BRAKES

SUMMARY

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— The brakes are the principal safety component in a vehicle.

— A failure of any part of the brake system could result in extremely serious consequences.

Therefore, any work on the brake system must be done under conditions of maximum cleanliness, following to the letter, the relevant instructions with particular reference to :
- periodical maintenance
- the stipulated methods
- material specified.

IMPORTANT - Following the fitting of new parts (pads and/or linings, discs, drums), it is essential that the customer be avised to "bed-in" the brakes, since immediate full application could result in subsequent instability.

Brake fluid

— Brake fluids must satisfy severe conditions in service :
- boiling point (ability to withstand high temperatures - severe braking)
- freezing point (low Winter temperatures in cold countries)
- chemically inert (inhibitors prevent corrosion of metals and the attack of joints and seals).

For this reason use only :

Lockheed 55
Nafic FN3
Peugeot
which can be mixed in any proportion.

— Brake fluids are hygroscopic, and any water absorbed can alter subsequently the boiling and freezing points.

— After a period of time the inhibitors, incorporated in the fluid, will deteriorate.

Therefore :
- Store in full air-tight containers in a dry atmosphere,
- protect them, as far as possible, from shaking,
- replace fluids at the stipulated intervals.

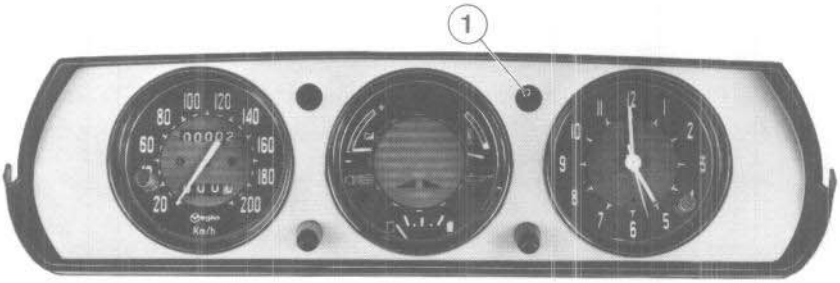
— Brake fluid will attack some chemical compositions, in particular, paint work and some rubber compounds.

Therefore :
- prevent spilling and splashing.
- protect parts which could be affected (clutch, engine mountings etc...) when bleeding, draining and refilling.

IMPORTANT - If the warning light **(1)** is "ON", check.

1 - the level of the brake fluid,

2 - thickness of brake pads.



EVERY 3.000 miles (5 000 km)

– Check thickness of pads. When this is reduced to 2.5 m/m all 4 - pads, on an axle, MUST be replaced.

EVERY 6.000 miles (10 000 km)

– Adjust rear brakes (long models)

– Check and final adjust, handbrake.

EVERY 12.000 miles (20.000 km) (504 with rear drum brakes)

– Dust out drum and shoes.

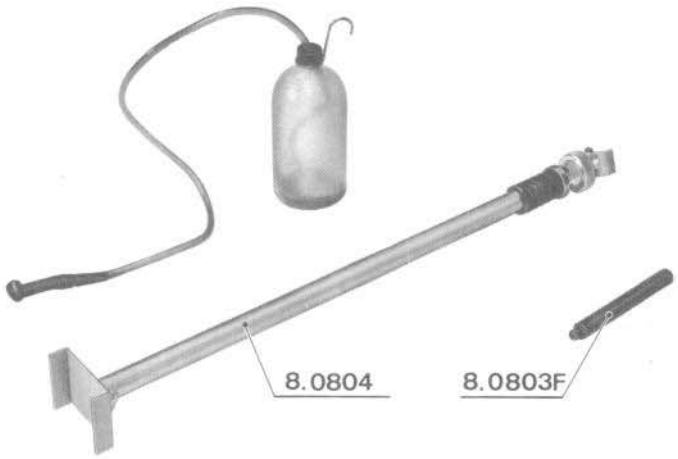
– Check wheel cylinders for security and leak-proof.

EVERY 25.000 miles (40 000 km), or every 2 years when the vehicle is used unfrequently,

– Replace brake fluid with,

Lockheed 55
Nafic FN3
Peugeot
which can be mixed in any proportion.

www.504.org



TOOLS REQUIRED

8.0803 F

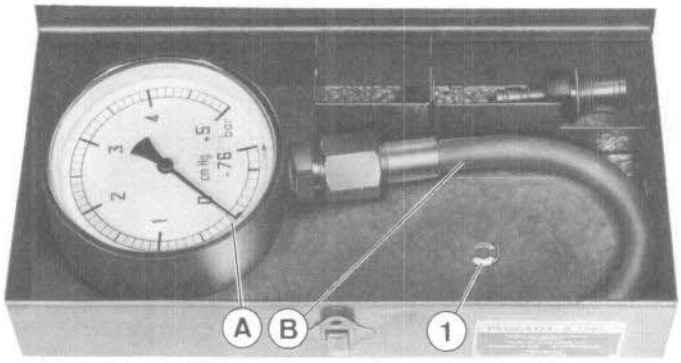
– Rod for plugging master-cylinder.

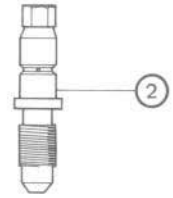
8.0804

– Fixture for depressing brake pedal.

– an 18" (40 cm) length of transparent flexible hose.

– a transparent vessel.





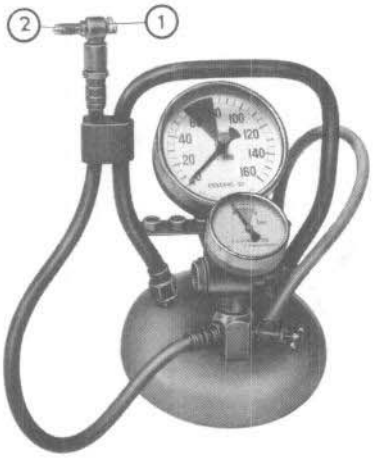
8.1503

– Kit for checking pressures and pressure-drop.

A - pressure gauge.

B - union.

1 - security clip for use with union **(2)** P.D. 9787.07.



RECOMMENDED TOOLING

– Testarc 50 apparatus for measuring low pressure, and high pressure with.

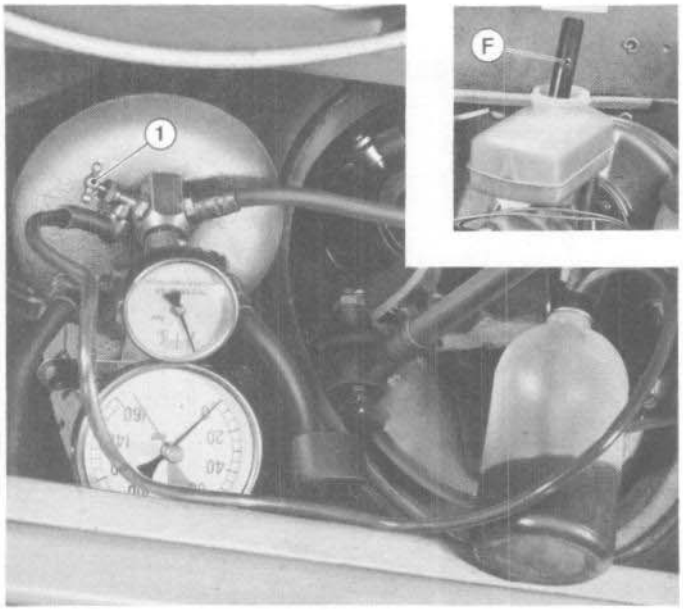
1 - security clip.

2 - union P.D. 9787.07.

WARNING - Never use a pressure gauge which has been used for any purpose other than the testing of the brakes hydraulic system.

BRAKES

PRESSURE TESTING



HYDRAULIC SYSTEM LEAKS

System bled and brakes correctly adjusted

I - HIGH PRESSURE TEST

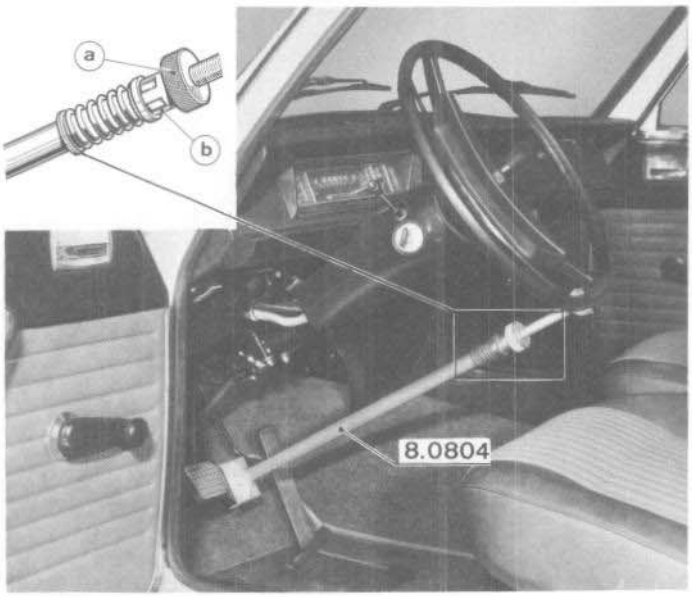
– Plug the master-cylinder inlet. (plug F).

– **Connect-up Testarc 50 gauge to a front bleed hole.**

– Remove plug **(F).**

– Bleed pressure gauge **(1)** when in the position illustrated.

– **With engine stopped "release" servo-unit.** (by five applications of the brake pedal).



– **504 with dual circuit master-cylinder :**

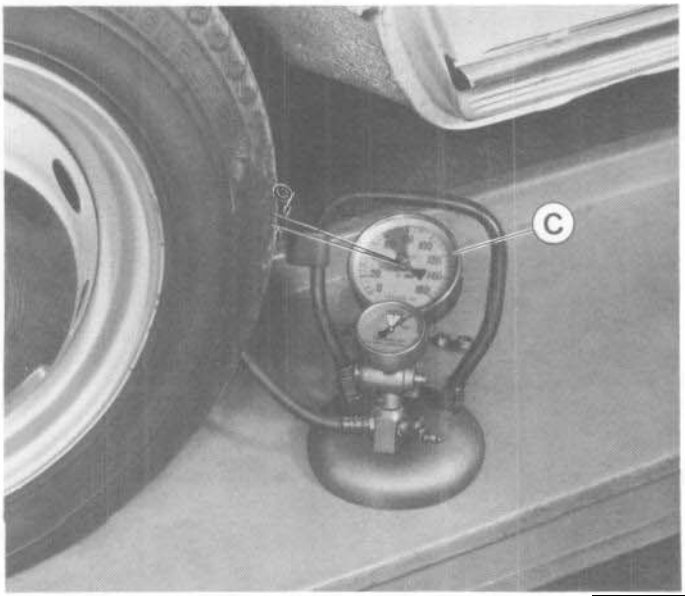
- release a rear bleed screw (the tube should be immersed in the fluid in the receiving vessel).

– Install brake depressing fixture.

– Screw the knurled nut **(a)** until the slots **(b)** are obscured and then continue screwing a further 10 turns.

– Wait a few movements to allow circuit to stabilise.

– Unscrew the nut **(a)** until the slots are just visible.

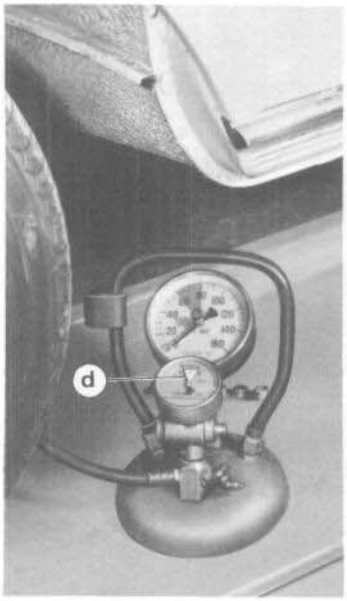


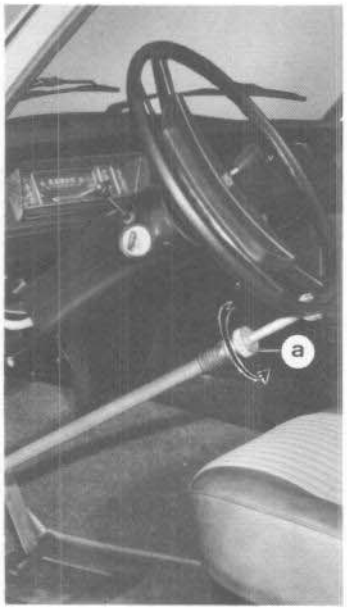
– Align the two 2 needles of the H.P. gauge **(c).**

There should be no fall in pressure after an interval of 15 minutes. If there is, then there is a leak. Trace, rectify and re-test.

NOTE - *A leak through the main cup of the master-cylinder will not be indicated by a fall in fluid level or by traces of fluid on the outside.*

Some leaks through cups and seals only show at low pressure.





II - LOW PRESSURE TESTING

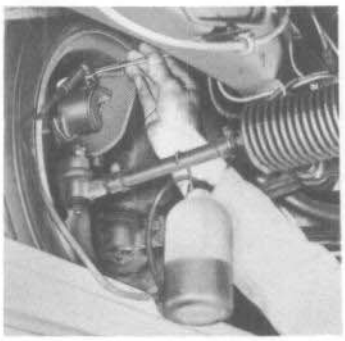
– Unscrew the knurled nut **(a)** to release pressure to zero ("0") on the L.P. gauge **(d).**

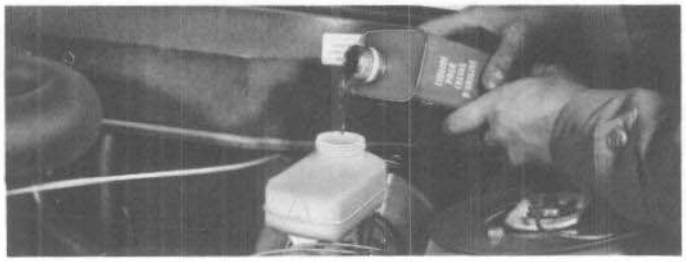
N.B. - *If pressure is indicated, however low, refer to servo-unit checking, page 10 06.*

– Gently turn the knurled nut clockwise until the pressure is stabilised at, 10 p.s.i. (0,7 bars).

– There should be no fall in pressure after an interval of 15 minutes. If there is, check for leaks around cups and seals. Trace, rectify and re-check.

N.B. - *Leakage through the main cup of the master-cylinder will not be indicated by a fall in liquid level, or by traces of fluid on the outside.*





– 504 with dual-circuit master-cylinder

- Close the rear bleed screw.

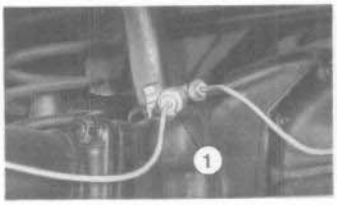
- Connect the Testarc 50 gauge to the rear circuit and the bleed hose and bottle to a rear bleed screw hole.

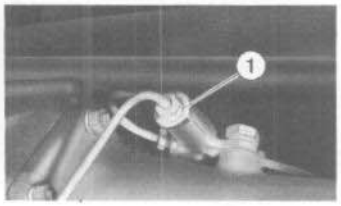
- Repeat the test as at I and II.

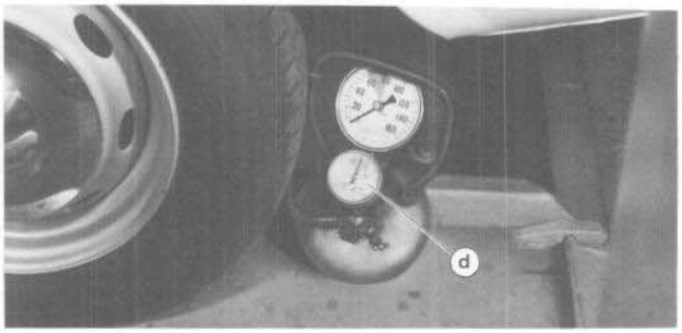
– Top-up fluid level, in the reservoir.

BRAKES

PRESSURE TESTING





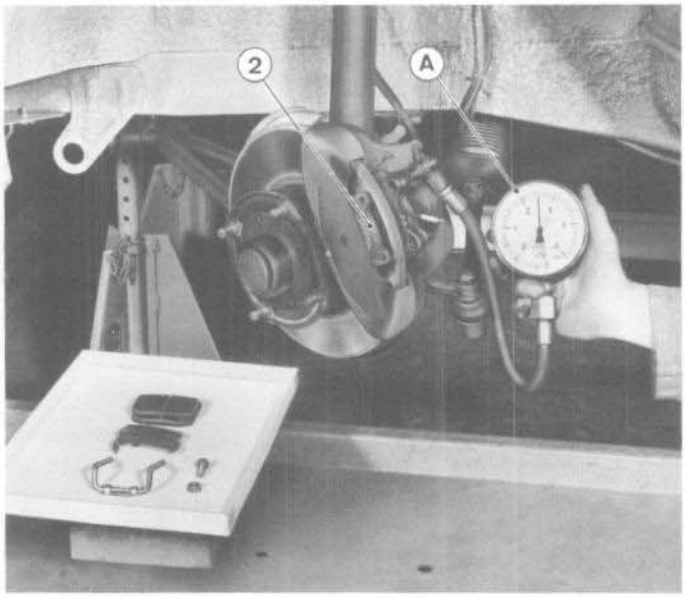


VARIOUS TESTS

RESIDUAL PRESSURE IN SYSTEM 504 with rear drum brakes.

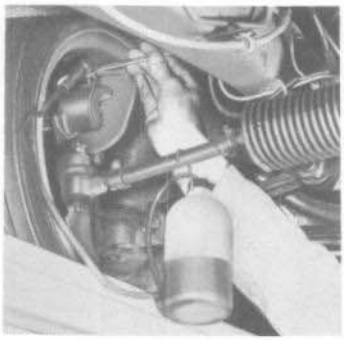
- Block the master-cylinder inlet (plug F).
- Connect the Testarc 50 gauge to a rear bleed hole.
- Remove plug F.
- After an application of the brake pedal, the pressure in the rear circuit should be stable at **7 to 27 p.s.i. (0,5 to 1,9 bars)** (gauge **d**).

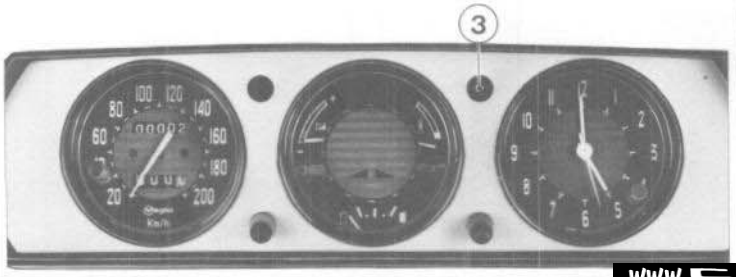
Given that the system is leak proof. (tests I and II) if the pressures obtained are not within the specified limits, then exchange the union **(1)** inside which is a valve.



CALIPER MOVEMENT

- Connect pressure gauge **(A)** to a bleed hole.
- **Replace the outer pad with a used pad (2).**
- Gently operate the brake pedal.
- The calipers should operate at pressures below :
  - front caliper - 43 p.s.i. (3 kg/cm²).
  - rear caliper - 64 p.s.i. (4,5 kg/cm²)
- If this conditions are not met, dismantle body and pistons, clean with meths. Re-assemble and re-test.
- Replace the original pad.

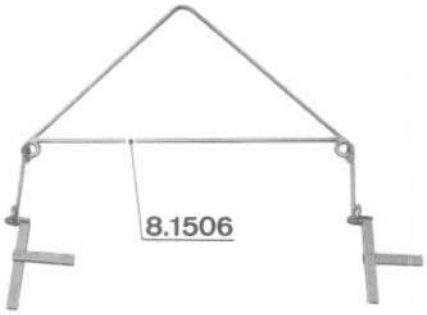


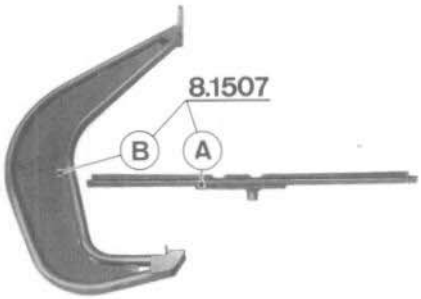


BRAKE PRESSURE WARNING LIGHT (504 U.S.A.)

- Slack off handbrake.
- Make contact.
- Depress brake pedal.
- Open a bleed screw.
- The warning light **(3)** should light-up.
- Close bleed screw.

IMPORTANT - After these tests check travel of brake pedal and bleed, if necessary.





TOOLS REQUIRED

8.1506

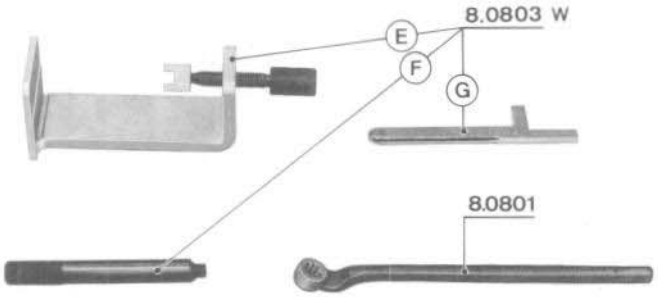
– Front lifting tackle.

8.1507

– Rear lifting tackle, including :

A - Cross-piece.

B - Hook.



8.0801

– Key for adjusting rear drum brakes.

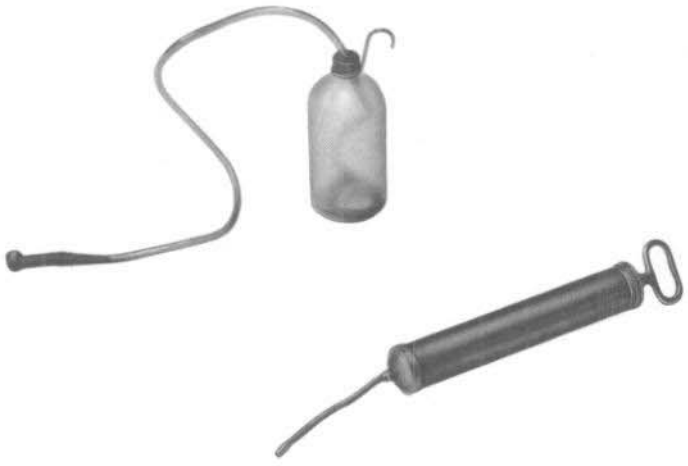
8.0803 W

– Tool kit for disc brakes.

E - Fixture for actuating the pistons.

F - Master-cylinder plug.

G - Key for positioning the rear brake pistons.



– An 18" (40 cm) length of transparent flexible hose.

– A transparent vessel.

– A syringe.

BRAKES

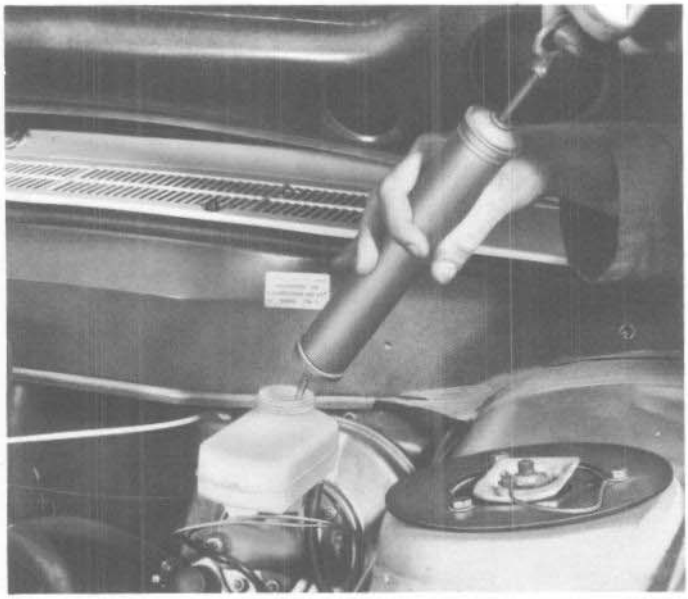
CHANGING THE BRAKE FLUID

– Chock-up the vehicle :

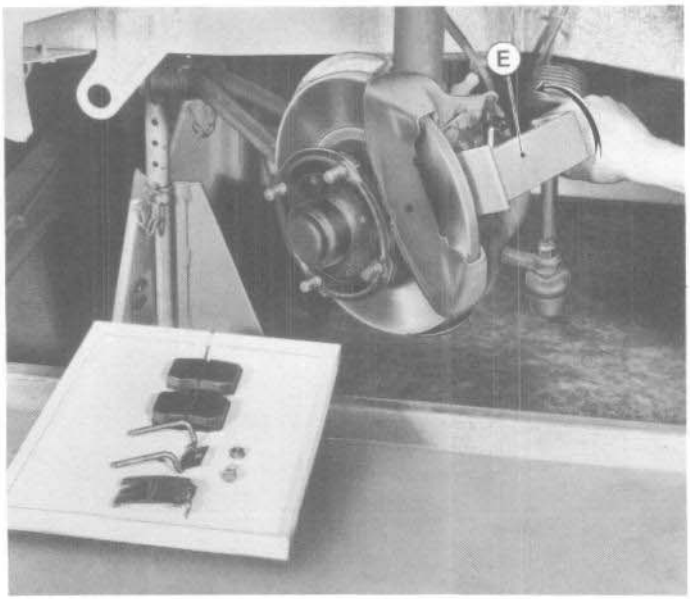
- by the cross-member at the front,
- by the rear jacking points.

– Remove the wheels.

– Slacken the hand brake.



– Drain the reservoir.

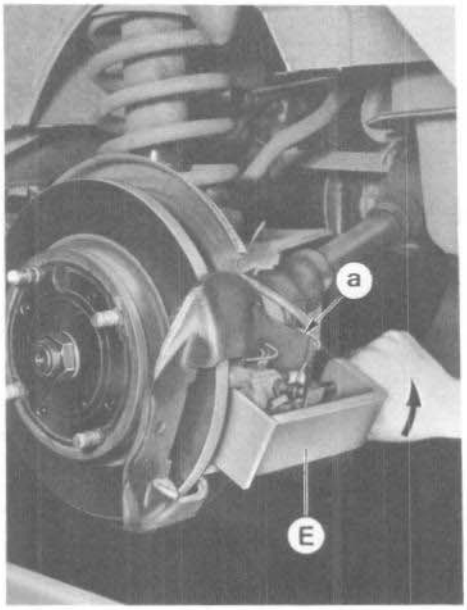


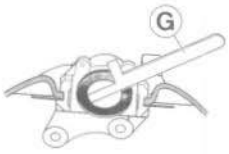
– Remove the pads.

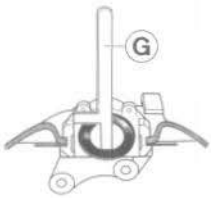
– Retract the front pistons.

WARNING - Ensure that the screw in fixture **(E)** is hand-tight.

– Replace pads.





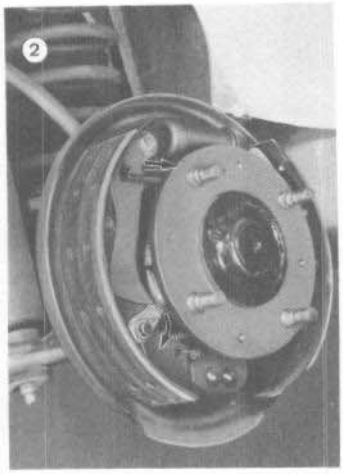


504 with rear disc brakes.

– Remove the pads.

– Retract pistons as far as possible.

– Replace the pads.

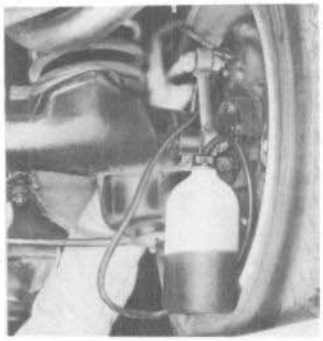


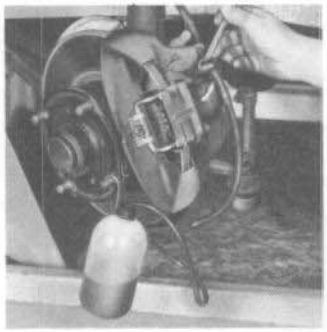
504 with rear drum brakes.

– Remove the drums.
- Dust-out drums and plates.
- Check wheel cylinders for leaks.

– Shoes to be in position of maximum retraction.
1 - Long models.
2 - 504 L.

– Replace the drums.





– Re-drain the reservoir.

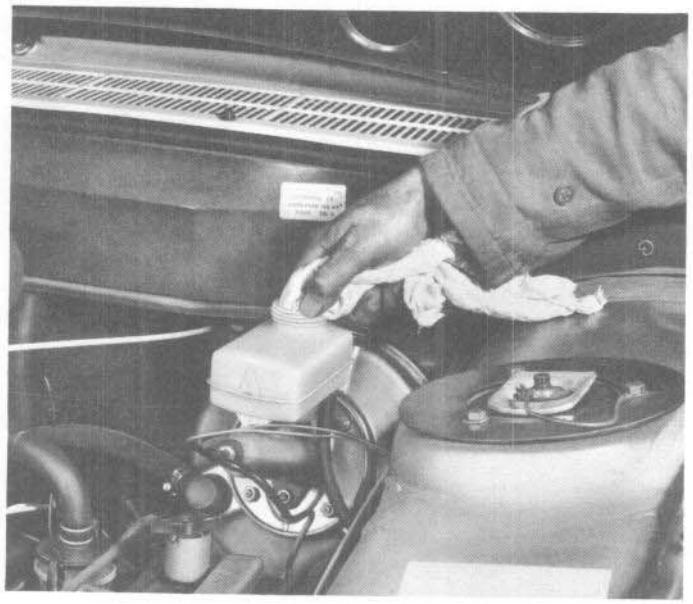
– Drain the wheel cylinders.

WARNING - Do not drain the rear wheel cylinders on 504 with rear disc brakes.

- loosen beld screw farthest away from the master cylinder,
- gently operate brake pedal until all fluid is expelled,
- tighten the bleed screw, and proceed to check the remaining brakes in a similar manner.

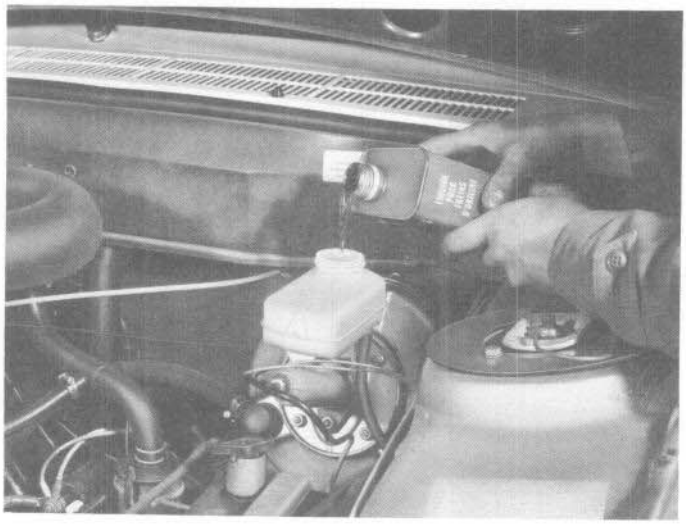
BRAKES

CHANGING THE BRAKE FLUID



FLUSHING AND REFILLING

– Clean out the reservoir with a clean, dry and lint free cloth.



IMPORTANT - Use only brake fluid.

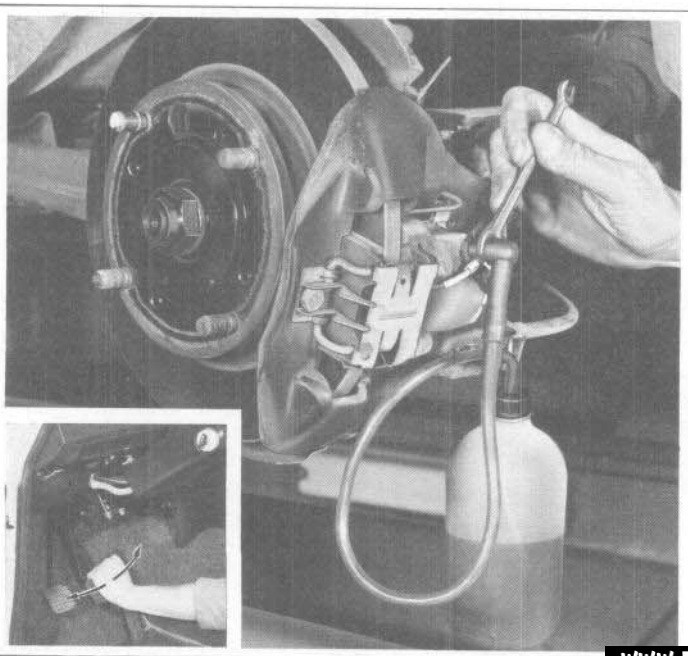
Lockheed 55

Nafic FN3

Peugeot.

which can be mixed in any proportions.

– Slowly refill the reservoir ensuring that the level is maintained during operation of the system.



– Slacken a rear bleed screw.

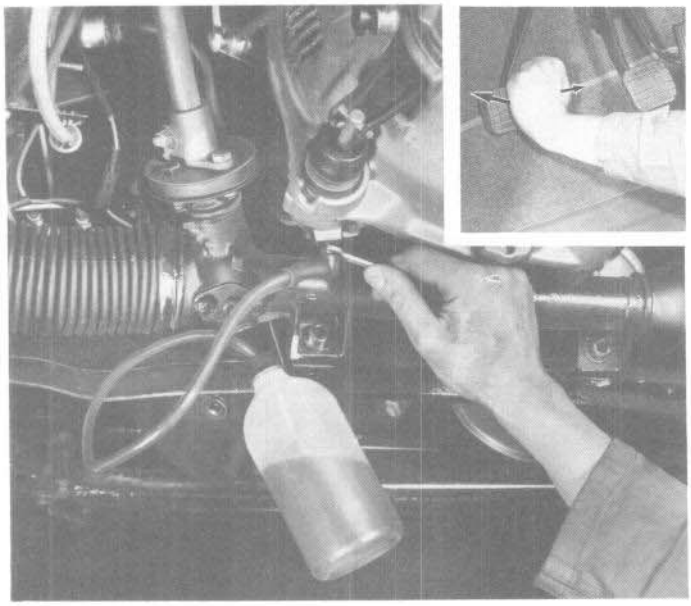
– Pump the brake pedal :

- depress and release **slowly** until its complete return.

– After the fluid runs **clean**, tighten the bleed screw.

– Proceed likewise with the remaining 3 - bleed screw.

NOTE - *504 with dual-circuit - (Lockheed tandem) Before refilling slacken the front RH bleed screw.*



Clutch circuit

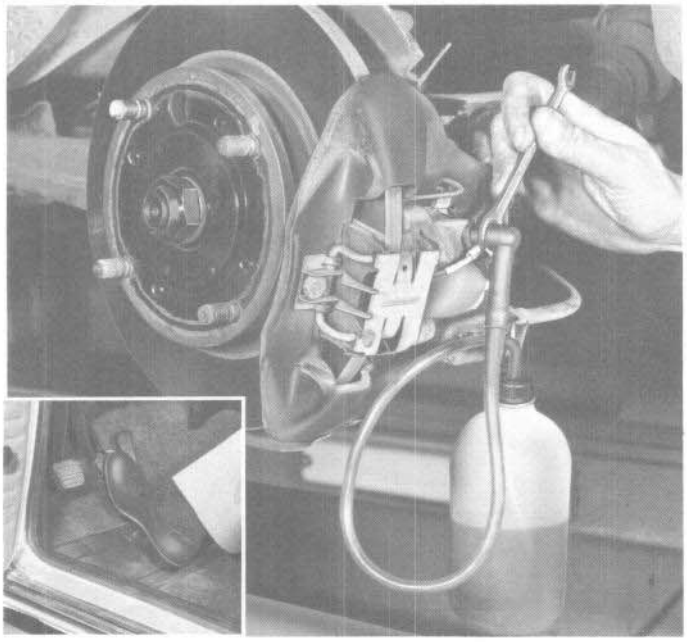
— Depress clutch pedal and hold-down.

— Slacken the bled screw of the slave cylinder.

