUCED SINCE 1963
(Except AMI 6 and AMI 8)

03/ 1974 EDITION

CHARACTERISTICS

ADJUSTMENTS

CHECKS

Manual 812-1

Printed in France

SOCIETE ANONYME AUTOMOBILES CITROEN
CAPITAL 600.000.000 F - SIEGE SOCIAL 117 à 167, QUAI ANDRE CITROEN - 75747 PARIS CEDEX 15 - R.C. SEINE 64 B 50 19
DTAV (ASSISTANCE TECHNIQUE) - 163, Avenue Georges Clémenceau - 92 000 NANTERRE - Tél. 204-40-00 - Postes 577 et 578

USING THE MANUAL

PREPARATION

To facilitate the use of the Manual, operations have been grouped in two volumes :

- Volume I contains :
  - the CHARACTERISTICS - ADJUSTMENTS - CHECKS

  All workshops should be in possession of this volume, which is essential for carrying out adjustments or emergency repairs.
- Volume II contains :
  - RECONDITIONING
  - ELECTRICAL SYSTEM

The above volumes are sold separately. They are presented bound in green Fibrex binder with a « MULTO » type mechanism to facilitate the insertion of amendments or the extraction of a particular operation required by the workshop.

COMPOSITION

Every volume comprises :

- the list of operations contained in the volume
- these operations filed in numerical sequence
- the list of all the tools mentioned in the operations and the manufacturing drawings for special tools which are not sold but are intended to be manufactured by the Repair Department itself.

OPERATIONS

The sequence of operations has been devised in order to obtain the best quality of work in the shortest possible time.

The numbering of the operations is made up as follows :

a) The code letter for the car : « A »

b) A number made up of three figures denoting the unit or its element

c) A figure code designating the type of repair :

- the figures 0 0 0 indicate the characteristics of the car
- the figures 0 0 indicate the characteristics of the unit
- the figure 0 indicates checks and adjustments
- the figures 1, 4, 7 indicate removal or fitting
- the figures 2, 5, 8 indicate dismantling or reassembly and
- the figures 3, 6, 9 indicate reconditioning

The thumb indexing which corresponds to the list of operations enables the particular operation to be found without difficulty.

TOOLING

Special tooling is denoted in the text by a number followed by the letter T.

These tools are sold by :
- Etablissements FENWICK, Departement AMA, 24 Bd Biron - 93404 ST-OUEN - FRANCE - Tel. 252-82-85

Additional tools of local manufacture are indicated in the text by a number preceded by the index MR. drawings for these tools appear at the end of the particular volume filed in numerical order.

TIGHTENING TORQUES

Torques are expressed in the following units :
- in metres Newton (mΛN) : the legal unit for measuring torque
- metre-kilogrammes (m.kg), since torque wrenches at present in use are sometimes graduated in m.kg :
  1 m.kg = 9.81 mΛN (which may also be written mΛN or m.N)
- in foot pounds (ft.Ibs) converted at 7.22 ft.Ibs = 1m.kg

The numbers corresponding to the torques are « rounded off »

Examples : 2 mΛN = 0.2 m.kg = 1.4 ft.Ibs
60 mΛN = 6 m.kg = 43 ft.Ibs

IMPORTANT : When a tightening torque figure is followed by the words « torque wrench », the operation must OF NECESSETY be carried out with a torque wrench.

ADVISORY SERVICE

For all technical information concerning these vehicles, please contact :

CITROEN CARS Limited
After-Sale Department
SLOUGH SL 1. 4 QA - GREAT BRITAIN

or :

SOCIETE AUTOMOBILES CITROEN
Département Technique Après-Vente
163, avenue G. Clémenceau
92000 NANTERRE - FRANCE

LIST OF OPERATIONS GIVEN IN SECTION N° 1 OF MANUAL 812

« A » vehicles produced since 1963 (except AMI 6 and AMI 8)

Number of Operation	DESCRIPTION
	GENERAL ➧ (1)
A. 000	General characteristics
A. 01	Protection of electrical components
A. 02	Work on hydraulic system
A. 03	Recommended products
	ENGINE - CARBURATION - IGNITION ➧ (2)
A. 100-00	Characteristics and special features of engines
A. 112-0	Setting valve clearances
A. 120-0	Checking valve timing
A. 142-00	Characteristiques of carburettors
A. 142-0	Adjustments of carburettors and controls
A. 173-0	Checking petrol feed
A. 210-00	Characteristics of the ignition system
A. 210-0	Tests and adjustments of the ignition system
A. 220-0	Checking and adjusting the oil pressure. Checking the vacuum in the engine casing - Checking the oil pressure on the vehicle - Checking the vacuum in the engine casing
	CLUTCH ➧ (3)
A. 300-0	Checking the alignment of the engine/gearbox assembly
A. 312-00	Characteristics and special features of the clutch
A. 314-0	Checking and adjusting the clutch control
	GEARBOX ➧ (4)
A. 330-00	Characteristics and special features of gearboxes
A. 334-0	Adjustment of gear selection forks
	TRANSMISSION ➧ (5)
A. 372-00	Characteristics and special features of drive-shafts
	FRONT AXLE ➧ (7)
A. 410-00	Characteristics and special features of the front axle
A. 410-0	Tests and adjustments on the front axle : - Checking the camber angle - Measuring and adjusting the parallelism of the front wheels - Adjusting steering angle - Checking a front wheel arm removed from the vehicle
	REAR AXLE ➧ (8)
A. 420-00	Characteristics and special features of the rear axle
A. 420-0	Checks on the rear axle : - Checking the rear wheel arms on the vehicle - Checking a rear wheel arm removed from the vehicle

LIST OF OPERATIONS GIVEN IN SECTION N° 1 OF MANUAL 812

« A » vehicles produced since 1963 (except AMI 6 and AMI 8)

Number of Operation	DESCRIPTION
	SUSPENSION ➧ (9)
A. 430-00	Characteristics and special features of the suspension
A. 430-0	Checking and adjusting the suspension - Measuring heights - Adjusting heights - Adjusting the front suspension stops
	STEERING ➧ (10)
A. 440-00	Characteristics and special features of the steering system
A. 440-0	Checking and adjusting the steering : - Measuring and adjusting the toe-out of the front wheels - Adjusting the steering angle
	BRAKES ➧ (11)
A. 450-00	Characteristics and adjustments of the brake system
A. 451-0	Checking and adjusting the brakes : - Adjusting brakes - Bleeding brakes - Checking the hydraulic system and its components for leaks
A. 453-0	Checking and adjusting the brake control : - Adjusting the free travel of the brake pedal - Checking the hydraulic system and its components for leaks
A. 454-0	Adjusting the hand brake
	ELECTRICAL SYSTEM ➧ (12)
A. 530-0	Characteristics of and tests on electrical components (dynamos, alternators, regulators, starter motors)
A. 540-0	Adjusting headlights
	TOOLS ➧ (14)
	List of special tools mentioned in the Manual
	Manufacturing drawings for tools not sold.

9 ➧
10 ➧
11 ➧
12 ➧
14 ➧

IDENTIFICATION of « A » VEHICLES

Vehicles produced since 1963 (except AMI 6 and AMI 8)

Usual name	Official Code	Commercial symbol	French Fiscal power
2 CV	AZ (Series A and AM) ⟼ 3/1963 ⟶ 2/1970	2 CV AZL	2 CV (HP)
	AZ (Series A 2) ⟼ 2/1970	2 CV 4	2 CV
	AZ (Series KA) ⟼ 2/1970	2 CV 6	3 CV
Dyane	AYA (Series A and AM) ⟼ 8/1967 ⟶ 3/1968	Dyane	2 CV
	AYA2 (Series A and AM) ⟼ 3/1968 ⟶ 2/1970	Dyane 4	2 CV
	AYA3 (Series A and AM) ⟼ 1/1968 ⟶ 10/1968	Dyane 6	3 CV
	AYB (Series A and AM) ⟼ 10/1968 ⟶ 2/1970	Dyane 6	3 CV
	AYA2 (Series A and AM) ⟼ 2/1970	Dyane	2 CV
	AY (Series CB) ⟼ 2/1970	Dyane 6	3 CV
Mehari	AY (Series CA)	Dyane 6 Mehari	3 CV
2 CV Van	AZU (Series A) ⟼ 1/1963 ⟶ 8/1972	AZU (Series A) ⟼ 1/1963 ⟶ 2/1972 CITROEN 250 ⟼ 2/1972	2 CV
	AZU (Series B) ⟼ 8/1972	CITROEN 250	2 CV
3 CV Van	AK ⟶ 1/1963 ⟼ 5/1968	AK	3 CV
	AK (Series B) ⟼ 5/1968 ⟶ 8/1970	AK	3 CV
	AK (Series AK) ⟼ 8/1970	CITROEN 400	3 CV

« 2 CV »

I. GENERAL CHARACTERISTICS

	AZ (Series A and AM) 2 CV AZL March 1963 to February 1970	AZ (Series A2) 2 CV 4 February 1970	AZ (Series KA) 2 CV 6 February 1970
Official symbol Commercial symbol			
Number of seats	4	4	4
Tyres :			
- Type { France (tubeless)	125 - 380 X	125 - 380 X	125 - 380 X
- Type { Export (with inner tube)	135 - 380 X	135 - 380 X	135 - 380 X
- Pressure { Front	2 psi	2 psi	2 psi
- Pressure { Rear	2.5 psi	2.5 psi	2.5 psi

II. GENERAL DATA

Wheel base	2.400 m	2.400 m	2.400 m
Front track	1.260 m	1.260 m	1.260 m
Rear track	1.260 m	1.260 m	1.260 m
Overall length	3.830 m	3.830 m	3.830 m
Overall width	1.480 m	1.480 m	1.480 m
Overall height (empty)	1.600 m	1.600 m	1.600 m
Ground clearance (loaded)	0.150 m	0.150 m	0.150 m
Turning circle	10.700 m	10.700 m	10.700 m
Weight empty in running order	535 kg	560 kg	560 kg
Payload	335 kg	335 kg	335 kg
Permissible loaded weight	870 kg	895 kg	895 kg
Towing capacity			
- Maximum weight on the towbar	20 kg	20 kg	20 kg
- Maximum weight without brake	200 kg	200 kg	200 kg
- Maximum weight with inertia brake	400 kg	400 kg	400 kg
- Maximum gradient towing 400 kg	11%	11%	11%
- Maximum weight on roof rack	30 kg	30 kg	30 kg

III. CAPACITIES

Petrol tank	20 litres	20 litres	20 litres
Engine :			
- Engine casing after draining	2 litres	2 litres	2.2 litres
- Gearbox	0.9 litres	0.9 litre	0.9 litre

« DYANE »

(Vehicles produced up to February 1970)

I GENERAL CHARACTERISTICS

	AYA (Series A and AM)	AYA2 (Series A and AM)	AYA3 (Series A and AM) AYB (Series A and AM)
Official symbol			
Commercial symbol	Dyane	Dyane	Dyane
Dates of production	August 1967 to March 1968	March 1968 to February 1970	AYA3 from January 1968 to October 1968 AYB from October 1968 to February 1970
Number of seats	4	4	4
Tyres :			
- Type (tubeless)	125 - 380 X 135 - 380 X	125 - 380 X 135 - 380 X	125 - 380 X 135 - 380 X
- Pressure Front	2 psi	2 psi	2 psi
Rear	2.5 psi	2.5 psi	2.5 psi

II. GENERAL DATA

Wheel base	2 400 m	2.400 m	2.400 m
Front track	1.260 m	1.260 m	1.260 m
Rear track	1.260 m	1.260 m	1.260 m
Overall length	3.870 m	3.870 m	3.870 m
Overall width	1.500 m	1.500 m	1.500 m
Overall height (empty)	1.540 m	1.540 m	1.540 m
Ground clearance loaded	0.155 m	0.155 m	0.155 m
Turning circle	10. 700 m	10.700 m	10.700 m
Weight empty in running order	AYA series A Sedan = 570 kg " Commerciale"=585kg AYA series AM Sedan = 575 kg "Commerciale"=590 kg	AYA2 series A and AM Sedan = 590 kg "Commerciale"=605 kg	AYA3 series A Sedan = 585 kg "Commerciale=600kg AYA3 series AM Sedan = 590 kg "Commerciale"=605 kg AYB series A and AM Sedan = 600 kg "Commerciale"=605 kg
Total permissible loaded weight	910 kg	925 kg	AYA 3 = 925 kg AYB = 930 kg
Towing capacity :			
- Maximum weight on towbar	20 kg	20 kg	20 kg
- Maximum weight without brake	200 kg	200 kg	200 kg
- Maximum weight with inertia brake	400 kg	400 kg	400 kg
- Maximum gradient towing 400 kg	11%	11%	11%
- Maximum weight on roof rack	30 kg	30 kg	30 kg

III. CAPACITIES

Petrol tank	20 litres	20 litres	20 litres
Engine :			
- Engine casing after draining	2 litres	2 litres	AYA3 = 2.5 litres AYB = 2.2 litres
- Gearbox	0.9 litre	0.9 litre	0.9 litre

« DYANE »

(Vehicles produced since February 1970)

I. GENERAL CHARACTERISTICS

	AYA2 (Series A and AM)	AY (Series CB)
Official symbol	Dyane	Dyane 6
Commercial symbol	February 1970	February 1970
Dates of production	4	4
Number of seats		
Tyres :		
- Type (tubeless)	125 - 380 X 135 - 380 X	125 - 380 X 135 - 380 X
- Pressure front :	2 psi	2 psi
- Pressure rear :	2.5 psi	2.5 psi

II. GENERAL DATA :

Wheel base	2.400 m	2.400 m
Front track	1.260 m	1.260 m
Rear track	1.260 m	1.260 m
Overall length	3.870 m	3.870 m
Overall width	1.500 m	1.500 m
Overall height (empty)	1.540 m	1.540 m
Ground clearance (loaded)	0.155 m	0.155 m
Turning circle	10.700 m	10.700 m
Weight empty in running order	590 kg	600 kg
Total permissible loaded weight	925 kg	930 kg
Towing capacity :		
- Maximum weight on towbar	20 kg	20 kg
- Maximum weight without brake	200 kg	200 kg
- Maximum weight with inertia brake	400 kg	400 kg
- Maximum gradient towing 400 kg	11 %	11 %
- Maximum weight on roof rack	30 kg	30 kg

III. CAPACITIES :

Petrol tank	20 litres	20 litres
Engine :		
- Engine casing after draining	2 litres	2.2 litres
- Gearbox	0.9 litre	0.9 litre

« MEHARI »

I. GENERAL CHARACTERISTICS :

Official symbol	AY series CA
Commercial symbol	Dyane 6 Mehari
Dates of production	October 1968
Number of seats : without rear seat	2
Number of seats : with rear seat	2 + 2

Tyres :

Size	Type	Pressure (in psi)	
		Front	Rear
135 - 380 X	Tubeless	Highway = 2.0	2.5
		Stony tracks = 2.25	2.5
135 - 380 X M + S	With inner tube	Highway = 2.0	2.0
		Sand = 1.75	1.75

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II. GENERAL DATA :

Wheel base	2.400 m
Front track	1.260 m
Rear track	1.260 m
Overall length	3.520 m
Overall width	1.530 m
Overall height (empty)	1.635 m
Ground clearance (loaded)	0.177 m
Turning circle	10.700 m
Weight empty in running order	555 kg
Total permissible loaded weight	935 kg
Towing :	
- Maximum weight on towbar	20 kg
- Maximum weight without brake	200 kg
- Maximum weight with inertia brake	400 kg
- Maximum gradient towing 400 kg	11 %

III. CAPACITIES :

Petrol tank	25 litres
Engine :	
- Engine casing after draining	2.2 litres
- Gearbox	0.9 litre

« 2 and 3CV VANS »

I. GENERAL CHARACTERISTICS

Official symbol	AZU (Series A) AZU (Series B)	AK AK (Series B)
Commercial symbol	AZU (Series A) January 1963 to February 1972 CITROEN 250 since February 1972	AK (Series AK) AK January 1963 to May 1968 AK (Series B) May 1968 to August 1970 CITROEN 400 since August 1970
Dates of production	AZU (Series A) January 1963 to August 1972 AZU (Series B) August 1972	AK January 1963 to May 1968 AK (Series B) May 1968 to July 1970 AK (Series AK) August 1970
Number of seats :		
- without rear seat	2	2
- with rear seat	2 + 2	2 + 2
Tyres :		
- Type (tubeless)	125 - 380 X 135 - 380 X	135 - 380 X
- Pressure front	2 psi	2 psi
- Pressure rear	2.2 psi	AK and AKB 2.2 psi AK (Series AK) 2.4 psi

II. GENERAL DATA :

Wheel base	2.400 m	2.400 m
Front track	1.260 m	1 260 m
Rear track	1.260 m	1.260 m
Overall length	3.605 m	3.805 m
Overall width	1.500 m	1.500 m
Overall height (empty)	1.723 m	AK and AKB = 1.723 m AK (Series AK) = 1.840 m
Ground clearance (loaded)	0.180 m	0.160 m
Turning circle	10.700 m	10.700 m
Weight empty in running order	530 kg → 2/1972 560 kg ← 2/1972	AK and AKB = 620 kg AK (Series AK) = 640 kg
Total permissible loaded weight	880 kg → 2/1972 895 kg ← 2/1972	AK and AKB = 1055 kg AK (Series AK) = 1115 kg
Towing :		
- Maximum weight on towbar	20 kg	20 kg
- Maximum weight without brake	200 kg	200 kg
- Maximum weight with inertia brake	400 kg	400 kg
- Maximum gradient towing 400 kg or 500 kg	11%	11 %
- Maximum weight on roof rack	30 kg	30 kg

III. CAPACITIES :

Petrol tank	20 litres → 7/1971 25 litres ← 7/1971	25 litres
Engine :		
- Engine casing after draining	2 litres	AK = 2.5 litres AKB and AK (Series AK) = 2.2 litres
- Gearbox	0.9 litre	0.9 litre

PROTECTION OF ELECTRICAL COMPONENTS
PRECAUTIONS TO BE TAKEN WHEN WORKING ON THE VEHICLE

It is extremely important to avoid certain errors of operation which are likely to damage the electrical components or cause a short circuit. (with risk of fire or accident).

1.. Battery :

a) First disconnect the negative terminal clamp from the battery, then the positive one .
b) Carefully connect the two terminal clamps to the battery. The negative terminal should be connected last.
c) Before connecting the negative terminal, make sure that no current is flowing. To do this, place this terminal intermittently in contact with the negative post of the battery : there should be no sparks. Otherwise there is a short circuit in the electrical system which must be corrected.
d) The battery must be connected the right way round : the negative post should be connected to earth.
e) Before operating the starter, make sure that the two clamps are properly tightened on their respective posts.

2. Dynamo - Alternator - Regulator :

a) Never rotate the alternator unless it is connected to the battery.
b) Before connecting the alternator. make sure that the battery is connected the right way round (negative pole to the chassis).
c) Do not check the operation of the alternator by short circuiting the positive and chassis terminals, or the « EXC » and chassis terminals.
d) Do not interchange the wires connected to the regulator.
e) Never try to excite an alternator : this is never necessary and it could damage the alternator and the regulator.
f) Do not connect a radio suppressor capacitor to the « EXC » terminal of the dynamo, alternator or regulator.
g) Do not connect the terminals of the battery to a charger, and never use an arc welder (or work with a welding clamp) on the vehicle chassis, without first disconnecting the two cables, positive and negative, from the battery and isolating the positive cable from the chassis.

3. Ignition coil :

Do not connect a radio suppressor capacitor to the « RUP » terminal of the coil.

Fit the capacitor recommended by the works to the « + » or « BAT » terminal of the coil.

1. PRECAUTIONS

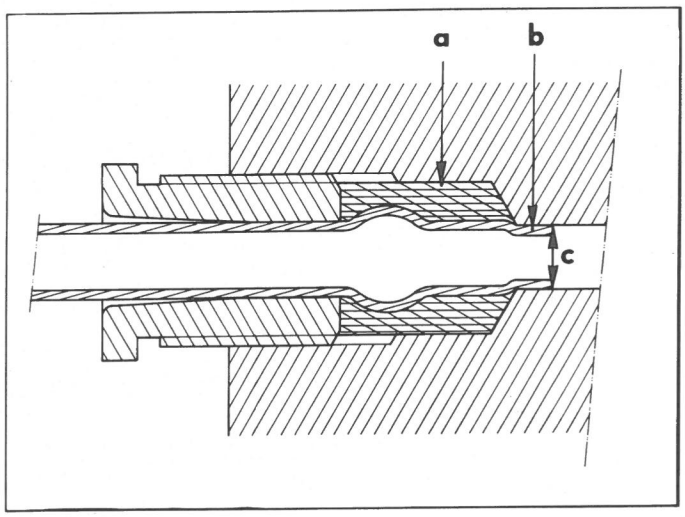
Use TOTAL 70 R 3 synthetic hydraulic fluid in the brake circuit.

NOTE : LOCKHEED 55 synthetic hydraulic fluid is miscible with TOTAL 70 R 3 synthetic hydraulic fluid.

Use only seals, linings and flexible tubes of the correct quality corresponding to the special synthetic hydraulic fluid for brake systems.

Clean parts with alcohol or with hydraulic fluid of the same quality as that used in the brake circuit.

To couple up a union, proceed as follows :



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- Install the lining « a » smeared with hydraulic brake fluid, to the tube. This lining should not reach to the end « b » of the tube.

- Centre the tube in the bore by offering it centrally in the hole and avoiding any stress (make sure that the end « b » of the tube penetrates the small opening « c ».

- Screw the union nut in by hand.

- Moderately tighten the nut : overtightening might cause a leak by deforming the tube.

NOTE : Tightening torques :

3.5 mm dia. tube
4.5 mm dia. tube } 8 to 9 mΛN (0.8 to 0,9 m.kg)

The different seals are designed to be more leak proof as the pressure rises. Thus sealing is not improved by tightening the unions .

2. CHECKS TO BE CARRIED OUT AFTER WORKING ON THE HYDRAULIC SYSTEM.

After working on the components or the hydraulic circuit, check that there are no leaks at the unions.

PRINCIPAL RECOMMENDED PRODUCTS

PRODUCTS	USE	SUPPLIERS
POLYCLENS	Grease remover for mechanical parts. Used pure or diluted and should be flushed away with water.	ACBIMEX S.A.M. 12, avenue F.D. Roosevelt 75008 - PARIS Tel. 359-84-32 or Palais de la Scala MONTE-CARLO Tel. 30-53-79
ADEXOLIN 56	Adhesive for water pump impeller seal.	AREXONS (S.I.P.A.L.) 406, cours Emile Zola 69100 - VILLEURBANNE Tel : 84-17-35
RILSAN Adhesive	Adhesive for plastic tube	BOYRIVEN 37 bis, rue de Villiers 92200 - NEUILLY S/SEINE Tel : 624-36-11
PROTOJOINT	Sealing the two halves of the engine casing, or covers. Withstands hydrocarbons.	Jean BRASSART 44, rue de la Boétie 75008 - PARIS Tel. 359-54-82
CURTYLON	Sealing compound for engine casing	CEFILAC Département Joints CURTY 25, rue Aristide Briand 69800 - SAINT-PRIST Tel : 20-08-94 or 7 to 11, rue de la Py - 75020 - PARIS Tel : 797-01-49
DEVCON	Sealing porosity in engine casings	COMET 10, rue Emile Cazeau 60300 - Z.I. de SENLIS Tel. 455-35-40
LOCTITE AUTOFORM	Sealing the two halves of the engine casing, or covers. Withstands hydrocarbone.	
METALIT	Sealing porosity of engine casings	DISEMPEX 1, rue Goethe 75016 - PARIS Tel. 727-89-59
SILASTIC 733 RTV	Sealing porosity of engine casings	DOW CORNING S.A.R.L. 140, avenue Paul Doumer 92500 - RUEIL - MALMAISON Tel. 977-00-40
MOLYKOTE 557	Silicone grease for water pump impeller seal	

OPERATION N° A. 03. : *Recommended products.*

PRODUCTS	USE	SUPPLIERS
METOLUX A	Sealing porosity of engine casings	METOLUX 167, avenue de Fontenay 94300 - VINCENNES Tel. 808-55-11
OIL AND GREASE REMOVER	Removing grease from mechanical parts.	MULLER & Cie 28, avenue de l'Opéra 75002 - PARIS Tel. 742-58-36
ROCOL ASP	Water pump grease	LABO INDUSTRIE 1, rue Lavoisier 92000 - NANTERRE Tel. 204-62-00
G.S.I. 160 Grease	Silica grease for bearings	P.C.A.S. 23, rue Bossuet 91160 - LONGJUMEAU Tel. 920-00-71
ARALDITE	Adhesive	PROCHAL 5, rue Bellini 92800 - PUTEAUX Tel. 722-99-39
MASTI-JOINT HD 37	Sealing compound	REXON 33, avenue du Général Michel Bizot 75012 - PARIS Tel. 307-79-56
PATE LOWAC	Sealing compound resistant to hydrocarbones	S.E.B.I.S. 3 - 5 rue de Metz 75010 - PARIS Tel. 770-13-08
PLASTISOL D.C.O. 625	Sealing compound for studs on engine casings	SYNTHESIA 28, rue de l'Arbroust 94130 - NOGENT S/MARNE Tel. 871-09-36
Colle mastic réfractaire (Refractory adhesive compound) Ref. 1500 (COLLAFEU)	Sealing the heater tubes from the intake manifold	Ets BARTHELEMY 61, 64, 71, rue Defrance 94300 - VINCENNES Tel. 328-42-87

LOCTITE

The Replacement Parts Department markets two grades of LOCTITE seal with the following numbers :

GX. 01 459 01 A and GX. 01 460 01 A

together with the hardener LOCQUIC-T GX. 01 461 01 A.

APPLICATION : The LOCQUIC-T hardener is an activating agent for the parts to which the LOCTITE seal is being applied. Non-metallic parts require pre-treatment with LOCQUIC-T hardener. The majority of parts coated with zinc, cadmium or aluminium, or made of stainless steel, require this treatment so that the LOCTITE seal can harden quickly. LOCQUIC-T hardener can be used for removing grease from parts. It can also be used to activate inert surfaces. Spray on surfaces to which the LOCTITE seal is to be applied.

Brush or wipe to remove traces of grease. Spray again for perfect cleanliness. Repeat the operation if necessary. Do not apply the LOCTITE seal until the hardener is *perfectly dry.*

CAUTION : *Precautions to be taken.* The area where LOCQUIC-T is being used must be properly ventilated. Avoid prolonged or repeated contact with the skin. Do not swallow. Avoid spraying painted surfaces. The drum of LOCQUIC-T must be kept at a temperature less than 44° C.

I. GENERAL CHARACTERISTICS

TYPE OF ENGINE	VEHICLE
A 53 (425 cc)	AZ (Series A and AM) *from March 1963 to February 1970* AZU *from March 1963 to August 1967*
A 79/0 (425 cc)	AZU *from August 1967 to August 1972* AYA (Series A and AM) *from August 1967 to March 1968*
A 79/1 (435 cc)	AYA 2 (Series A and AM) *from March 1968* AZ (Series A 2) *from February 1970* AZU (CITROEN 250) *from August 1972*
M 4 (602 cc)	AYA 3 (Series A and AM) *from January 1968 to October 1968* AK *up to May 1968*
M 28/1 (602 cc)	AYB (Series A and AM) *from October 1968 to February 1970* AZ (Series KA) *from February 1970* AY (Series CA) *from October 1968* AK (Series B) *from May 1968 to August 1970* AK (Series AK) *from August 1970*
M 28 (602 cc)	AY (Series CB) *from February 1970*

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Engine type	A 53 - A 79/0	A 79/1	M 4 - M 28 - M 28/1
- No of cylinders	2 (flat twin)	2 (flat twin)	2 (flat twin)
- Fiscal rating	2 HP	2 HP	3 HP
- Cylinder capacity	425 cc	435 cc	602 cc
- Bore	66 mm	68.5 mm	74 mm
- Stroke	62 mm	59 mm	70 mm
- Compression ratio.....	A 53 = 7.5/1 A 79/0 = 7.75/1	8.5/1	M4 = 7.75/1 M 28/1 = 8.5/1 - M 28 = 9/1
- Effective power	A 53 = 18 HP SAE at 5000 rpm A 79/0 = 21 HP SAE at 5450 rpm	26 HP SAE at 6750 rpm	M 4 { AYA 3 = 28 HP SAE at 5000 rpm AK = 26 HP SAE at 4500 rpm M 28/1 = 32.8 HP SAE at 5750 rpm M 28 = 35 HP SAE at 5750 rpm
- Max. torque	A 53 = 2.9 m.kg SAE at 3500 rpm A 79/0 = 3 m.kg SAE at 3500 rpm	3.1 m.kg SAE at 4000 rpm	M4 { AYA 3 = 4.4 m.kg SAE at 3500 rpm AK = 4 m.kg SAE at 3500 rpm M28/1 = 4.1 m.kg SAE from 3500 to 4500 rpm M28 = 4.7 m.kg SAE at 4750 rpm

Cooling : forced air .

Lubrication : pressurized system fed by an oil pump of the « EATON » type mounted on the end of the camshaft.
- Built-in filter cartridge on engines M 28/1 and M 28 *from November 1969 to November 1970.*
- External filter cartridge on engines M 28/1 and M 28 *from November 1970*

Carburation :

ENGINE TYPE	TYPE OF CARBURETTOR	CARBURETTOR REF	
		Conventional clutch	Centrifugal clutch
A 53 (425 cc)	SOLEX 28 IBS	32 [1]	
	SOLEX 28 CBI		30 [1]
	ZENITH 28 IN	Z 32	
	ZENITH 28 IN 4		Z 30
A 79/0 (425 cc)	SOLEX 32 PICS	38	
	SOLEX 32 PCIS		39
A 79/1 (435 cc)	SOLEX 34 PICS 4	101	
	SOLEX 34 PCIS 4		102
	SOLEX 34 PICS 5	101 [1]	
	SOLEX 34 PCIS 5		102 [1]
	SOLEX 34 PICS 6	121	
	SOLEX 34 PCIS 6		122
M 4 (602 cc)	SOLEX 40 PICS 3	44 [3]	
	SOLEX 40 PCIS 3		45 [3]
	SOLEX 30 PICS		
M 28/1 (602 cc)	SOLEX 34 PICS 4	103	
	SOLEX 34 PCIS 4		104
	SOLEX 34 PICS 5	103 [1]	
	SOLEX 34 PCIS 5		104 [1]
	SOLEX 34 PICS 6	123	
	SOLEX 34 PCIS 6		124
M 28 (602 cc)	SOLEX 26/35 CSIS	110 [2]	
	SOLEX 26/35 SCIC		111 [2]
	SOLEX 26/35 CSIC	113 [1]	
	SOLEX 26/35 SCIC		114 [1]
	SOLEX 26/35 CSIC	127	
	SOLEX 26/35 SCIC		128

- Intake silencer : with dry interchangeable element.
- Fuel : { Super grade for engine M 28
  Ordinary grade for all other types of engine

Ignition

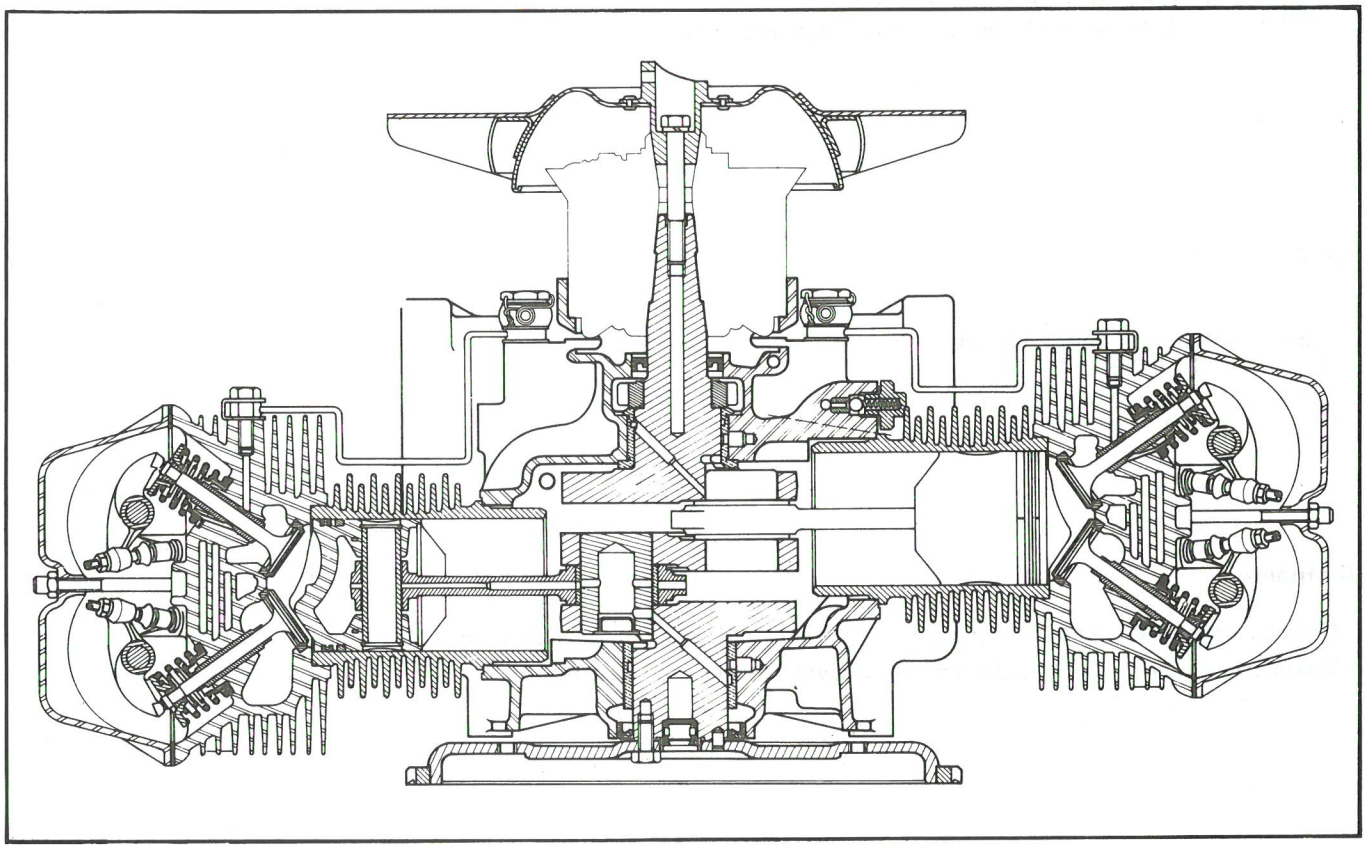
- Contact breaker on camshaft end, at front of engine
  Make : DUCELLIER
- Sparking plugs : *See appropriate Technical Bulletins*
- Firing order : 1 - 2

Distribution :

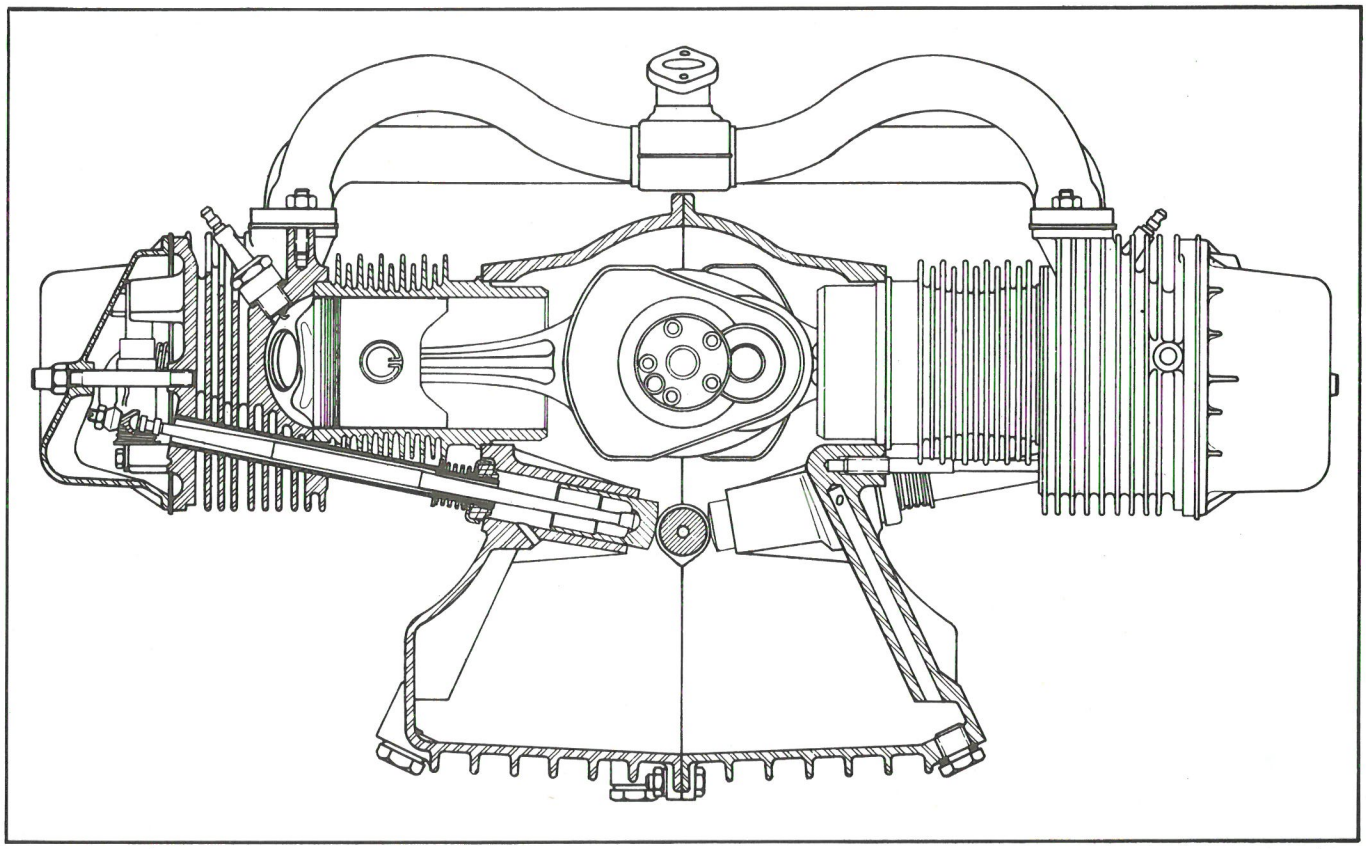
- Camshaft below crankshaft (timing gear with self-adjusting device for wear)
- Maximum run-out of the spindle for the contact breaker = 0.02 mm

ENGINES A 53 and A 79/0

HORIZONTAL SECTION

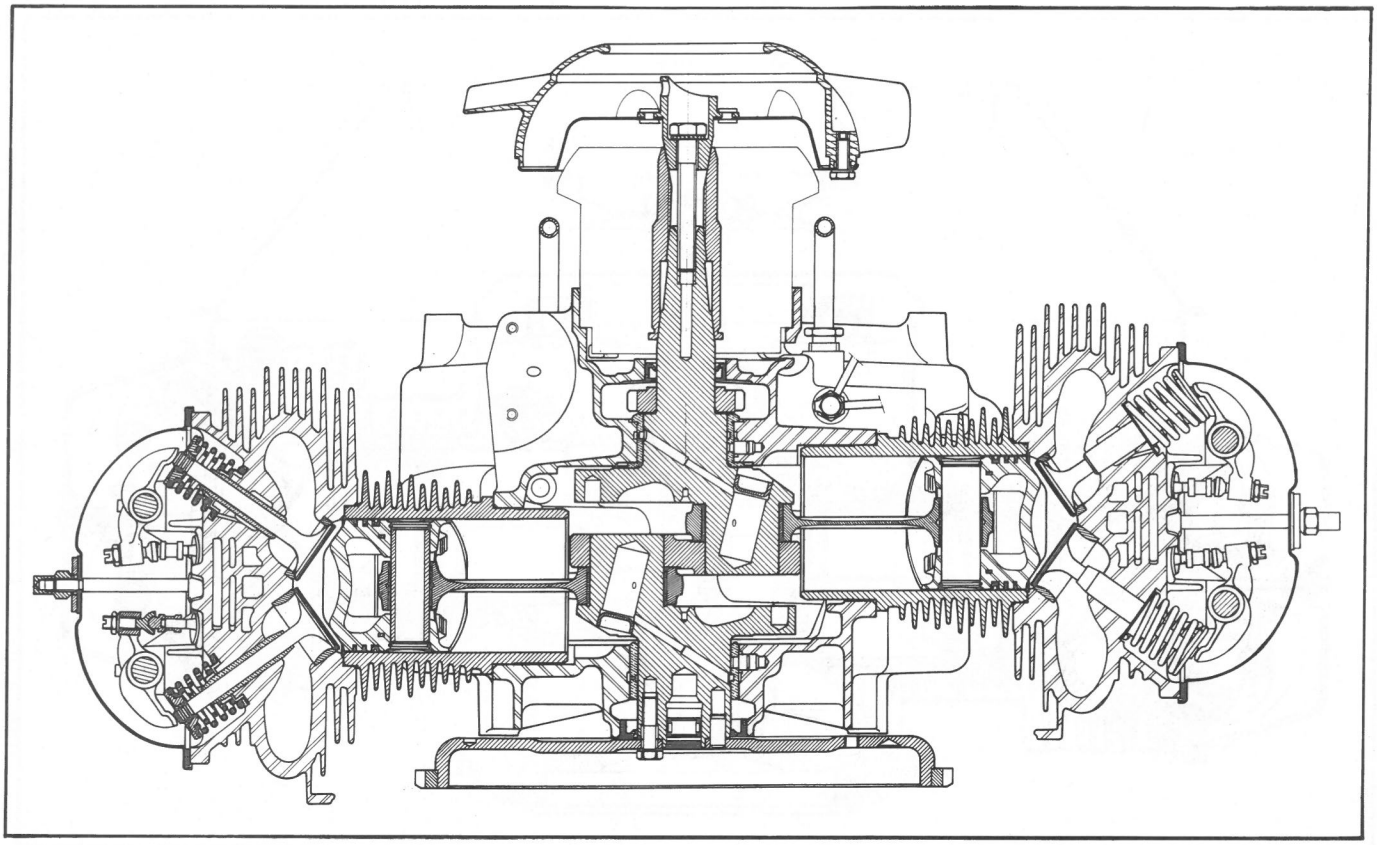


TRANSVERSE SECTION



ENGINE A 79/1

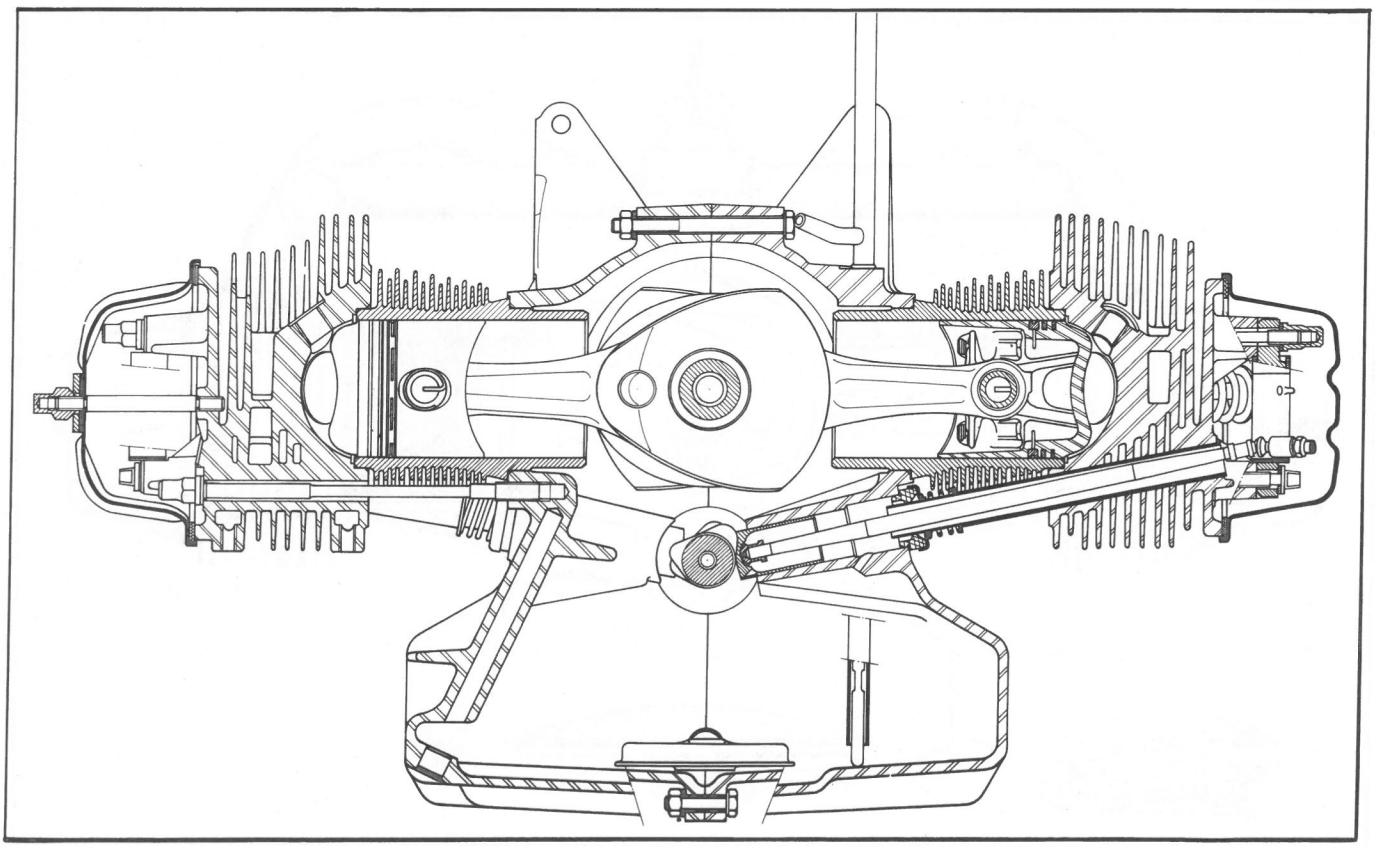
HORIZONTAL SECTION



Manual 812-1

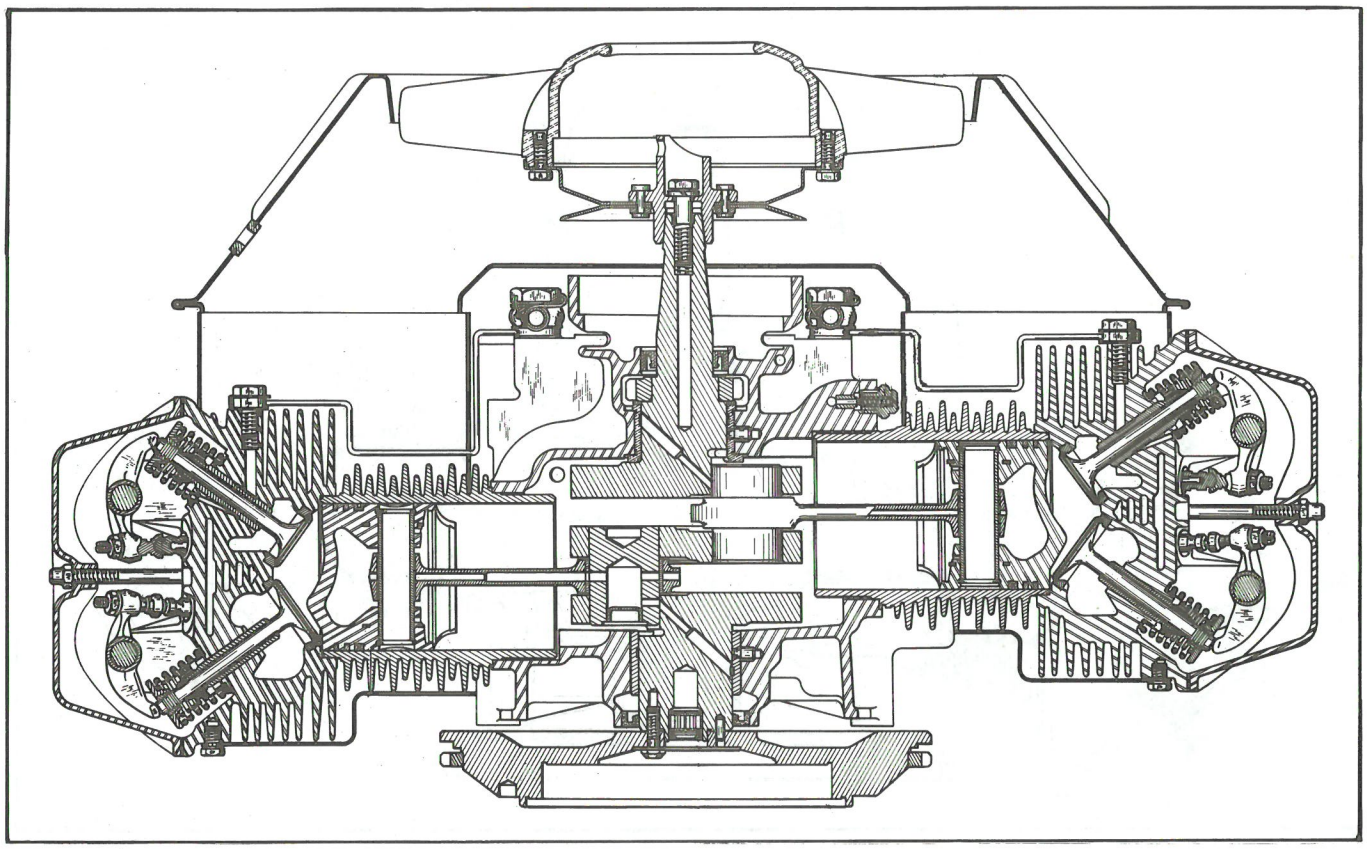
TRANSVERSE SECTION

A 10-1



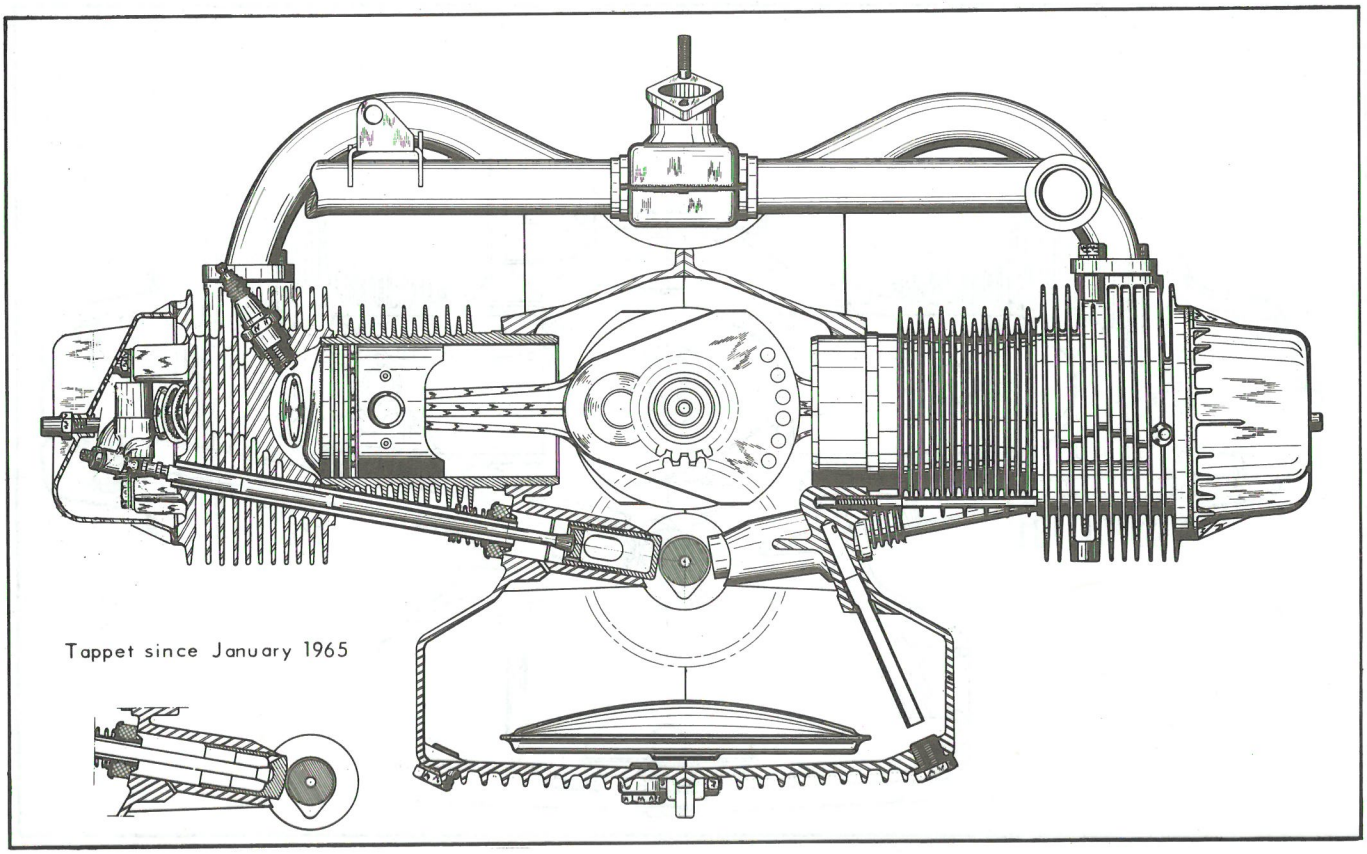
ENGINE M4

HORIZONTAL SECTION



TRANSVERSE SECTION

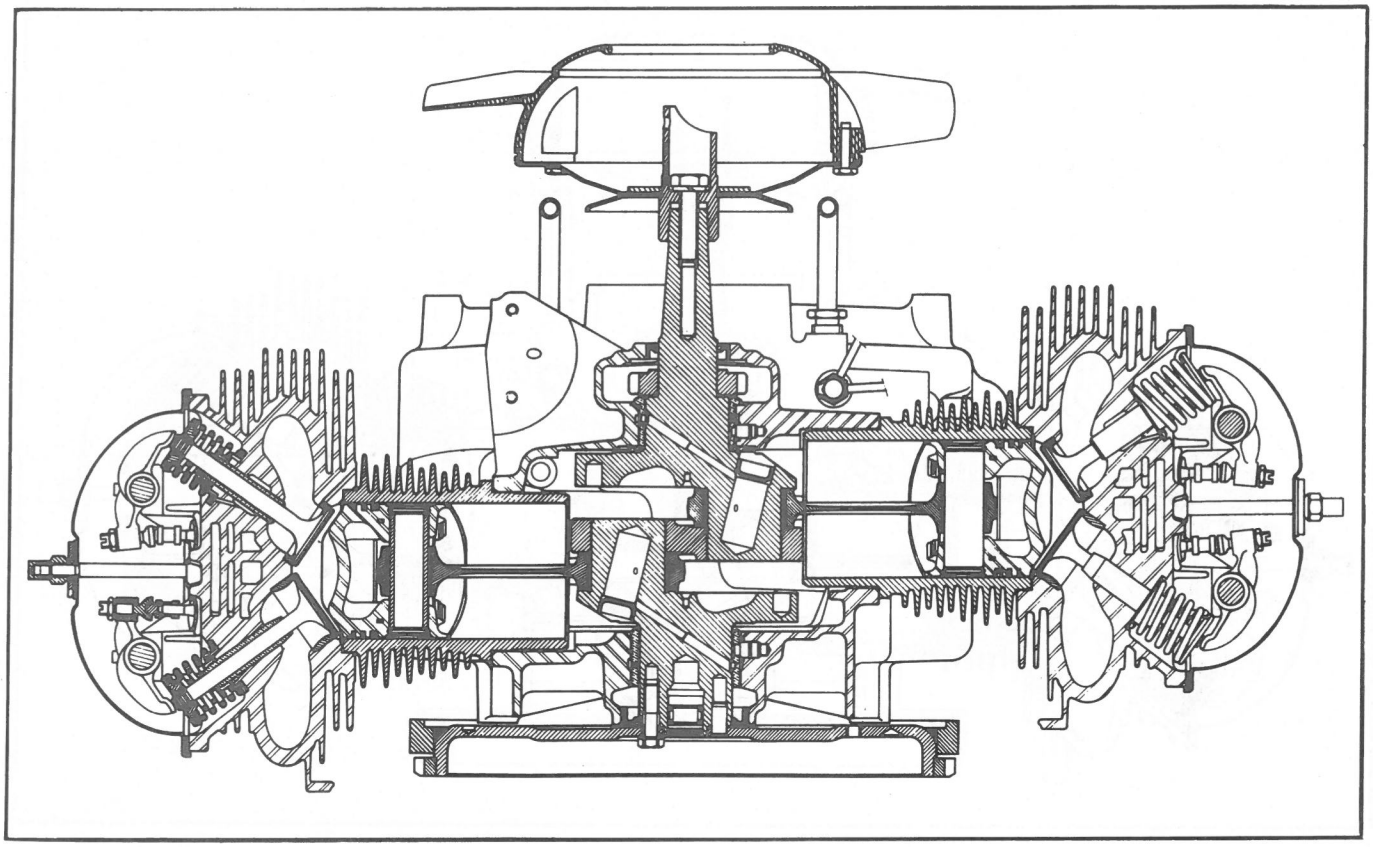
A. 10-9



ENGINES M 28/1 and M 28

(Vehicles produced up to December 1969)

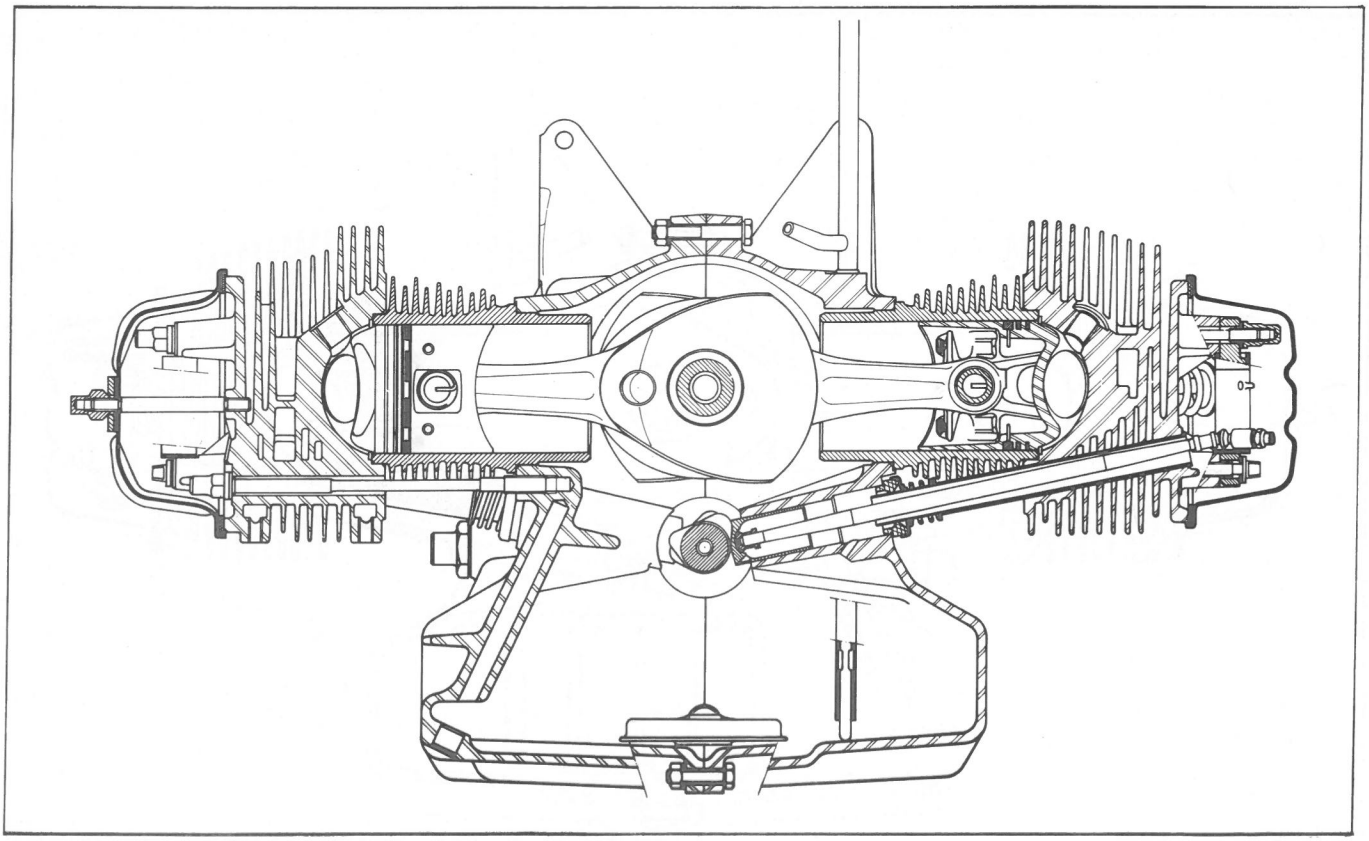
HORIZONTAL SECTION



Manual 812-1

TRANSVERSE SECTION

A 10-6

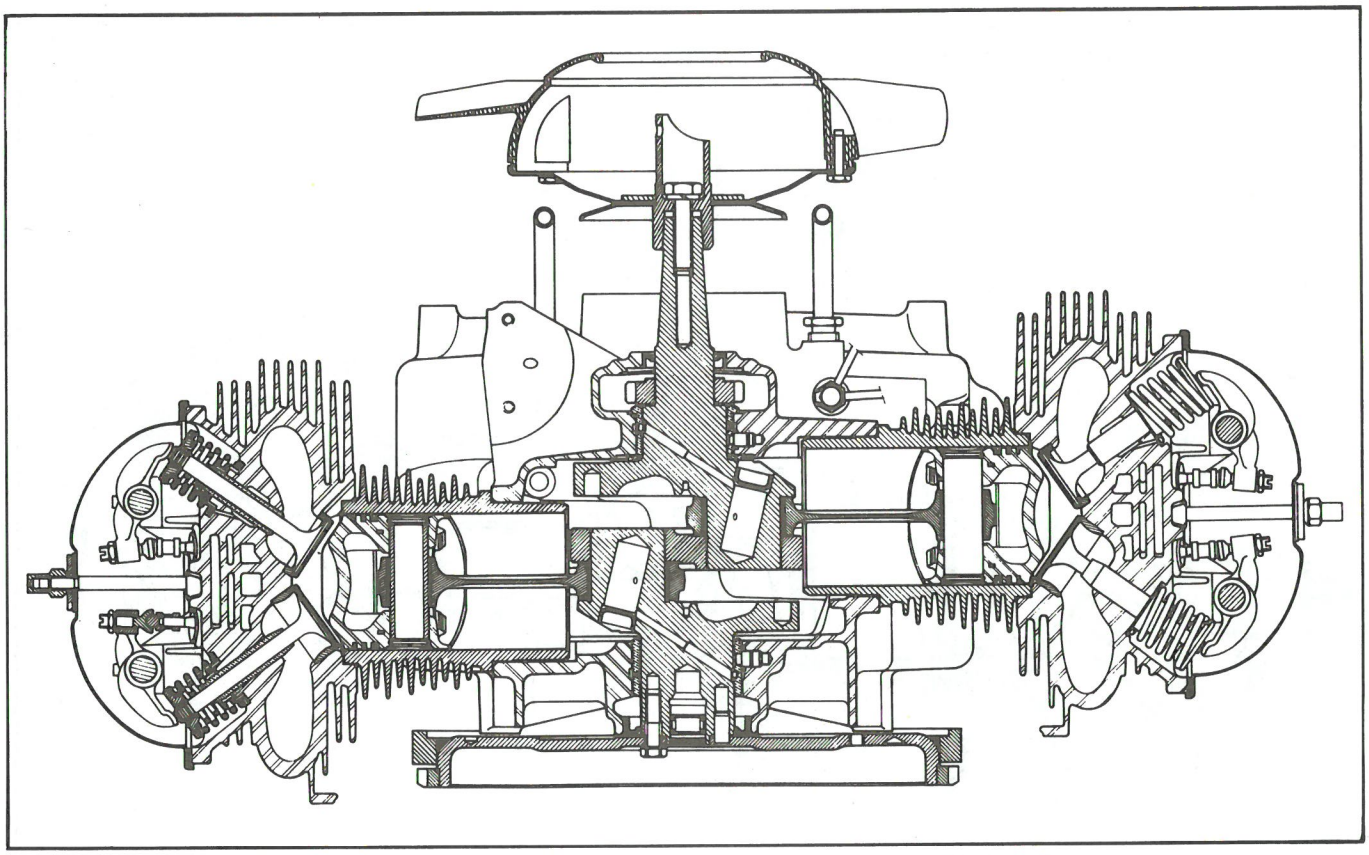


NOTA : The M 28 engine differs from the M 28/1 engine only in cylinder capacity.