— When the clutch fork returns to rest, tighten the bleed screw.

— **Slowly** release the clutch pedal.

— Repeat this operation until the fluid runs **clean.**

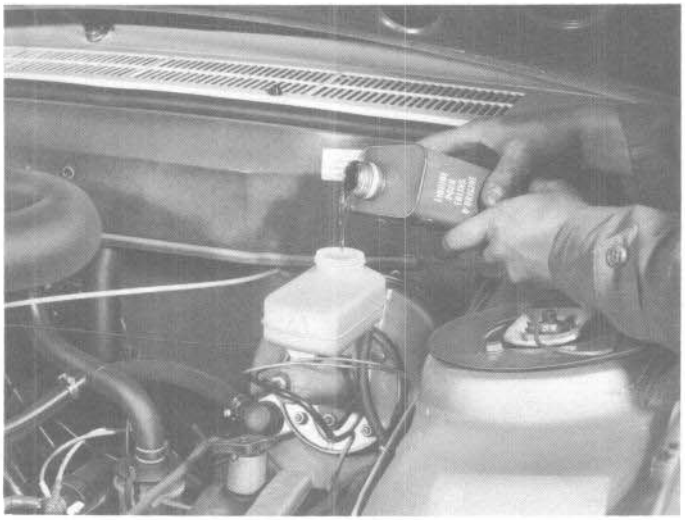


— **Bleed the brake system.**

(see page 02 22).

— **Adjust :**

- rear brake shoes of long models (see page 02 32).
- handbrake, if necessary (see page 02 31).



— **Check :**

- system for leaks,
- fluid level of reservoir,
- braking efficiency,
- clutch operation.

— **Tightening torques**

- bleed screw - 9 ft/lbs. **(1,25 m.kg.).**
- wheel nuts - 43 ft/lbs. **(6 m.kg.).**

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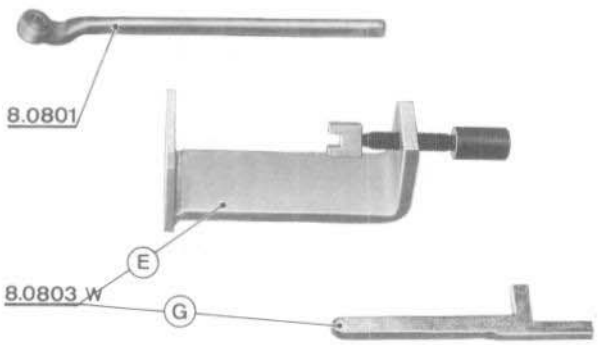


TOOLS REQUIRED

8.0801

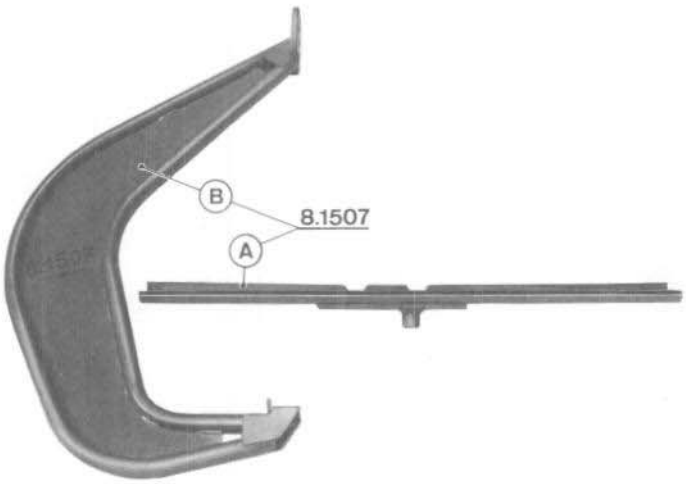
– Key for adjusting the rear brakes of long models.

8.0803 W

– Tool kit for disc brakes.

E - fixture for movement of pistons.

G - key for positioning rear disc brake pistons.

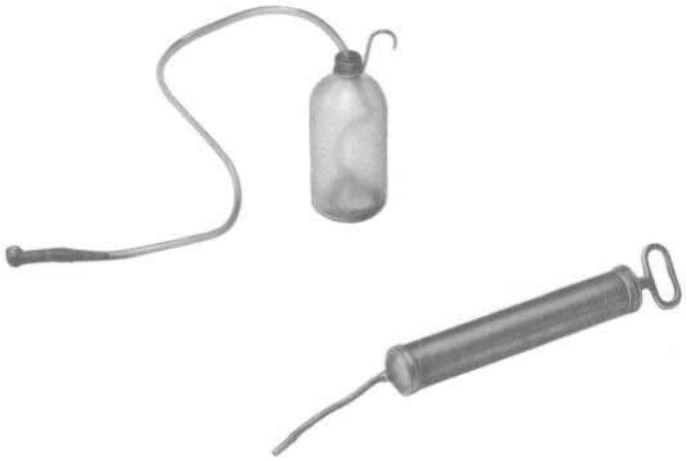


8.1507

– Rear lifting tackle, including :

A - Cross-piece.

B - Hook.



– 18" (40 cm) length of flexible transparent hose.

– A transparent bottle.

– A syringe.

BLEEDING

WARNING :

NOTE THE FOLLOWING TWO CONDITIONS

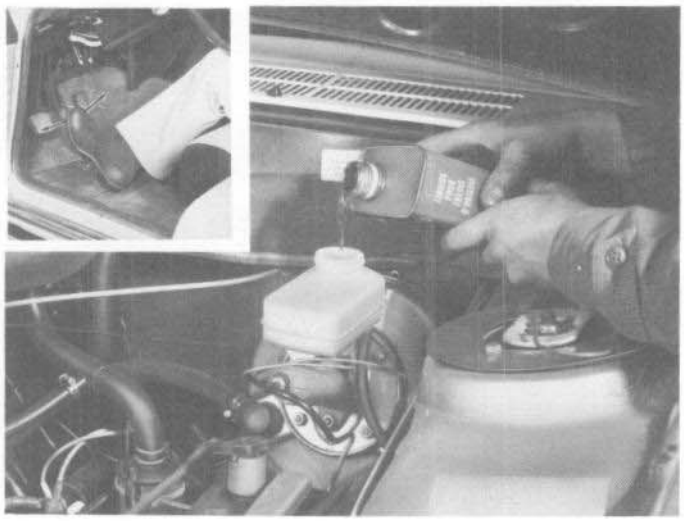
1) Bleeding : *- 504 with rear drum brakes.*
- 50 4 with rear disc brakes when the rear wheel cylinders have not been drained.

2) Topping-up and Bleeding : *504 with rear disc brakes, when replacing a caliper or after, drain and refill.*

IMPORTANT - Use only the following brake fluids :

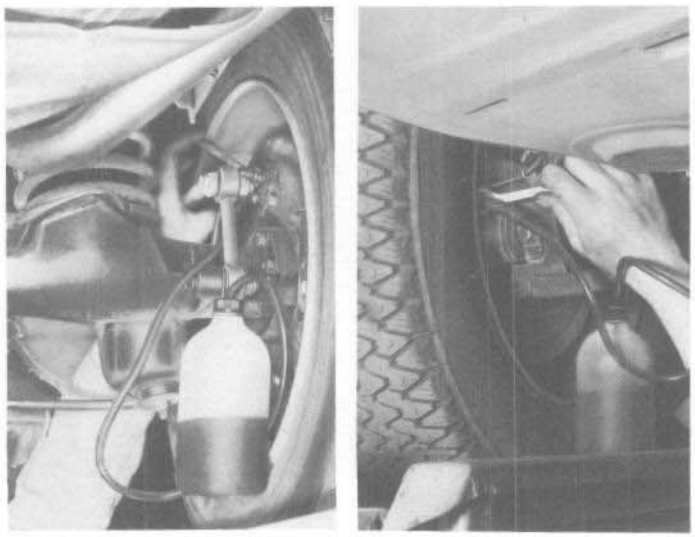
Lockheed 55
Nafic FN3
Peugeot

These fluids can be admixed in any proportions.



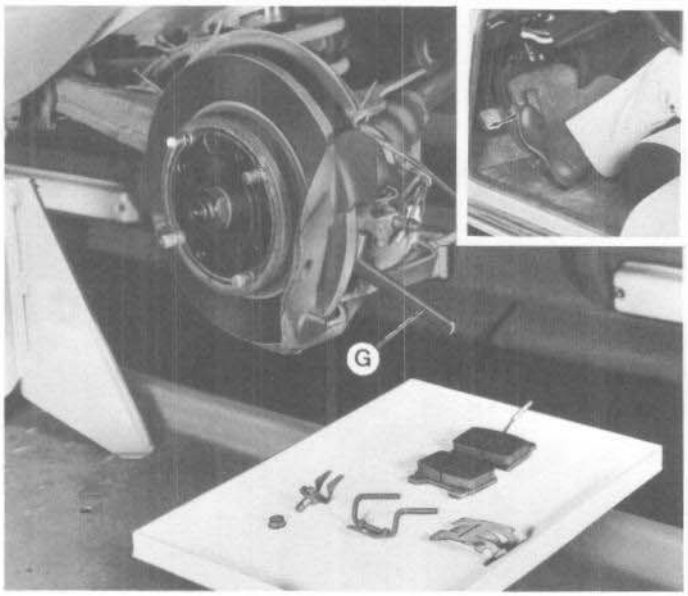
Procedure for bleeding (valid in all cases)

- Ensure there is sufficient level of fluid in the reservoir.
- Release the handbrake.
- Press firmly on the brake pedal.
- Slacken the bleed screw of the appropriate cylinder.
- Hold brake pedal in fully depressed position.
- Tighten the bleed screw.
- Release pedal, **slowly.**
- Repeat operation until fluid is free of air bubbles.



1) BLEEDING

- Vehicle at rest on wheels.
- Bleed each wheel cylinder in accordance with the foregoing instructions.



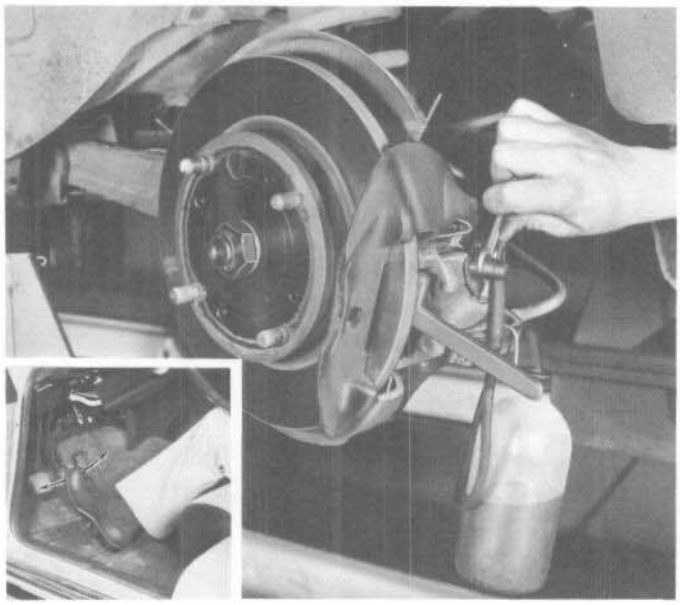
2) TOPPING-UP AND BLEEDING A NEW REAR WHEEL CYLINDER OR AFTER DRAINING AND REFILLING COMPLETE.

Before replacing the pads.

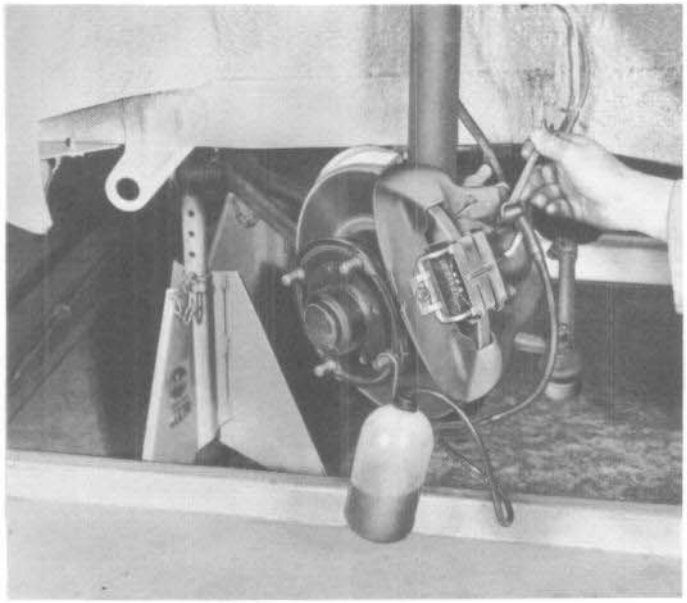
– Insert piston actuating fixture (G) in slot.

– Actuate brake pedal several times.

- the piston should travel to its maximum.



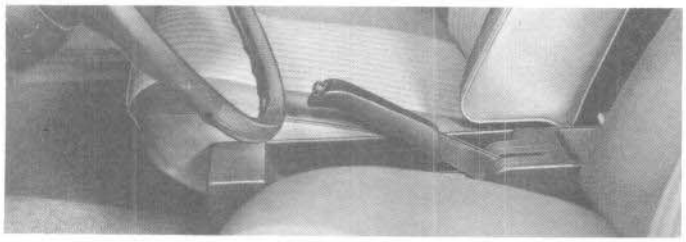
– Bleed each wheel cylinder accordingly.

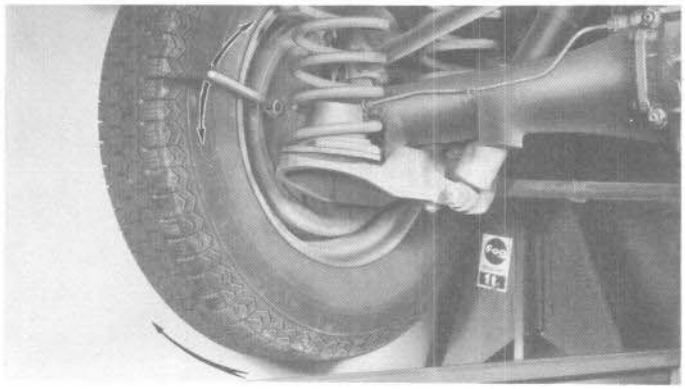


– Replace pads (see page 03 06).

– Proceed to bleed the other rear wheel cylinder and the front cylinders.

IMPORTANT - With engine running, actuate brake pedal several times until strong resistance is encountered.

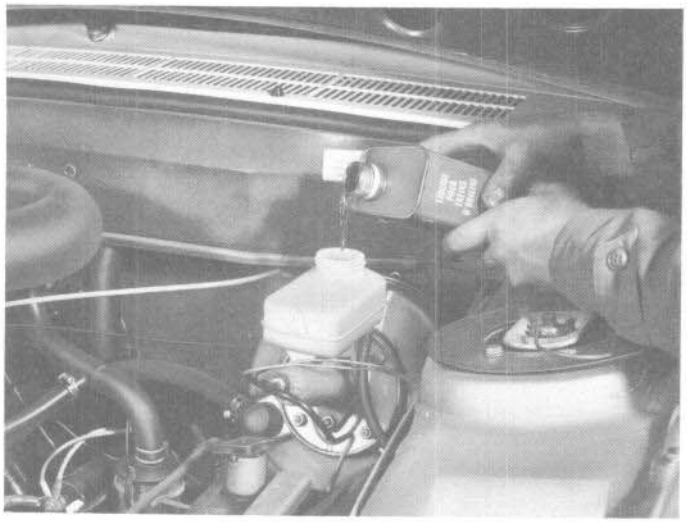




FINAL OPERATIONS

— **Adjust :**

- shoes of rear drum brakes of long models (see page 02 32).
- the handbrake, if necessary (see page 02 31).

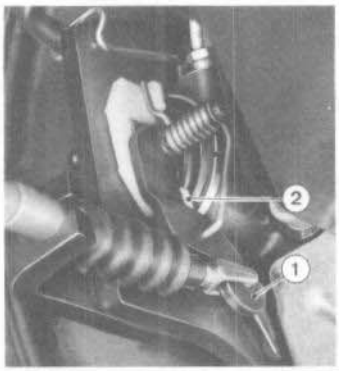


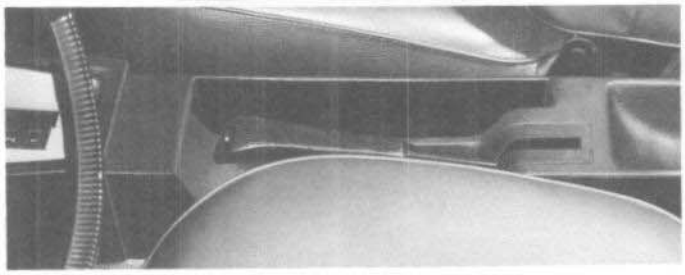
— **Check :**

- system for leaks,
- fluid level in reservoir,
- braking efficiency,
- clutch operation.

— Tightening torque :

- bleed screw - 9 ft/lbs. **(1,25 m.kg)**
- wheel nut - 43 ft/lbs. **(6 m.kg).**



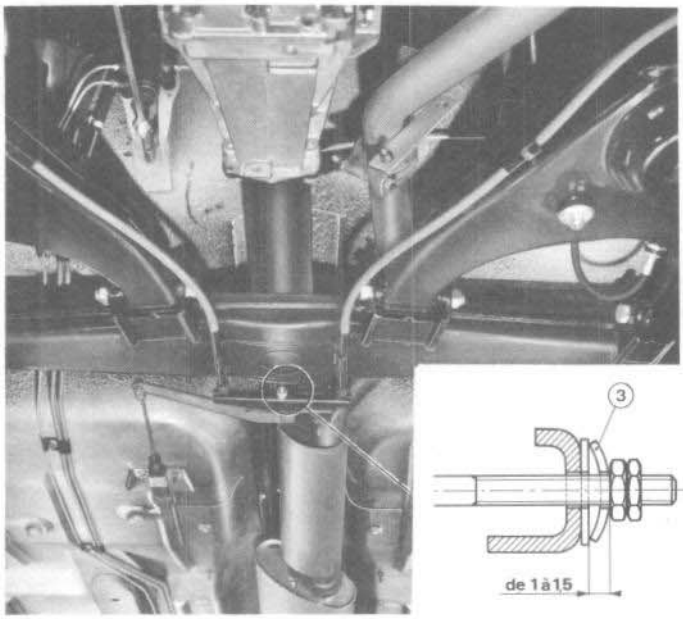


REAR DISC BRAKES

HANDBRAKE ADJUSTMENT

IMPORTANT - When the handbrake has been slackened, the lever **(1)** for operating the rear brakes should be in contact with the nylon pad **(2).**

– Prior to making any adjustment :
- the system must have been bled.
- actuate firmly the brake pedal a number of times (engine running).

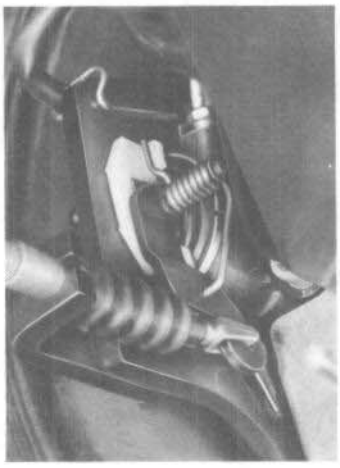


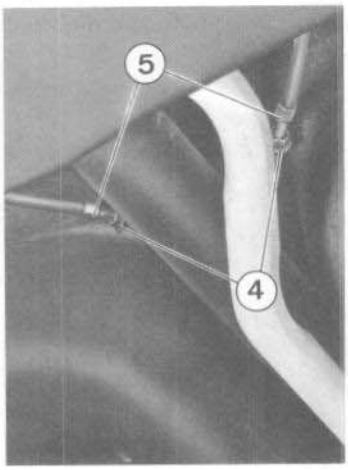
I - Dashboard mounted handbrake

– Slacken the equalising arm nuts.

– Tighten adjusting nut to give 1 to 1,5 mm flexing of the spring washer **(3).**

– Hold adjusting nut in position and tighten lock-out.





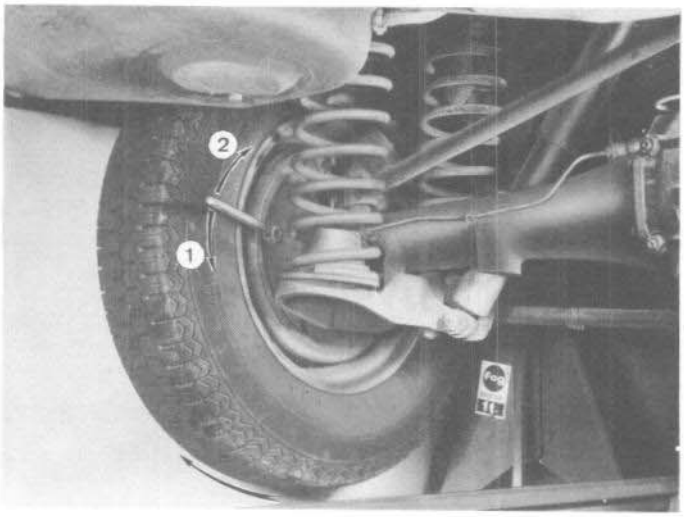
II - Handbrake mounted between front seats.

– Slacken the lock-nuts **(4).**

– Slacken simultaneously the threaded adjustors **(5)** until the levers **(1)** just fail to make contact with the nylon pad.**(2)**

– Re-tighten the adjustors **(5)** a half-turn and tighten the lock nuts.

IMPORTANT - The threaded adjustors **(5)** should protude equally, so that the equalising arm 6 is perpendicular to the handbrake shaft.



DRUM BRAKES

ADJUSTMENT OF REAR SHOES (long models)

— Jack-up rear of vehicle.

— Turn the wheel in the direction of travel.

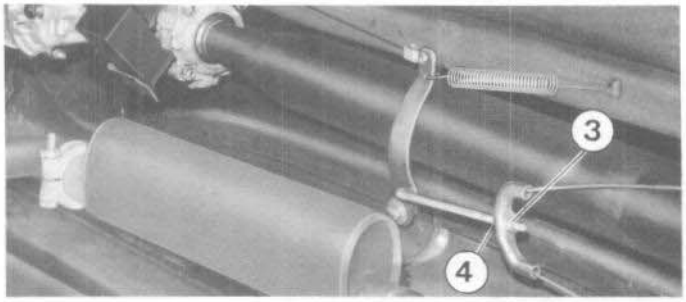
— Turn each adjuster :

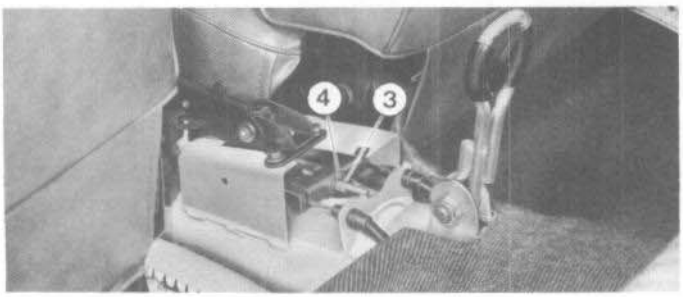
- **1st direction** (downward) until wheel locks.
- **2nd direction** (upwards) until wheel only just revolves freely.

HANDBRAKE ADJUSTMENT

WARNING :

- handbrake must be fully released,
- the system bled,
- actuate firmly the brake pedal a number of times **(engine running).**
- the shoes should now be in adjustment (long models).





Dashboard mounted handbrake.

Handbrake between the front seats.

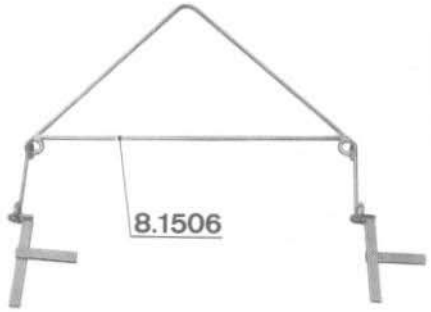
— Jack-up rear of vehicle.

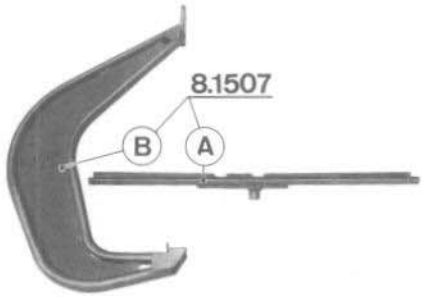
— Slacken lock-nut **(3).**

— **Tighten the screw (4) to give a travel of 4 to 7 notches.**

— Tighten lock-nut **(3).**

— Ensure that wheels revolve freely by-hand.





TOOLS REQUIRED

8.1506

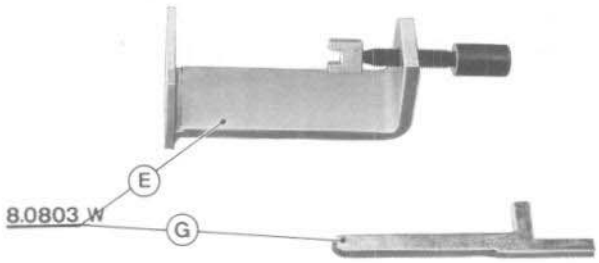
— Front lifting tackle.

8.1507

— Rear lifting tackle consisting of:

A - Cross-piece.

B - Hook.



8.0803 W

— Disc brakes tool kit.

E - Piston actuating fixture.

G - Key for positioning pistons of rear disc brakes.

BRAKES

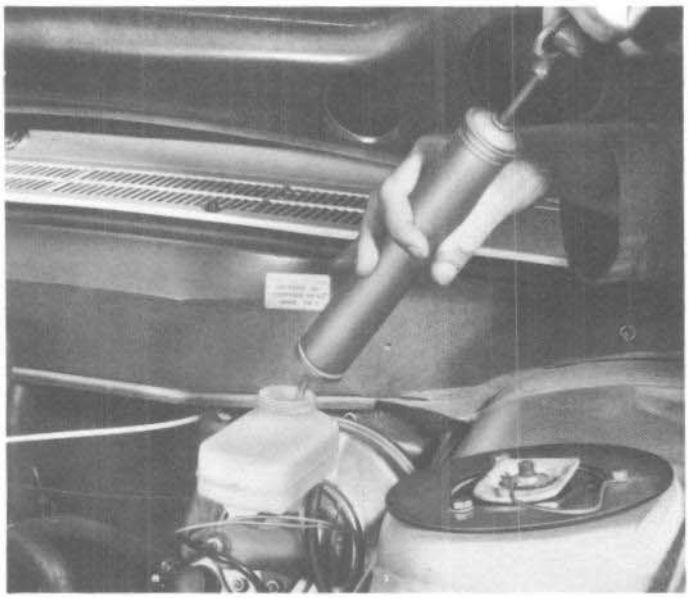
REPLACEMENT OF PADS

REMOVAL

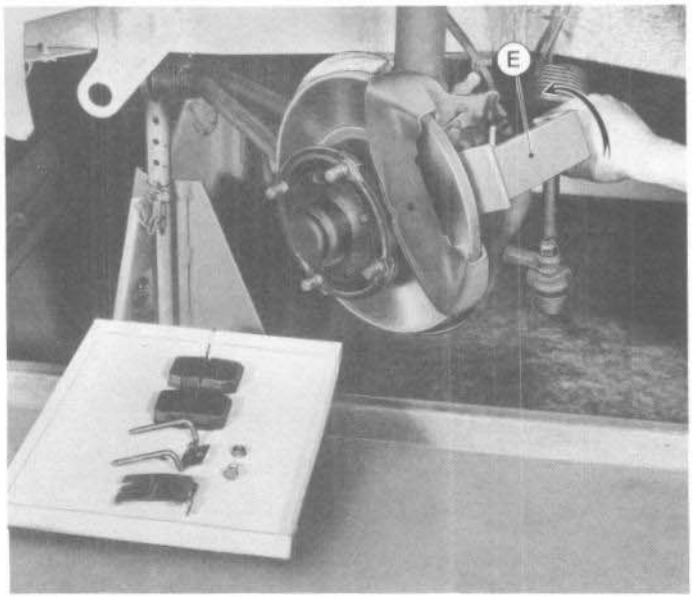
– Raise the vehicle :

- the front by the cross-member.
- the rear by the jacking points.

– Remove the wheels.



– Reduce fluid level in the reservoir to the minimum.



FRONT CALIPERS

– Remove pads.

– Push back pistons as far as they will travel.

WARNING - Ensure that the screw in fixture **(E)** is handtight.

fig I

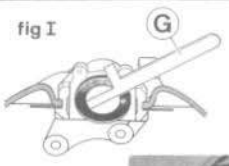
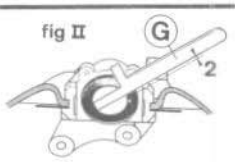


fig II



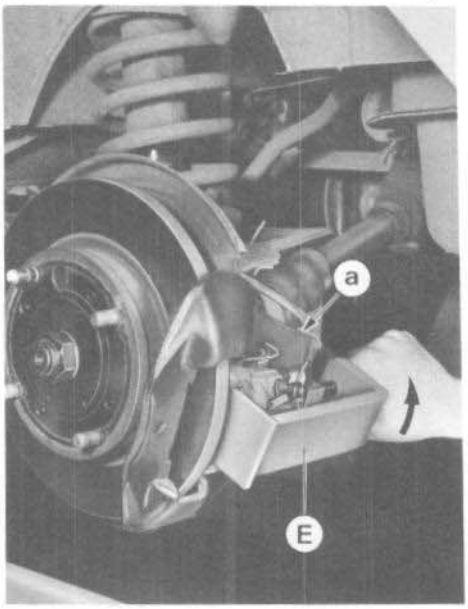


fig I

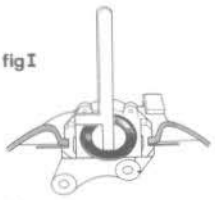
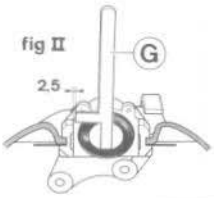


fig II



REAR BRAKE CALIPERS

– Remove pads.

– Rotate piston 1/8th of turn.

Fig. I - MK. I Caliper (rouded at **(a)**).

Fig. II - MK. III Caliper (chamfered at **(a)**).

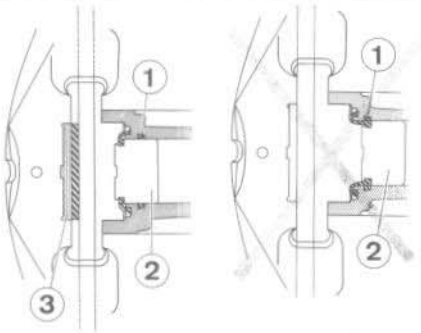
– Push back pistons as far as they will travel.

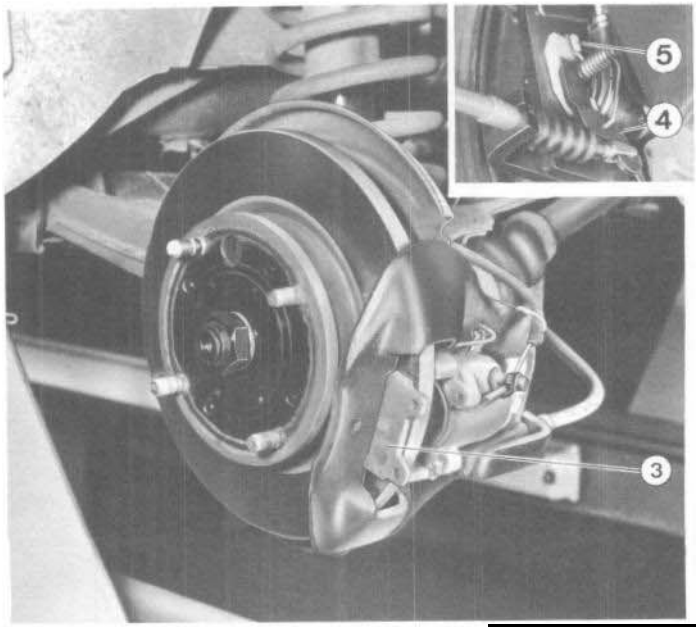
WARNING - Ensure that the screw of fixture **(E)** is hand tight.

– Return pistons to their initial position.

Fig. I Caliper MK. I (rounded at **(a)**).

Fig. II Caliper MK. III (chamfered at **(a)**).





PRECAUTIONS TO BE TAKEN

IMPORTANT - To prevent the seal **(1)** being displaced by the piston **(2)** put into position used pad **(3)**.

– Clean the caliper assembly and disc with meths.

– Ensure absolute cleanliness of :

- clip holes in the pads,
- handbrake linkage and levers,

moving parts of the caliper.

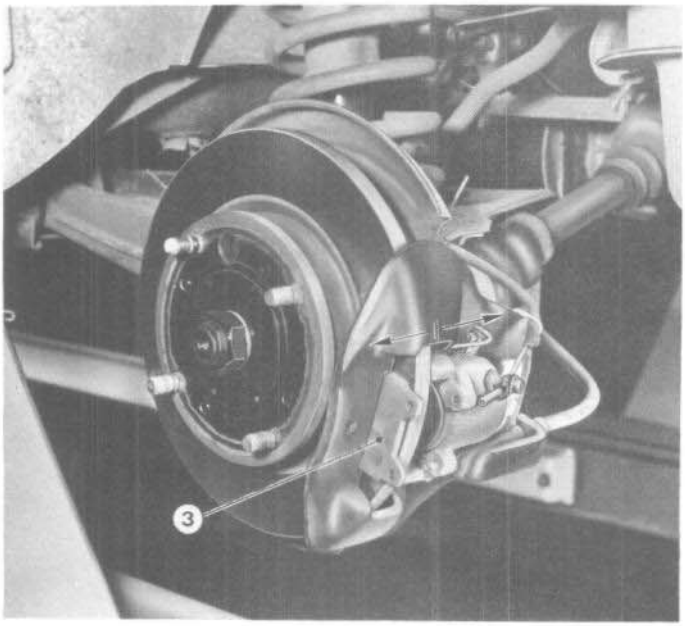
– Check :

- that wheels cylinders are leakproof,
- condition of rubber protectors.

– With the handbrake fully released ensure that the levers **(4)** press on their nylon pads **(5)**.

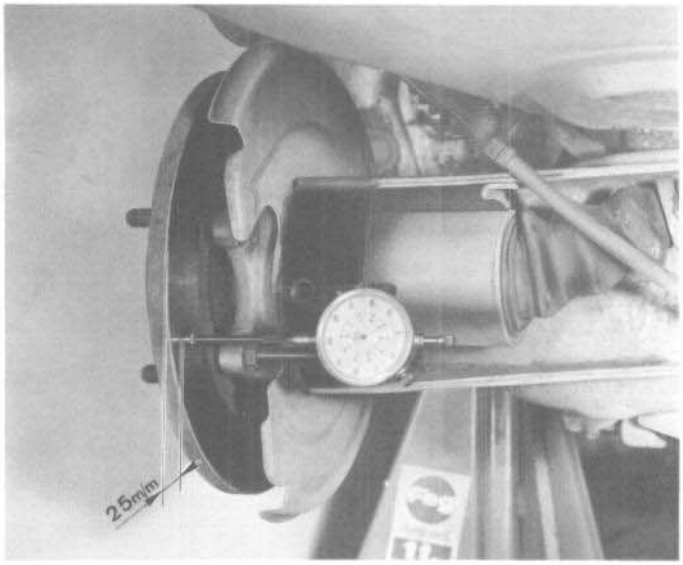
BRAKES

REPLACEMENT OF PADS



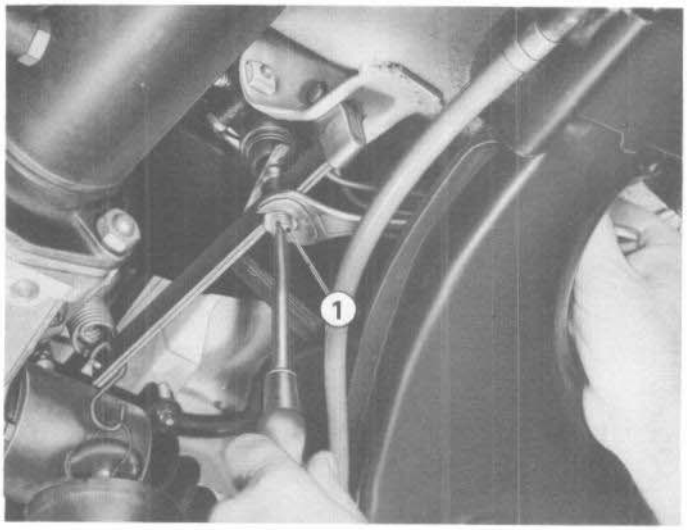
– Ensure free movement of the caliper (used pad **(3)** still in place).

– If necessary, check caliper movement (see page 02 08).



– Check condition of the disc.

– If necessary, check run-out : maximum 0". 0028 **(0,07 mm.)** (see pages 06 06 or 06 13).



IMPORTANT - Adjust the compensator if pad wear, as between front and rear brakes, is appreciably different. (see page 11 01).

FITTING

IMPORTANT - Fitting of Ferodo 2430 pads.

WARNING :

TWO GRADES OF PADS :

Ferodo EP 2430 - back plate, colour blak, marked FER 2430 F FF,

Ferodo F 2430 - back plate, colour grey, marked SAAF 2430 FF.

INTERCHANGEABILITY- These two grades of pad are interchangeable provided that a set of 4 pads of the same grade are fitted to an axle.

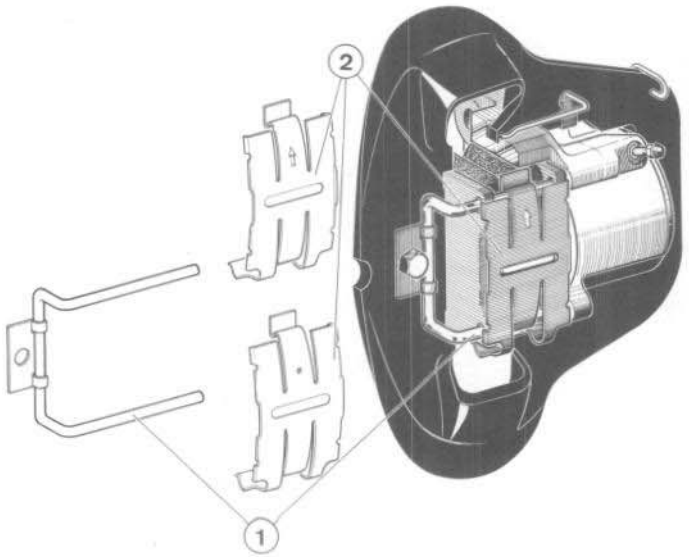
Ferodo 2430 pads can be used in place of NS 414 or F 737, or mixed pads, always provided that the near and offside calipers on any axle are fitted with the same grade of pad.

— **Protect the pads with masking tape.**

— **Apply Permatex "High Tack" to the backs of the pads.**

— Allow to set for 1 hour.

NOTE - *The adhesive becomes stronger whilst retaining elasticity.*



IMPORTANT - The retaining clips and springs must be replaced when fitting new pads.

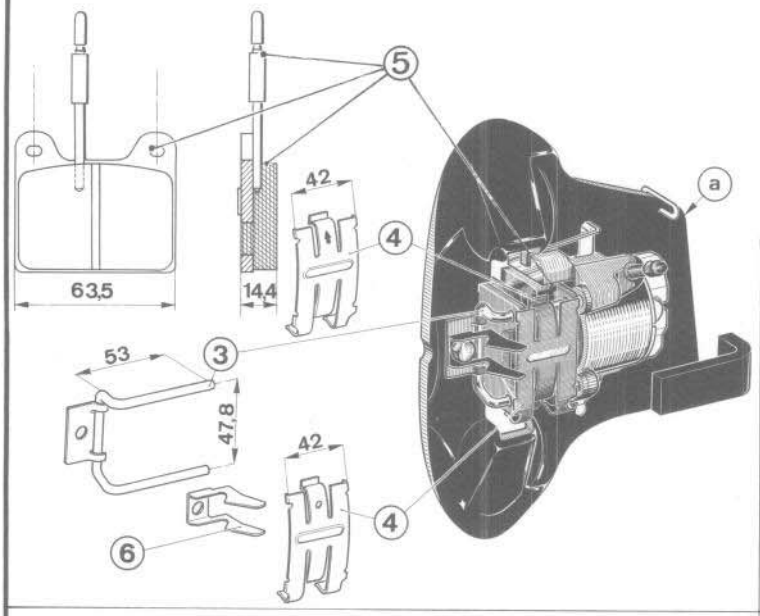
— Install the pads, taking into consideration the following fittings :

— **Front calipers :**

- clips **(1)**,
- pressure spring **(2)**.

BRAKES

REPLACEMENT OF PADS

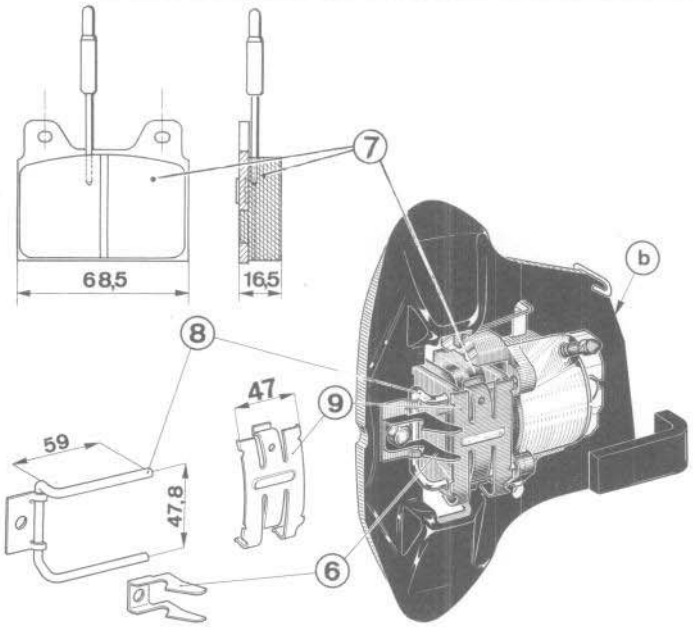


— **Rear calipers, type MKI (rounded at (a)):**

- clip **(3)**,
- pressure spring **(4)**.

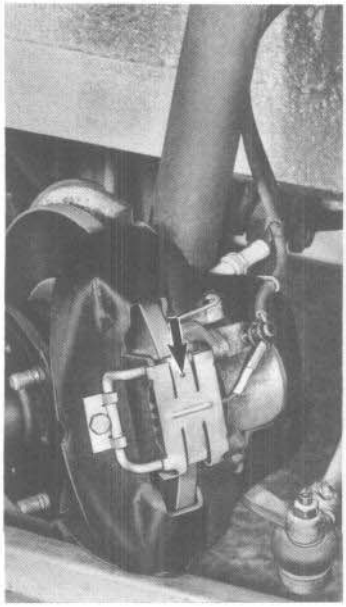
— **Rear calipers, type MKI (rounded at (a)) with Ferodo EP 2430 pads :**

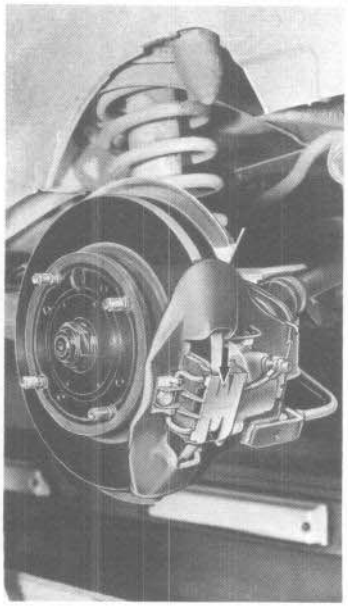
- Ferodo EP 2430 **(5)**,
- clip **(3)**,
- pressure spring **(4)**,
- return spring **(6)**.



— **Rear calipers, type MKIII (chamfered at b).**

- pads **(7)**,
- clips **(8)**,
- pressure spring **(9)**,
- return spring **(6)**.





— Fit the pressure springs with arrow or hole towards the top.

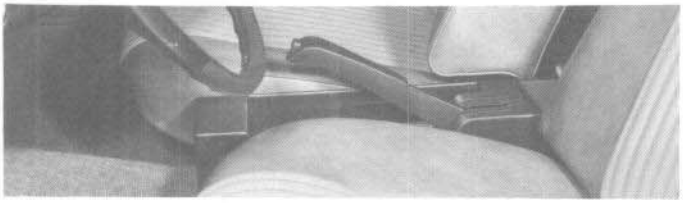
— Connect the wear warning wires.

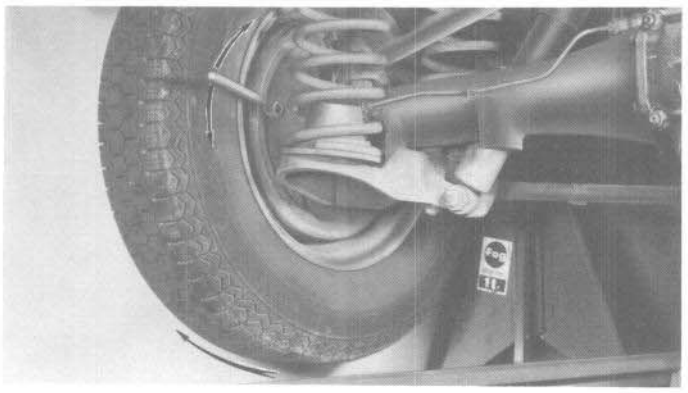
— Fix the pads.

NOTE - *Place a* **new** *grower ring under the ordinary HM nut.*

Tightening torque to : 12 1/2 ft/lbs **(1,75 m.kg).**

IMPORTANT - Operate the brake pedal several times (engine running) until strong resistance is obtained.





FINAL OPERATIONS

– Check :

- amount of travel of the brake pedal, on 504 derivatives if necessary adjust the brake shoes.
- amount of travel of the handbrake.
- fluid level.
- effectiveness of brakes (road test)

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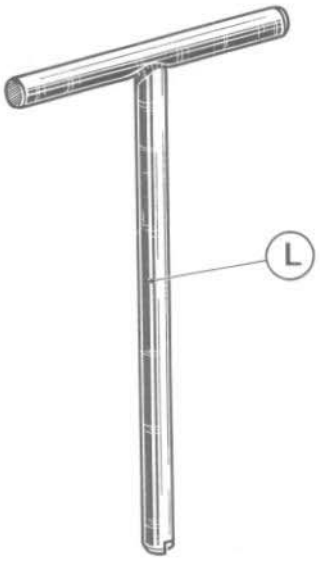
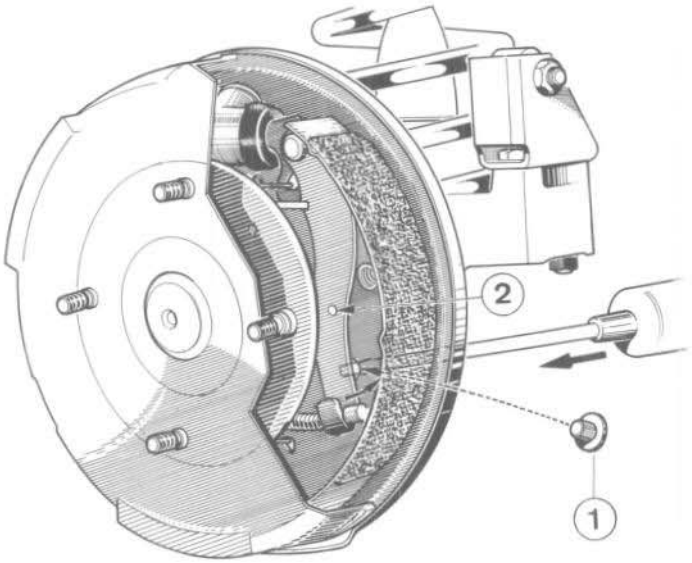


TOOLS REQUIRED

8.0803 W

– Disc brake tool kit.

L - Brake spring key.

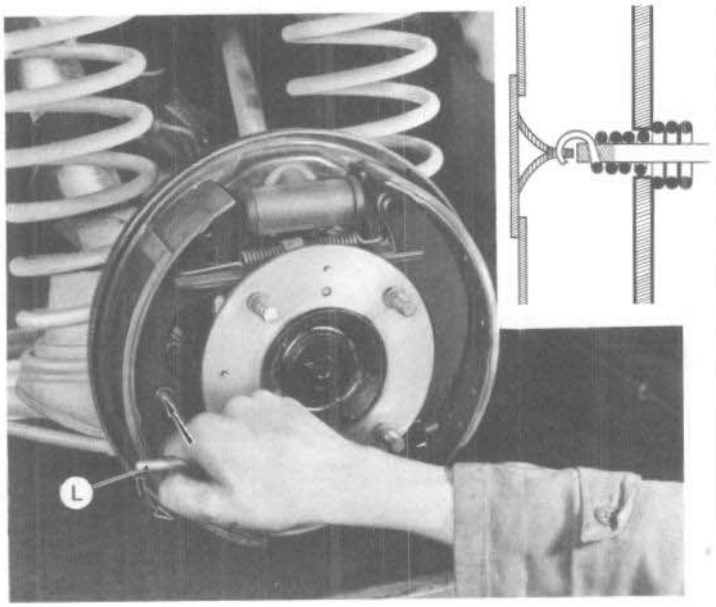


If difficulty is encountered when removing a 504 L drum :

– Remove plug **(1).**

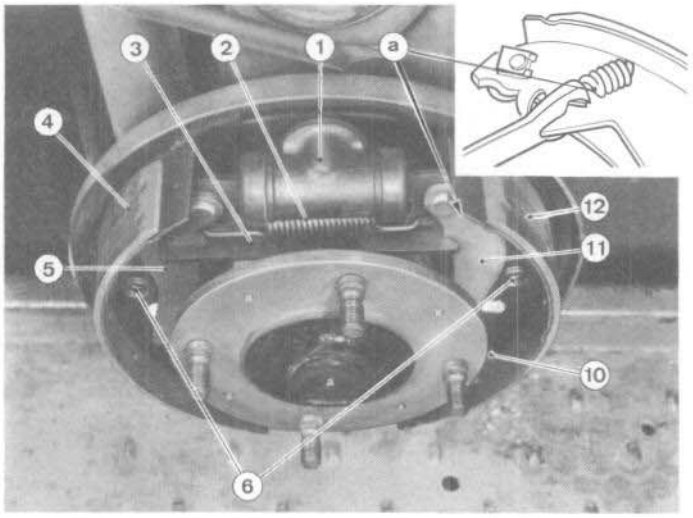
– Push the brake lever with a screw driver to release it from the stud **(2).** (Shoes will then be fully retracted).

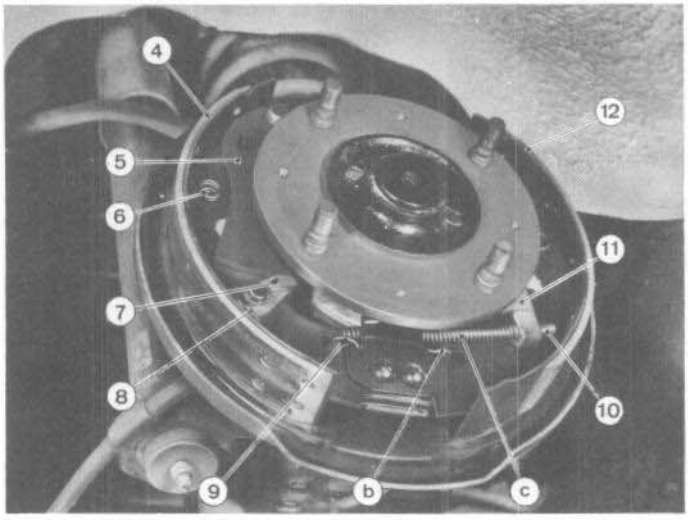
– Dismantle the drum.



– Use key **(L)** for the removal and re-fitting of lateral retaining springs.

IMPORTANT - The springs must be renewed after each dismantling.





ASSEMBLY OF 504 L REAR BRAKES

– Ensure that assembly conforms in respect of the following :

1 - Wheel cylinder, 22 m/m dia.

2 - Shoes return spring.

3 - Brake lever with return spring **(a).**

4 - Leading shoe (front).
Textar V 643 lining { length - 267 m/m.
width - 45 m/m.

5 - Adjusting lever.

6 - Pull-off springs.

7 - Pawl.

8 - Pawl spring.

9 - Shoe retaining springs.

10 - Handbrake cable.

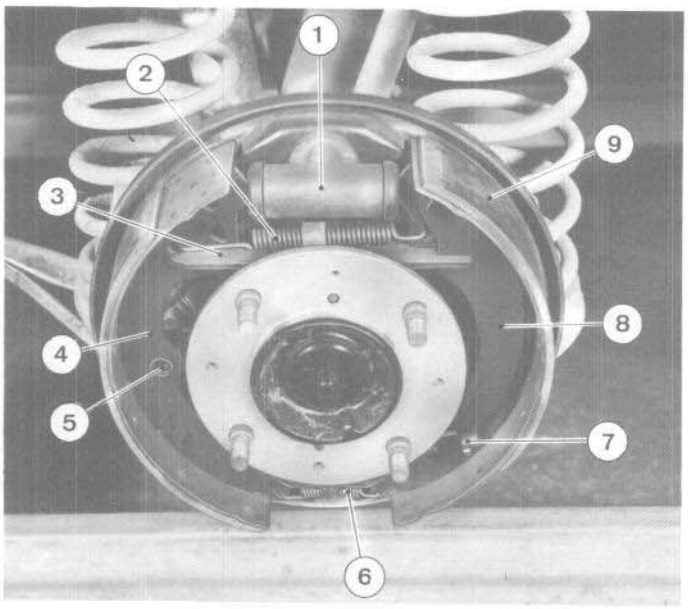
11 - Handbrake lever.

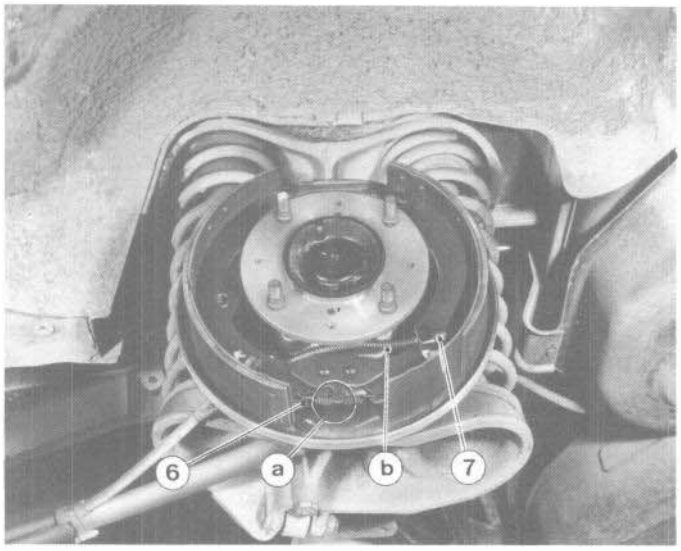
12 - Trailing shoe (rear).
Textar V 643 lining { length - 219 m/m.
width - 45 m/m.

– Assembly and movement.

b - of spring **(9).**

c - handbrake cable, **(10).**





ASSEMBLY OF REAR BRAKES ON 504 DERIVATIVES

– Ensure that the assembly conforms in respect of the following :

1 - Wheel cylinder, 22 m/m dia.

2 - Pull-of springs.

3 - Link.

4 - Leading shoe (front)

Lining Textar V 643 { length - 280 m/m. / width - 60 m/m.

5 - Lateral retaining clips.

6 - Segment retaining springs.

7 - Handbrake cable.

8 - Handbrake lever.

9 - Trailing shoes (rear).

Lining Textar V 643 { length - 248 m/m. / width - 60 m/m.

– Installation :

a - spring **(6).**

b - handbrake cable **(7).**

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RECTIFICATION

FRONT AND REAR DISCS

Discs which are badly scored, or show excessive wear of the pad track, can be rectified using the appropriate machine tool.

WARNING - A disc must be replaced if its thickness is less than the appropriate figure given in the following tables.

1 - Rectification and replacement dimensions.

ITEM	FRONT DISCS	REAR DISCS	
		Girling caliper type AH12 MK1	Girling caliper type AH12 MKIII
Original thickness	12,75 mm	10 mm	12 mm
Minimum permissable thickness after rectification	11,25 mm	9 mm	11 mm
A disc must be replaced when its thickness is less than -	10,75 mm	8,5 mm	10,5 mm

2) Run-out maximum permissable, in relation to hub face, is — **0,05 m/m.**

NOTE - *After fitting to vehicle maximum run-out is, 0,07 m/m.*

3) Variation in disc thickness, 0,02 m/m (at any point)

REAR DRUMS

WARNING - Both LH and RH drums must be machined to the same diameter (tolérance, 0,20 m/m.)

1) Rectification and replacement dimensions

	LONG MODELS	SALOON L.
Original diameter	280 m/m	255 m/m
Diameter after machining	281 m/m	256 m/m
A drum must be replaced when its diameter exceeds.	281,5 m/m	256,5 m/m

2) Maximum ovality of drum after machining : 0,07 m/m.

3) Maximum ovality of drum after fitting to vehicle : 0,10 m/m.

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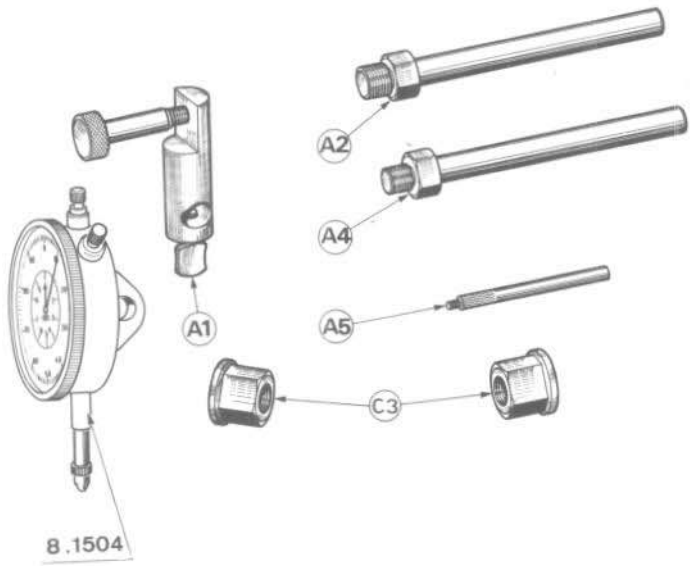


TOOLS REQUIRED

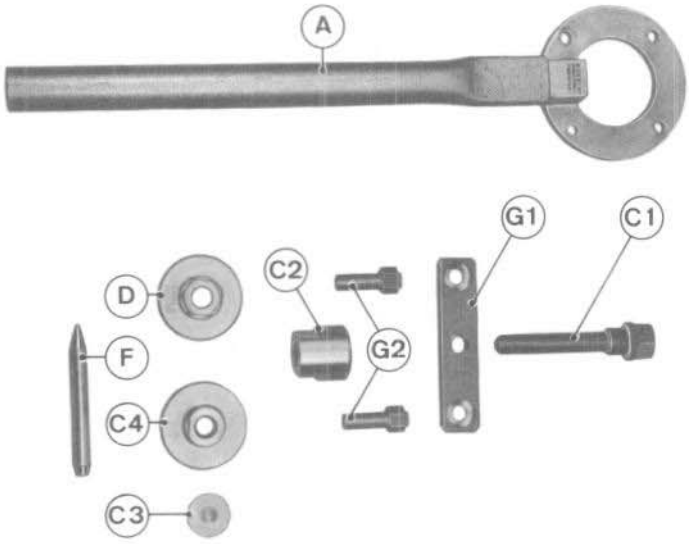
8.0803 W

Tool kit for discs

A - Dial indicator assembly comprising :
- **A1** - Indicator holder,
- **A2** - Threaded spindle, 12 x 150,
- **A4** - Threaded spindle, 12 x 125.
- **A5** - Extension-piece.

C3 - 2 nuts from set of guides.

8.1504 - Dial indicator with fixing lug.



8.0521 Z

Tool kit for rear hub bearings.

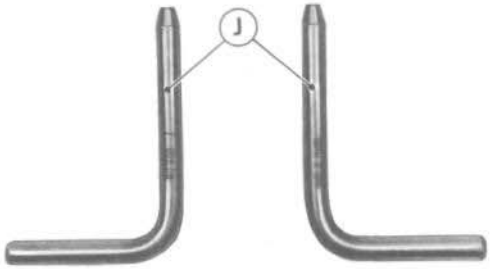
A - Hub holding fixture (in 2 - parts).

C - Device for removing and refitting the disc hub, comprising :
- **C1** - special bolt,
- **C2** - special nut,
- **C3** - thrust pad,
- **C4** - Extractor.

D - Spanner head for hub carrier nut.

F - Locking punch.

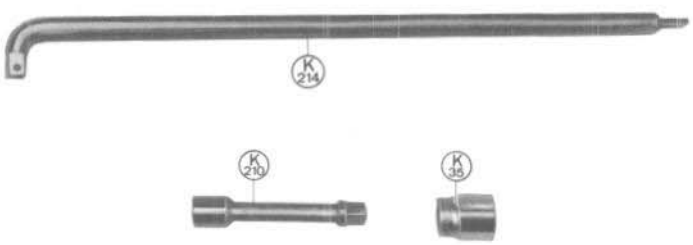
G - Drive shaft extractor, comprising :
- **G1** - extractor plate,
- **G2** - Extractor plate screws.



8.0906 Y

Tools for front and rear suspension.

J - Pair of Tommy-bars for retaining rear arms in position on cross-member.



RECOMMENDED TOOLS

Standard Facom tools

K 214 - Extension-piece for torque spanner.

K 210 - 200 m/m long extension-piece.

K 35 - Socket, 35 m/m.

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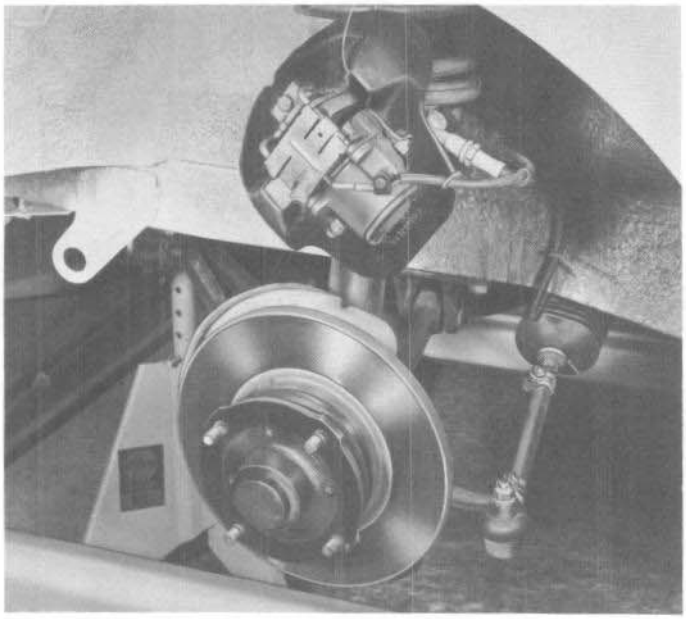
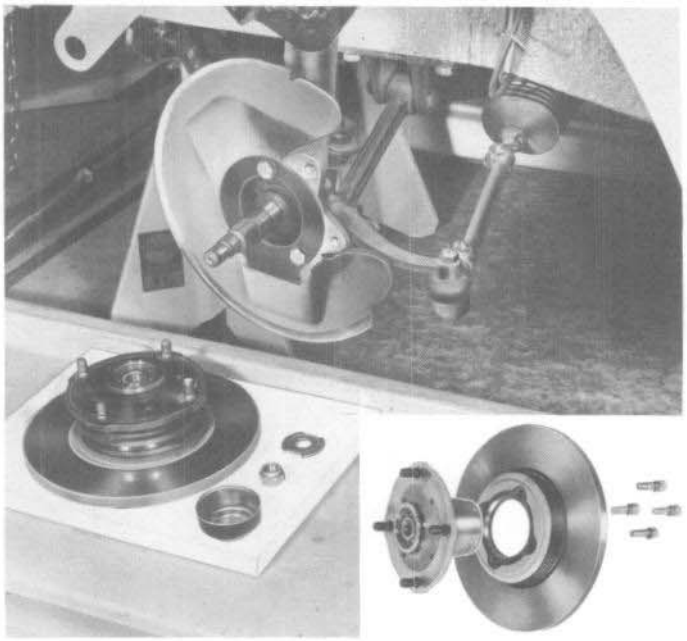


REMOVAL

– Hoist vehicle by front cross-member.

– **Partially remove caliper without disconnecting the flexible hose.**

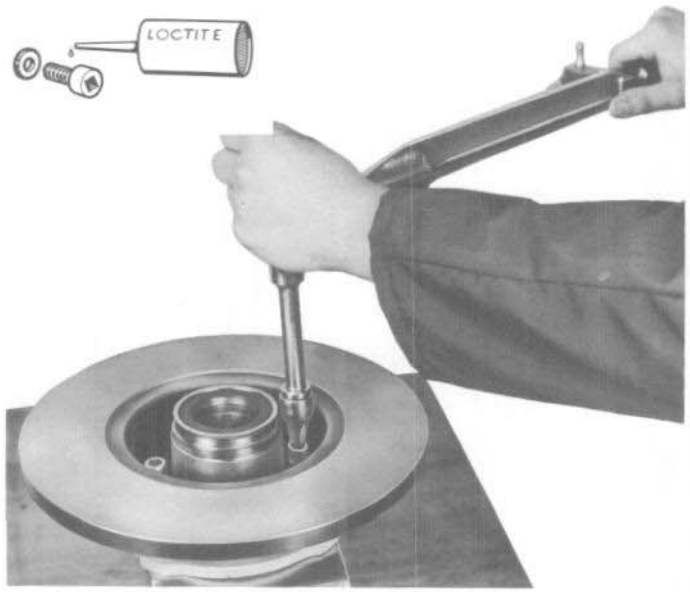


– Remove hub/disc assembly.

– Separate hub and disc.

– **Clean thoroughly.**

– Check the hub bearing before replacing.



REFITTING

– Assemble hub and disc (ensure that the mating surfaces are clean and free from burrs).

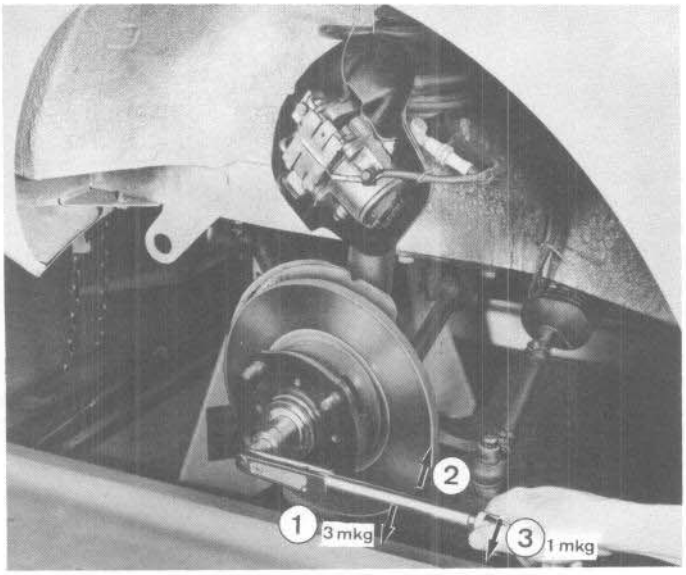
– Assemble each bolt (brushed clean) with :

- a **new** "Blocfor" lock washer,
- a few drops of Loctite, (standard grade).

– **Torque bolts to – 36 ft/lbs. (5 m.kg).**

BRAKES

REPLACING A FRONT DISC



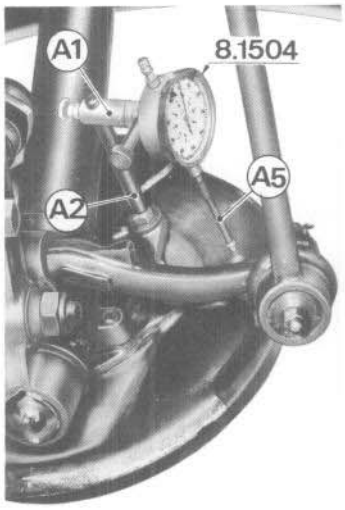
– Assembly of hub/disc to carrier :

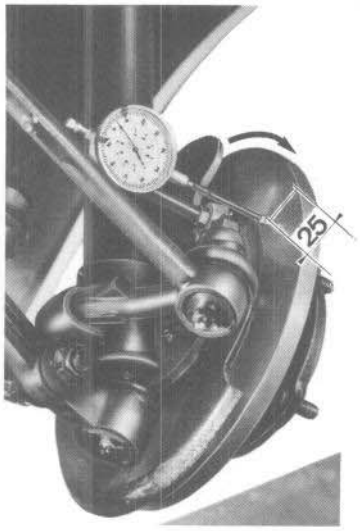
1 - torque a new nut to, 22 ft/lbs. **(3 m.kg)** then,

2 - slacken, and

3 - **re-torque to 7,2 ft/lbs. (1 m.kg).**

– Do not lock the nut at this stage.



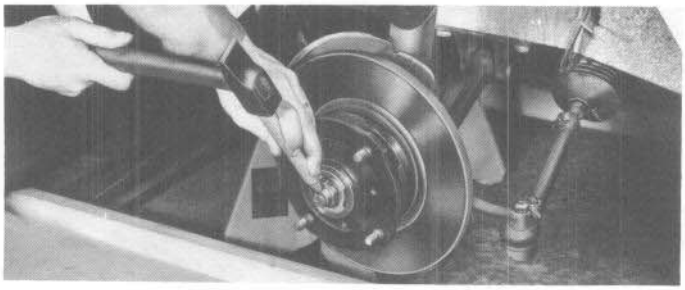


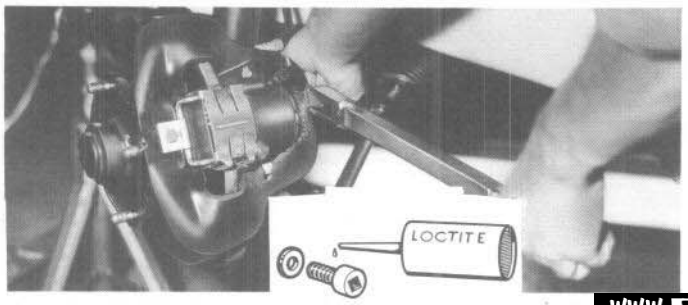
CHECK RUN-OUT

– Mount the dial indicator as shown opposite.

– **When rotated one complete turn maximum disc run-out should not exceed 0.07 m/m.**

– If this limit is exceeded rotate disc, in relation to hub, and re-check for run-out.





– **Locking of hub nut.**

– Fit the hub plug.

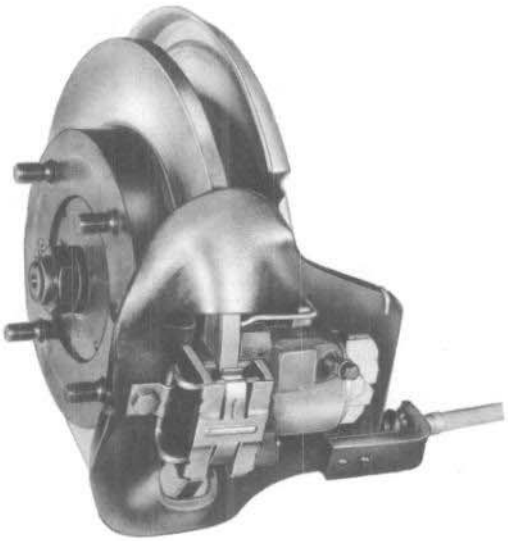
– Clean the disc surface with meths.

– Refit caliper (mating surfaces and bolt threads clean).

– Assemble each bolt (brushed clean) with :

- a **new** "Blocfor" lock washer.
- a few drops of Loctite, (standard grade).