ENGINES M 28/1 and M 28

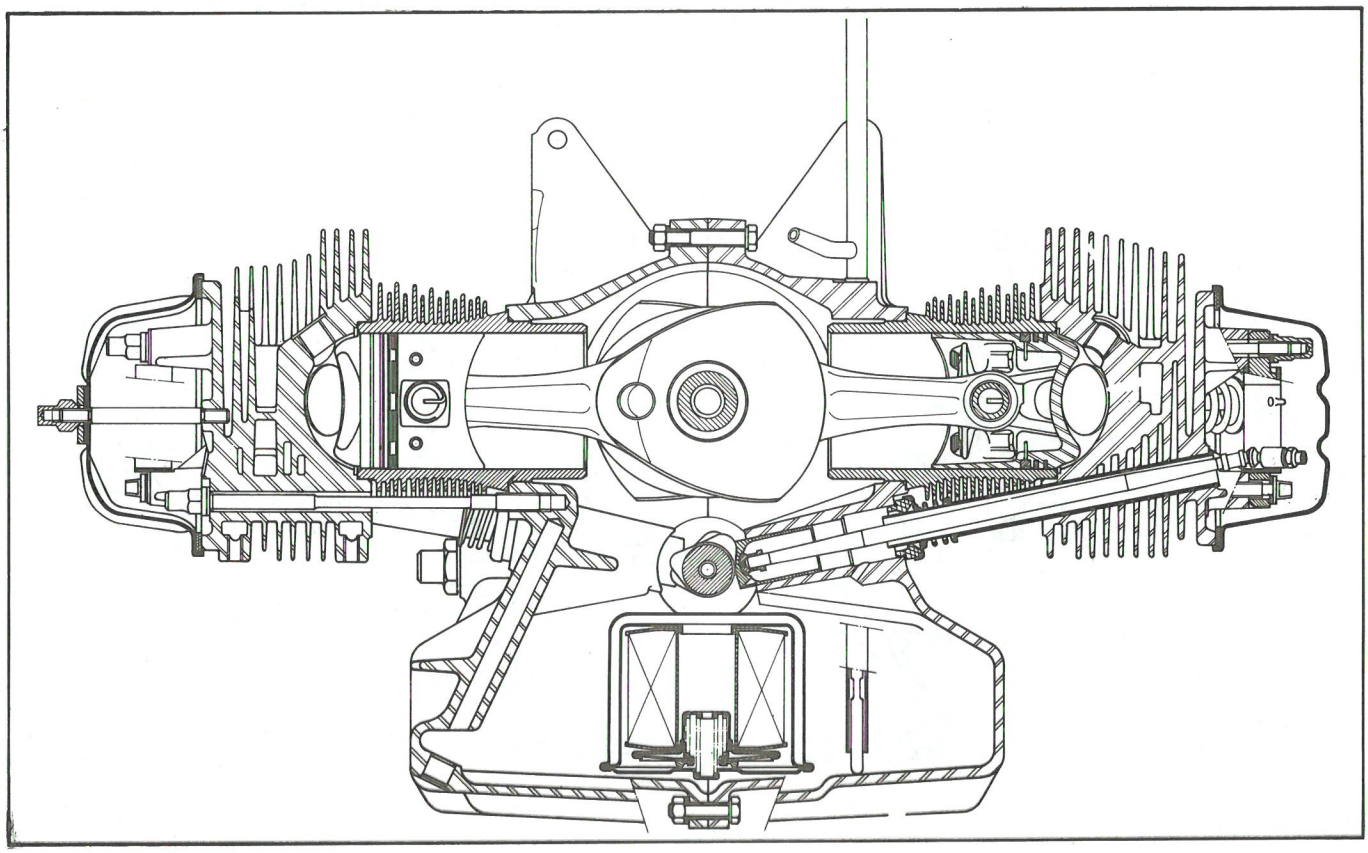
(Vehicles produced from December 1969 to November 1970)

HORIZONTAL SECTION



TRANSVERSE SECTION

A 10-6a

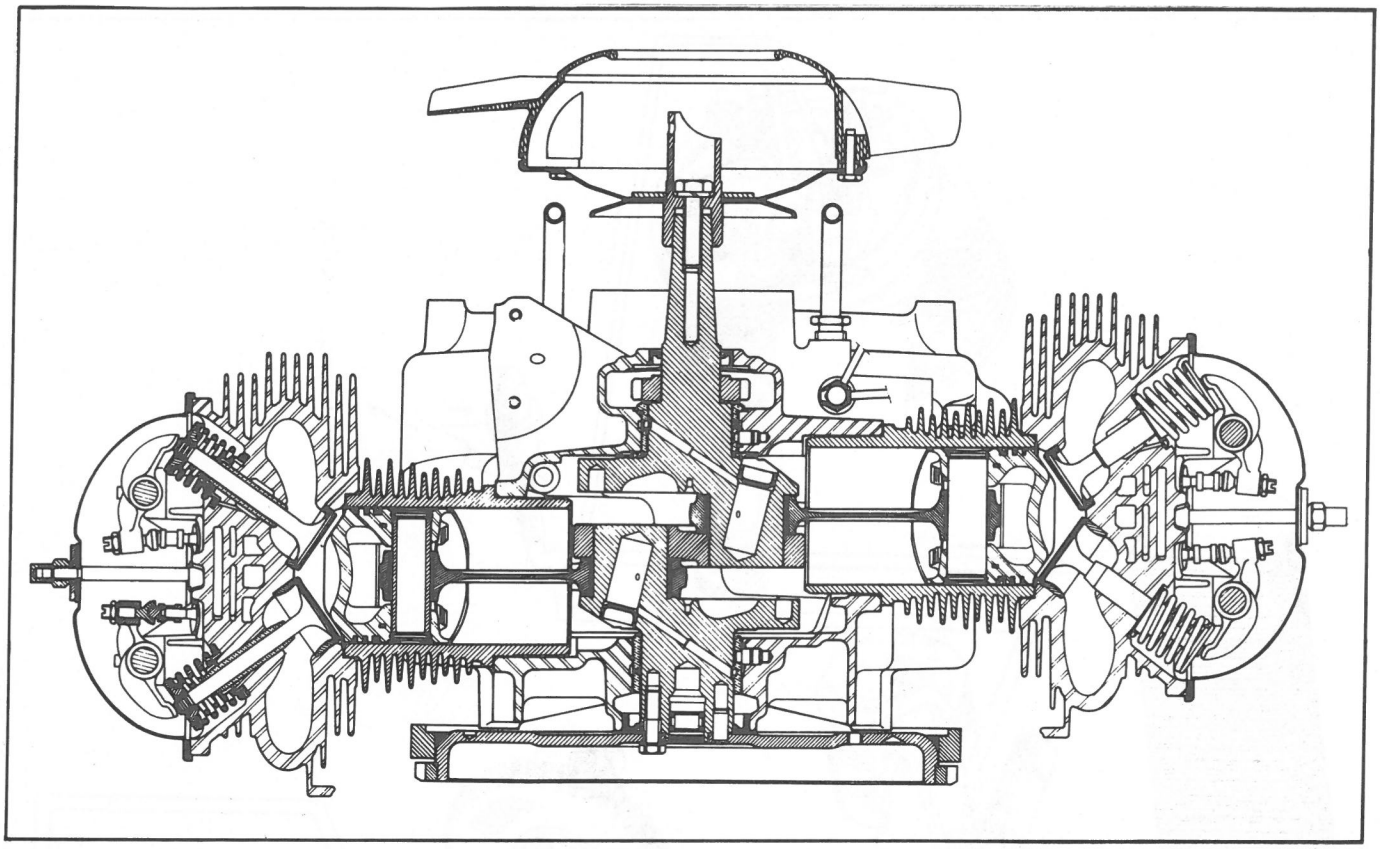


NOTE : The M 28 engine differs from the M 28/1 engine only in cylinder capacity.

ENGINES M 28/1 and M 28

(Vehicles produced since November 1970)

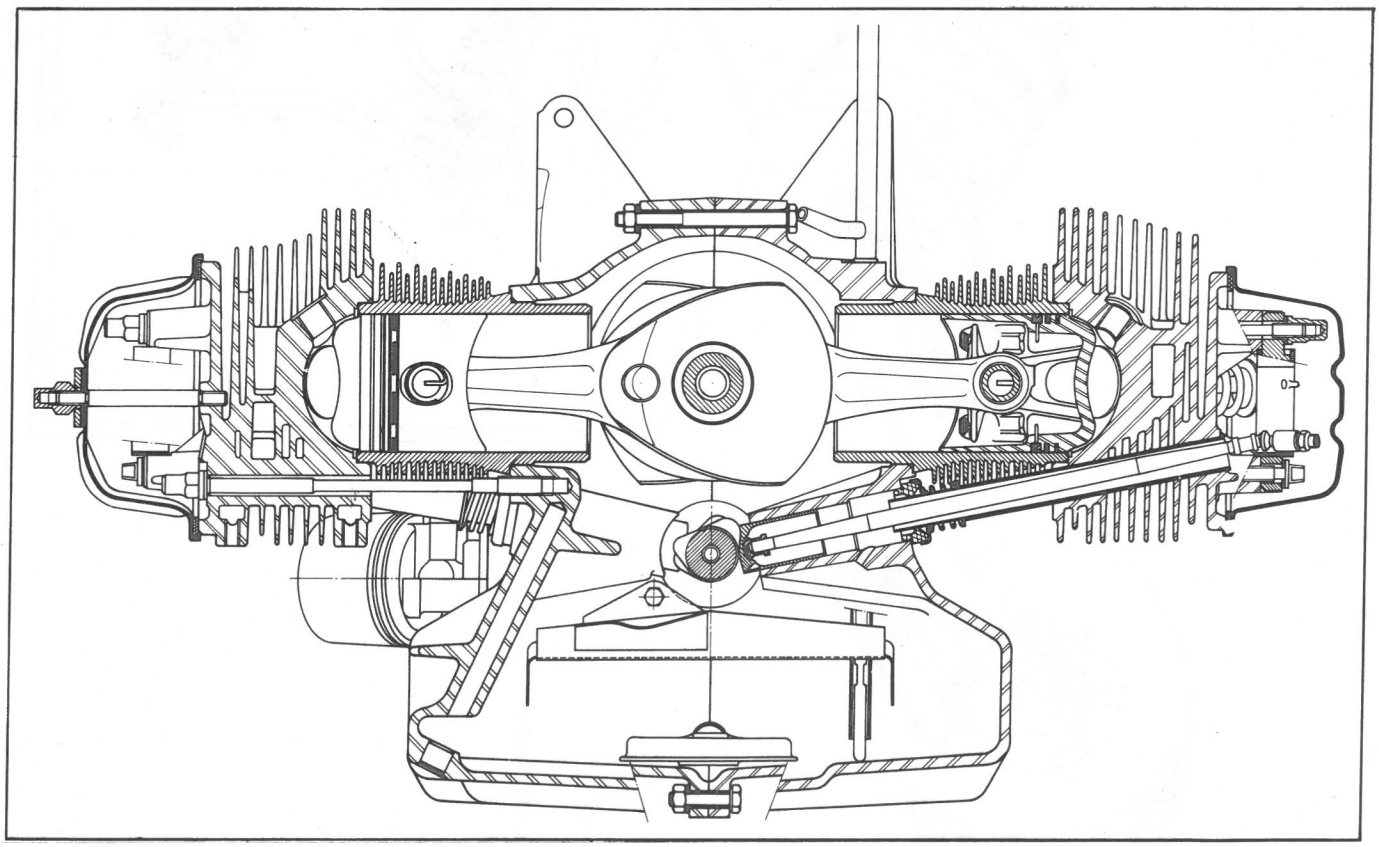
HORIZONTAL SECTION



Manual 812-1

TRANSVERSE SECTION

A. 10-7



NOTE : The M 28 engine differs from the M 28/1 engine only in cylinder capacity.

DIAGRAM OF LUBRICATION SYSTEM
ENGINES A 53 - A 79/0 - M4

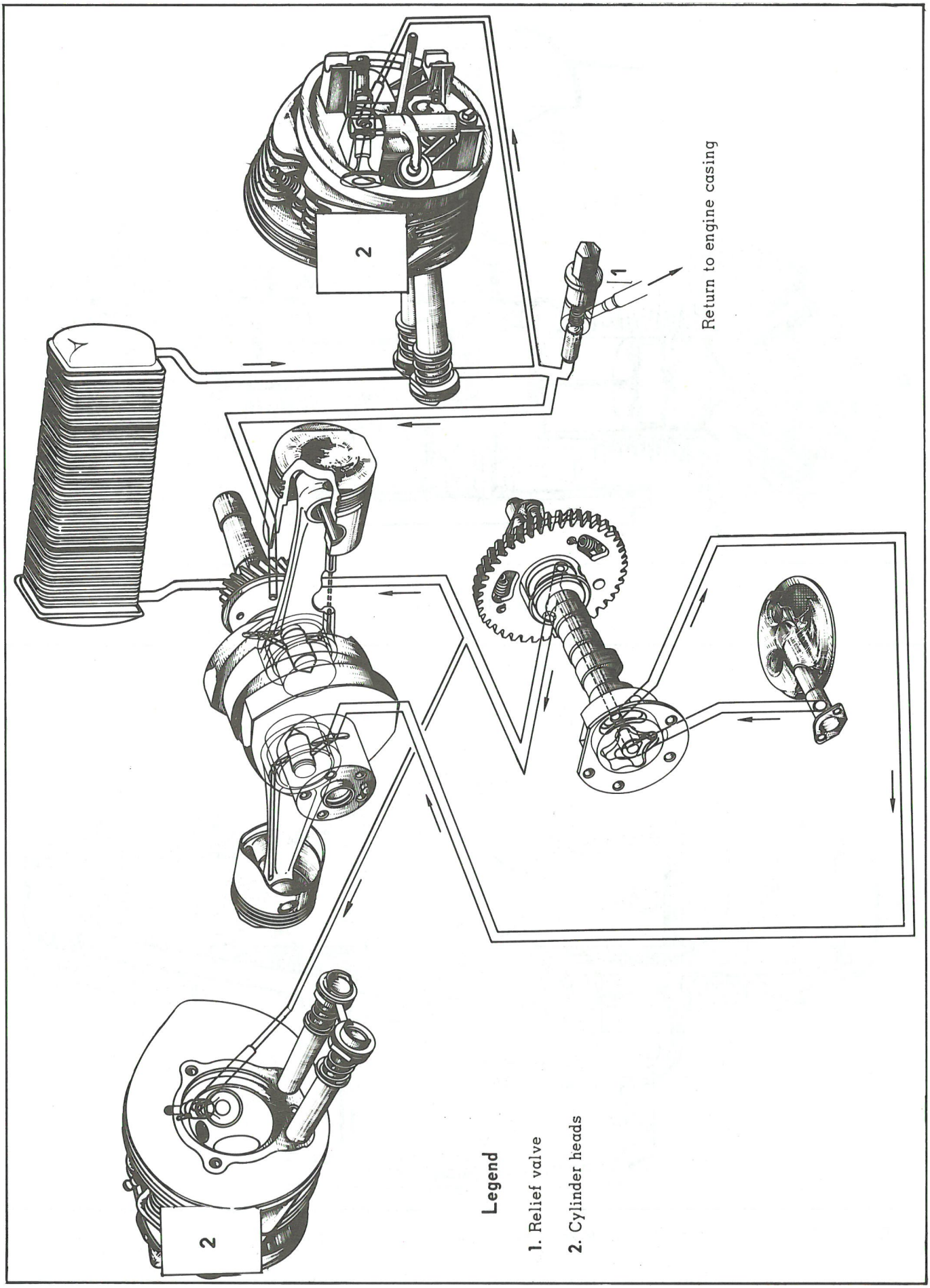


DIAGRAM OF LUBRICATION SYSTEM

ENGINES A 79/1 - (M 28/1) and M 28 *(up to November 1970)*

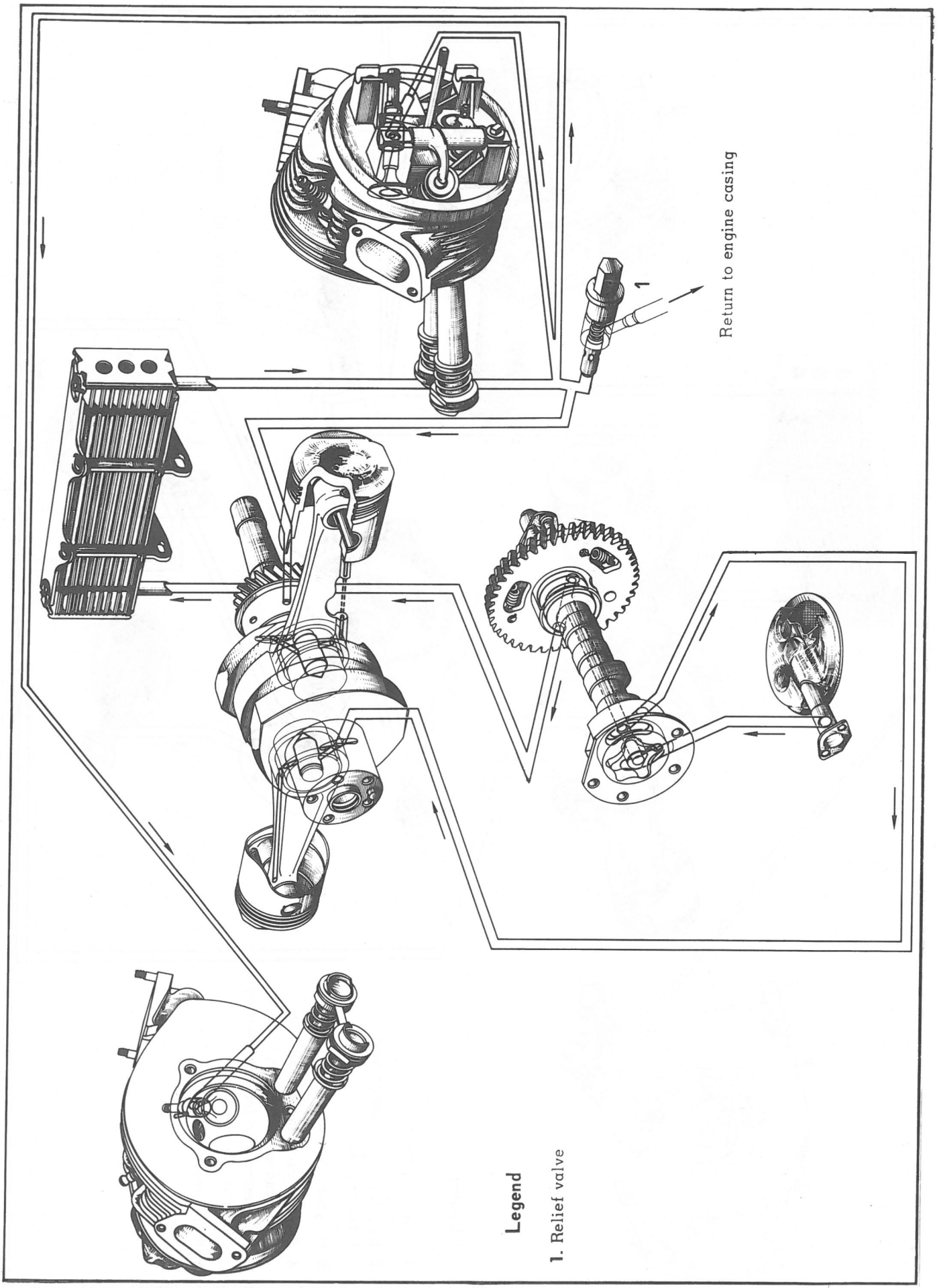
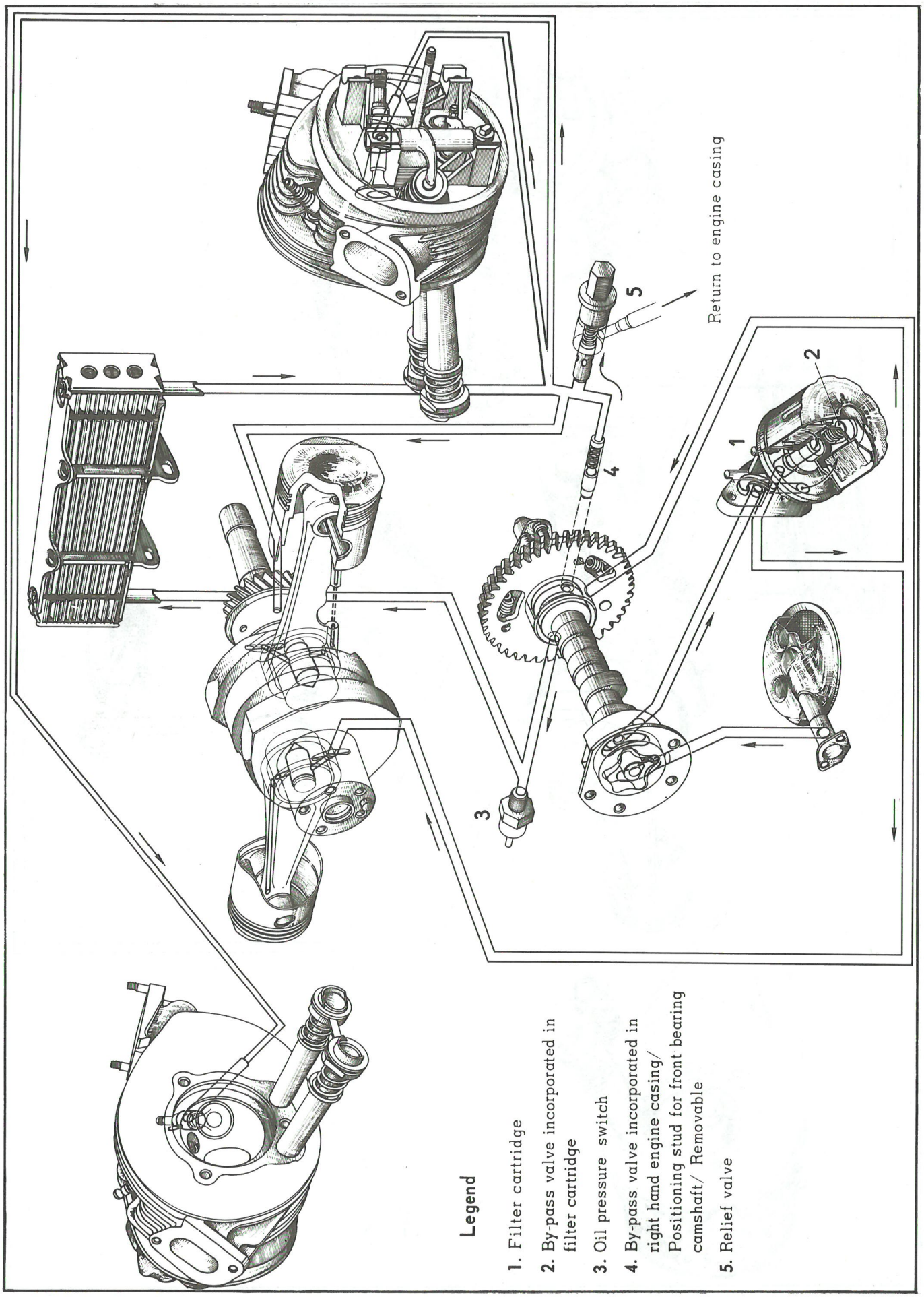


DIAGRAM OF LUBRICATION SYSTEM

ENGINES M 28/1 and M 28

(Engines produced since November 1970)



Legend

1. Filter cartridge
2. By-pass valve incorporated in filter cartridge
3. Oil pressure switch
4. By-pass valve incorporated in right hand engine casing/ Positioning stud for front bearing camshaft/ Removable
5. Relief valve

II. SPECIAL FEATURES

Engine casing :

Tightening torques :

- Halves of engine casing : assembly bolts and nuts ..... 15 to 20 mΛN (1.5 to 2 m.kg)
- Bearing nuts ..... 35 to 45 mΛN (3,5 to 4.5 m.kg)
- Oil strainer fixing bolt ..... 3 to 5 mΛN (0.3 to 0.5 m.kg)
- Bolts fastening front supports to engine casing ..... 60 mΛN (6 m.kg)
- Drain plug ..... 35 to 45 mΛN (3.5 to 4.5 m.kg)
- Bearing studs on halves of engine casing ..... 6 to 8 mΛN (0.6 to 0.8 m.kg)
- Assembly studs for engine casing halves ..... 3 to 5 mΛN (0.3 to 0.5 m.kg)

Crankshaft - Connecting rods :

- Lateral play of crankshaft (cannot be adjusted) ..... 0.07 to 0.14 mm
- Do not interfere with the front and rear bearings of the crankshaft (micro-turbine)
- Bore of small-end bushes ..... $20.005 \begin{smallmatrix} +0.011 \\ -0.006 \end{smallmatrix}$ mm
- Lateral play of connecting rods ..... 0.08 to 0.13 mm

Manual 812-1

Flywheel :

- Maximum out of true of starter ring ..... 0.3 mm
- Orientation of starter ring : teeth entry towards gearbox

Tightening torques :

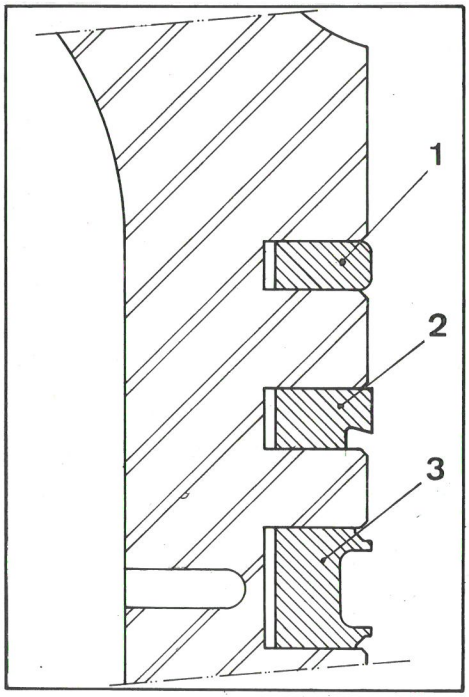
- Flywheel fixing bolts (to be replaced whenever dismantled) ..... 35 to 38 mΛN (3.5 to 3.8 m.kg)

Cylinders :

- A single type of cylinders.

Pistons - Rings :

- The gudgeon pins are loose fit.
- Orientation of pistons :
  After fitting, the number showing the compression ratio should be legible.



Rings :

The number (or the maker's mark) should be upper most.

Order of fitting : (from the up piston crown)

1 - Compression ring

2 - Scraper ring

3 - Scraper - collector ring

Cylinder heads :

Tightening torques :

- Cylinder head nuts (order of tightening « *cold* » : front upper nut - rear upper nut - lower nut).
- Lightly tighten the nuts to position the cylinder head :
  - 1st tightening ..... 5 to 10 m.ΛN (0.5 to 1 m.kg)
  - 2nd tightening ..... 20 to 23 mΛN (2 to 2.3 m.kg)
- Rocker cover nuts ..... 5 to 7 mΛN (0.5 to 0.7 m.kg)
- Bolts and nuts on intake -exhaust manifold ..... 19 mΛN (1.9 m.kg)
- Cylinder head studs on engine casing ..... 4 to 6 mΛN (0.4 to 0.6 m.kg)
- Rocker cover studs ..... 4 to 6 mΛN (0.4 to 0.6 m.kg)
- Bolts on exhaust collars ..... 19 mΛN (1.9 m.kg)

Valves :

Rotary valves (TEVES) on engines : A 79/0 - A 79/1 - M 28

	Valves	Angle	Head dia. (mm)	Stem dia. (below head)	Length (mm)
Engines A 53 - A 79/0	Intake	120°	39	8 $^{-0.025}_{-0.040}$	90.8 ± 0.25
	Exhaust	90°	32	8.5 $^{-0.035}_{-0.050}$	88.65 ± 0.25
Engine A 79/1	Intake	120°	39	8 $^{-0.005}_{-0.035}$	89.57 $^{+0.45}_{-0.25}$
	Exhaust	90°	34	8.5 $^{-0.020}_{-0.050}$	88,18 $^{+0.45}_{-0.25}$
Engine M 4	Intake	120°	39	8 $^{-0.025}_{-0.040}$	88.8 ± 0.25
	Exhaust	90°	34	8.5 $^{-0.035}_{-0.050}$	86.5 ± 0.25
Engines M 28/1 - M 28	Intake	120°	40	8 $^{-0.020}_{-0.035}$	88.5 $^{+0.45}_{-0.25}$
	Exhaust	90°	34	8.5 $^{-0.035}_{-0.050}$	86.95 $^{+0.45}_{-0.25}$

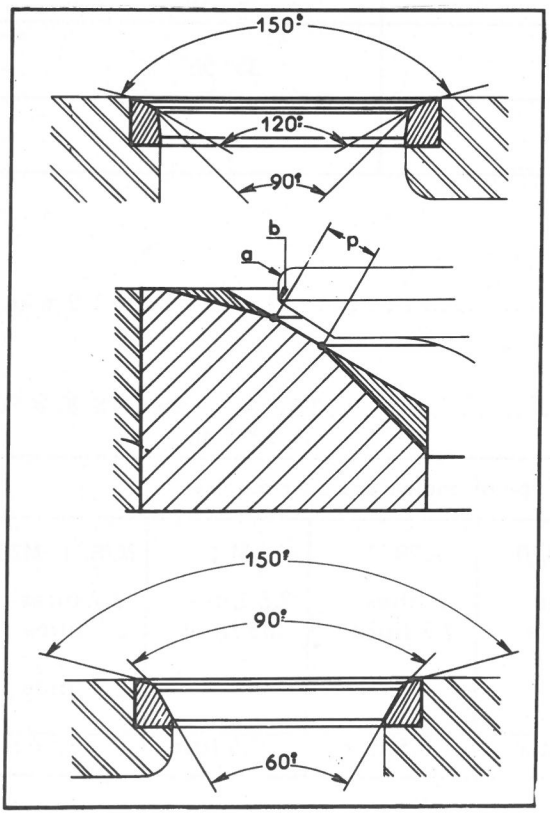
Valve springs :

Engines	Springs		Normal length	Length under load	Load in kg	Length under load	Load in kg
A 53 A 79/0 M 4	Up to September 1963	outer	38 mm	24 mm	38 to 42	31 mm	18 to 21
		inner	28 mm	14.5 mm	7.4 to 8.3	21.5 mm	3.6 to 4.4
	Since September 1963	outer	38.6 mm	24.4 mm	47.3 to 48.3	31.7 mm	21.2 to 24.6
		inner	28.8 mm	15 mm	9 to 10	22.3 mm	3.7 to 4.7

Engines	Springs	Length under load	Load in kg	Length under load	Load in kg	sense of winding
A 79/1 M 28/1 M 28	Outer	31.4 mm	28 ± 1.5	24.15 mm	42.5 ± 2	Righthand
	Inner	24.4 mm	12 ± 1	17.15 mm	25 ± 1.5	Lefthand

Seats and guides :

INTAKE



EXHAUST

Bore of valve guides :

Engines A 53 - A 79/0 :

- intake : $\phi = 8 \begin{smallmatrix} +0.025 \\ 0 \end{smallmatrix}$ mm
- exhaust : $\phi = 8.5 \begin{smallmatrix} +0.025 \\ 0 \end{smallmatrix}$ mm

Engine A 79/1 :

- intake : $\phi = 8 \begin{smallmatrix} +0.020 \\ +0.005 \end{smallmatrix}$ mm
- exhaust : $\phi = 8.5 \begin{smallmatrix} +0.010 \\ +0.005 \end{smallmatrix}$ mm

Engines M 4

- intake : $\phi = 8 \begin{smallmatrix} +0.040 \\ +0.025 \end{smallmatrix}$ mm
- exhaust : $\phi = 8.5 \begin{smallmatrix} +0.050 \\ +0.025 \end{smallmatrix}$ mm

Engines M 28/1 - M 28 :

- intake : $\phi = 8 \begin{smallmatrix} +0.030 \\ +0.005 \end{smallmatrix}$ mm
- exhaust : $\phi = 8.5 \begin{smallmatrix} +0.015 \\ -0.010 \end{smallmatrix}$ mm

Dimension « p » :

- Intake ..... 1.45 mm max.
- Exhaust ..... 1.80 mm max.
- Maximum out of straight of push rods..... 0.2 mm max.

Distribution :

Camshaft :

- Lateral play (not adjustable) ..... 0.04 to 0.09 mm

Theoretical timing setting :

Theoretical setting with a clearance of 0.53 mm at the intake valve and a clearance of 0.43 mm at the exhaust valve.		
	Engines A 53 and M 4	Engine A 79/0
Inlet opens B.T.D.C.	3°	12°
Inlet closes A.T.D.C.	45°	54°
Exhaust open B.T.D.C.	45°	55°
Exhaust closes A.T.D.C.	11°	21°

Theoretical setting with a clearance of 1 mm at the intake and the exhaust valves		
	Engine A 79/1	Engines M 28/1 - M 28
Inlet opens A.T.D.C.	2° 5'	0° 5'
Inlet closes A.B.D.C.	41° 30'	49° 15'
Exhaust opens B.B.D.C.	35° 55'	35° 55'
Exhaust closes A.T.D.C.	3° 30'	3° 30'

Tightening torques :

- Nuts for adjusting valve clearance ..... 14 to 19 mAN (1.4 to 1.9 m.kg)

Lubrication system :

- Grade of oil ..... TOTAL Altigrade GTS 20 W 50 or GT 20 W 40

	Type of engine and oil capacity				
	A 53	A 79/0	A 79/1	M 4	M28/1 - M28
- After draining	2 litres	2 litres	2 litres	2.5 litres	2.2 litres
- After removing the rocker covers	2.2 litres	2.3 litres	2.3 litres	2.85 litres	2.5 litres
- After removing the rocker covers and the cartridge (*from November 1970*)					2.7 litres
- Difference between minimum and maximum	0.5 litre	0.5 litre	0.5 litre	0.5 litre	0.5 litre

- Oil pressure at 80° :
  - Engines A 53 - A 79/0 - M 4 ..... 35.5 to 44 psi at 4000 rpm
  - Engine A 79/1 ..... 57 to 71 psi at 6000 rpm
  - Engines M 28/1 - M 28 ..... 78 to 92 psi at 6000 rpm
- Pressure switch setting ..... 7 to 11 psi

Filter cartridge :

Engines M 28 and M 28/1 *(from November 1969 to November 1970).*
- Intake strainer with built-in by-pass filter cartridge.

Engines M 28 and M 28/1 *(since November 1970)*
- New lubrication circuit with built-in (removable) by-pass in place of the front camshaft bearing positioning stud (right-hand engine casing)
- External filter cartridge with built-in « by-pass ».

Oil cooler :

Engines A 53 - A 79/0	7 elements
Engine M 4	9 elements
Engine A 79/1	6 elements (Aluminium)
Engines M 28/1 - M 28	9 elements (Aluminium)

Oil pump :

- Lateral play of gears	0.1 mm maximum

Tightening torques :

- Connector bolts on cylinder heads and engine casing	10 to 13 mAN (1 to 1.3 m.kg)
- Connector bolt on oil cooler (old model)	27 to 29 mAN (2.7 to 2.9 m.kg)
- Connector bolt on oil cooler (new model)	10 to 14 mAN (1 to 1.4 m.kg)
- Bolt holding anti-mixing plates	Moderately tight (LOCTITE N° GX 01 459 01 A)
- Bolt holding oil strainer	3 to 5 mAN (0.3 to 0.5 m.kg)
- Bolt holding oil pump cover	13 to 15 mAN (1.3 to 1.5 m.kg)
- Bolt holding oil cooler	19 mAN (1.9 m.kg)
- Blancking plug in lubrication system	27 to 30 mAN (2.7 to 3 m.kg)
- Drain plug	35 to 45 mAN (3.5 to 4.5m.kg)

Fan :

Number of blades :

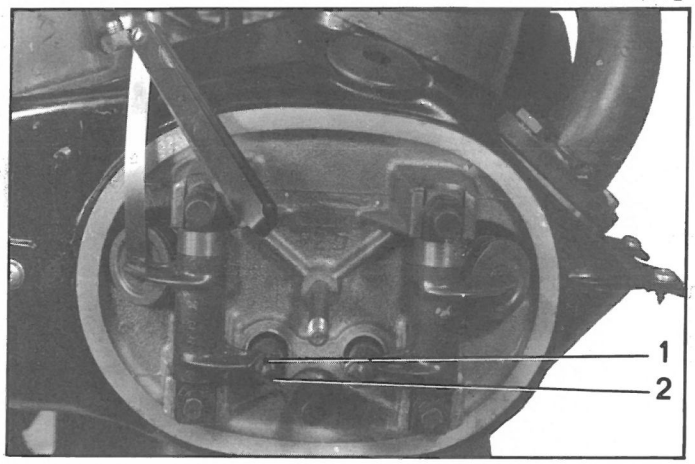
- Engine A 53	6 blades (metal fan)
- Engines A 79/0 - A 79/1 - M4 - M 28/1 - M 28	8 blades (plastics fan)
- Engines M 28/1 - M 28	9 blades (plastics fan) *(since October 1970)*

Positioning the fan :
- At TDC, arrange the fan so that the notches for the starting handle are horizontal.

Tightening torque for the fan fixing bolt ..... 50 to 60 mAN (5 to 6 m.kg)

SETTING VALVE CLEARANCES

4112



1. Place a container under the two cylinders in order to collect the oil and remove the rocker covers.

2. **Set the valve clearances :**

This adjustment must be done with the engine cold.

Set a valve when the corresponding valve of the opposite cylinder is fully open.:

Intake = 0.20 mm
Exhaust = 0.20 mm

Slacken the locknut (1) and adjust the clearance using the tappet screw (2). Tighten the locknut.

3. **Fit the rocker covers :**

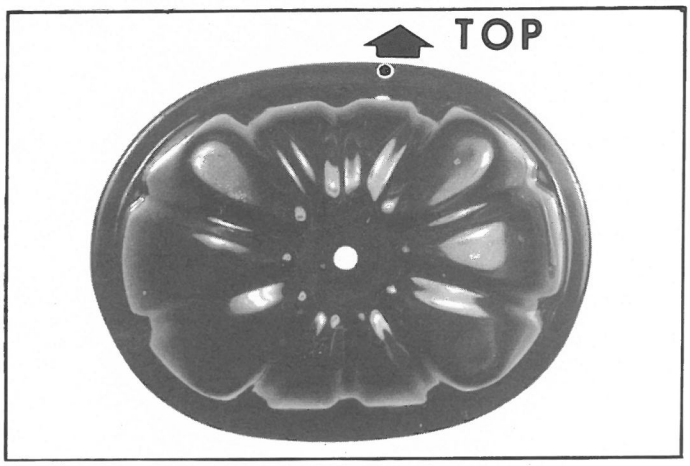
Ensure that there is no roughness on the seal face.
The faces in contact must be dry.
Stick the gasket to the rocker cover using Bostick 1400 or Minnesota F 19 adhesive.

CAUTION : *On a number of engines the rocker covers are stamped with a letter « O ». The rocker cover should be fitted with this letter positioned towards the top.*

NOTE : If the rocker covers or gaskets are wrongly positioned or the nut holding the rocker cover is insufficiently tightened, this may lead to all engine oil being lost.

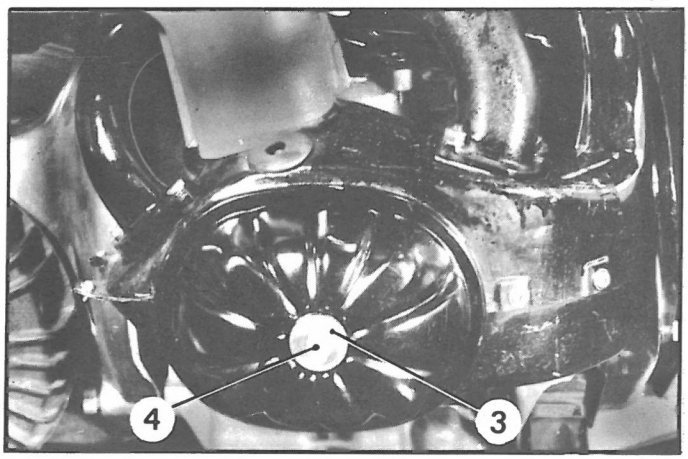
Tighten the nut (4) to 5 to 7 mΛN (0.5 to 0.7 m.kg).
(Fit the rubber washer and the flat washer (3) where these are used).

4278



4. Start the engine and check that there is no leak from the gaskets.

3986

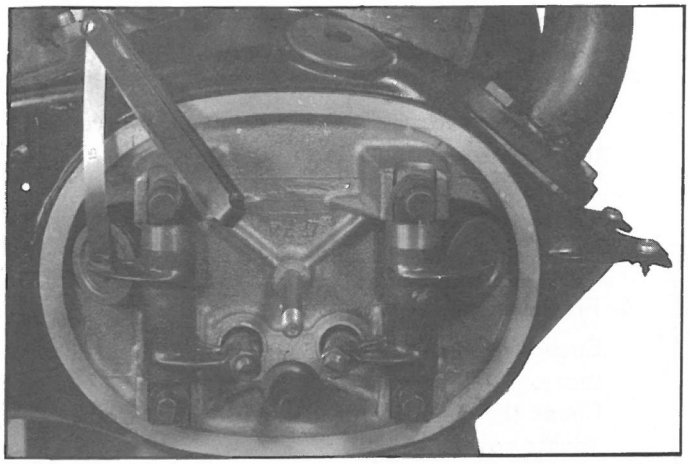


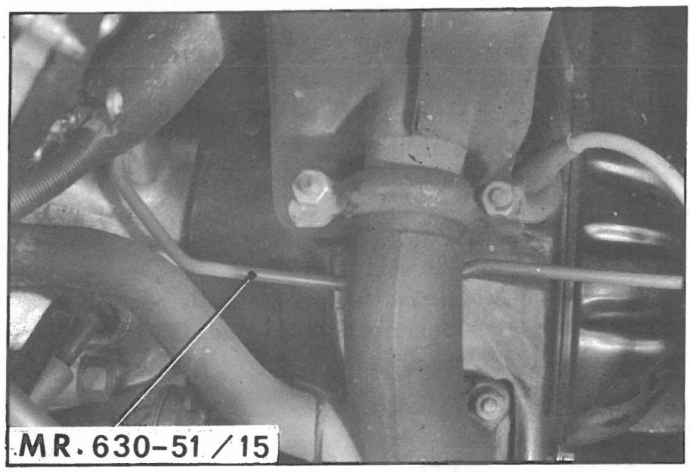
5. When the engine is hot, adjust the idling speed if necessary to 750 to 800 rpm.

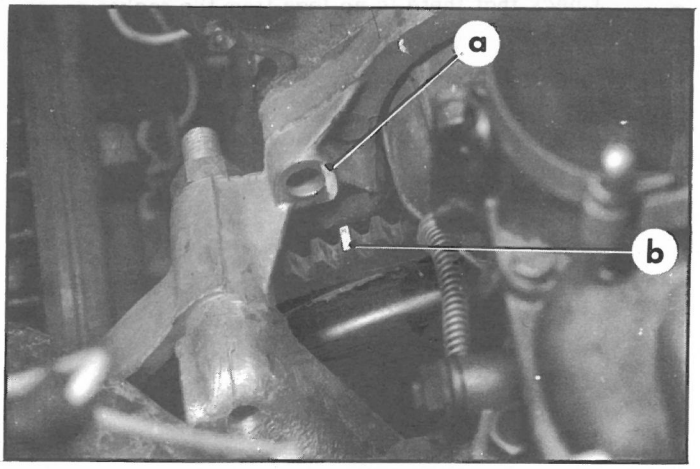
6. Where a centrifugal clutch is fitted, check the setting of the throttle closing dashpot (The operation time must be between 1 and 2 seconds) Adjust it if necessary.

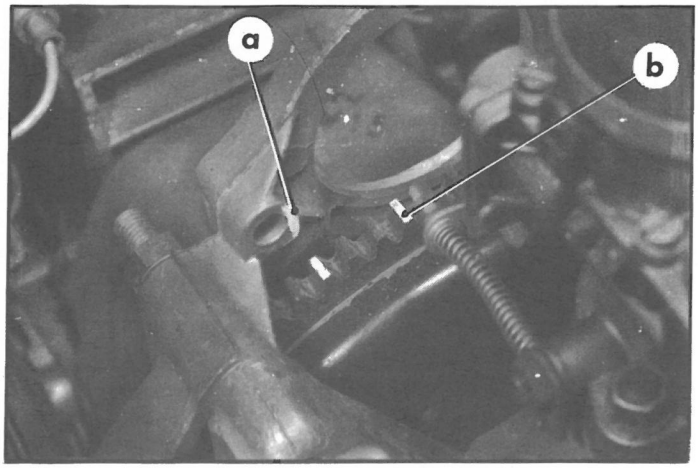
7. Top up the engine oil level.

CHECKING THE DISTRIBUTION TIMING









NOTE : The engine must be cold for this operation.

1. Position a suitable container to collect the oil and remove the rocker cover from the left-hand cylinder.

2. Turn the engine until the intake valve is fully open :
   Set the exhaust valve clearance to :
   - Engine A 53 ..... 1.95 mm
   - Engines A 79/0 and M 4 ..... 2.40 mm
   - Engine A 79/1 ..... 2.40 mm
   - Engines M 28/1 and M 28 ..... 2 mm

3. Insert a 6 mm diameter rod (MR. 630-51/15) into the hole on the left-hand side of the engine housing provided for this purpose.
   Turn the engine in the direction opposite to the normal until the rod enters the hole in the flywheel,

4. Measure the exhaust valve clearance. For the timing to be correct this clearance should be between :
   - Engine A 53 ..... 0.04 and 0.83 mm
   - Engines A 79/0 and M 4 ..... 0.06 and 0.80 mm
   - Engine A 79/1 ..... 0.09 and 0.88 mm
   - Engines M28/1 and M28 ..... 0.03 and 0.75 mm

   NOTE : On certain engines type A 79/1 (435 cc), it is not possible to obtain a clearance of 2.40mm at the exhaust valve.
   Proceed as follows :

   a) Turn the engine until the intake valve is fully open and then adjust the exhaust valve clearance to 1.50 mm.

   b) Insert the rod MR. 630-51/15 into the hole on the left-hand side of the engine housing provided for this purpose.

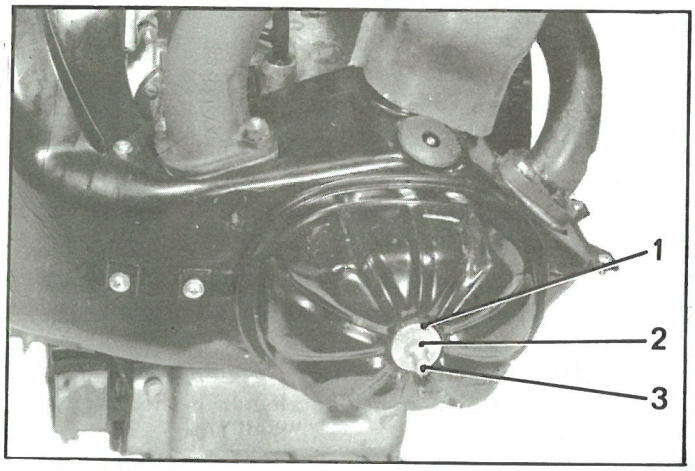
   c) Turn the engine *in the direction opposite to normal* until the rod enters the hole in the engine flywheel.

   d) With a piece of chalk make a mark « b » on one tooth of the starter ring and another mark « a » on the engine housing, directly opposite.
   Remove the timing rod.

   e) Turn the engine in the *normal direction of operation through a distance corresponding to three teeth on the starter ring.*

   Measure the exhaust valve clearance.

   If the timing is correct, this clearance should be between : 0.05 and 0.65 mm.



5. Set the valve clerances :

This adjustment is done with the engine cold.

Adjust a valve when the corresponding valve on the opposite cylinder is fully open :

Intake = 0.20 mm
Exhaust = 0.20 mm

6. Fit the rocker covers :

Ensure that there is no roughness on the seal faces.
Check the condition of the seal bonded to the rocker cover.

Fit :
- the rocker covers,
- the rubber seals (1),
- the flat washers (2) (on the rocker covers which are fitted with these),
- the cap nuts (3).

Tighten the nuts (3) to 5 to 7 mΛN (0.5 to 0.7 m.kg)

CAUTION : If the gaskets are badly positioned or the nuts (3) incorrectly tightened, this may lead to all the engine oil being lost.

7. Start the engine.
Check that there is no leak from the rocker cover gaskets.

Top up the engine oil.

OPERATION N° A. 142-00 : *Characteristics of carburettors.* **Op. A. 142-00** 1

SCHEDULE OF CARBURETTORS

Type of engine	Type of vehicle	Dates produced	Type of carburettor	Reference on carburettor	
				Conventional clutch	Centrifugal clutch
A 53 (425 cc)	AZ (Series A and AM)	3/1963 → 2/1970	SOLEX 28 IBC * SOLEX 28 CBI or ZENITH 28 IN * ZENITH 28 IN4	32 [1]	30 [1]
	AZU	3/1963 → 8/1967		Z 32	Z 30
A 79/0 (425 cc)	AZU	8/1967 → 8/1972	SOLEX 32 PICS *	38	
	AYA (Series A and AM)	8/1967 → 3/1968	SOLEX 32 PCIS	38	39
A 79/1 (435 cc)	AYA 2 (Series A and AM)	3/1968 → 2/1970	SOLEX 34 PICS 4 * SOLEX 34 PCIS 4	101	102
	AYA 2 (Series A and AM)	2/1970 → 8/1972	SOLEX 34 PICS 5 * SOLEX 34 PCIS 5	101 [1]	102 [1]
	AZ (Series A 2)				
	AYA2 (Series A and AM)	→ 8/1972	SOLEX 34 PICS 6 * SOLEX 34 PCIS 6	121	122
	AZ (Series A 2)				
	AZU			121	
M 4 (602 cc)	AYA3 (Series A and AM)	1/1968 → 10/1968	SOLEX 40 PICS 3 * SOLEX 40 PCIS 3	44 [3]	45 [3]
	AK	→ 5/1968	SOLEX 30 PICS		
M 28/1 (602 cc)	AYB (Series A and AM)	10/1968 → 1/1970	SOLEX 34 PICS 4 * SOLEX 34 PCIS 4	103	104
	AY (Series CA)			103	104
	AK (Series B)	5/1968 → 1/1970		103	
	AYB (Series A and AM)	1/1970 → 2/1970	SOLEX 34 PICS 5 * SOLEX 34 PCIS 5	103 [1]	104 [1]
	AY (Series CA)	1/1970 → 8/1972		103 [1]	104 [1]
	AK (Series B)	1/1970 → 7/1970		103 [1]	
	AK (Series AK)	7/1970 → 8/1972		103 [1]	
	AZ (Series KA)	2/1970 → 8/1972		103 [1]	104 [1]
	AY (Series CA)	→ 8/1972	SOLEX 34 PICS 6 * SOLEX 34 PCIS 6	123	124
	AK (Series AK)	→ 8/1972		123	
	AZ (Series KA)	→ 8/1972		123	124
M 28 (602 cc)	AY (Series CB)	2/1970 → 6/1970	SOLEX 26/35 CSIC * SOLEX 26/35 SCIC	110 [2]	111 [2]
	AY (Series CB)	6/1970 → 8/1972		113 [1]	114 [1]
	AY (Series CB)	→ 8/1972		127	128

* Carburettor without throttle closing dashpot (conventional clutch)

SOLEX or ZENITH carburettors	SOLEX 28 IBC (32 [1]) or 28 CBI (30 [1])	ZENITH 28 IN (Z 32) or 28 IN 4 (Z 30)
Venturi bore	22	22
Main jet	125	132
Air correction jet	E 1	
Choke jet	80	
Idling jet	42.5	45
Air idling jet		160
Seat of needle valve	1.2	1.25

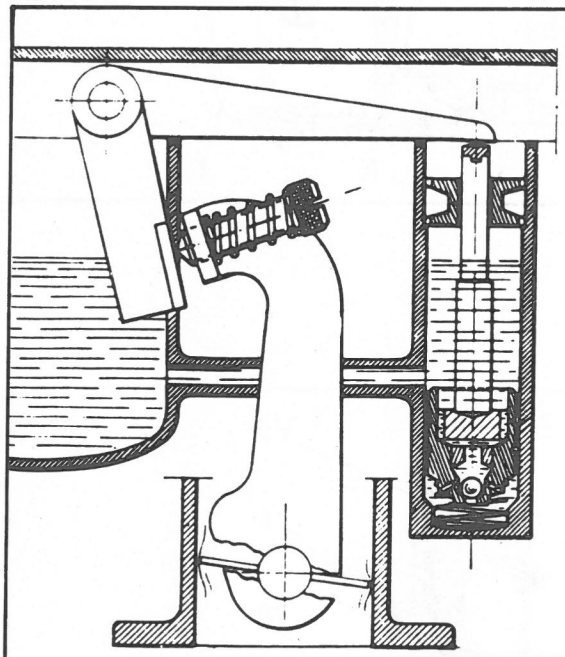
SOLEX carburettors	30 PICS	32 PICS (38) 32 PCIS (39)	34 PICS 4 (101) 34 PCIS 4 (102) 34 PICS 5 (101 [1]) 34 PCIS 5 (102 [1])	34 PICS 4 (103) 34 PCIS 4 (104) 34 PICS 5 (103 [1]) 34 PCIS 5 (104 [1])	34 PICS 6 (121) 34 PCIS 6 (122)	34 PICS 6 (123) 34 PCIS 6 (124)	40 PICS 3 (44 [1])
Venturi bore	26	28	28	28	28	28	32
Main jet	140	150	155	160	155	165	170
Air correction jet	AB	215	AB	AB	AB	AC	AC
Idling jet	47 5	55	40	42.5	40	42.5	50
By-pass jet			55	55	50	52.5	
Pump injector		40	35	40	35	40	40
Seat of needle valve	1 3	1 3	1.3	1.3	1.3	1.3	1.3
Float	5.7 g	5.7 g	5.7 g	5.7 g	5.7 g	5.7 g	5.7 g

SOLEX carburettors	26/35 CSIC (110 [2]) or 26/35 SCIC (111 [2]) 26/35 CSIC (113 [1]) or 26/35 SCIC (114 [1])		26/35 CSIC (127) or 26/35 SCIC (128)	
	First choke	Second choke	First choke	Second choke
Venturi bore	21	24	21	24
Main jet	125	75	125	82.5
Air correction jet	1 F 1	2 AA	1 F 1	2 AA
Pump injector	40		40	
Idling jet	50		40	
Seat of needle valve (with spring)	1.7		1.7	

SCHEMATIC DIAGRAMS

1. SOLEX CARBURETTORS 28 IBC (marked 32^1) and 28 CBI (marked 30^1)

A. 14-2 a



A. 14-2

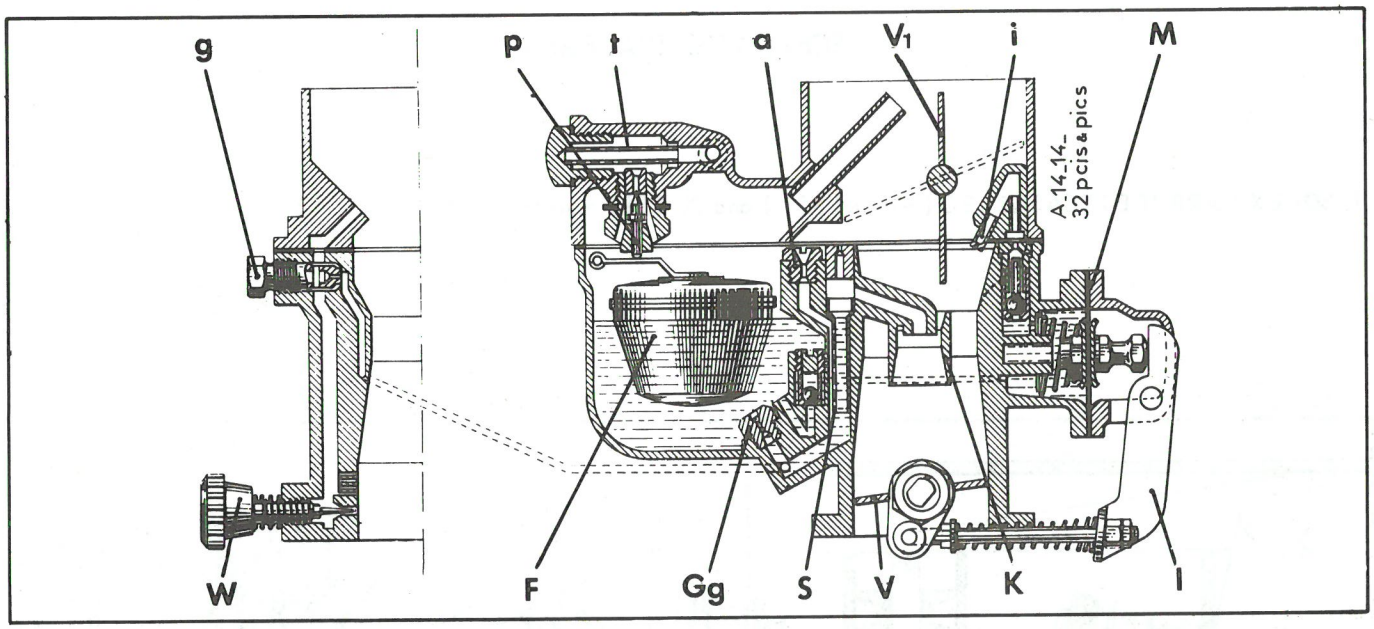
Manual 812-1

Legend :

a	: Air correction jet	I	: Choke lever
F	: Float	P	: Needle valve
Gg	: Main jet	S	: Mixing tube
Gs	: Choke jet	t	: Filter
g	: Idling jet	V	: Throttle butterfly
K	: Choke	W	: Idling mixture control screw

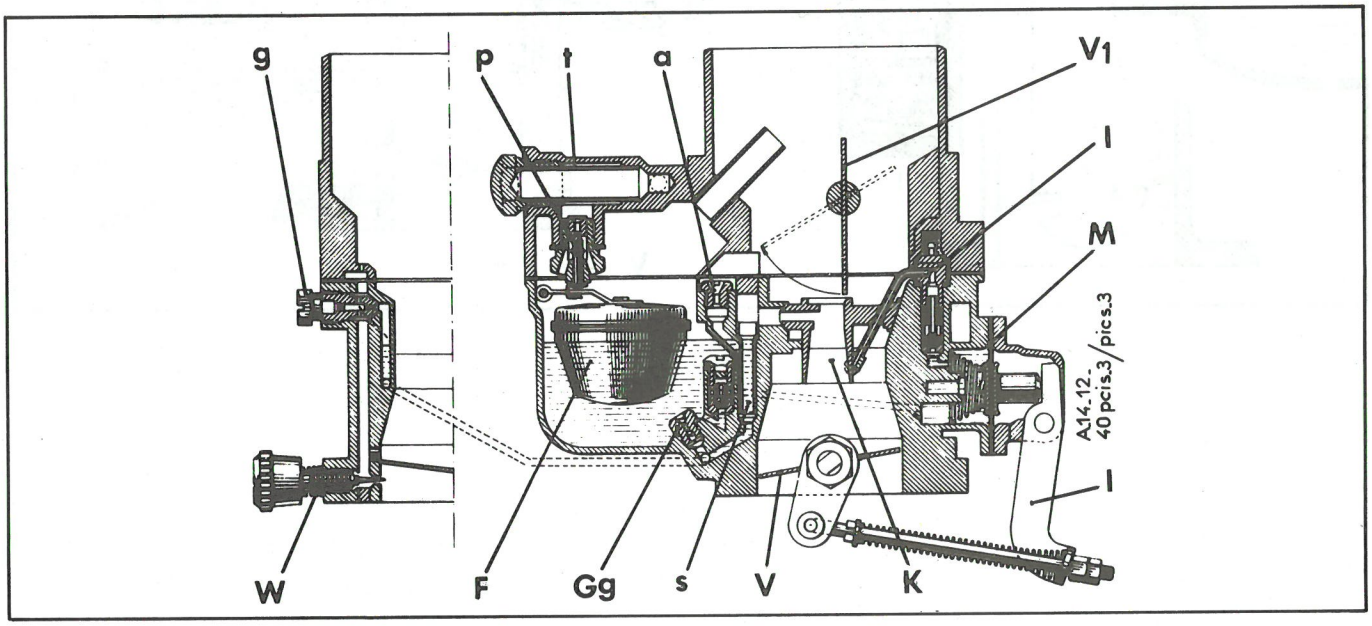
2. SOLEX CARBURETTORS 30 PICS - 32 PICS (marked 38) and 32 PCIS (marked 39)

A. 14-14



3. SOLEX CARBURETTORS 40 PICS - 40 PICS 3

A. 14-12

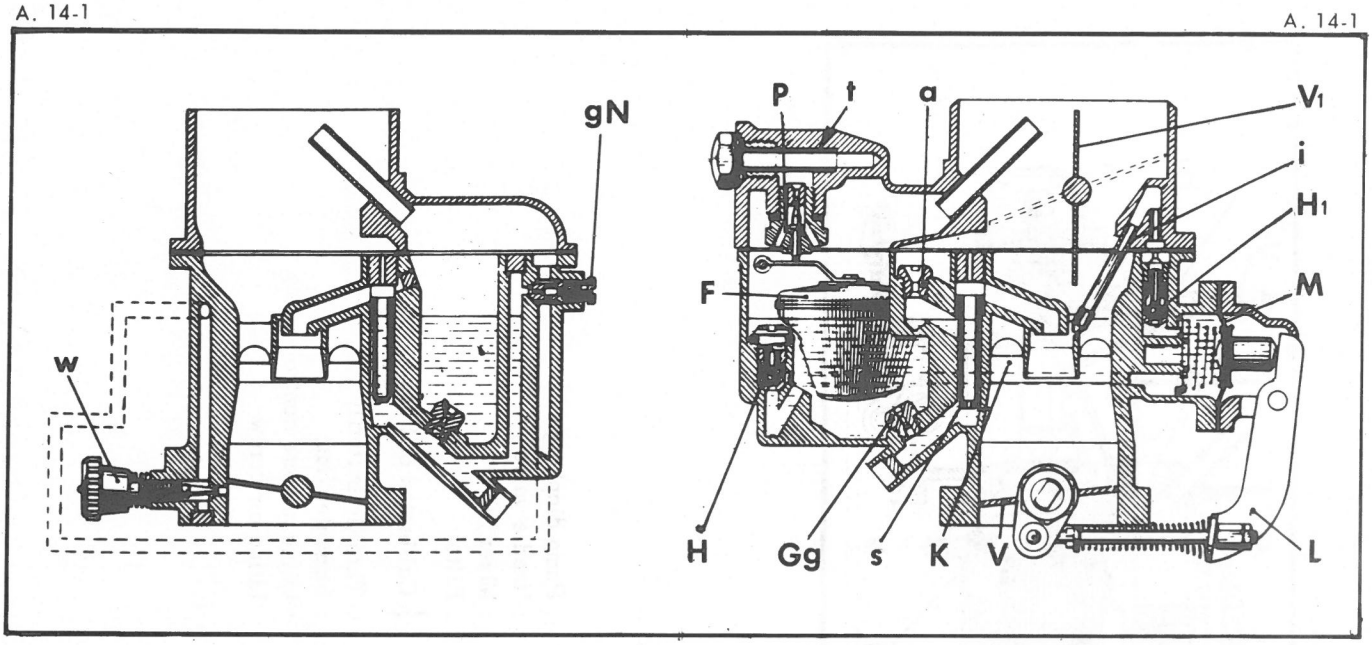


Legend :

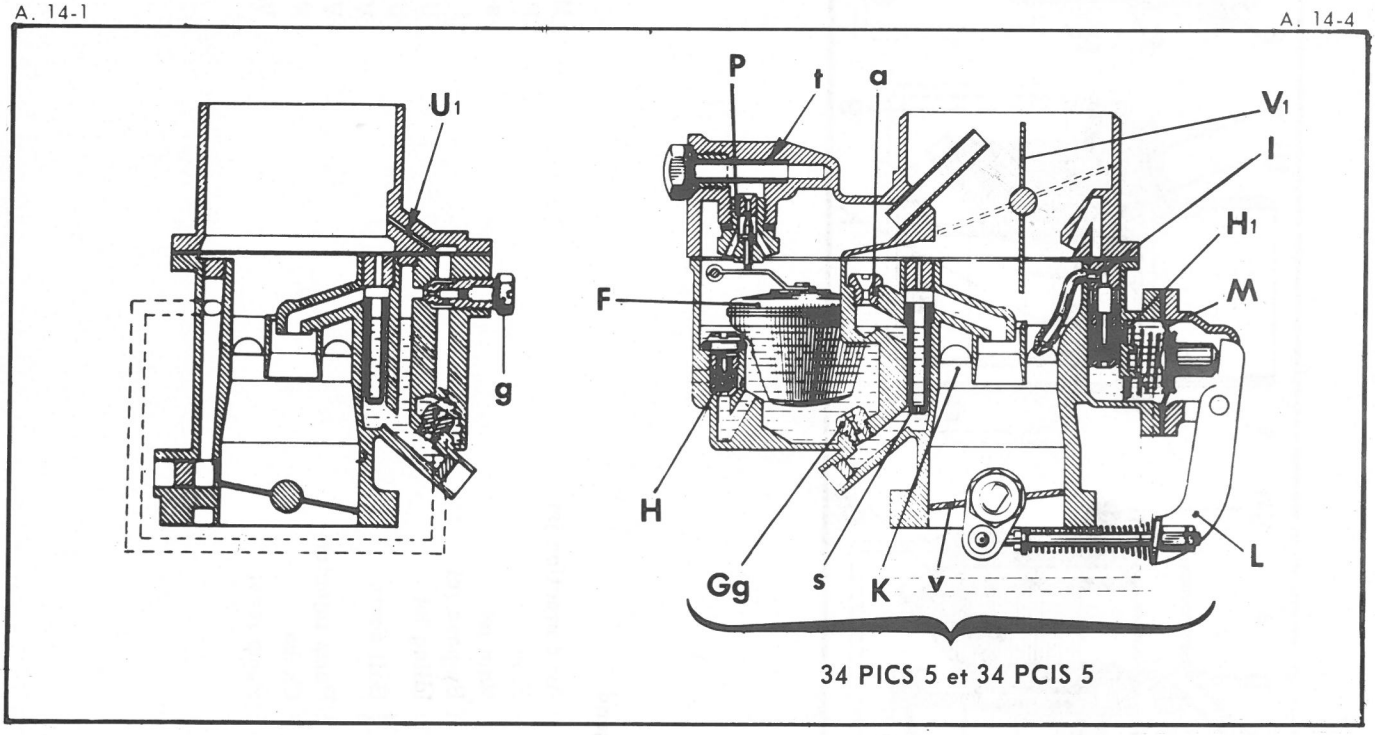
- a : Air correction jet
- F : Float
- Gg : Main jet
- g : Idling jet
- i : Pump injector
- K : Choke
- I : Pump lever
- M : Pump diaphragm
- P : Needle valve
- S : Mixing tube
- t : Filter
- V : Throttle butterfly
- V1 : Strangler flap
- W : Idling mixture control screw