– **Torque to 51 ft/lbs. (7 m.kg.).**

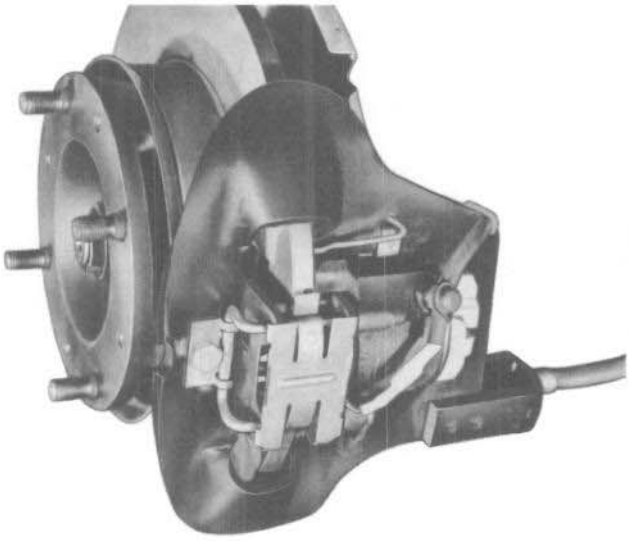


WARNING :

THERE ARE 3 DIFFERENT METHODS OF REPLACING A REAR DISC, depending on the type of assembly.

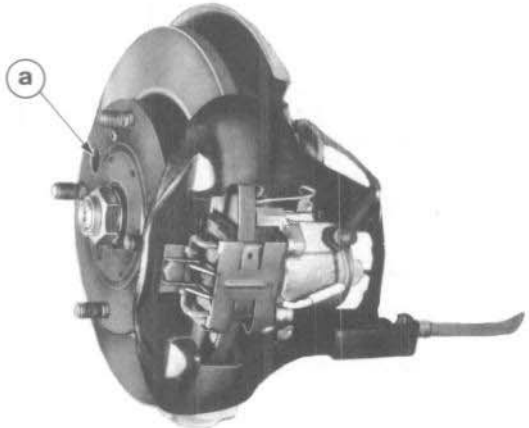
1st fitting to Saloon :

I - *Disc mounted on the outside face of hub.*



1st fitting to Coupé/Convertible :

II - *Discs fitted to the inside face of hub.*

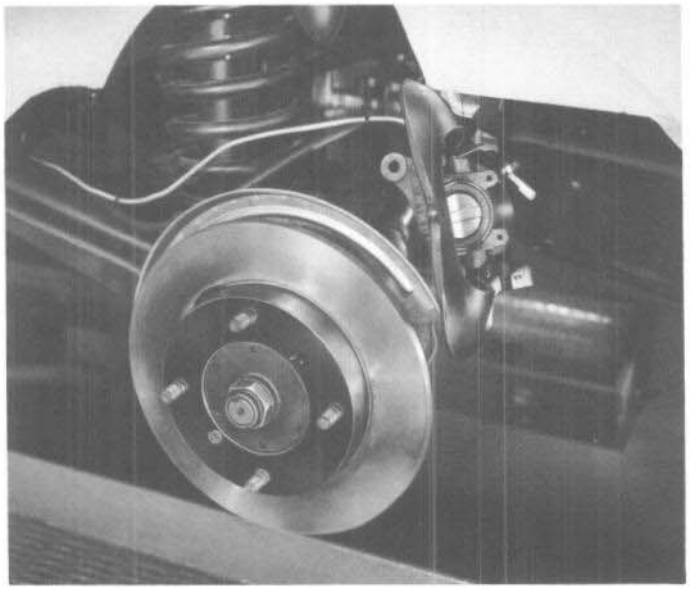


2nd fitting, all models :

III - *Disc fitted to the inside face of hub which has an access hole* **(a)** *to the carrier nut.*

BRAKES

REPLACING A REAR DISC



I - DISC MOUNTED OUTSIDE HUB

1st assembly on Saloon

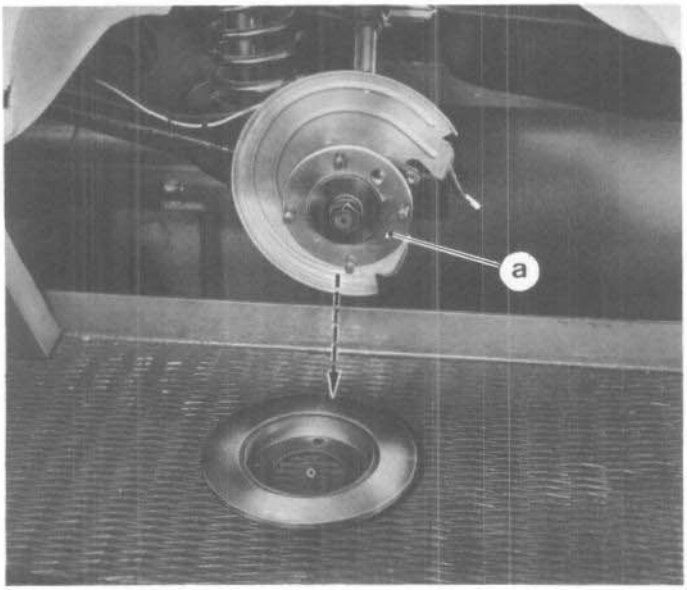
REMOVE

– Raise vehicle by the rear jacking points.

– Disengage the arms, brakes pipes and flexible hose.

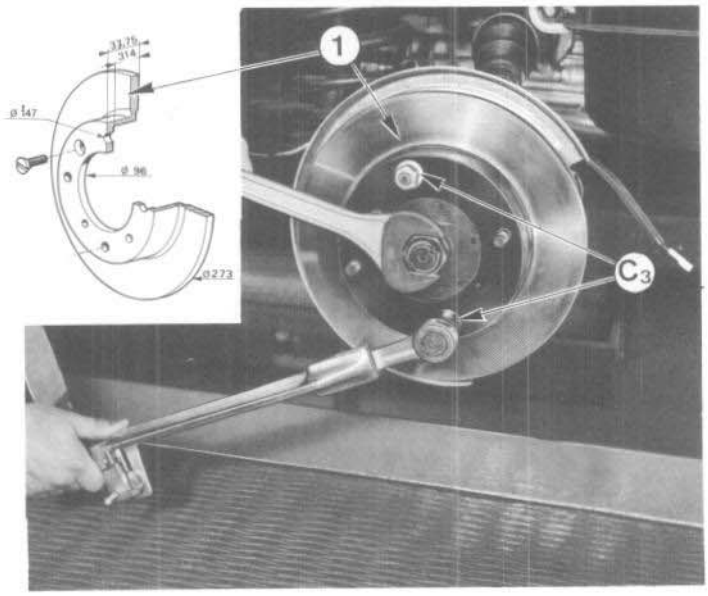
– Remove brake pads.

– **Partially dismantle the caliper without disconnecting the brake hose.**



– Remove the disc.

– Thoroughly clean hub face **(a).**



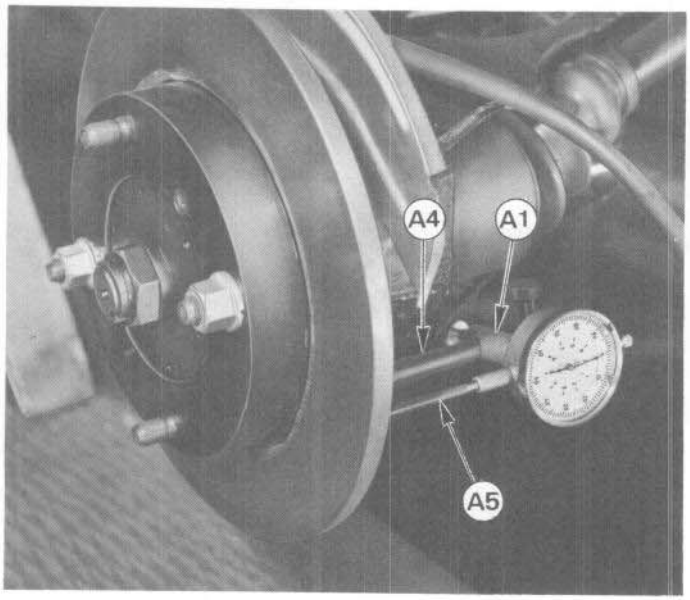
REFIT

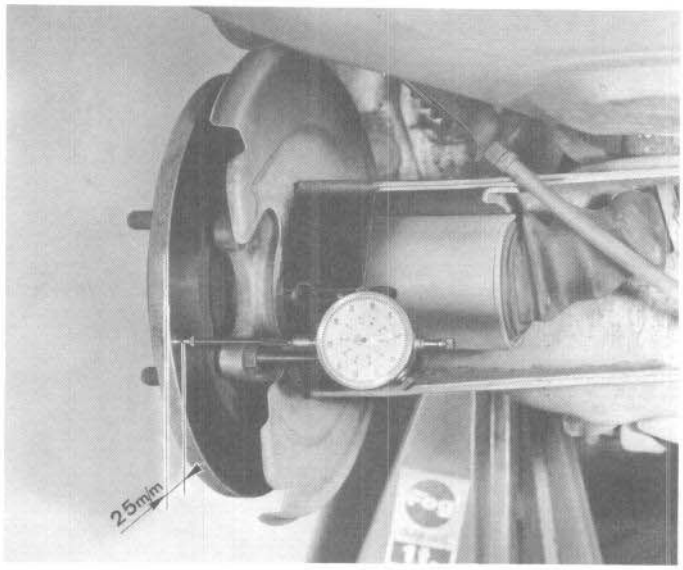
– Fit the disc **(1)** to the hub (mating surfaces clean and free from burrs) using :

- the retaining bolt,

- special nuts **(C3).**

– **Torque nuts to : 43 ft/lbs. (6 m.kg.).**





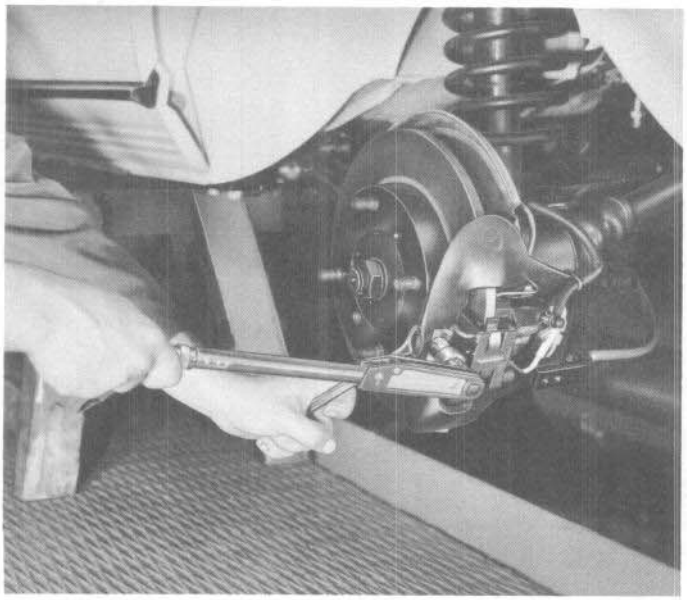
CHECKING RUN-OUT

– Mount dial indicator as shown

– **When rotated one complete turn maximum disc run-out must not exceed 0,07 m/m.**

– If this limit is exceeded, rotate the disc one half-turn, in relation to the hub carrier, and re-check run-out.

NOTE - *If run-out is still in excess of 0,07 m/m, check the hub.*



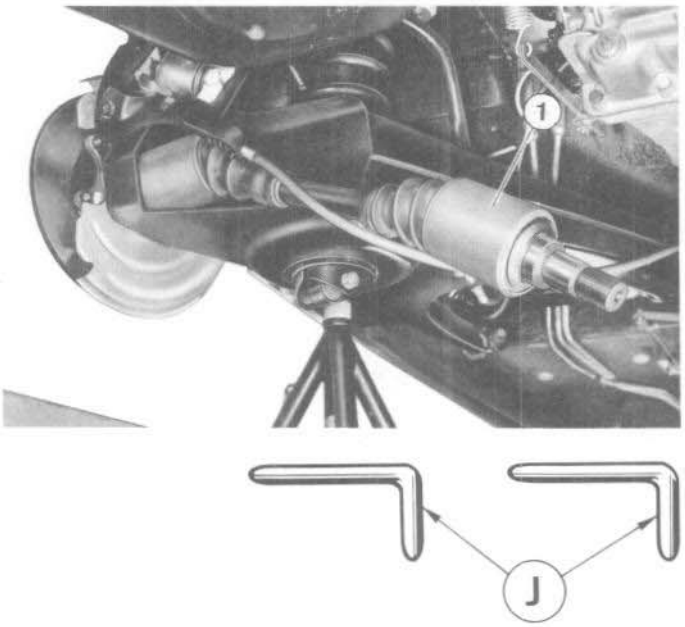
– Clean the disc surfaces with meths.

– Replace the caliper (ensure mating surfaces contact, and all threads clean).

– Mount each bolts (brushed clean) with :
- a **new** "Blocfor" lock washer.
- a few drops of Loctite (standard grade).

– **Torque bolts to 36 ft/lbs. (5 m.kg.).**

– Replace disc pads.
- torque to, 12,7 ft/lbs. **(1,75 m.kg.).**



II - DISC MOUNTED ON THE INSIDE OF HUB.

1st fitting to Coupé/Convertible

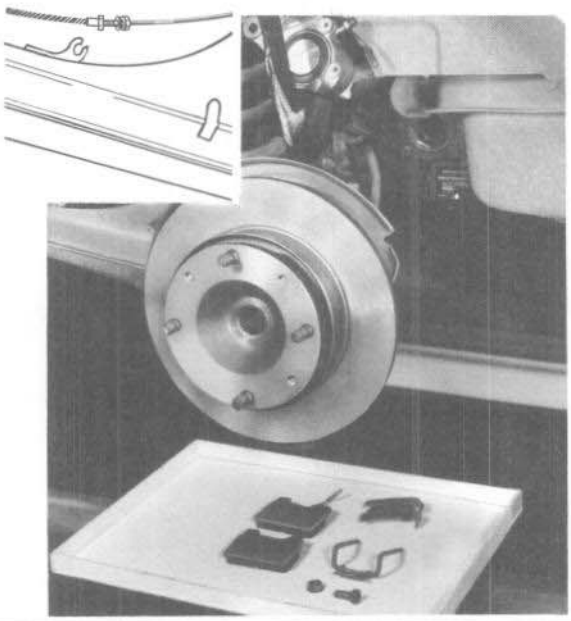
REMOVE

– Raise vehicle at rear jacking point.

– Disengage the arms, brake pipe and flexible hose.

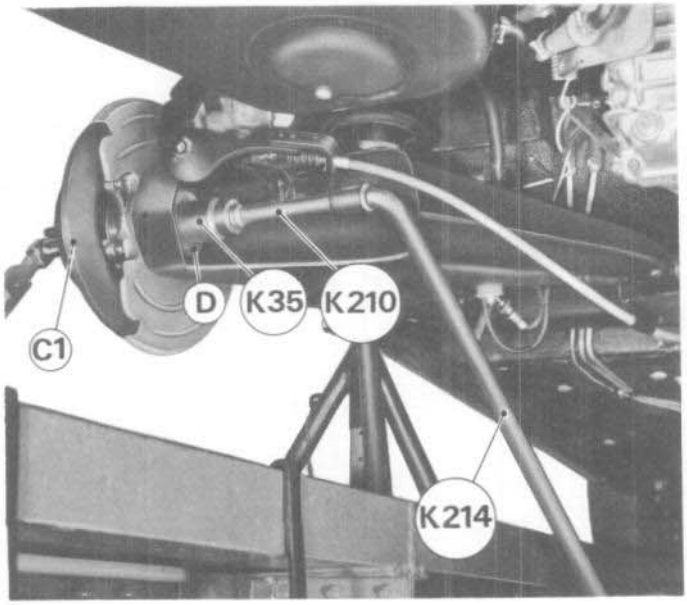
– Dismantle the drive shaft **(1)** by disconnecting the rear cross-member.

– Hold the cross-member temporarily in place by means of the tommy-bars **(J).**



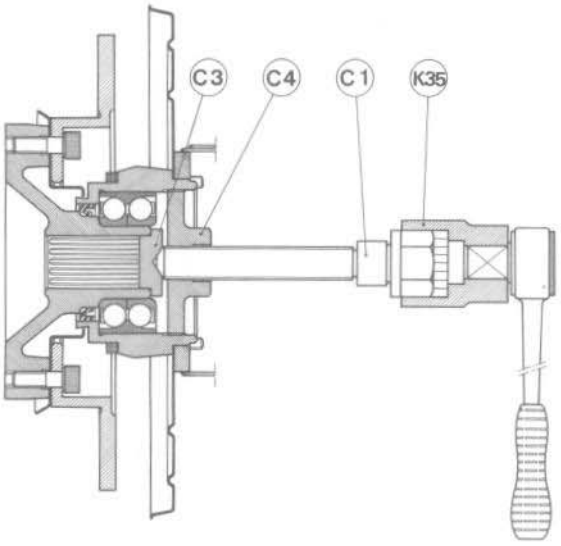
– Remove the pads.

– **Partially dismantle the caliper without disconnecting the brake pipe.**

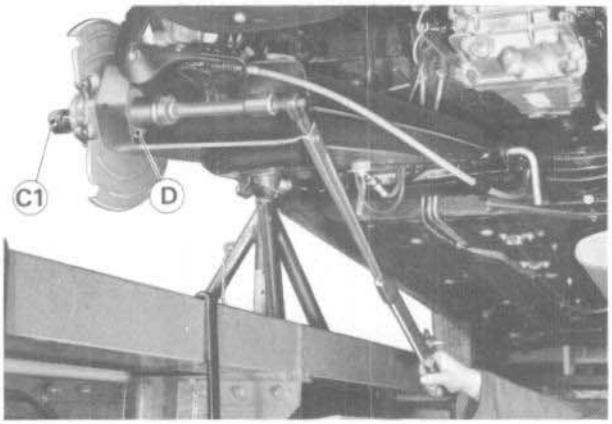


– Proceed as shown to remove the hub nut.

- retain the screw **C1** whilst in this position.



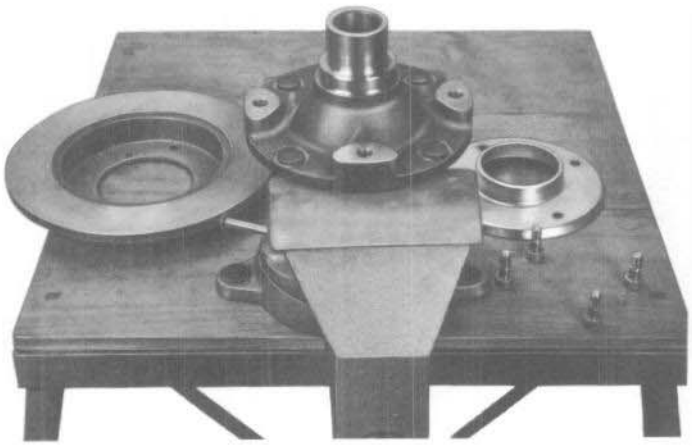
– Remove the hub/disc assembly.



– Check condition of oil seal **(2)** and fit hub nut.

- **Torque nut to , 181 ft/lbs. (25 m.kg.).**

– **Do not lock hub nut at this stage.**



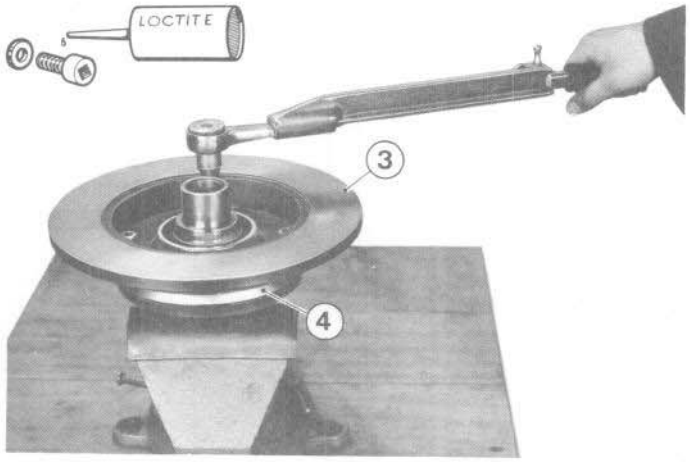
– Dismantle the disc.

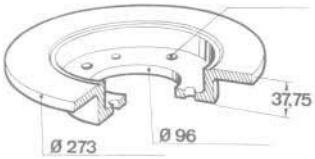
– Salvage the deflector.

– Thoroughly clean all parts.

BRAKES

REPLACING A REAR DISC





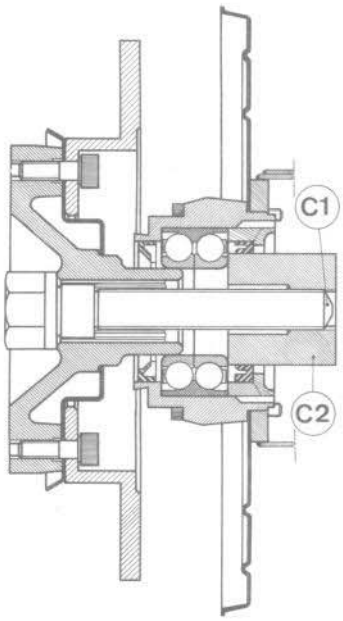
REFIT

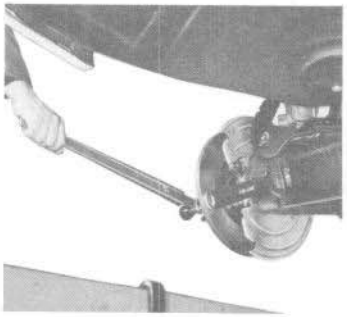
– Assemble the disc **(3)** and hub, interposing the deflector **(4)** (ensure that all mating surfaces are clean and free from burrs).

– Mount each bolt (brushed clean) with :

- a **new** "Blocfor" lock washer.
- a few drops of Loctite (standard grade).

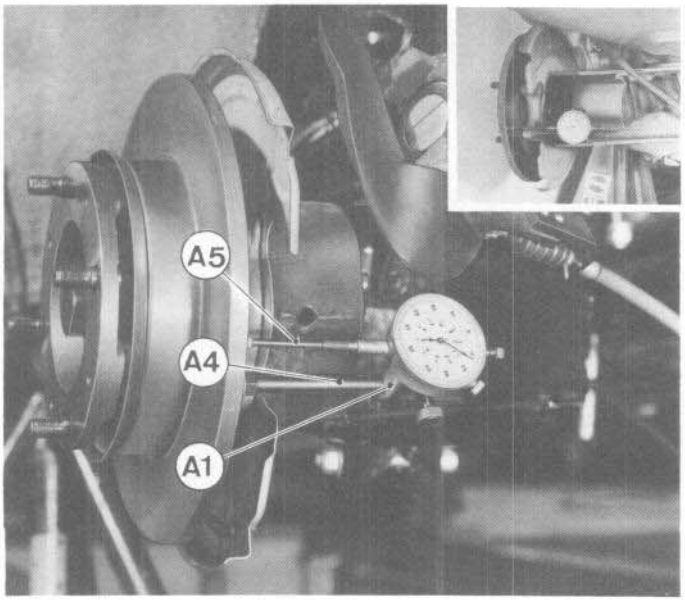
– **Torque bolts to, 36 ft/lbs. (5 m.kg.).**





– Replace the disc/hub assembly.

– The hub butting against the bearing, leave in position the tools **(C1), (C2),** for checking run-out.



– Mount the dial indicator as shown.

– When rotated one complete turn the disc run-out must not exceed, **0,07 m/m.**

– If this limit is exceeded, rotate disc, in relation to hub, a 1/4 or 1/2 turn and re-check run-out.

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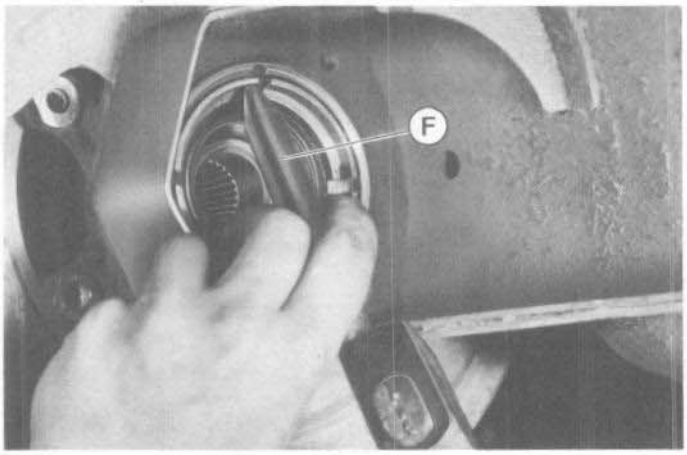
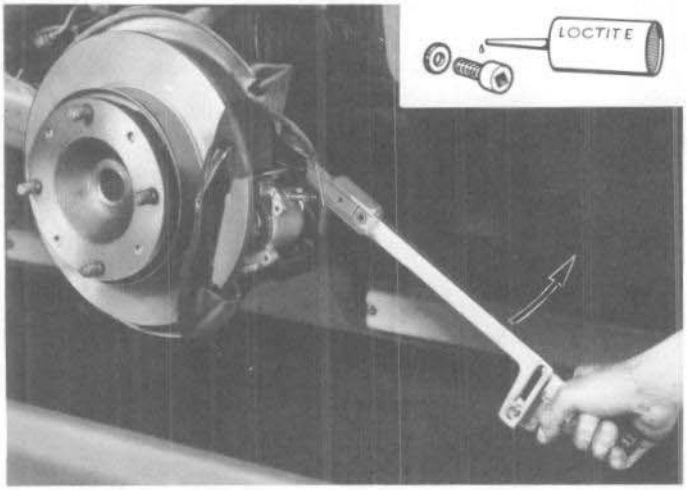




— **Securing the hub nut.**

— Clean disc surface with meths.

— Refit caliper, mating faces in contact and all threads clean.

— Mount each bolt (brushed clean) with :

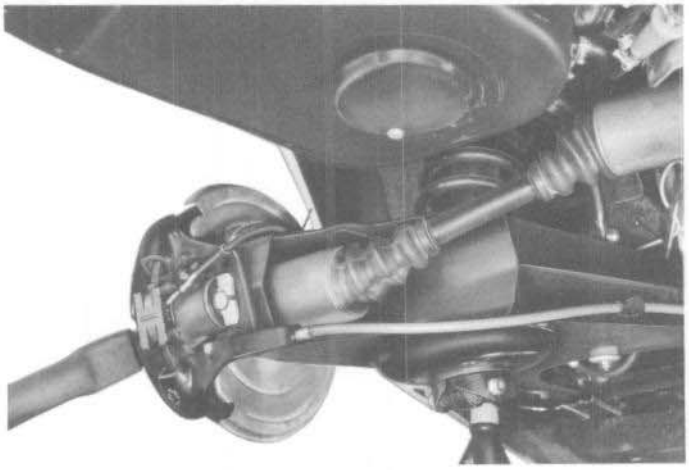
- a **new** "Blocfor" lock washer.

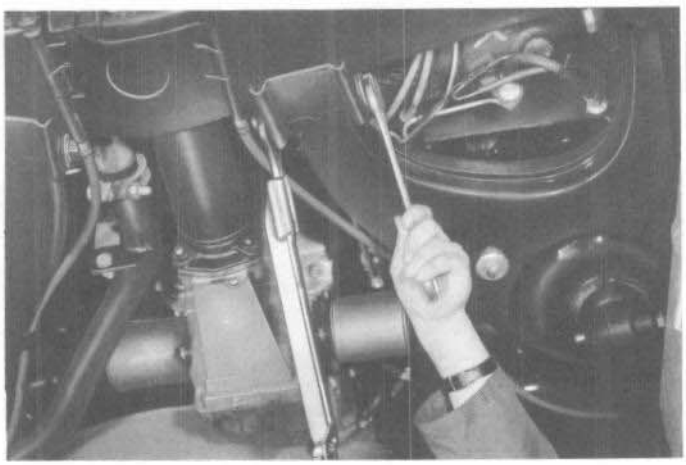
- a few drops of Loctite (standard grade).

— **Torque nut to, 31 ft/lbs. (4,25 m.kg.).**

— Replace pads.

- Torque to, 12,7 ft/lbs. **(1,75 m.kg.).**

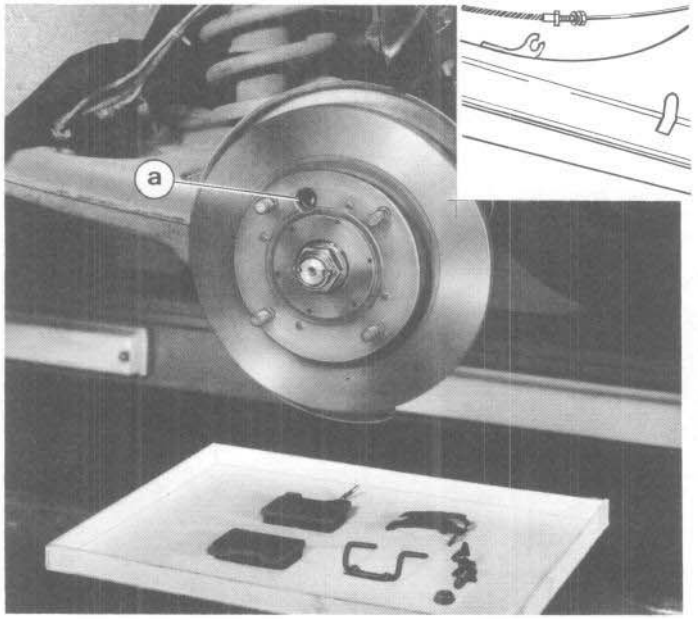




— Replace drive shaft.

— Torque nut to, 181 ft/lbs. **(25 m.kg.)** and stake.

— **With the vehicle on the ground and 2 - persons seated in the rear,** torque rear suspension arm pivots to, **47 ft/lbs. (6,5 m.kg.).**



III - DISC MOUNTED ON INSIDE OF HUB (hub with access hole to bearing housing bolt **(a)**).

2nd assembly on all models

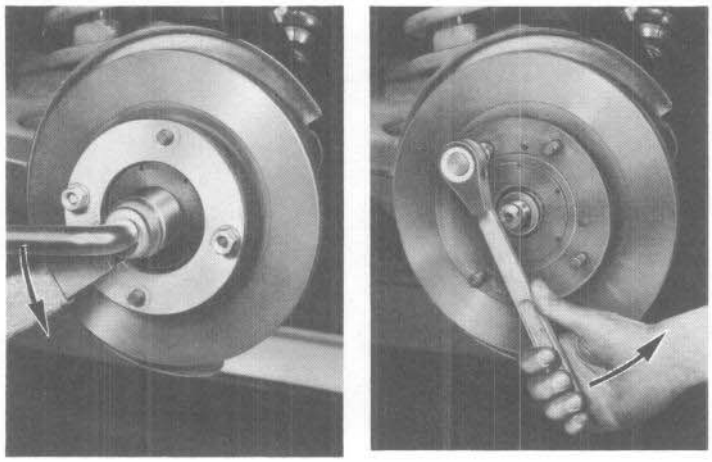
REMOVE

– Raise vehicle at rear jacking points.

– Disengage the brake pipe and flexible hose from the arm.

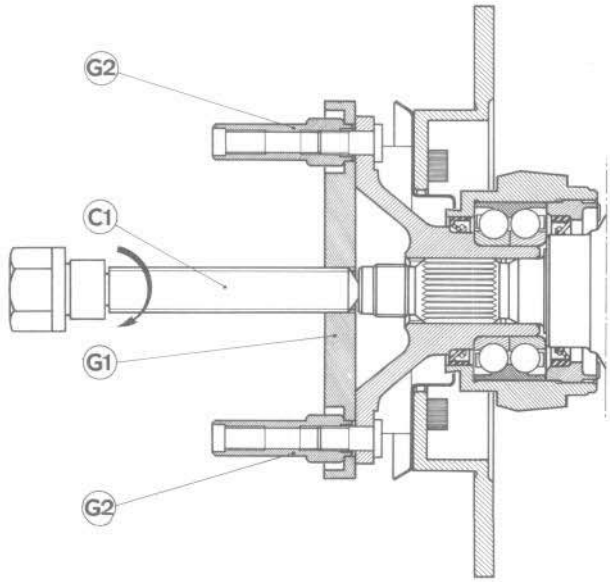
– Remove brake pads.

– Partially dismantle caliper without disconnecting the brake pipe and hose.

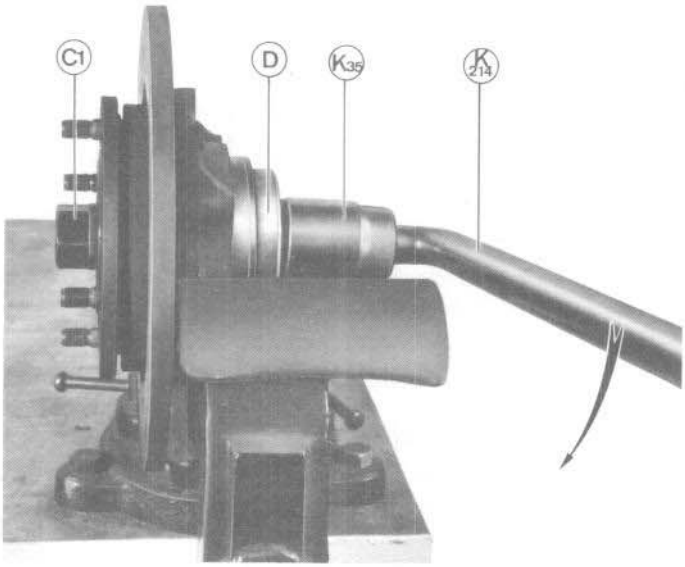


– Remove shaft nut.

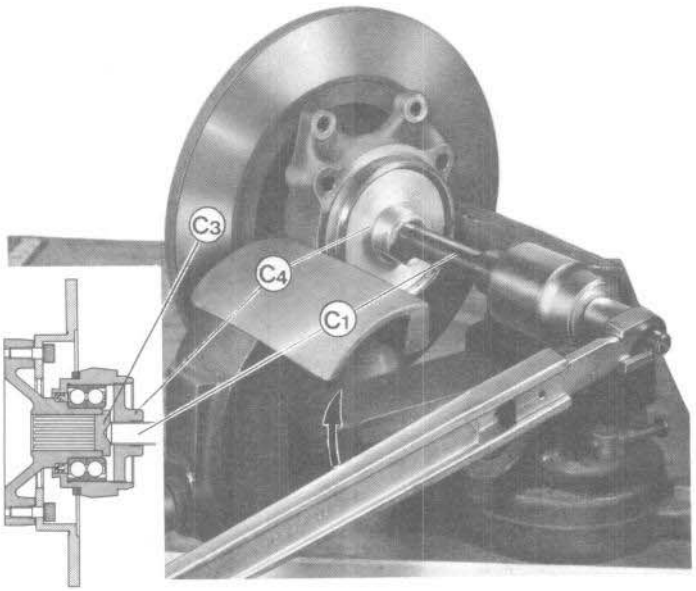
– Remove the shaft, hub, disc assembly after removal of the bearing housing bolt.



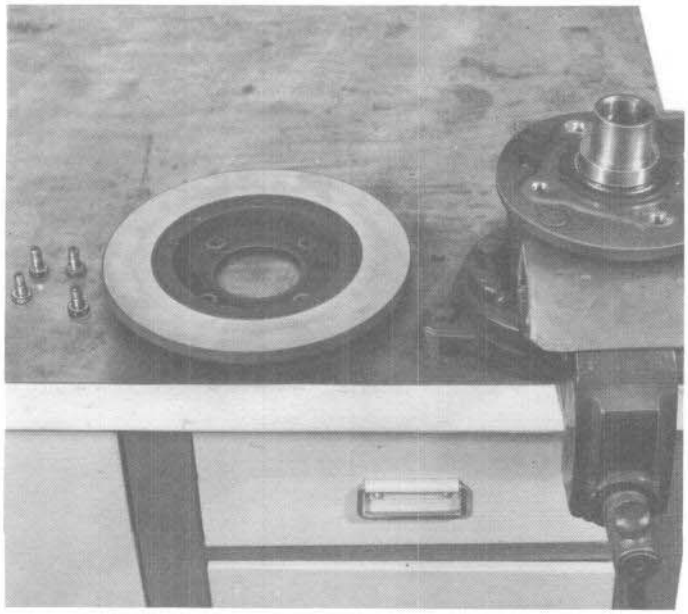
– Dismantle drive shaft using the tools shown opposite.



– Remove bearing housing nut.



– Remove hub/disc assembly.