4. SOLEX CARBURETTORS 34 PICS 4 - 34 PCIS 4 - 34 PICS 5 and 34 PCIS (all markings)

A. 14-1



A. 14-1



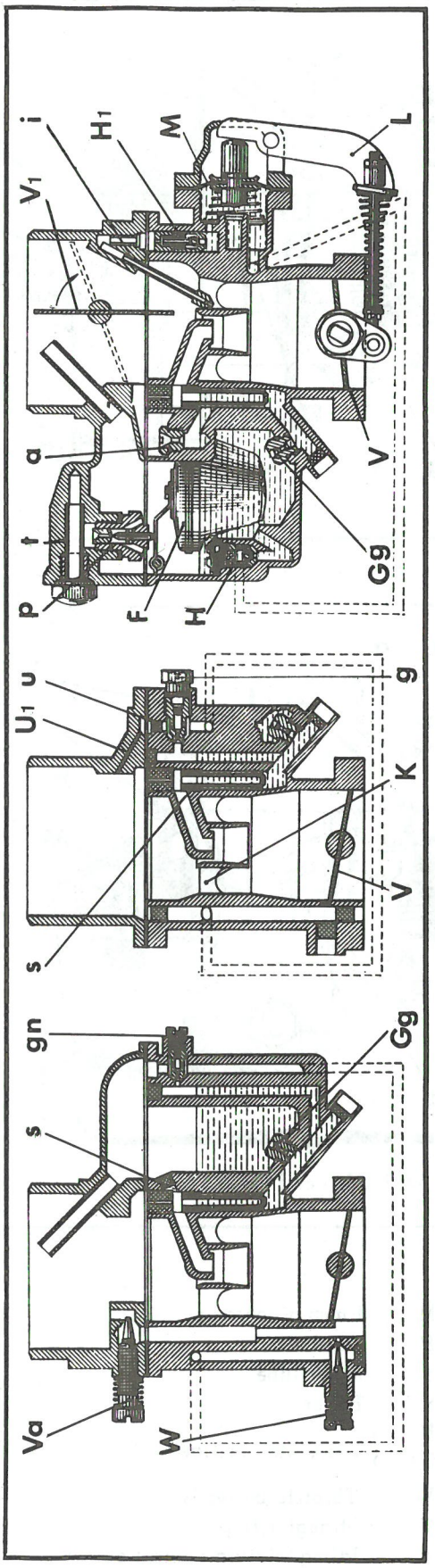
34 PICS 5 et 34 PCIS 5

Manual 812-1

Legend :

a	: Air correction jet	M	: Pump diaphragm
F	: Float	P	: Needle valve
Gg	: Main jet	s	: Mixer tube
g	: By-pass jet	t	: Filter
gN	: Idling jet	U, U1	} Calibrated orifices
H, H1	} Ball seats	V	: Throttle butterfly
i	: Pump injector	V1	: Strangler flap
K	: Choke	W	: Idling mixture control screw
L	: Pump lever		

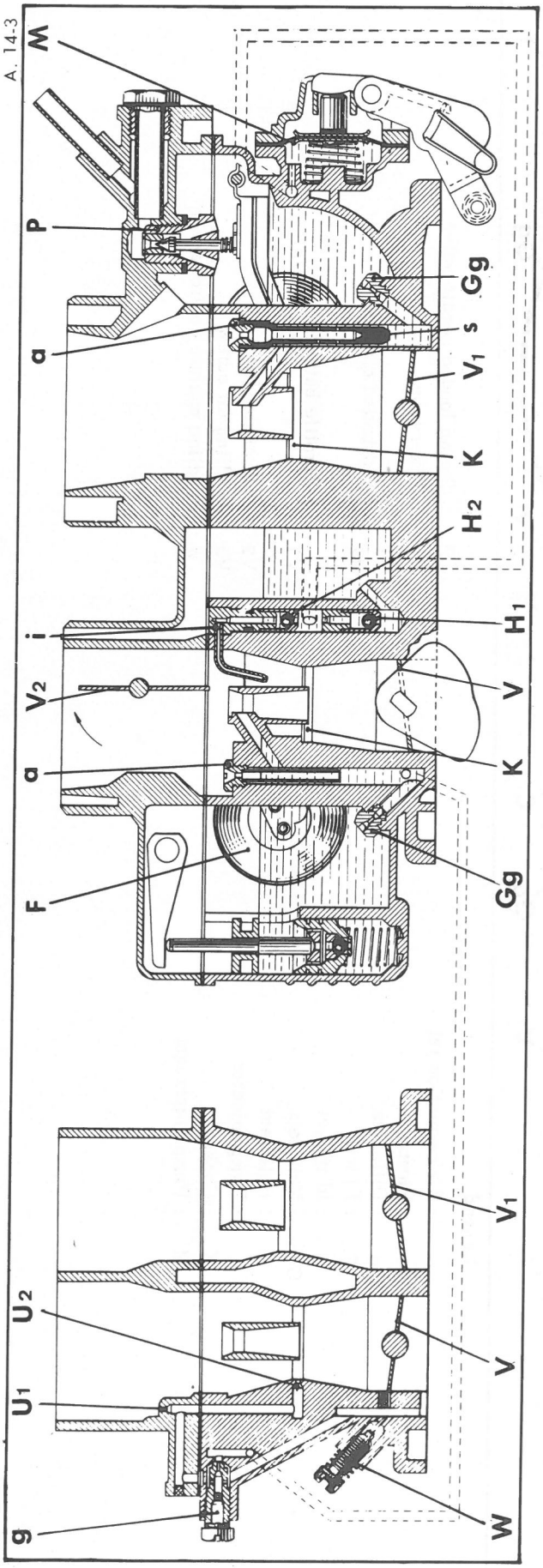
5. SOLEX CARBURETTORS 34 PICS 6 and 34 PCIS 6 (all markings)



Legend

a	: Air correction jet	M	: Pump diaphragm
F	: Float	P	: Needle valve
Gg	: Main jet	s	: Mixer tube
g	: By-pass jet	t	: Filter
gN	: Idling jet	U	} Calibrated orifices
H	} Ball seats	U1	
H1		V	: Throttle butterfly
i	: Pump injector	V1	: Strangler flap
K	: Choke	W	: Idling mixture control screw
L	: Pump lever	Va	: Idling air screw

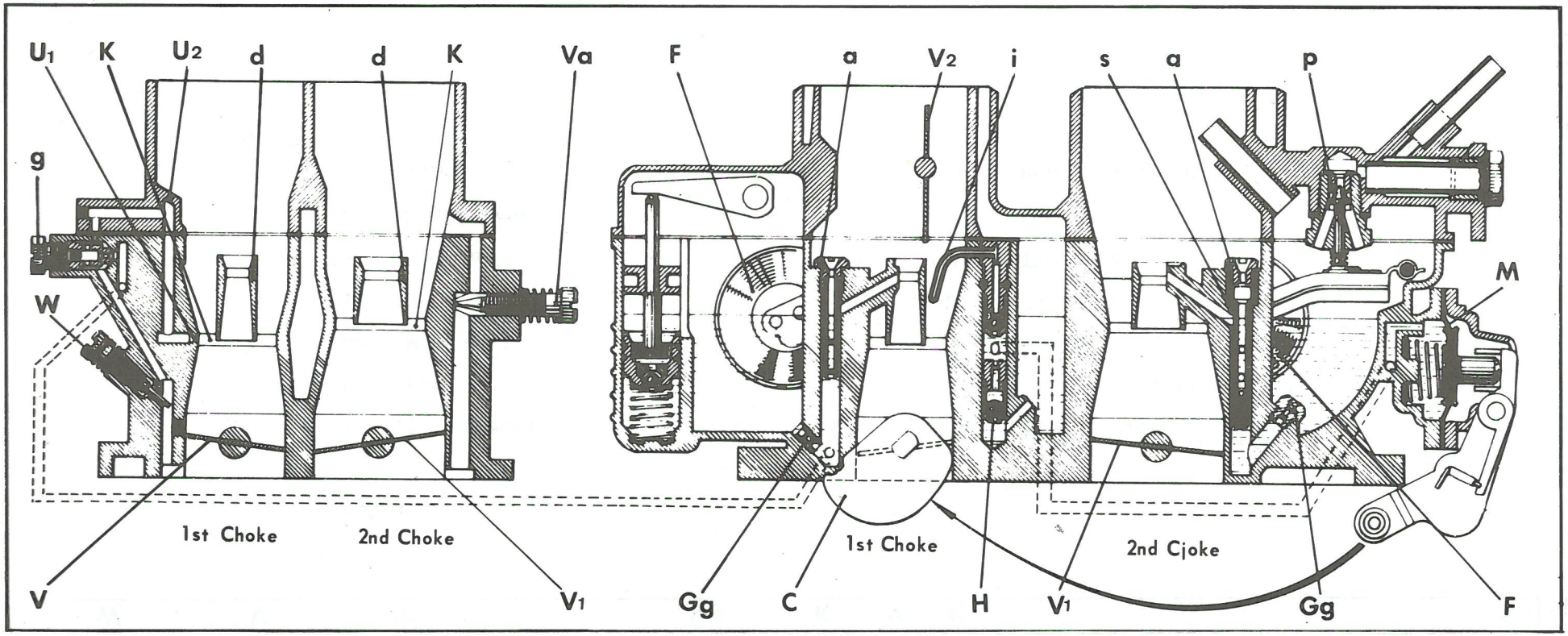
6. SOLEX CARBURETTORS 26/35 CSIC and 26/35 SCIS (all markings) ⟶ *9/1972*



Manual 812-1

Legend :

α	: Air correction jet	M	: Pump diaphragm
F	: Float	P	: Spring-loaded needle valve
Gg	: Main jets	s	: Mixer tube
g	: Idling jet	U1-U2	: Calibrated orifices
H1-H2	: Ball seats	V-V1	: Throttle butterfly
i	: Pump injector	V2	: Strangler flap
K	: Chokes	W	: Idling mixture control screw



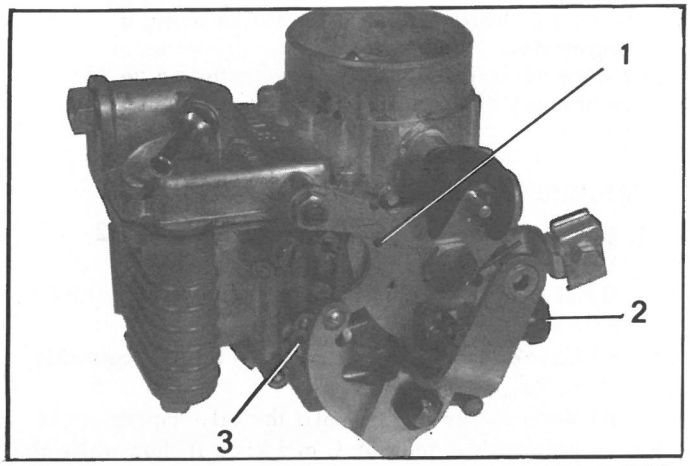
Legend

a	: Air correction jet
c	: Pump cam
d	: Diffusers
F	: Float
g	: Idling jet
Gg	: Main jets
H	: Ball seat
i	: Pump injector
K	: Chokes
M	: Pump diaphragm
P	: Spring loaded needle valve
s	: Mixer tube
U1, U2	Calibrated orifices
V, V1	Throttle butterfly
V2	: Strangler flap
Va	: Idling air screw
W	: Idling mixture control screw

I. ADJUSTMENTS TO CARBURETTORS

(Vehicles produced up to August 1972)

4128



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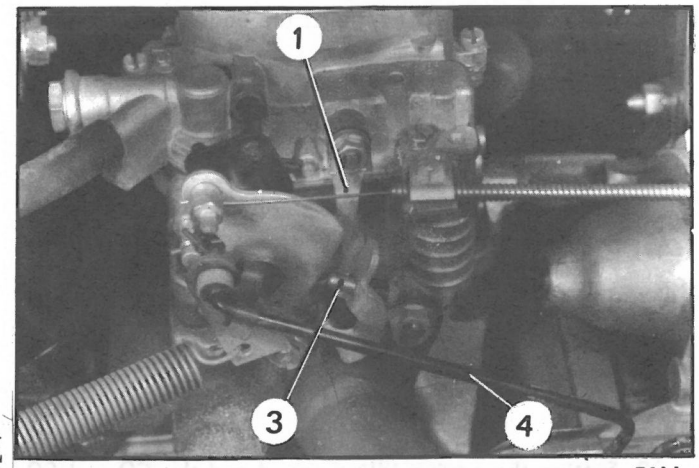

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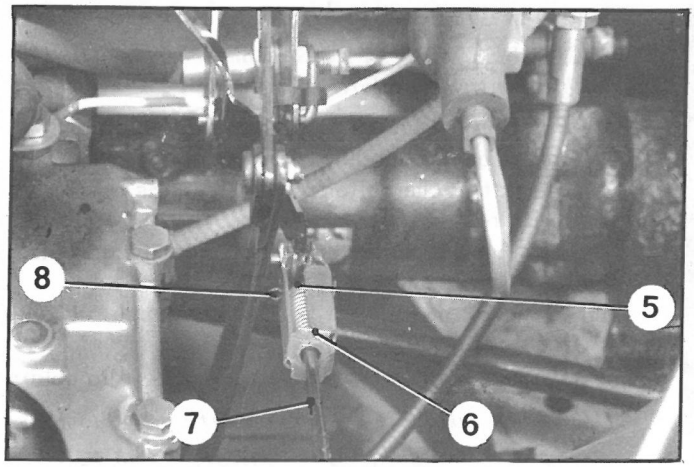


Manual 812-1

SETTING IDLING SPEED

1. Adjusting mixture screw :

a) When the engine has reached its normal running temperature, adjust the butterfly valve stop screw (3) to give an engine speed of :

Engine A 53	: 500 to 550 rpm
Engine A 79/0	: 650 rpm
Engine A 79/1	: 650 rpm
Engine M 4	: 500 to 600 rpm
Engine M 28/1	: 650 rpm
Engine M 28	: 750 rpm

b) Slowly screw in the mixture screw (2) until the engine runs unsteadily (about to stall). At this point slacken the screw by :

Engine A 53	: 1/2 turn
Engine A 79/0	: 1/4 turn
Engine A 79/1	: 1/4 turn
Engine M 4	: 1/2 turn
Engine M 28/1	: 1/2 turn
Engine M 28	: 1/3 turn

which gives the correct mixture.

2. Setting the engine speed :

a) *Engines fitted with a conventional clutch :*

Screw in the butterfly valve stop screw (3) to obtain an engine speed of :

Engine A 53	: 600 to 650 rpm
Engine A 79/0	: 800 to 850 rpm
Engine A 79/1	: 800 to 850 rpm
Engine M 4	: 750 ± 50 rpm (AYA 3)
	: 650 to 700 rpm (AK)
Engine M 28/1	: 750 to 800 rpm
Engine M 28	: 750 to 800 rpm

b) *Engines fitted with a centrifugal clutch :*

Gradually screw in the butterfly valve stop screw (3) until the point where the drum of the automatic clutch begins to turn, then slacken this screw by 1/8th of a turn.

3. Adjusting the throttle closing dashpot :
(Engines fitted with a centrifugal clutch)

a) Ensure that the lever (1) of the throttle closing dashpot moves smoothly and that the accelerator control rod (4) does not touch any part of the engine or fittings as it moves.

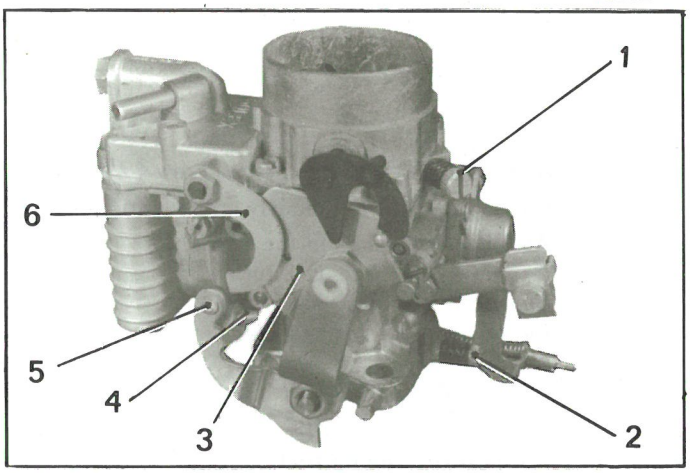
b) Accelerate briskly and release the accelerator. Note the time during which the lever of the dashpot moves.
This time should be between 1 and 2 seconds. Otherwise adjust the accelerator control return spring to obtain this condition.

4. Adjusting the accelerator control :
(Engines M 28/1 and M 28 • SOLEX 26/35 double choke carburettor) :

Depress the accelerator pedal fully, with a 5 mm thick packing piece between the pedal and the floor carpet of the car. The butterfly valves should be fully open and there should be a maximum clearance of 1.5 mm between the end (5) of the accelerator rod and the pin (8).
Screw the rod (7) in the tension limiter (6) in or out to obtain these conditions.

II. ADJUSTING CARBURETTORS

10252



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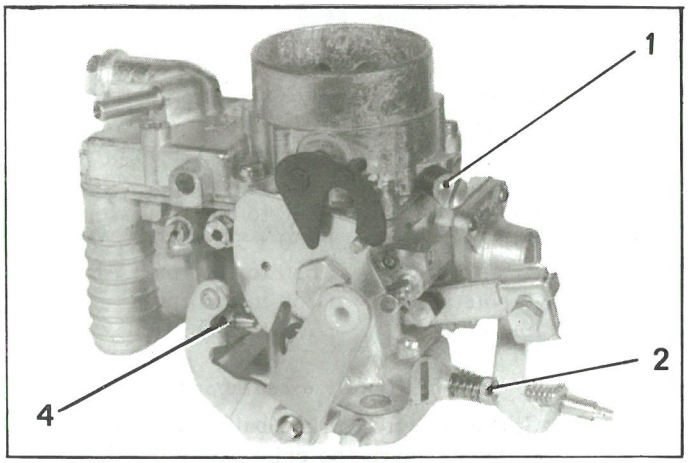

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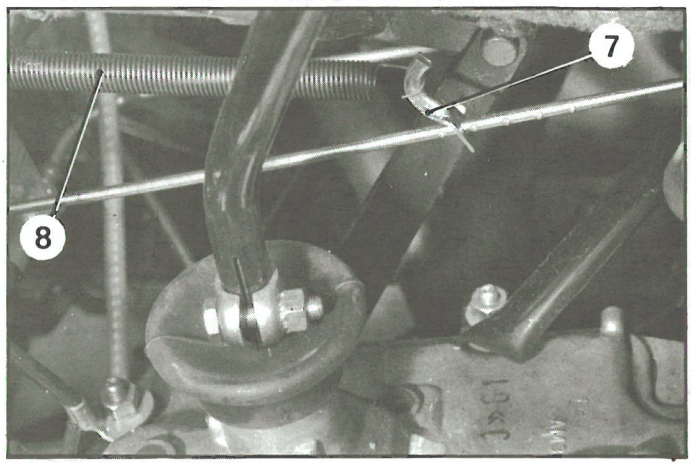


IMPORTANT NOTES :

- *Do not interfere with the butterfly valve stop screw (4)* which is set at the works using a micrometer.
- Before adjusting the idling speed, the valve clearances and ignition timing must be correctly set.

CARBURETTORS 34 PICS 6 and PCIS 6.

1. Setting the idling speed and the CO and CO^2 contents using a gas analyser :

CARBURETTORS 34 PICS 6 *(on vehicles fitted with a conventional clutch) :*

a) Check that the butterfly valve returns correctly to its position.

b) Warm up the engine until the oil temperature is between 70 and 80° C and keep it thus while the idling speed is being adjusted.

c) Turn the screw (1) until the engine idling speed is : **800 ± 50 rpm.**

d) By means of the screw (2), adjust the mixture to obtain :

Carbon monoxide (CO) content : 0.8 % to 1.6 %
Carbon dioxide (CO^2) content : 9 % to 12.5 %

These contents should be obtained at the engine speed indicated : the two operations should be carried out simultaneously.

NOTE : The permitted CO and CO^2 contents are given for an ambient air temperature of between 15 and 30° C.

2. Setting the engine idling speed and the CO and CO^2 content using a gas analyser :

CARBURETTORS 34 PCIS 6 *(on vehicles fitted with a centrifugal clutch) :*

a) Position the hook (7) of the return spring (8) on the centre notch.

b) Check that the butterfly valve returns correctly to its rest position.

c) Warm up the engine until the oil temperature is between 70 and 80° C.

d) Using screw (1), set the engine speed to about 800 rpm.

e) By means of screw (2) set the mixture to obtain :

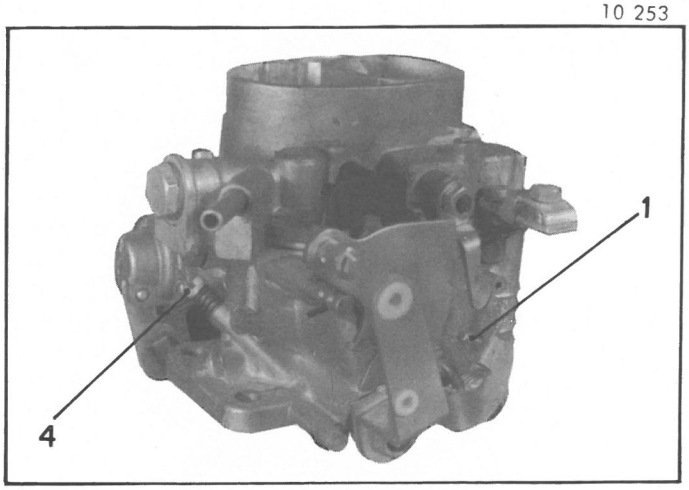
Carbon monoxide (CO) content : 0.8 % to 1.6 %
Carbon dioxide (CO^2) content: 9 % to 12.5 %

f) Turn the screw (1) until the clutch drum just begins to turn, then drop the engine speed by about 50 rpm and note the new speed.

g) Turn the mixture screw and the air screw in turn to set the CO and CO^2 contents at this engine speed.

h) Accelerate fully, then release the accelerator. Make a note of the time when the control lever (5) comes into contact with the dashpot lever (6) and the time when the butterfly stop screw (4) touches the cam (3) of the choke control. This time should be 1.5 to 2 seconds. Otherwise, move the hook (7) on the accelerator rod to obtain this condition.

10 253



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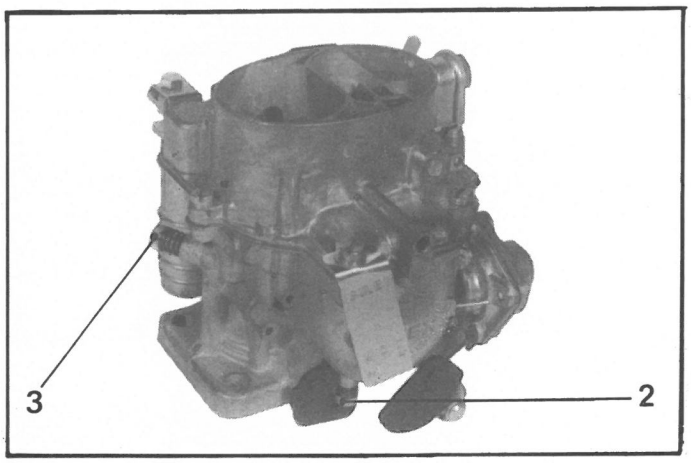

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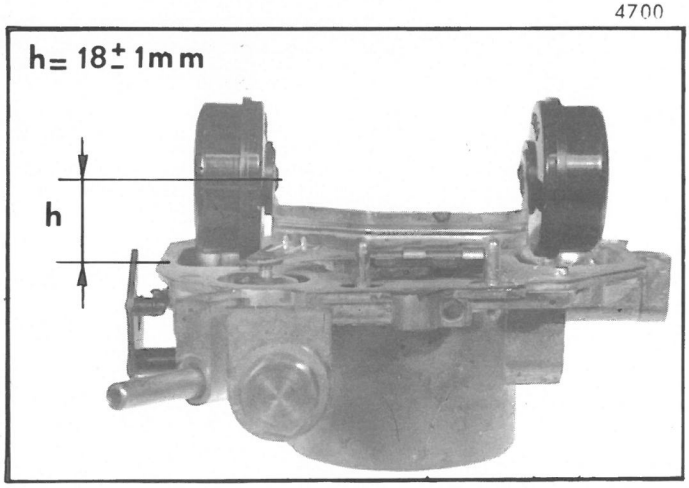


Manual 812-1

CARBURETTORS 26/35 CSIC and SCIC.

IMPORTANT NOTES :

- Do not interfere with the butterfly valve stop-screws (1) and (2) on the first and second chokes. These are set at the works using a micrometer and should not be disturbed in any circumstances.
- The idling speed should be set after the valve clearances and ignition timing have been correctly adjusted.

3. Setting the idling speed and the CO and CO_2 content using a gas analyser :

CARBURETTOR 26/35 CSIC *(on vehicles fitted with a conventional clutch) :*

a) Make sure that the butterfly valves return correctly to their rest position.

b) Heat the engine until the oil temperature is 70 to 80° C and keep it at this value while the idling speed is being adjusted.

c) By means of the screw (3), adjust the engine idling speed to :

$$750 \begin{smallmatrix} +50 \\ 0 \end{smallmatrix} \text{ rpm}$$

d) By means of the screw (4) adjust the richness of the mixture to obtain :
Carbon monoxide (CO) content : 0.8 % to 1.6%
Carbon dioxide (CO_2) content : 9 % to 12.5 %

These measurements should be made with the engine running at the speed indicated above, and therefore the two operations should be done simultaneously.
NOTE : The permitted CO and CO_2 contents are given for an ambient air temperature between 15° and 30° C.

4. Adjusting the idling speed and the CO and CO_2 contents using a gas analyser :

CARBURETTORS 26/35 SCIC *(on vehicles fitted with a centrifugal clutch) :*

a) Check that the butterfly valves return correctly to their rest position.

b) Warm up the engine until the oil temperature is between 70° and 80° C.

c) By means of the screw (3), set the engine speed to about 750 rpm.

d) By means of the screw (4), adjust the richness of the mixture to obtain :
Carbon monoxide (CO) content : 0.8 % to 1.6 %
Carbon dioxide (CO_2) content : 9 % to 12.5 %

e) Adjust the air screw (3) until the clutch drum just begins to turn, (clutch drag speed) then reduce the engine speed by about 50 rpm and note this speed.

f) Set the CO and CO_2 contents at this engine speed by adjusting the richness screw (4) and the air screw (3) in turn.

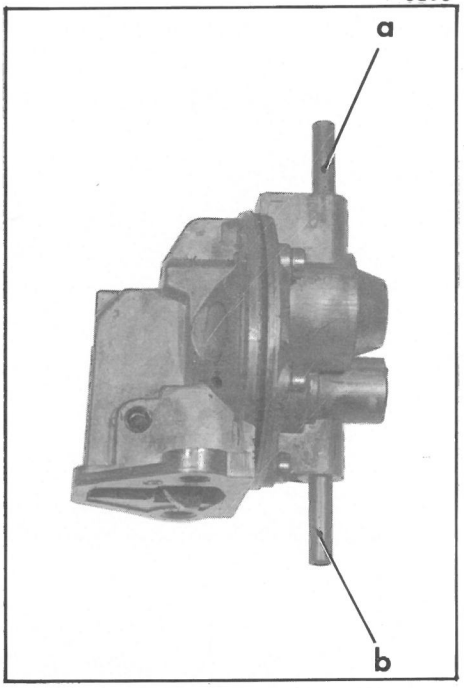
g) Top accelerate briskly and then release the accelerator. Note the time from the first movement of the throttle closing dashpot lever until its stops. This time should be 1 to 2 seconds. Obtain this condition by selecting the relevant notch for the adjusting rod on the silencer (air filter).

h) **Adjusting the float :** *(carburettor cover removed and turned upside down) :*

The distance between the centre line of the float and the joint-face of the cover (gasket in position) should be virtually the same for each float (permissible difference : 1 mm). This distance should be : **h = 18 mm.**

CHECKING PETROL FEED

5235



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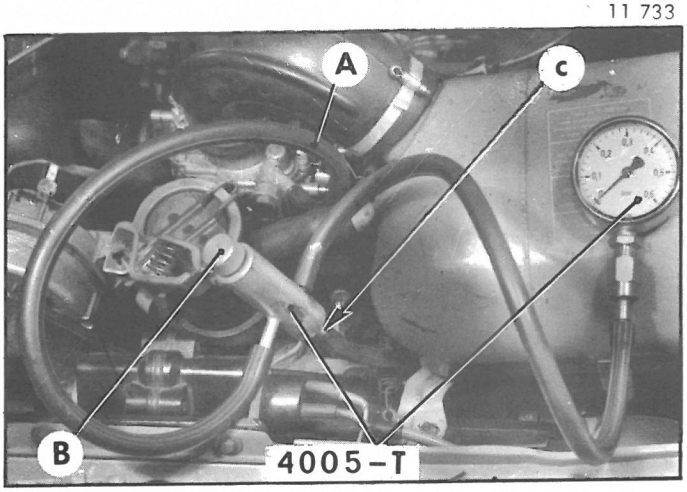

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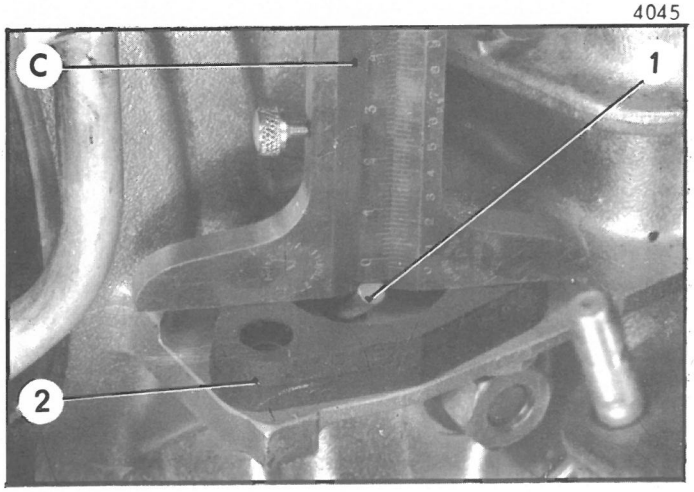


PETROL PUMP.

1. Characteristics :

Suction and pressure pump of the diaphragm type actuated by an eccentric

Suppliers :

- SEV-MARCHAL
- GUIOT

2. Leak testing (pump removed)

a) Close off the discharge tube « a ».

b) Blow compressed air at a pressure of *11 psi.* into the intake tube « b » of the pump.

c) Submerge the pump in a container full of clean petrol.

No leakage should be detectable.

3. Pressure check on the vehicle using rig 4005-T :

Install the rig as shown in the figure :

Disconnect the petrol feed pipe from the carburettor and connect it at « c » on the rig.

Connect pipe A to the carburettor.

Slacken the milled knob B by about 1 1/2 turns.

Start the engine.

a) *Measure the pressure at 0 flow :*

Screw the milled knob B fully home.

When the pressure has stabilized, read the pressure gauge; the maximum value should be *2.5 to 3 psi.*

b) *Check that the pump valves are leak-tight :*

Stop the engine.

There should be no rapid fall in pressure.

c) *Check that the carburettor needle valve is leak-tight :*

Slacken the milled knob B.

Start the engine and allow it to run for a few moments.

Stop the engine.

There should be no sudden fall in pressure.

Remove the rig 4005-T and reconnect the petrol feed pipe to the carburettor.

4. Checking the stroke of the drive rod :

Bring the push-rod (1) to its lowest position by turning the engine.

Using a depth gauge C, measure how far the rod stands proud of the upper face of the pump spacer (2)

This distance should be :

- 1 mm { 425 cc engines (A 53 and A 79/0)
  602 cc engines (M 4)
- 1.2 mm: Engines A 79/1 - M 28 and M 28/1

Measure the length of the rod which should be :

- 144.3 mm { 425 cc engines (A 53 and A 79/0)
  602 cc (M 4)
- 110.6 to 110.7 mm (Engines A 79/1 - M 28 and M 28/1)

The stroke of the operating rod should be :

- 1.12 mm (Engines A 53 - A 79/0 and M4)
- 2.6 $^{0}_{-0.16}$ mm (Engines A 79/1 - M 28 and M28/1)

OPERATION N° A. 210-00 : *Characteristics of the ignition system.* **Op. A. 210-00** 1

CHARACTERISTICS

SPARK GENERATOR

Make : DUCELLIER

Type of engine	Type of vehicle	Date produced	Initial advance *Timing rod hole*	Advance curve	Maximum centrifugal advance	Check on centrifugal advance using rig 1692-T *Needle in ZONE*
A 53 (425 cc)	AZ (Series A and AM)	⟵ 3/1963 ⟶ 2/1970	12°	A	6° to 8°	« AZB »
	AZU	⟵ 3/1963 ⟶ 8/1967				
A 79/0 (425 cc)	AZU	⟵ 8/1967 ⟶ 8/1972	12°	B	7°30' to 12°30'	Between « AZB » and « AZP »
	AYA (Series A and AM)	⟵ 8/1967 ⟶ 3/1968				
A 79/1 (435 cc)	AYA2 (Series A and AM)	⟵ 3/1968	12°	C	10° to 15°	« AZP »
	AZ (Series A 2)	⟵ 2/1970				
	AZU	⟵ 8/1972				
M 4 (602 cc)	AYA3 (Series A and AM)	⟵ 1/1968 ⟶ 10/1968	12°	A	6° to 8°	« AZB »
	AK	⟶ 5/1968				
M 28/1 (602 cc)	AYB (Series A and AM)	⟵ 10/1968 ⟶ 2/1970	8°	C	10° to 15°	« AZP »
	AZ (Series KA)	⟵ 2/1970				
	AY (Series CA)	⟵ 10/1968				
	AK (Series B)	⟵ 5/1968 ⟶ 7/1970				
	AK (Series AK)	⟵ 7/1970				
M 28 (602 cc)	AY (Series CB)	⟵ 2/1970	8°	C	10° to 15°	« AZP »

Contact point gap : 0.35 to 0.45 mm

Dwell angle :

- *Spark generators fitted up to February 1970* : 144° ± 2°
- *Spark generators fitted from February 1970* : 109° ± 3°

COIL :

Make : DUCELLIER

- 6 volts circuit : Reference 2768
- 12 volts circuit : Reference 2769

SPARKING PLUGS :

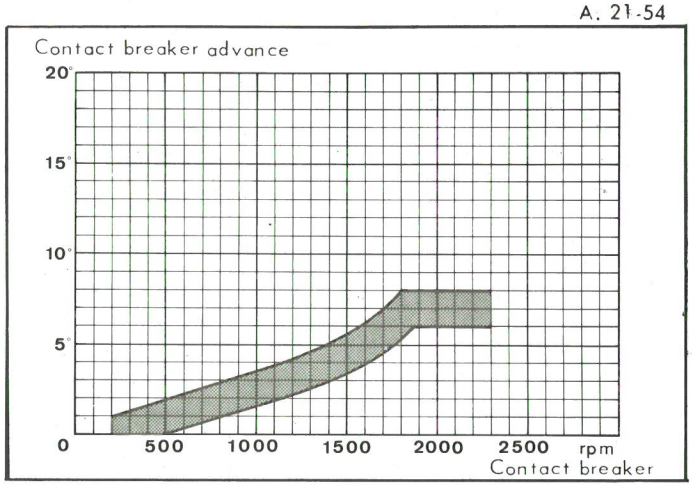
For the recommended makes and types of sparking plugs, consult the Technical Bulletins on this subject which are issued from time to time.

CONDENSER

Capacity : 0.18 to 0.22 μF

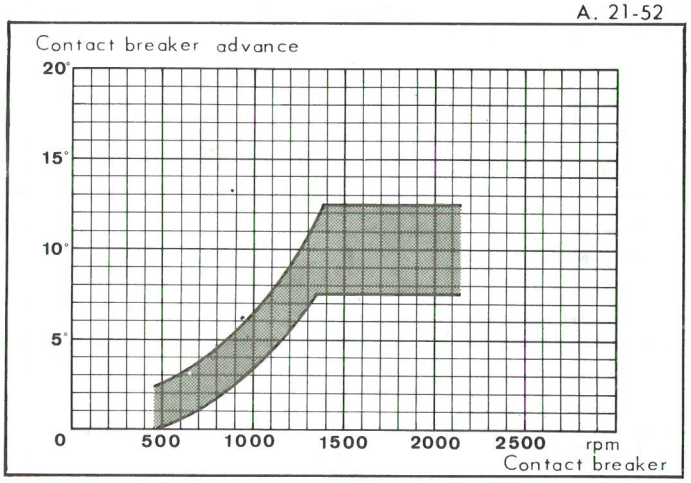
CENTRIFUGAL ADVANCE CURVES

A. 21-54



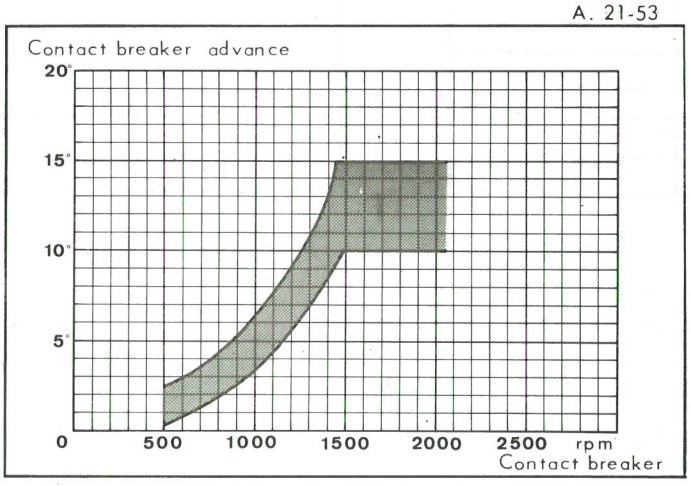
CURVE A

A. 21-52



CURVE B

A. 21-53

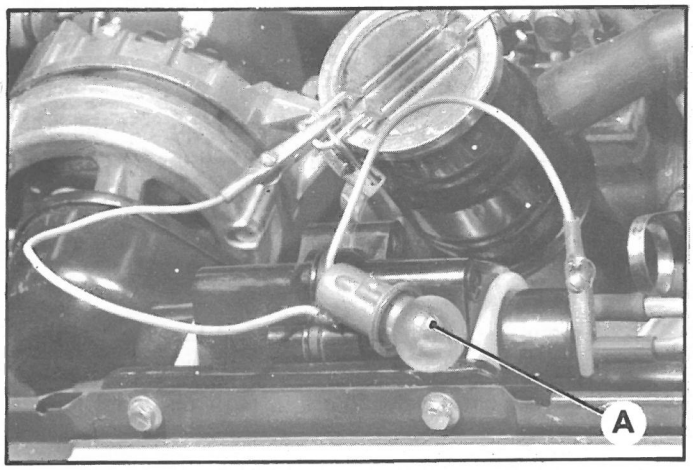


CURVE C

I. CHECKING THE STATIC TIMING

1. Connect a test light A between the « - » terminal (marked blue) of the ignition coil and chassis (the oil filler cap for example).
Disconnect the plug leads.

5135



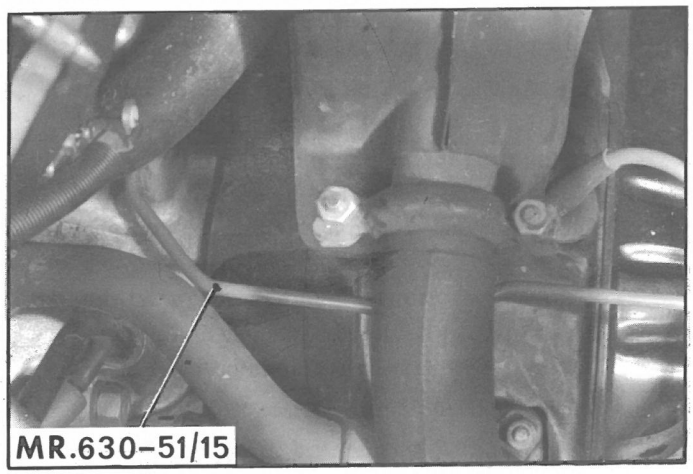
2. Switch on the ignition.

3. Insert a 6 mm dia.timing rod or a gauge MR.630-51/15 for engines of type A 79/1, M 28/1 or M 28, into the hole in the left-hand side of the engine casing, between the exhaust pipe and the cylinder head. Hold the rod against the flywheel.

4. Turn the engine by means of the flywheel in the normal direction. As the timing rod enters the hole in the flywheel (ignition point), the test light should come on. If the light comes on before the ignition point (advance) or after this point (retard), by an angle greater than 1°, (2/3 of 1 tooth or tooth space on the starter ring),the ignition setting must be adjusted.

   At the point of ignition setting make a mark on the flywheel and another directly opposite on the housing.

4514



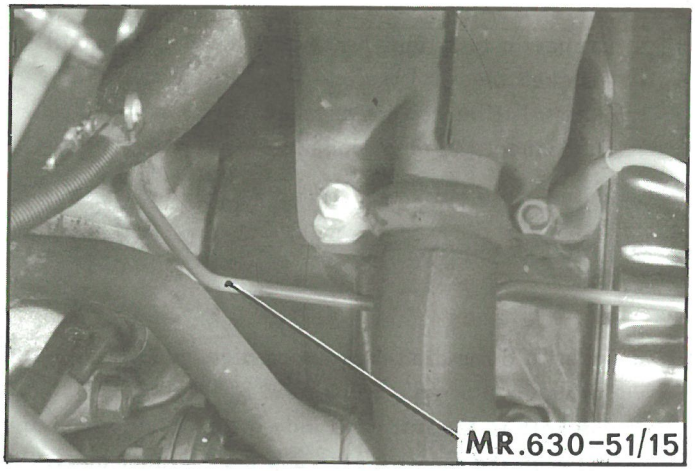
5. Repeat this test for the other cylinder : turn the flywheel in the normal direction. Mark the ignition point on the flywheel with respect to the mark previously made on the engine casing. If there is a difference of more than 3° (1 tooth plus 1 tooth space on the starter ring), between the two ignition points, remove the contact breaker and replace the cam.

6. Switch off the ignition, *remove the timing rod* and the test light A.

   Reconnect the plug leads.

II. SETTING THE STATIC TIMING

4514



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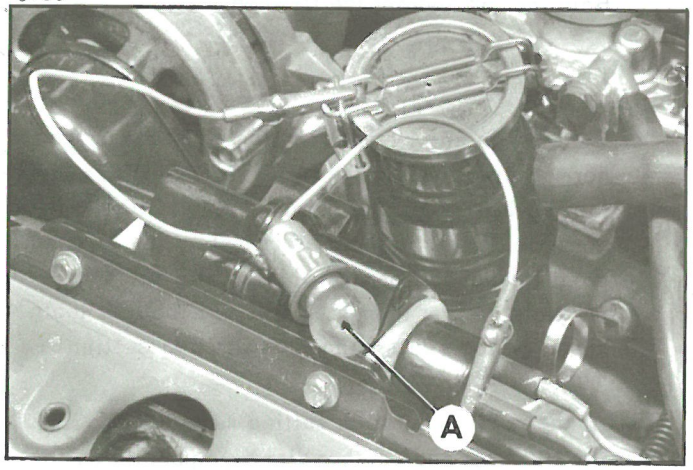

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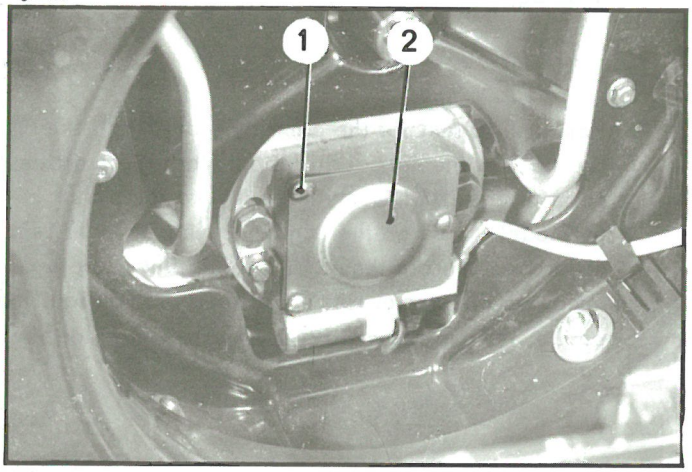
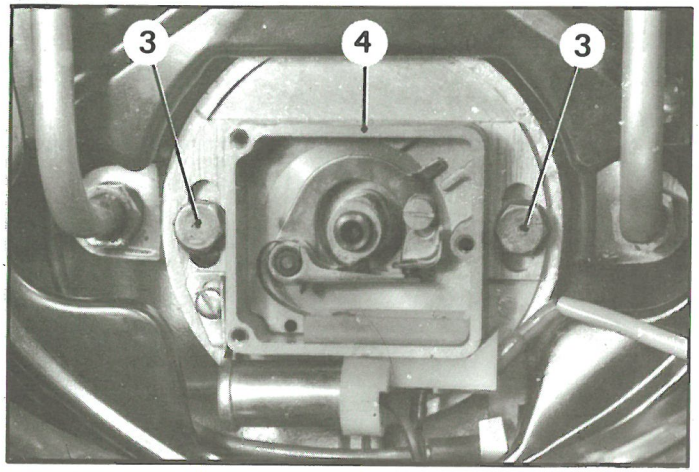


5152



1. Remove the grille, at the front of the engine. Remove the fan (extractor 3006-T bis).
2. Insert a 6 mm dia. timing rod or a gauge MR.630-51/15 according to engine type, into the hole provided on the left-hand side of the engine casing.
3. Turn the engine by means of the flywheel until the timing rod enters the hole in the flywheel. The engine is now at the ignition point.
4. Disconnect the plug leads. Connect a test light A between the « – » terminal (marked blue) of the ignition coil and chassis (the oil filler cap for example).
   Switch on the ignition.
5. Remove the three screws (1) and the cover (2) from the contact breaker. Check that the centrifugal advance weights are in their rest position.
6. Slacken the two bolts (3) holding the contact breaker.
   Then find the exact point at which the contact points separate by rotating the casing (4). The test light comes on as the contact points separate Tighten the bolts (3). Replace the cover (2) and the three screws (1) (serrated washer under head of screw).
   Remove the timing rod.
7. Turn the engine by the flywheel in the normal direction of rotation. The test light goes out. Stop turning the engine when the light comes on again (the engine has described one revolution). The timing rod should now enter the hole in the flywheel.
   If the hole in the flywheel has gone past the rod, the ignition is retarded. The ignition point on this cylinder must be reset, in no case should the advance be less than :

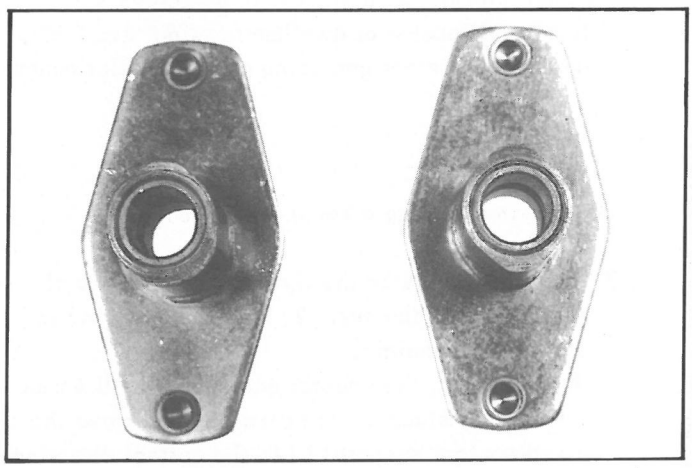
   12° (engines A 53 - A 79/0 - A 79/1 - M 4)
   8° (engines M 28/1 and M 28).

   Any difference between the ignition point of one cylinder and that of the other cylinder should not be greater than 3° (1 tooth plus 1 tooth space on the starter ring). Otherwise, the cam must be renewed.
9. *Remove the timing rod.*

   Replace the fan and the grille.

III. CHECKING THE CONTACT POINT GAP

8383



New cam Old cam

Without dismantling, this check can only be done using a large screen oscilloscope or a device for checking cam angle (Dwellmetre).

The dwell angle for the contact points should be :

144 ± 2° for vehicles produced up to February 1970,

109 ± 3° for vehicles produced from February 1970 or fitted with the new spark generator cam.

This corresponds to a contact gap of :

0.4 ± 0.05 mm

On the same contact breaker, any difference between the dwell angles of the two cam bosses should not be greater than 1°30'.

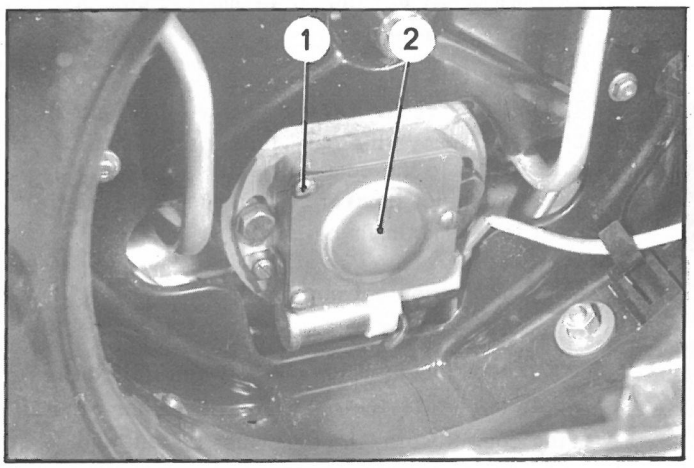
NOTE :

a) The oscilloscope can be used for a complete check of the ignition system and particularly for checking the dwell angle and any possible differences.

b) The dwellmetre permits a check on the dwell angle but does not allow any check on the angle difference between the two cam bosses.

IV. SETTING CONTACT POINTS

5114



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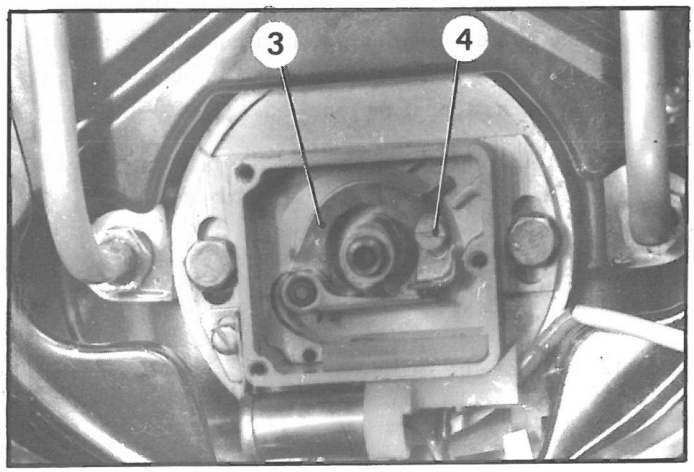


1. Remove the fan grille.

2. Remove the fan (extractor 3006-T bis)

3. Remove the screws (1) and the cover (2) from the contact breaker.

NOTE : Check the condition of the contact points: if these are pitted they must be replaced (see relevant operation).

A. Setting using test instruments .

4. Connect an oscilloscope or a dwellmetre.

5. Start the engine. Slacken the screw (4) and move the fixed contact support (3) in the required direction to give a contact point closing angle of *144 ± 2° or 109 ± 3° according to the vehicle (see chapter III above).*

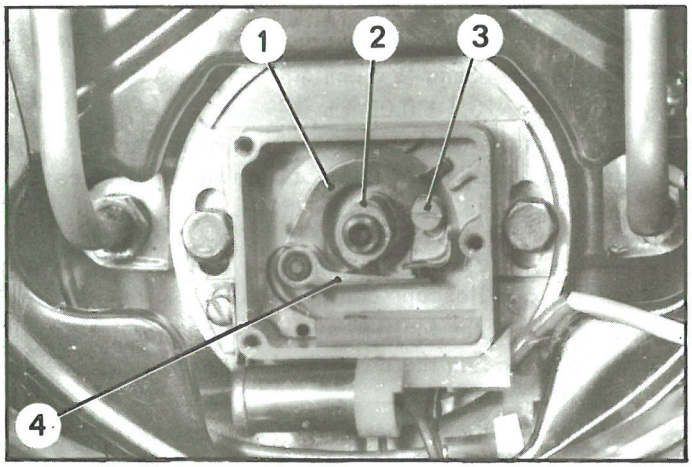
Tighten the screw (4).

Repeat the test and readjust if necessary.

6. Check the dwell angle on both bosses of the cam.

This is only possible using the oscilloscope.
NOTE : During these checks, do not run the engine too long, to avoid overheating.If a fault is found, proceed as indicated in paragraph 9.
If an oscilloscipe or dwellmetre is not available, adjust the contact gap using a set of feeler gauges.

5152



B. Adjustment using a set of feeler gauges :

7. Turn the engine by the flywheel so that one of the bosses of the cam (2) lifts the pawl (4) to its maximum height.
At this point, the contact gap should be 0.4 mm. Otherwise, slacken the screw (3) and move the fixed contact support (1) in the correct direction to adjust the gap.

8. Lightly tighten the screw (3).

9. Turn the engine until the second boss of the cam (2) lifts the pawl (4) to its maximum height Recheck the contact gap. If this is less than 0.35 mm or greater than 0.45 mm, the cam or camshaft is defective.

To check this :
Without turning the engine, remove the contact breaker , remove the cam, turn it through 180° and refit it to the camshaft end.
Fit the contact breaker so that the cam lifts the pawl to its maximum height.

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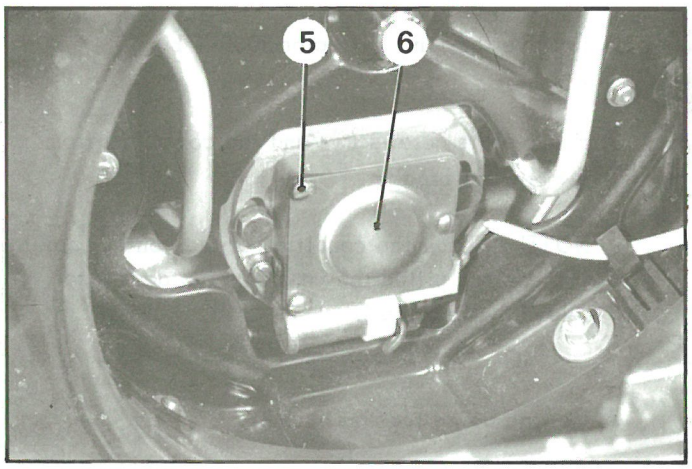


Measure the contact gap again :

CASE 1 :

- The gap measured is now between 0.35 and 0.45 mm ; this indicates that the other boss of the cam is worn; the cam must be renewed.

CASE 2 :

- The gap measured is the same as that previously measured (beginning of paragraph 9): this shows that the camshaft end is out-of-true : the camshaft must be renewed.

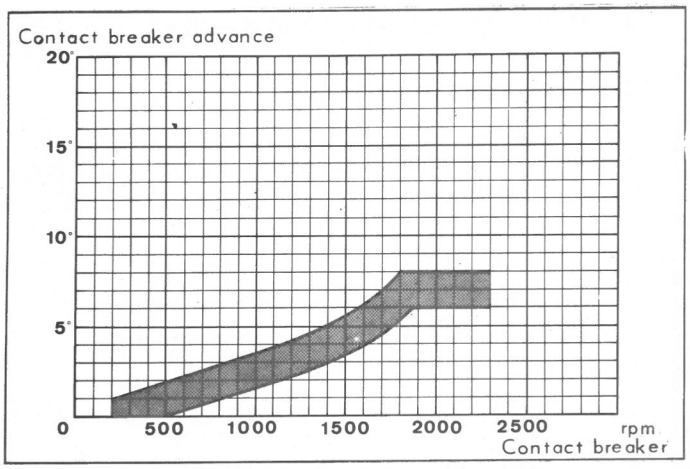
10. Replace the cover (6) and the three screws (5) (serrated washer) on the spark generator.

11. Install the fan.

12. Replace the grille.

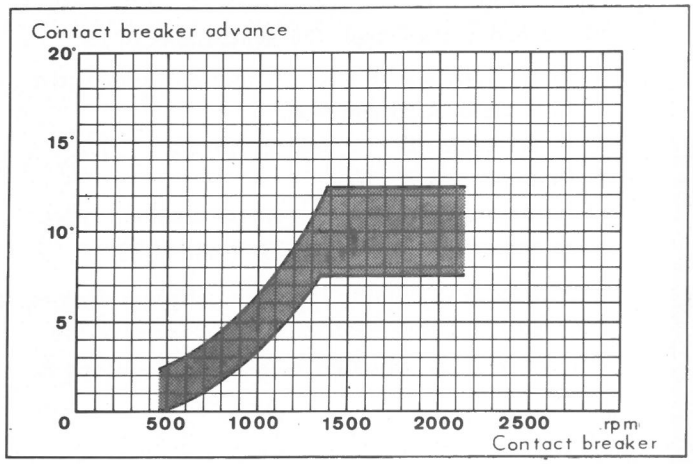
V. CHECKING THE CENTRIFUGAL ADVANCE CURVE

A 21-54



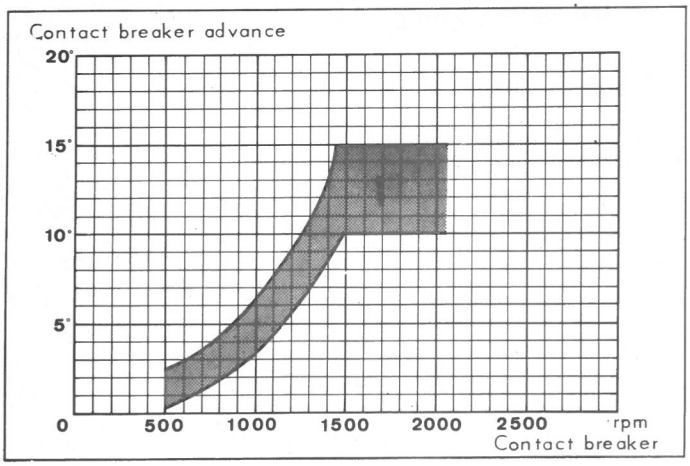
Curve A

A. 21-52



Curve B

A. 21-53



Curve C

NOTES :

a) Without dismantling, this check can only be done using a stroboscopic light, a an angle dephaser and a rev counter.
A mark must first be made on the flywheel and on the engine casing at the ignition point.

b) See the table *(given under operation A. 210-00)* for the correspondence between engines and vehicles.

CURVE A :
- Engines A 53 and M 4

CURVE B
- Engines A 79/0

CURVE C :
- Engines A 79/1 - M 28/1 and M 28

1. Find the position of the ignition point :
Connect a test light between the « - » terminal (market blue) of the coil and earth (the oil filler cap for example).
Disconnect the plug leads.
Switch on the ignition.
Turn the engine by the flywheel in the normal direction of rotation. At the point when the light comes on, carefully make two marks facing each other, one on the flywheel, the other on the engine casing (on a coupling clip to the gearbox, for example, using a pencil mark on a strip of adhesive paper).

2. Remove the test light. Reconnect the plug leads.

3. Install the stroboscopic light, its dephaser and the rev counter..

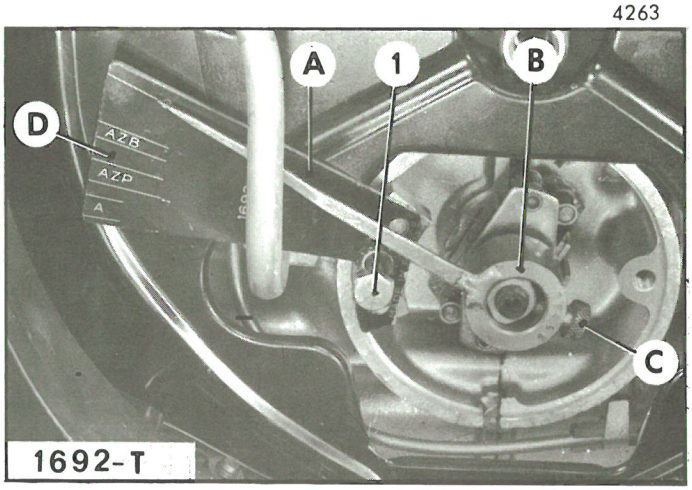
4. Start the engine and check the curve. If this is incorrect, adjust the centrifugal advance or renew the weights.

5. Stop the engine. Remove the stroboscopic light, with its dephaser and rev counter.

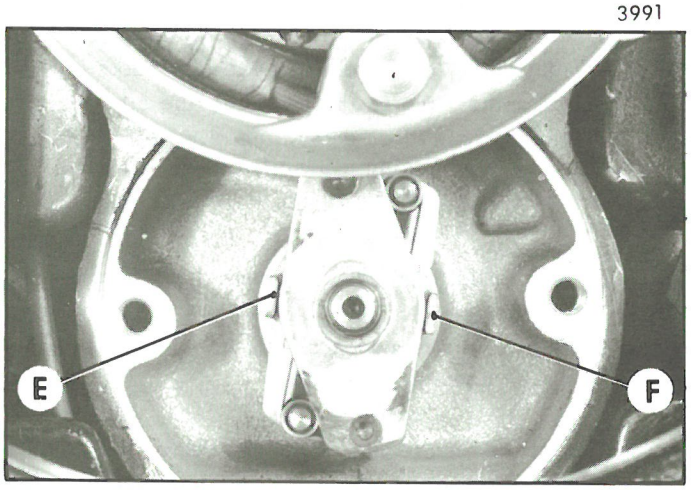
NOTE : The maximum centrifugal advance can be checked without stroboscopic light and dephaser (see chapter VI, same operation).

VI. CHECKING AND ADJUSTING THE MAXIMUM CENTRIFUGAL ADVANCE

4263



3991

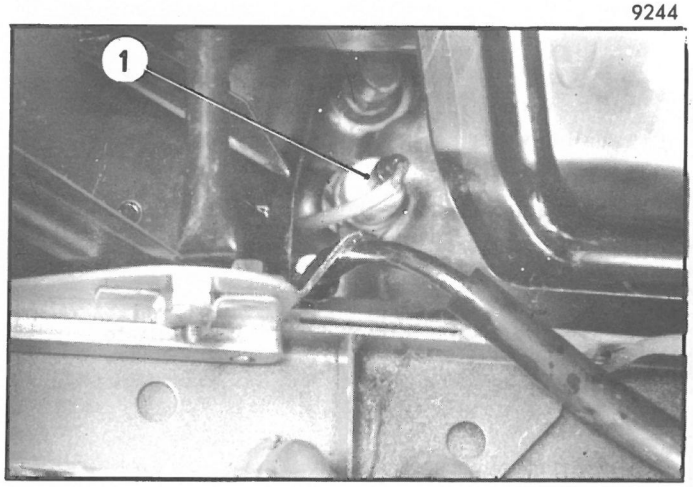


1. Remove the grille at the front of the engine.
2. Remove the fan (extractor 3006-T bis).
3. Remove the contact breaker.
4. Install the graduated segment A of rig 1692-T bis using securing bolts (1) on the contact breaker.
5. Fit the needle holder B on the cam, pushing it right home, and lightly tighten the retaining screw C.
6. Turn the flywheel until the needle is opposite the line marked O.
7. Turn the needle holder, without forcing, from right to left.
   At the end of its travel, the needle should be :
   a) In the zone « **AZB** » for contact breakers fitted to engines **A 53 and M 4.**
   b) In the zone « **D** » for contact breakers fitted to engines **A 79/0.**
   c) In the zone « **AZP** » for contact breakers fitted to engines **A 79/1 - M 28/1 and M 28.**

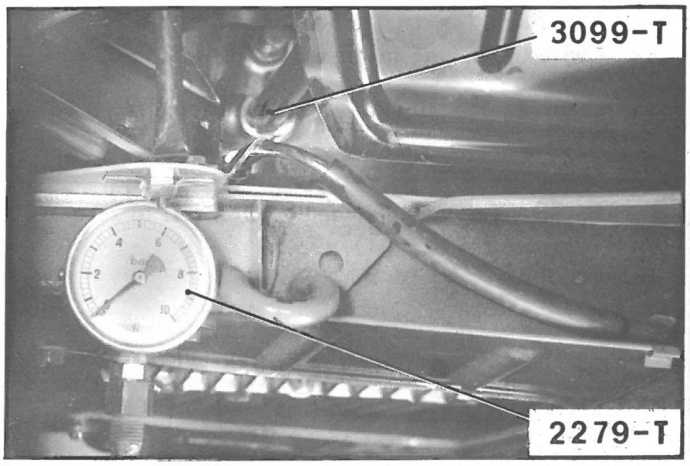
   If the needle is outside the zone corresponding to the type of contact breaker, the movement of the weights must be adjusted by bending the stops E and F.
8. Remove the rig 1692-T.
9. Fit the contact breaker, set the contact gap and ignition point.
10. Install the fan.
11. Fit the grille.

I. CHECKING THE OIL PRESSURE ON THE VEHICLE

9244



9243



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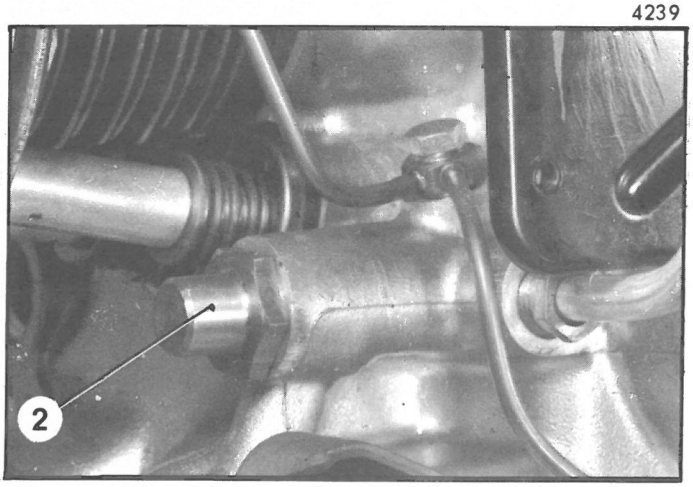


1. Warm up the engine until the oil reaches a temperature of about 80° C.

2. Stop the engine.
On the left hand side of the engine casing, remove the oil pressure switch (1) or the blanking plug if the engine is not fitted with a pressure switch

3. Install the union 3099-T (copper seal) fitted with the pressure gauge 2279-T gratuated from 0 to 10 bars (0 to 142 psi).

4. **Measure the oil pressure :**

a) *Engines A 53 - A 79/0 and M 4 :*
Run the engine at a speed of **4000 rpm.**
The pressure should be : **2.5 to 3.1 bars (35 to 44 psi).**
If the oil pressure is incorrect, change the number of washers located underneath the spring of the relief valve (do not lose the ball).

b) *Engine A 79/1 :*
Run the engine at **6000 rpm.**
The pressure should be : **4 to 5 bars (56 to 71 psi).**
If the oil pressure is incorrect, replace the spring on the piston of the relief valve located in the plug (2).

c) *Engines M 28/1 and M 28 :*
Run the engine at **6000 rpm.**
The pressure should be : **5.5 to 6.5 bars (78 to 92 psi).**
If the oil pressure is incorrect, replace the spring on the piston of the relief valve located in the plug (2).

NOTE : If these repairs are not successful, it is necessary to check the oil pump and the lubrication system.

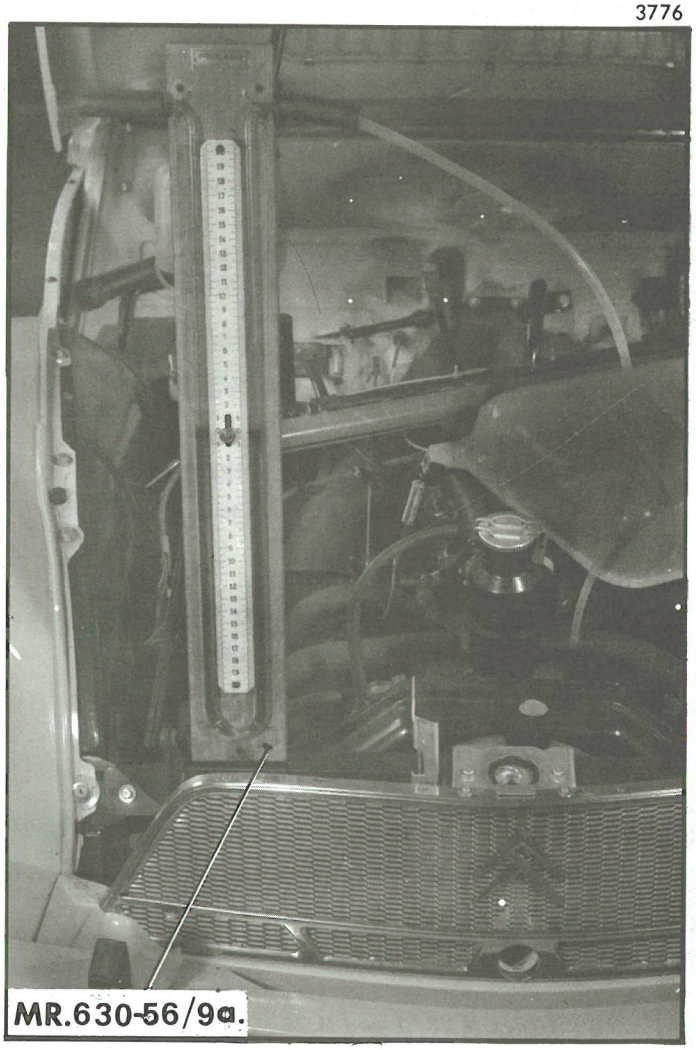
5. Remove the pressure gauge 2279-T, the union 3099-T and the rev counter.

6. Fit the oil pressure switch (1) or the blanking plug (copper seal).
Connect up the lead to the pressure switch

7. Check the engine oil level and top up if necessary.

II. CHECKING THE VACUUM IN THE ENGINE CASING

3776



1. The vacuum in the engine casing is measured using water gauge MR. 630-56/ 9 a.

   Connect one end of the manometer to the rubber sealing tube of the oil pressure gauge.

2. With the engine idling, accelerate gently to stabilize the levels in the gauge.

   CAUTION : The liquid should rise on that side of the gauge connected to the engine.

   Read the difference in levels :

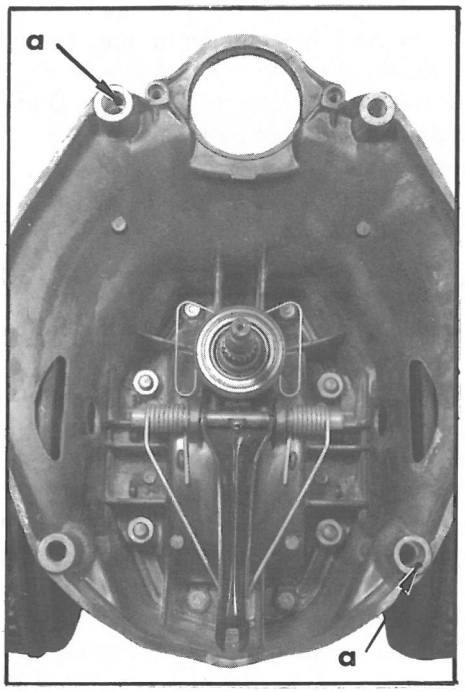
   This should be :
   - with the engine idling : 5 cm of water minimum.

   Otherwise, the breather must be replaced.

   NOTE : The vacuum should never fall to zero whatever the engine speed.

CHECKING THE ALIGNMENT OF THE ENGINE/GEARBOX ASSEMBLY

3921



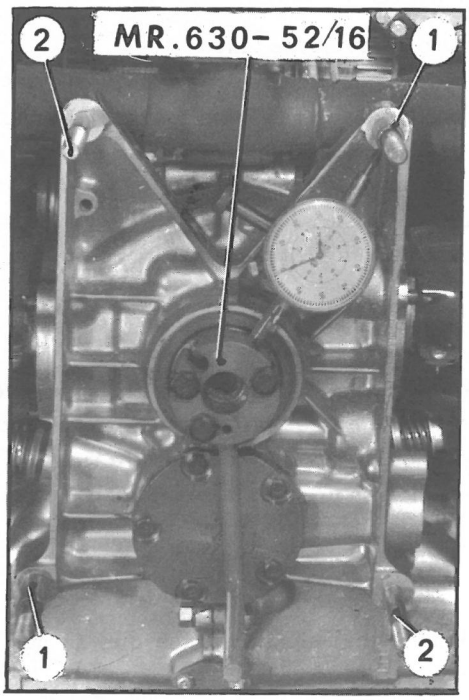
REMOVAL.

1. **Remove the engine/gearbox assembly.**
2. Remove the expansion chamber.
   Place the engine/gearbox assembly on a work-bench.
3. **Uncouple the engine from the gearbox.**
   When releasing the gearbox, make sure that no stress is put on the drive shaft.
4. **Prepare the gearbox** *(centrifugal clutch)* :
   Remove the clutch drum :
   Unlock and slacken the bearing lock nut (left hand thread).
   CAUTION : While slackening the nut, hold the spanner so as not to bear on the drive shaft.
   Withdraw the clutch drum-mechanism assembly.
5. **Prepare the engine :**
   Remove the cluch mechanism and disc *(conventional cluch only)*.
   Remove the engine flywheel.
   Remove the sparking plugs.

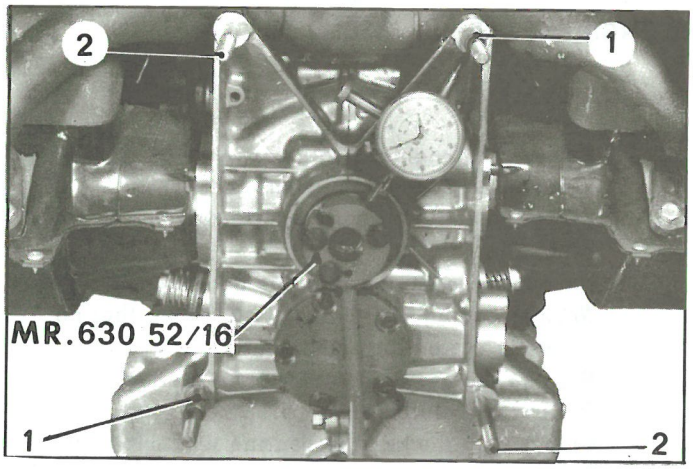
CHECKS

6. **Check the housings of the centring dowels :**
   Remove the centring dowels from the engine casing
   Very carefully check the housings « a » of the centring dowels in the engine casing and especially in the clutch casing.
   If the bores are not perfectly cylindrical, the damaged casing must be replaced.

4377



7. **Check the position of the studs and centring dowels on the engine casing :**
   Fix the support MR. 630-52/16 fitted with a dial gauge (2437-T) to the crankshaft.
   NOTE : This operation is to compare the distances between the center line of the crankshaft and the centring dowels (1) or the studs (2).
   When the point of the dial gauge comes into contact with these parts which are cylindrical, the needles turn first in one direction, then in the other.
   The reading must be taken at the exact point where the needles change direction.
   Install the centring dowels.
   Rotate the crankshaft and test the two centring dowels (1) in turn. *The positions at which the needle changes direction should be same to within 0.10 mm.*
   Turn the crankshaft and test the two fixing studs (2) in turn. *The positions at which the needle changes direction should be the same to within 0.10 mm.*
   If the positions at which the gauge needle. changes direction are not within tolerance, the engine casing must be renewed.



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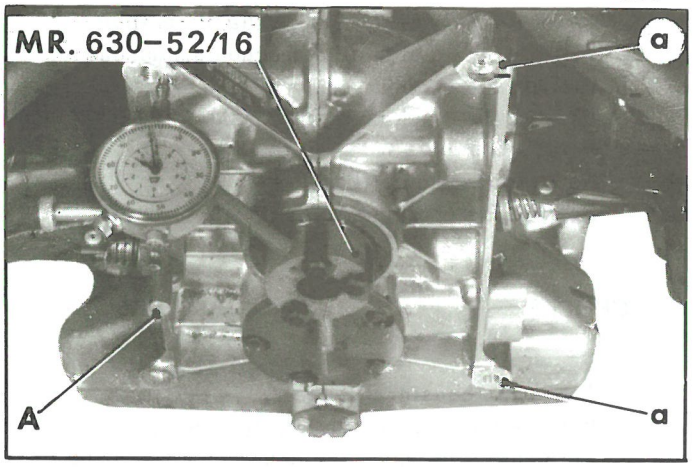

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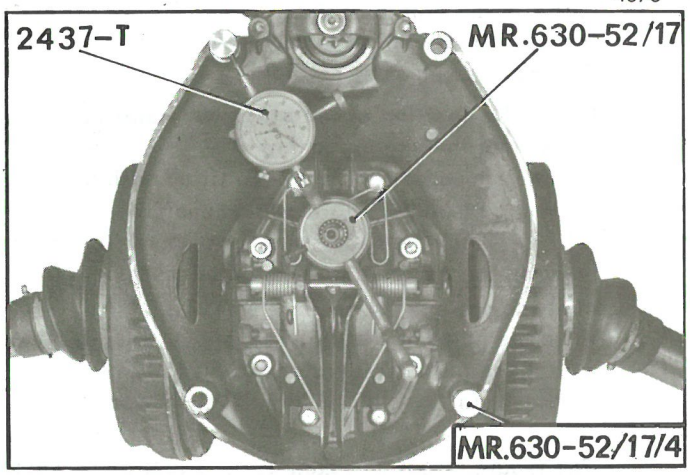

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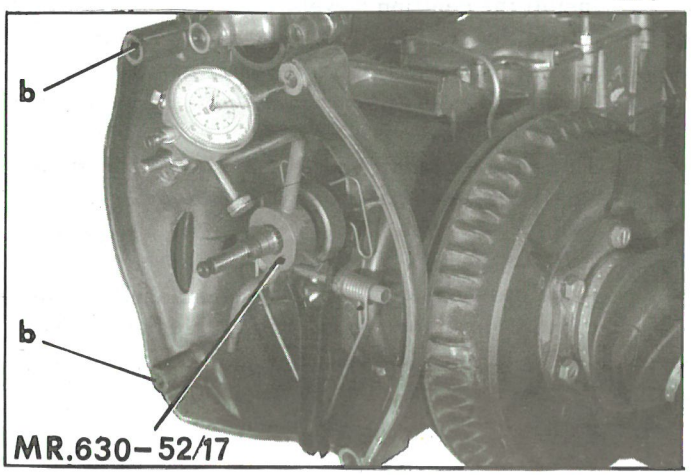


8. Check the bearing surface of the engine casing :

Remove the centring dowels (1) and the studs (2). (mark the position of the studs).
Place the dial gauge on the supporting rod A (see figure).
Turn the crankshaft and test the bearing bosses « a » of the engine casing in turn. *The position of the dial gauge needles should be the same on the four bosses to within 0.10 mm.* Otherwise, the engine casing must be renewed.
Remove the support and the gauge.

9. Check the position of the bores into which the centring dowels are inserted on the clutch casing :

Place the support MR. 630-52/17 (fitted with the dial gauge 2437-T on the shortest rod) on the drive shaft and tighten the retaining screw.
Place the two gauge pins MR. 630-52/17/4 into the holes for the centring dowels : hold them in position with two nuts (diameter 10 mm, pitch 150).
Engage a gear and turn the drive shaft using the differential.
Test the two pins in turn. *The positions at which the dial gauge needle changes direction should be the same to within 0.10 mm.*

10. Checking the bearing surface of the clutch casing :

Remove the gauge pins.
Fit the dial gauge on the other support rod.
Turn the drive shaft and test the four clutch casing bosses « b » in turn. *The position of the gauge needles should be the same to within 0.10 mm on the four bosses, otherwise the casing must be straightened or replaced.*

NOTE : The casing can be straightened and out-of-tolerance bosses brought back to their original position by striking them with a mallet. Check their position again after straightening.

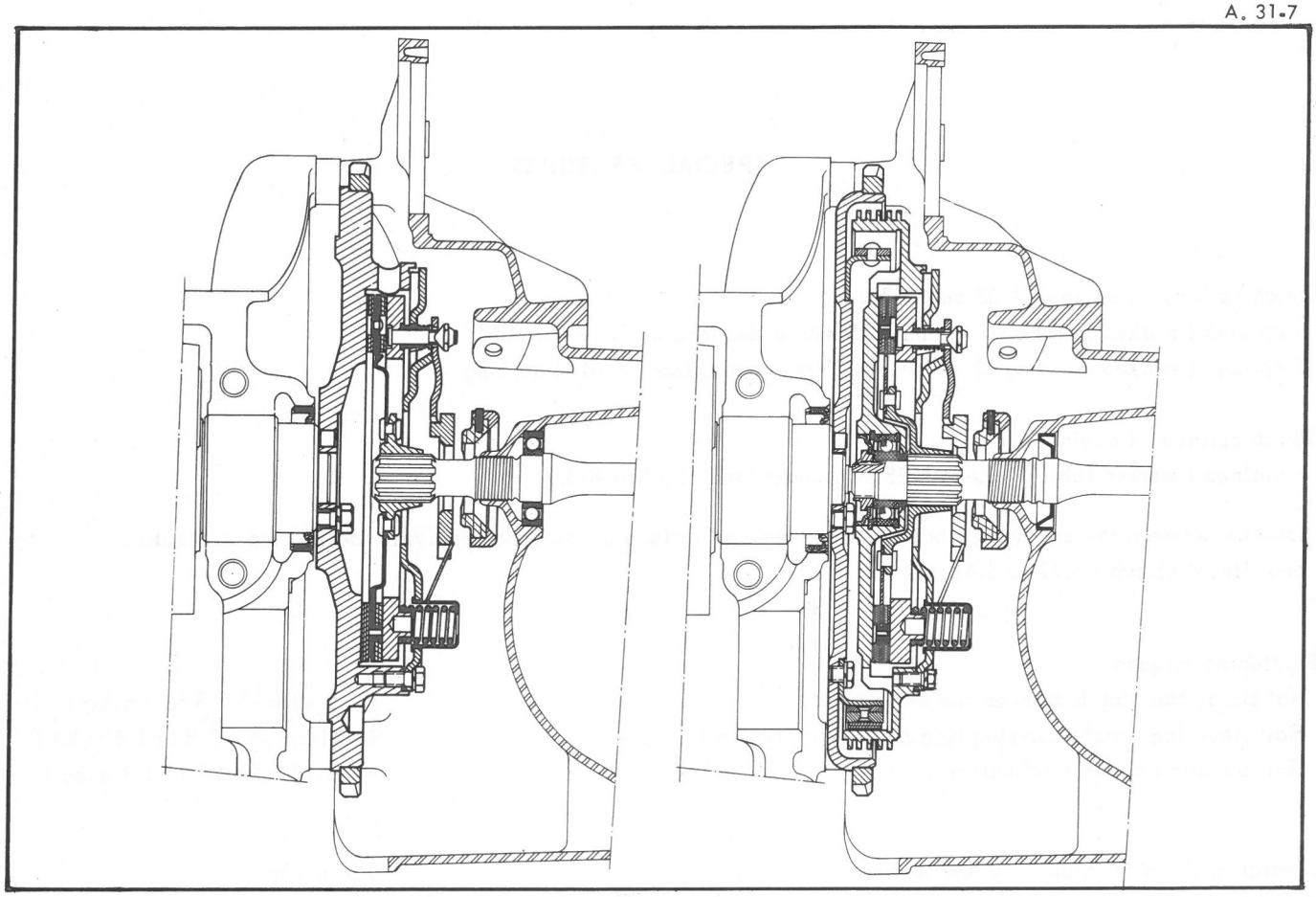
Remove the support and the dial gauge.

OPERATION N° A. 312-00 : *Characteristics and special features of the clutch.* **Op. A. 312-00** 1

CLUTCHES FITTED TO VEHICLES WITH ENGINES :

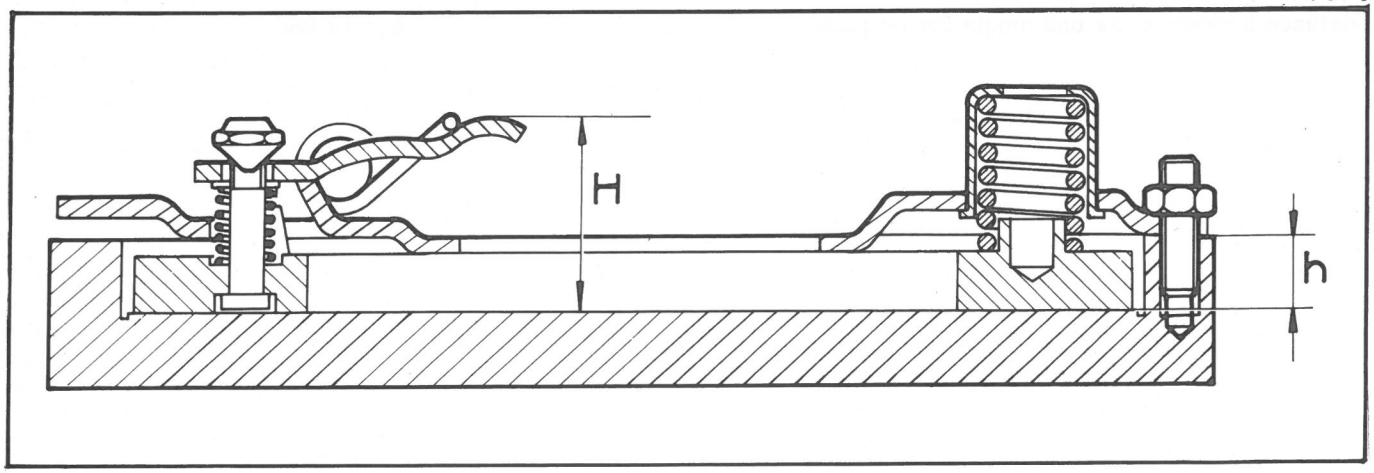
A 53 up to February 1970
A 79/0 up to January 1972
M 4 up to October 1968

A. 31-7



Manual 812-1

A. 31-3



CHARACTERISTICS

Mechanism : FERODO type PKH 3 (engines A 53 and A 79/0)
FERODO type PKH 4 (engine M 4)
Disc ..... Progressive type up to October 1967 - DENTEL type as from October 1967
Disc hub ..... 10 grooves up to April 1966 - 18 grooves as from April 1966
Lining ..... FERODO M 8 or A 3 S grade
Thrust bearing .....Graphite ring

SPECIAL FEATURES

Clutch springs : (engines A 53 and A 79/0)
- 3 springs (marked in pink) - Length 25 mm, under load of 27 to 29.5 kg
- 3 springs (marked in orange) - Length 25 mm, under load of 18 to 20.5 kg

Clutch springs : (engine M 4)
- 6 springs (marked ruby) - Length 25 mm, under load of 37 to 40 kg

Distance between the engine-gearbox joint face and the surface of the boss receiving the bearing in the drum (centrifugal clutch) 5.12 to 5.42 mm.

Tightening torques :
- Nut fixing the clutch drum on the drive shaft ..... 30 to 40 mΛN (3 to 4 m.kg)
- Bolt securing weight-carrying ring on engine flywheel ..... 9 to 14 mΛN (0.9 to 1.4 m.kg)
- Bolt securing clutch mechanism ..... 10 to 13 mΛN (1 to 1.3 m.kg)

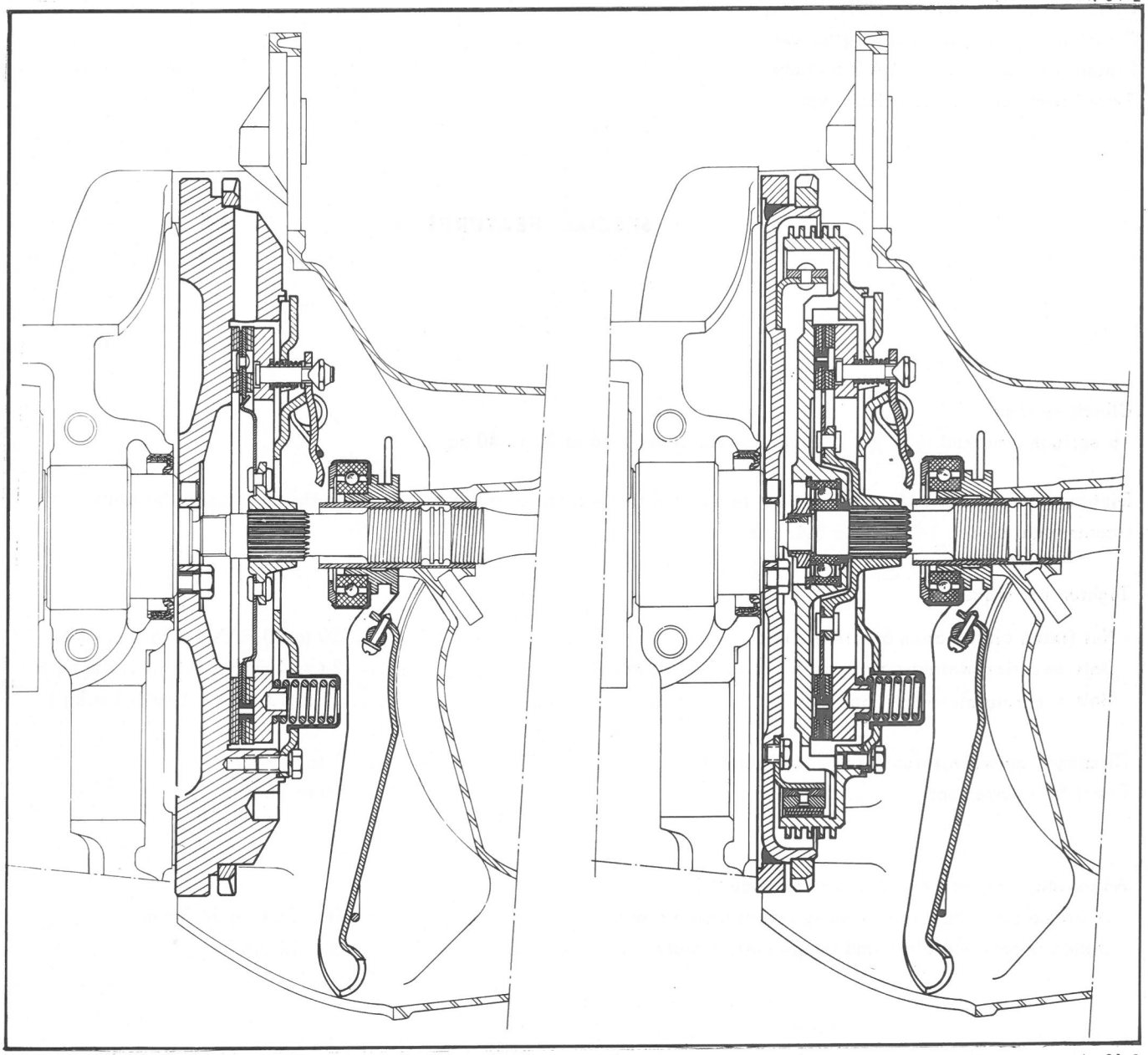
Clearance between thrust ring and toggles .....0.5 to 1 mm
Pedal free movement .... 10 to 15 mm

Adjusting toggles (see disgram on page 1)
- Distance between top of toggles and pressure plate ..... H = 26 to 27.5 mm
- Distance between plate and toggle carrier plate ..... h = 12 mm

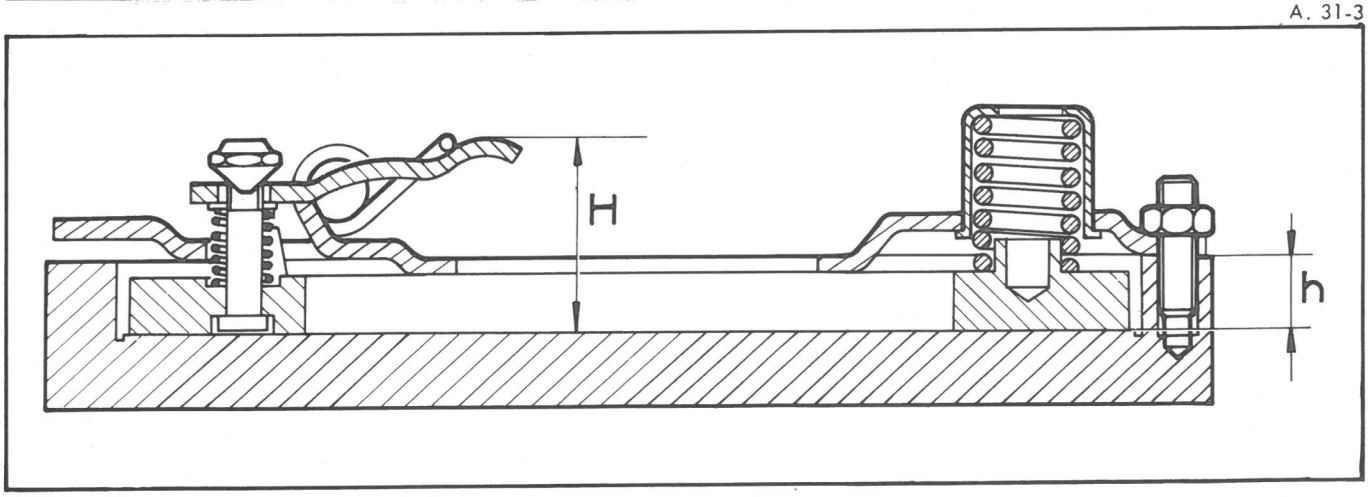
CLUTCHES FITTED TO VEHICLES WITH ENGINES :

A 79/0 from January 1972 to August 1972
A 79/1 from March 1968
M 28/1 from May 1968
M 28 from February 1970

A. 31-2



A. 31-3



CHARACTERISTICS

Mechanism ..... FERODO type PKHB 4 8
Disc ..... DENTEL type
Disc hub ..... 18 grooves
Lining ..... A 3 S grade
Thrust bearing ..... Ball type

SPECIAL FEATURES

Clutch springs :
- 6 springs (marked ruby) - Length 25 mm, under load of 37 to 40 kg

Distance between engine-gearbox joint faces and the surface of the boss receiving the bearing in the drum (centrifugal clutch) = 5.12 to 5.42 mm.

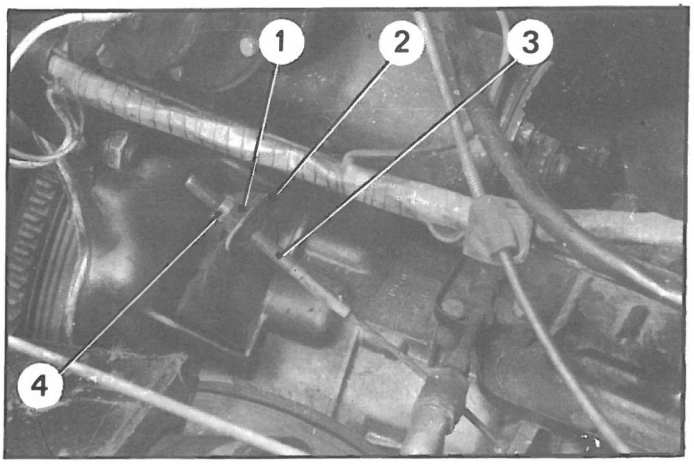
Tightening torques :

- Nut fixing clutch drum on drive shaft ..... 30 to 40 mΛN (3 to 4 m.kg)
- Bolt securing weight-carrying ring on engine flywheel ..... 9 to 14 mΛN (0.9 to 1.4 m.kg)
- Bolt securing clutch mechanism ..... 10 to 13 mΛN (1 to 1.3 m.kg)

Clearance between thrust ring and toggles ..... 1 to 1.5 mm
Pedal free movement ..... 20 to 25 mm

Adjusting toggles (see diagram on page 3) :
- Distance between top of toggles and pressure plate ..... H = 25.6 to 26.3 mm
- Distance between plate and toggle carrier plate ..... h = 12 mm

ADJUSTING THE CLUTCH CLEARANCE



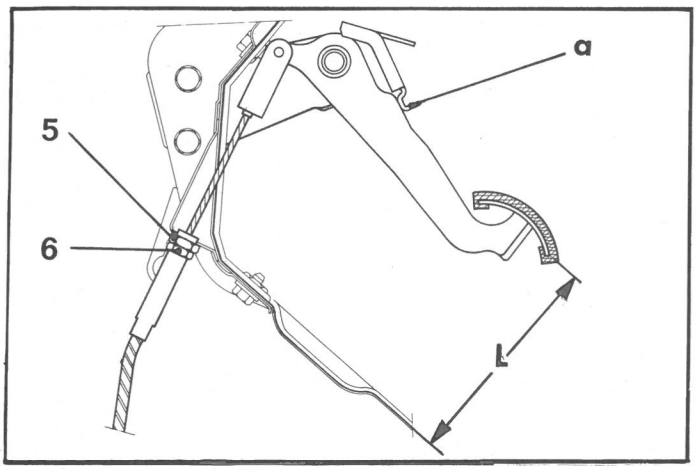
A. *Vehicles AZ (2 CV) up to February 1970*
Vehicles AZU (2 CV) up to January 1972
Vehicles AK (3 CV) up to October 1967

NOTE : The clutch pedal should be at the same height as the brake pedal.
The height of the clutch pedal is adjusted by moving the stop pin located in one of the holes of the pedal shaft.

1. Adjust the clutch clearance :
Slacken the lock nut then tighten or slacken the adjustment nut (1) to obtain a clearance **of 0.5 to 1 mm** between the nut (1) and the fork (2).
This check should be carried out while holding the clutch operating cable (3) taut from its free end and pressing slightly on the operating fork (2) in order to bring the graphited thrust bearing into contact with the operating lever ring.
Tighten the lock nut (4).

B. *Vehicles AY - AK - AZU AZL fitted with a pendent pedal gear.*

Manual 812-1



2. Check the pedal height :

With the pedal up against the stop « a », the height of the pedal should be :

L = 130.5 ± 5 mm

measured from the bottom corner of the pedal to the floor plate. Otherwise, adjust the support plate at « a » to obtain the correct height.

3. Adjust the clutch clearance :

Slacken the lock nut (6) and turn the nut (5) to obtain a clearance of **1 to 1.5 mm** between the ball thrust bearing and the operating levers. The clutch pedal free movement should then be 20 to 25 mm.

Tighten the lock-nut (6).

OPERATION N° A. 330-00 : *Characteristics and special features of gearboxes.* **Op. A. 330-00** 1

I. GEARBOXES :

With gear lever on rear cover, fitted on vehicles

AZ produced up to February 1970
AY produced up to October 1968 (up to March 1968 on AYA DYANE)
AZU produced up to January 1972
AK produced up to May 1968

SPECIAL FEATURES

Settings :

- Lateral play of second speed loose pinion ..... 0.05 to 0.35 mm
- Lateral play of intermediate gear train
  - 2 CV (not adjustable) : old torque *(with 18 mm wide bearing)* ..... 0.05 to 0.35 mm
    : new torque *(with 16 mm wide bearing)* ..... 0.45 to 1 mm
  - 3 CV (adjustable) ..... 0.10 to 0.20 mm
- Back lash (pinion, crownwheel) ..... 0.13 to 0.23 mm
- Minimum clearance between planetary and satellite gears ..... 0.1 mm

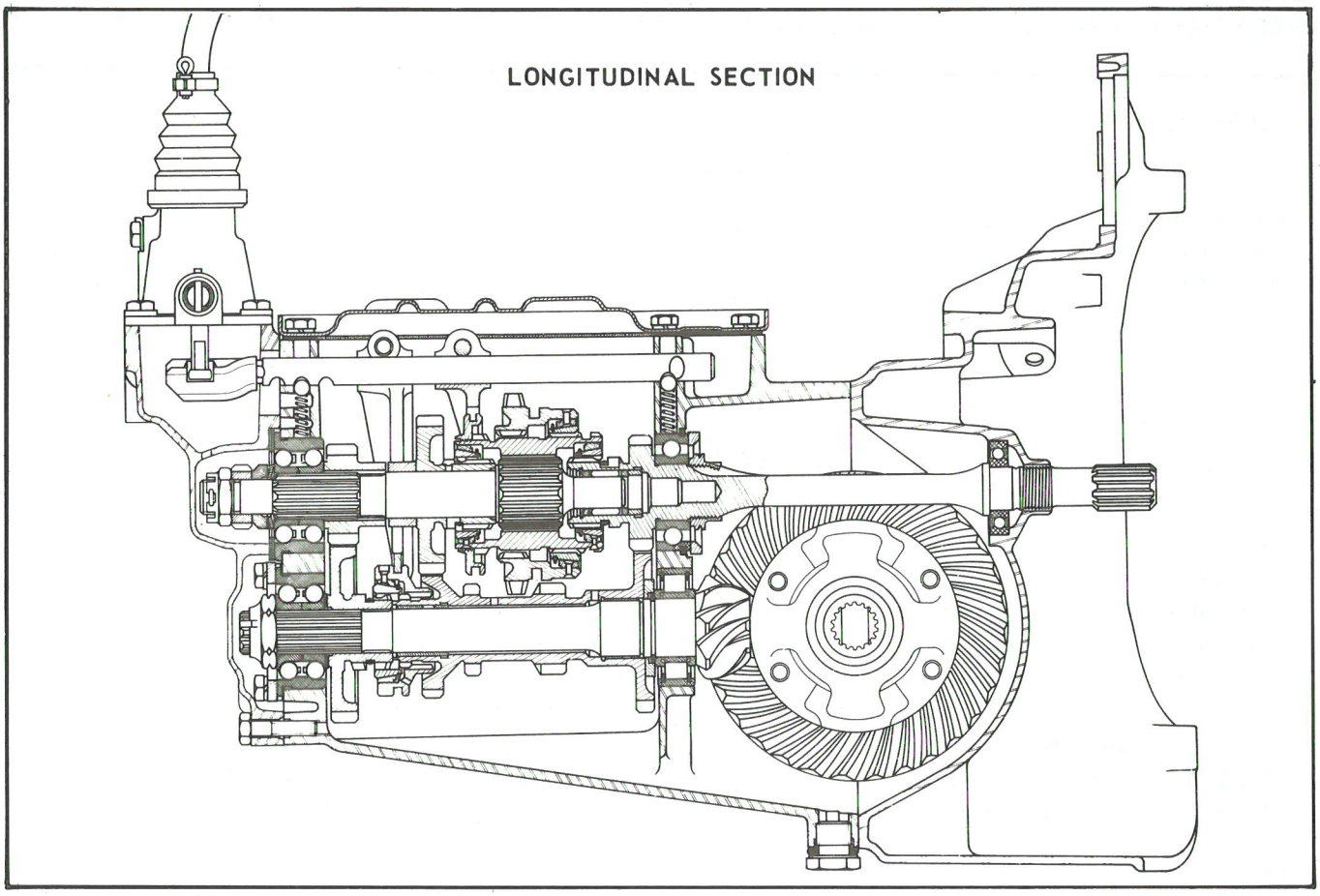
Torques :

- Primary shaft nut ..... 70 to 90 mΛN (7 to 9 m.kg)
- Bevel pinion shaft nut ..... 70 to 85 mΛN (7 to 8.5 m.kg)
- Flange bolt securing drive shaft bearing ..... 25 mΛN (2.5 m.kg)
- Flange bolt securing rear bearing on bevel pinion shaft ..... 25 to 30 mΛN (2.5 to 3 m.kg)
- Bearing nut on drive shaft ..... 120 to 140 mΛN (12 to 14 m.kg)
- Differential crownwheel bolt ..... 70 to 80 mΛN (7 to 8 m.kg)
- Nut for locking ball bearing on differential shaft ..... 100 to 120 mΛN (10 to 12 m.kg)
- Ring nut for locking ball bearing on differential shaft ..... 100 to 140 mΛN (10 to 14 m.kg)
- Drain plug ..... 35 to 45 mΛN (3.5 to 4.5 m.kg)
- Level plug ..... 10 to 15 mΛN (1 to 1.5 m.kg)
- Clutch housing : securing nuts (10 mm) ..... 35 to 45 mΛN (3.5 to 3.5 m.kg)
  : securing screws (7 mm) ..... 15 to 20 mΛN 1.5 to 2 m.kg)
- Rear cover (7 mm diameter screws) ..... 15 to 20 mΛN (1.5 to 2 m.kg)
- Nuts securing differential shaft bearing (gearbox outlet) (diameter 9 mm) 38 to 42 mΛN (3.8 to 4.2 m.kg)

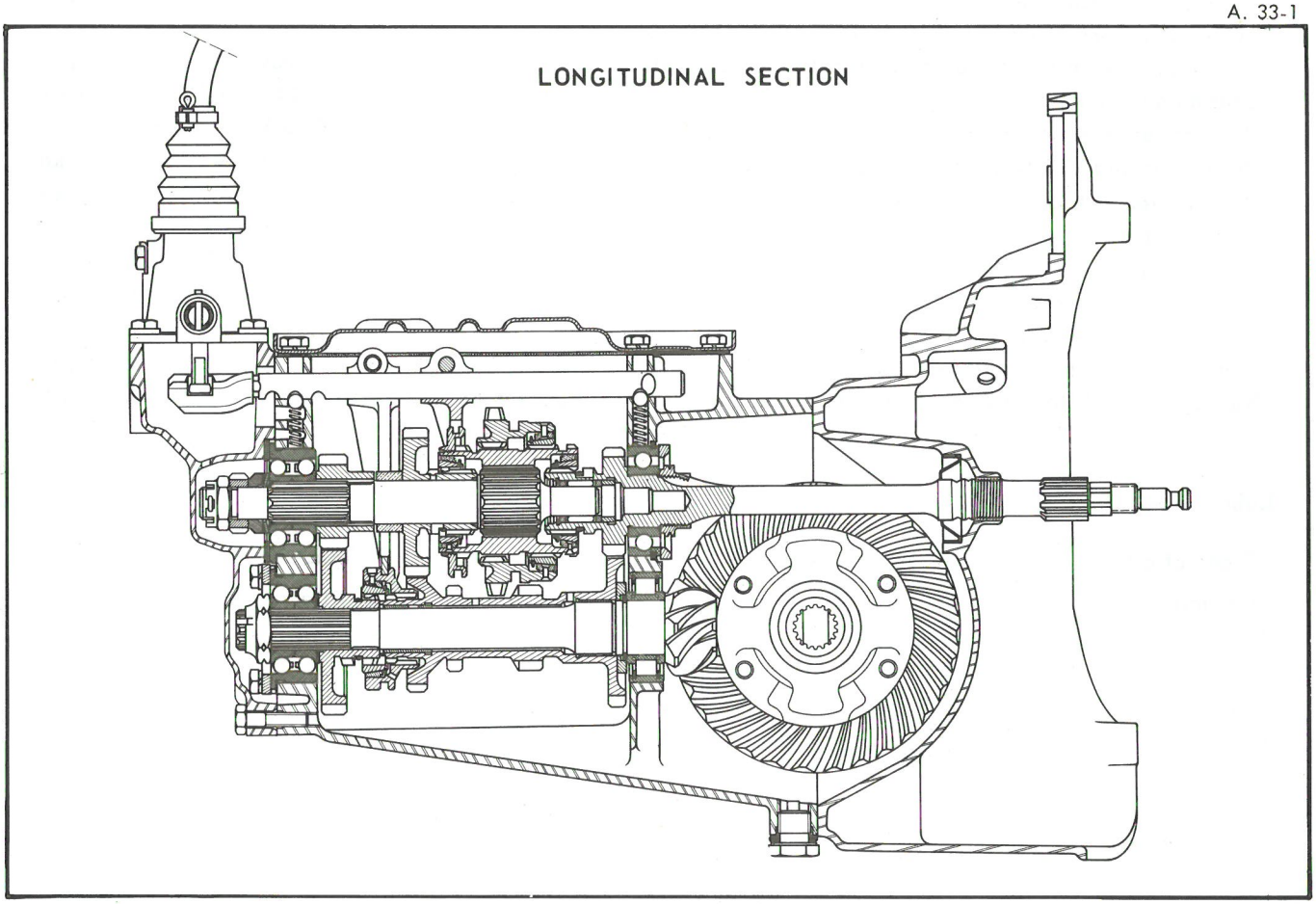
Lubrication :

- Grade of oil ..... TOTAL EP 80
- Capacity ..... 0.9 litre

A. 33-1a

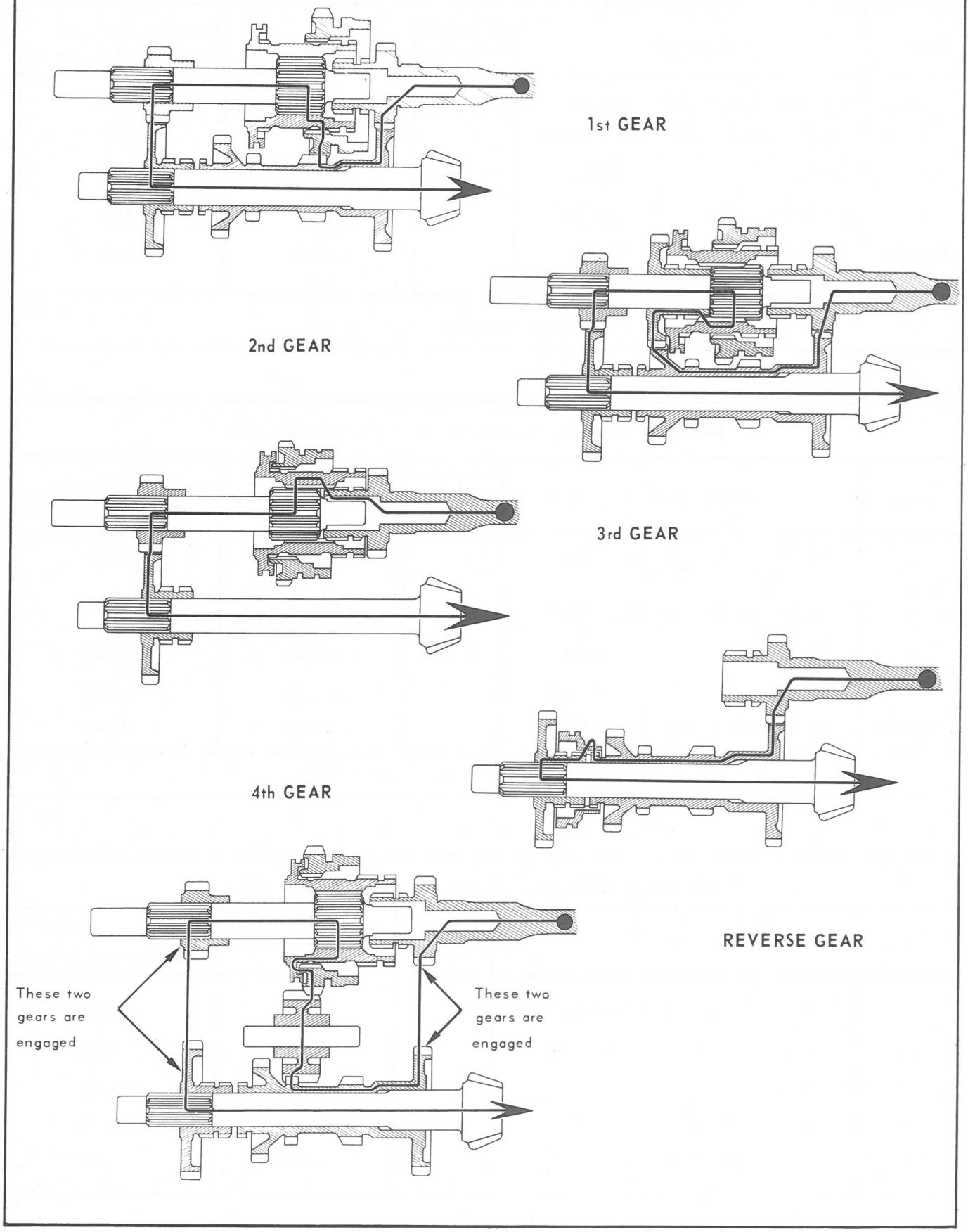


A. 33-1



GEAR SEQUENCE

A. 33-5



Gear ratios (with 125 - 380 X tyres with effective circumference under load of 1.842 meter).

Gearbox *on* **AZ** *vehicles from November 1964 to February 1970*				
Gears	Gearbox ratios	Crownwheel and pinion	Overall ratios	Speed for 1000 rpm engine speed (in km/h)
1	19/28 × 14/33 × 15/32 = 0.1349		0.0372	4.113
2	19/28 × 22/25 × 15/32 = 0.2799		0.0772	8.536
3	15/32 = 0.4687	8/29	0.1293	14.297
4	19/28 = 0.6785		0.1872	20.689
Reverse	19/28 × 13/33 × 15/32 = 0.1253		0.0345	3.812
Speedometer drive ratio = 6/25				

Gearbox *on* **AZU** *vehicles from November 1964 to March 1968*				
Gears	Gearbox ratios	Crownwheel and pinion	Overall ratios	Speed for 1000 rpm engine speed (in km/h)
1	19/28 × 14/33 × 55/32 = 0.1349		0.0348	3.848
2	19/28 × 22/25 × 15/32 = 0.2799		0.0722	7.983
3	15/32 = 0.4687	8/31	0.1209	13.369
4	19/28 = 0.6785		0.1750	19.351
Reverse	19/28 × 13/33 × 15/32 = 0.1253		0.0323	3.569
Speedometer drive ratio = 5/22				

Gearbox *on* **AZU** *vehicles from March 1968 to January 1972*				
Gears	Gearbox ratios	Crownwheel and pinion	Overhall ratios	Speed for 1000 rpm engine speed (in km/h)
1	18/28 × 14/33 × 15/32 = 0.1278		0.0329	3.638
2	18/28 × 24/26 × 15/32 = 0.2781		0.0717	7.928
3	15/32 = 0.4687	8/31	0.1209	13.368
4	18/28 = 0.6428		0.1658	18.334
Reverse	18/28 × 13/33 × 15/32 = 0.1187		0.0306	3.383
Speedometer drive ratio = 5/22				

Gear ratios (with 125 - 380 X tyres with effective circumference under load of 1.842 meter)

Gearbox *on* **AYA (DYANE)** *vehicles from August 1967 to March 1968*				
Gear	Gearbox ratios	Crownwheel and pinion	Overall ratios	Speed for 1000 rpm engine speed (in km/ h)
1	18/ 28 × 14/ 33 × 15/ 32 = 0.1278		0.0352	3.892
2	18/ 28 × 24/ 26 × 15/ 32 = 0.2781		0.0767	8.481
3	15/ 32 = 0.4687	8/ 29	0.1293	14.297
4	18/ 28 = 0.6428		0.1773	19.605
Reverse	18/ 28 × 13/ 33 × 15/ 32 = 0.1187		0.0327	3.614
Speedometer drive ratio = 6/ 25				

Gearbox *on* **AYA** *vehicles* **(DYANE)** *from August 1967 to March 1968*				
Gear	Gearbox ratios	Crownwheel and pinion	Overall ratios	Speed for 1000 rpm engine speed (in Km/ h)
1	19/ 25 × 14/ 31 × 13/ 25 = 0.1784		0.0492	5.440
2	19/ 25 × 23/ 26 × 13/ 25 = 0.349		0.0962	10.659
3	14/ 25 = 0,520	8/ 29	0.1434	15.857
4	19/ 25 = 0.760		0.2096	23.177
Reverse	19/ 25 × 14/ 31 × 13/ 25 = 0.1784		0.0492	5.440
Speedometer drive ratio = 4/ 15				

Gear ratios (with 135 - 380 X tyres with effective circumference under load of 1.862 meters)

Gearbox *on* **AK** *vehicles up to May 1968*				
Gears	Gearbox ratios	Crownwheel and pinion	Overall ratios	Speed for 1000 rpm engine speed (in km/ h)
1	19/ 27 × 14/ 31 × 13/ 25 = 0.1652		0.046	5.083
2	19/ 27 × 23/ 26 × 13/ 25 = 0.3236		0.088	9.965
3	13/ 25 = 0.5200	8/ 29	0.143	16.020
4	19/ 27 = 0.7037		0.194	21.684
Reverse	19/ 27 × 14/ 31 × 13/ 25 = 0.1652		0.046	5.083
Speedometer drive ratio = 4/ 15				

II. GEARBOXES

With gear lever on upper cover, fitted to vehicles :

AZ from February 1970
AY from October 1968 (from March 1968 on DYANE 4)
AZU from January 1972
AK from May 1968
MEHARI from October 1968

SPECIAL FEATURES

Settings :

- Lateral play on 2nd speed loose pinion ..... 0.05 to 0.35 mm
- Lateral play of intermediate gear train ..... 0.10 to 0.20 mm
- Minimum clearance between planetary and satellite gears ..... 0.1 mm
- Clearance between teeth (pinion, crownwheel) (gearboxes with gear lever on rear upper cover) ..... 0.13 to 0.23 mm
- Clearance between teeth (pinion, crownwheel) (gearboxes with gear lever on upper cover) ..... 0.14 to 0.18 mm

Tightening torques :

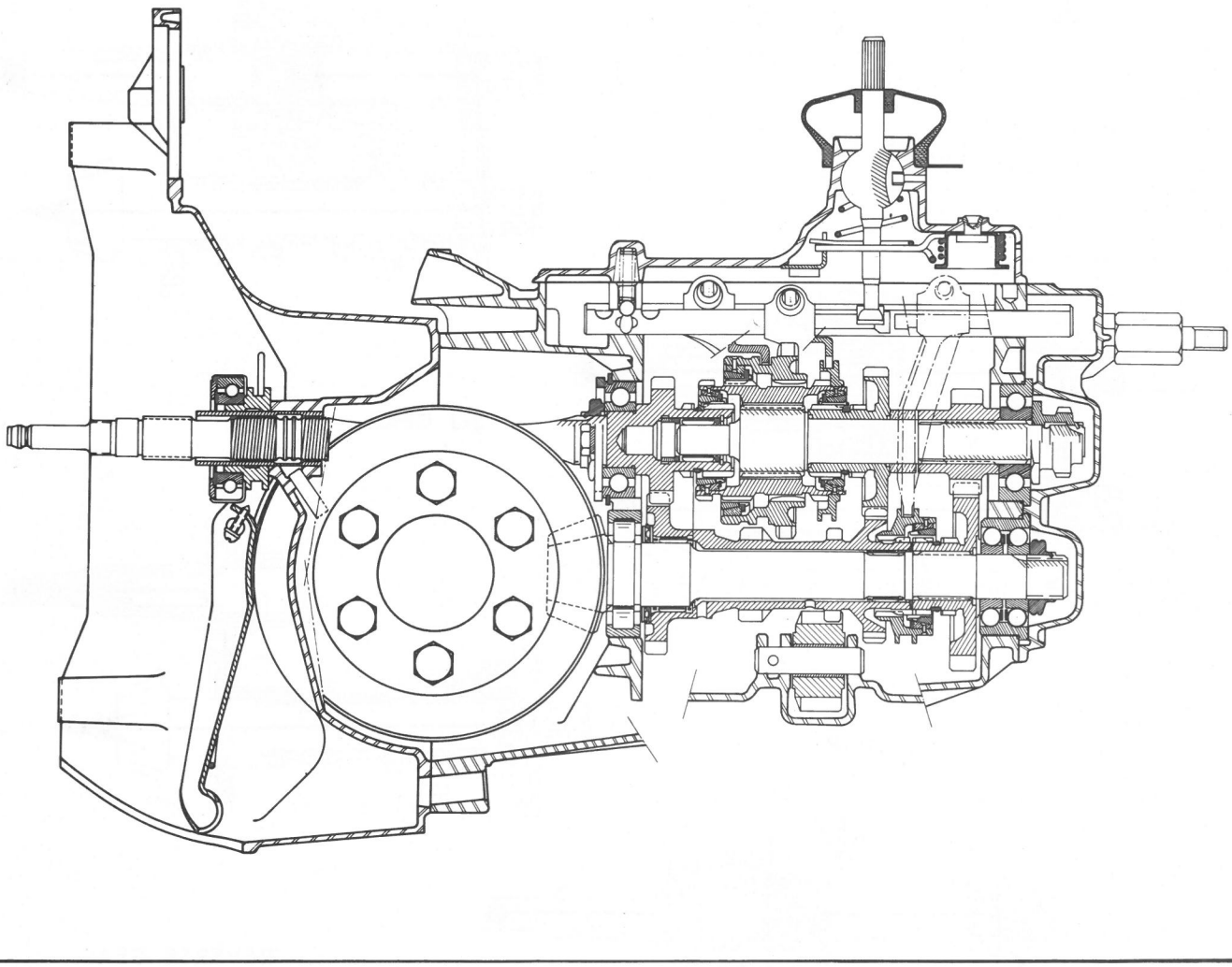
- Primary shaft nut ..... 70 to 90 mAN (7 to 9 m.kg)
- Drive pinion shaft nut ..... 70 to 85 mAN (7 to 8.5 m.kg)
- Flange bolt on drive shaft bearing ..... 25 mAN (2.5 m.kg)
- Drive shaft bearing nut ..... 120 to 140 mAN (12 to 14 m.kg)
- Differential crownwheel bolt ..... 70 to 80 mAN (7 to 8 m.kg)
- Clutch casing : bearing bolt ..... 35 to 45 mAN (3.5 to 4.5 m.kg)
  : 7 mm diameter bolt ..... 15 to 20 mAN (1.5 to 2 m.kg)
- Nut for locking ball bearing on differential shaft ..... 100 to 120 mAN (10 to 12 m.kg)
- Ring-nut for locking ball bearing on differential shaft ..... 60 to 100 mAN (6 to 10 m.kg)
- Output shaft bearing nuts ..... 38 to 42 mAN (3.8 to 4.2 m.kg)
- Bolts holding rear upper cover, diameter 7 mm ..... 15 to 20 mAN (1.5 to 2 m.kg)
- Drain plug ..... 35 to 45 mAN (3.5 to 4.5 m.kg)
- Level plug ..... 10 to 15 mAN (1 to 1.5 m.kg)

Lubrication :

- Oil grade ..... TOTAL EP 80
- Capacity ..... 0.9 litre

LONGITUDINAL SECTION

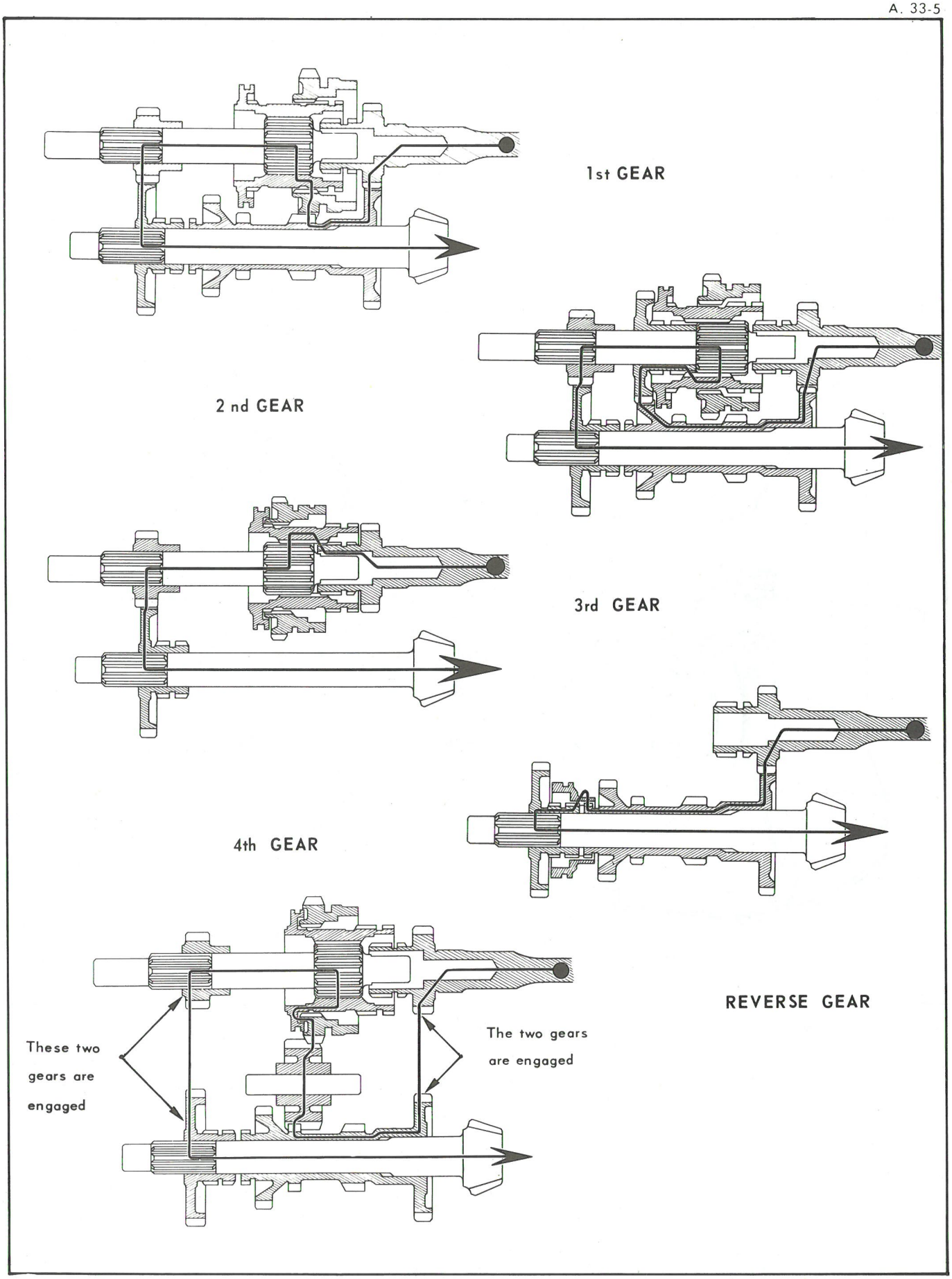
A. 33-2



Manual 812-1

GEAR SEQUENCE

A. 33-5



Gear ratios (with 125 - 380 X tyres with effective circumference under load of 1.842 meters).

Gearbox on vehicles { **AYA 2 (DYANE 4)** *from March 1968*; **AZ (2 CV 4)** *from February 1970*; **AZU (2 CV Van)** *from January 1972*

Gears	Gearbox ratios	Crownwheel and pinion	Overall ratios	Speed for 1000 rpm engine speed (in km/h)
1	19/28 × 14/31 × 15/32 = 0.1436		0.0348	3.848
2	19/28 × 23/26 × 15/32 = 0.2813		0.0682	7.541
3	15/32 = 0.4687	8/33	0.1136	12.561
4	19/28 = 0.6785		0.1645	18.190
Reverse	19/28 × 14/31 × 15/32 = 0.1436		0.0348	3.848

Speedometer drive ration = 3/14.

Manual 812-1

Gearbox on vehicles { **AYB (DYANE 6, engine M 28/1)** *from October 1968 to February 1970*; **AZ (2 CV 6)** *from February 1970*

Gears	Gearbox ratios	Crownwheel and pinion	Overall ratios	Speed for 1000 rpm engine speed (in km/h)
1	19/25 × 14/31 × 14/25 = 0.1922		0.0465	5.141
2	19/25 × 23/26 × 14/25 = 0.3764		0.0912	10.084
3	14/25 = 0.5600	8/33	0.1357	15.005
4	19/25 = 0.7600		0.1842	20.368
Reverse	19/25 × 14/31 × 14/25 = 0.1922		0.0465	5.141

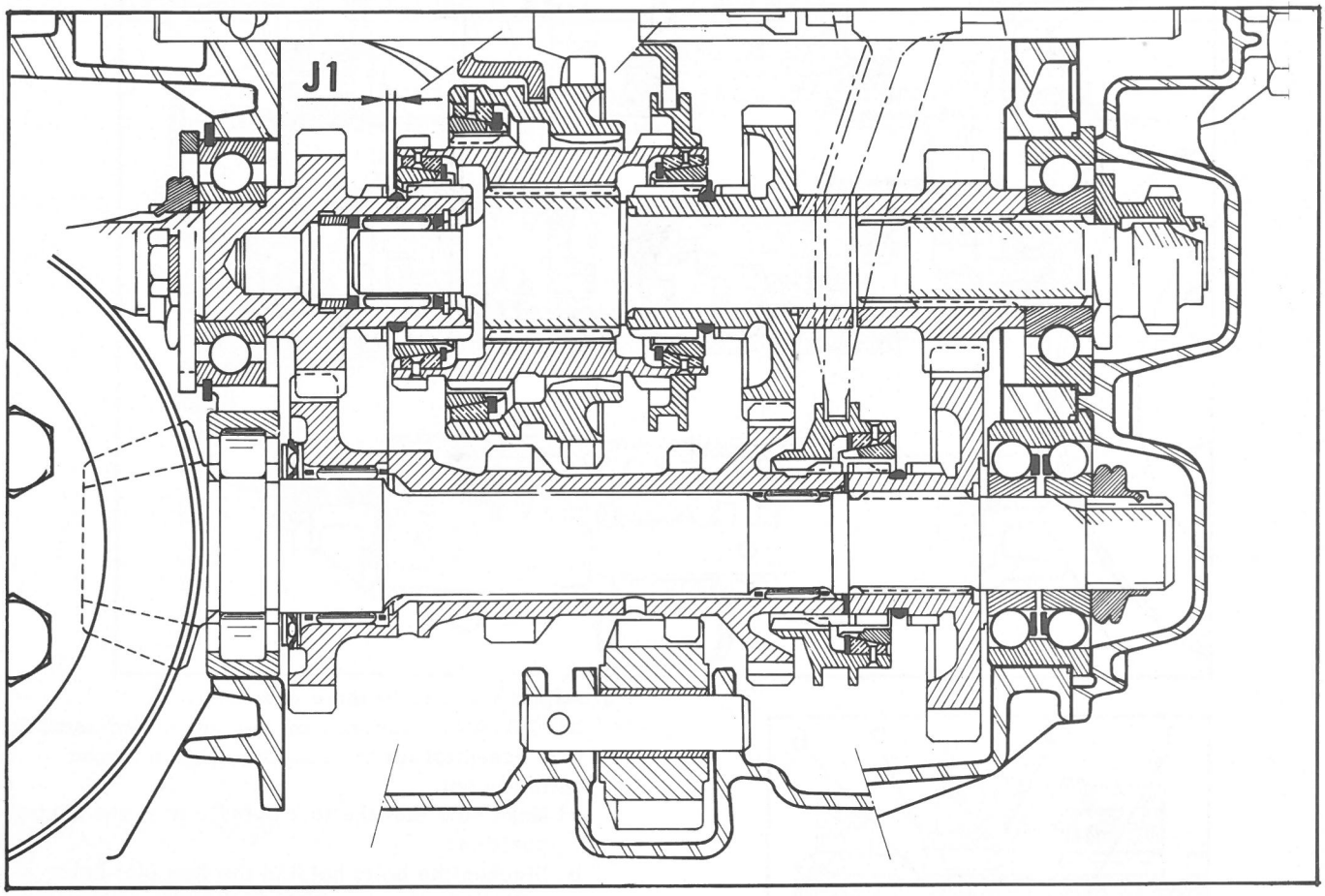
Speedometer drive ratio = 4/16

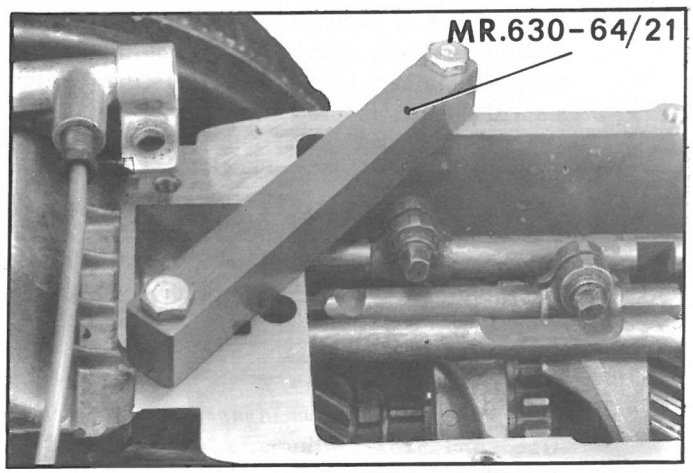
Gear ratios (with 125 - 380 X tyres with effective circumference under load of 1.842 meters).