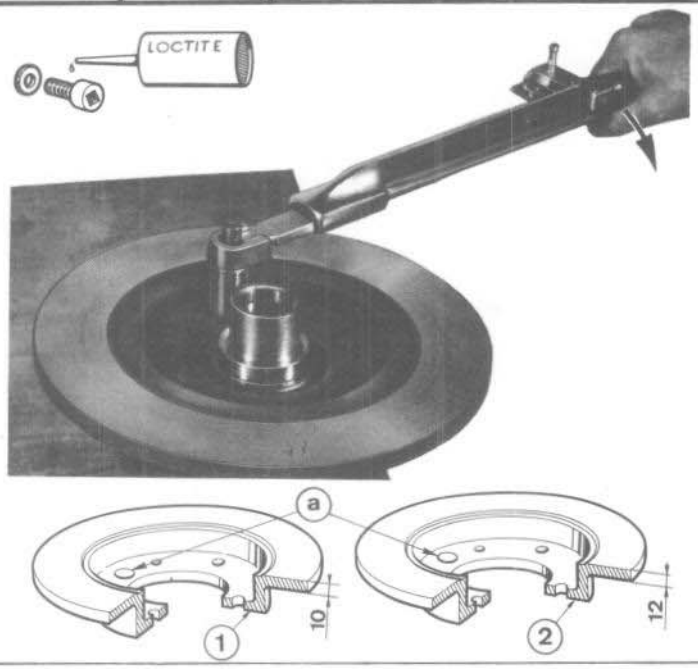


– Remove the disc.

– Thoroughly clean all parts.

BRAKES

REPLACING A REAR DISC



REFIT

– Fit the disc to hub (ensure mating surfaces are clean and free from burrs).

– a hole **(a)** mating with a hub hole.

WARNING :

TWO TYPES OF DISC

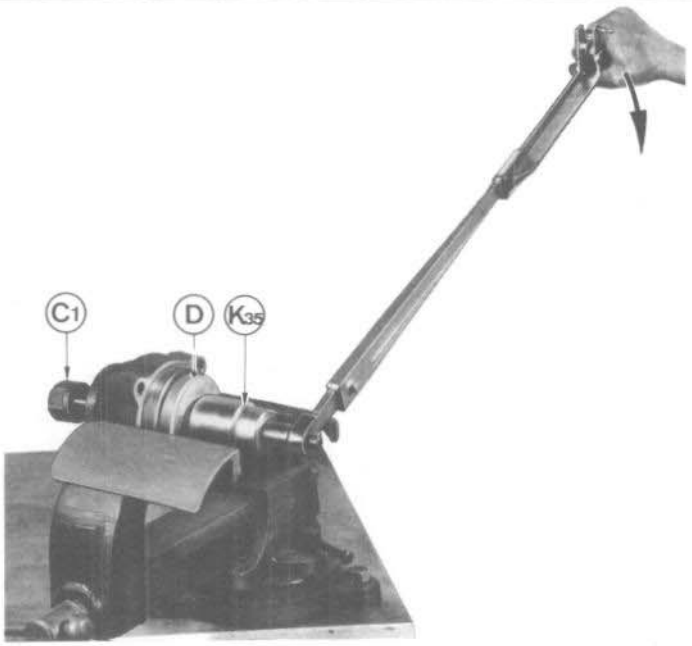
– *10 m/m thick disc fitted to vehicles with calipers type AH 12 MKI.*

– *12 m/m thick disc fitted to vehicles with calipers type AH 12 MKIII.*

– Mount each bolt (brushed clean) with :

- a **new** "Blocfor" lock washer
- a few drops of Loctite (standard grade).

– **Torque bolts to, 36 ft/lbs. (5 m.kg.).**

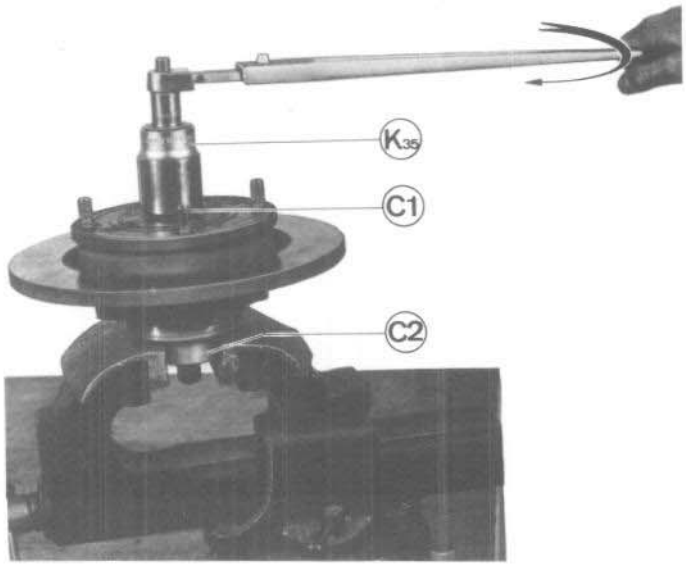


– Check the condition of the seals and bearing housing bolt in the event they require replacing.

– Tighten the bearing housing nut.

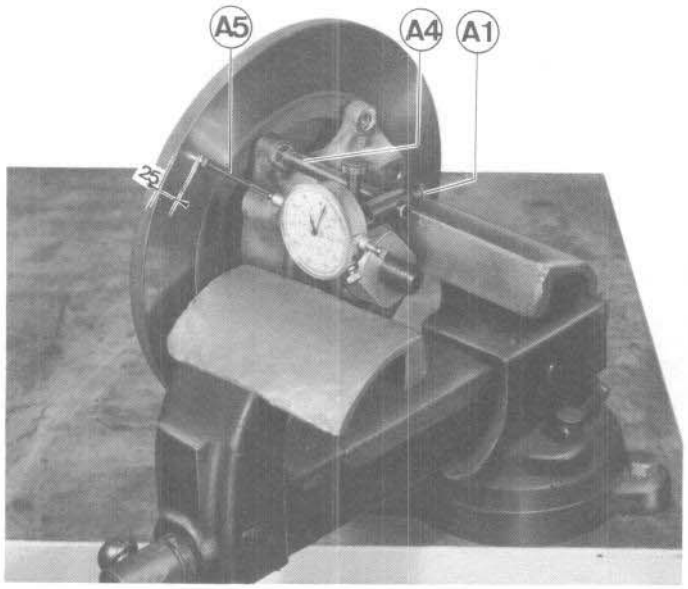
– **Torque the nut to, 181 ft/lbs, (25 m.kg.)** using the tools as illustrated.

– **Do not lock the nut at this stage.**



– Assemble hub/disc to bearing housing.

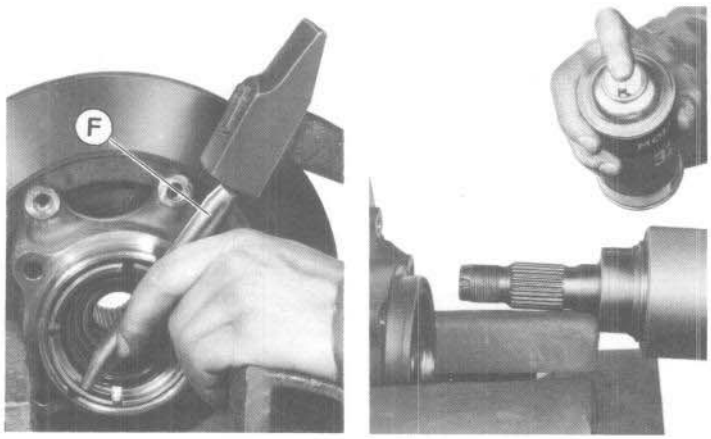
– Leave tools **(C1)** and **(C2)** in position.



– Mount the dial indicator as shown.

– When rotated one complete turn disc run-out must not exceed, 0,07 m/m.

– If this limit is exceeded, rotate the disc one-half turn, in relation to the hub, and re-check run-out.

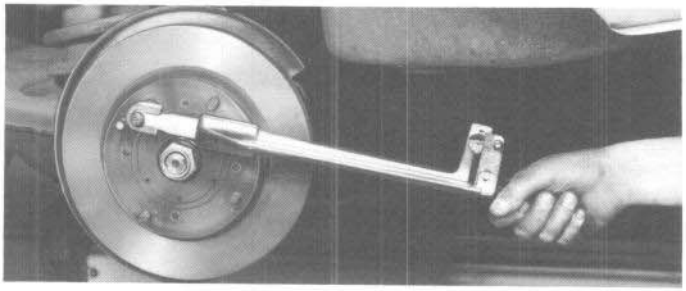


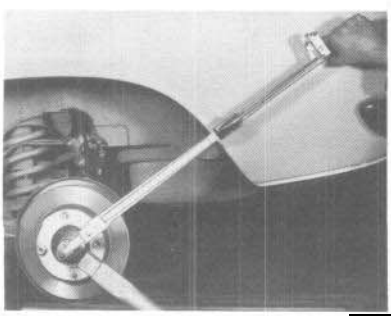
– Remove tools **(C1)** and **(C2)**.

– **Stake the hub carrier nut.**

– Coat the drive shaft splines with Molykote 321.

– Fit drive shaft to hub.





– Replace the assembly in vehicle.

– Mount each bolt (brushed clean) with :

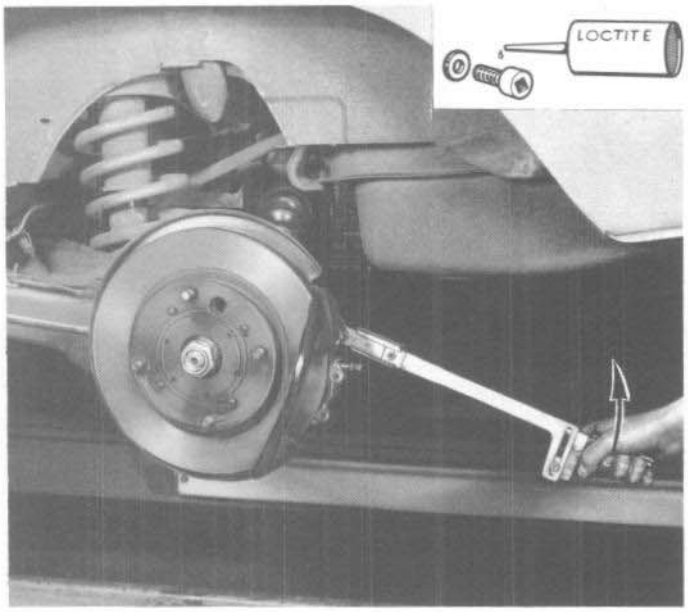
- a **new** washer.
- a few drops of Loctite, (standard grade).

– **Torque to, 31 ft/lbs. (4,5 m.kg.).**

– Torque shaft nut to, **181 ft/lbs. (25 m.kg.)** and stake.

BRAKES

REPLACING A REAR DISC



– Replace the caliper.

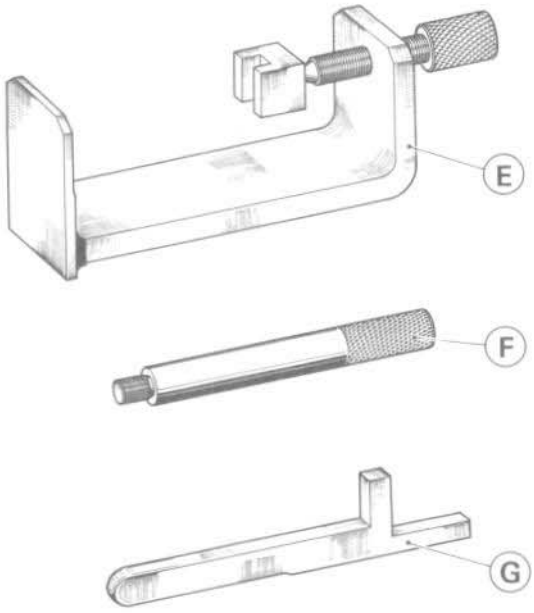
– Mount the bolts (brushed clean) with :

- a **new** "Blocfor" lock washer
- a few drops of Loctite, (standard grade).

– Torque to, 31 ft/lbs. (4,25 m.kg.).

– Replace disc pads.

Torque to, 12,7 ft/lbs. (1,75 m.kg.).



TOOLS REQUIRED

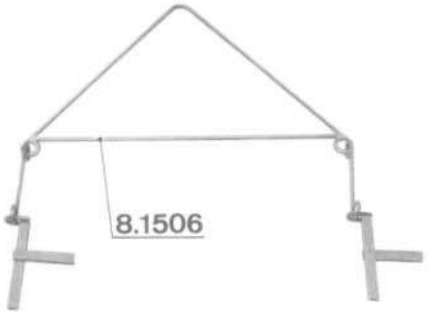
8.0803 W

— Tool kit for disc brakes.

E - Fixture for actuating front and rear pistons.

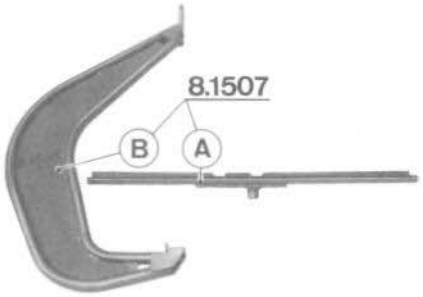
F - Screwed rod for plugging master cylinder.

G - Key for positioning the rear pistons.



8.1506

— Front hoisting tackle.



8.1507

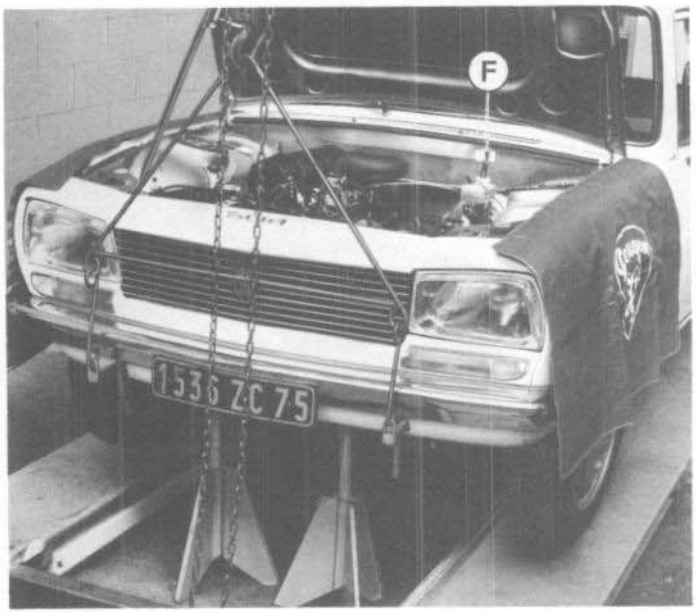
— Rear hoisting tackle, comprising :

A - cross-piece,

B - hook.

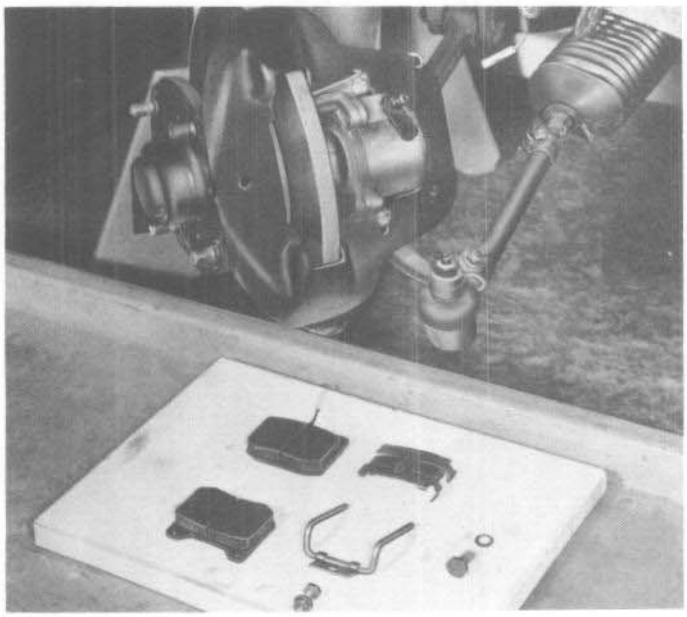
BRAKES

REMOVING A FRONT BRAKE CALIPER



– Hoist vehicle by front cross-member.

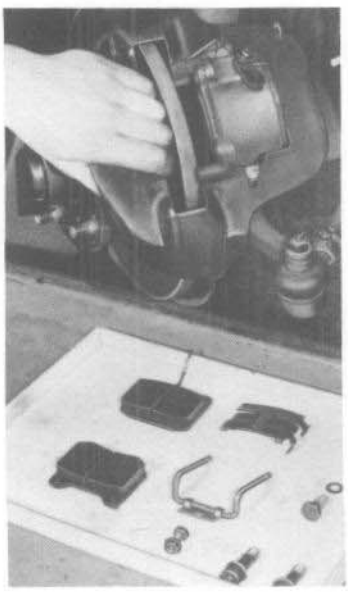
– Block the master-cylinder inlet (plug **F**).

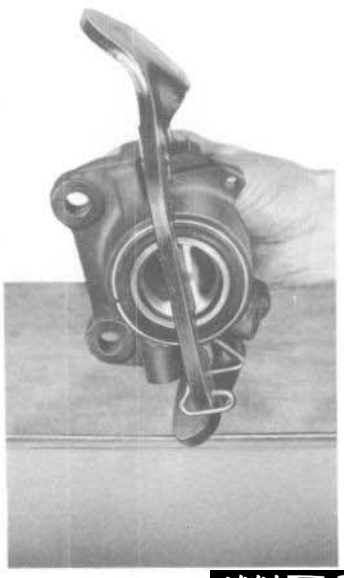


– Remove the wheels.

– Remove the pads.

– Disconnect from the caliper,
- warning light lead,
- flexible hose.

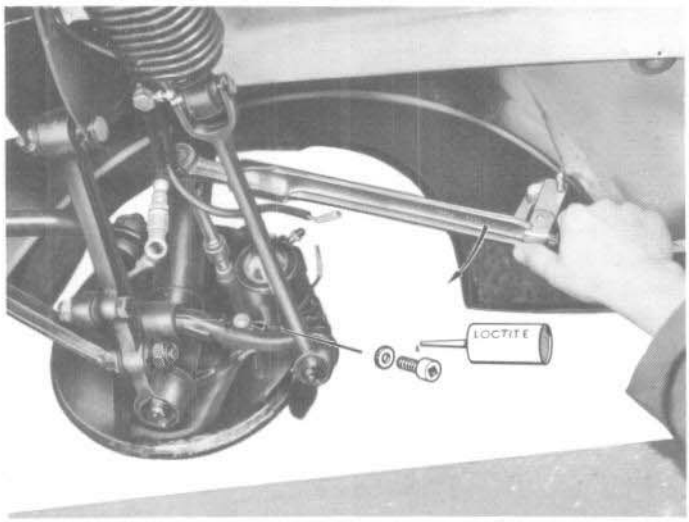




– Remove the caliper.

– Remove the bleed screw.

– Drain the cylinder.



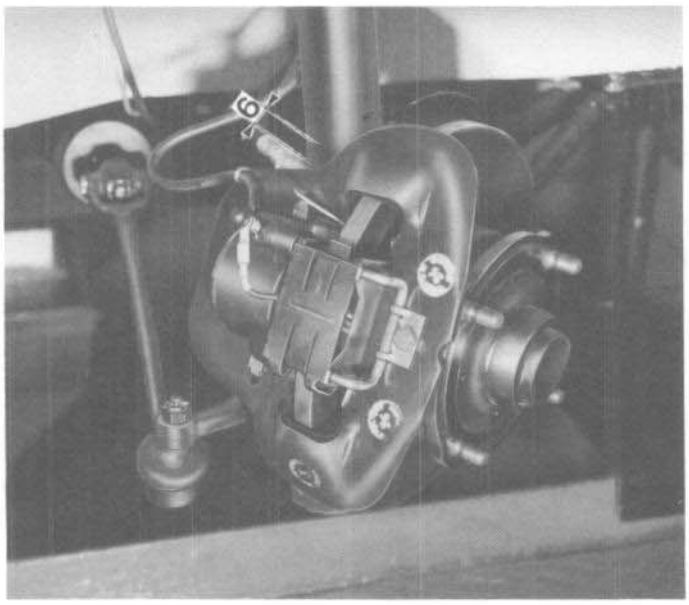
– Replace the caliper (ensure that mating surfaces and all threads are clean).

– Mount each bolt (brushed clean) with :

- a **new** "Blocfor" lock washer,

- a few drops of Loctite, (standard grade).

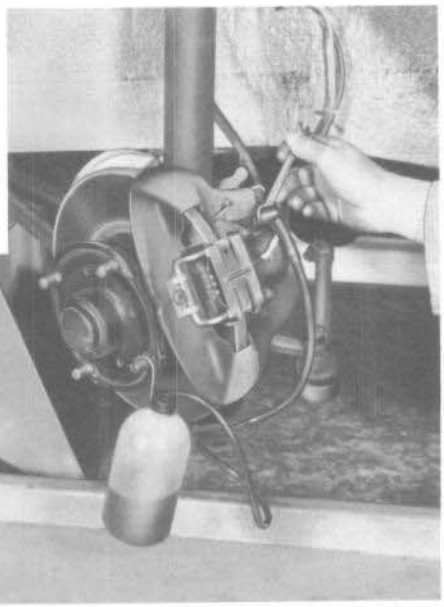
– **Torque to, 50,5 ft/lbs. (7 m.kg.).**



– Connect the flexible hose using **new** sealing washers

- make certain run of hose is correct.

– Replace pads (see page 03 01).



– Remove the plug **(F).**

– **Bleed the system** (see page 02 22).

FINAL OPERATIONS

– Replace the wheels (torque to, 43,5 ft/lbs. **(6 m.kg.)**).

– Check :

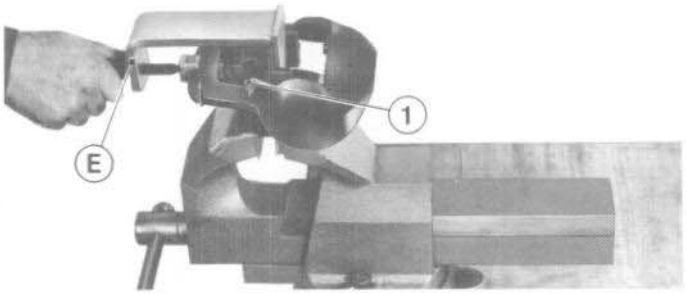
- brake pedal travel,

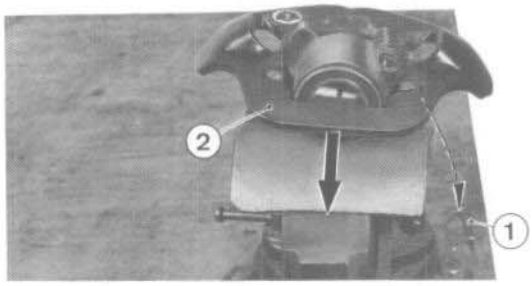
- brake fluid level,

- effectiveness of brakes (road test).

BRAKES

OVERHAULING A FRONT BRAKE CALIPER



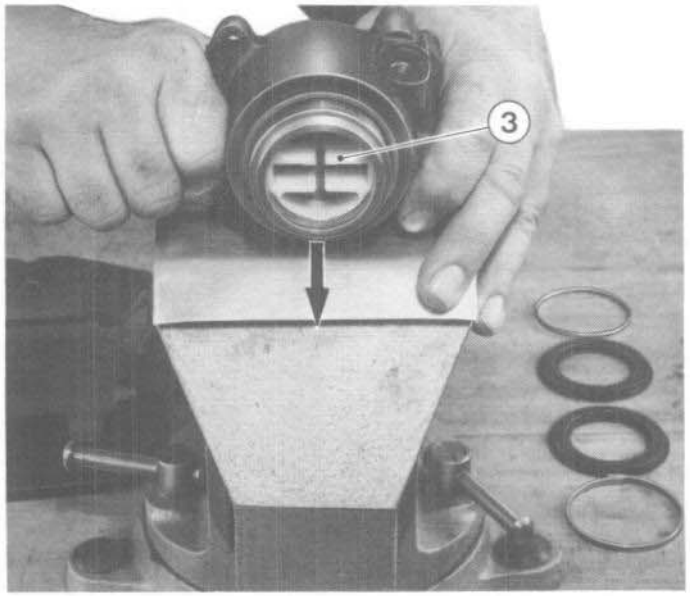


DISMANTLING

— Draw pistons forwards.

— Remove :

- thrust spring **(1).**
- caliper body **(2).**

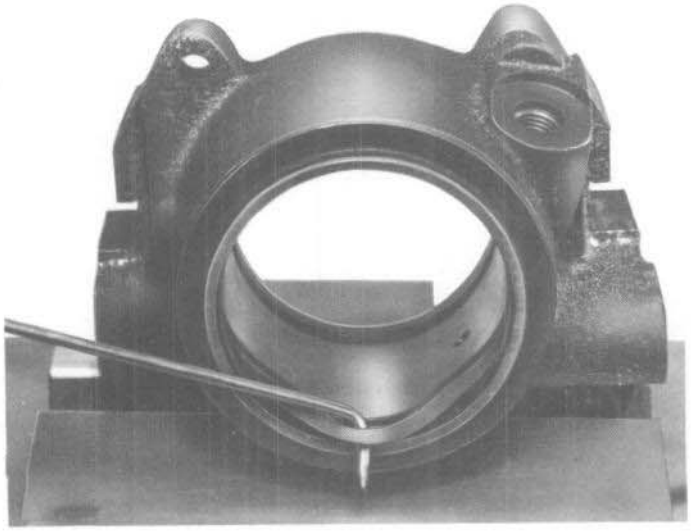


— Remove :

- protector retaining circlips,
- protectors.

— The two pistons from their cylinder.

— The nylon spacer **(3).**



— Remove the seals.

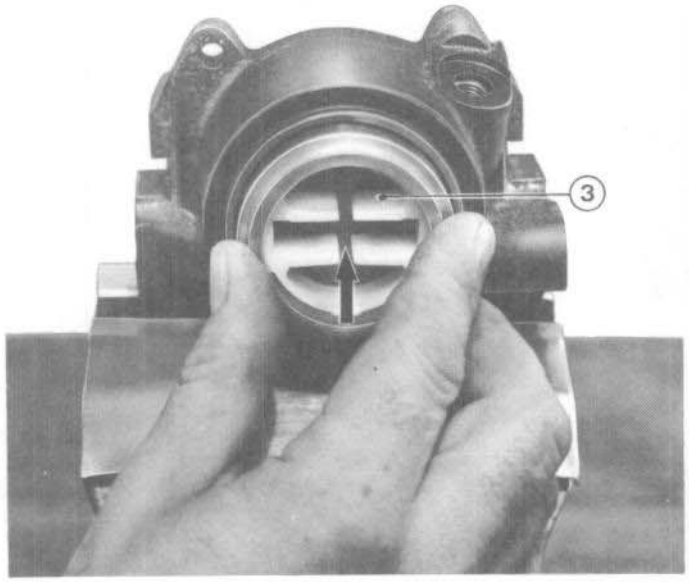
— **With meths** clean pistons and cylinders (ensuring that all grooves are clean).

— If the pistons and/or cylinders show signs of wear, scoring or corrosion, replace them.

RE-ASSEMBLY

– Coat the new seals with Lockheed Spagraph grease.

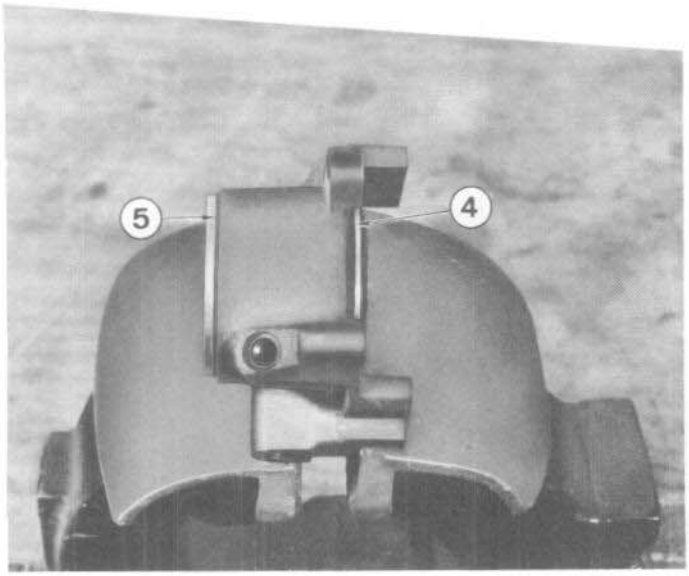
– Locate the seals in cylinder throat.



– Lightly coat the pistons with Lockheed Spagraph grease.

– Insert pistons in cylinder body:

- with the nylon spacer **(3),** caliper plate side.



– Fit :

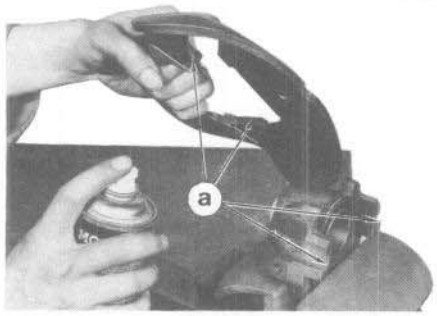
- the rubber protectors,
- retaining circlips

narrow clip **(4),** disc side,

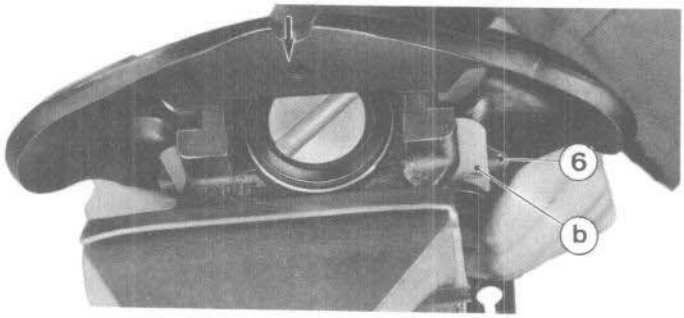
wide clip **(5),** caliper side.

BRAKES

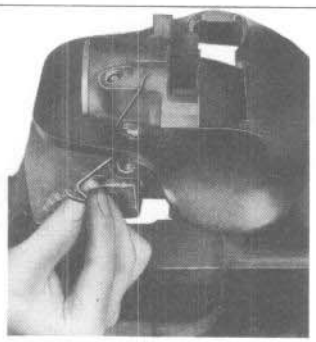
OVERHAULING A FRONT BRAKE CALIPER



– Lightly coat moving parts **(a)** with Molykote 321.

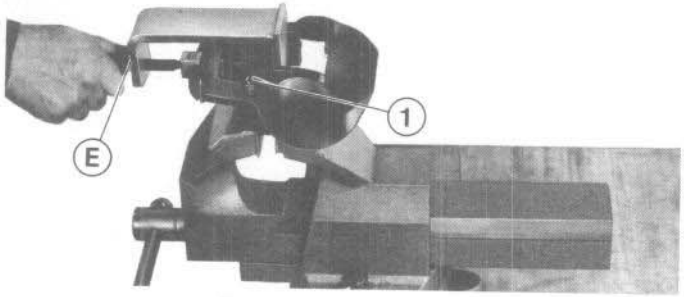


– Fit the caliper plate **(b)** with the aid of two pieces of 0,20 m/m thick shim **(6).**



– Fit the thrust spring **(1).**

– Assemble in place the pistons and caliper plate (hand tighten the fixture **E**).



– Re-fit the bleed screw.

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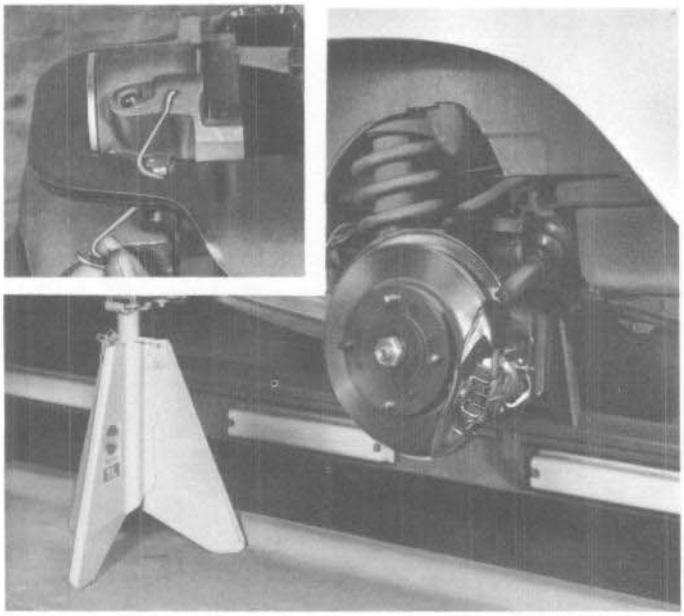
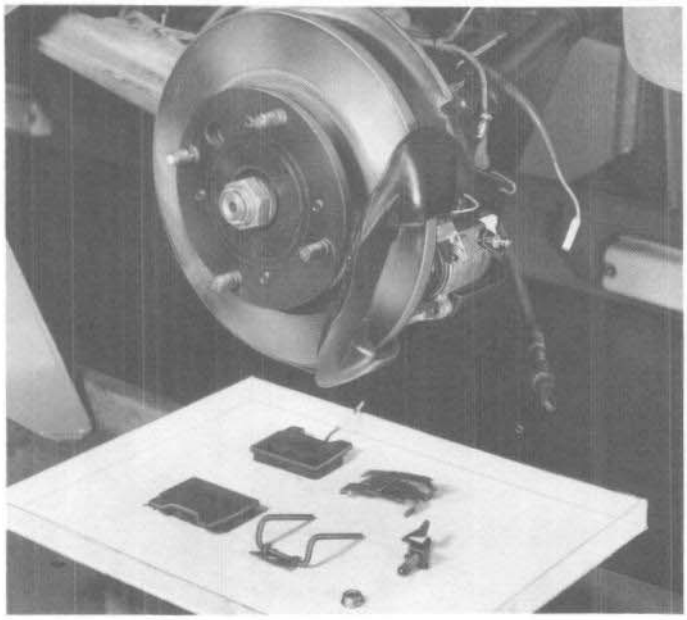


– Raise vehicle on rear jacking points.

– Block master-cylinder inlet (plug **F**).

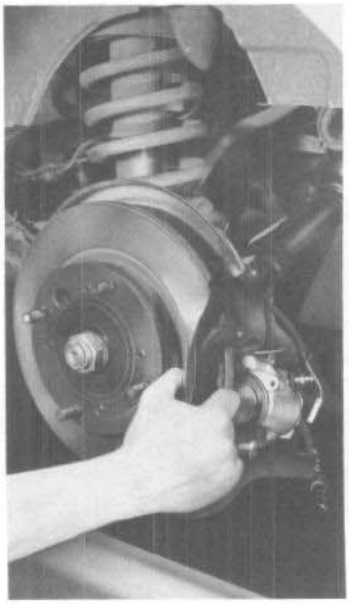
– Remove the wheels.

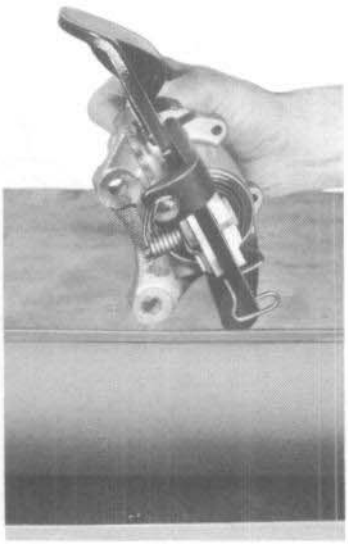


– Remove the pads.

– Disconnect, from the caliper :

- brake warning light lead,
- fluid feed hose,
- handbrake cable and outer casing.





– Remove the caliper.

– Remove the bleed screw.

– Drain the cylinder.