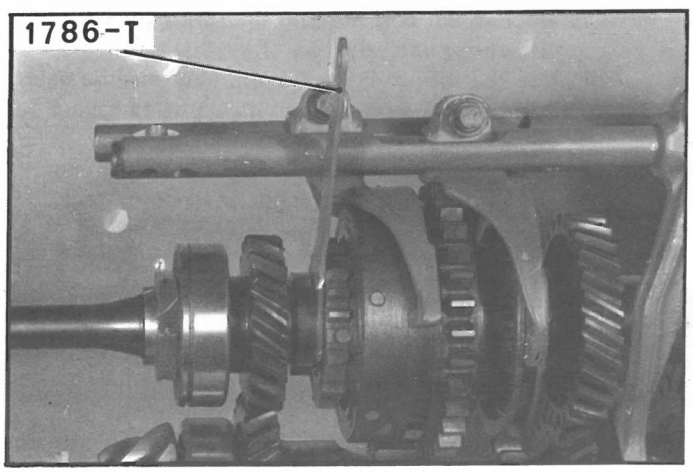
Gearbox *on vehicles* **AYB (DYANE 6, engine M 28)** *from February 1970*				
Gears	Gearbox ratios	Crownwheel and pinion	Overall ratios	Speed for 1000 rpm engine speed (in km/h)
1	20/27 × 14/31 × 13/25 = 0.1739		0.0448	4.953
2	20/27 × 23/26 × 13/25 = 0.3407		0. 0879	9.719
3	13/25 = 0.5200	8/31	0.1341	14.828
4	20/27 = 0.7407		0.1911	21.131
Reverse	20/27 × 14/31 × 13/25 = 0.1739		0.0448	4.953
Speedometer drive ratio = 4/16				

Gearbox *on vehicles* { **AY** *series* **CA (MEHARI)** *from October 1968* **AK** *from May 1968*				
Gears	Gearbox ratios	Crownwheel and pinion	Overall ratios	Speed for 1000 rpm engine speed (in km/h)
1	19/27 × 14/31 × 13/25 = 0.1652		0.0426	4.759
2	19/27 × 23/26 × 13/25 = 0.3236		0.0835	9.328
3	13/25 = 0.5200	8/31	0.1341	14.981
4	19/27 = 0.7037		0.1816	20.288
Reverse	19/27 × 14/31 × 13/25 = 0.1652		0.426	4.759
Speedometer drive ratio = 4/16				

ADJUSTING FORKS







1. Remove the upper cover from the gearbox.

2. Adjust the second-third gear fork :

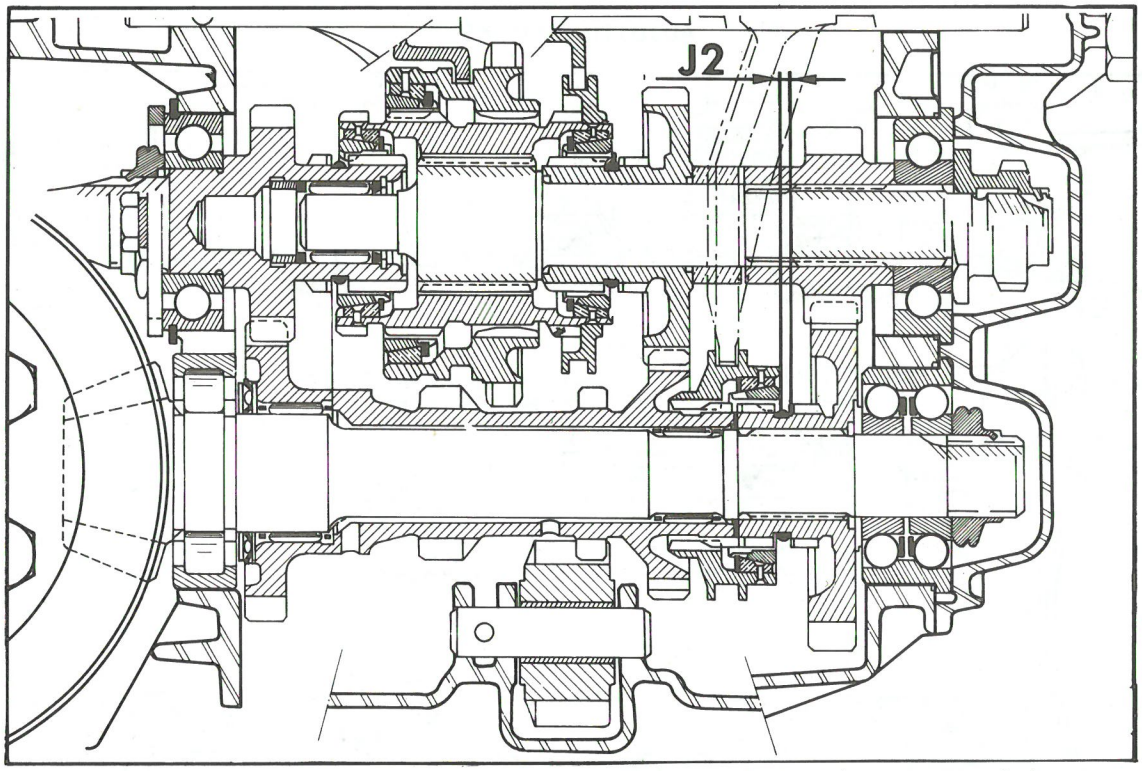
a) Position the fork pin in the neutral position.
NOTE : In the case of a gearbox with the gear lever on the upper cover , this operation is simplified by using the clamp MR. 630-64/ 21 which holds the locking spring in place.

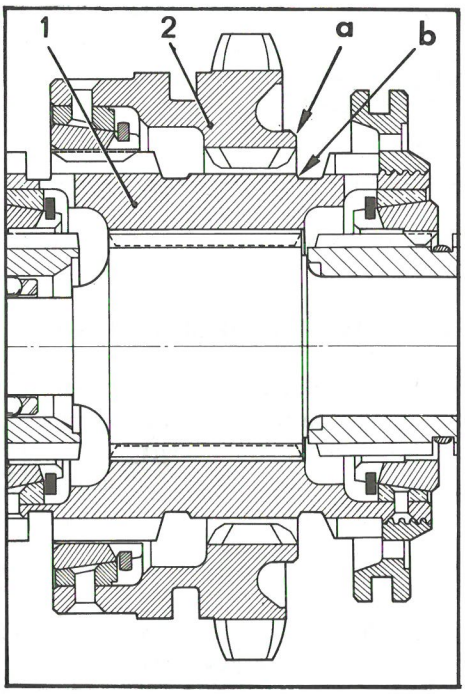
b) Place the shim 1786-T (1.8 mm thick) on the retarding ring of the drive shaft.
Slacken the bolts holding the fork (for bolts with flats, use key 1677-T).

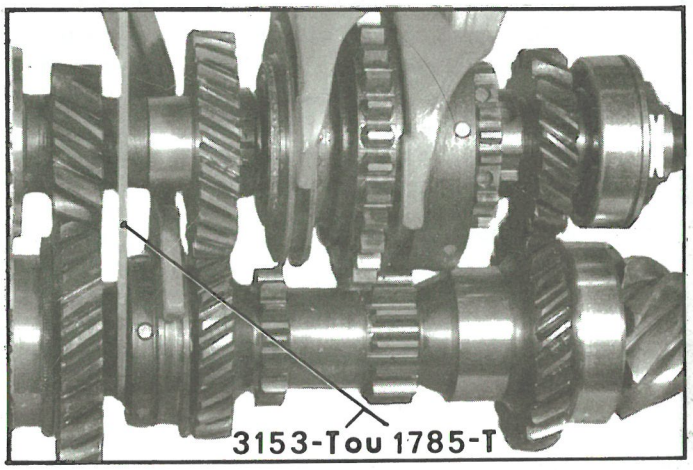
c) By means of the fork, bring the 2nd/ 3rd sliding gear into contact with the shim , so as to obtain a clearance J1 = 1.8 mm between the end of the 2nd/ 3rd sliding gear and the drive shaft dogs.

d) Tighten the bolt holding the fork.

c) Remove the shim.







3. Adjust the first/reverse gear fork :

IMPORTANT : Before carrying out this adjustment, it is essential for the 2nd/3rd gear fork to be correctly set.

a) Make sure that the fork spindle is in the neutral position.

b) Slacken the bolts holding the fork (for bolts with flats, use key 1677-T).

c) Use the fork to position the 1st/reverse sliding gear (2) mid-way along its travel on the second/third sliding gear (1), which alines the rear face. « a » of the 1st/reverse sliding gear with the rear end «b» of the machined portion of the 2nd-3rd sliding gear.

d) Tighten the bolt holding the fork.

4. Adjust the 4th gear fork :

a) Make sure that the fork spindle is in the neutral position.

b) Position the shim on the retarding ring of the step-down gear :

- *AZ up to February 1970*
- *AZU up to January 1972*
- *DYANE (AYA) from August 1967 to March 1968*

Use shim 3153-T (thickness 2.70 mm) for the other vehicles.

c) Slacken the bolt holding the fork (for bolts with flats, use key 1677-T).

d) Use the fork to bring the 4th gear sliding gear into contact with the shim , so as to give a clearance J2 (value determined above) between the end of the 4th gear sliding gear and the driving dogs of the step-down gear.

e) Tighten the bolt holding.the fork.

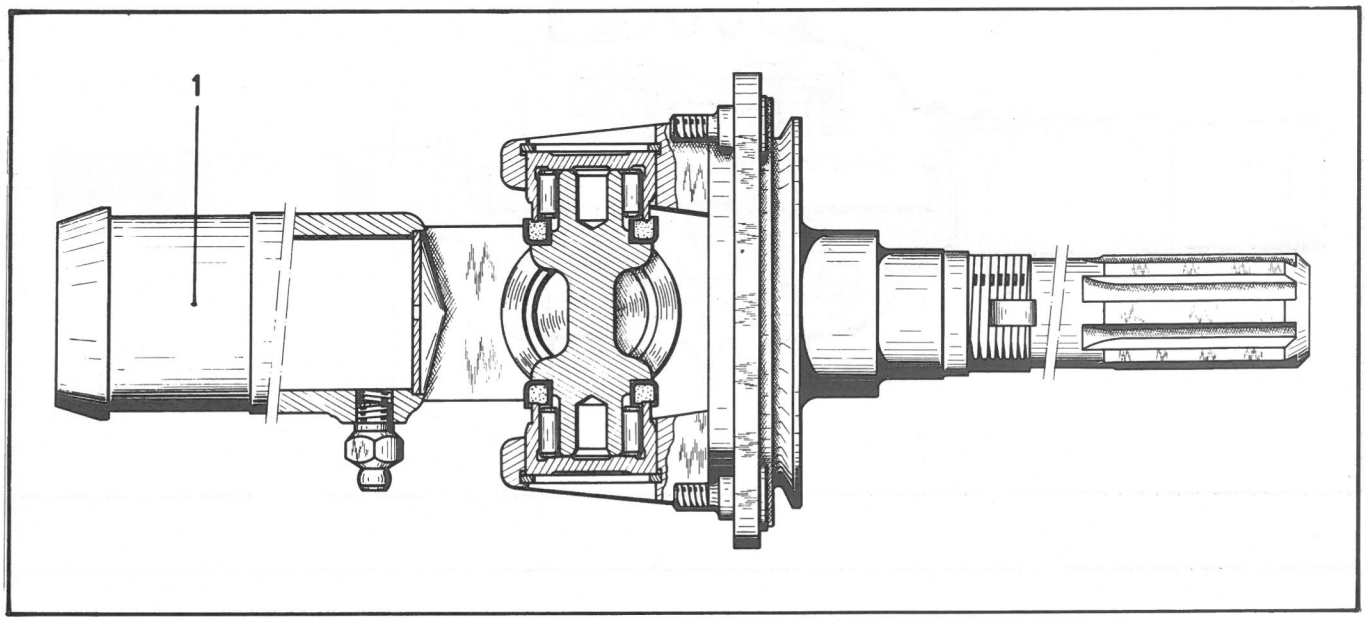
f) Remove the shim.

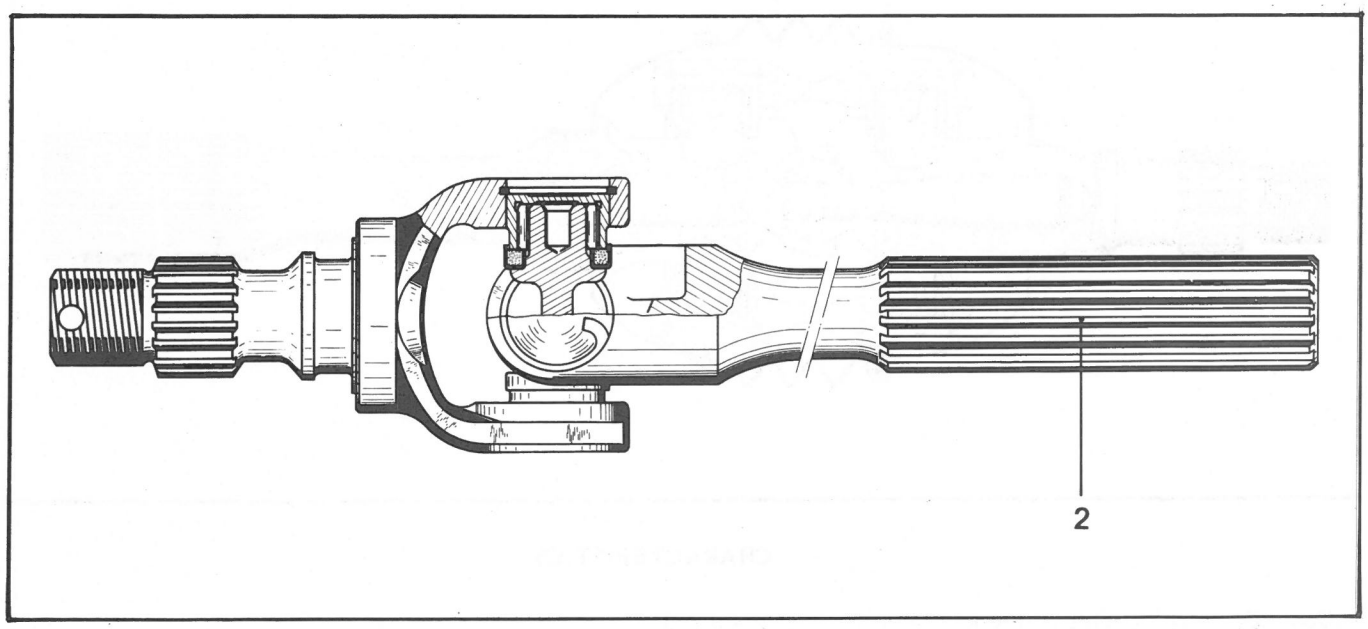
5. Select each gear in turn : remove the clamp MR. 630-64/21.

6. Replace the upper cover (take care with the locking springs) *for gearboxes with the gear lever on the upper cover.*

OPERATION N° A. 372-00 : *Characteristics and special features of drive shafts.* **Op. A. 372-00** 1

DRIVE SHAFT WITH SINGLE CROSSPIN UNIVERSAL JOINT





CHARACTERISTICS

- Simple crosspin joint, gearbox end
- Simple crosspin joint, wheel end
- Fitting; the fork of the sliding portion (1) (universal, gearbox end) should be aligned with the fork of the splined shaft (2) (universal, wheel end).

SPECIAL FEATURES

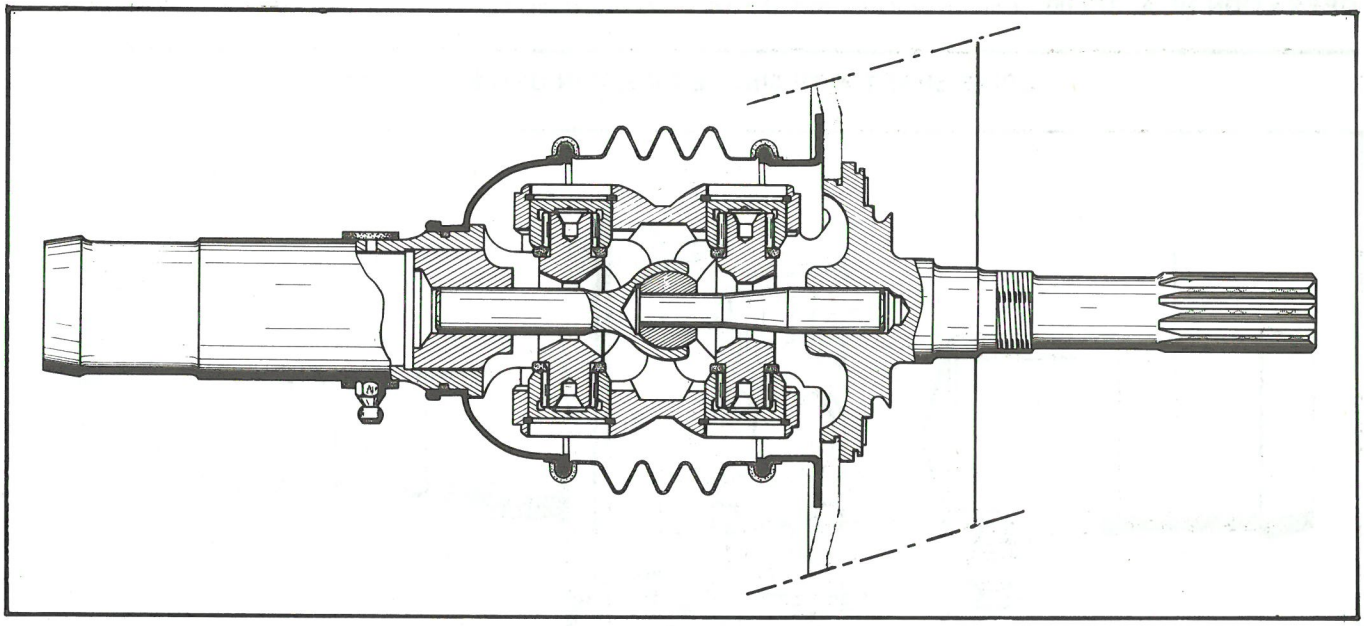
Tightening torque :

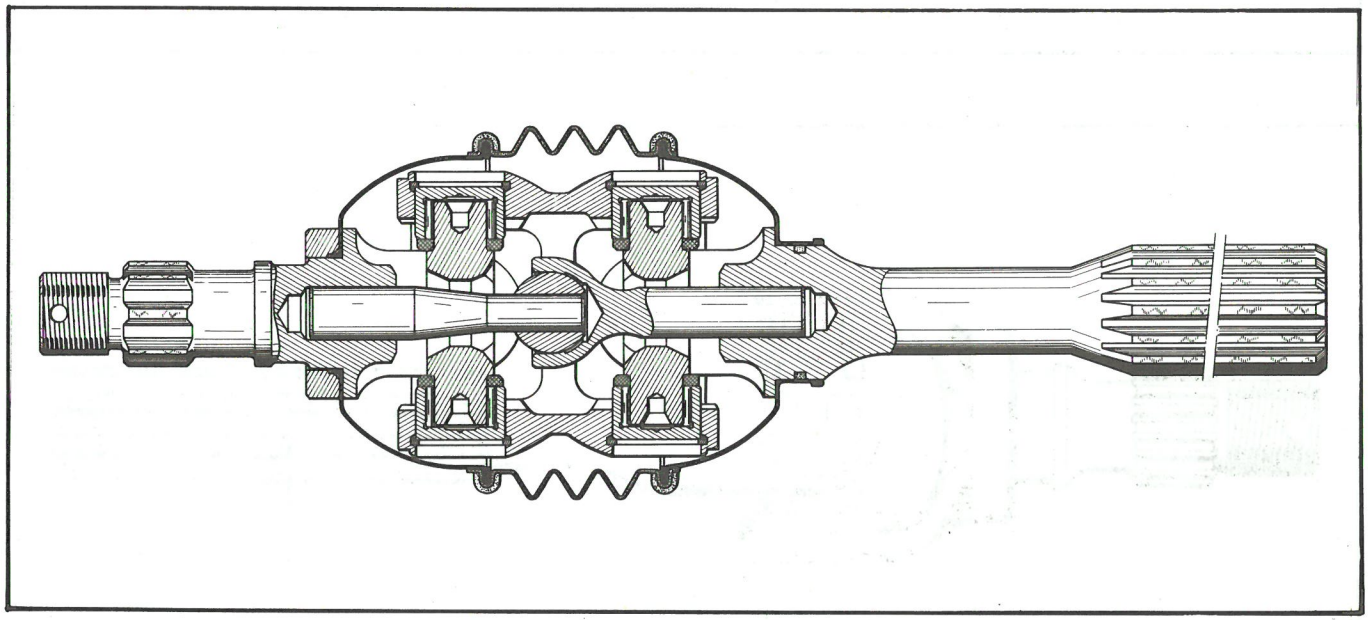
- Fixing nut on hub (face and threads greased) ..... 350 to 400 mΛN (35 to 40 m.kg)

Lubrication :

- Grease ..... TOTAL MULTIS MS

DRIVE SHAFT WITH DOUBLE CROSSPIN





CHARACTERISTICS

- Constant velocity joint with double crosspin, gearbox end
- Constant velocity joint with double crosspin, wheel end
- Fitting : the sliding jaw may have any position with respect to the splined shaft.

SPECIAL FEATURES

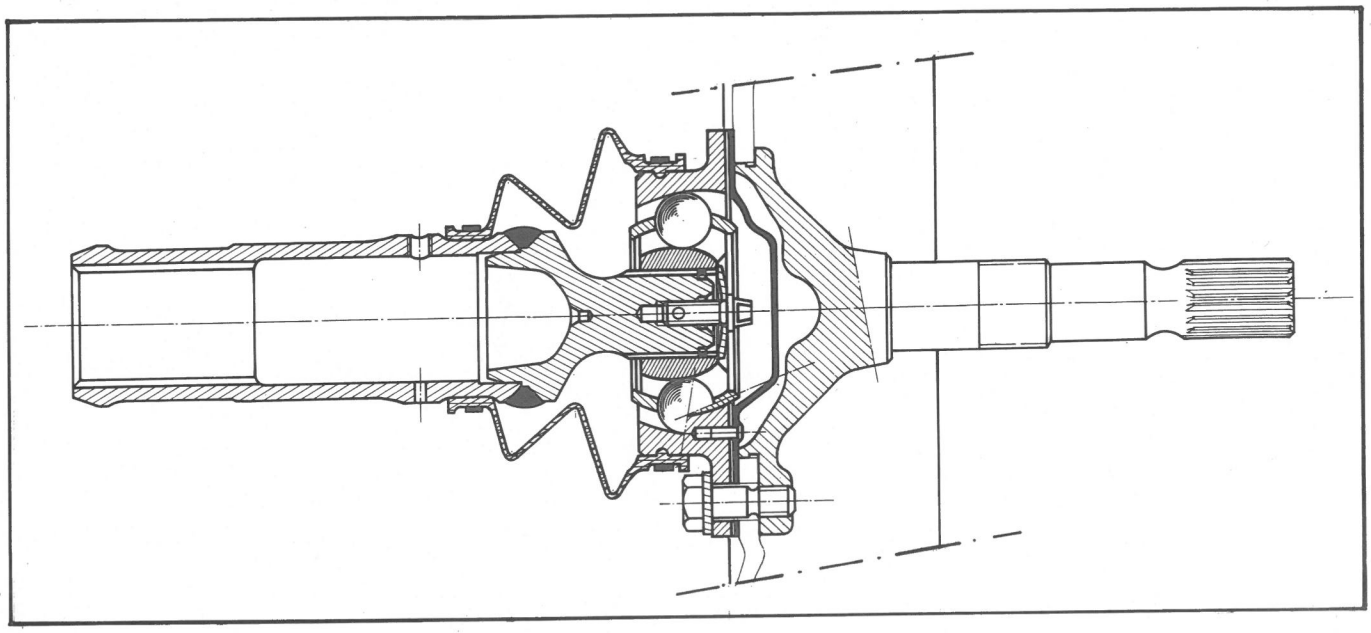
Tightening torque :

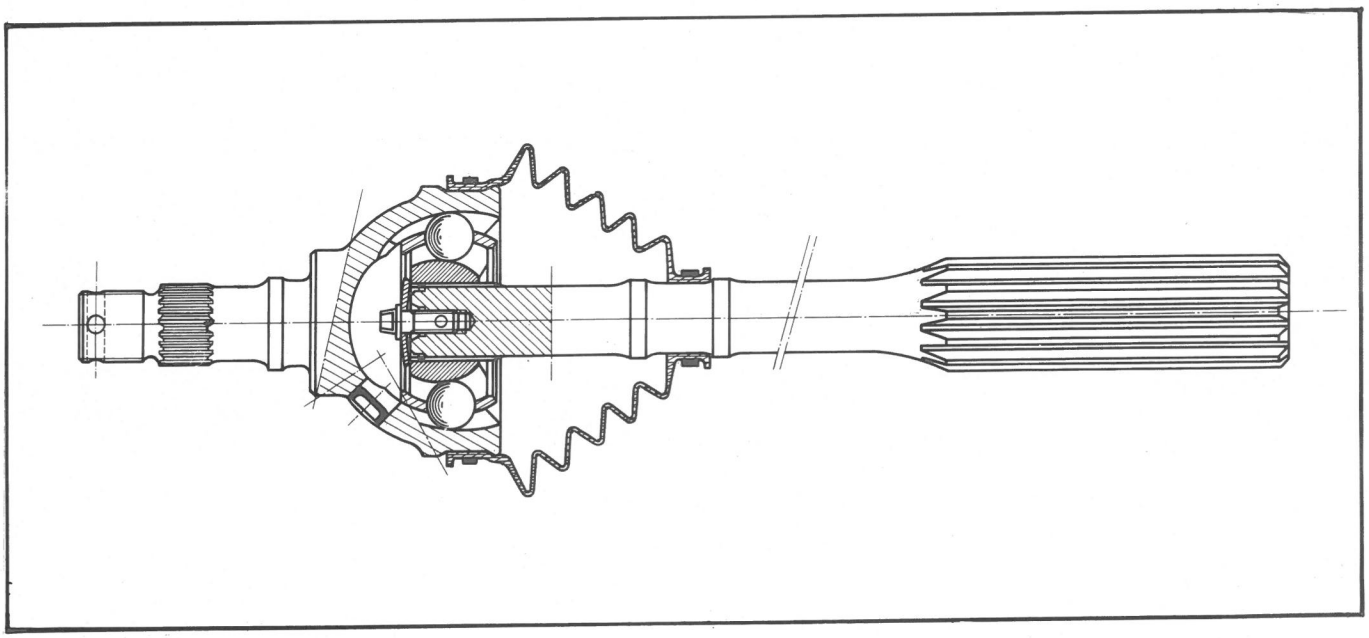
- Fixing nut on hub (face and threads greased) ..... 350 to 400 mΛN (35 to 40 m.kg)

Lubrication :

- Grease ..... TOTAL MULTIS

DRIVE SHAFT WITH BALL TYPE JOINT





CHARACTERISTICS

- Ball type constant velocity joint, gearbox end
- Ball type constant velocity joint, wheel end
- Fitting : the sliding portion may take up any position with respect to the splined shaft.

SPECIAL FEATURES

Tightening torques :

- Fixing nut on hub (face and threads greased) ..... 350 to 400 mAN (35 to 40 m.kg)
- Bolt securing drive shaft to gearbox output shaft .....45 to 50 mAN (4.5 to 5 m.kg)

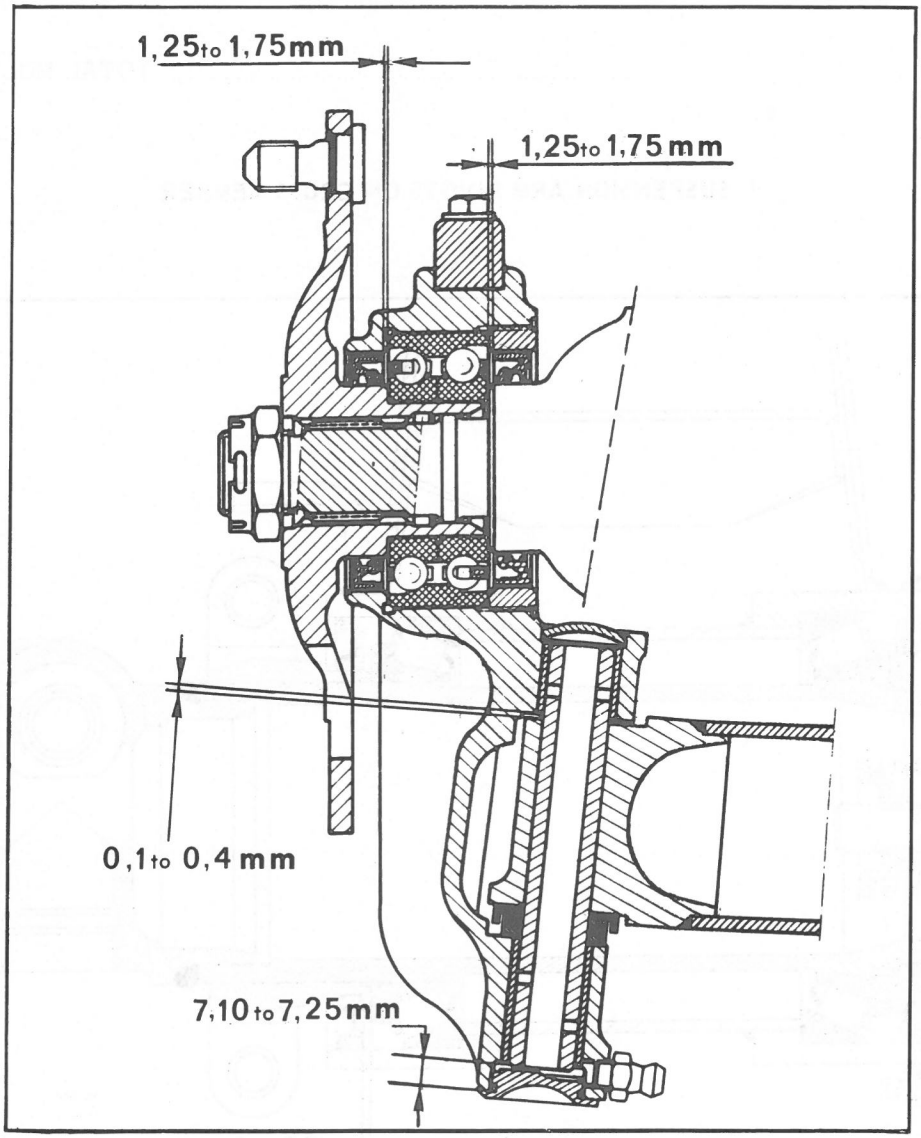
Lubrication :

- Grease .....TOTAL MULTIS MS

NOTE : *Since October 1971, certain vehicles have been fitted with drive shafts which have a double crosspin constant velocity joint at the gearbox end and a ball type constant velocity joint at the wheel end.*

OPERATION N° A. 410-00 : *Characteristics and special features of the front axle.* **Op. A. 410-00** 1

I. WHEEL SWIVEL



CHARACTERISTICS

- Camber angle	Wheels straight ahead	1° + 45' - 25'
	Wheels at full lock	9°30' ± 1°20'
- Castor angle (not adjustable)		15°
- Parallelism : toe-out		0 to 3 mm

SPECIAL FEATURES

Adjustments :

- Inset of sealing ring in hub ring	1.25 to 1.75 mm
- Inset of sealing ring with respect to bearing thrust face	1.25 to 1.75 mm
- Clearance between swivel and arm	0.1 to 0.4 mm
- Inset of lower part of spindle with respect to swivel	7.10 to 7.25 mm

Tightening torques :

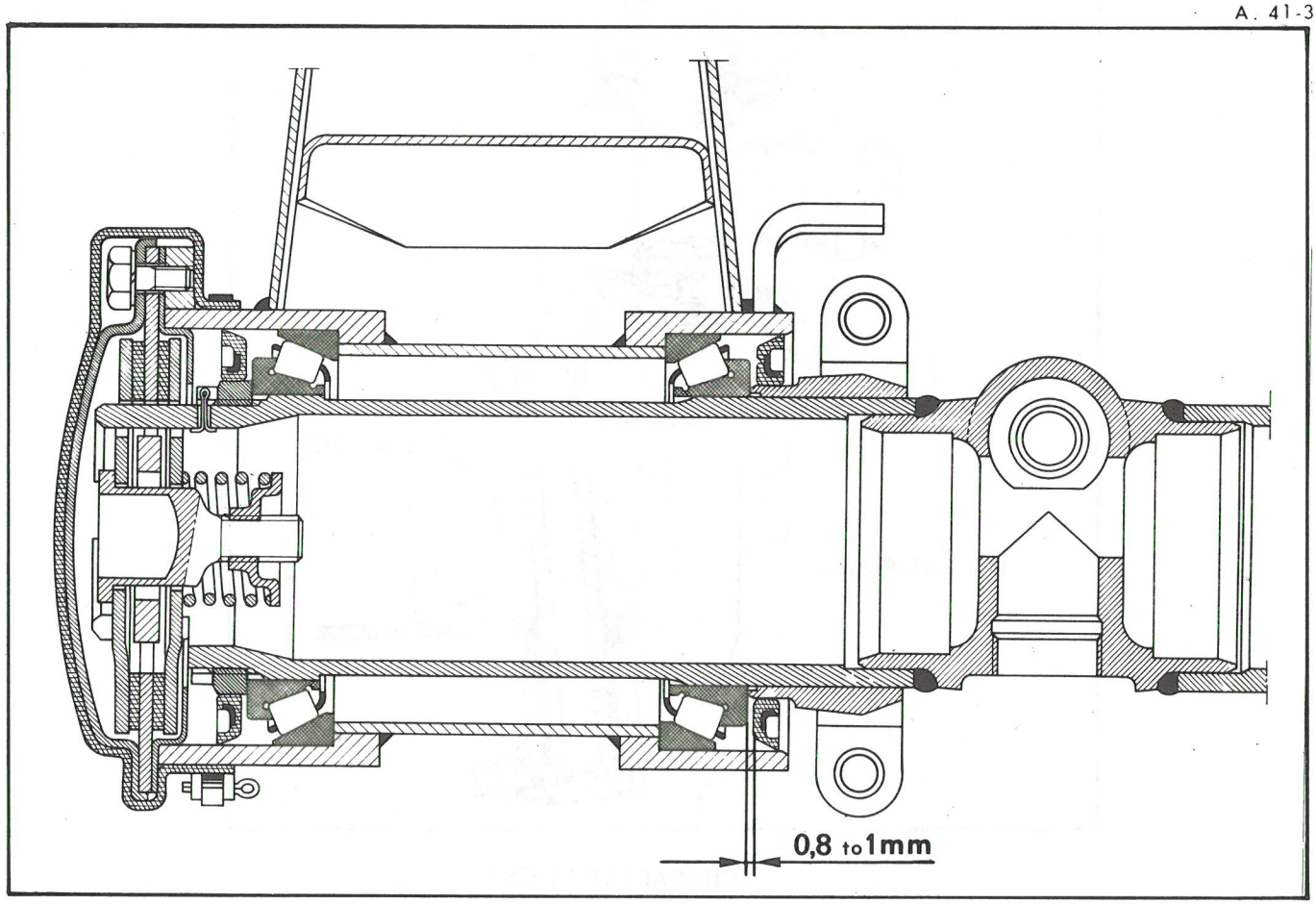
- Ring nut securing hub bearing (face and threads greased) ..... 350 to 400 mΛN (35 to 40 m.kg)
- Bolt securing coupling lever on swivel ..... 15 to 20 mΛN (1.5 to 2 m.kg)
- Nut locking hub on drive shaft (face and threads greased) ..... 350 to 400 mΛN (35 to 40 m.kg)
- Nuts holding inertia dampers ..... 60 mΛN (6 m.kg)
- Lower plug for swivel spindle ..... 20 mΛN (2 m.kg)

Lubrication :

- Swivel pin ..... TOTAL MULTIS MS grease

II. SUSPENSION ARM PIVOTS ON CROSS MEMBER

A. 41-3



SPECIAL FEATURES

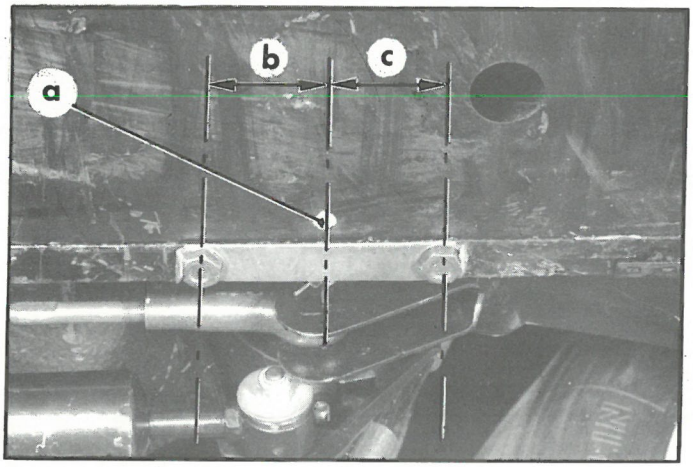
- Inset of sealing ring with respect to bearing thrust face ..... 0.8 to 1 mm

Tightening torques :

- Bolts holding cross member ..... 50 mΛN (5 m.kg)
- Castellated nuts holding suspension arms on cross member ..... 50 mΛN (5 m.kg)
- Wheel nuts ..... 40 to 60 mΛN (4 to 6 m.kg)

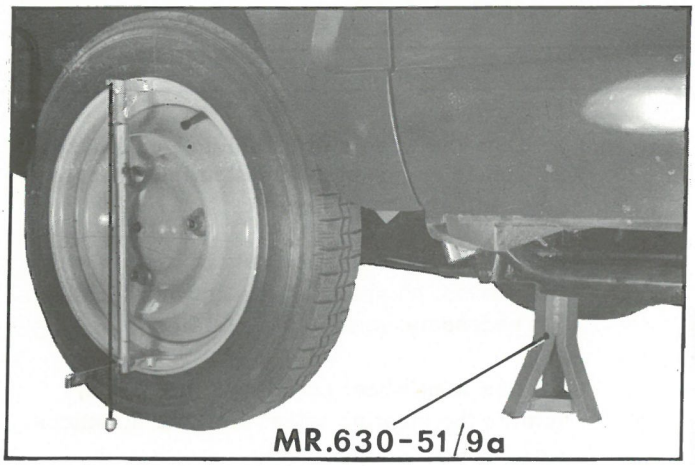
NOTE : There are no friction units on vehicles fitted with front shock absorbers.

I. MEASURING CAMBER ANGLE



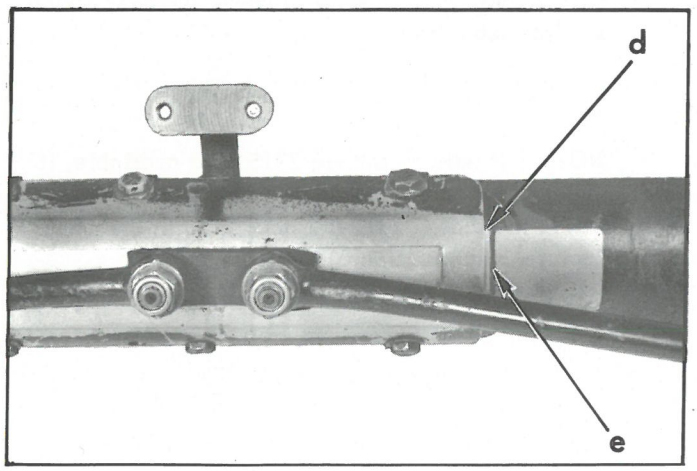
NOTE : This check should be carried out after an impact affecting the suspension arms. However, if there is excessive play in the swivel pin, no measurement can be made.

1. Check that the front wheel (on the side where the swivel is to be checked) is not out of true.



2. Put the vehicle on flat horizontal ground.

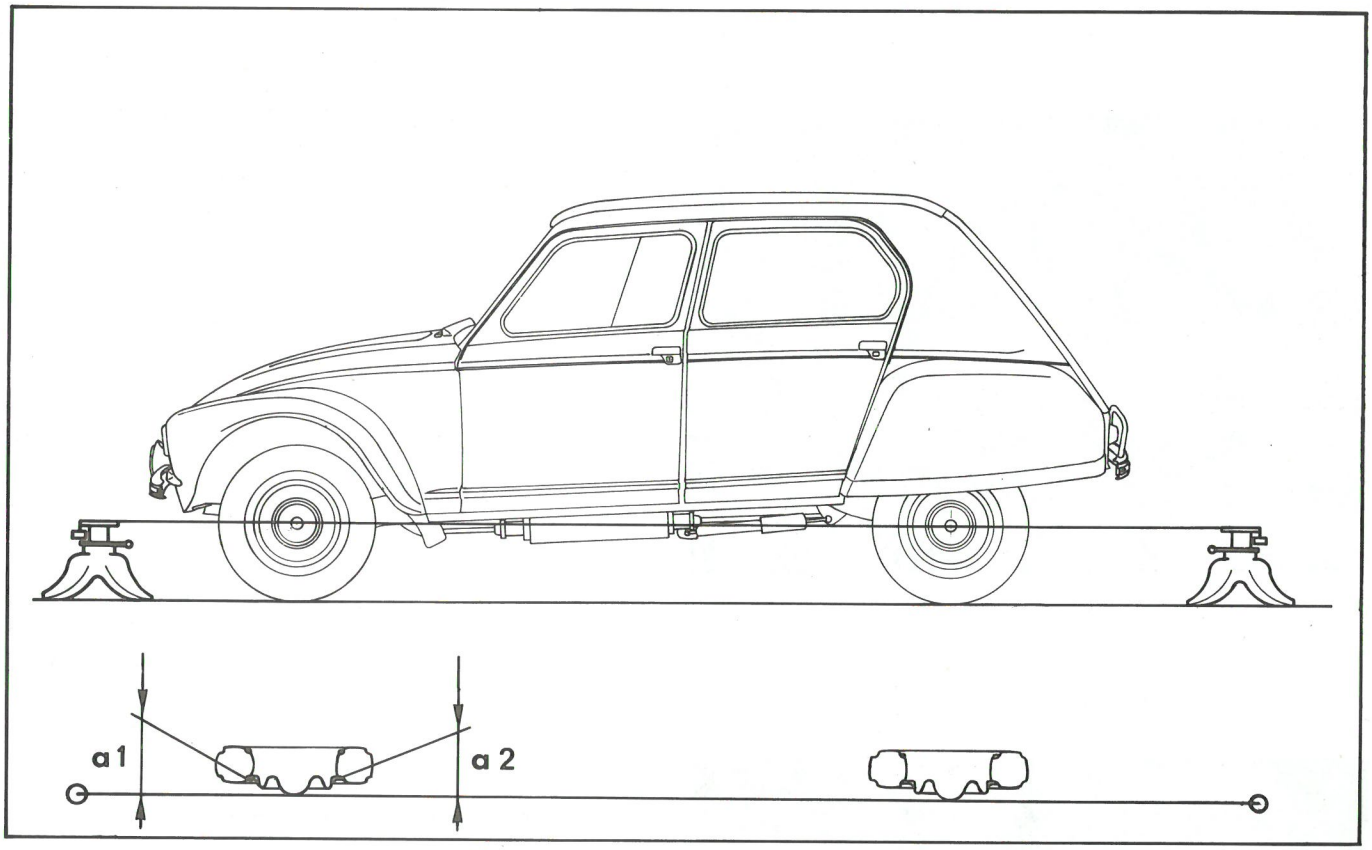
CAUTION : The vehicle height is measured at the front and the rear between the ground and the platform, at the point « a » equidistant from the two bolts holding the cross member (b = c) and on the side of the bolt's stop plate.



3. Chock up the vehicle under the platform at the front to give a distance of 207 mm between the ground and the point « a » on each side of the vehicle. Use the struts MR. 630-51/9 a (height 207 mm).

4. **Align the front wheels :**

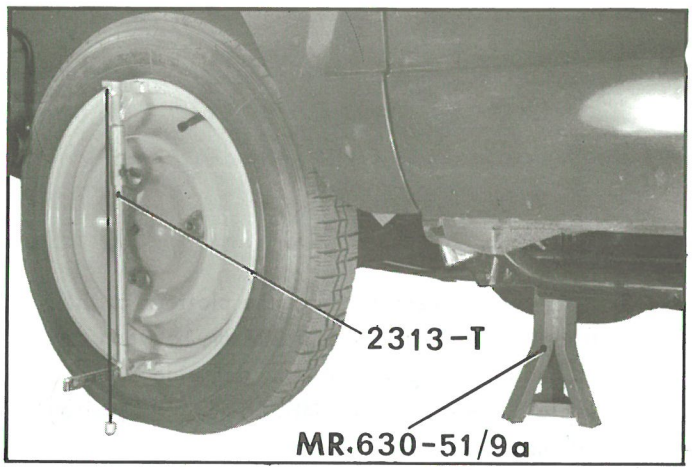
a) Bring the mark « e » engraved on the steering movable cover up to the steering ball pin guide on the left-hand side at the point « d ».



b) To align the wheels of a vehicle which has no marked engraved on the steering movable cover proceed as follows :

Stretch a wire at axle height, in contact with the wheels, as shown in the drawing above (if necessary, remove the mud flap).

Put the front wheel parallel to the wire by turning the steering wheel until the distances « a1 » and « a2 » are equal.



5. Now measure the camber angle of the wheel, Use rig 2313-T. *The wire should be in the zone « 1 » of the rig.* Otherwise, remove the suspension arm for inspection.

NOTE : If only an old rig 2315-T is available, it is essential to convert it to a rig 2313-T by fitting the plates 2312-T (according to the manufacturer's instructions).

6. Raise the vehicle until the front wheels leave the ground.

Turn the wheel to full lock, with the swivel in contact with the lock bolt. When working on the right-hand wheel lock fully to the right, and vice versa.

Replace the vehicle on the strut MR. 630-51/9 a (height 207 mm) or on blocks.

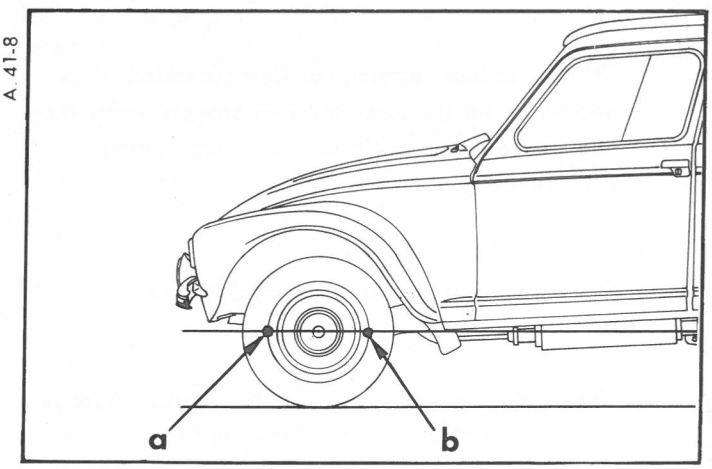
7. Now measure the camber angle of the wheel. Use rig 2313-T. *The wire should be in the zone « 2 » of the rig.*

Otherwise, remove the suspension arm for inspection.

II. CHECKING AND ADJUSTING THE PARALLELISM OF THE FRONT WHEELS

Manual 812-1

A. 41-8

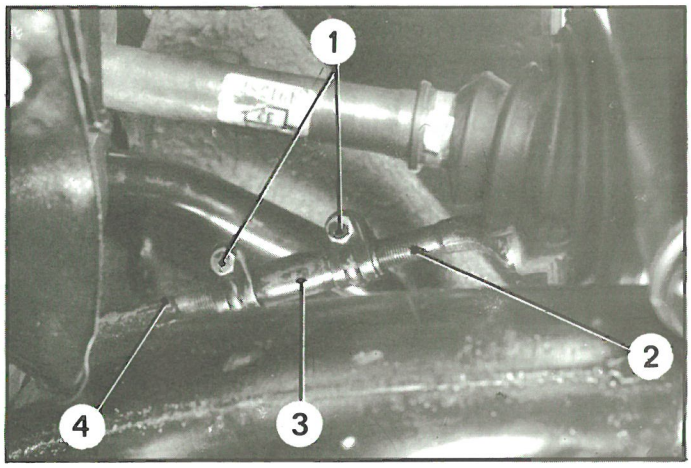


NOTE : The wheels should have a toe-out. The difference between the front and rear should be 0 to 3 mm. Before carrying out this operation, *it is necessary for the front and rear heights under the chassis to be correctly set.*

1. Place the wheels in the straight ahead position (see chapter 1, same operation).

2. Check the front wheel toe-out :
Use a gauge of which several models are available on the market.
Proceed as follows :

At the point « a » at axle level, measure the distance between the front outer edges of the rims. Mark the measured points with chalk. Move the vehicle forward until the wheels have rotated through half a turn and measure the distance between the marks, now at the rear, point « b ». If this distance is smaller by 0 to 3 mm, the setting is correct. Otherwise, adjustment is necessary.

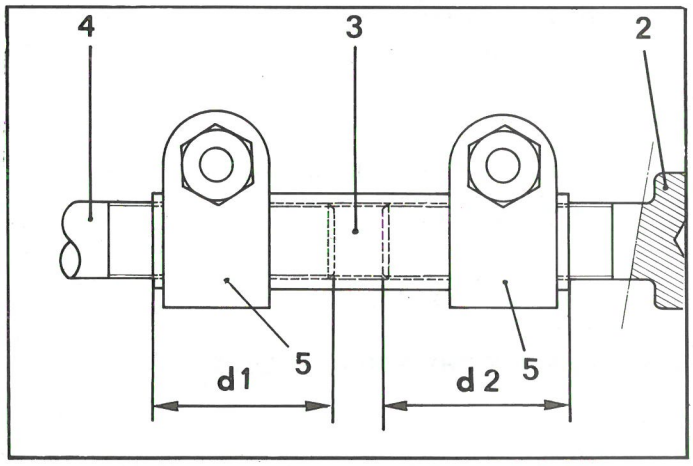


3. Adjust the front wheel toe-out :

Without removing the wings, slacken the nuts (1) on the bolts holding the left-hand and right-hand sleeves (3). Rotate each sleeve by the same amount to obtain the correct adjustment.

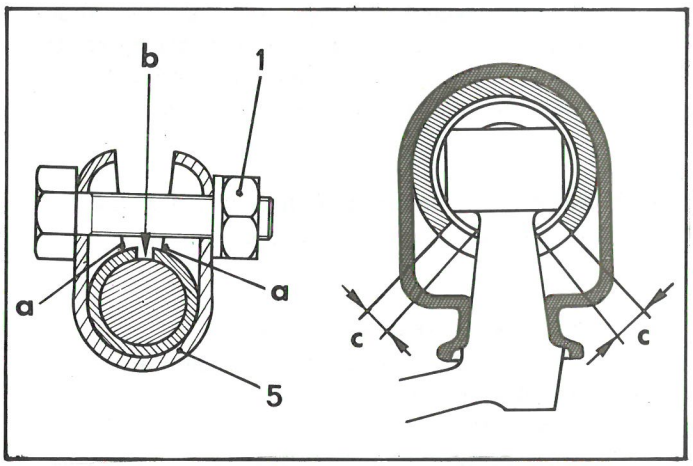
NOTE : One revolution of the sleeve varies the position of the wheels between 6 and 7 mm.

CAUTION : *Check that the amounts by which the track rod (4) and the end (2) are screwed into the sleeve (3) are equal* (d1 = d2 ± 2 mm).



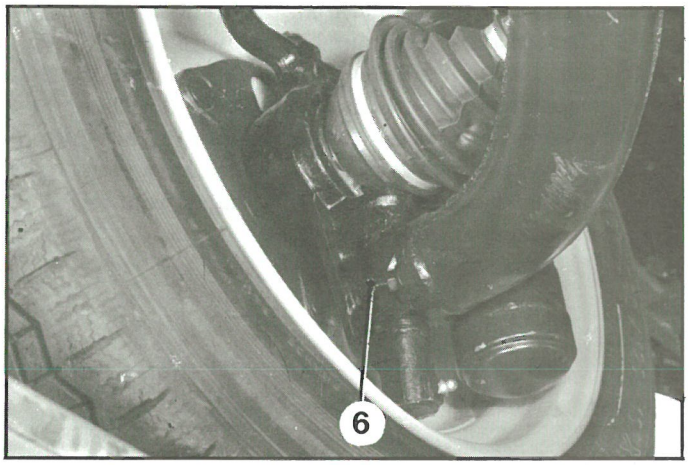
The clamps (5) holding the sleeves (3) should be arranged vertically with the bolt heads upwards. The position of the slot « b » is not important, provided that the points « a » are not within the slot.
The clearance « c » for steering ball pin movement should be evenly distributed. Tighten the nuts (1) on the sleeve securing clamps to 10 mΛN (1 m.kg).

III. ADJUSTING STEERING LOCK.



NOTE : Before carrying out this operation, it is necessary for the front and rear heights under the chassis to be correctly set (see appropriate operation).

1. Put the vehicle on flat horizontal ground.

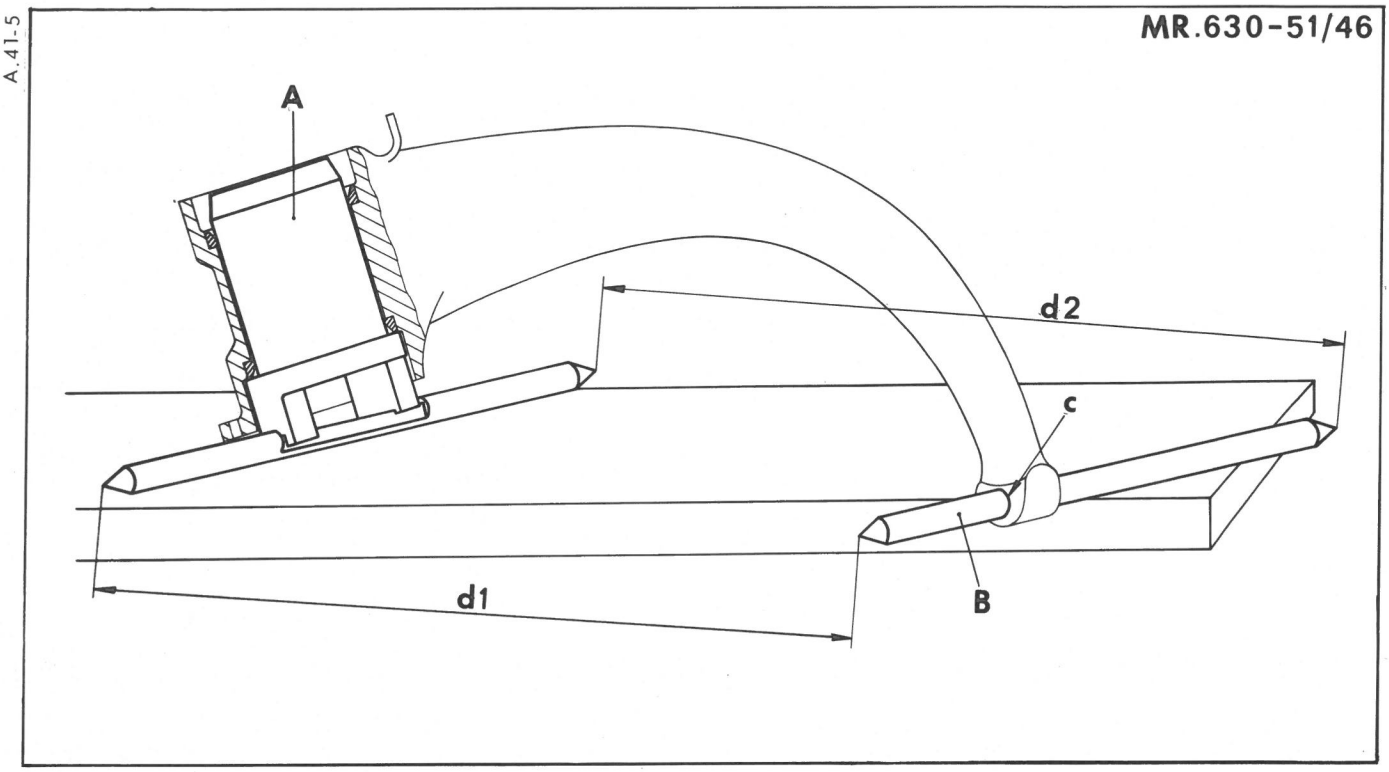


2. Turn the wheels to full lock. Check that there is a clearance of about 5 mm between the tyre and the suspension arm, and a clearance of at least 1 mm between the inertia damper and the suspension arm on the opposite side.
Otherwise, adjust the steering lock stop bolt (6) which is located on the suspension arm.

3. Check the lock on the other wheel.

IV. CHECKING A FRONT SUSPENSION ARM REMOVED FROM THE VEHICLE

A.41-5



Manual 812-1

1. Remove and strip down the suspension arm.
(see corresponding operation).

2. Inspect the arm :
Place the arm on an inspection rig (rig MR. 630-51/46).

Insert the pin B in the bore « c » of the swivel.

Insert the mandrel A in the hub bore.

Rotate the mandrel A until the two pins *rest squarely on the test bench.*

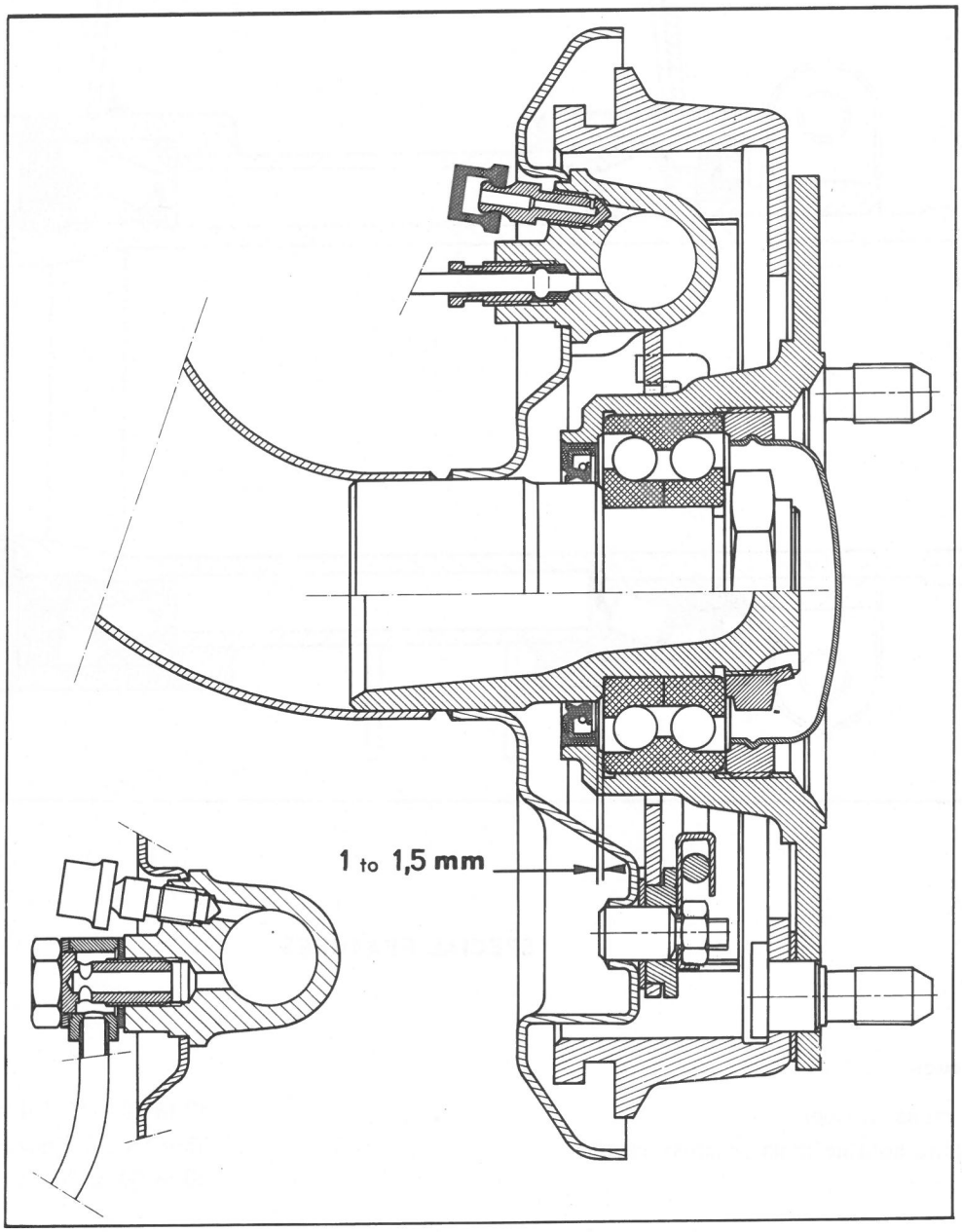
Measure the distance « d1 » between the points at one end and then the distance « d2 » at the other end.

These two distances should be the same to within 10 mm. Otherwise, the arm should be replaced.

3. Refit the accessories and re-install the arm.
(see corresponding operation).

OPERATION N° A. 420-00 : *Characteristics and special features of rear axle.* **Op. A. 420-00** 1

REAR AXLE



Manual 812-1

CHARACTERISTICS

Parallelism :

- Toe-in of wheels (not adjustable)
  - *Vehicles produced up to March 1969* ..... 0 to 8 mm
  - *Vehicles produced from March 1969* ..... 0 ± 4 mm
- Camber angle (not adjustable) ..... 0° tp 0°30'

SPECIAL FEATURES

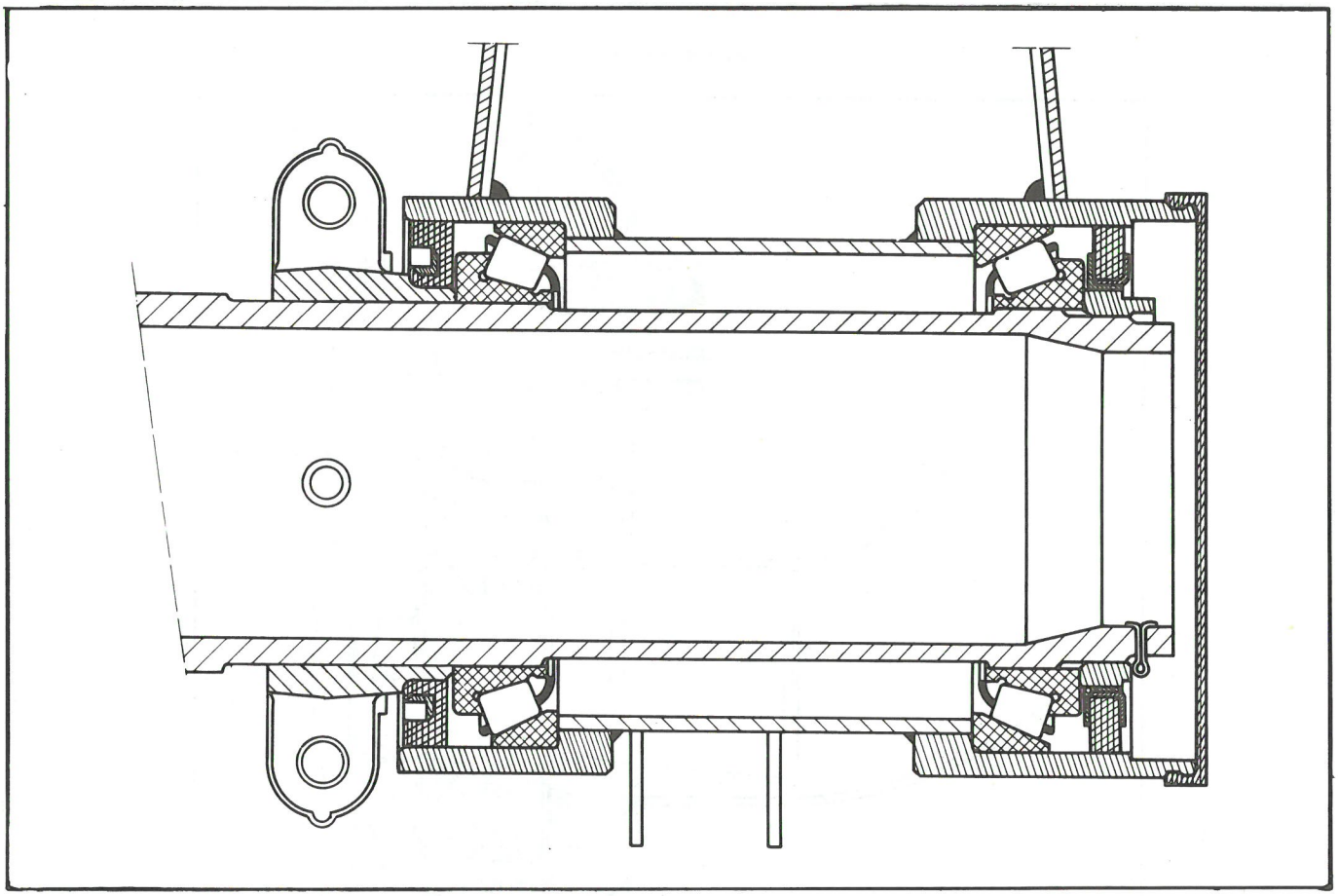
Setting :

- Inset of hub seal with respect to the bearing thrust face ..... $1 \begin{smallmatrix} +0.5 \\ 0 \end{smallmatrix}$ mm

Tightening torques :

- Hub bearing lock nut (face and threads greased) ..... 350 to 400 mAN (35 to 40 m.kg)
- Cap nut for hub bearing (face and threads greased) ..... 350 to 400 mAN (35 to 40 m.kg)

PIVOTING OF ARMS ON CROSS MEMBER

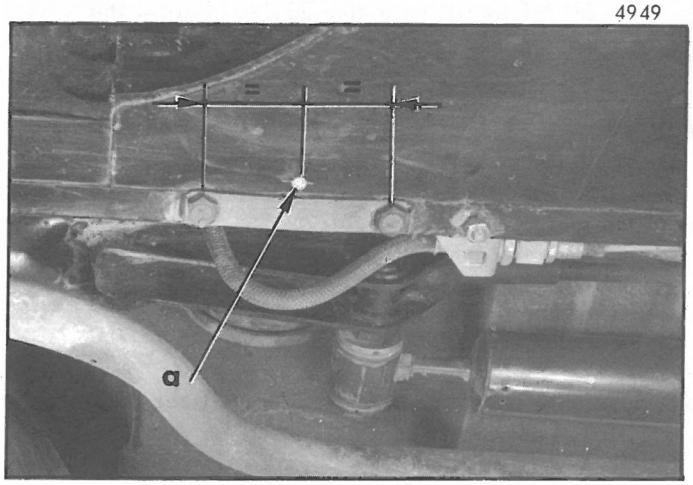


SPECIAL FEATURES

Tightening torques :

- Bolt holding cross member ..... 40 to 50 mAN (4 to 5 m.kg)
- Castellated nuts holding arms on cross member ..... 55 mAN (5.5 m.kg)
- Wheel nuts ..... 40 to 60 mAN (4 to 6 m.kg)

I. CHECKING REAR ARM ON VEHICLE



NOTE : These tests should be carried out.if a vehicle, after an impact, behaves abnormally on the road or shows unusual tyre wear.