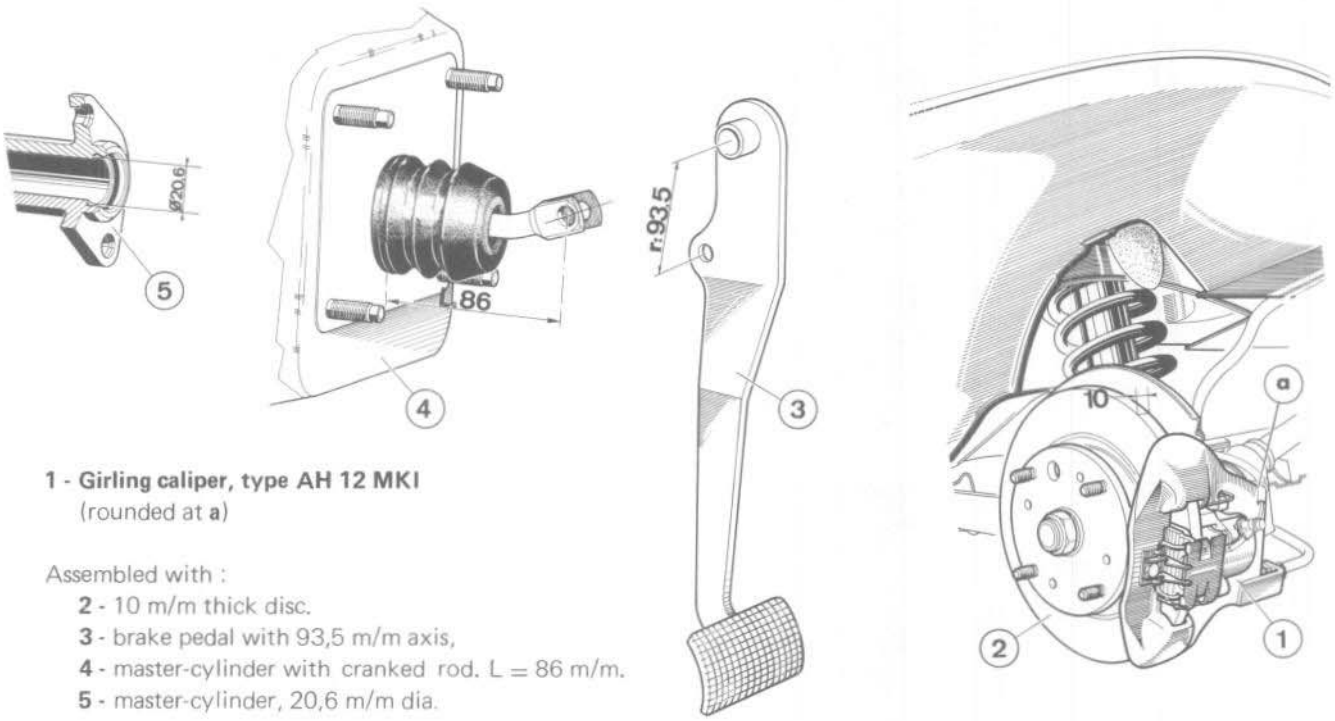
BRAKES

REPLACEMENT OF A REAR BRAKE CALIPER

WARNING :

TWO TYPES OF REAR BRAKE CALIPERS.

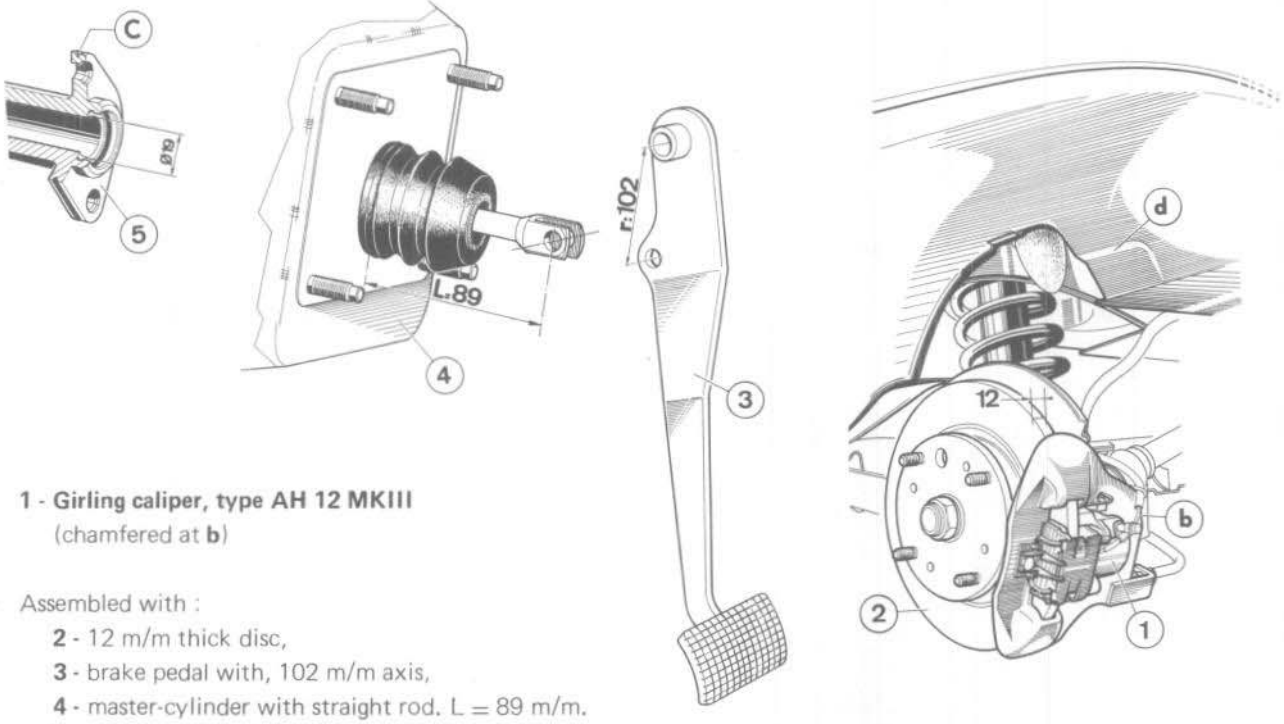
1st Assembly



1 - Girling caliper, type AH 12 MKI
(rounded at **a**)

Assembled with :
2 - 10 m/m thick disc.
3 - brake pedal with 93,5 m/m axis,
4 - master-cylinder with cranked rod. L = 86 m/m.
5 - master-cylinder, 20,6 m/m dia.

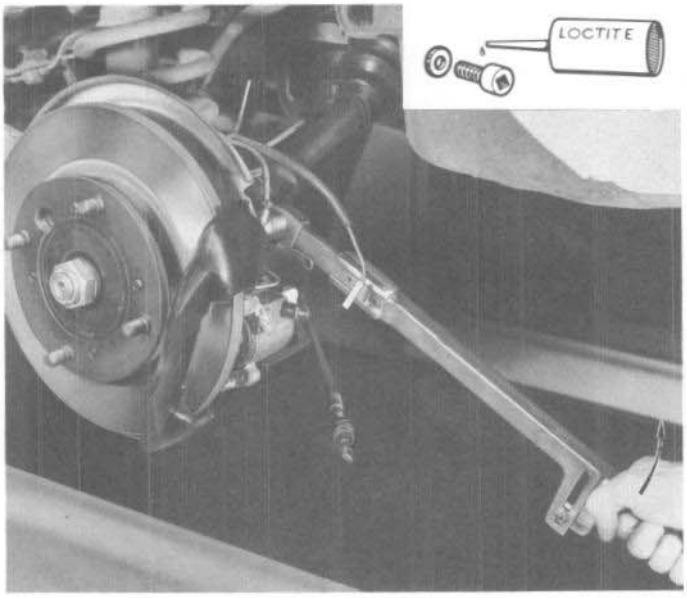
2 nd Assembly



1 - Girling caliper, type AH 12 MKIII
(chamfered at **b**)

Assembled with :
2 - 12 m/m thick disc,
3 - brake pedal with, 102 m/m axis,
4 - master-cylinder with straight rod. L = 89 m/m.
5 - master-cylinder 19 m/m dia. (groove at **c**).

WARNING - Parts from either assembly are not separately interchangeable. Girling calipers AH 12 MKIII are fitted only to vehicles whose hull is shaped as at **(d)**.

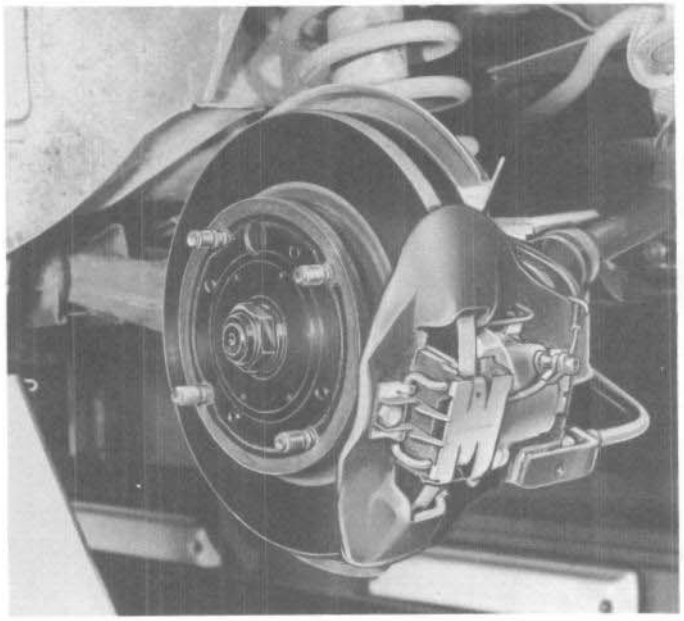


– Fit the caliper (mating surfaces in contact, all threads clean).

– Mount each bolt (brushed clean) with :

- a **new** "Blocfor" lock washer,
- a few drops of Loctite, (standard grade).

– Torque bolts to, 31 ft/lbs. **(4.25 m.kg.).**



– Connect :

- the brake hose,
- handbrake cable and casing.

– Replace the pads (see page 03 06).

– Remove the plug **(F).**

– Bleed the system (see page 02 22).

– Adjustment of the handbrake (see page 02 31).

FINAL OPERATIONS

– Replace the wheels (torque to, 43,5 ft/lbs. **(6 m.kg.)**).

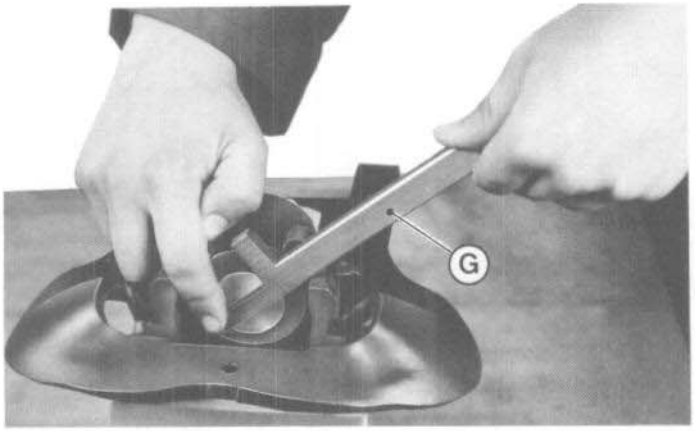
– Check :
- brake pedal travel,
- handbrake travel,
- hydraulic fluid level,
- effectiveness of brakes (road test).

BRAKES

OVERHAULING A REAR BRAKE CALIPER

fig. I

fig. II

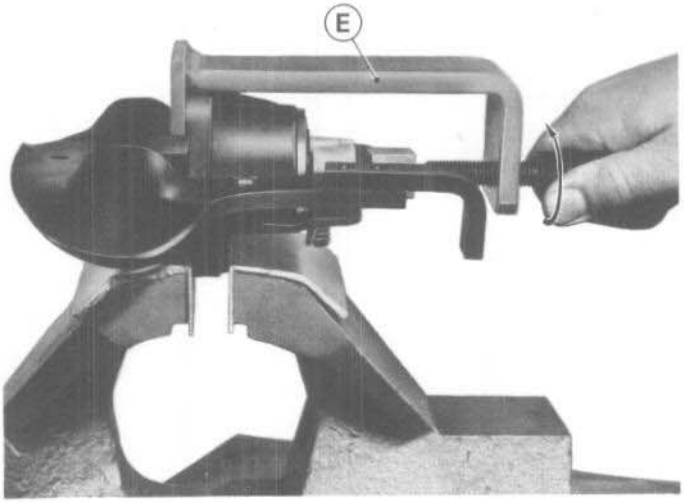


DISMANTLING

— Rotate the piston 1/8 of a turn.

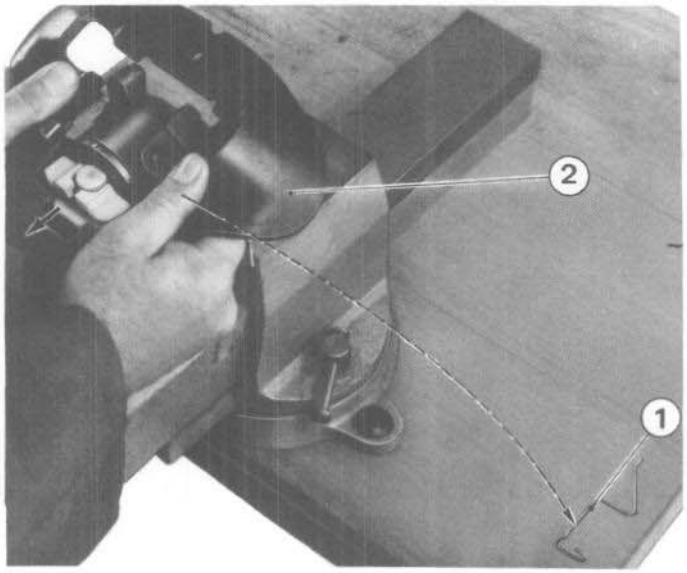
- caliper MKI (Fig. I).

- caliper MKIII (Fig. II).



— Return the pistons,

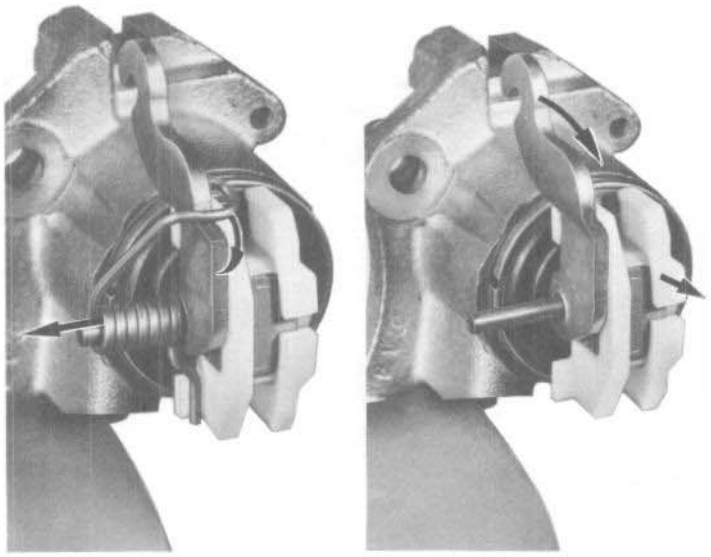
- (fixture **E** hand tight).



— Remove :

- the thrust spring **(1)**,

- caliper plate **(2)**.

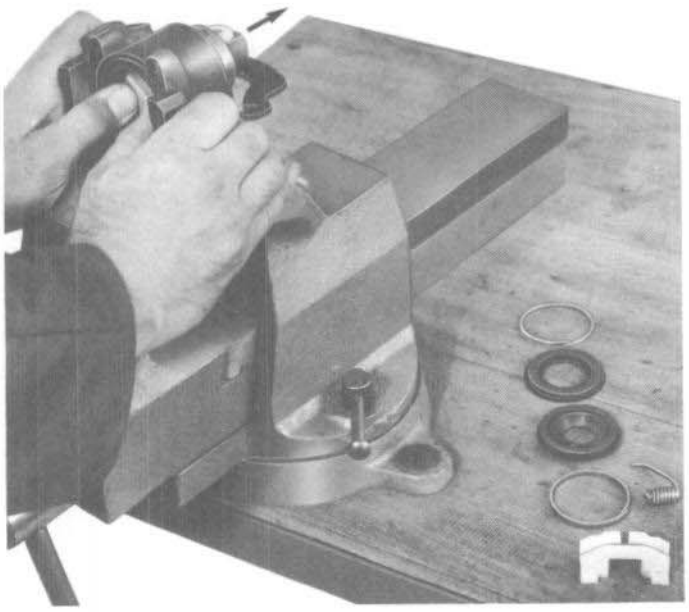


– Remove :

- the Truarc ring, if necessary,
- handbrake lever return spring.

– Remove the nylon spacer,

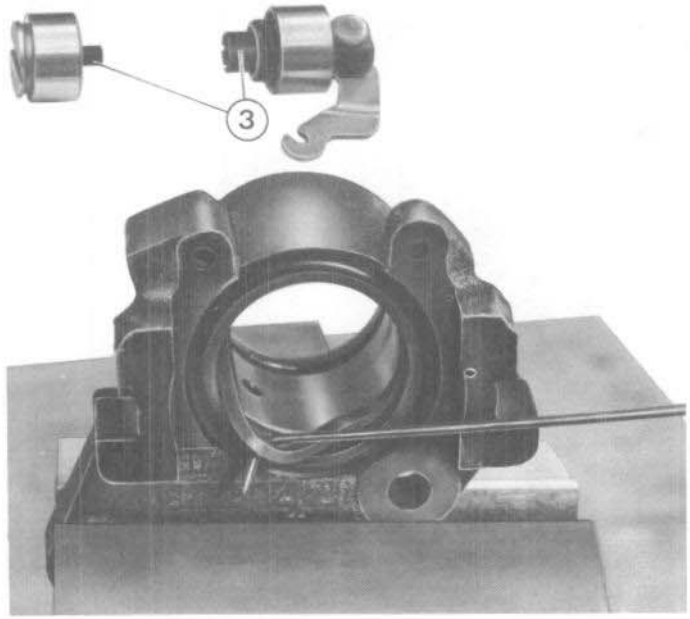
- (lift-up the handbrake lever).



– Remove :

- the protector retaining circlips,
- the protectors.

– Remove the pistons.



– Remove seals from cylinder body.

– With meths, clean the pistons and cylinder body (ensure that all grooves are clean).

– If pistons and/or cylinders show signs of wear, scoring, or corrosion, replace them.

– Check wear compensation system **(3)**.

REASSEMBLY

WARNING

TWO TYPES OF REAR BRAKE CALIPER.

I - Girling caliper, type AH 12 MKI.

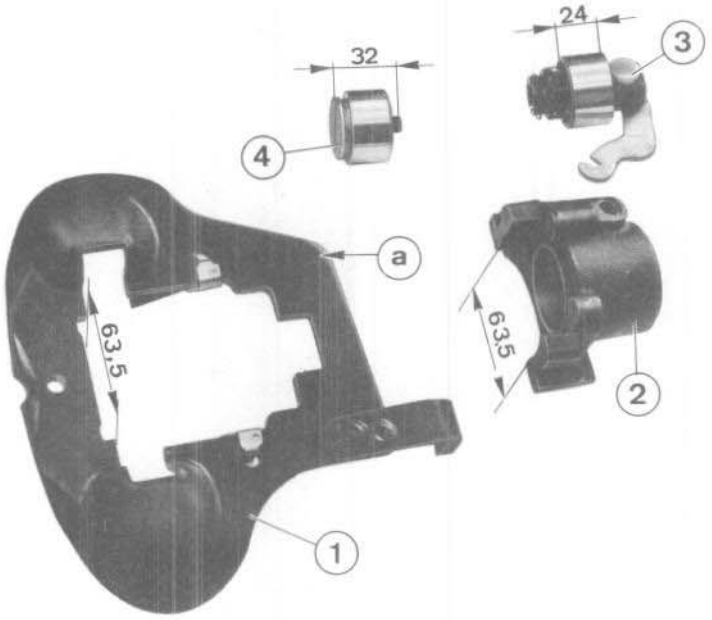
Assembled with :

1 - *caliper plate rounded at* (a) *L = 63,5 m/m,*

2 - *cylinder body L = 63,5 m/m,*

3 - *piston L = 24 m/m,*

4 - *piston L = 32 m/m.*



II - Girling caliper type AH 12 MKIII

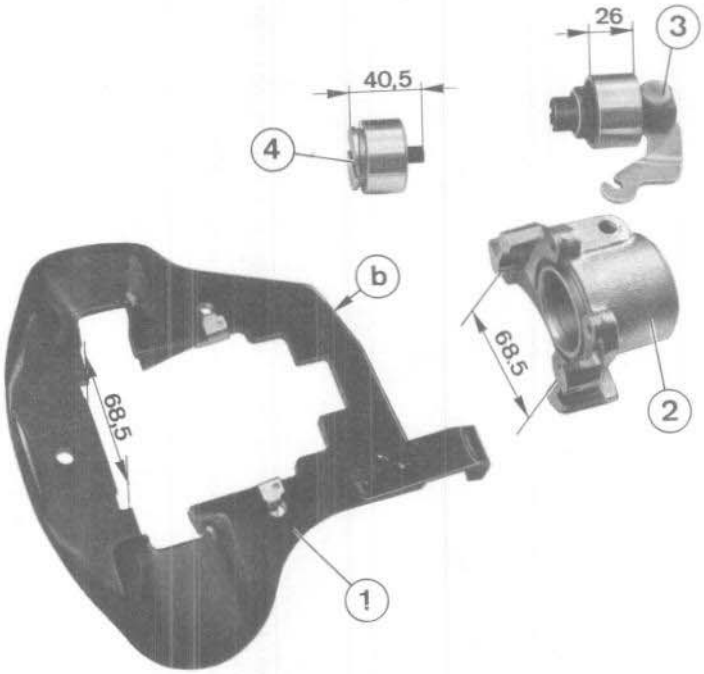
Assembled with :

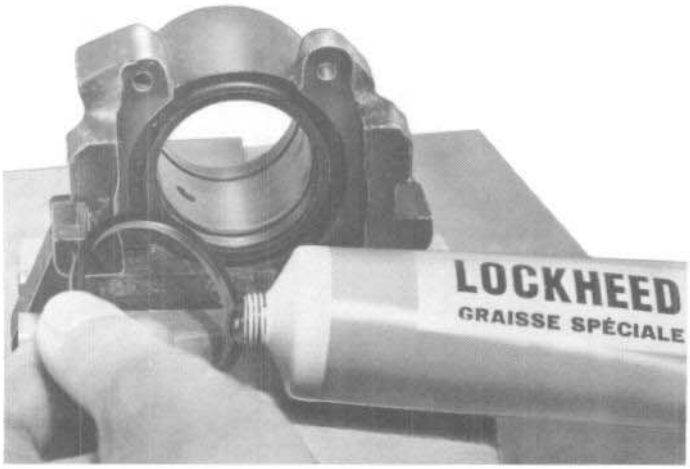
1 - *caliper plate chamfered at* (b) *L = 68,5 m/m,*

2 - *caliper body L = 68,5 m/m,*

3 - *piston L = 26 m/m.*

4 - *piston L = 40,5 m/m.*

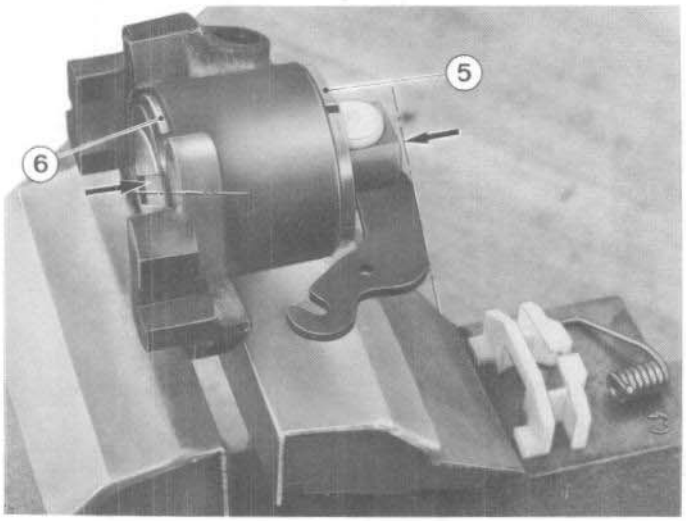




REASSEMBLY

– Coat new seals with Lockheed Spagraph grease.

– Locate seals in throat of cylinder.



– Lightly coat the pistons with Lockheed Spagraph grease.

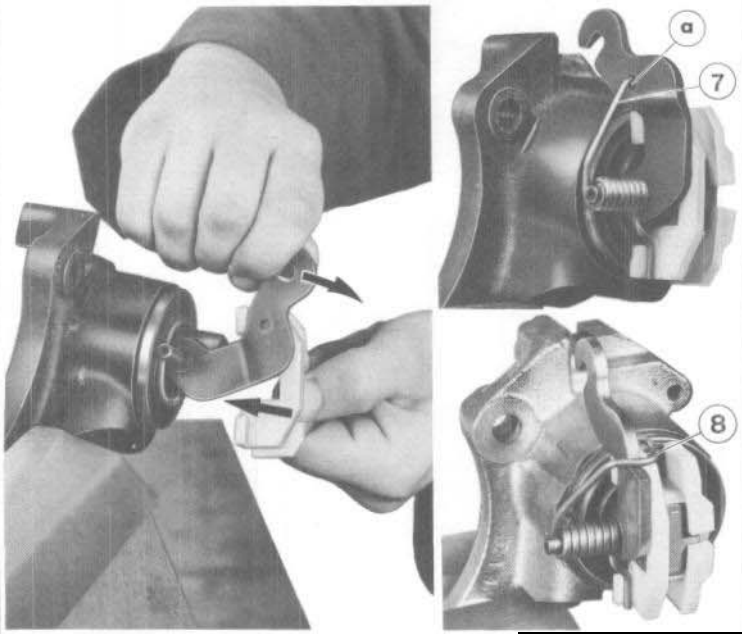
– Insert the pistons in their respective positions (as illustrated opposite).

– Fit :

- the rubber protectors
- retaining circlips

narrow clip **(6)** disc side,

wide clip **(5)** caliper plate side.



– Fit nylon spacer (raise brake lever).

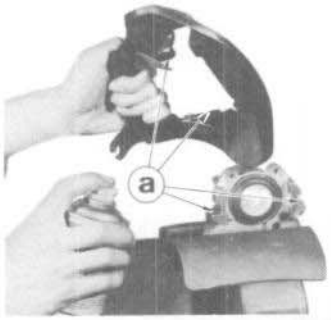
– Hook handbrake lever return spring,

- fit a **new** Truarc ring in the hole **(a)** for spring **(7)**.

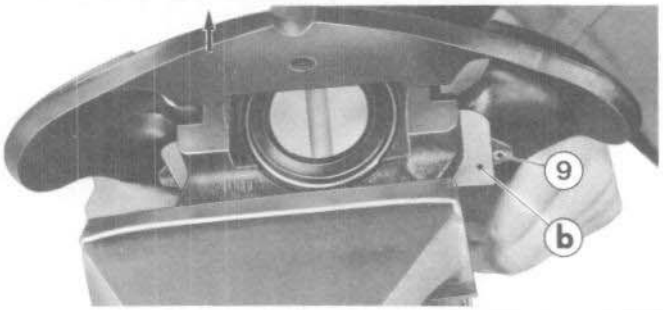
- spring **(8)** anchors without a Truarc ring.

BRAKES

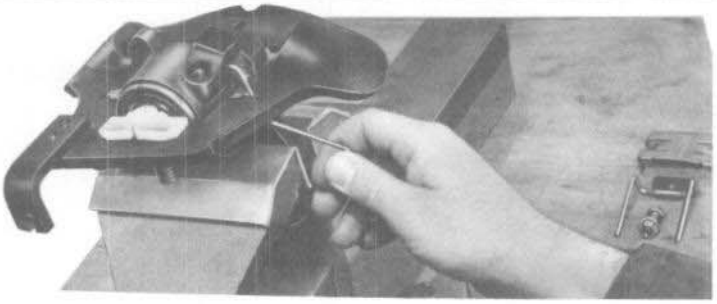
OVERHAULING A REAR BRAKE CALIPER



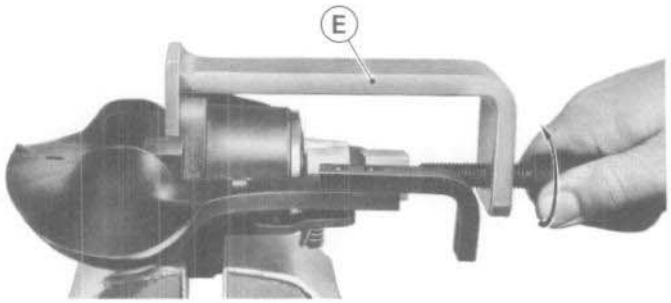
– Lihgtly coat moving parts **(a)** with Molykote 321.



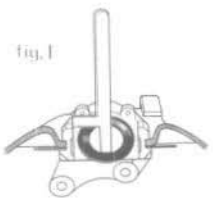
– Assemble the armature plate with the aid of 2 - pieces of 0,20 m/m thick shim steel **(b)** placed under the thrust plates **(9).**

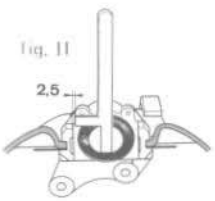


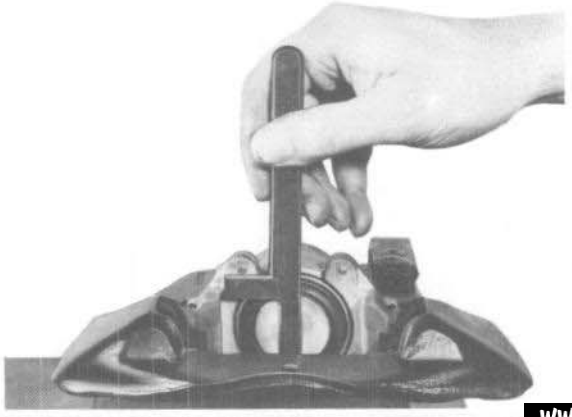
– Fit the thrust spring.



– Assemble pistons and caliper plate (hand tighten fixture **E**).



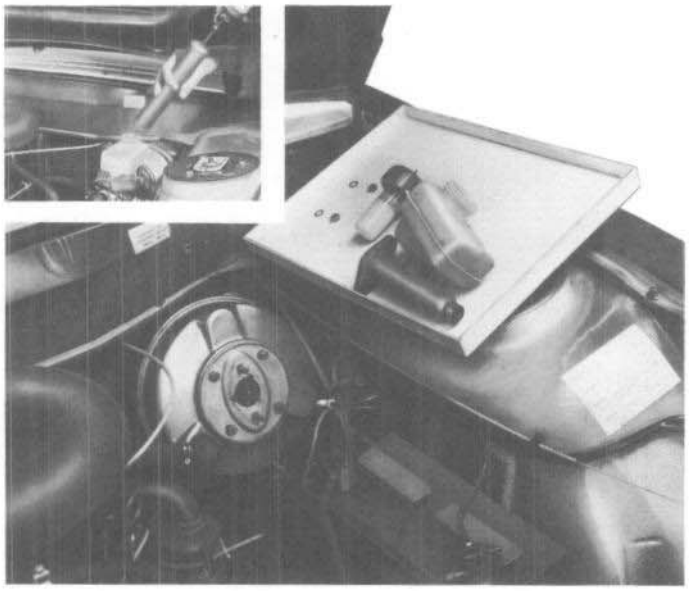




– Pistons positioned as illustrated opposite :

- caliper MKI (Fig. I),
- caliper MKIII (Fig. II).

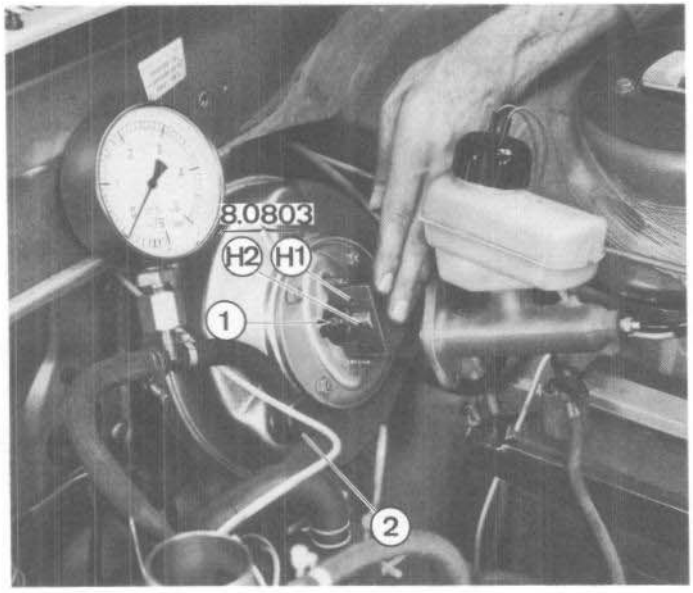
– Replace bleed screw.



REMOVE

– Drain the reservoir.

– Remove the master-cylinder.



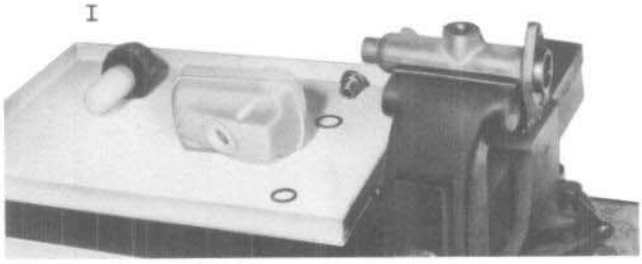
WARNING

– Do not pull the thrust rod (1).

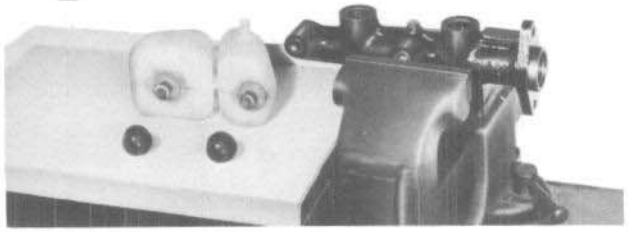
– Check the distance the rod protrudes, **engine idling after accelleration** (see page 10 06).

No attempts can be made to repair a servo-unit, other than replacement of the valve (2) and adjustment of the thrust rod. If it is faulty, it must be replaced.

I



II



– Remove the reservoir :

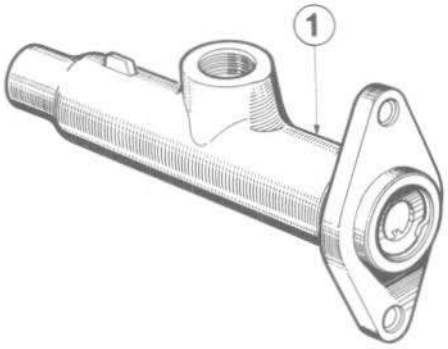
- Lockheed master cylinder (Fig. I).

- Teves tandem cylinder (Fig. II).