1. Check the position of the rear wheels :

Vehicles produced up to March 1969 :
The wheels should have a toe-in of between 0 and 8 mm.

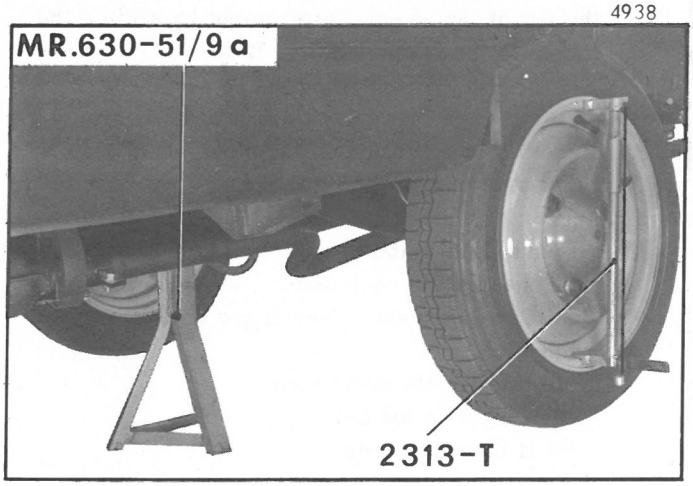
Vehicles produced from March 1969 :
The wheels may have either a toe-out or a toe-in between 0 and 4 mm.

For this check it is necessary for the front and rear heights of the vehicle to be correctly set (see corresponding operation).

Measure the distance between the front outer edges of the rims at the height of the wheel centers. Mark the measured points with chalk. Roll the vehicle forward until the wheels have made half a turn and measure the distance between the marks which are now at the rear (at the same height). Use a gauge of which various models are available on the market.

If the toe-in or toe-out is not within tolerance :
One arm or both arms are out of true. In this case :
- either check the position of the rear arms on the vehicle (see paragraphs 3 to 7, this operation),
- or remove the arm and check it on a face plate(see chapter II, this operation).

If the toe-in or toe-out are within tolerance :
It is necessary to check the camber angle.

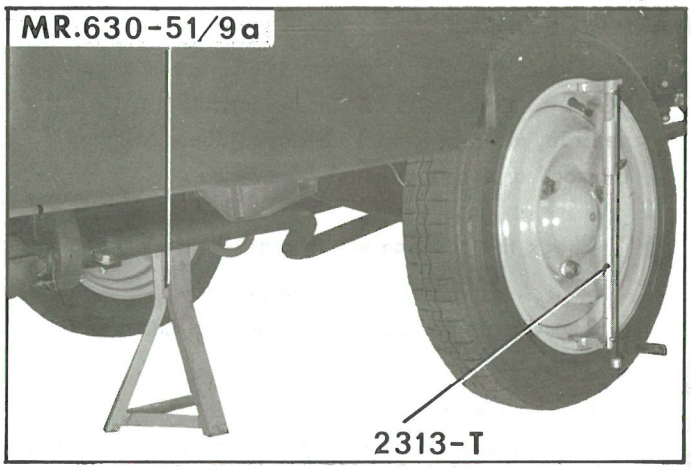


2. Check the camber angle of the rear wheels :

a) Check the tyre pressures and correct if necessary. Put the vehicle on flat horizontal ground.

b) Jack up the vehicle until the point « a » is 295 mm from the ground.
This point is halfway between the two bolts holding the cross member.
For this purpose, use the struts MR.630-51/9 a (height = 285 mm) fitted with packing pieces 10 mm thick.

4938



c) Remove the rear wing on the side to be worked on (if necessary).

d) Check the camber angle : use rig 2313-T.
The wire should be in the zone « 3 » of the rig.
Otherwise, remove the arm for inspection (see corresponding operation).

NOTE : A rig 2315-T can be converted into a rig 2313-T by fitting plates 2312-T. Follow the manufacturer's instructions.

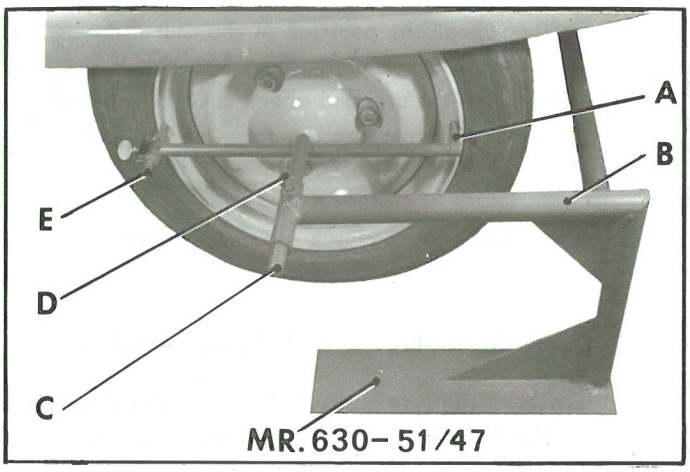
Checking the position of the rear arms

NOTE : If there is unusual tyre wear, it may be necessary to check the toe-in of each rear wheel.

3. Put the vehicle on flat horizontal ground : the front and rear heights must be correctly adjusted (see corresponding operation).

4. Arrange the rig MR. 630-51/47 as shown in the figure.

2315



Slacken the movable gauge E and move it away from the rim. Bring the probe A into the contact with the rim at the wheel centre height by sliding the fork C in the support B.
Fix the fork by tightening the screw D.

Repeat this operation on the other wheel with the other side of the rig.

At each side, bring the movable probe E into contact with the rim. On each scale, read the figure opposite the mark « a » (see figure on following page).
Note this figure, specifying :
- 01 if there is toe-out
- P1 if there is toe-in.

5. Release the forks C and move the vehicle forward in order to turn the wheels through exactly half a turn.

6. Repeat the operations given in paragraph 4. Note again the figures indicated on the scales.

- 02 for toe-out
- P2 for toe-in.

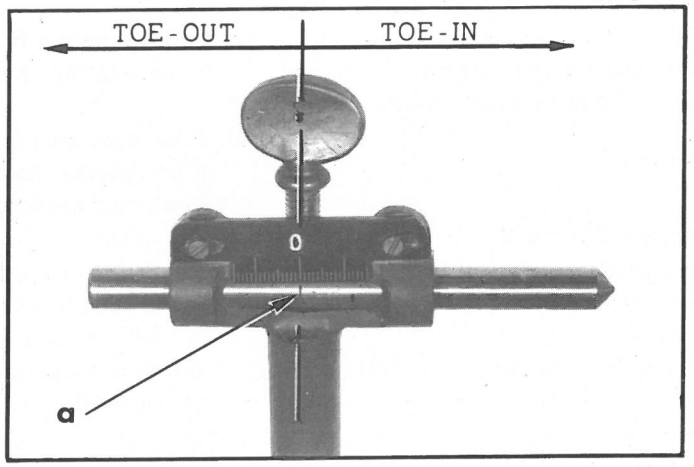
7. Measure the parallelism for each wheel : (O = Toe-out - P = Toe-in)

There are several possible cases :

a) Both measurements indicate toe-out : Take the average of the two readings :

$$\frac{O1 + O2}{2}$$

2315-1



Both measurements indicate toe-in : Take the average of the two readings :

$$\frac{P1 + P2}{2}$$

b) One measurement indicates toe-out, and the other toe-in :

There are two possible cases :

O is greater than P

The position of the arm will be :

$$\frac{O - P}{2}$$

P is greater than O

The position of the arm will be :

$$\frac{P - O}{2}$$

On vehicles produced *up to March 1969*, each wheel should have a *toe-in* between 0 and 4 mm.
On vehicles produced *from March 1969*, each wheel may have a *toe-out* or a *toe-in* between 0 and 2 mm.

The arms must be replaced if the average :

$$\frac{O1 + O2}{2} \text{ or } \frac{P1 + P2}{2} \text{ or } \frac{O - P}{2} \text{ or } \frac{P - O}{2}$$

is not between : 0 and 4 mm *(Vehicles produced up to March 1969)*
or between : 0 and 2 mm *(Vehicles produced from March 1969)*

NOTE :

Any differences between the measurements O1 and O2 or O and P measured in paragraph 7, *can arise only from wheel run-out.*

The difference between the values read on the rig is twice the actual run-out of the rim at the points in question. If it is greater than 4 mm (corresponding to a measured run-out of $\frac{4}{2} = 2$ mm) the wheel must be checked since the actual deformation of the rim must no exceed 2 mm.

II. CHECKING A REAR ARM REMOVED FROM THE VEHICLE

1. Remove the arm (see corresponding operation).

2. Strip down the arm (see correponding operation).
It is not necessary to remove the adjustment cams.

3. Check the arm :

Place the arm on an inspection rig (rig MR.630-51/46)
Insert the spindle into the bore of the plate E and rest the plate on a surface plate.
Insert the mandrel A into the bore of the arm.
Pack up the arm mounting end until the plate E is fully in contact with the surface plate.

Check the toe-in (see fig. 1)

a) Arrange the inclined pin B of the mandrel A *in the same plane* of the welding seam of the arm.

b) Using a marking gauge, measure the height « h1 » of one point, rotate the mandrel by half a turn and measure the height « h2 » at *this same points :*
The difference between the two heights should be between 0 and 1.2 mm, the smaller of these two heights can correspond to either end of the arm.

Check the camber angle (see fig. 2)

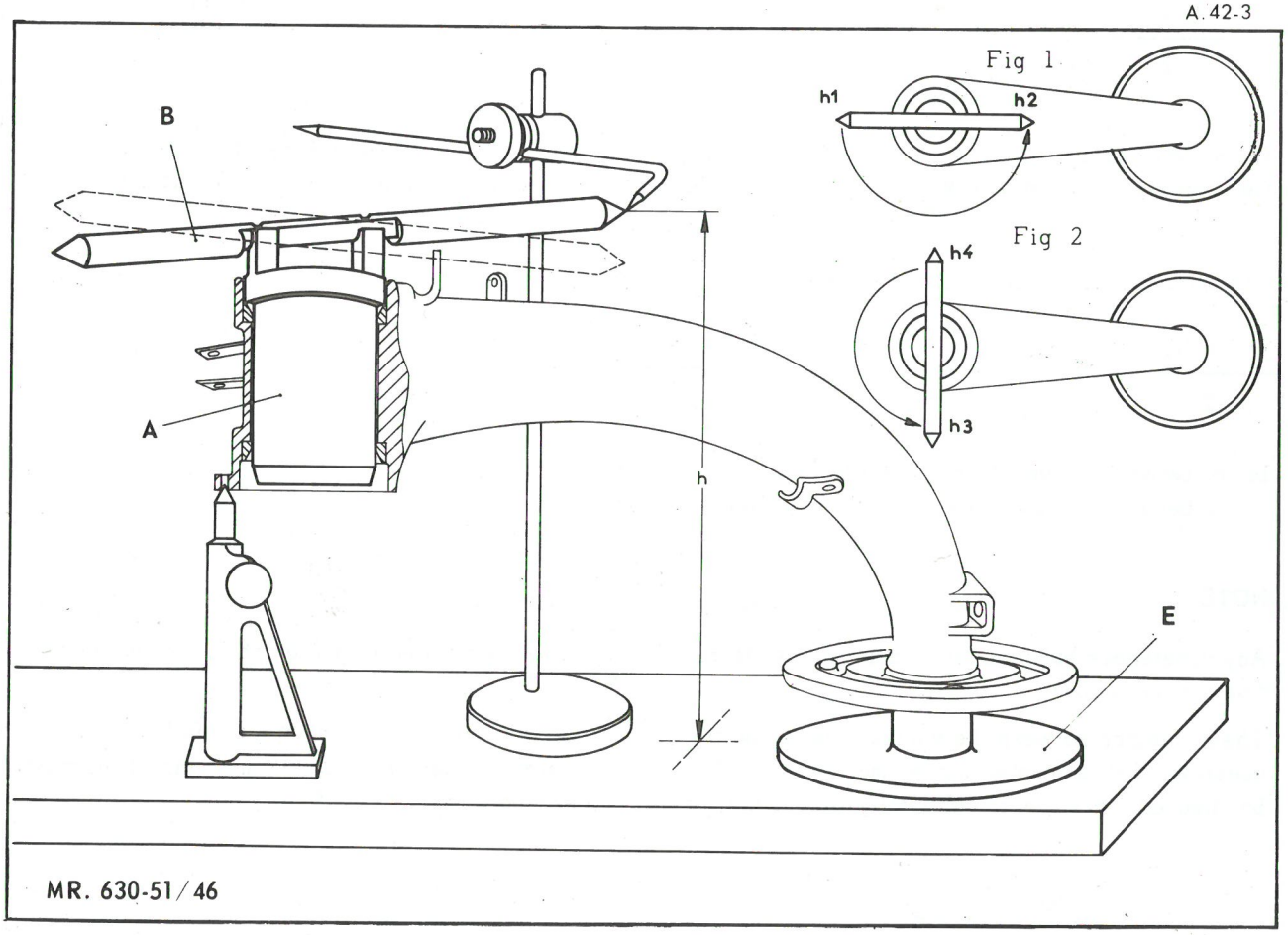
a) Arrange the pin B of the mandrel A perpendicular to the welding seam of the arm.

b) Using a marking gauge, measure the height « h3 » of one point; rotate the mandrel through half a turn and measure the height « h4 » *at this same point :*
The difference between the two heights should be between 0 and 3.5 mm. The smaller of the two heights must always be on the side of the knife carrying plate. Otherwise the arm must be renewed.

4. Replace the accessories on the arm :
(see corresponding operation).

5. Refit the arm :
(see corresponding operation).

A.42-3



A. 43-55

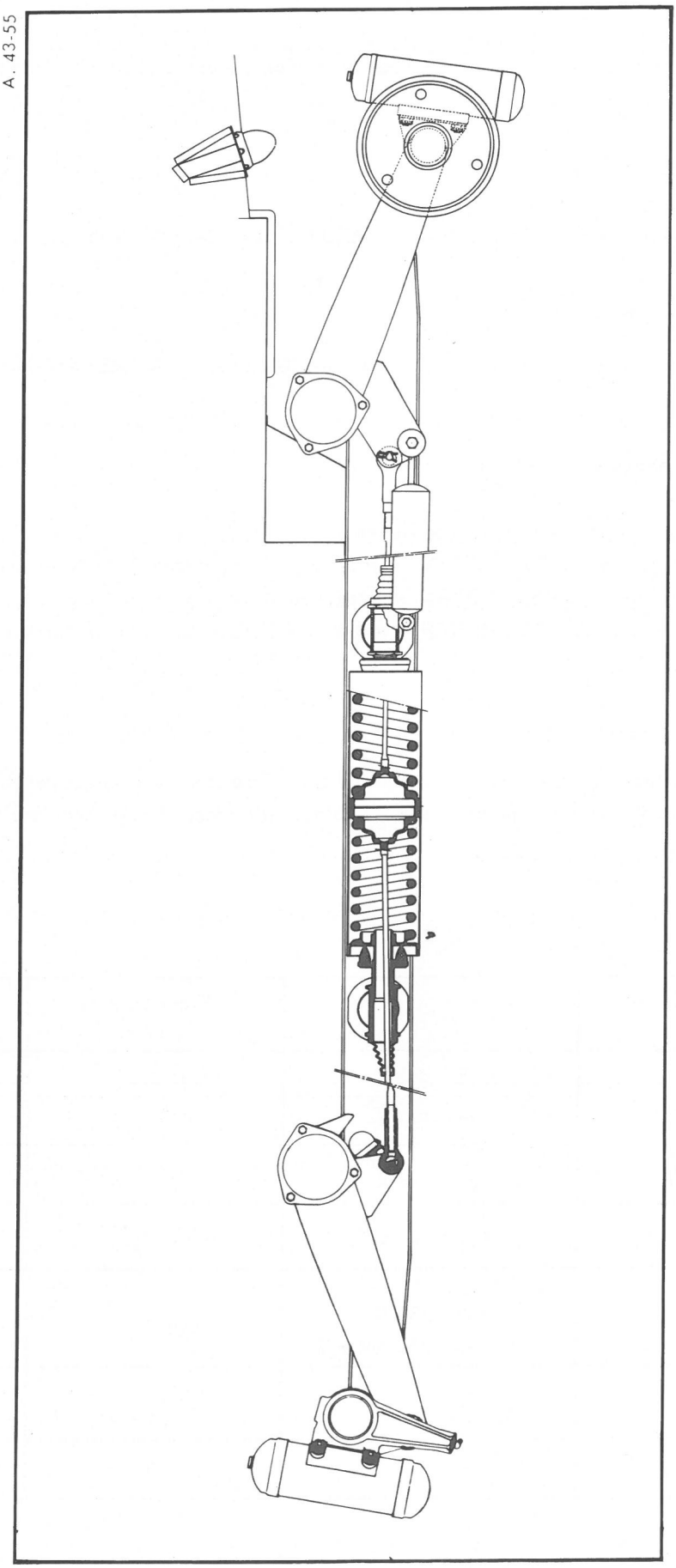


DIAGRAM OF SUSPENSION SYSTEM

CHARACTERISTICS

Suspension :

- Interacting type (the two suspension arms at each side of the vehicle are connected through the suspension unit).

Shock absorbers :

- Hydraulic on all four wheels for vehicles AK
- Hydraulic on the rear wheels for vehicles AZ - AY - AZU and AY-CA (MEHARI)

Shock absorbers (friction units) :

- Friction units on the front wheels in vehicles AZ - AY - AZU and AY-CA (MEHARI).

Inertia units (inertia type shock absorbers) :

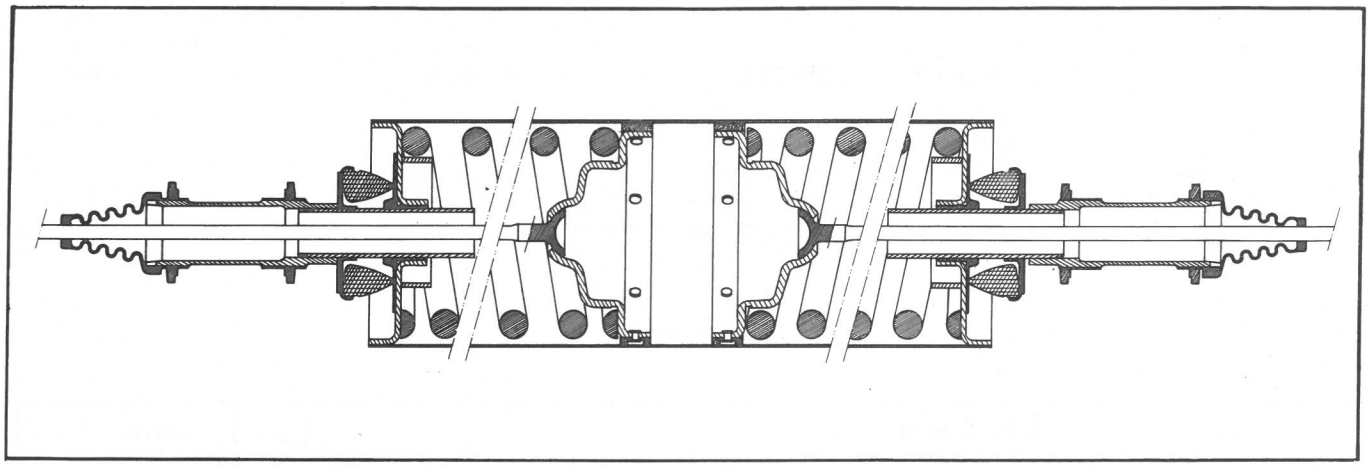
- On all four wheels for all vehicles produced up to November 1970
- On the front wheels for vehicles 2 CV 4 - DYANE 4 and Van AZU produced *since November 1970*
- On the front wheels of vehicles 2 CV 6 and DYANE 6 produced *since May 1971.*
- On the front wheels of vehicles AY - CA (MEHARI) and Van AK produced *since September 1971.*

Heights settings :

CAUTION : The vehicle heights are measured at both sides and at the front and rear between the ground and the vehicle platform at a point equidistant from the two bolts holding the cross member and near the stop plate of the bolts.

Type of vehicle	Tyres	Front heights (in mm)	Rear heights (in mm)
AZ ⟶| 7/1969	125 - 380 X	195 ± 2.5	280 ± 2.5
	135 - 380 X	208 ± 2.5	291 ± 2.5
AZ (2 CV 4 and 2 CV 6)	125 - 380 X	195 ± 2.5	280 ± 2.5
AY (Dyane)	125 - 380 X	195 ± 2.5	280 ± 2.5
AY - CA (Mehari)	135 - 380 X 135 - 380 XM + S	236 ± 5	346 ± 5
AZU	125 - 380 X	205 ± 2.5	335 ± 2.5
AK	135 - 380 X	212 ± 2.5	347 ± 2.5

SUSPENSION UNITS



Suspension units fitted to vehicles **AZ** *and* **AZU**

TYPE OF VEHICLE	Free length of springs and diameter of wire (in mm)		Length of tie-rods (in mm)		Length of end pieces (in mm)	
	Front	Rear	Front	Rear	Front	Rear
AZ ⟶ 9/1962 ⟶ 3/1963 AZU ⟶ 6/1955 ⟶ 3/1963	185 14,35	170 15,25	623	644	191	173
AZ ⟶ 3/1963 AZU ⟶ 9/1965	185 14,8	170 15,25	600	644	173	173
AZ ⟶ 9/1965 ⟶ 2/1970 AZU ⟶ 9/1965 ⟶ 9/1972 AZ (2 CV 4) ⟶ 2/1970 AZ (2 CV 6) ⟶ 10/1971	185 14,8	170 15,25	600	642	173	182
AZ (2 CV 4) ⟶ 10/1971 AZ (2 CV 6) ⟶ 9/1972	193 15,25	170 15,25	600	642	173	182
AZU ⟶ 9/1972	193 15,25	170 15,25	593	611	109	109
AZ (2 CV 4 AZ (2 CV 6) ⟶ 9/1972	193 15,25	189 16,3	593	632	109	109

Suspension units fitted to vehicles **DYANE - DYANE 4 and DYANE 6**

AYA ⟶ 8/1967 ⟶ 3/1968 AYA 2 ⟶ 3/1968 ⟶ 12/1968 AYA 3 ⟶ 1/1968 ⟶ 10/1968 AYB ⟶ 10/1968 ⟶ 12/1968	185 14,8	170 15,25	600	642	173	182
AYA 2 ⟶ 12/1968 AYB ⟶ 9/1972	193 15,25	170 15,25	600	642	173	182
AYA AYB ⟶ 9/1972	193 15,25	170 15,25	593	632	109	109

Manual 812-1

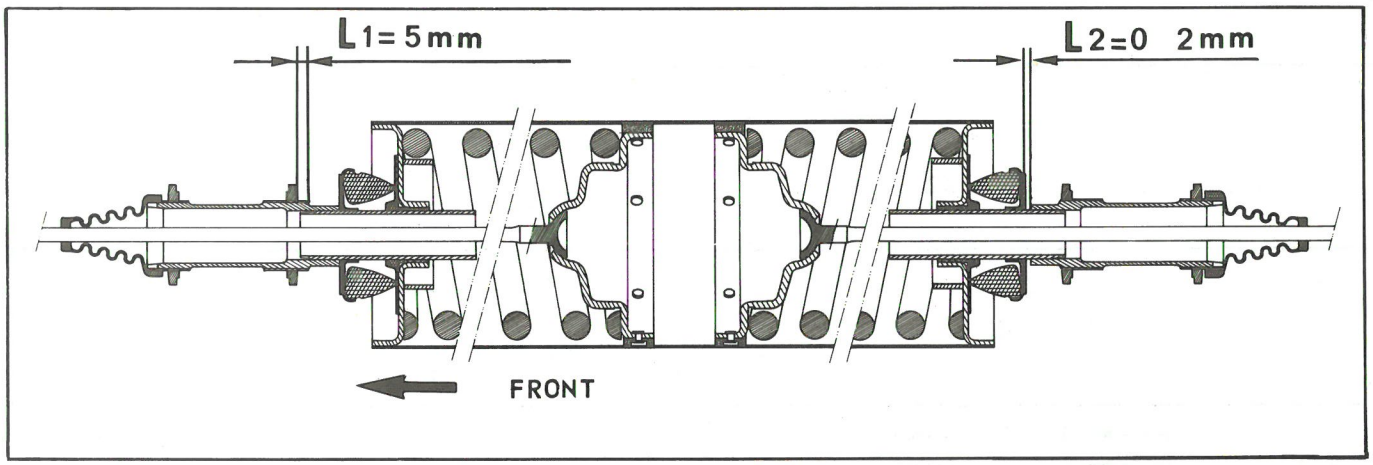
SPECIAL FEATURES

Shock absorbers :

- Fitting : **BOGE** shock absorbers : The shock absorber at the suspension unit end has the identifying mark upwards and the drain holes downwards.
  Shock absorbers **ALLINQUANT** or **LIPMESA** : The shock absorber body at the suspension arm end has the identifying mark upwards.
- Length (between mounting point) of a compressed rear shock absorber :
  - *Vehicles AZ - AY - AY-CA (MEHARI) - AZU* ..... 450 mm
  - *Vehicles AK* ..... 349 mm
- Length (between mounting points) of a compressed front shock absorber :
  - *Vehicles AK* ..... 349 mm

Suspension units :

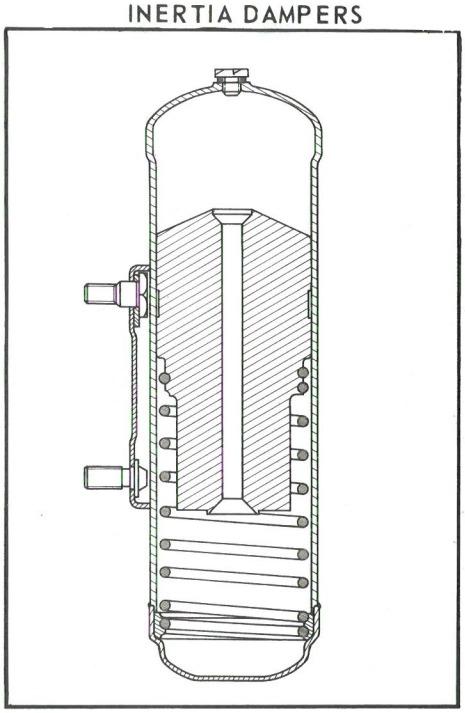
- Fitting : The marking « AV » on the casing is towards the front.



- Adjustment : The vehicle should be unladen, in running order, standing on flat horizontal ground with the tyres inflated correctly (see relevant Technical Bulletins for correct pressure).
- Position of front end piece of suspension unit ..... L1 = 5 mm min.
- Positioning of rear end piece of suspension unit : This should be adjusted to give a clearance L2 = 0 to 2 mm between the end piece and the anti-pitch stop

Clearance between limit stop and front suspension arm ....3 to 6 mm

INERTIA DAMPERS



Friction units :

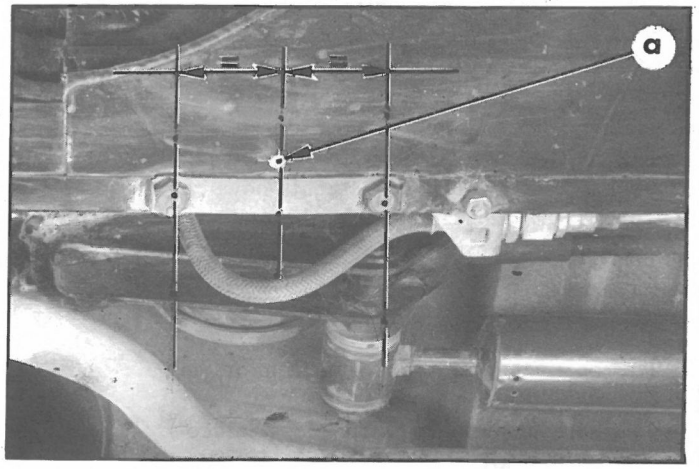
- Setting .....23 to 27 mAN (2,3 to 2,7 m.kg)

Tightening torques :

- Nuts holding inertia dampers 60 mAN (6 m.kg)
- Nuts holding front limit stop ....40 to 50 mAN (4 to 5 m.kg)
- Bolts holding front shock absorbers supports ..... 40 mAN (4 m.kg)
- Shock absorber spindles ....200 mAN (20 m.kg)
- Shock absorber mounting nuts...35 to 40 mAN (3.5 to 4 m.kg)
- Nuts holding suspension units ..... 175 to 215 mAN (17.5 to 21.5 m.kg)

I. HEIGHT MEASUREMENT

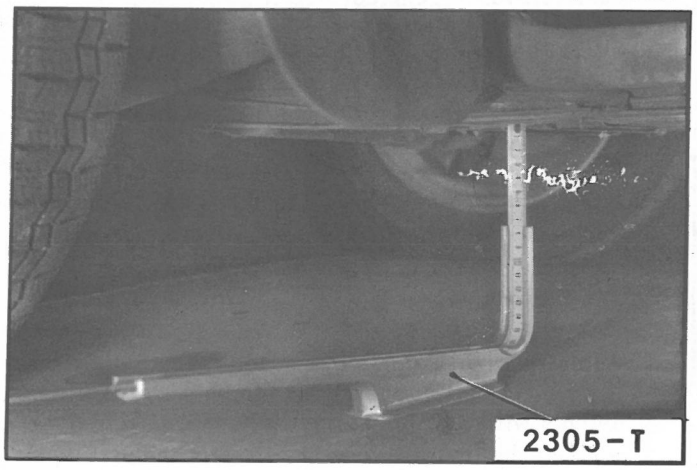
4949



CAUTION : *The vehicle heights must be measured at the front and rear between the ground and the underside of the platform at the point « a » mid-way between the two bolts holding the cross member and next to the bolt stop plate.*

1. Prepare the vehicle (in running order).
   It should be equipped with :
   - the spare wheel (in its proper place),
   - the tool kit,
   - about five litres of petrol in the tank, and no other load.

12124



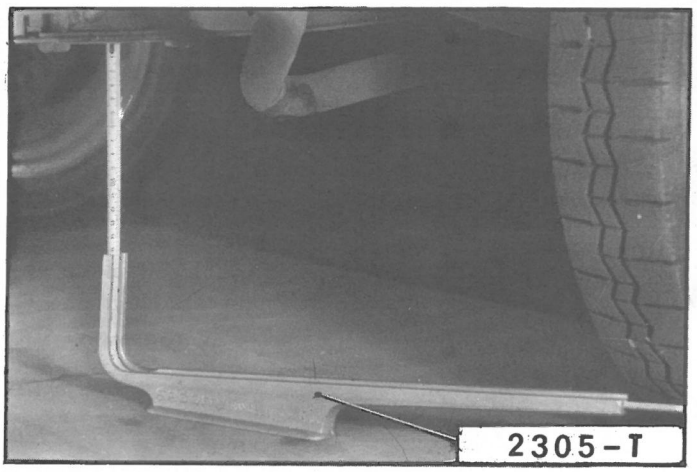
2. Check the tyre pressures and correct if necessary (see relevant Technical Bulletins).

   Put the vehicle on flat horizontal ground with the front wheels straight ahead.

3. Move the vehicle up and down by means of the bumpers and allow it to stabilize.

4. **Measure the heights :**

12123

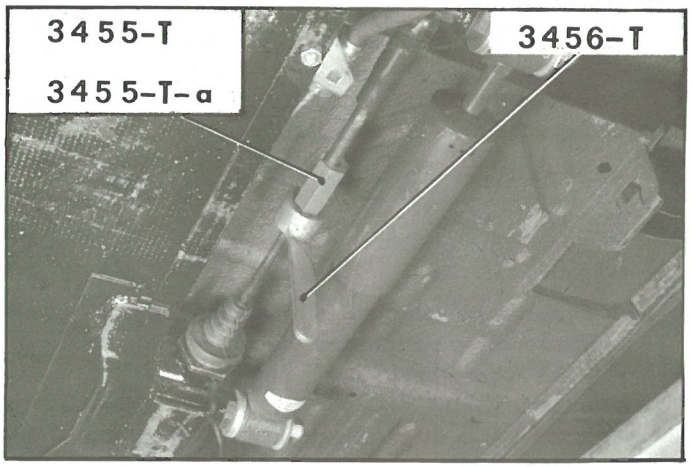


Measure the distances between the ground and the underside of the vehicle platform at the point « a » mid-way between the two bolts holding the cross member and at the side of the bolt stop plate.

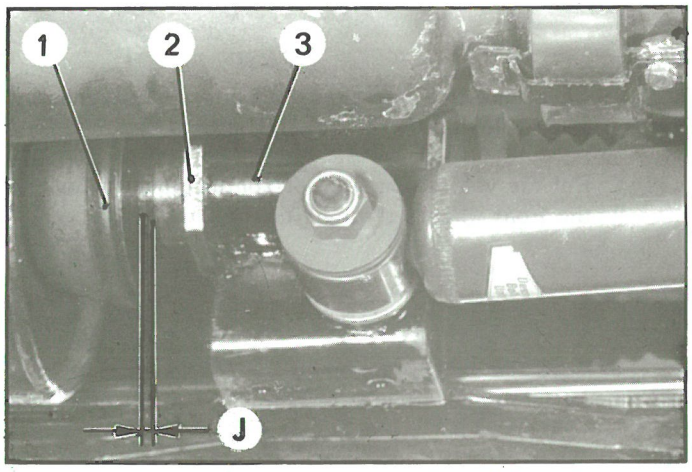
For measuring the heights at the front and rear, use the gauge 2305-T as shown in the figures.

II. ADJUSTING HEIGHTS

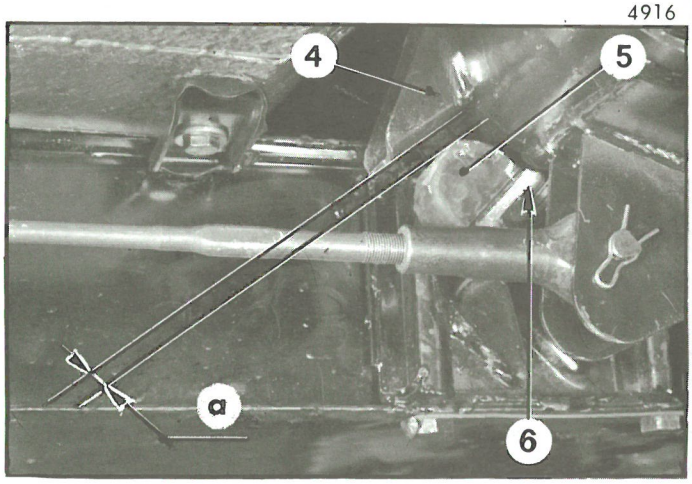
4939



4857



4916



NOTE : If the friction units or shock absorbers have been removed, carry out the height adjustments before installing the bolts which hold the friction unit protective covers or installing the shock absorbers.
The nuts on the shock absorber mounting studs should not be tightened until the heights have been adjusted and the vehicle is resting on the ground, in order to avoid damaging the « silentblocs » mountings.
When the heights are adjusted as described below, the weight distribution is correct.

1. Prepare the vehicle (in running order).
   It should be equipped with :
   - the spare wheel (in its proper place),
   - the tool kit,
   - about five litres of petrol in the tank, without any other load.

2. Check the tyre pressures and correct if necessary (see relevant Technical Bulletins).

3. **Check the front heights** by turning the front tie-rods, Use the end piece 3455-T or 3455-Ta (these being fitted on the tie-rod flat) and the key 3456-T.

   Avoid using any other tool, especially claw spanners which scratch surfaces and create insipient fractures. Hold the suspension unit with the hand as its rotation may interfere with the adjustment of the rear tie-rods.

4. **Adjust the rear heights** by turning the rear tie-rods If a substantial correction has to be made, the front heights will be outside their tolerances. Therefore readjust the front tie-rods to complete the setting procedure. Use the end piece 3455-T or 3455-Ta and the key 3456-T.

   Hold the suspension unit with the hand to prevent interfering with the adjustment of the front tie-rods.

5. Check the front and rear heights after each adjustment.

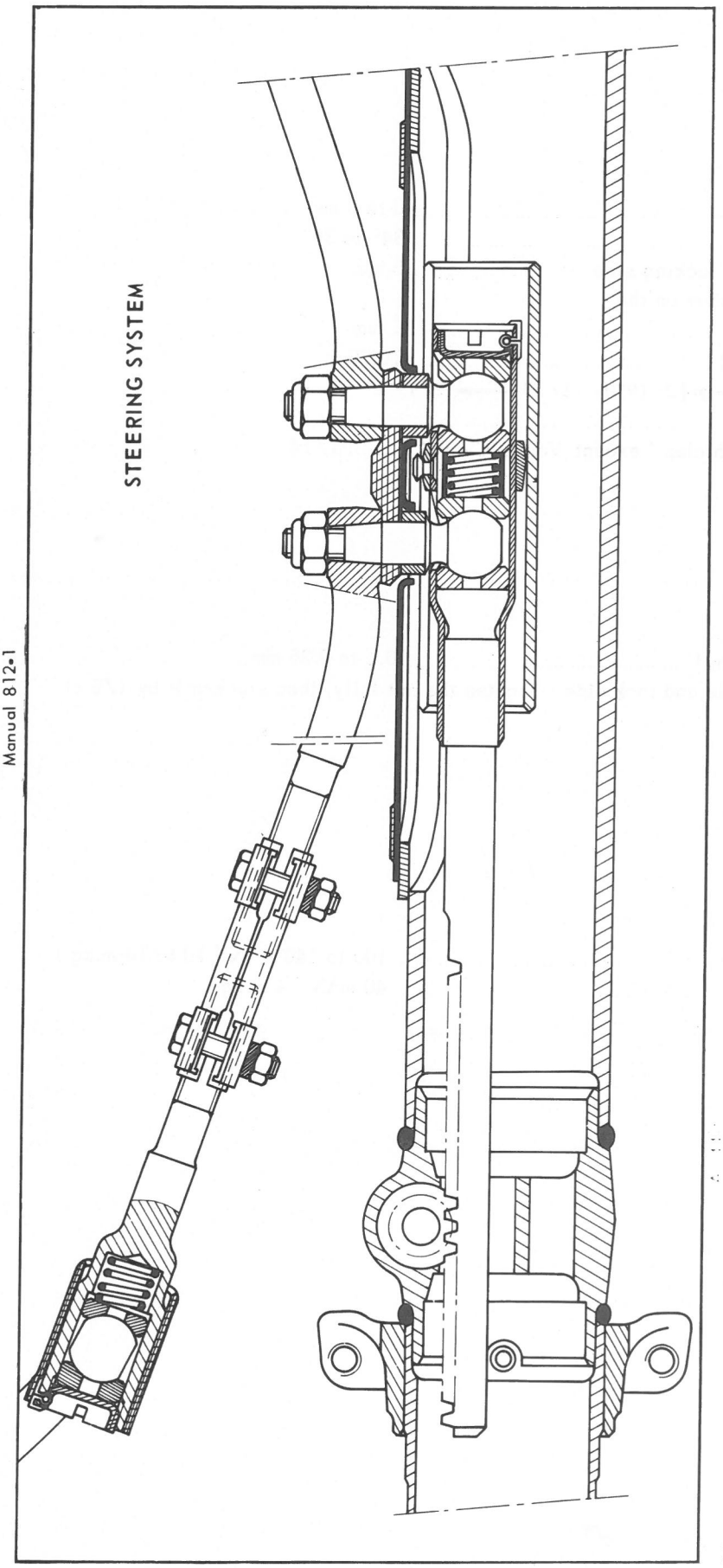
6. Check the clearance « j » between the end piece (3) and the rear rubber stop (1) which must be between 0 and 2 mm.

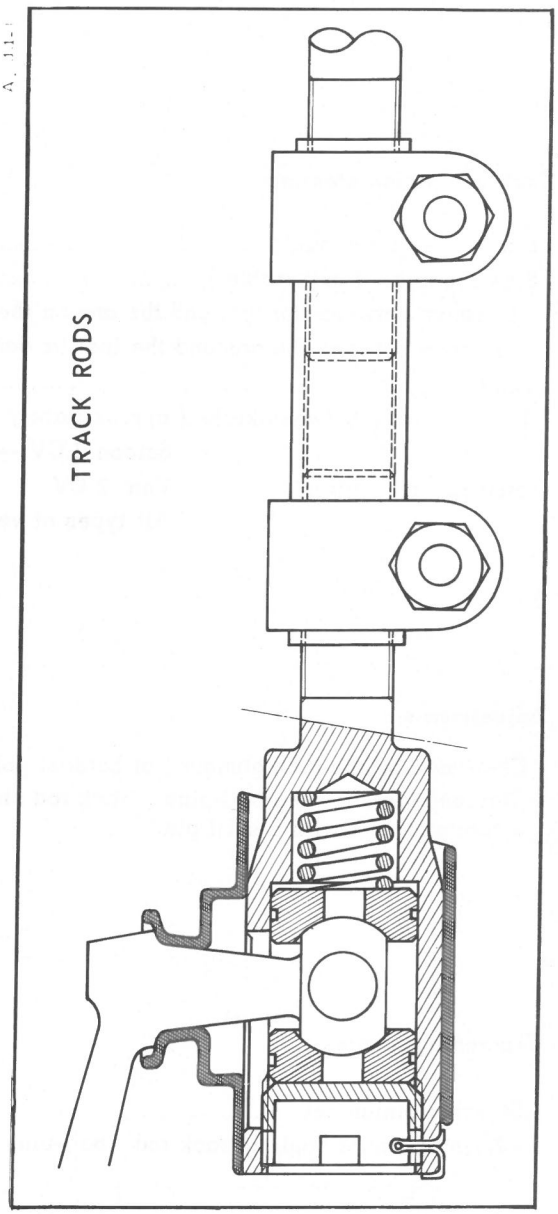
   If necessary, alter the position of the end piece (3) by means of the nuts (2) to obtain this clearance.

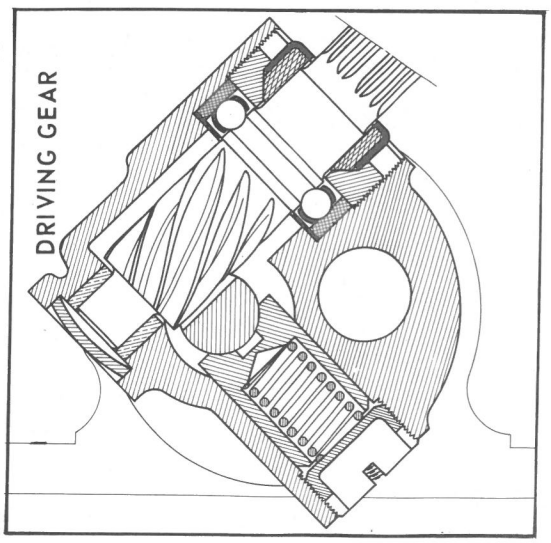
III. ADJUSTING THE FRONT ARM STOPS

7. Once the platform heights have been adjusted, check that there is a distance « a » = 3 to 6 mm between the rubber stops (5) and the arm travel stops (4).
   If necessary, obtain this clearance by placing shims (6) of suitable thickness between the rubber stop and its support.

OPERATION N° A. 440-00 : *Characteristics and special features of the steering system* **Op. A. 440-00** 1







CHARACTERISTICS

Rack and pinion steering :

- Parallelism : toe-out ..... 0 to 3 mm
- Steering angle (adjustable) ..... 34° to 35°
- Clearance between the tyre and the arm on the locking side ..... 5 mm
- Clearance between the arm and the inertia damper on the opposite side ..... 1 mm
- Turning circle between kerbs (approximately) ..... 10.70 m
- Steering gear ratios
  - Saloon 2 CV ⟶| *2/1970* 1/13 |⟶ *2/1970* 1/14
  - Van 2 CV 1/13
  - All types of vehicles (except Van 2 CV) 1/14

Adjustments :

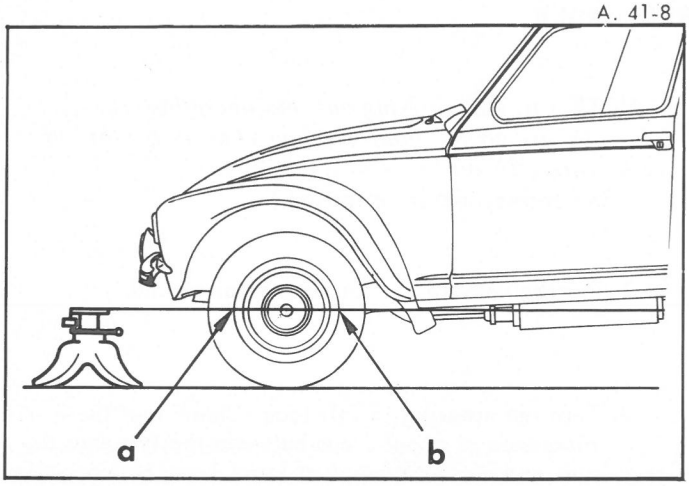
- Clearance on the rack plunger (at hardest point) ..... 0.1 to 0.25 mm
- Clearance on steering ball-pins (track rod side and rack side : Tighten the nut fully, then slacken it by 1/6 of a turn and lock with a split pin.

Tightening torques :

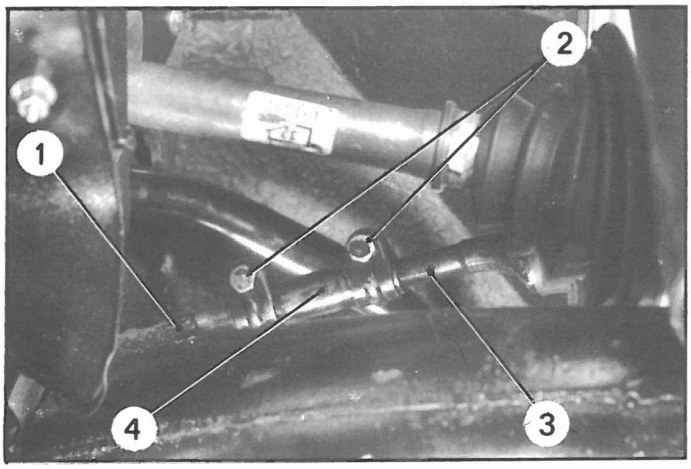
- Steering pinion nut ..... 100 to 140 mΛN (10 to 14 m.kg)
- « Nylstop » nuts holding track rod ball-pins ..... 40 mΛN (4 m.kg)

I. MEASURING AND ADJUSTING THE TOE-OUT OF THE FRONT WHEEL

A. 41-8



4855



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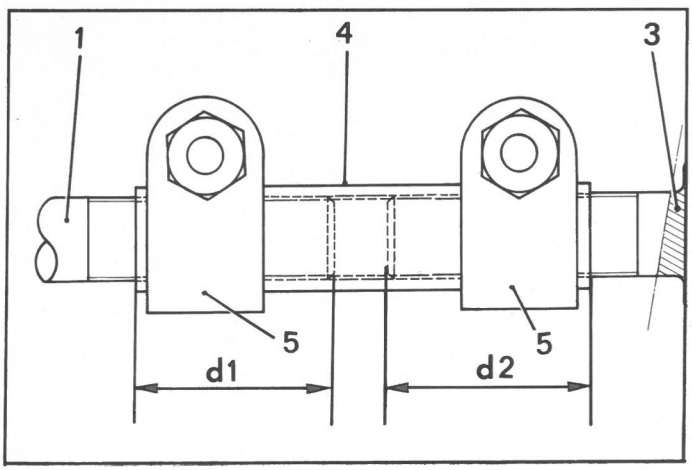
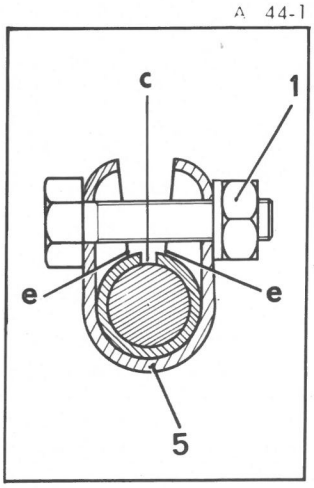
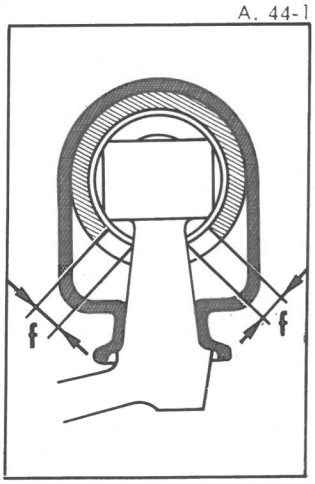
A. 44-1



A. 44-1



A. 44-1



NOTE : **The wheels should have a toe-out of 0 to 3 mm.**
To carry out this operation, it is necessary for the front and rear chassis heights to be correctly set.
(See appropriate operation).

1. Place the wheels in the straight ahead position.

2. Check the front wheel toe-out :

Use a gauge of which several types are available on the market.
Proceed as follows :
At the point « a », at axle height, measure the distance between the front outer edges of the rims. Mark the measured points with chalk. Move the vehicle forward until the wheels have rotated through half a turn and then measure the distance between the marks, now at the rear (at the same height at « b »).
If this distance is smaller by 0 to 3 mm, the toe-out is correctly set. Otherwise, adjust.

3. Adjusting the front wheel toe-out :

Without removing the wings, slacken the nuts (2) on the bolts locking the right and left-hand side sleeves (4) in position. Rotate each sleeve by the same amount to obtain the correct setting.

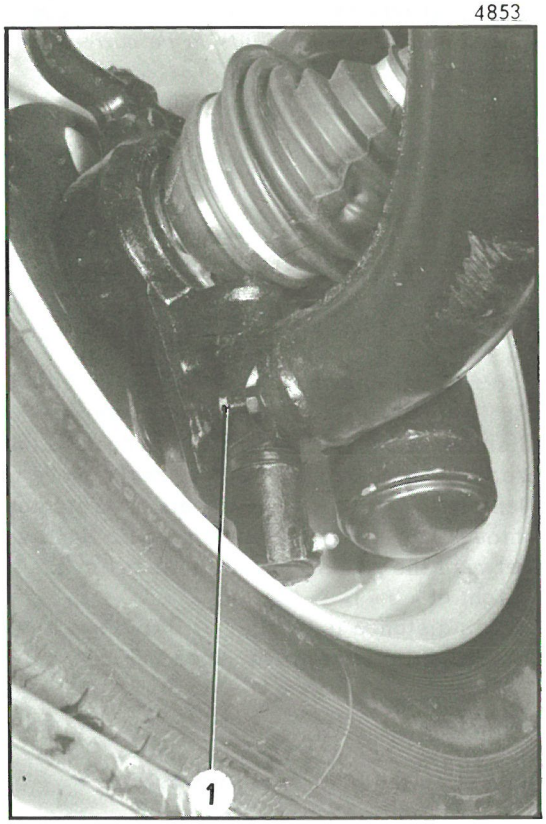
NOTE : One complete turn of the sleeve alters the wheel position by 6 to 7 mm.

CAUTION : *Make sure that the amounts by which the track rod (1) and the end piece (3) are screwed into the sleeve (4) are equal* (d1 = d2 ± 2 mm).

The clamps (5) holding the sleeves (4) should be arranged vertically, with the bolt head facing upwards. The position of the slot « c » is not important so long as it is not opposite the points « e ». The play « f » in the steering ball pins should be distributed evenly. Tighten the nuts (2) on the bolts holding the sleeves to a torque of 10 mΛN (1 m.kg).

II. ADJUSTING STEERING ANGLE

4853



NOTE : *Before carrying out this operation, it is necessary for the front and rear chassis heights to be correctly set.*
(See corresponding operation).

1. Put the vehicle on flat horizontal ground.

2. Turn the steering to full lock. Check that there is a clearance of about 5 mm between the tyre and the arm, and a clearance of at least 1 mm between the inertia damper and the arm on the opposite side.

   Otherwise, adjust the lock stop bolt (1) which is located on the arm.

3. Check the steering lock of the other wheel.

A.45-62 b

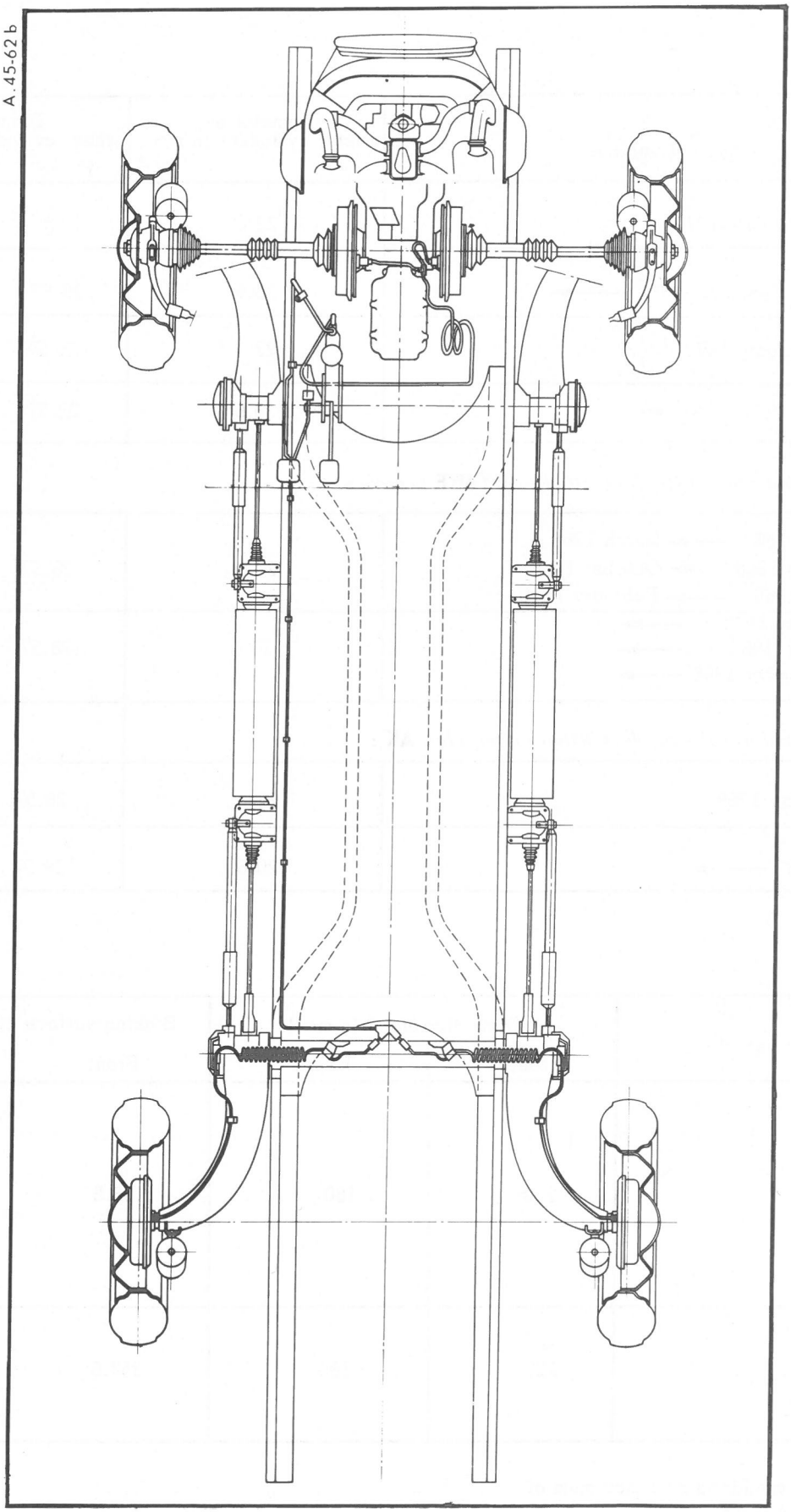


DIAGRAM OF BRAKING SYSTEM

CHARACTERISTICS

Master cylinder - Wheel cylinders :

Master cylinder and wheel cylinders fitted to vehicles **AZ** *and* **AZU** :

Type of vehicle	Diameter of master cylinder (in mm)	Diameter of wheel cylinders (in mm)	
		Front	Rear
AZ ⟶ February 1970	22	22.5	19
AZ (2 CV 4) AZ (2 CV 6) February 1970 ⟶	20.6	28.57	17.5
AZU ⟶ January 1972	22	28.57	19
AZU January 1972 ⟶	20.6	28.57	17.5

Master cylinder and wheel cylinders fitted to **DYANE** *vehicles :*

AYA August 1967 ⟶ March 1968 AYA 3 January 1968 ⟶ October 1968 AYA 2 March 1968 ⟶ February 1970	20.6	28.57	19
AYA 2 February 1970 ⟶ AYB October 1968 ⟶ MEHARI September 1968 ⟶	20.6	28.57	19

Master cylinder and wheel cylinders fitted to vehicles **AK** :

AK ⟶ May 1968	22	28.57	19
AK May 1968 ⟶	20.6	28.57	19

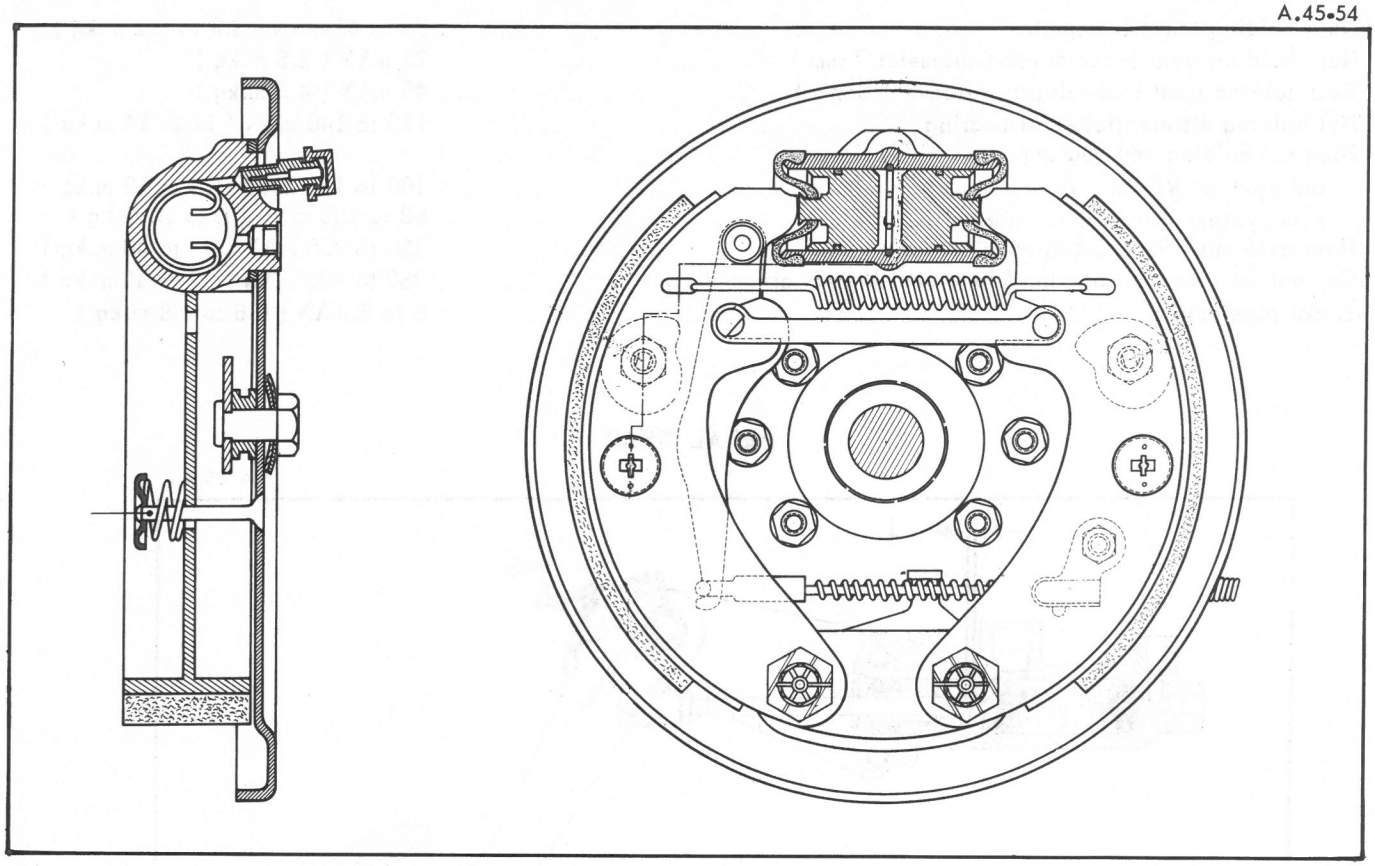
Brake drums :

Type of vehicle	Drum diameter (in mm)		Braking surface area (in cm^2)	
	Front	Rear	Front	Rear
AZ AZ (2 CV 4) AZ (2 CV 6) AYA AYA 3 AYA 2 AZU	200	180	195.5	193.2
AK AYB MEHARI	220	180	354.6	193.2

- Drums may be machined by a maximum of ..... 2 mm
- Maximum out-of-round ..... 0.10 mm
- Thickness of linings ..... 4.8 to 5.3 mm

FRONT BRAKES

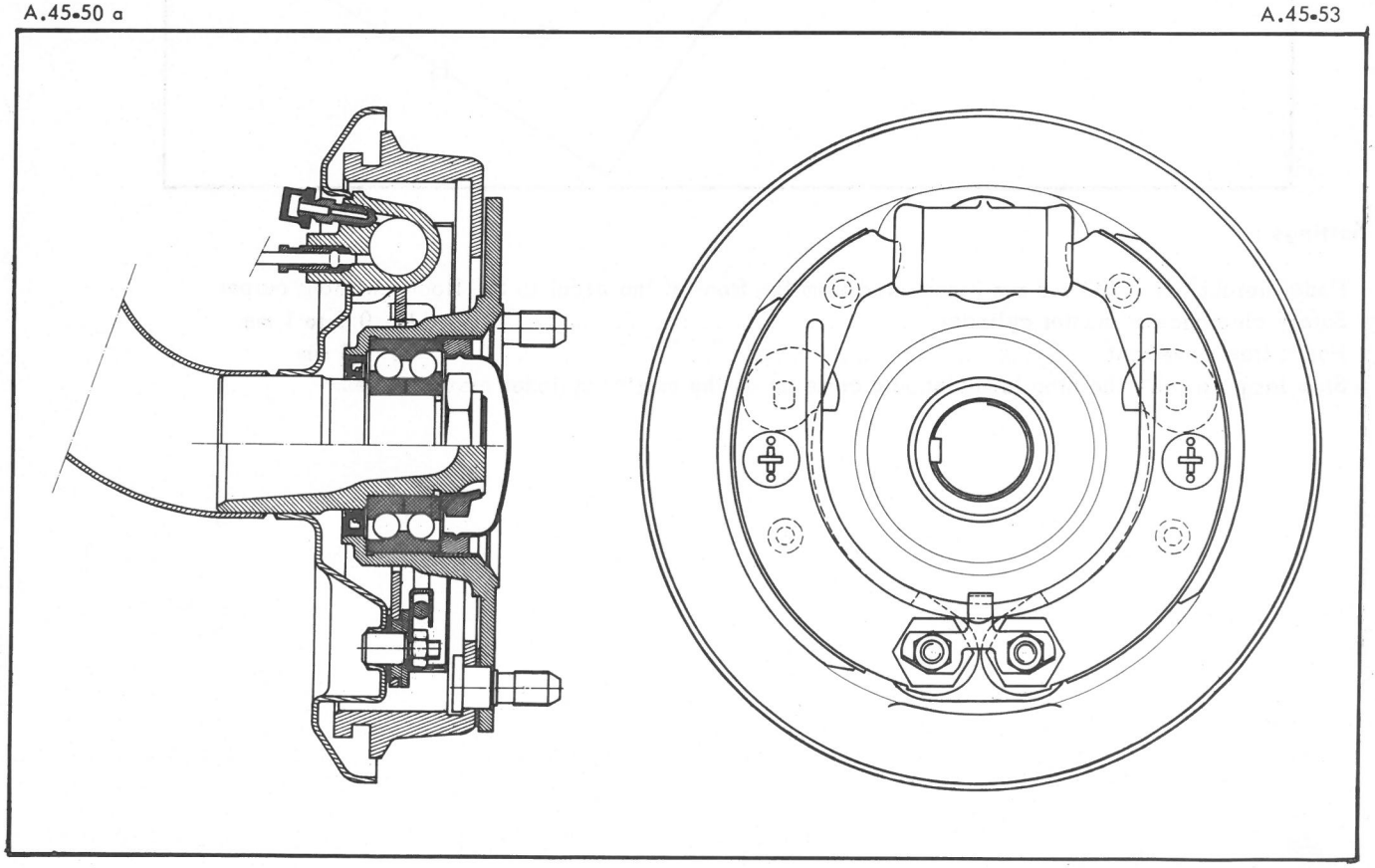
A.45-54



REAR BRAKES

A.45-50 a

A.45-53

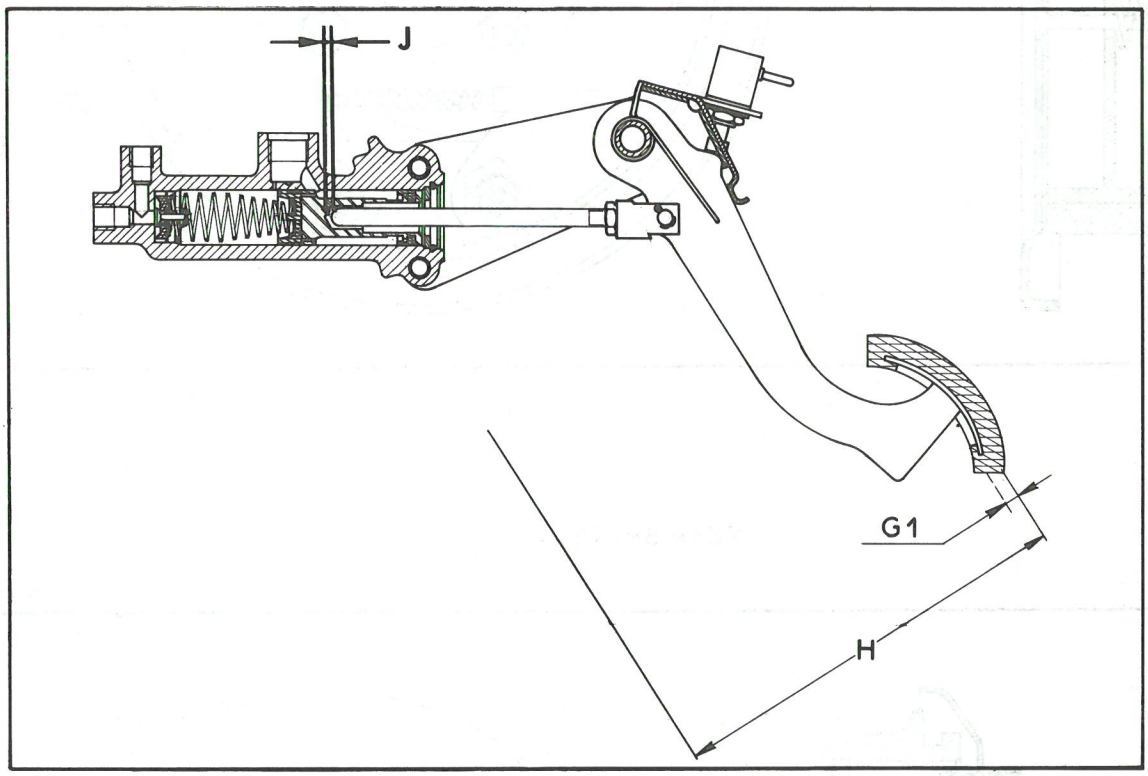


Tightening torques :

- Nuts holding brake backplates ..... 38 to 42 mΛN (3.8 to 4.2 m.kg)
- Nuts holding front brake drums (diameter 7 mm) ..... 25 mΛN (2.5 m.kg)
- Bolt holding front brake drums (diameter 9 mm) ..... 45 mΛN (4.5 m.kg)
- Nut holding differential shaft bearing ..... 120 to 140 mΛN (12 to 14 m.kg)
- Ring nut holding end bearing :
  - old system (*Ring nut in bearing*) ..... 100 to 120 mΛN (10 to 12 m.kg)
  - new system (*Ring nut on bearing*) ..... 60 to 100 mΛN (6 to 10 m.kg)
- Rear axle nut (face and threads greased) ..... 350 to 400 mΛN (35 to 40 m.kg)
- Cap nut for rear axle bearing (face and threads greased) ..... 350 to 400 mΛN (35 to 40 m.kg)
- Brake pipe unions ..... 6 to 8 mΛN (0.6 to 0.8 m.kg)

PEDAL GEAR

A.45-8 a



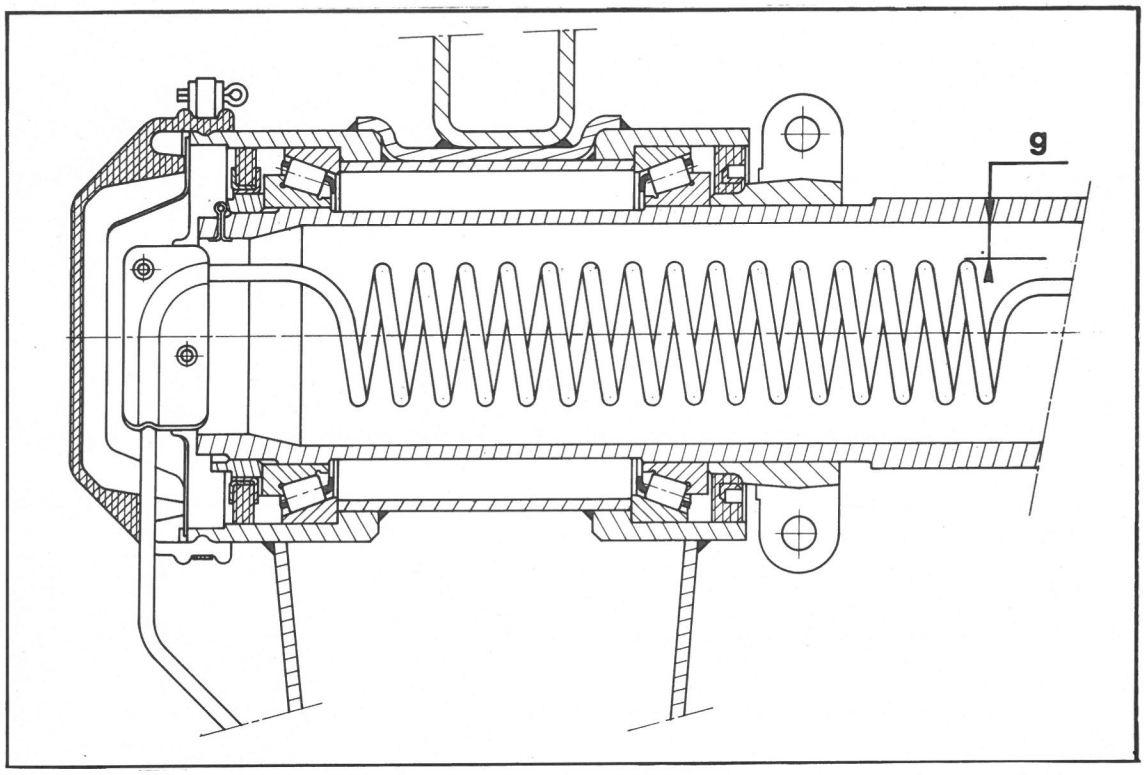
Settings :

- Pedal height : **H = 130 ± 5 mm** (measured from the front of the pedal to the floor « without carpet ».
- Safety clearance at master cylinder ..... **J = 0.5 to 1 mm**
- Pedal free movement ..... **G1 = 5 mm**
- Stop lamp switch : the stop lamps should come on as the master cylinder piston moves.