REPLACEMENT

WARNING :

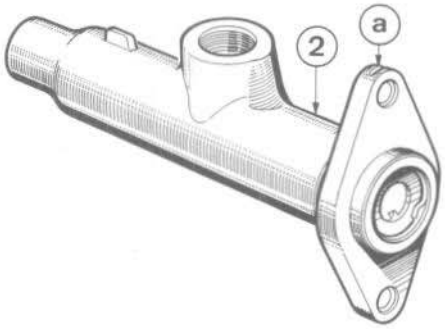
TWO TYPES OF STANDARD MASTER-CYLINDER



1 - 20,6 m/m dia. *(not marked) fitted to :*

– *504 with Girling type AH 12 MKI rear calipers.*

– *504 derivatives.*

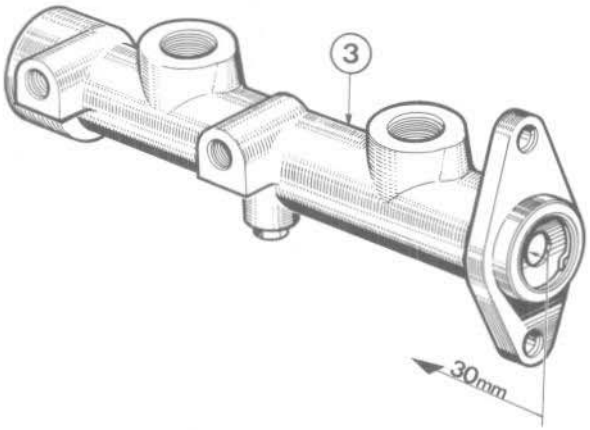


2 - 19 m/m dia. *(groved* **a***) fitted to :*

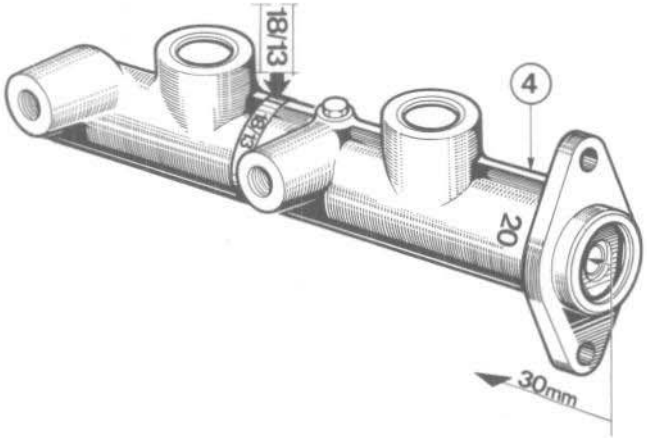
– *504 with Girling type AH 12 MKIII rear calipers.*

– *504 L.*

SIX TYPES OF TANDEM MASTER-CYLINDER



3 - 20,6 m/m dia. Lockheed, *30 m/m travel (not marked).*



4 - 20,6 m/m dia. Teves, *30 m/m travel. (figure 20 and band marked 18 - 13) fitted as replacement for the preceding master-cylinder* **(3)** *on :*

– *504 with Girling type AH 12 MKI rear brake calipers.*

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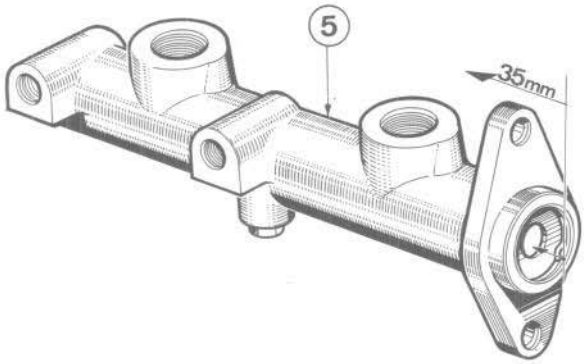
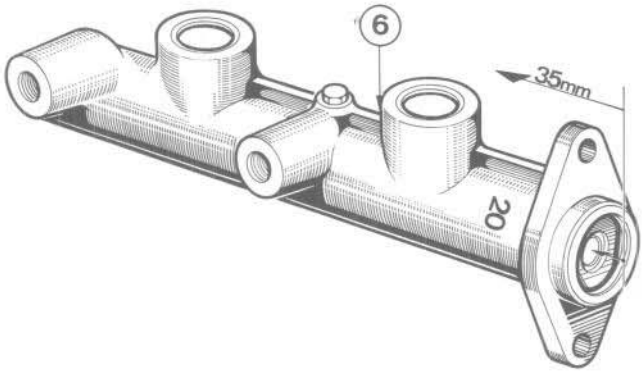
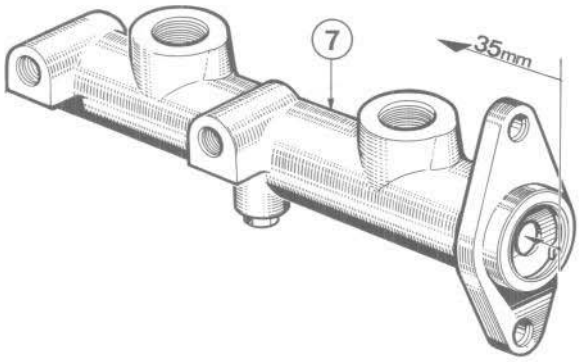


5 - 20,6 m/m dia. Lockheed, *35 m/m travel (not marked).*

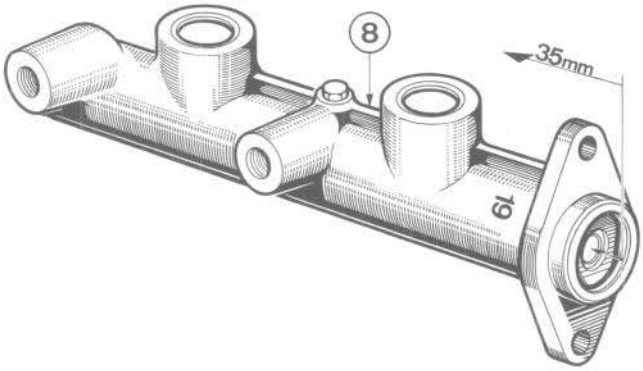


6 - 20,6 m/m dia. Teves, *35 m/m travel (figured 20) replacement for the preceding master-cylinder on :*

– 504 derivatives.



7 - 19 m/m dia. Lockheed, *35 m/m travel (not marked).*



8 - 19 m/m dia. Teves, *35 m/m travel (figured 19) fitted to :*

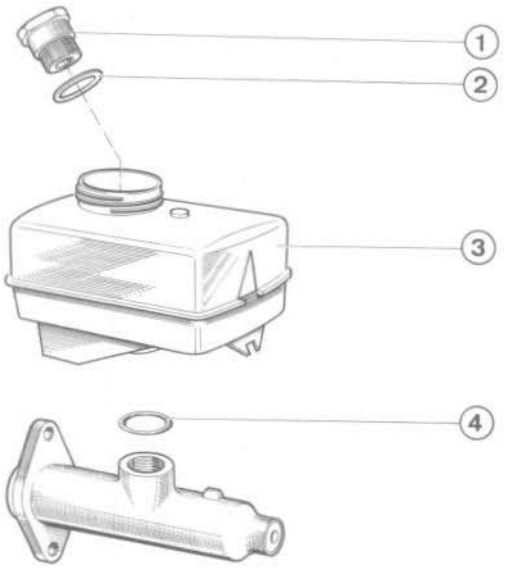
– 504 L,

and as replacement for the preceding master-cylinder on :

– 504 fitted with Girling type AH 12 MKIII rear calipers.

BRAKES

MASTER-CYLINDER



— Reassembling the reservoir :

- **in all cases fit one or two new "rubber" seals "S".**
- **torque union screw to, 11 ft/lbs (1,5 m.kg.)**

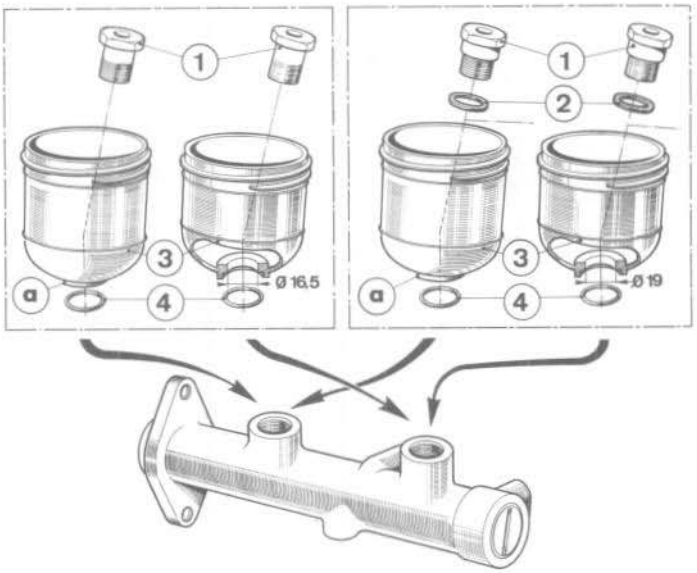
I - Standard master-cylinder comprises :

1 - union screw shouldered and screwed 16 x 18,5.

2 - washer, 19,2 x 27 x 0,5 m/m.

3 - reservoir,

4 - "rubber" washers, 18 x 23 x 2,5.



II - Lockheed tandem master-cylinder,

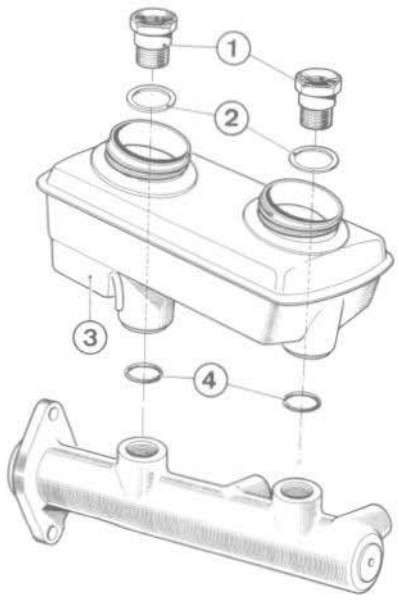
separate reservoirs, the flats **(a)** located towards the rear.

WARNING :

TWO DIFFERENT ASSEMBLES

1° - U.S.A.
- 1 - *Union screw 16 x 18 Ø.*
- 3 - *reservoir-hole 16,5 Ø ,*
- 4 - *"rubber" washers 17 x 23 x 3.*

2° - SWEDEN
- 1 - *shouldered union screw Ø 16 x 18,5.*
- 2 - *washers 19,2 x 27 x 0,5.*
- 3 - *reservoir-hole 19,5 m/m Ø*
- 4 - *"rubber" washers 18 x 23 x 2,5.*



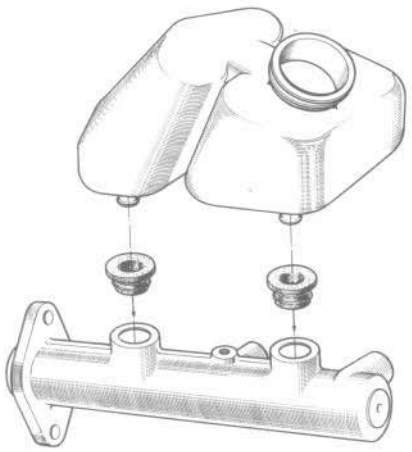
dual reservoir

1 - shouldered union screw, Ø 16 x 17,

2 - washer, 19,2 x 27 x 0,5.

3 - reservoir,

4 - "rubber" washers, 18 x 23 x 2,5.

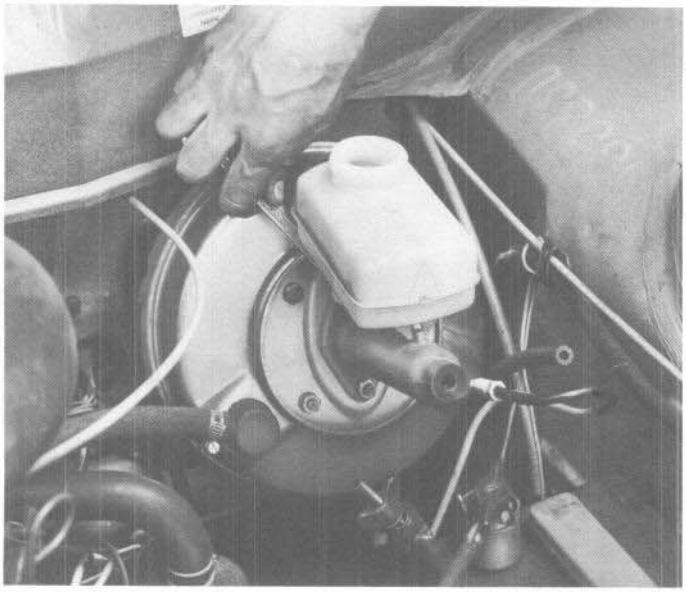


III - On Teves tandem master-cylinder.

– Dip **new** seals in brake fluid, and insert in recesses in master-cylinder.

– Fully engage the rear ferrule of the reservoir.

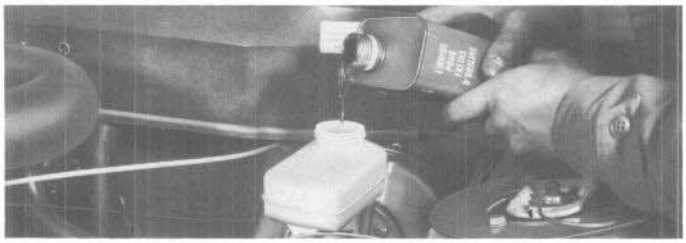
– Likewise the front ferrule (if necessary, use a hammer handle).

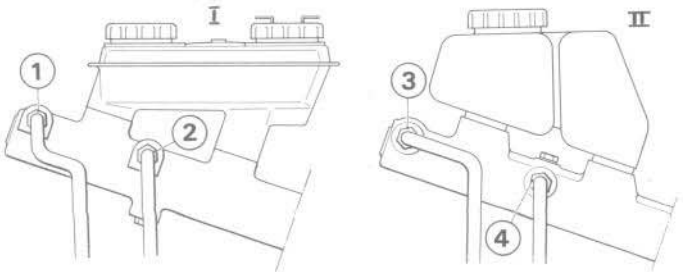


– Replace the master-cylinder.

– Torque the nuts mounted with **new** lock washers, to - 7,2 ft/lbs. **(1 m.kg).**

– Connect clutch feed hose.





– Gently fill the reservoir.

– When the fluid flows connect the pipe.

WARNING :

TWO DIFFERENT CONNECTIONS FOR TANDEM MASTER-CYLINDERS

I - Lockheed master-cylinder
1 - *feed to rear brakes,*
2 - *feed to front brakes.*

II - Teves master-cylinder
3 - *feed to front brakes*
4 - *feed to rear brakes.*

The pipes **(1)** - **(2)** and **(3)** - **(4)** are not the same shape, hence they are not interchangeable.

– Bleed brakes (see page 02 22).

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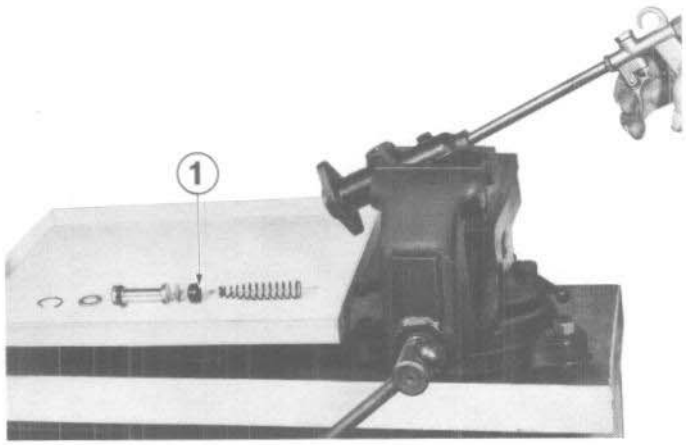
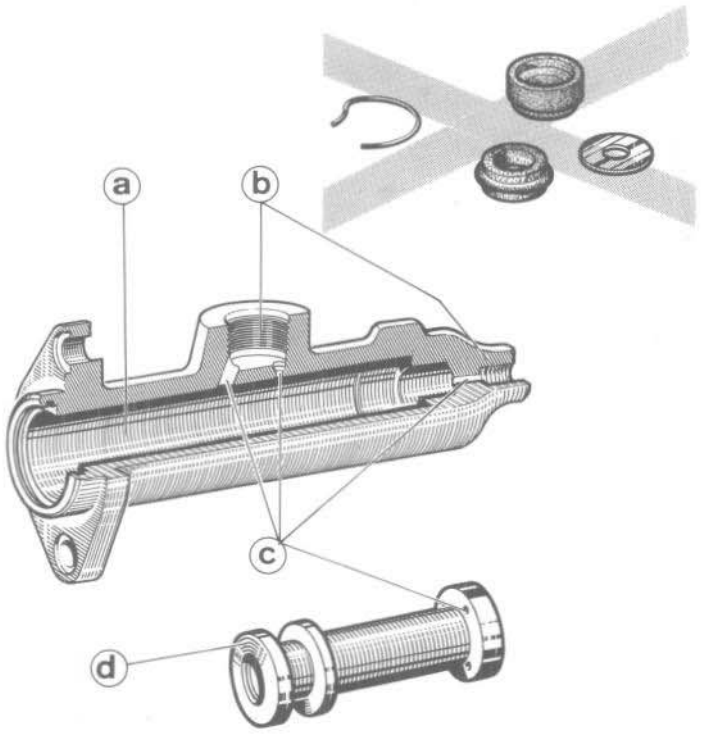


OVERHAULING

DISMANTLING

– Remove the securing circlip and adjoining washer,

– Withdraw the piston and spring (eject the main cup **(1)** using an air-line).



– **Thoroughly clean with meths, and dry all parts.**

VISUAL CHECK

– **Any defect which could be the cause of leakage or faulty operation of the cylinder cannot be tolerated.**

Look for : scale, scoring, burrs, corrosion, wear distortion.

– Check in particular :

a - cylinder bore,
b - threads,
c - all orifices,
d - piston .

IMPORTANT :

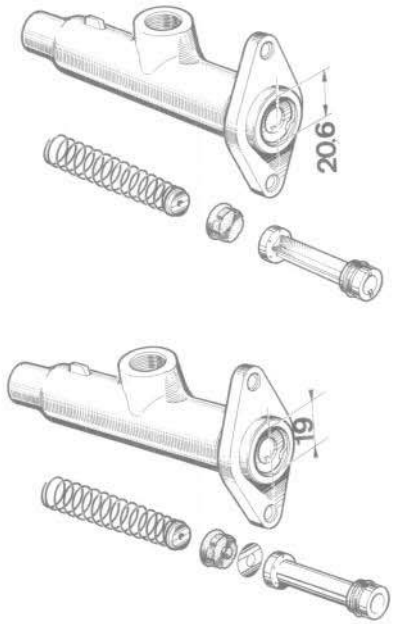
– Polishing the cylinder bore or the piston with emery cloth is absolutely forbidden.

– Cups, security disc, and circlip must all be replaced.

– The master-cylinder must not be re-assembled with the residual pressure valve in-place.

BRAKES

STANDARD MASTER-CYLINDER



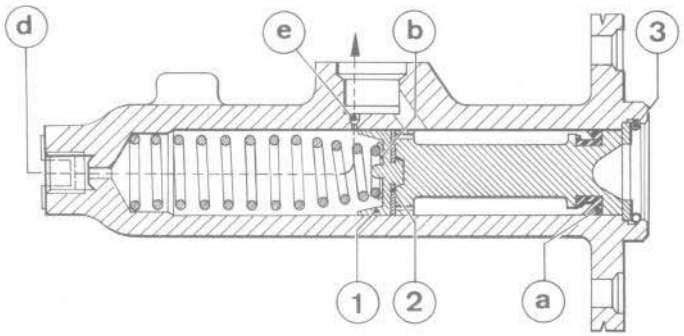
RE-ASSEMBLY

WARNING :

TWO TYPES INVOLVED

1 - *20,6 m/m dia. master-cylinder,*

2 - *19 m/m dia. master-cylinder.*

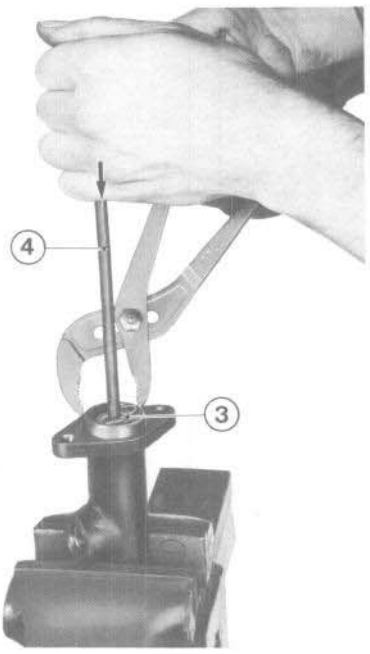


– Prior to assembly all parts, absolutely clean, must be lubricated with brake fluid.

– Assemble :

- the security disc **(2)** and main cup **(1)**,
- the secondary cup and piston (lip **(a)** towards the front).

– Fit the sequence of components **without damaging the cups** (the metal spring cup **(b)** bearing on the main cup **(1)**).

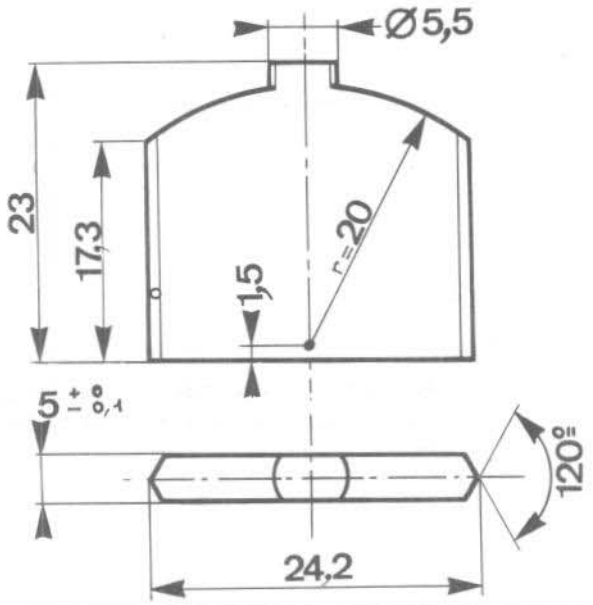


– Fit :

- the stop washer,
- a **new** circlip **(3)**, with the aid of rod with a rounded end **(4)**.

– Pass air through the outlet **(d)**. Air should escape by the return orifice **(e)** without any apparent leakage.

– Operate the piston a number of times in order to ensure that it returns to its stop, and that there are no "hard-spots".



TOOLS REQUIRED

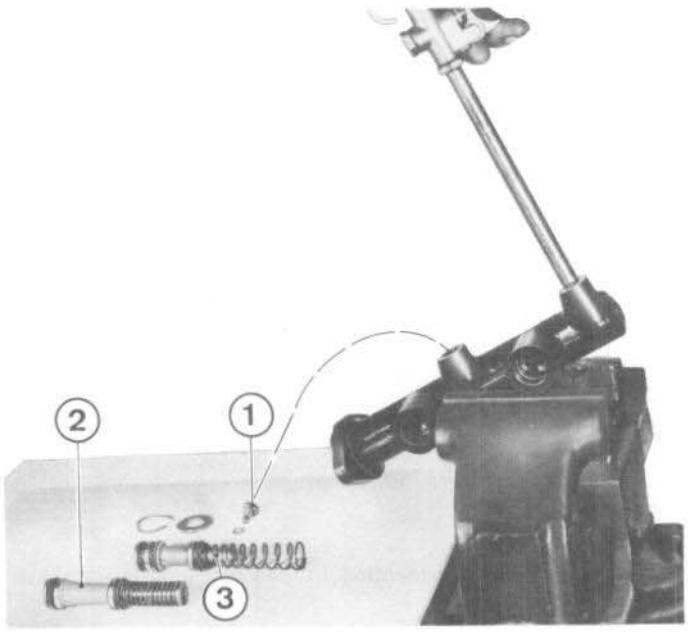
To be made in Workshop

0.0804

– Key for removing and replacing the plug of Lockheed tandem master-cylinder.

Tool steel

- heat to 830° C and quench in oil.
- temper at 200° C.



OVERHAUL

DISMANTLING

– Remove :

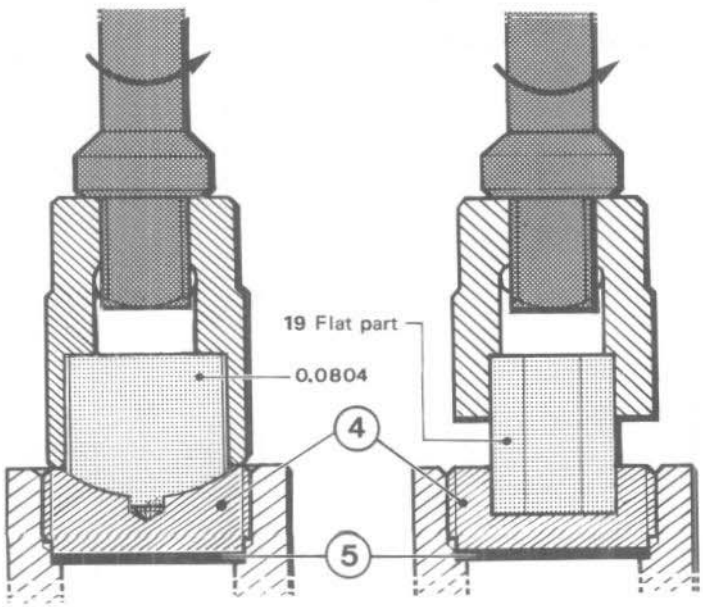
- the stop screw **(1)**,
- the circlip,
- stop washer.

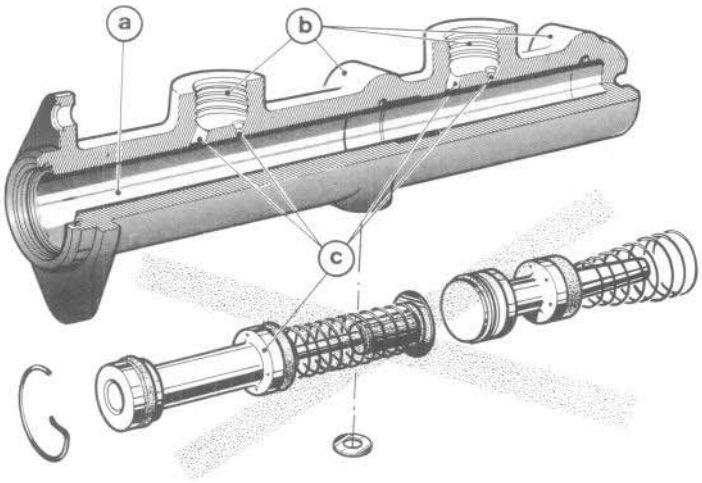
– Extract the primary piston **(2)**.

– Eject the secondary pistor **(3)**, using an air-line.

– With a 20,6 m/m Ø Lockheed tandem master-cylinder.

- If necessary, remove the screwed plug **(4)** in order to replace the copper seal **(5)**.





– **Clean and dry all parts, using meths.**

VISUAL CHECK

– **Any defect which could be the cause of leakage or faulty operation of the master-cylinder cannot be tolerated.**

Look for : scale, scoring, burrs, bruises, corrosion, wear, distortion.

– Check in particular :

a - cylinder bore,

b - threads,

c - all orifices.

WARNING - The primary and secondary piston sub-assemblies should not be dismantled. In the event of deterioration of either piston, replace both, sub-assemblies.

Polishing the cylinder bore with emery cloth is absolutely forbidden.

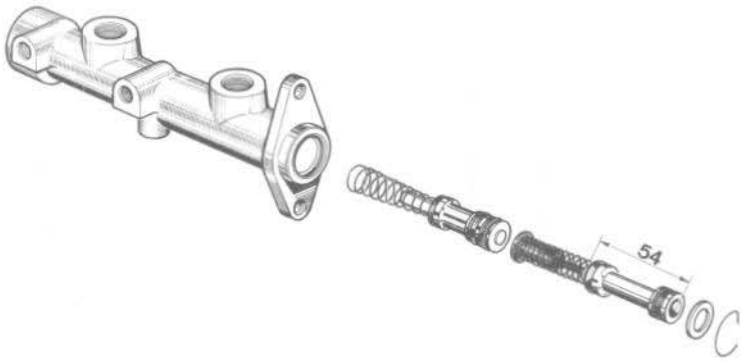
ASSEMBLY

WARNING - Never remove the piston cup and spring.

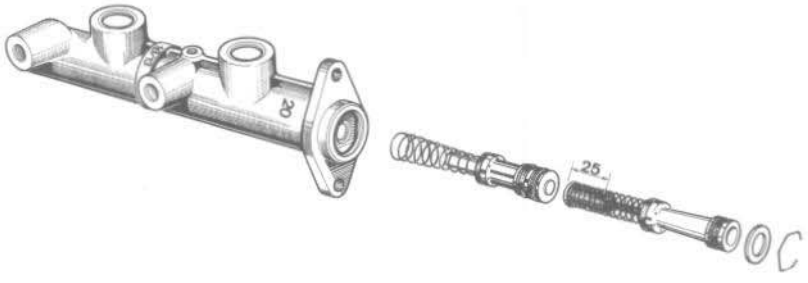
In the event of deterioration of any of these parts (cups, pistons, springs) replace complete.

WARNING :

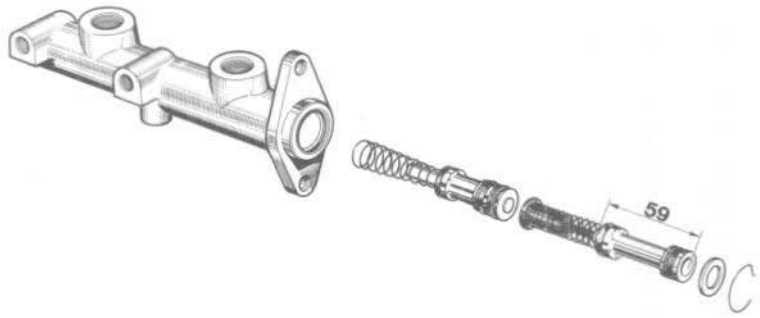
SIX DIFFERENT MODELS ARE INVOLVED .



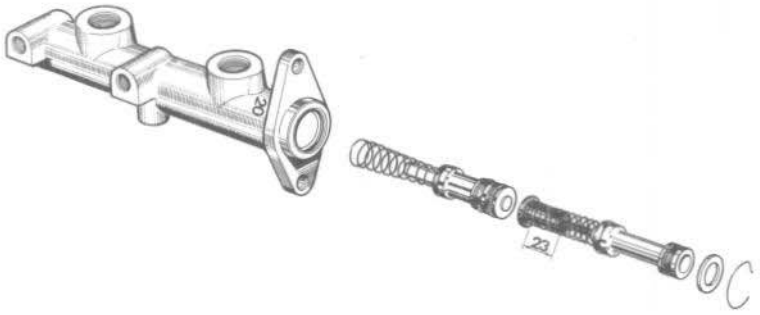
3 - *For Lockheed master-cylinder, 20,6 m/m dia., 30 m/m travel.*



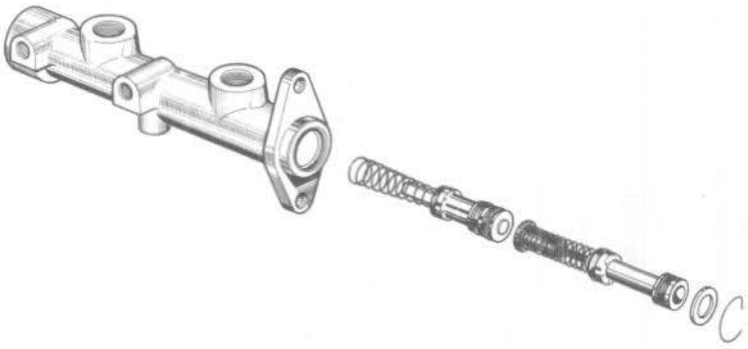
4 - *For Teves master-cylinder, 20,6 m/m dia., 30 m/m travel. (numbered 20 and with identification band, 18-13).*



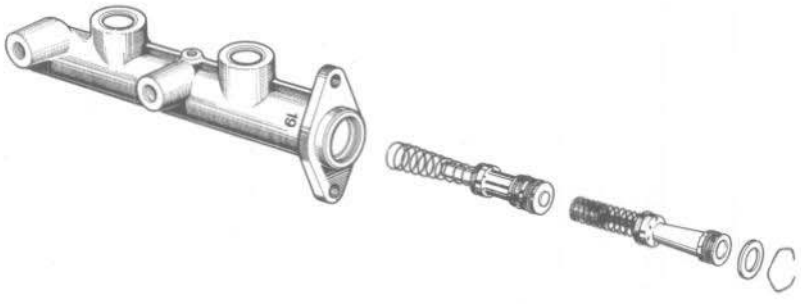
5 - *For Lockheed master-cylinder, 20,6 m/m dia., 35 m/m travel.*



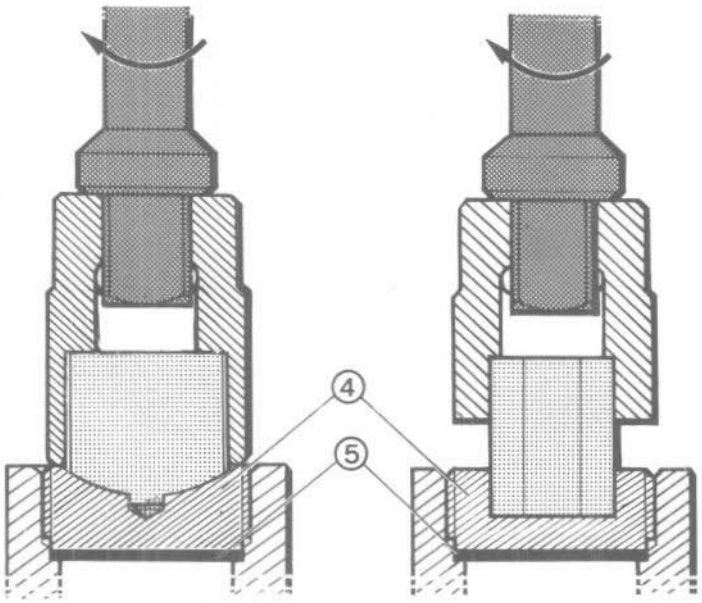
6 - *For Teves master-cylinder, 20.6 m/m dia., 35 m/m travel. (numbered 20).*



7 - *For Lockheed master-cylinder, 19 m/m dia. , travel 35 m/m (grooved a).*

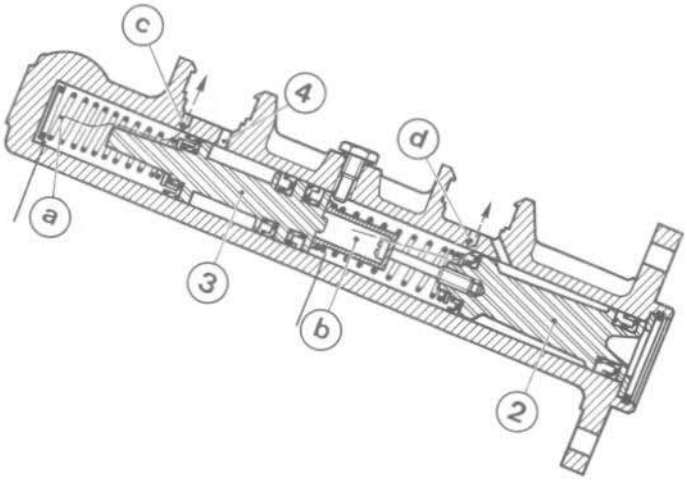


8 - *For Teves master-cylinder, 19 m/m dia., 35 m/m travel (numbered 19).*



– With a Lockheed tandem master-cylinder replace, if necessary, the seal **(5)** for the screwed plug **(4)**.

- torque to, 72 ft/lbs. **(10 m.kg.)**.



– Insert the sub-assemblies :

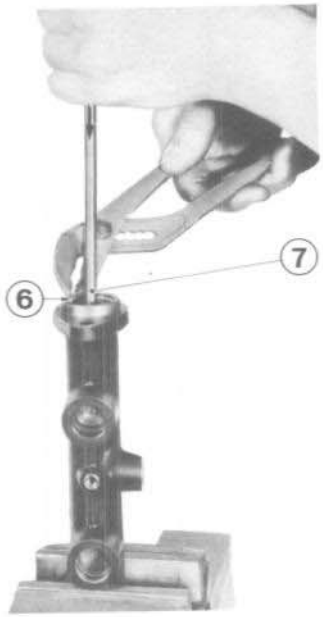
- the primary piston **(2)**.

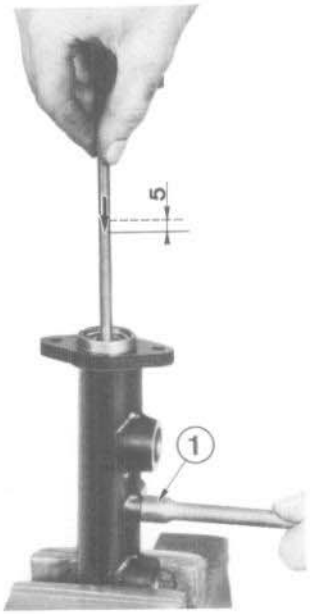
- the secondary piston **(3)**.

– Fit :

- The stop washer,

- a new circlip **(6)** and with a rounded end rod **(7)**.