REAR BRAKE PIPEWORK

(new fitting)

A. 42-51



Manual 812-1

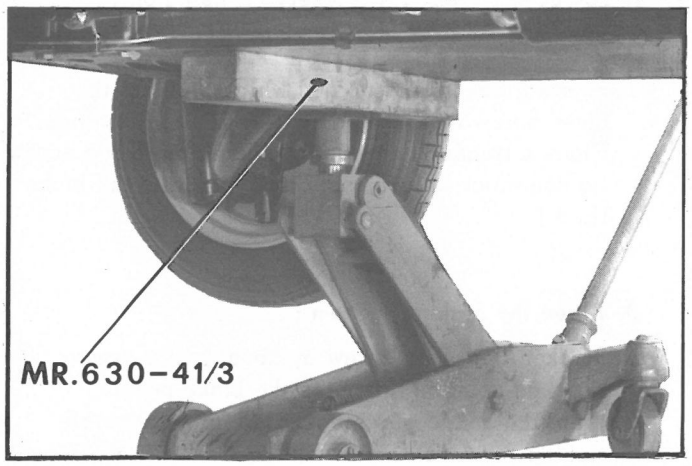
- Clearance between the feed pipe spirals and the tube ..... g = 6 mm maximum
- Outside diameter of brake pipes ..... 3.5 mm
- Inside diameter of seals ..... 3.5 mm
- Diameter of pipe unions ..... 8 mm, pitch 1.25

Tightening torques :

- Nuts holding feed pipe securing clips ..... 10 mΛN (1 m.kg)
- Bolt holding three-way union ..... 20 mΛN (2 m.kg)
- Brake pipe unions ..... 8 to 9 mΛN (0.8 to 0.9 m.kg)

I. ADJUSTING BRAKES

PL. 478

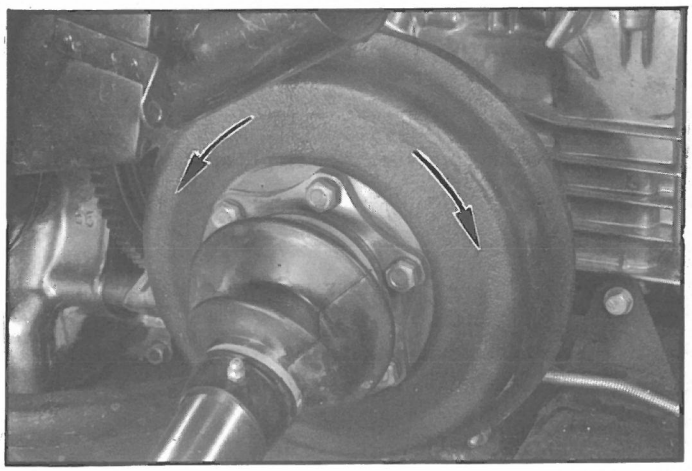


Adjusting the front brakes :

1. Raise the front of the vehicle (using the support MR. 630-41/3 on a mobile jack).

2. Turn the brake adjuster in the direction indicated by the arrows, while rotating the drum by hand until the brake shoe comes into contact with the drum. Turn the adjuster slightly in the other direction to release the shoe.
Tighten the adjuster once again until the brake shoe rubs slightly.
Repeat the operation for the other brake shoe.

3352



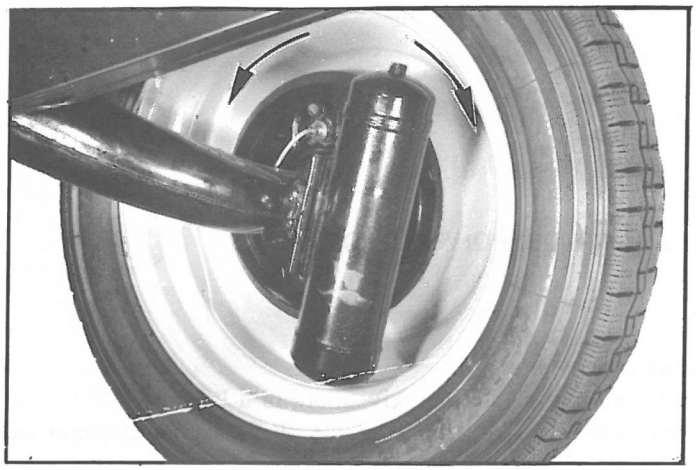
NOTE : *This adjustment should never end with a releasing motion.*

The brake shoes should be adjusted as near the drum as possible to ensure short pedal travel.

3. Repeat the operation on the other wheel.

4. Lower the vehicle to the ground.

PL. 515



Adjusting the rear brakes :

5. Raise the rear of the vehicle (using support MR. 630-41/3 on a mobile jack).

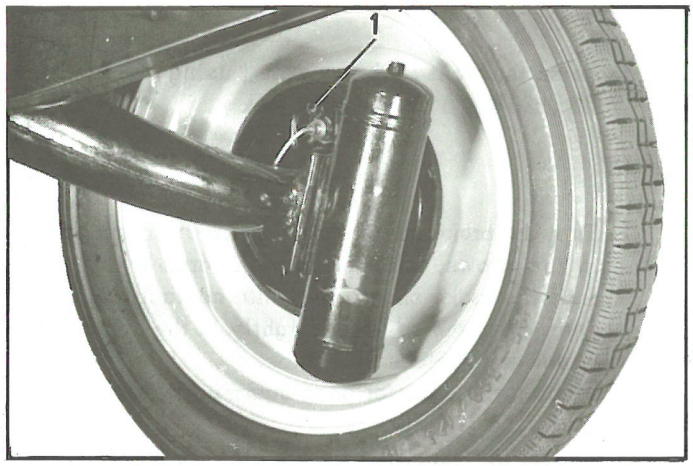
6. Proceed as in paragraph 2 above. Turn the brake adjusters in the direction indicated by the arrows.

7. Repeat the operation on the other wheel.

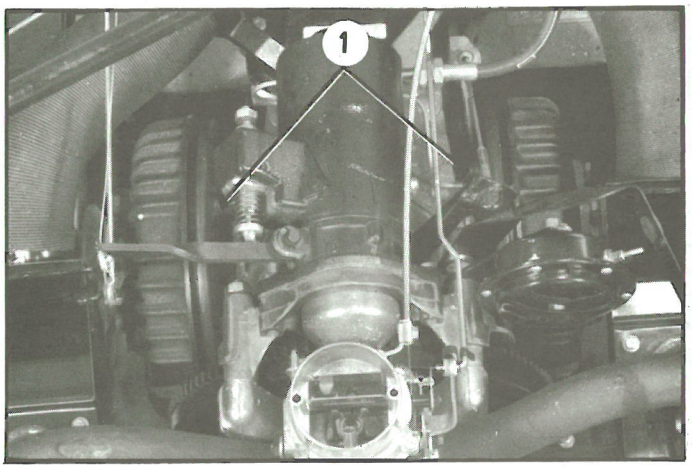
8. Lower the vehicle to the ground.

II. BLEEDING THE BRAKING SYSTEM

PL. 515



4459



1. Top up the brake fluid reservoir, using only LOCKHEED N° 55 hydraulic fluid.

2. Remove the rubber cap (1) which protects the bleed screw on the rear right-hand wheel cylinder. Place a transparent plastic tube on the bleed screw (a container is necessary for collecting the brake fluid).

3. **Bleed the braking system :**

   Slacken the bleed screw by about half a turn.
   Have an assistant depress the brake pedal.
   When the pedal is depressed as far as possible tighten the bleed screw. Release the pedal. Repeat this operation until air bubbles not longer appear in the transparent tube.
   Check the brake fluid reservoir level and top up as required.

   Only close the bleed screw while the pedal is being depressed.

4. Remove the plastic tube. Replace the rubber cap on the bleed screw.

5. Repeat these operations for each wheel in the following order :
   - rear right-hand wheel,
   - rear left-hand wheel,
   - front right-hand wheel,
   - front left-hand wheel.

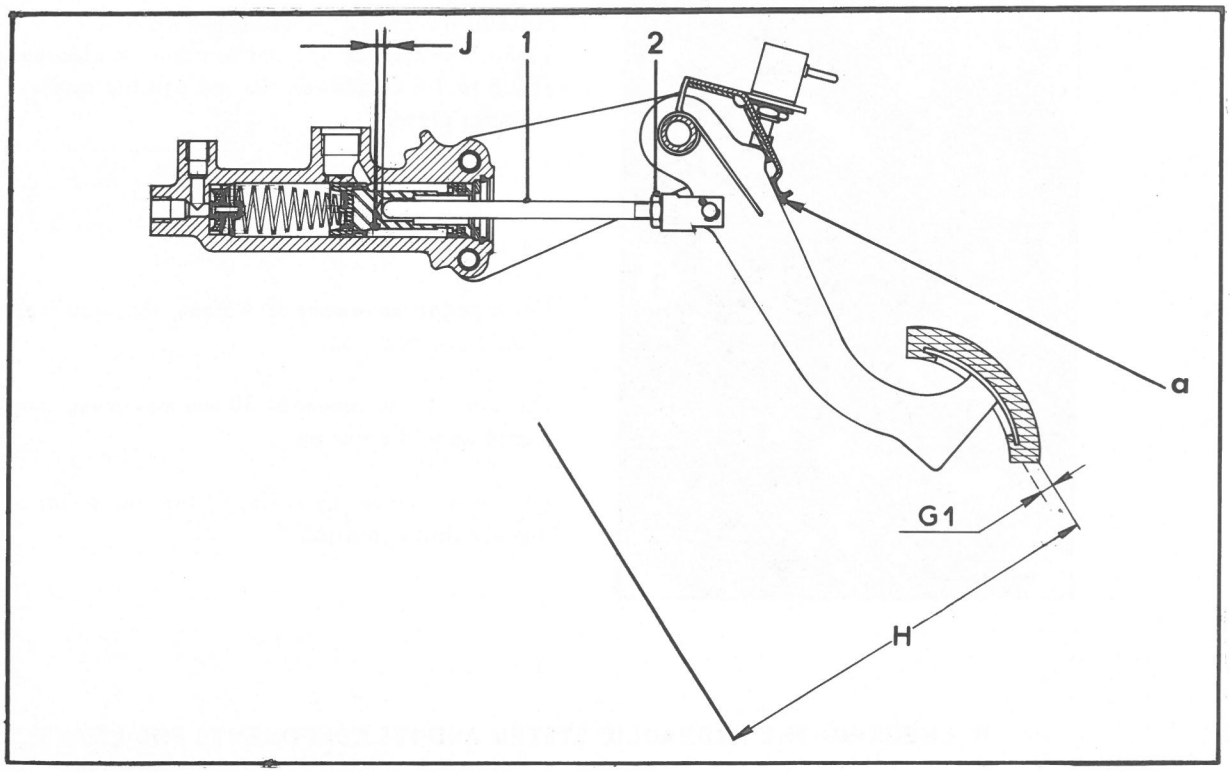
6. Top up the brake fluid reservoir using LOCKHEED N° 55 hydraulic brake fluid.

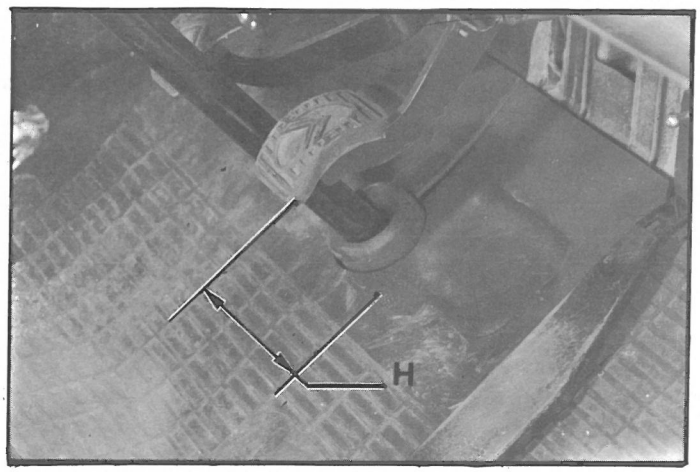
III. CHECKING THE HYDRAULIC SYSTEM AND ITS COMPONENTS FOR LEAKS

Depress the brake pedal as firmly as possible for 30 seconds to 1 minute.
If there is a resistance, sealing is good. If the pedal goes down more or less quickly, there is a leakage.
Watch the level in the fluid reservoir at the same time. If the fluid is forced back, the cup of the master cylinder is not leaktight and the unit must be overhauled.

I. ADJUSTING THE FREE MOVEMENT OF THE BRAKE PEDAL

A.45-8 a





1. Check pedal height :

With the pedal against the stop « a », the pedal height should be :
H = 130 ± 5 mm (measured from the upper corner of the pedal to the vehicle floor, without carpet).

Otherwise, bend the support plate at « a » to correct the height.

2. Adjust the pedal clearance :

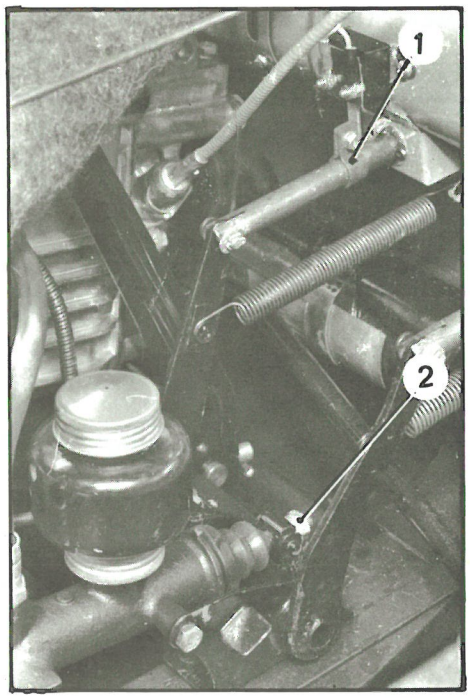
Slacken the lock nut (2). Turn the rod (1) to give clearance « j » **of 0.5 to 1 mm** between the rod and the piston of the master cylinder, which gives a clearance at the pedal of « **G1** » = **5 mm.**

3. Adjust the stop light switch :

a) Check that the brake pedal is correctly adjusted (see paragraphs 1 and 2 above).

b) Depress the brake pedal with the hand. The stop lights should come on once the clearance has been taken up and the master cylinder piston moves.

If necessary, bend the switch support plate to obtain this condition.



Adjust the pedal clearance :
(old pedal design).

Slacken the nut (2) holding the rod.
Tighten of slacken the rod to obtain **a clearance of 0.5 to 1 mm between the rod and the master cylinder piston.**

Adjust the stop light switch :

For a pedal **movement** of **1.5 mm,** the stop light should not come on.

For a pedal **movement** of **10 mm maximum,** the stop lights should come on.

Otherwise, move the collar (1) on the pedal to satisfy this condition.

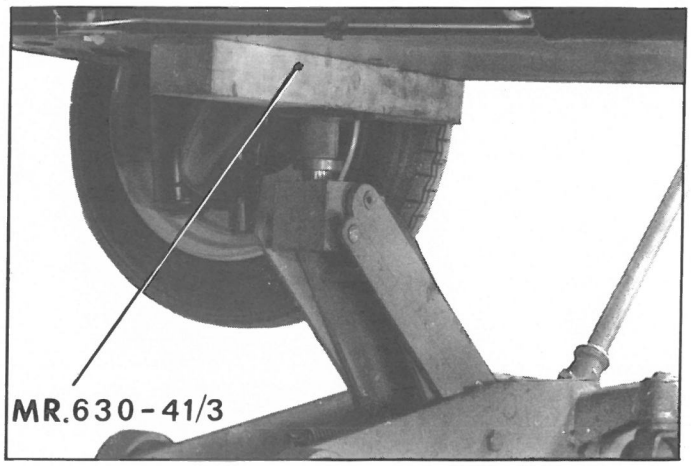
II. CHECKING THE HYDRAULIC SYSTEM AND ITS COMPONENTS FOR LEAKS

Depress the pedal as firmly as possible for thirty seconds to one minute. If there is resistance, sealing is good, If the pedal goes down more or less quickly, there is a leak.

Also watch the level in the fluid reservoir. If the fluid is pushed back, the cup on the master cylinder is not leaktight. In this case the master cylinder must be overhauled.

ADJUSTING THE HANDBRAKE

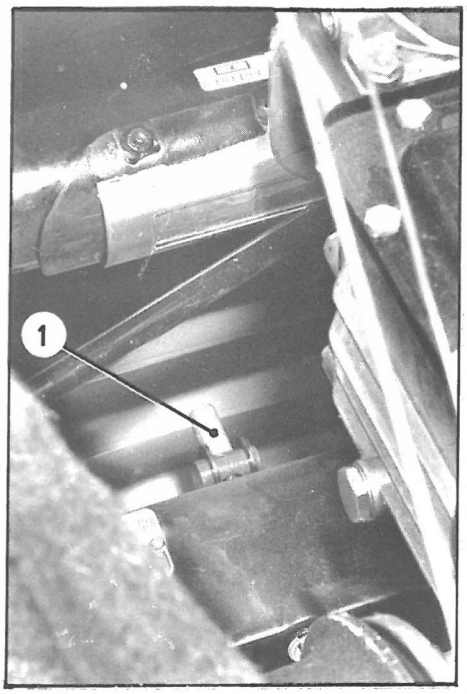
PL. 478



NOTE : The handbrake operates only on the front brake drums.

1. Raise the front of the vehicle using support MR. 630-41/3 on a mobile jack.

PL. 518



2. Adjust the tension in the two brake cables in turn, using the nuts (1), so that when the brake handle is raised to the third notch, the brakes begin to tighten and are locked at the fifth notch.

CHARACTERISTICS

DYNAMOS AND REGULATORS

	6 volt equipment		12 volt equipment	
Make	Dynamo	Regulator	Dynamo	Regulator
DUCELLIER	7276 G	8325 A	7302 H	8243 F
PARIS-RHONE	G 11 R 111	XT 212		
CIBIE		D 67		

SKIMMING

Make of dynamo	DUCELLIER		PARIS-RHONE
Type of dynamo	7276 G	7302 H	G 11 R 111
Minimum commutator diameter after skimming	52.5 mm	35 mm	51 mm

TESTING DYNAMOS ON THE BENCH OR ON THE VEHICLE :

Dynamo without regulator : terminal « DYN » connected to the terminal « EXC » and the body of the dynamo or the black lead to the chassis.

Make and type of dynamo	DUCELLIER 7276 G	PARIS-RHONE G11 R111	DUCELLIER 7302 H
Cold starting speed at 6.5 V	1350 rpm	1200 rpm	
Cold working current at 6.5 V	12 A at 1800 rpm 21 A at 2200 rpm	13 A at 1600 rpm 25 A at 2200 rpm	
Cold starting speed at 13 V			1520 rpm
Cold working current at 13 V			12 A at 2000 rpm 25 A at 3000 rpm

BENCH TEST OF REGULATORS-ADJUSTMENTS

A. Regulators types DUCELLIER 8325 A and PARIS-RHONE XT 212 (6 volts) :

Pull in voltage : 6 to 6.5 volts *(cold working)*
Drop-out voltage : at least 1 volt less than the pull-in voltage.
Return current : 3 to 7 amperes at 6 volts *(cold working)*
REGULATION : *(cold working)* Dynamo turning at 3500 rpm :

Regulator 8325 A :

a) Current limiting section :
Set the voltage to 6.6 volts, the current should be 23 to 25 amperes
b) Voltage regulating section :
Set the current to 4 amperes, the voltage should be 7.1 to 7.5 volts
Set the current to 18 amperes, the voltage should be 6.9 to 7.3 volts

Regulator XT 212 :

a) Current limiting section :
Set the voltage to 6.6 volts, the current should be 23 to 25 amperes
b) Voltage regulating section :
Set the current to 5 amperes, the voltage should be 7.3 to 7.7 volts.
Set the current to 18 amperes, the voltage should be 7.1 to 7.5 volts

B. Regulators type DUCELLIER 8243 F (12 volts) :

Pull-in voltage : 12 to 13.6 volts *(cold working)*
Drop-out voltage : at least 1 volt less than the pull-in voltage
Return current : 5 ampères maximum *(cold working)* at 13 volts
REGULATION : Dynamo turning at 3500 rpm
a) Current limiting section :
Set the voltage to 13.2 volts, the current should be 20 to 22 amperes
b) Voltage regulating section :
Set the current to 2 amperes, the voltage should be 14 to 14.4 volts
Set the current to 17 amperes, the voltage should be 13.5 to 14.4 volts.

ALTERNATORS AND REGULATORS (12 volts)

IMPORTANT :

- Never rotate the alternator unless connected to the battery.
- Never connect the alternator to a battery with posts reversed
- Never check the operation of the alternator by short-circuiting the « + » terminal and the chassis or the « EXC » and the chassis.
- Never recharge the battery or use an arc welder on the chassis without disconnecting the alternator.

A. Alternator type DUCELLIER 7522 B
(on AK vehicles from March 1966 to May 1968).

Alternator type DUCELLIER 7542 A (same as above, except for different connections to charging warning light)
(on vehicles AYA 3 « DYANE 6 » from January 1968 to September 1968)
(on vehicles AYM « MEHARI » from August 1968 to July 1969)
Nominal rating : 260 watts
Nominal current at 13 volts : 20 amperes with alternator turning at 5000 rpm
Resistance of rotor : 7.4 Ω
Pull-in speed : 1500 rpm alternator
Ratio of alternator speed/engine speed = 2. 1/1

Alternator type DUCELLIER 7542 G :
(on vehicles AYA 3 « DYANE 6 » fitted with an FR - 20 heating system).
Nominal rating : 320 watts
Nominal current at 13 volts : 25 amperes at 6000 rpm alternator.

Regulator type DUCELLIER 8347 B (for above alternators):
Single stage « J » type.

B. Alternator type DUCELLIER 7534 A
Alternator type PARIS-RHONE A 11 M 4

On vehicles
- *AY CA « MEHARI » from July 1969*
- *AK from May 1970 to July 1970*
- *AY « DYANE 4 » from March 1968 to February 1970*
- *AYB « DYANE 6 » from September 1968 to February 1970*

Alternator type DUCELLIER 7532 A } identical with the above two types but without alternative connections
Alternator type PARIS-RHONE A 11M6 } for charging warning light

On vehicles
- *AY « DYANE 4 » from February 1970*
- *AY CB « DYANE 6 » from February 1970*
- *AK from July 1970*
- *AZA 2 (2 CV 4) and AZKA (2 CV 6 from February 1970*

Rating : 400 watts
Voltage : 14 volts
Nominal current : 28 amperes at 8000 rpm alternator
Rotor resistance : 7 Ω
Pull-in speed : 1450 rpm alternator
Ratio alternator speed-engine speed = 1.8/1

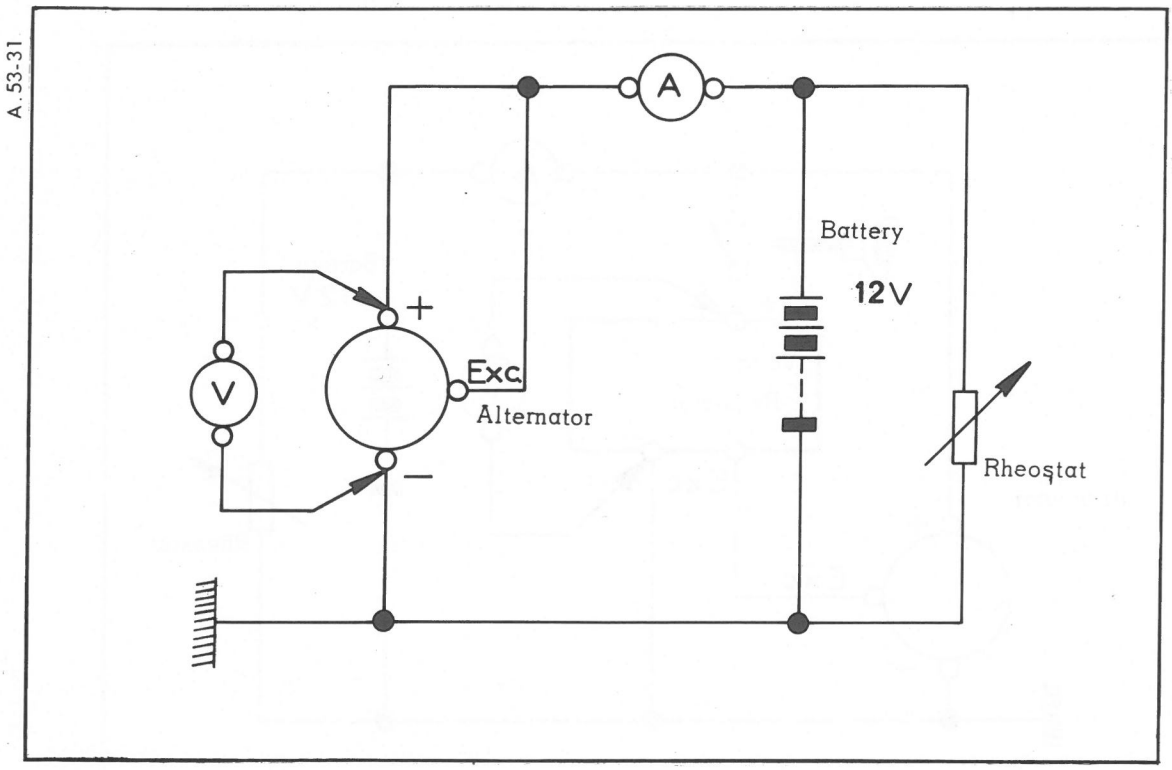
Regulator type DUCELLIER 8347 C
Regulator type PARIS-RHONE AYA 213 } Suitable for the four above alternators

C. Transistorized relay type DUCELLIER 8363 :

On vehicles fitted with alternators having alternative output connections : alternators 7542 A - 7542 G - 7534 A A 11 M 4.

This relay switches off the charging light when the alternator is delivering its normal current .

CHECKING THE CURRENT DELIVERED BY AN ALTERNATOR



Manual 812-1

Connect the above circuit using a voltmeter V, an ammeter A and a rheostat, or better still using a combined « voltmeter - ammeter - rheostat » now available commercially.

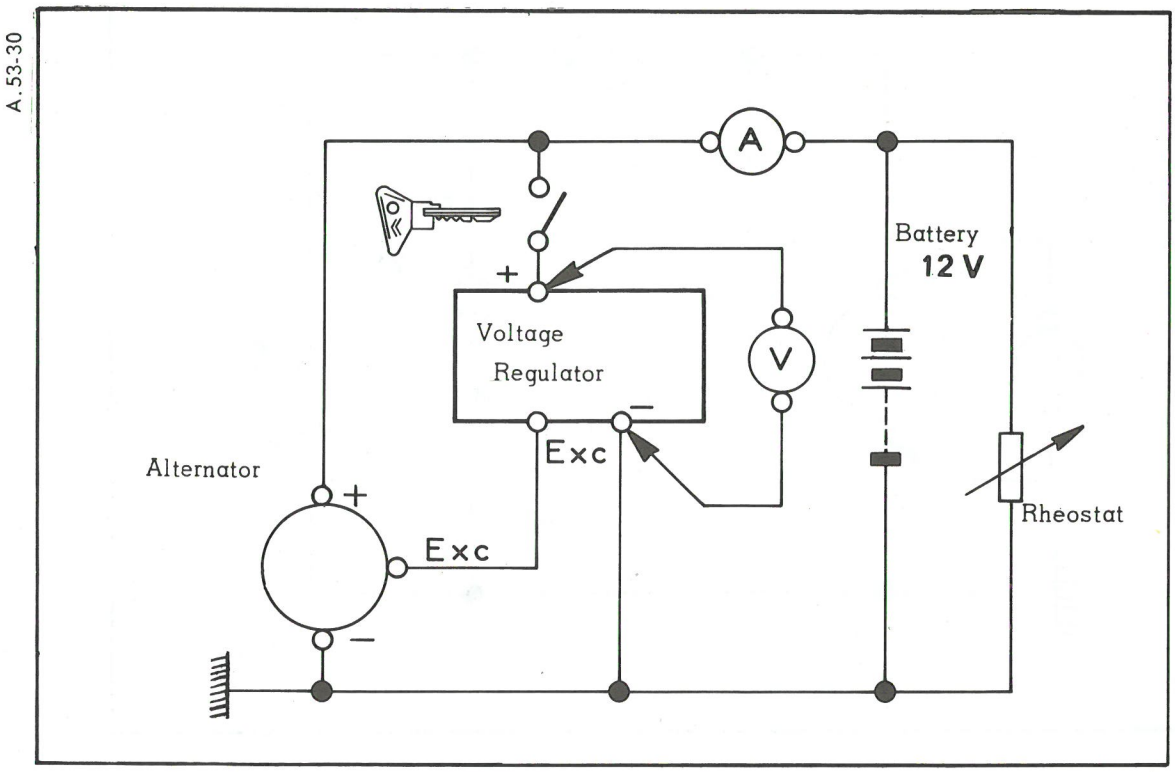
Measuring output : (battery well charged)

a) Alternators 7522 B and 7542 A :
Measure the output while increasing the engine speed and using the rheostat *to keep the voltage at 13 volts.*
Output : 5 amperes at 900 rpm engine speed (1900 rpm alternator speed at 13 volts)
17 amperes at 1800 rpm engine speed (3800 rpm alternator speed at 13 volts)
20 amperes at 2400 rpm engine speed (5000 rpm alternator speed at 13 volts)

b) Alternator 7542 G :
Output : 7.5 amperes at 1300 rpm engine speed (2700 rpm alternator speed at 13 volts)
24 amperes at 2900 rpm engine speed (6000 rpm alternator speed at 13 volts)

c) Alternators 7534 A - 7532 A - A 11 M 4 - A 11 M 6 :
Measure the output , while increasing engine speed and using the rheostat *to keep the voltage at 14 volts.*
Output : 6 amperes at 1050 rpm engine speed (1900 rpm alternator speed at 14 volts)
22 amperes at 2350 rpm engine speed (4200 rpm alternator speed at 14 volts)
28 amperes at 4450 rpm engine speed (8000 rpm alternator speed at 14 volts)

CHECKING A VOLTAGE REGULATOR TYPE 8347 or AYA 213



Connect the circuit shown above using an ammeter A, a voltmeter V and a rheostat or a combined voltmeter - ammeter - rheostat » instrument now available commercially.

Run the engine so that the alternator is turning at 5000 rpm, ie :
- 2400 rpm engine speed for vehicles fitted with alternators types : 7522 B - 7542 A - 7542 G
- 2800 rpm engine speed for vehicles fitted with alternators types : 7534 A - 7532 A - A 11 M 4 - A 11 M 6

Use the rheostat to obtain an output of 15 amperes.

Cut off the output by switching off the ignition for a very short time.

Wait until the engine has regained its speed, the voltmeter should then indicate a voltage between 14 and 14.6 volts at 20° C.

NOTE : This value depends on temperature. The voltage varies inversely with temperature by about 0.2 volt for every 10° C.

If the voltage measured is not within tolerance, the regulator is defective.

STARTER MOTORS

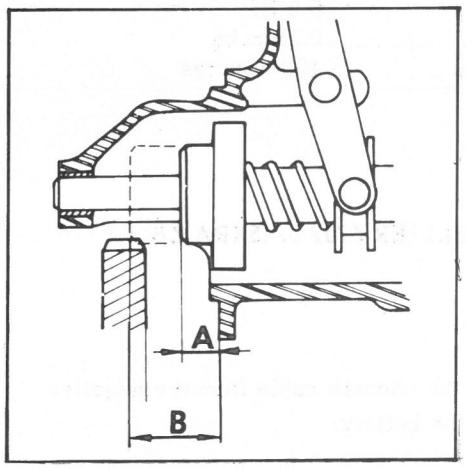
6 volts starter motor (operated by pull knob)

Make and type	minimum commutator diameter after skimming	Current taken		Fitted to vehicles
		of load	starting	
DUCELLIER 6112 A	31,5 mm	30 à 35 A	70 à 90 A	AZ → *2/1970* AK → *2/1966* AY → *3/1968*
PARIS-RHONE D 8 L 38	34,5 mm	30 à 35 A	70 à 90 A	
ISKRA-KRANJ ZC 4	32 mm	30 à 35 A	70 à 90 A	
DUCELLIER 6188 A	31,5 mm	30 à 35 A	70 à 90 A	AY *3/1968* → *2/1970*
PARIS-RHONE D 8 L 79	34,5 mm	30 à 35 A	70 à 90 A	

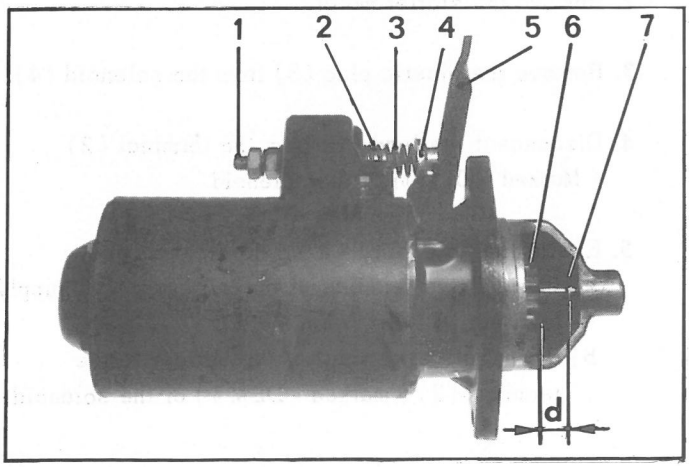
12 volt starter motors (operated by pull knob)

Make and type	minimum commutator diameter after skimming	Current taken		Fitted on vehicles
		off load	starting	
DUCELLIER 6134	31,5 mm	25 à 30 A	45 à 60 A	AY (12 volts) → *2/1970* AK *2/1970* → AYA 3 (Dyane 6)
PARIS-RHONE D 8 L 67	34,5 mm	25 à 30 A	45 à 60 A	
DUCELLIER 6174	30,5 mm	25 à 30 A	45 à 60 A	AZ (12 volts) → *2/1970* AYA2 (12 volts) *3/1968* → *2/1970* AYB → *9/1969* AY CA (Mehari) → *12/1971*
PARIS-RHONE D 8 L 80	34,5 mm	25 à 30 A	45 à 60 A	

Adjustment of operating lever :



6 Volts		12 Volts	
DUCELLIER	PARIS-RHONE	DUCELLIER	PARIS-RHONE
6112 6188	D 8 L 38 D 8 L 79	6134 6174	D 8 L 67 D 8 L 80
A = 19,7 mm B = 31,7 mm	A = 21 mm B = 31,7 mm	A = 19,7 mm B = 31,7 mm	A = 21 mm B = 31,7 mm



Adjusting the contacter on starter motor types 6134 D and D 8 L 67 :

1. Connect a 12 volts supply between the supply terminal (1) and the casing, *interposing a test lamp in series.*
2. Move the lever (5) until the lamp comes on. At this point, the front face of the driving gear (6) should be at a distance d 1 ± 0.2 mm from the thrust washer (7).
   NOTE : This thrust washer (7) has been fitted to this type of starter motor since January 1967.
3. If this condition is not satisfied, adjust the travel of the push rod (2) by turning the stud (4) of the lever (5).
   Compress the spring (3) to release the slot of the stud (4) from the lever (5).

12 volt starter motors with solenoid :

Make and type	Minimum commutator diameter after skimming	Current taken		Fitted to vehicles
		off load	starting	
DUCELLIER 6202 A-B	31 mm	30 à 40 A	150 A	AYB *9/1969* → AZ-AYA 2 *2/1970* → AY CB *2/1970* → AY CA *12/1971* →
PARIS-RHONE D 8 E 99	34,5 mm	30 à 40 A	150 A	
ISKRA ZB 4	31 mm	30 à 40 A	150 A	AZ T.T AY T.T *12/1971* →

CHECKING A STARTER MOTOR TYPE DUCELLIER 6202 or ISKRA ZB 4

1. Test on vehicle :

a) Confirm that the battery is properly charged and measure :
Current taken with driving gear prevented from turning ..... 280 amperes

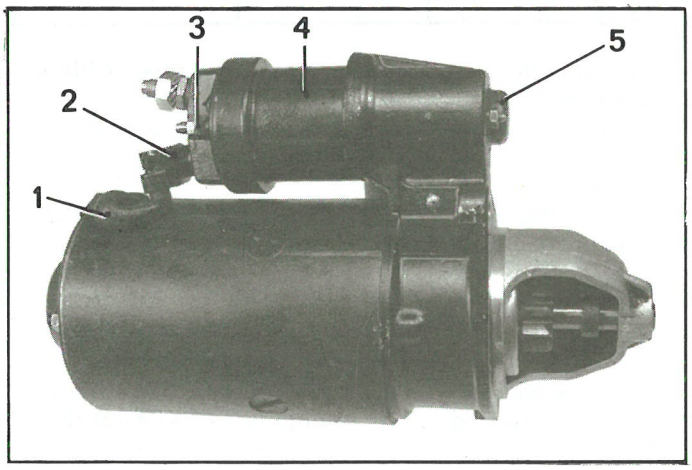
b) Remove the starter motor and measure :
Current taken off load ..... 30 to 40 amperes

2. Bench test :

a) Average torque at 1000 rpm ..... 0.4 m.kg
Current taken by this torque ..... 215 amperes

b) Maximum power ..... 0.8 HP
Torque corresponding to maximum power ..... 0.25 m.kg
Current taken by this torque ..... 150 amperes

ADJUSTING THE DRIVING GEAR OF A STARTER MOTOR TYPE DUCELLIER 6202 or ISKRA ZB 4



5351

1. Disconnect the chassis cable from the negative terminal of the battery.

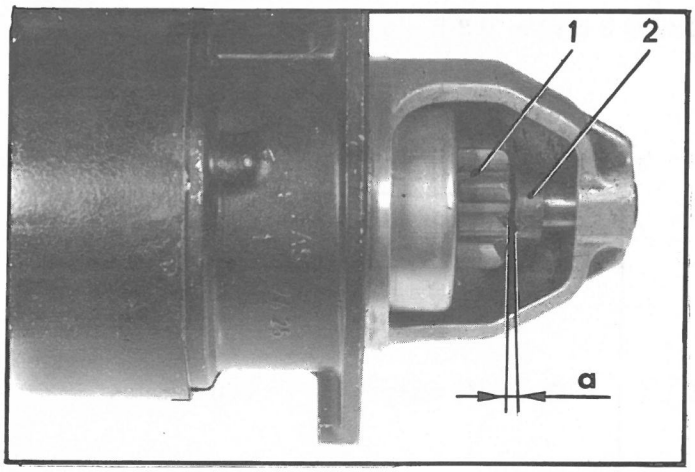
2. Remove the starter motor.

3. Remove the plastic plug (5) from the solenoïd (4).

4. Disconnect the lead (1) from the terminal (2) (Marked « DEM ») of the solenoïd.

5. Excite the solenoïd (4). To do this, connect :
a) the positive terminal of the battery to the supply terminal (3) of the solenoïd,
b) the negative terminal of the battery to the terminal (2) (marked « DEM ») of the solenoïd.

5370



The driving gear (1) is now advanced : measure the distance « a » between the end of the driving gear (1) and the thrust block (2).

This distance « a » should be 1 mm, otherwise, make it so using the adjusting screw (3).

6. Disconnect the battery from the solenoid. The drive gear (1) withdraws to its rest position. Measure the distance « b » between the flange of the starter motor which bears on the clutch housing and the end of the drive gear (1). *This distance « b » should be a maximum of 21 mm,* otherwise, the motor needs attention.

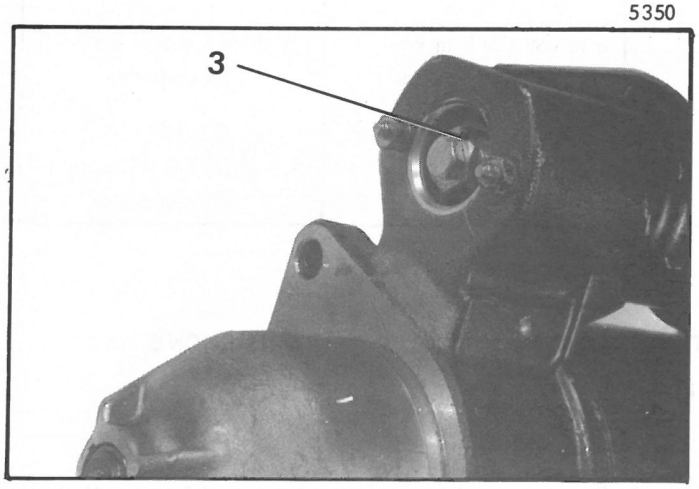
7. Connect the lead (4) from the windings to terminal (5) (marked « DEM ») of the solenoid (7).

8. Replace the plastic plug (8).

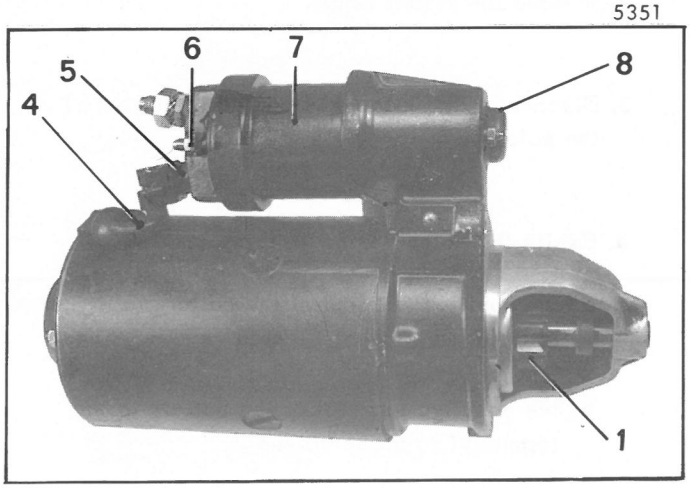
9. Install the starter motor on the vehicle.

10. Connect the chassis cable to the negative terminal of the battery.

5350



5351



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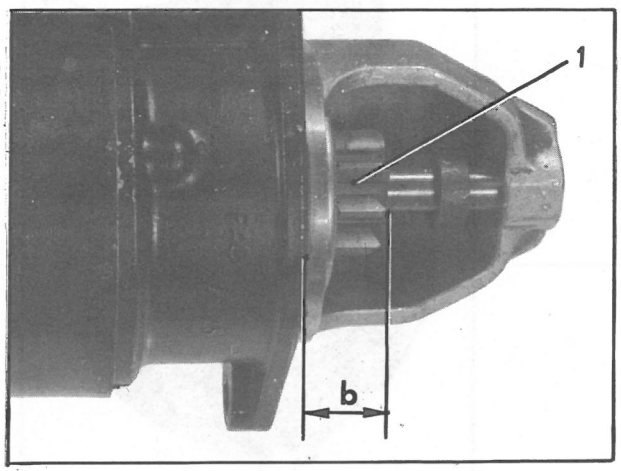
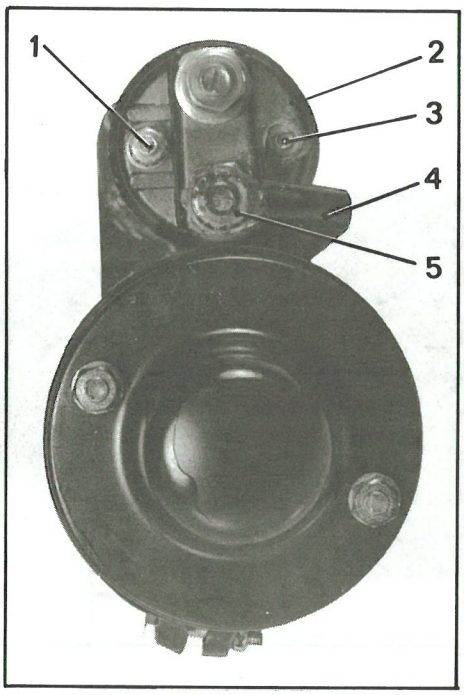


CHECKING A STARTER MOTOR TYPE PARIS-RHONE D 8 E 99 or D 8 E 116 *(from June 1972)*

	D 8 E 99	D 8 E 116
1. Test on vehicle :		
a) Check that the battery is properly charged and measure :		
- Current taken with driving gear prevented from rotating	330 to 340 amperes	360 amperes
b) Remove the starter motor and measure :		
- Current taken off load	30 to 40 amperes	30 to 40 amperes
2. Bench test :		
a) Average torque at 1000 rpm	6 mΛN (0.6 m.kg)	5 mΛN (0.5 m.kg)
- Current taken by this torque	220 amperes	220 amperes
b) Maximum power	1 HP	0.9 HP
- Torque corresponding to maximum power	3.8 mΛN (0.38 m.kg)	3.5 mΛN (0.35 m.kg)
- Current taken by this torque	180 amperes	175 amperes

ADJUSTING THE DRIVE GEAR OF A STARTER MOTOR TYPE PARIS-RHONE D 8 E 99 or D 8 E 116 WITH SOLENOID CONTACTER CED 402



1. Disconnect the chassis cable from the negative terminal of the battery.

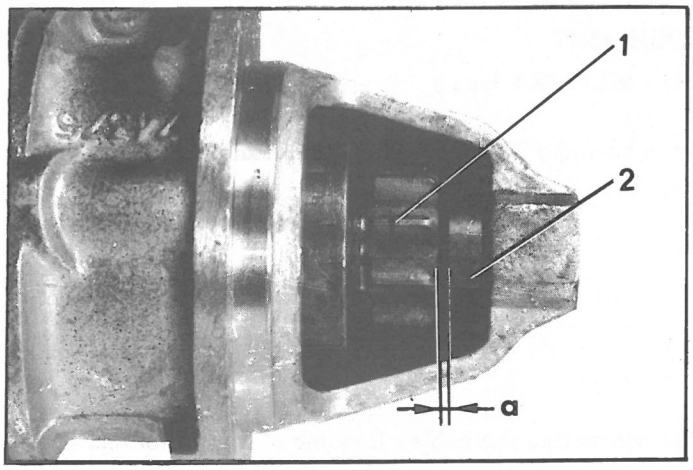
2. Remove the starter motor.

3. Disconnect the lead (4) from the terminal (5) of the solenoïd.

4. Excite the solenoïd. To do this, connect :

   a) the positive terminal of the battery to the supply terminal (1) of the solenoid,

   b) the negative terminal of the battery to the terminal (3) of the solenoid.



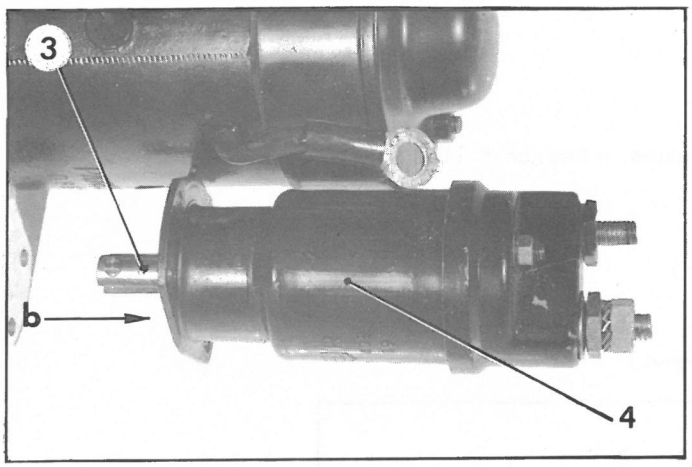
The drive gear (1) has now moved forward , measure the distance « a » between the end of the drive gear (1) and the thrust block (2).

This distance « a » should be 1 mm.

Otherwise :

- Disconnect the solenoid from the starter motor.
- Press in the cap of the spring (in the direction « b ») and hold the yoke (3). Screw this in or out on the solenoid spindle to obtain the distance « a ».
  If « a » > 1 mm : screw the yoke in.
  If « a » < 1 mm : screw the yoke out.
  (Operate in fractions of a turn).
- Couple the solenoid to the starter motor.

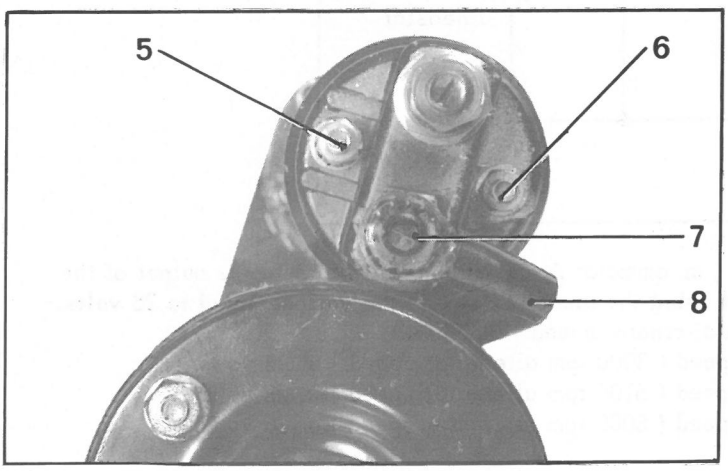
5. Disconnect the battery from terminals (5) and (6) of the solenoid.
The drive gear (1) moves back to its rest position.
Measure the distance « c » between the flange of the starter motor which bears on the clutch housing and the end of the drive gear (1).
This distance « c » should be 21 mm maximum (starter motor D 8 E 99) *or 21.57 mm* (starter motor D 8 E 116).
Otherwise, the starter motor needs attention.

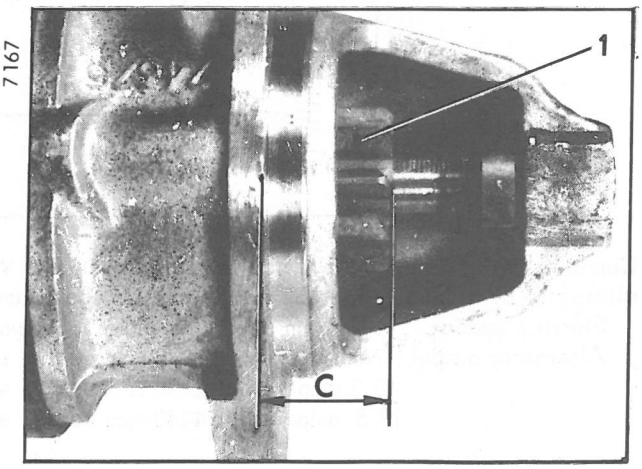


6. Connect the lead (8) from the windings to the terminal (7) of the solenoid (4).

7. Install the starter motor on the vehicle.

8. Connect the chassis cable to the negative terminal of the battery.





7167

24 volts EQUIPMENT
(Special MEHARI - MILITARY type)

This new vehicle differs from the standard version primarily in having a 24 volts system to operate special radio equipment (transceiver).

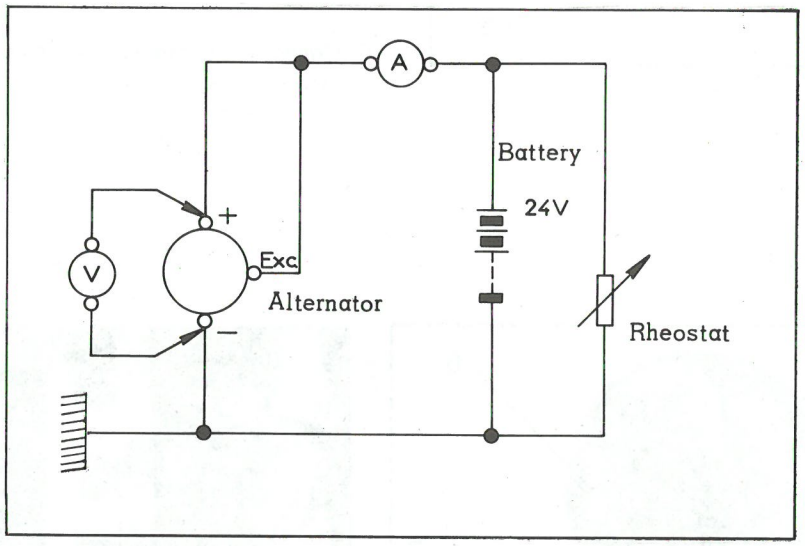
BATTERIES

Two 12 volts batteries connected in series :
Make : STECO 12 volts, 43 Ah (200/40 Ah)
Type : 2 HN military
Reference : 6140 - 14 - 238 - 9715
An ARELCO terminal is provided on the positive terminal for connecting the cables from the starter motor and the junction box.
Reference ARELCO : P 1 M 64
Tightening torque on upper nut : 3.5 mΛN (0.35 m.kg)
A battery switch type DUCELLIER Ro 80 A 1, reference 1034 A is fixed on the apron.
NOTE : One battery is located in the standard position. The other is located against the dashboard at the front passenger side, which requires to following parts to be fitted :
- a dashboard support,
- a modified dashboard (different glove box)
- a battery inspection plate
- a support and cover for this new battery.

ALTERNATOR

Single phase alternator type PARIS-RHONE 24 volt, 20 amperes, reference A 11 M 9.
Maximum power as from 8000 rpm : 580 watts
Resistance of windings : 21 ± 5 % Ω
Brushes : minimum worn length : 13 mm
Pressure of springs on new brushes : 2.85 ± 10 % newtons
Ratio alternator speed/engine speed = 1.8/1

CHECKING THE ALTERNATOR *(with batteries well charged)*



Connect up the circuit shown above with a voltmeter **V** , an ammeter **A** and a rheostat. Measure the output of the alternator by gradually increasing the engine speed and using the rheostat to keep **the voltage equal to 28 volts.**

Starting speed : 1030 rpm engine speed (1850 rpm alternator speed) at 28 volts
Alternator output : 7.5 amperes at 1670 rpm engine speed (3000 rpm alternator speed) at 28 volts
15.5 amperes at 2830 rpm engine speed (5100 rpm alternator speed) at 28 volts
18.5 amperes at 4440 rpm engine speed (8000 rpm alternator speed) at 28 volts

VOLTAGE REGULATOR

Electronic voltage regulator type PARIS-RHONE 24 volts, type L 21, reference ZL 210.

IMPORTANT NOTES :

It is essential to avoid certain wrong operations which can destroy the voltage regulator.

a) Make sure that the chassis lead is connected to the chassis shunt (fixing screw) of the regulator

b) Avoid connecting the excitation circuit to the chassis

c) Never interchange the leads connected to the « + » and « EXC » terminals of the regulator.

d) Never stop the engine by means of the battery switch

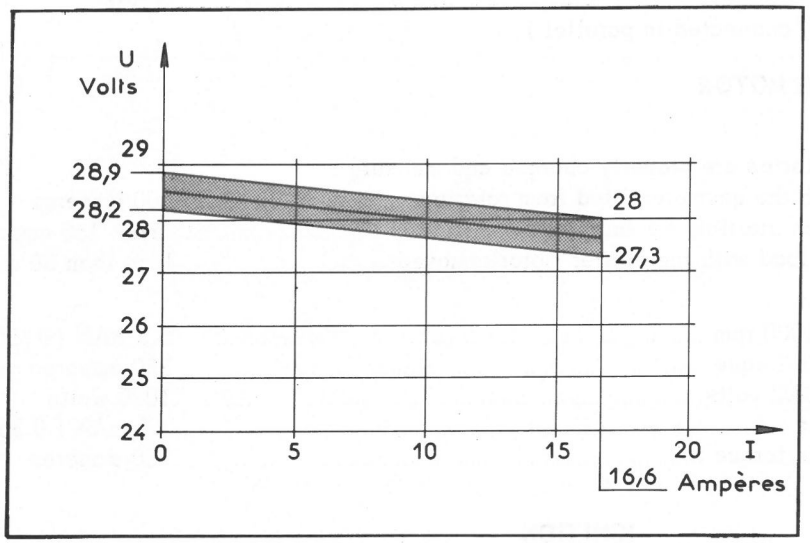
The battery switch should be turned off with the engine stopped.

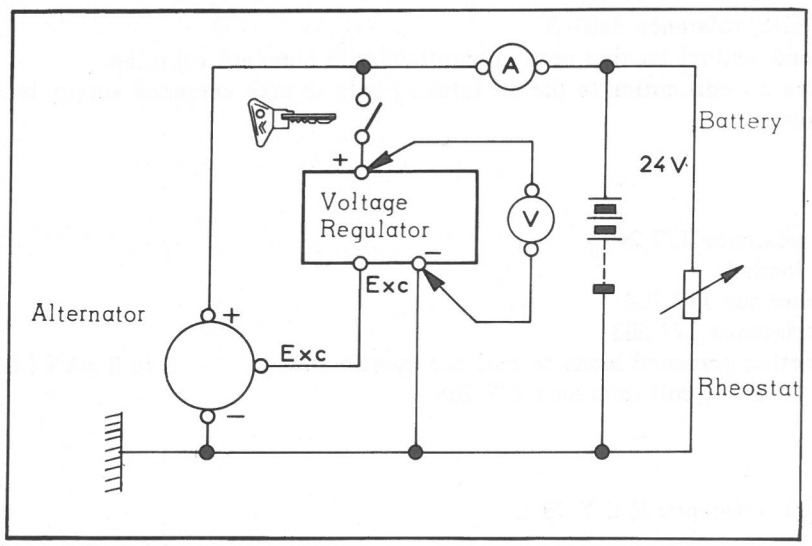
Testing the voltage regulator :

Connect up the circuit shown in the figure below using an ammeter **A,** a voltmeter **V** and a rheostat.

Run the engine at a speed of 3330 rpm (ie : 6000 rpm alternator speed).

Use the rheostat to increase the output of the alternator in progressive steps and read off the corresponding voltage. **Do not reduce the output during this operation.**





Take a number of measurements and compare them with the graph in the figure above. The results should fall within the shaded area, otherwise, the regulator is defective.

NOTE : The above curve is for measurements taken at a temperature of 20° C.

If the ambient temperature « t » is different, the readings on the graph must be modified.

The voltage correction to be applied is given by the formula :

$$U \text{ (volts)} = \frac{20° - t}{10} \times 0.18$$

STARTER MOTOR

Starter motor, solenoid operated with positive control, pre-engaged pinion type, PARIS RHONE 24 volts, reference D8E110
Brushes : minimum length, when worn ..... 7 mm
Resistance of windings ..... 0.034 Ω
Minimum diameter of commutator after skimming ..... 35.5 mm
Lateral play ..... 0.5 to 1 mm

Starter (adjustment)
With the starter motor removed from the engine, disconnect the windings supply lead from the solenoid. Excite the solenoid and measure the distance between the stop washer and the end of the drive gear. This should be 0.5 to 1.5 mm, otherwise, turn the solenoid adjustment screw.

Solenoid :
Resistance of pull-in coil ..... 1.16 Ω
(Heavy-gauge wire winding, connected in series with the starter motor field coils)
Resistance of hold-in coil ..... 3.5 Ω
(Light-gauge wire winding, connected in parallel)

CHECKING THE STARTER MOTOR

1°) Testing on vehicle :
Make sure that the batteries are properly charged and measure :
- the current taken with the gear prevented from rotating ..... 300 amperes
- the current taken when starting the engine ..... about 150 amperes at 20° C
- the current taken off load with the starter motor removed ..... less than 60 amperes

2°) Bench test :
a) minimum torque at 1000 rpm ..... 5.5 mΛN (0 :55 m.kg)
current taken by this torque ..... 220 amperes
b) minimum power at 20.2 volts ..... 1000 watts
corresponding torque ..... 3.5 mΛN (0.35 m.kg)
current taken by this torque ..... 180 amperes

IGNITION

CONTACT BREAKER

Screened DUCELLIER 24 volts, reference 4407 A.
Centrifugal advance curve and contact breaker setting identical with standard vehicles.
This contact breaker requires a modification to the air intake (hole to take screened supply lead to larger spark generator and cut-out eliminated).

IGNITION COIL

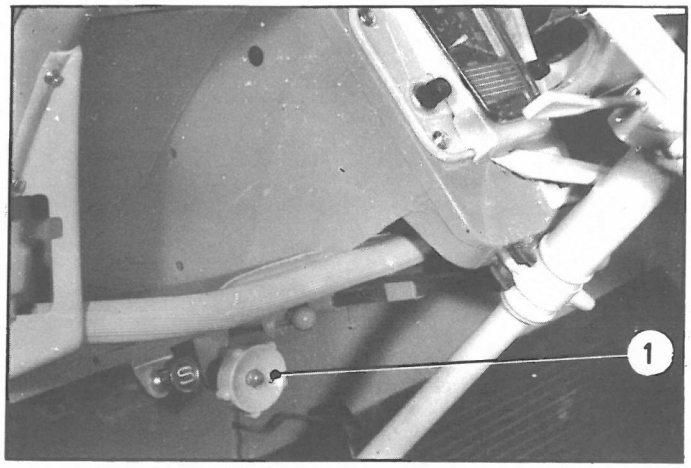
Screened A. B.G. 24 volts, reference 177 267.
Two high voltage screened leads :
- left-hand lead A. B. G. reference 177 264
- right-hand lead A. B. G. reference 177 263

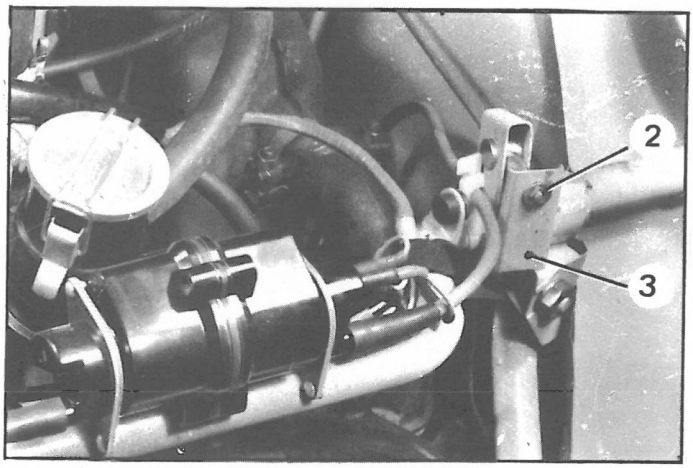
Tightening torque for connecting screened leads to coil and sparking plugs ..... 6 to 8 mΛN (0.6 to 0.8 m.kg)
Filter on primary circuit of A. B. G. coil reference 177 265

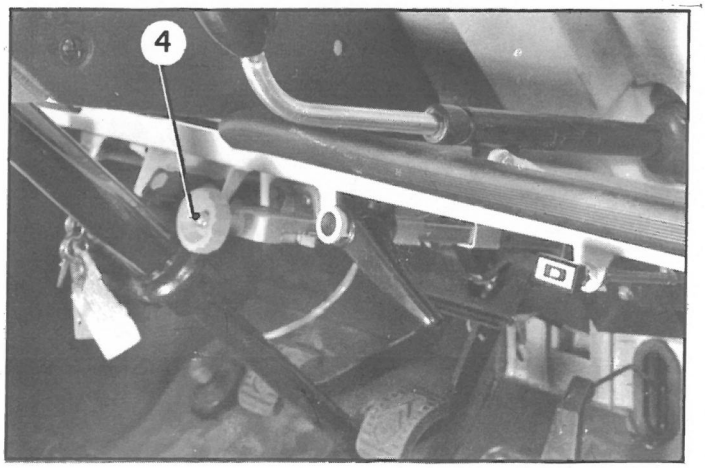
SPARKING PLUGS

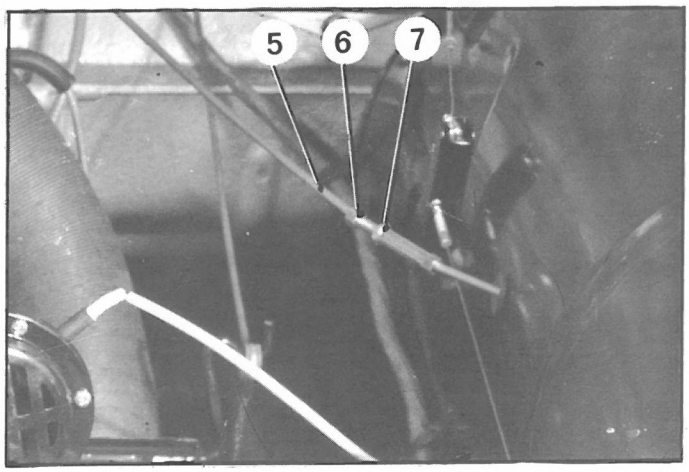
Two screened A. B. G. plugs, reference M C Y 78 L.
Electrode gap ..... 0.5 to 0.6 mm
Tightening torque, when cold ..... 20 to 25 mΛN (2 to 2.5 m.kg)

ADJUSTING HEADLIGHTS









Manual 812-1

NOTE : A manual control is provided for correcting the headlight setting according to the vehicle load. However it is necessary to carry out an initial adjustment of the headlights with the vehicle empty, in running order (with the tool kit, the spare wheel and with five litres of petrol in the tank).

A. VEHICLES OF TYPE AZ AND AK.

1. Check the lateral play in the manual control :

If necessary, insert washers (2) until the clearance between the adjustment shoe (3) of the headlight bar and the first washer is 0.5 mm.

2. Adjust the headlights :

a) Put the vehicle on flat horizontal ground.

b) Rotate the control knob (1) from left to right as far as it will go.
Turn the knob from right to left by two and a half turns.

c) With the tyre pressures and vehicle height correct, adjust the headlights using an instrument of the type :
« REGLOSCOPE » or « REGLOLUX ».
Check that the vehicle and the instrument are resting at the same level.

B. VEHICLES OF TYPE AY.

3. Adjust the flexible drives to each headlight :

a) Check that the flexible cables (5) are not kinked.

b) Rotate the manual control knob (4) as far as possible clockwise.

c) Adjust the headlight unit to the end of its travel.
To do this :
- Slacken the lock nut (7).
- Gradually unscrew the tensioner (6) until the headlight unit will move no further.
(Check that this operation has been carried out correctly by pressing on the top of the headlight unit).

4. Adjust the headlights :

a) Put the vehicle on flat horizontal ground.

b) Check that the manual control knob (4) is screwed in as far as possible.

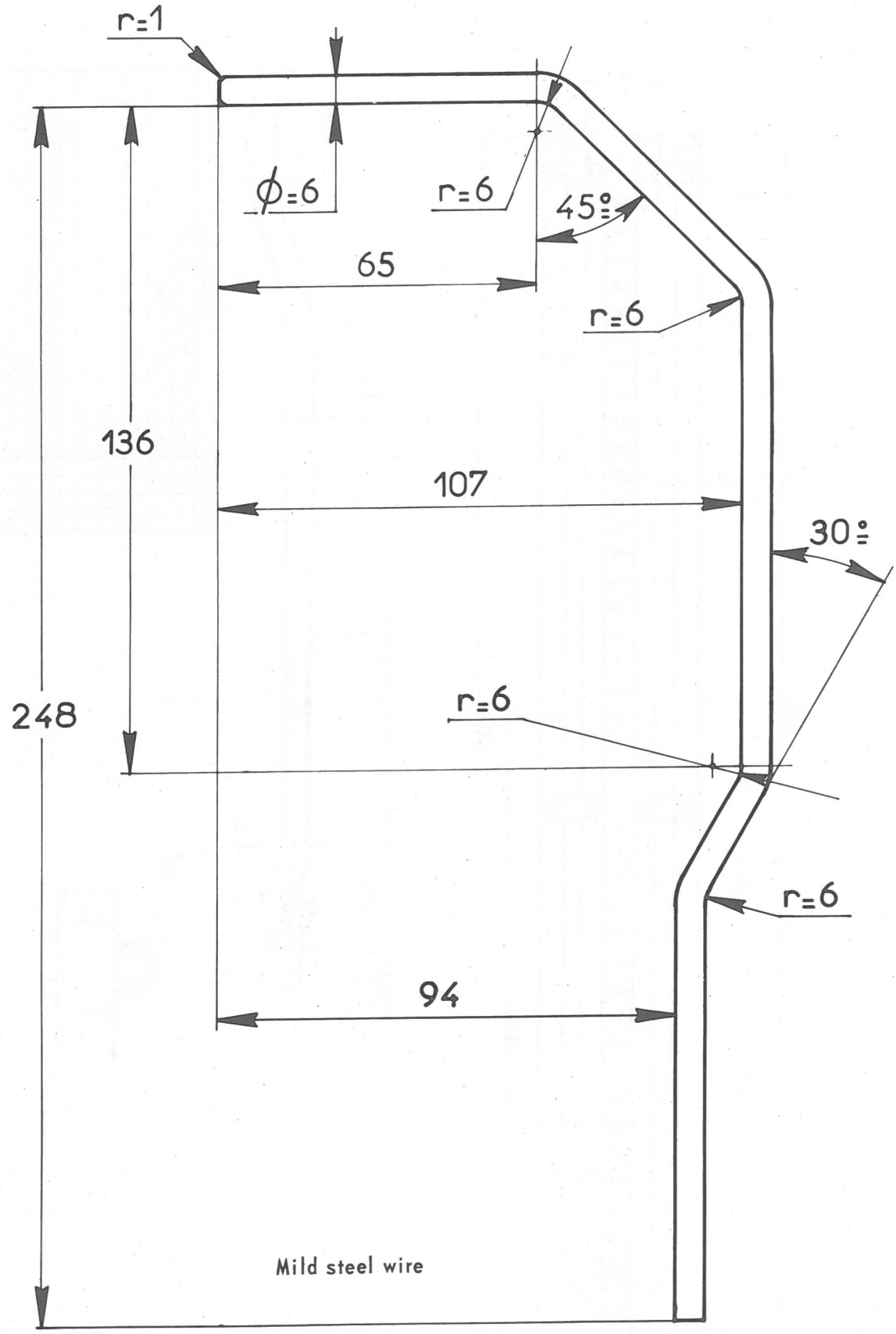
c) With the tyre pressures and vehicle height correct, adjust the headlights using an instrument of the type :
« REGLOSCOPE » or « REGLOLUX »

Make sure that the vehicle and the instrument are resting at the same level.

LIST OF SPECIAL TOOLS GIVEN IN VOLUME N° 1 OF MANUAL 812

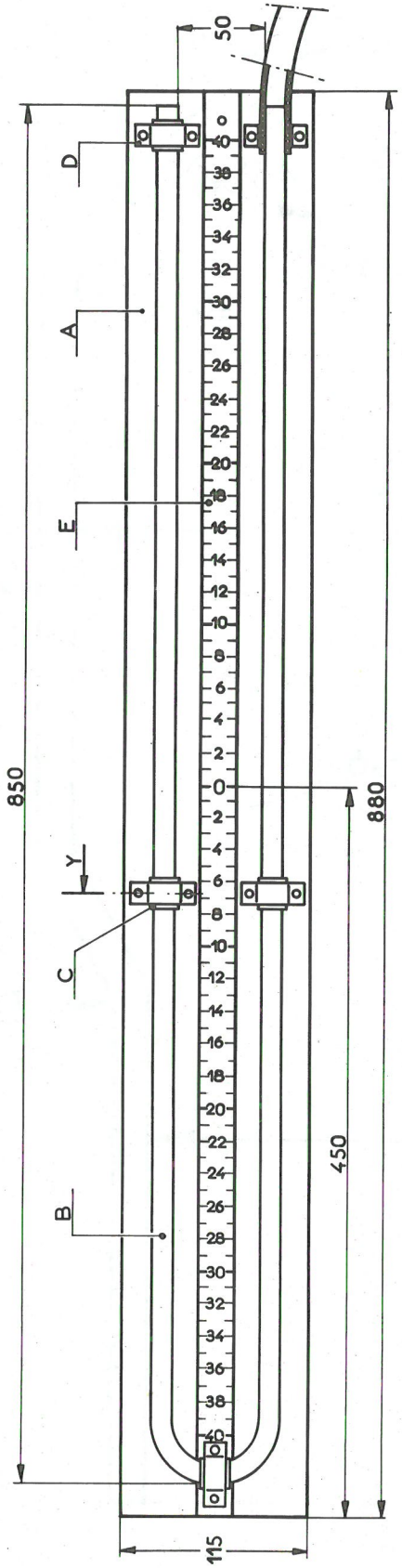
DESCRIPTION	NUMBERS Repairs - Methods Old	NUMBERS Repairs - Methods New	REFERENCE of tools sold
(2) ENGINE			
Gauge for static ignition setting		MR. 630-51/15	
Instrument for measuring petrol pressure			4005-T
Union for measuring engine oil pressure			3099-T
Pressure gauge (0 to 10 bars)			2279-T
Instrument for measuring the vacuum in the engine casing		MR. 630-56/9a	
Support for checking the alignment of the engine casing	MR. 3365-290	MR. 630-52/16	
Support for checking the alignment of the gearbox casing	MR. 3365-300	MR. 630-52/17	
Gauge pins (used with support MR. 630-52/17)	MR. 3365-304	MR. 630-52/17/4	
Dial gauge			2437-T
(4) GEARBOX			
Fork adjustment gauge (thickness = 1.5 mm)			1785-T
Fork adjustment gauge (thickness = 1.8 mm)			1786-T
Fork adjustment gauge (thickness = 2.7 mm)			3153-T
Clamp for holding locking spring for 2nd/3rd gear fork spindle		MR. 630-64/21	
Spanner for nuts coupling engine-gearbox assembly			1791-T
Spanner for bolts with flats (6 × 9 across flats)			1677-T
(7) (8) FRONT AND REAR AXLES			
Fixture for checking camber angle			2313-T
Struts for checking front and rear axles		MR. 630-51/9a	
Jig for checking axle arms	MR. 3745	MR. 630-51/46	
Instrument for checking parallelism of rear axle	MR. 3756-20/28	MR. 630-51/47	
(9) SUSPENSION			
Height gauge			2305-T
End fitting for height adjustment			3455-T or 3455-T bis
Key for adjustment end fitting			3456-T
(11) BRAKES			
Support for raising a vehicle	MR. 3300-70	MR. 630-41/3	

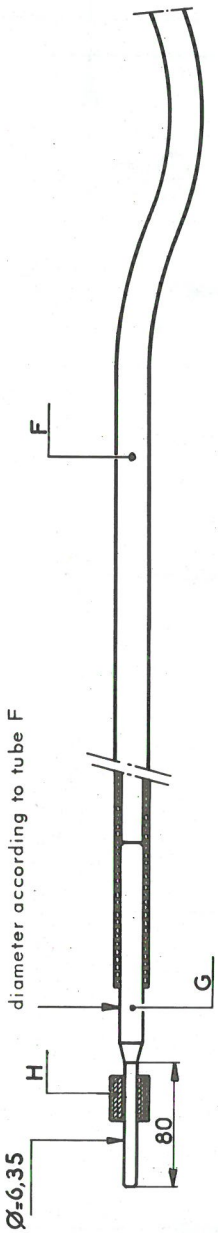
MR. 630-51/15

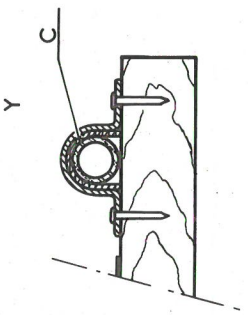


Developed length 340 mm

MR. 630-56/9 a



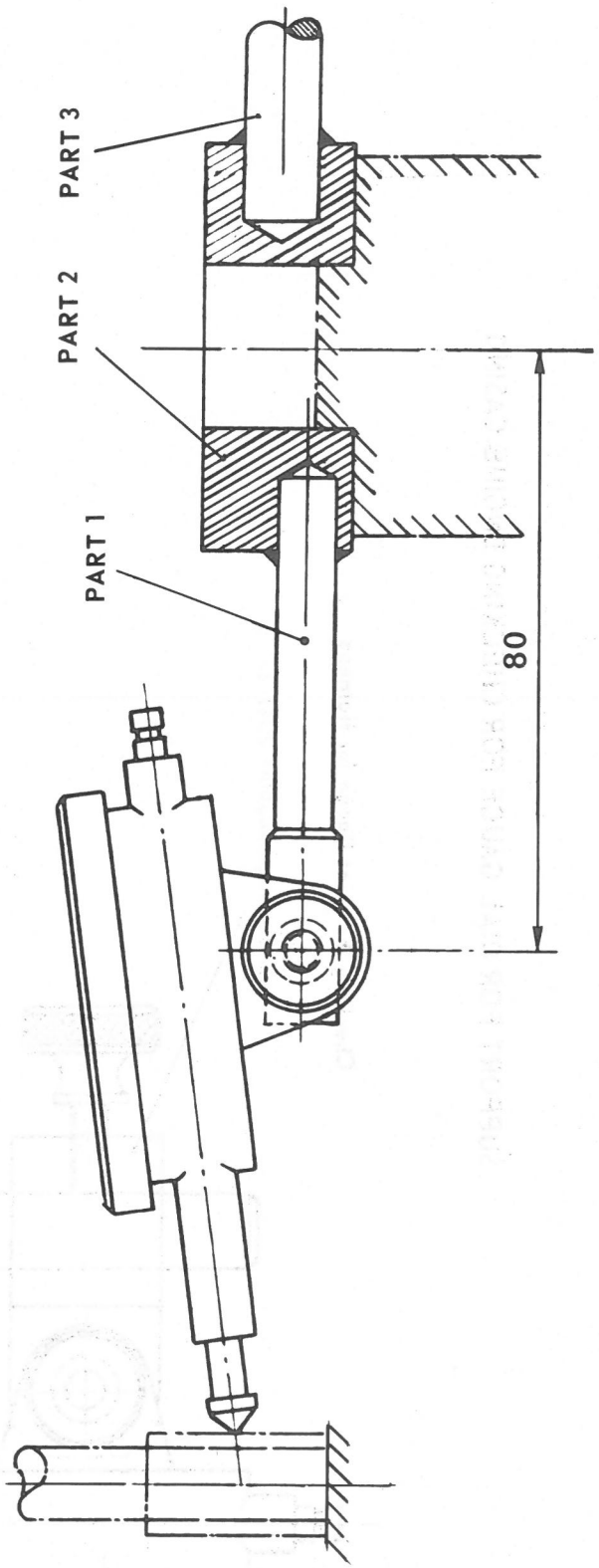




N°	Qty	Description
A	1	Back plate thickness 20 mm
B	1	Glass or plastic tube
C	4	Rubber sheath
D	5	Collar
E	1	Scale
F	1	Flexible tube according to diameter of B
G	1	Tubular end
H	1	Seal NN 394-87

MR.630-52/16
ex MR. 3365-290

Fig. 1



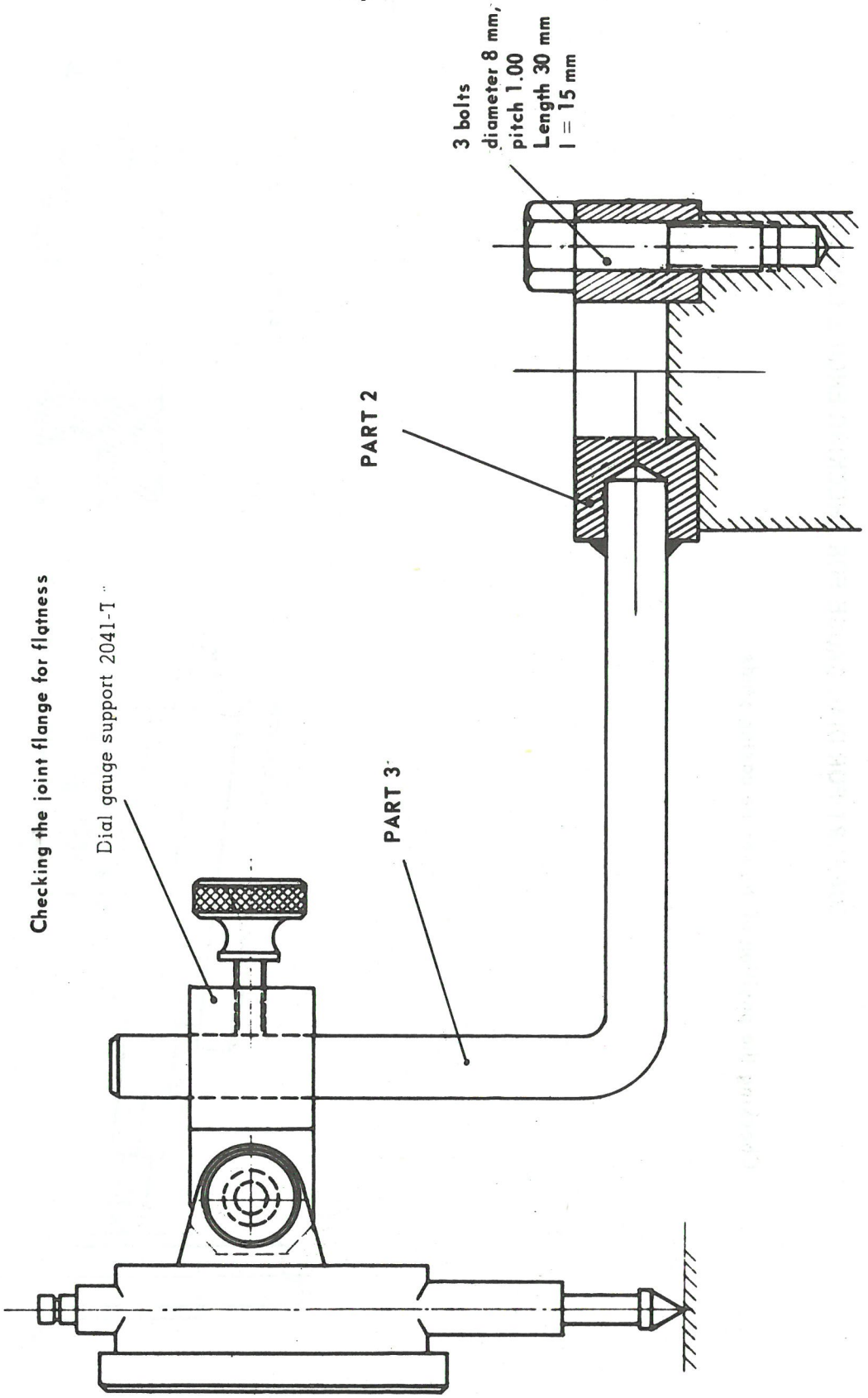
SUPPORT FOR DIAL GAUGE FOR CHECKING ENGINE CASING

Checking the position of the engine casing studs

Manual 812-1

MR. 630-52/16
ex MR. 3365-290

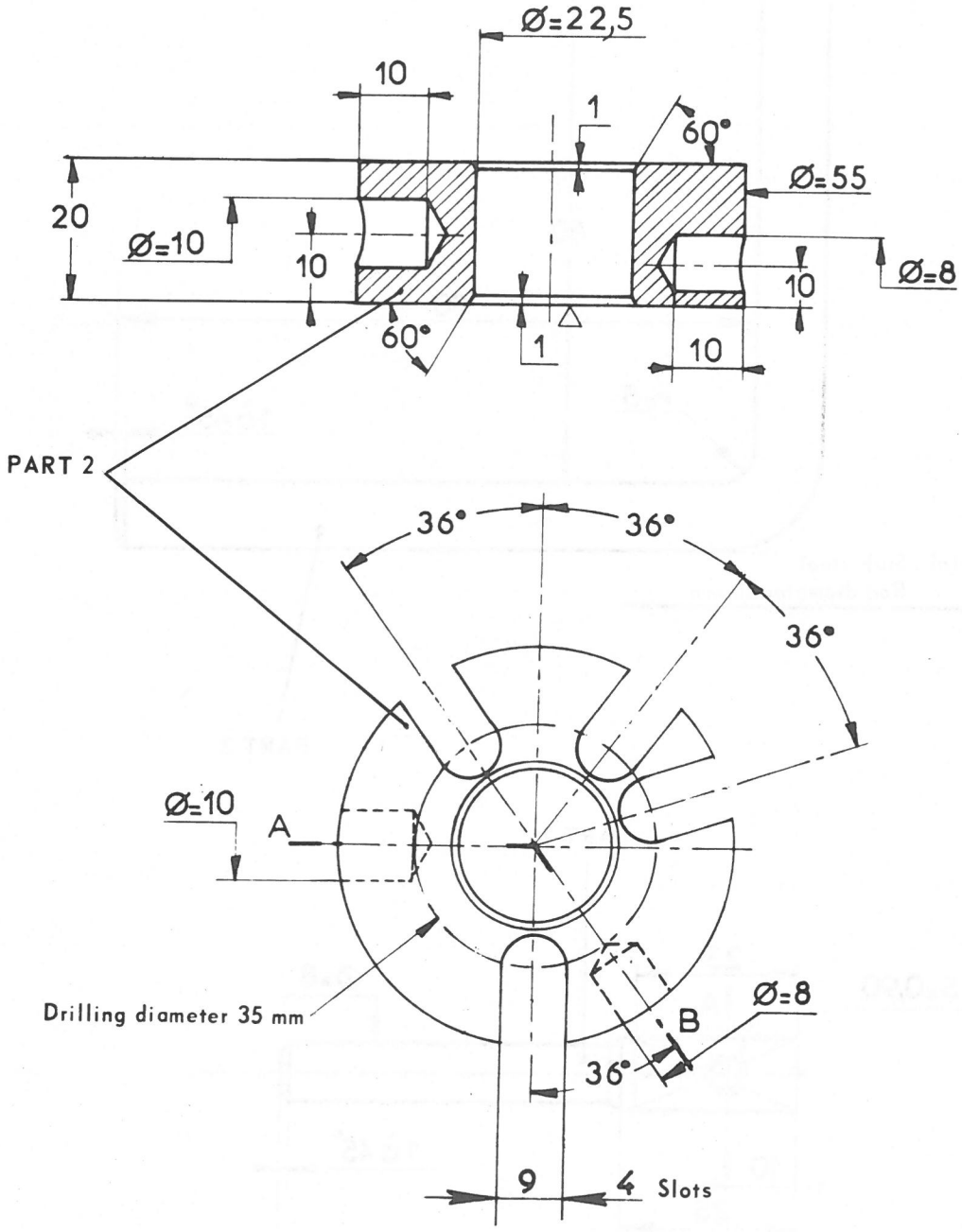
Fig. 2



MR. 630-52/16
ex MR.3365-290

Fig. 3

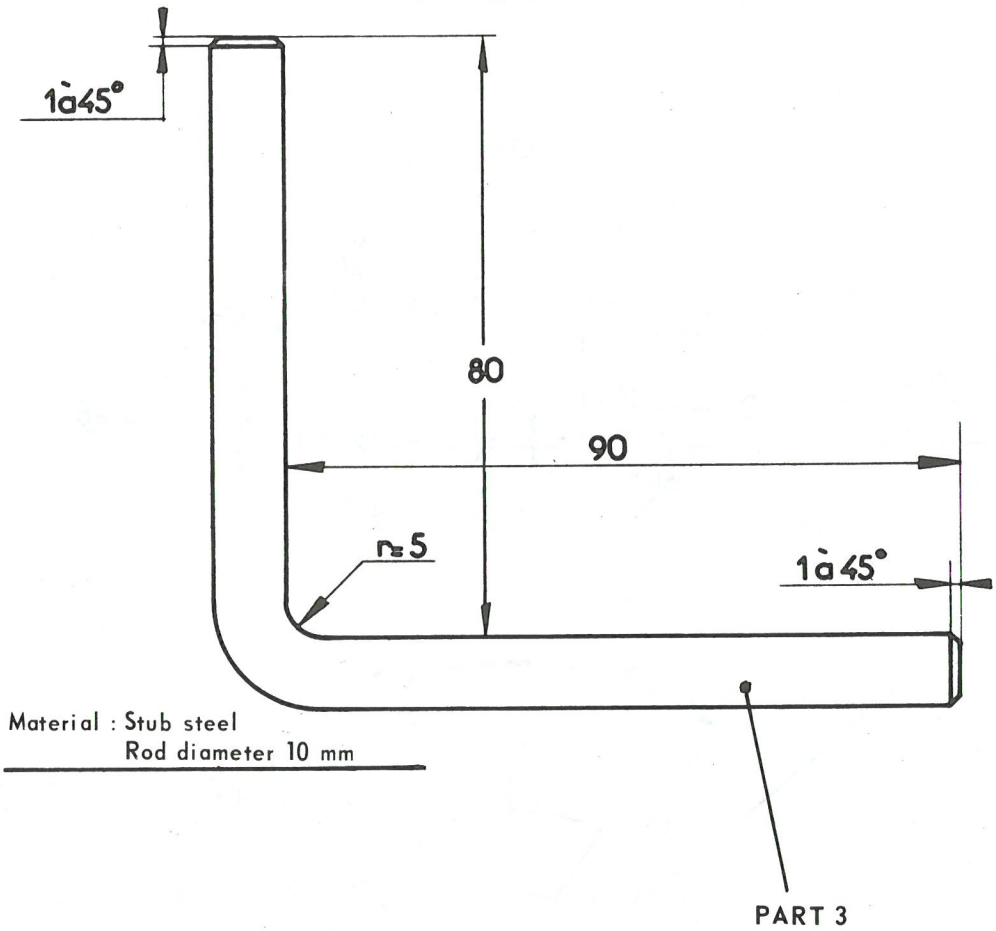
SECTION AB



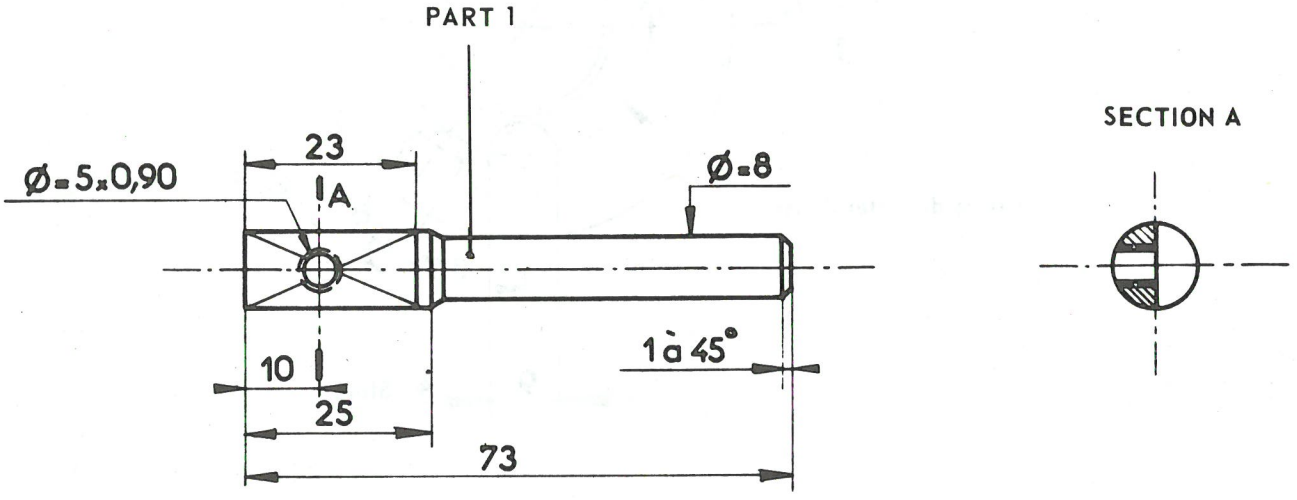
Material : semi-hard steel

MR. 630-52/ 16
ex MR. 3365-290

Fig. 4



Material : Stub steel
Rod diameter 10 mm



Material : Stub steel
Rod diameter 10 mm

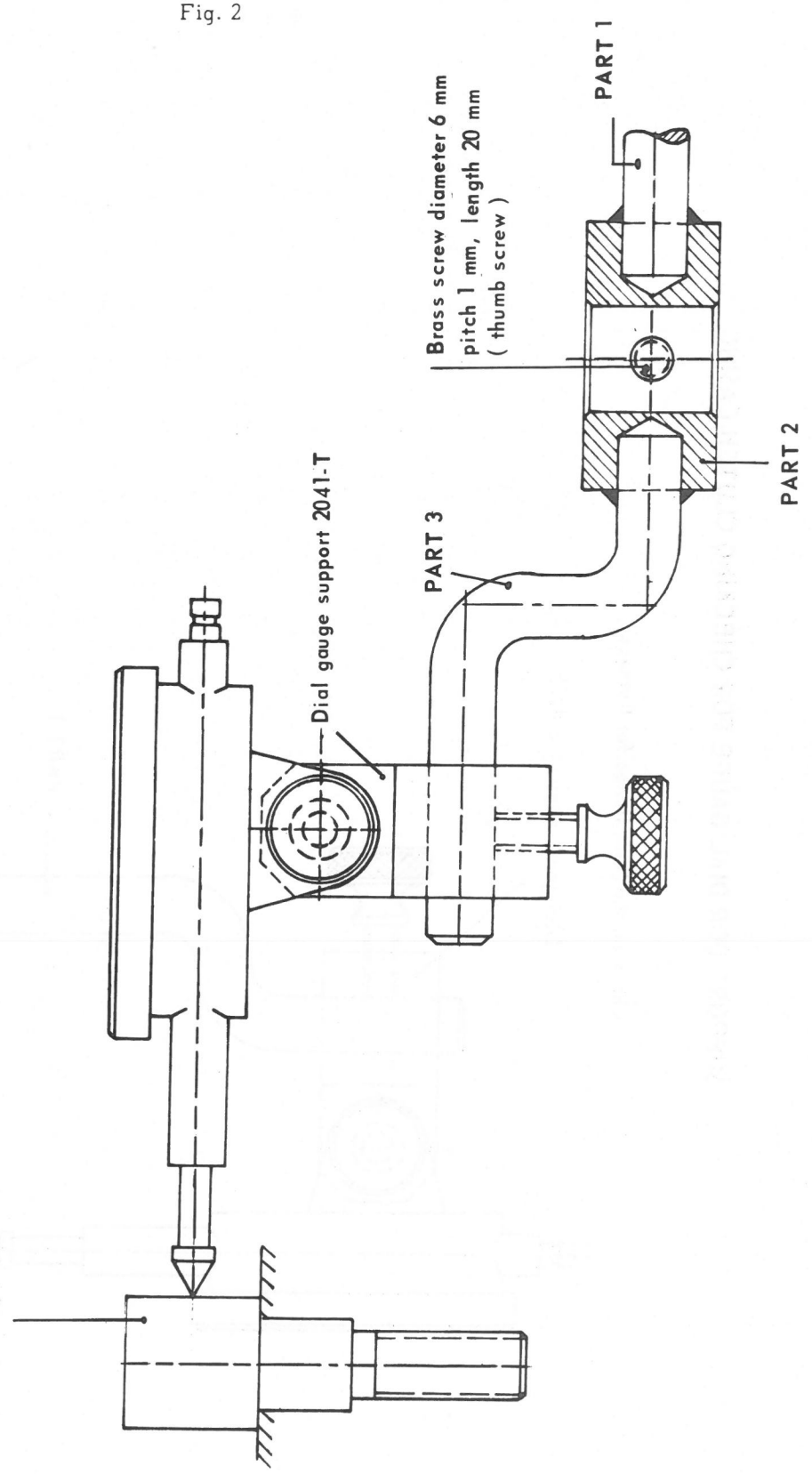
MR. 630-52/17

ex MR. 3365-300

Fig. 2

SUPPORT FOR DIAL GAUGE FOR CHECKING CLUTCH CASING

Checking the position of the bores for the centring dowels



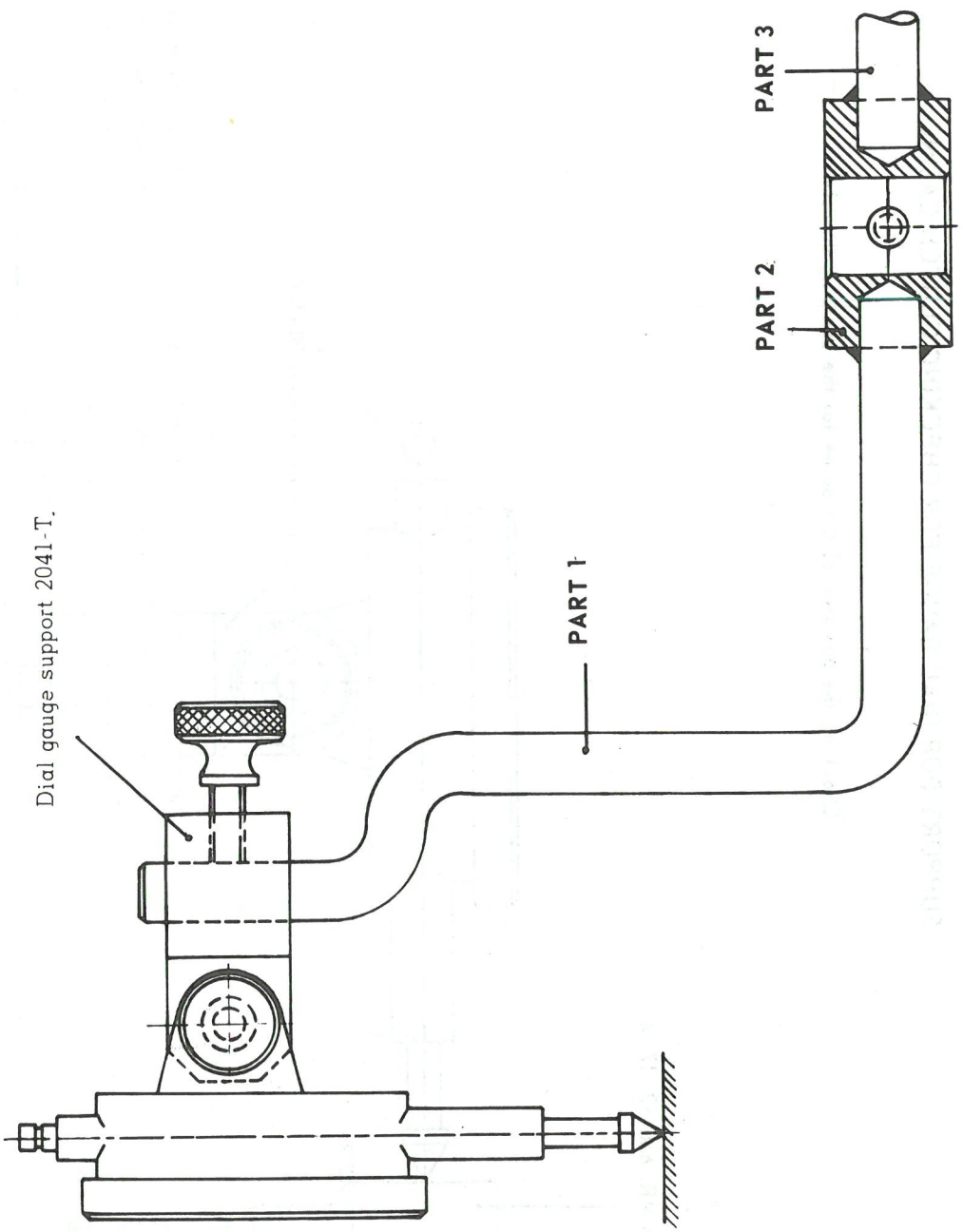
Manual 812-1

MR. 630-52/ 17
ex MR. 3365-300

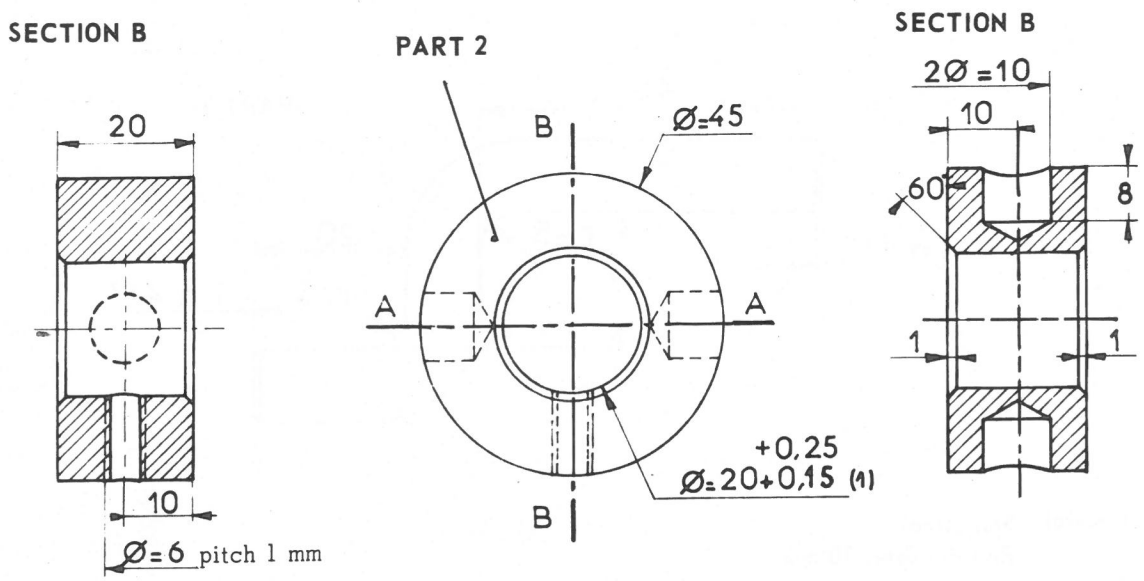
Fig. 1

SUPPORT DOR DIAL GAUGE FOR CHECKING CLUTCH CASING

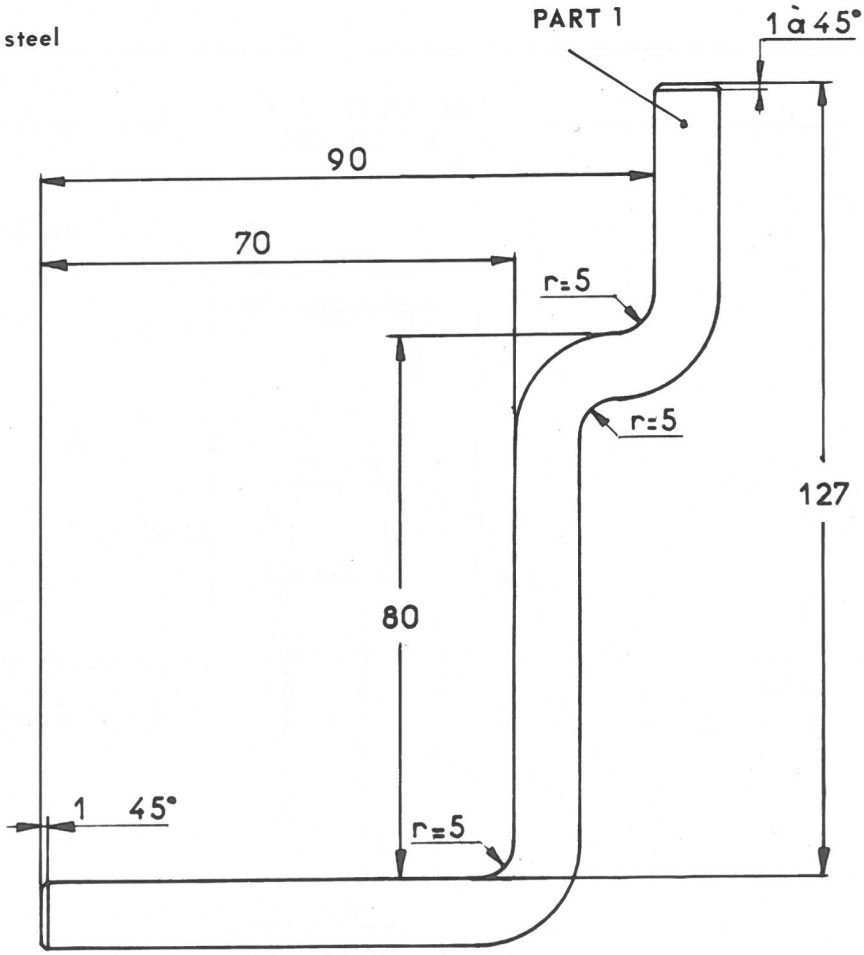
Checking the joint flange for flatness



MR.630-52/17
ex MR. 3365-300



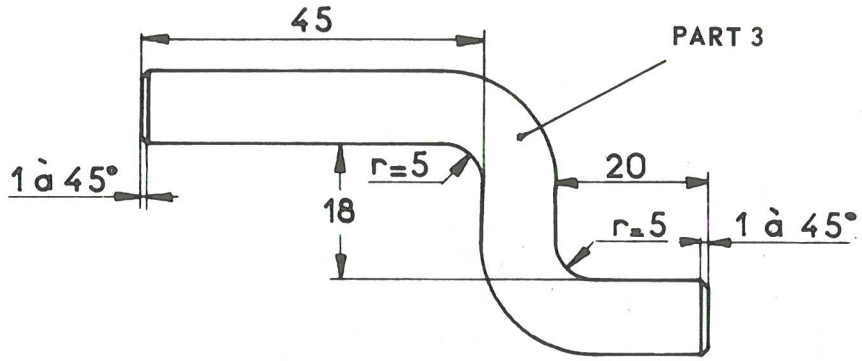
Material : semi-hard steel



Material : Stub steel
Rod diameter 10 mm

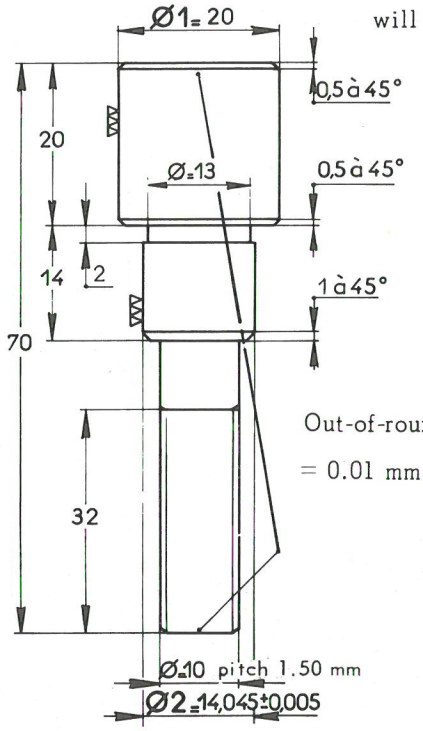
MR. 630-52/ 17
ex MR. 3365-300

Fig. 4



Material : Stub steel
Rod diameter 10 mm

MR. 630-52/ 17/ 4
ex MR. 3365-304



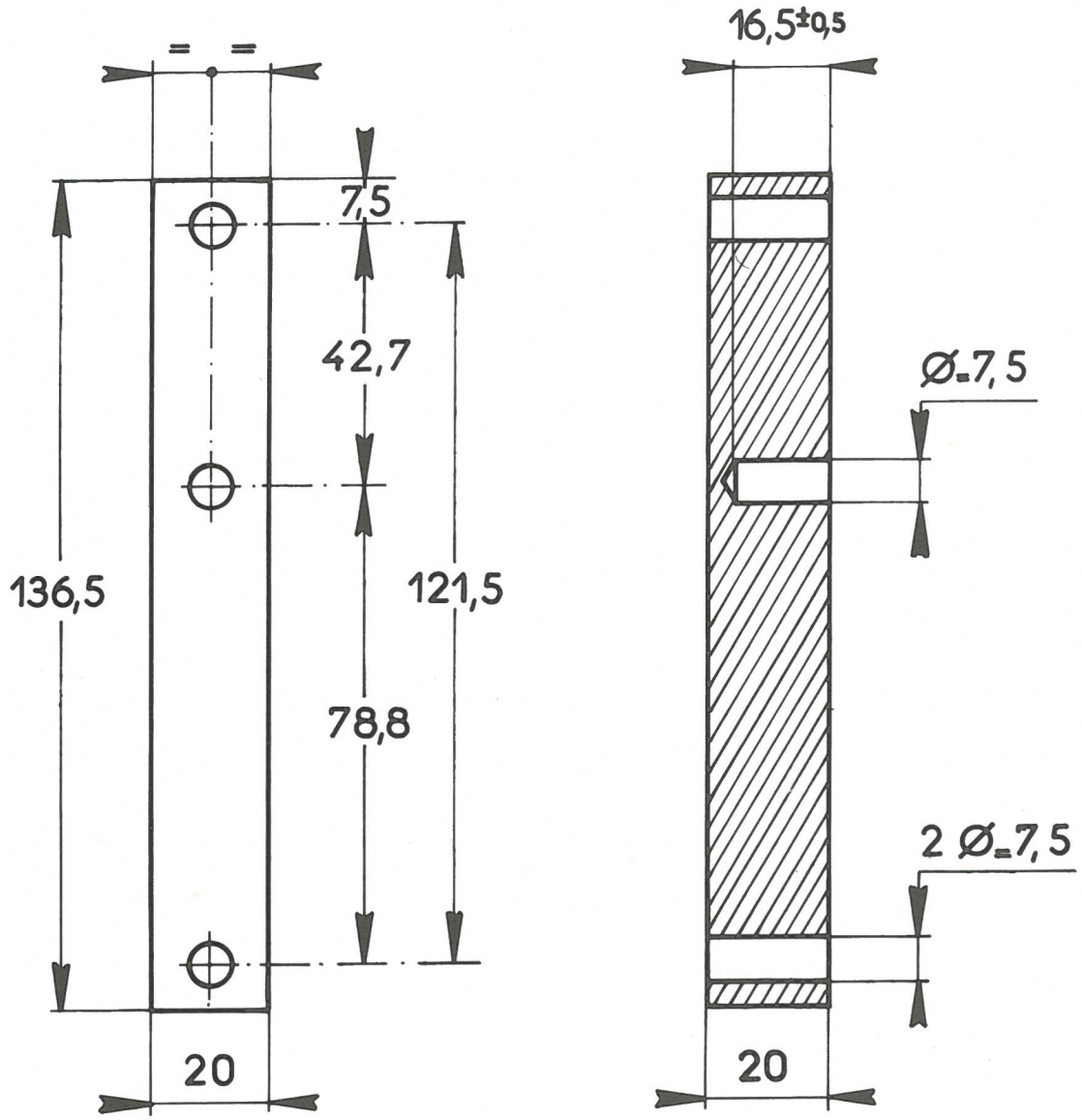
The 1 mm diameters of the 2 parts will be equal to within 0.01 mm

Out-of-round of diameter 1 and diameter 2 = 0.01 mm maximum

Semi-hard steel

2 parts

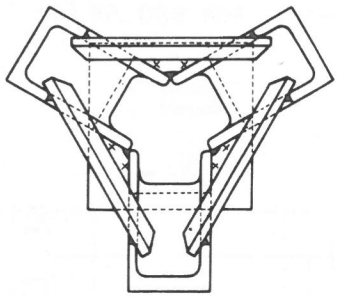
MR. 630-64/21



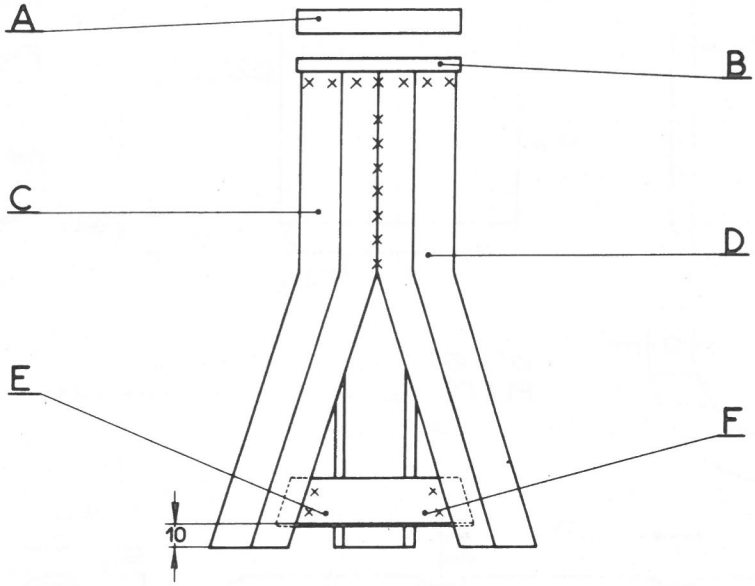
Material : Mild steel or other hard material

MR. 630.51/9a

Rear strut - B + C + E + plate A
Height - 284 ± 1 + 10 mm

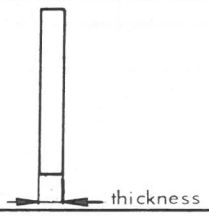


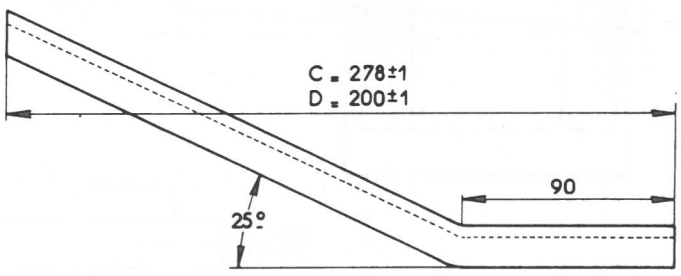
Front strut - B + D + F
Height - 206 ± 1 mm

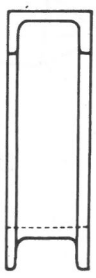


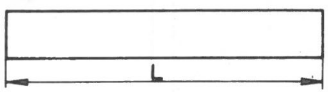
Ref	Qty	Material	Form
A	1	semi hard steel	70 · 70 thickness 10
B	1	Mild steel	70 · 70 thickness 6
		Rear plate	
C	3	U iron 35x17,5	Dev.length 298
		Front plate	
D	3	U iron 35x17,5	Dev. length 212
		Rear plate	
E	3	Flat bar 20x4	L.=135
F	3	Flat bar 20x4	L.=85

Diagram



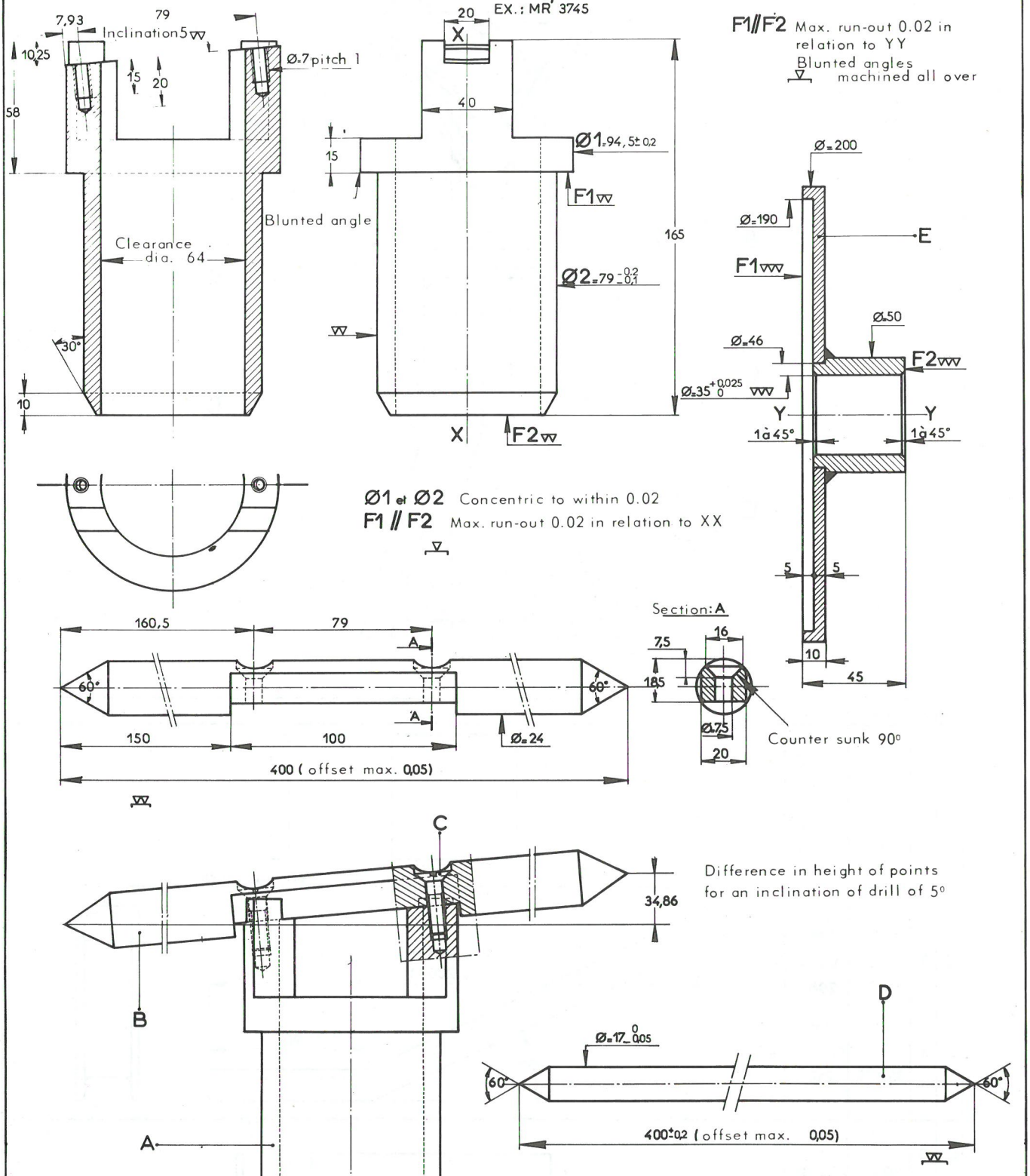






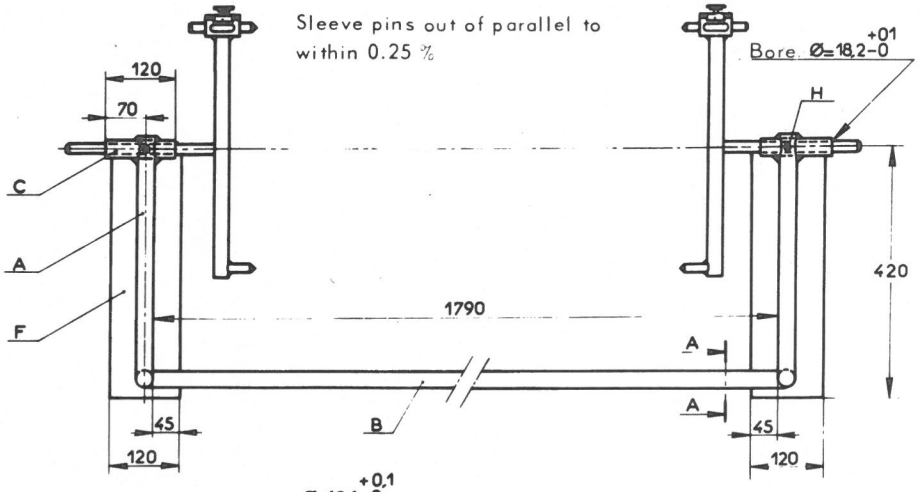
MR 630_51/46

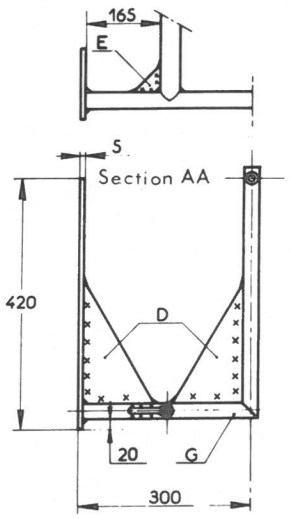
EX.: MR 3745

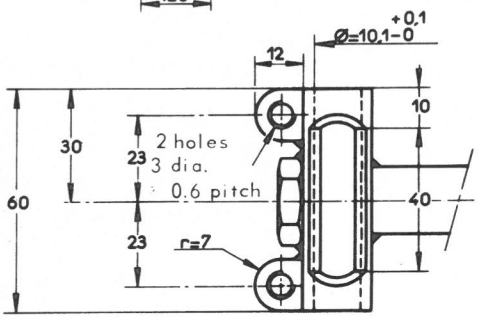


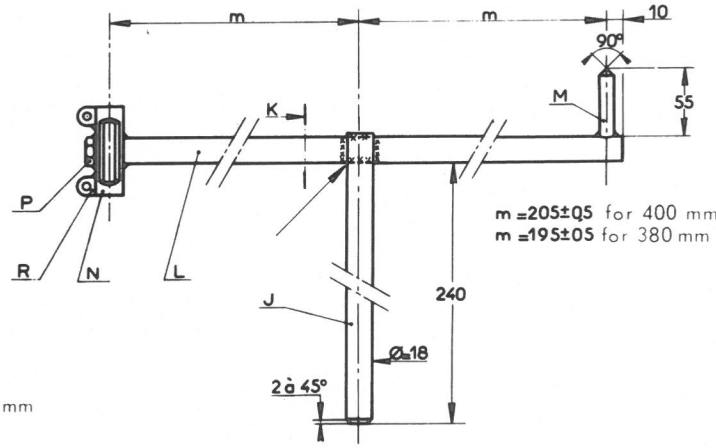
Ref	Description	Material	Qty.
A	Peg	semi-hard steel	1
B	Pin	semi-hard steel	1
C	Screw dia. 7mm pitch 1mm L. 25		2
D	Pin	semi-hard steel	1
E	Plate plate 10	semi-hard steel	1

MR 630-51/47
ex : MR 3756-20

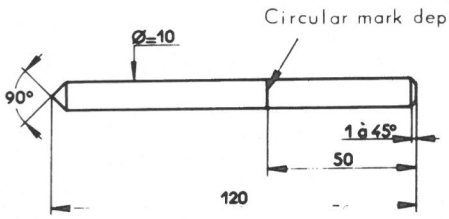






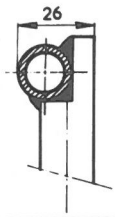


m =205±0,5 for 400 mm wheels
m =195±0,5 for 380 mm wheels

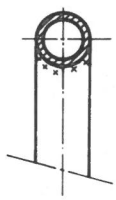


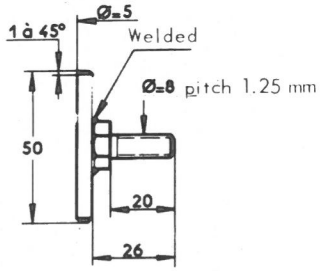
Stub Ø=10

Section K for 380 mm wheels

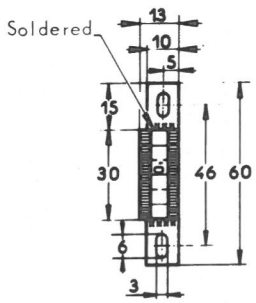


Section K for 400 mm wheels





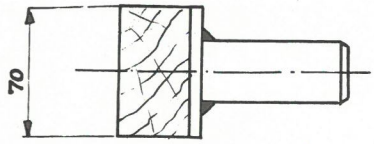
Drawn dia. 5 mm, semi-hard steel

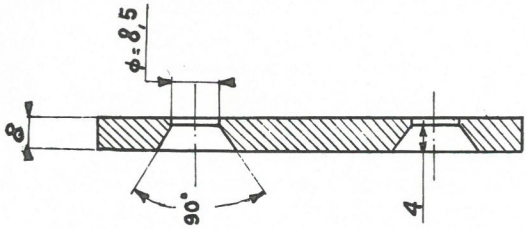


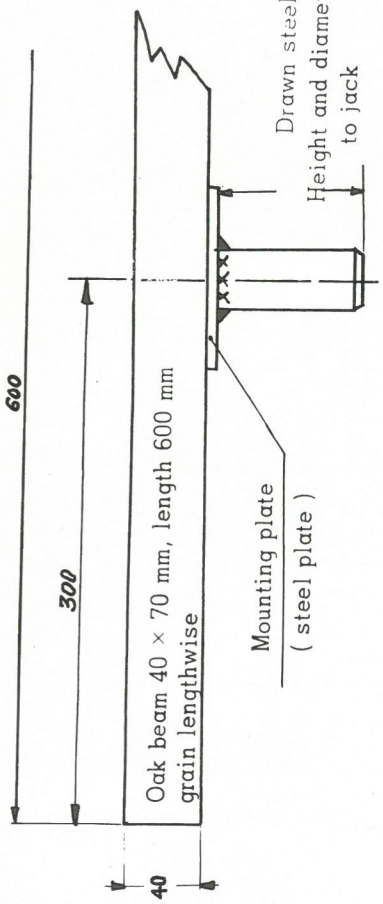
Thickness of rule 0.5

Ref	Description	Material	Qty.
A	Fork support length =420	Tube Ø=26x30	2
B	Spacer length =1820	Tube Ø=26x30	1
C	Sleeve length = 140	Tube Ø=18x26	2
D	Bracket 200 x 120	5 mm plate	4
E	Bracket 50 x 50	5 mm plate	2
F	Stiffener, length 420 width 120	5 mm plate	2
G	Foot length =310	Tube Ø=26x30	2
H	Nut dia.8mm, pitch 1.25, h 6		2
J	Rod welded on L	Semi-hard steel	4
L	Support bar	Tube Ø=13x18	4
M	Fixed gauge	Stub Ø=10	4
N	Vernier	Tube Ø=10x18	4
P	Nut dia.8mm, pitch 1.25, h 6		4
R	Lugs	plate =3	8

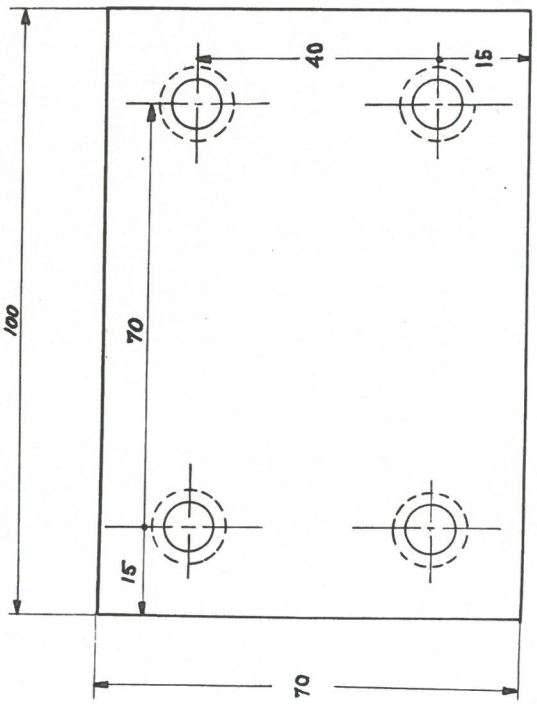
MR. 630 , 41 / 3
ex MR. 3300 -70







Detail of plate



Fixed by 4 flat head screws, diameter 8 mm, length 40 mm

Manual 812-1