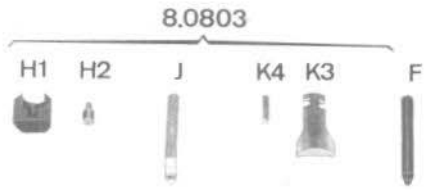


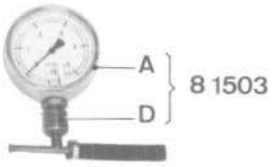
– force-in the primary piston for a distance of approx. 5 m/m and fit the stop-screw (1) together with a new seal washer.

– Blow air into the outlets **(a)** and **(b)**. It should exhaust via the return orifices **(c)** and **(d)** and no apparent leakage should occur.

– Actuate the primary piston a number of times ; to ensure it returns against its stop, without any "hard-spot".

www.504.org





TOOLS REQUIRED

8.0803 W

– Kit for disc brakes.

F - Plug for master-cylinder.

H - Thrust rod checking gauge :
H1 - body,
H2 - contact-piece, (504)

J - Key for holding thrust-rod.

K - Fixture for checking the return to "stop" of the thrust-rod, comprising :
K3 - body,
K4 - spindle.

8.0804

– Pedal depressor.

8.1503

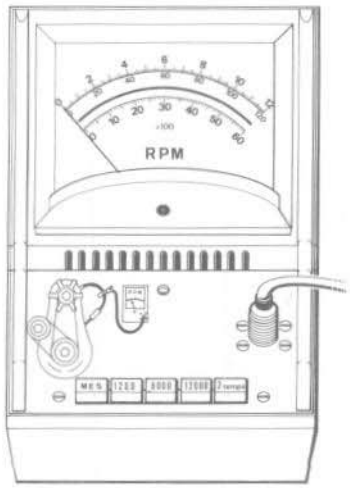
– Apparatus for checking pressure and pressure drop.

A - Double reading vaccum gauge, calibrated, 76 cm/ Hg. to 0 and 0 to 5 bars (73,5 p.s.i.).

D - T - piece with rubber tube.

– 16" **(400 m/m)** length of transparent flexible bleed hose.

– A transparent vessel.



RECOMMENDED TOOLS

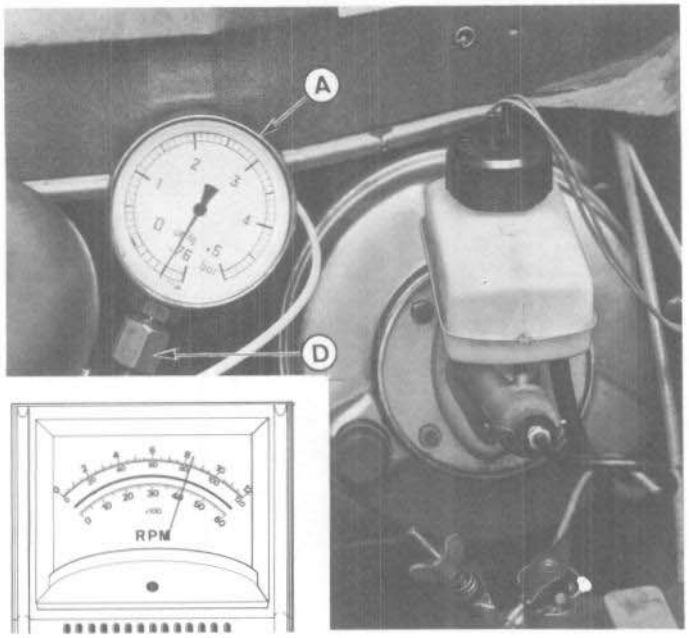
– Tachometer, Souriau 1494.

– TESTARC

Instrument for measuring high and low pressures, complete with a union **(1)** (pt/N° 9787.07) and a safety clip.

BRAKES

CHECKING A SERVO-UNIT



I - CHECKING VACUUM

504 petrol engine

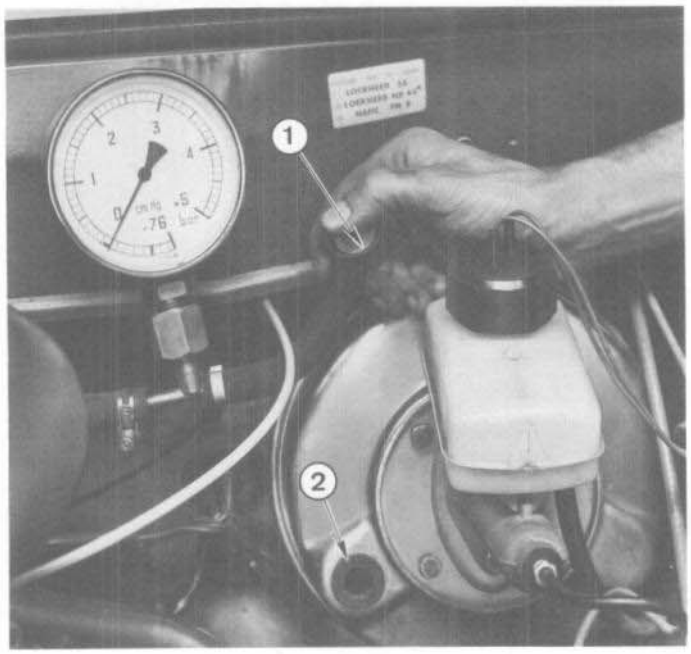
- Connect :
  - vacuum gauge,
  - tachometer.
- **Run engine until fan cuts-in.**
- Check idling speed (504 carb. 800 r.p.m., inj. 850).
- Accelerate to 4,500 r.p.m.
- Decelerate abruptly.

Maximum vacuum indicated during deceleration should be equal to or greater than, 500 mm/Hg.

504 Diesel

- Connect vacuum gauge.
- **Run engine at fast idling for not less** than 1 minute.

The indicated vacuum should ne equal to or greater than, 500 mm/Hg.



IF VACCUM IS LESS THAN 500 mm/Hg.

- Disconnect the valve **(1).**
- Re-check, blocking the valve connection with the thumb.

1st example . Vacuum is still less than 500 mm/Hg.

Air losses adjacent ot the valve.

In particular : **on 504 petrol.**

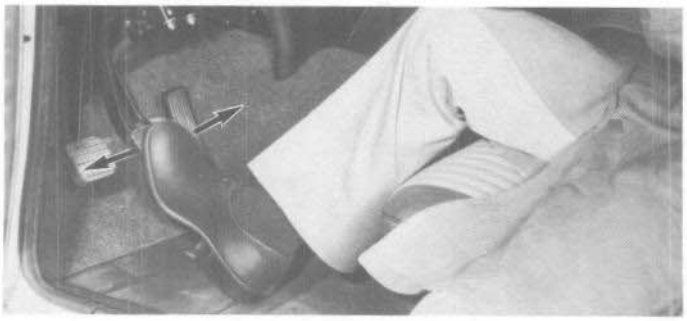
- **abnormal air entry :** deterioration and/or lack of tightess of :
  - the valve,
  - hoses and pipes,
  - carburettor mounting flange,
  - the air distribution chamber "rubber" busches on 504 injection.
- **condition of engine :** check compression in each cylinder **on 504 Diesel.**
- **abnormal air-entry :** deterioration or lack of tightness of the valve and/or hoses and pipes.
- **condition of the vacuum pump :** first check belt tension.

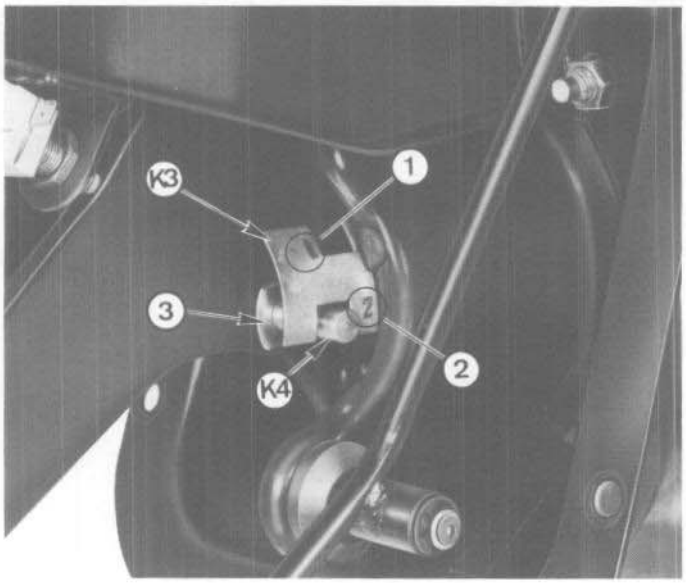
2nd example . Vacuum is equal to or greater than, 500mm/Hg.

- Replace the valve fitted with a **new** seal **(2).**
- Repeat tests.

If the vacuum is again less than 500 mm/Hg, the servo-unit is suspect.

NOTA - *Take into account the fall in atmospheric pressure above an altitude of 1 000 m. Thus, a vacuum of 370 mm/Hg. is acceptable at 2 000 m.*





II - CHECKING RETURN TO "STOP"

– **Free the servo-unit** (five applications of the brake pedal with **engine switched-off).**

– Replace the pivot pin with gauge rod **(K4)** "pushed home".

– Slacken a bleed screw (connect bleed tube and vessel).

– Depress the brake pedal, fully.

– Re-tighten the bleed screw.

– **Slowly** release the brake pedal.

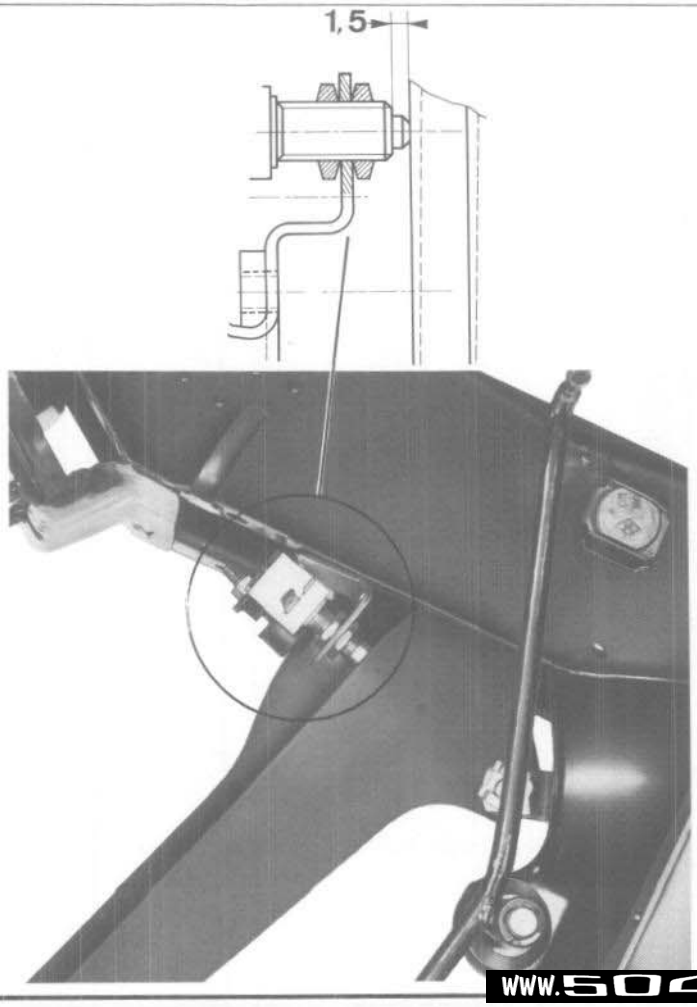
– Position the gauge **(K3)** so that **it presses against the servo-unit** at the foot of the rubber bellows. the gauge rod **(K4)** should engage freely in the notch.

1 - On all 504 LH drive saloon models, Mastervac with cranked thrustrod **(3).**

- On 504 RH drive saloons equipped with a 20,6 m/m dia. master cylinder.

2 - On 504 LH drive saloon models Mastervac with straight thrustrod **(3).**

- Derivatives of 504.
- On 504 L
- On 505 RH drive saloons equipped with a 19 m/m dia. master-cylinder.



If the thrust rod does not engage with the corresponding notch.

– Check :

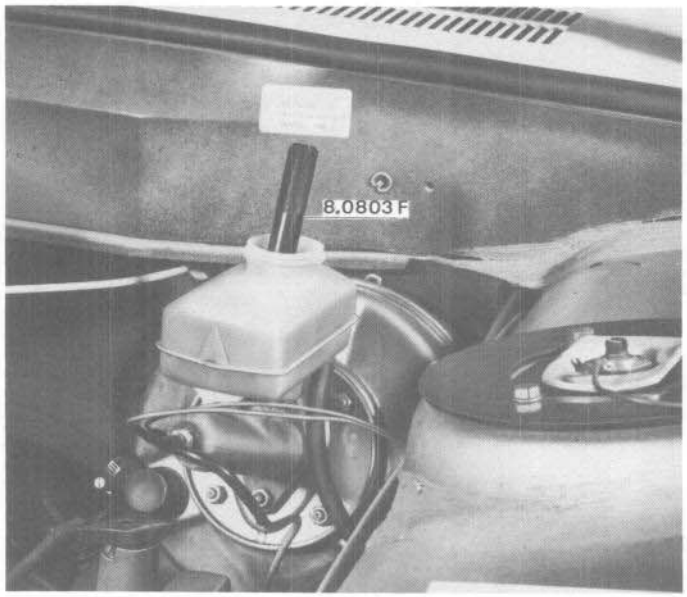
- the adjustment of the stop light switch (working clearance 1,5 m/m.).
- the free movement of the break pedal.

If adjustment of the stop light switch and the brake pedal is correct, then the servo-unit is suspect

– Replace pivot pin and secure with a **new** clip.

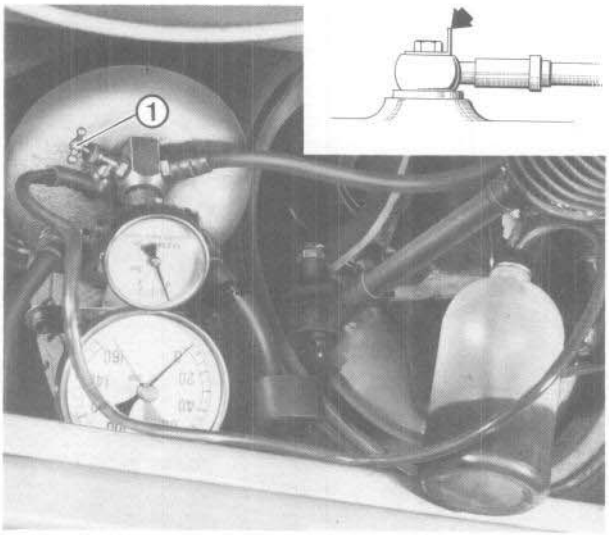
BRAKES

CHECKING A SERVO-UNIT



III - CHECKING THE MAIN VALVE

– Block master-cylinder intake.

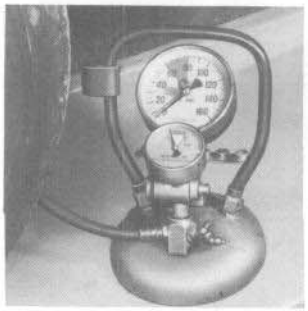


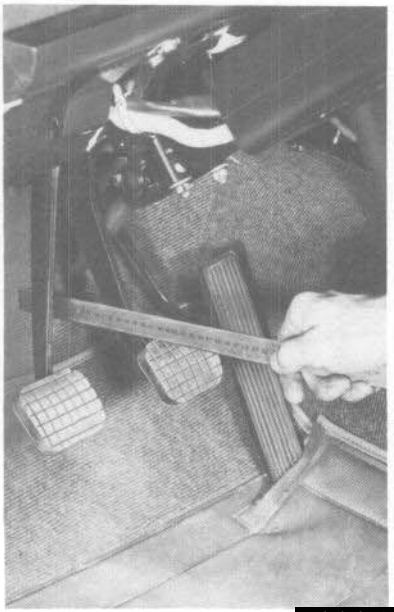
– Remove a front bleed screw and connect the Testarc 50 instrument.

– Remove the plug **(F).**

– Bleed the instrument **(1),** renew the brake fluid level in the reservoir.

WARNING - With the pedal at rest, there should not be any pressure in the system (low pressure gauge registering zero). If not, then refer to the instructions at check V.



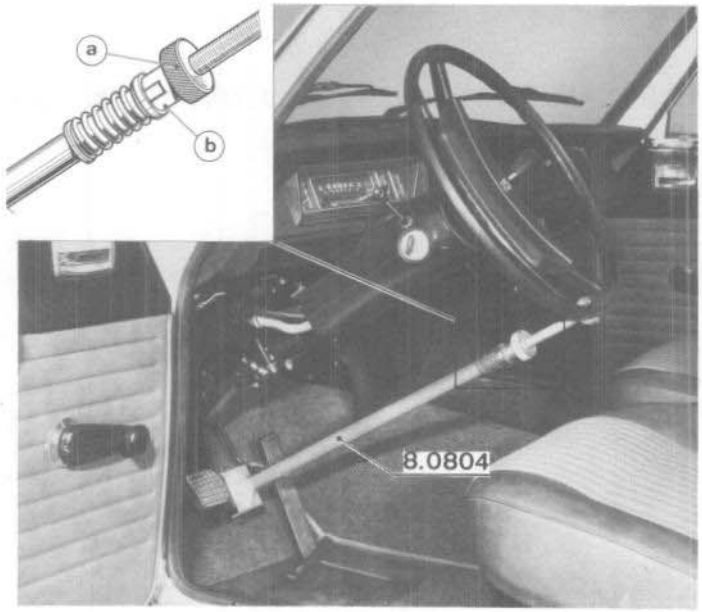


– **Free the servo-unit** (five applications of the brake pedal **with the engine at rest.**

– Start-up engine **without accelerating.**

- the pedal should not move forward more than 3 m/m.
- the Testarc 50 gauges should not indicate any pressures.

If otherwise, then the servo-unit is suspect.



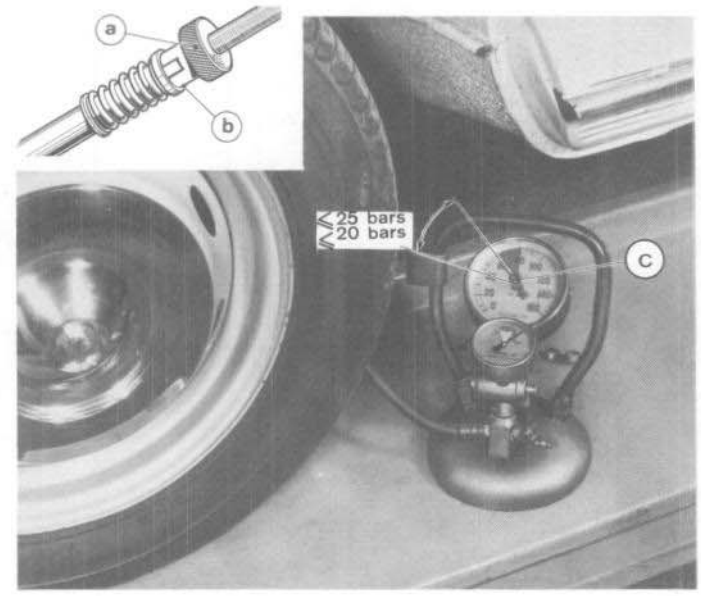
IV - CHECKING FOR AIR LEAKS

WARNING - This check must only be carried out after checking of the fluid system (see instructions for pressure checking).

– Free the servo-unit (five applications of the brake pedal, **engine at rest.**

– Install pedal depressor.

– Turn the knurled nut **(a)** until the slots **(b)** are closed-off.



– Start the engine :
- the pedal should descend, and
- hydraulic pressure increase.

– Re-tighten the knurled nut **(a)** until slots **(b)** are just closed-off.

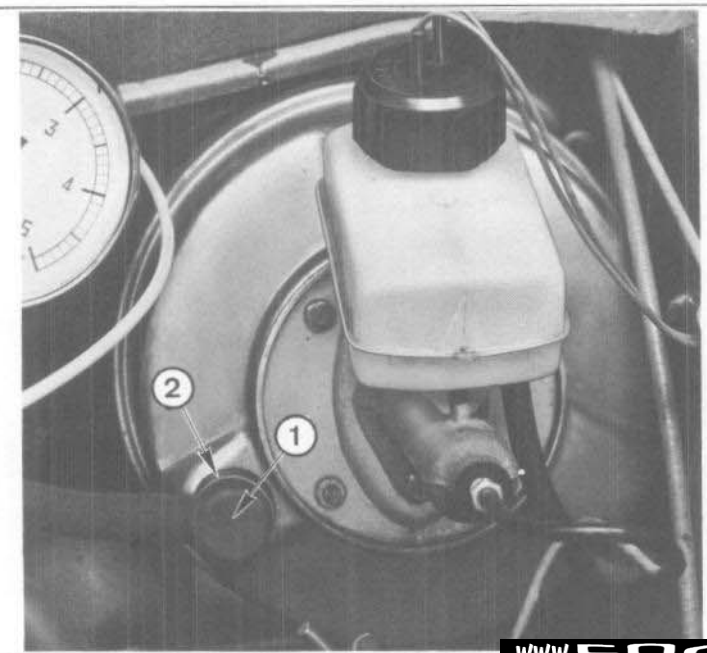
– Line-up the two needles of the H.P. gauge **(c).**

– Stop the engine.

– One minute later the indicated pressure should not be less than :

- 504 RH drive - 290 p.s.i. (20 bars)

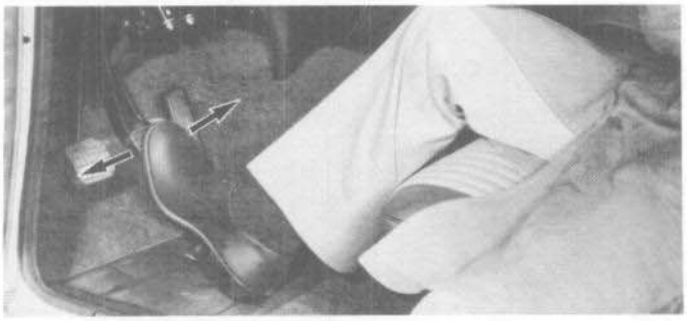
- 504 LH drive - 362 p.s.i. (25 bars).

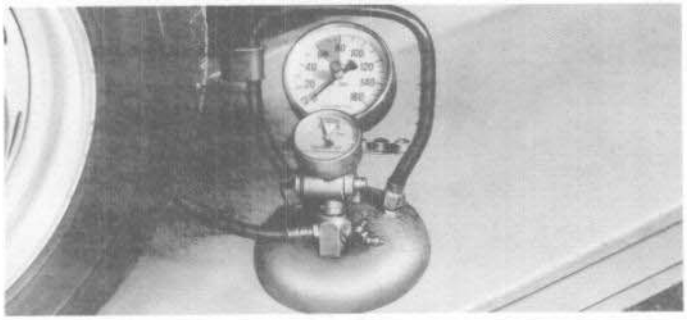


If the fall in pressure is excessive.

– Fit a **new** valve **(1)** and **new** seal **(2).**

– Repeat the tests, if the fall is pressure is still excessive the servo-unit is suspect.

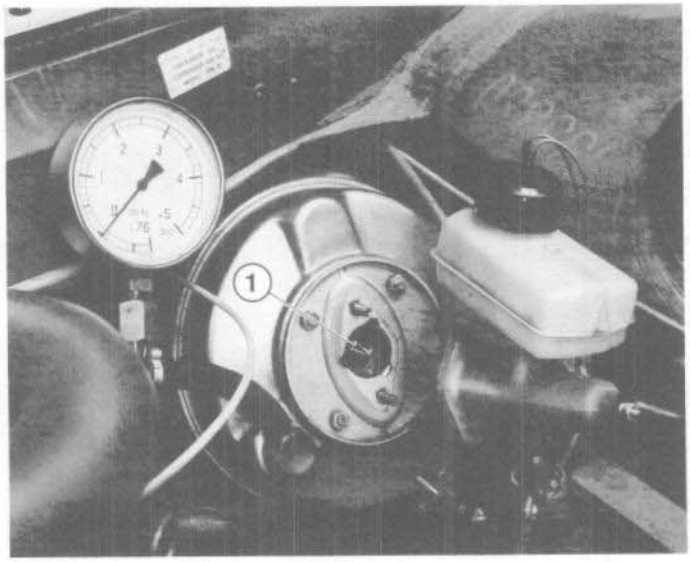




V - CHECKING AND ADJUSTING THE THRUST ROD

WARNING - Adjustment of this rod can only be made if the conditions of I, II and III have been satisfied.

– Depress and release the brake pedal, abruptly, pressure should fall instantly and completely **(zero on the L.P. gauge, connected at the front.**

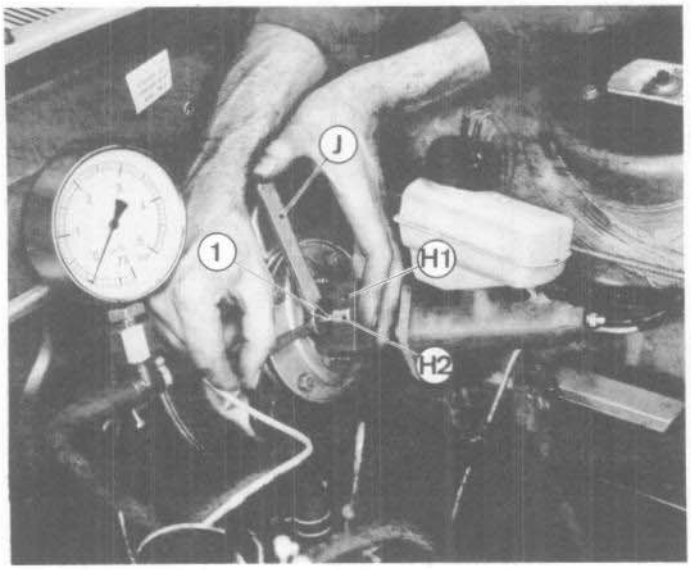


If pressure does not fall to zero

– Remove the master-cylinder without disconnecting the pipework.

If the pressure still does not fall, overhaul the master-cylinder.

WARNING - Never pull the thrustrod **(1);**



If the pressure falls to zero after removal of the master-cylinder.

Master-vac giving a reading of 500 mm/Hg. : (see check I) adjust the thrust-rod **(1)** in such a manner as it **just grazes** the base of the gauge (fig. 1) when the gauge is bearing on the mounting flange of the master cylinder.

– Accelerate the engine and briskly release the throttle drum several times. **If not instance should the thrust rod abut on to the base of the gauge.**

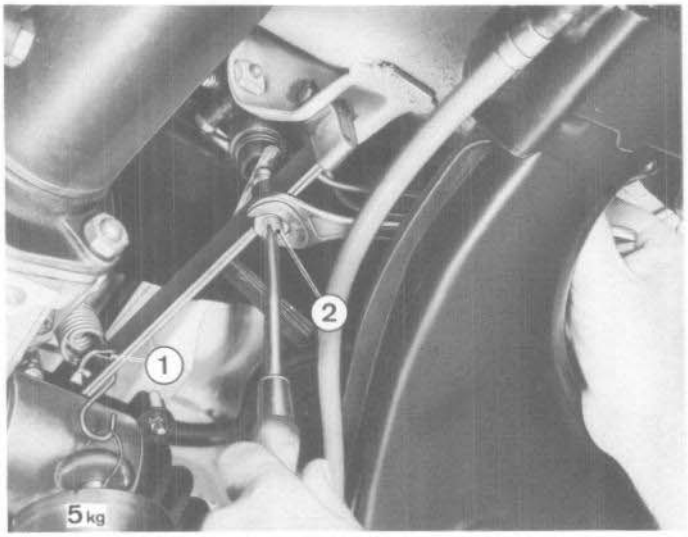
504 SALOONS

I - 504 GL and TI

BENDIX COMPENSATOR

– **Empty vehicle in working order** (complete with, tools, water, oil and petrol ; spare wheel in place).

– Locate vehicle over a pit or on a horizontal ramp.



– **Vehicle at rest on 4 wheels.**

– **Suspend an 11 lb. (5 kg.) weight from the compensator lever slot.**

– Push-in the compensator piston.

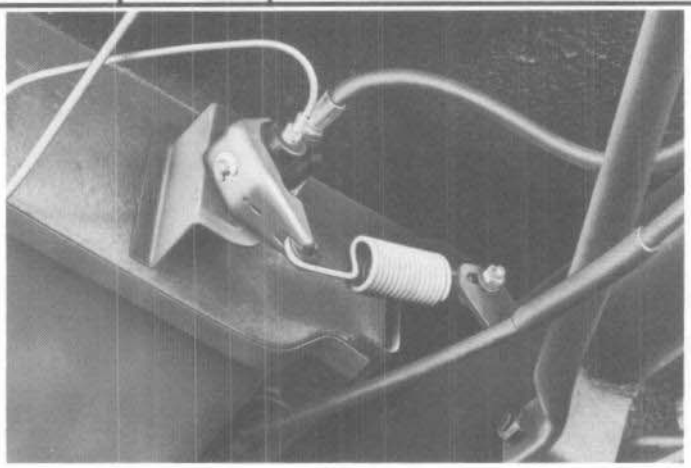
– **Adjust the screw (2) until a 1.4 m/m thick feeler is a good sliding fit.**

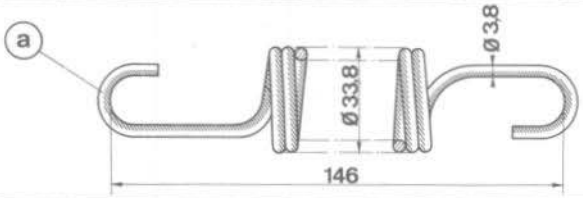
NOTE - *With an empty reservoir, adjust using a 1.6 m/m thick feeler.*

– **Remove the weight.**

BRAKES

COMPENSATOR ADJUSTMENT



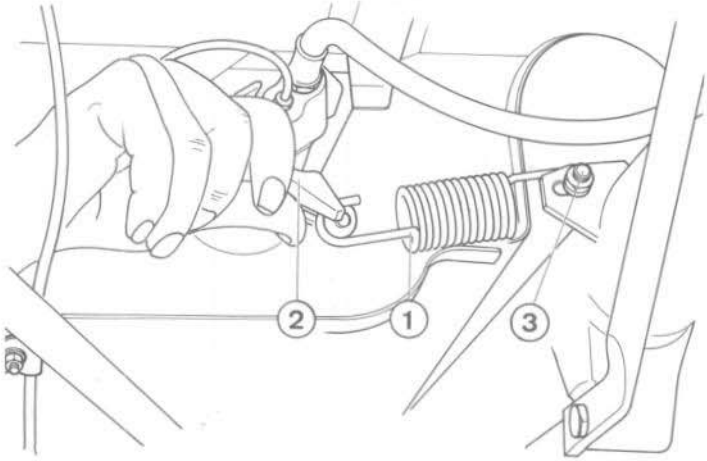


II - 504 L

TEVES COMPENSATOR

- **Restraining spring**
  - **(a)** "yellow" flash.
  - dimensions as illustrated.

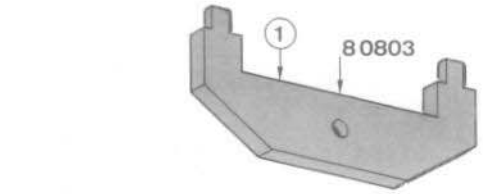
– Position the vehicle on a ramp and hoist the rear.

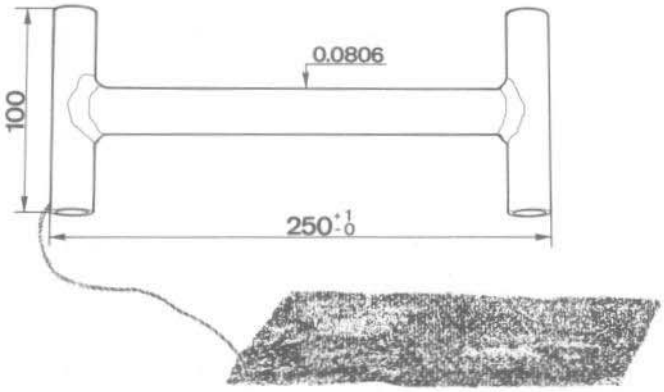


– **Rear wheels free of any load.**

– Press the lever **(2)** towards the torque tube.

– Adjust and tighten the slot nut **(3)** so that the spring **(1)** is without tension or play.





504 - DERIVATIVES

I - ROD RESTRAINED COMPENSATOR

TOOLS REQUIRED

8.0808 W

– Disc brake tool kit

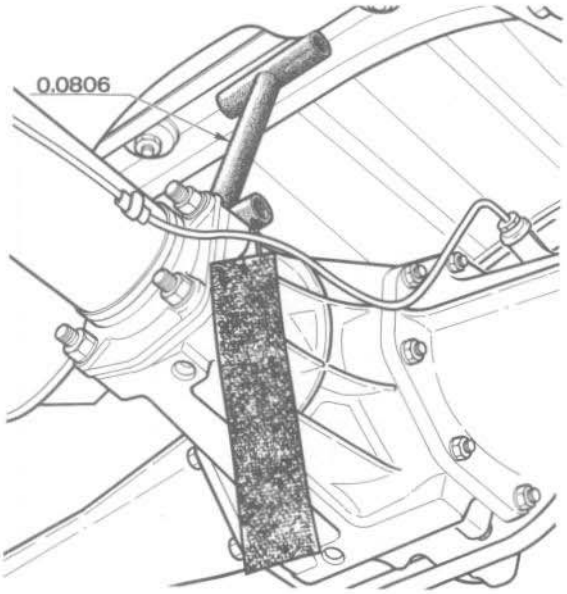
1 - adjustment gauge for rod restrained compensator.

TOOLS TO BE MADE

0.0806

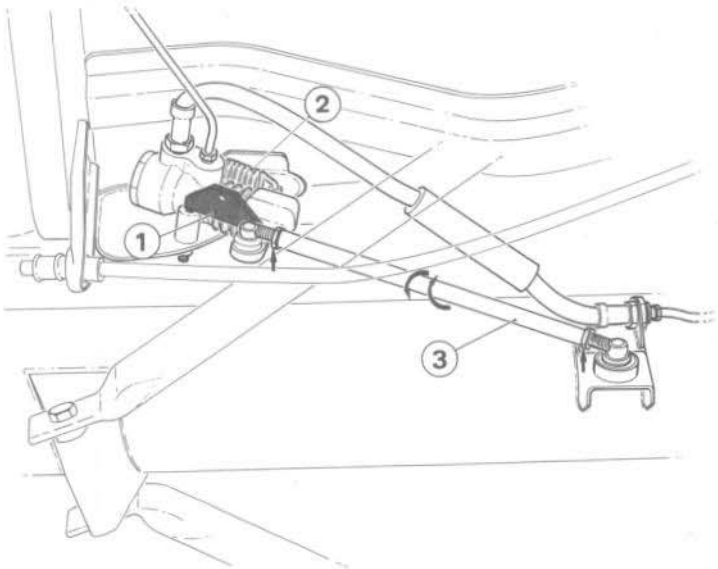
– Wedge, hull/diff.

- lenght of gas pipe, 15 x 21,
- red paint,
- red signal flag (skai).



– Position the vehicle over a pit, or on a horizontal ramp.

– Insert the wedge **(0.0806)** between hull and diff. housing, as illustrated.



WARNING - Do not interfere with the adjustment of the spring **(2)**.

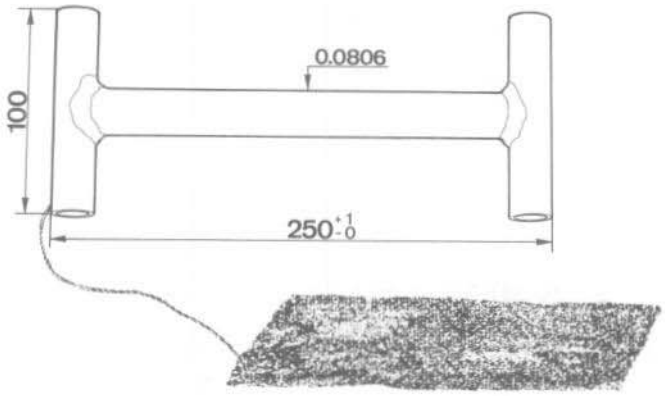
– Locate the gauge (1) in the holes in the compensator by acting on the adjustable rod (3).

– Re-tighten the lock nuts of the adjustable rod.

– Remove both the gauge **(1)** and the distance-piece **0.0806.**

BRAKES

COMPENSATOR ADJUSTMENT

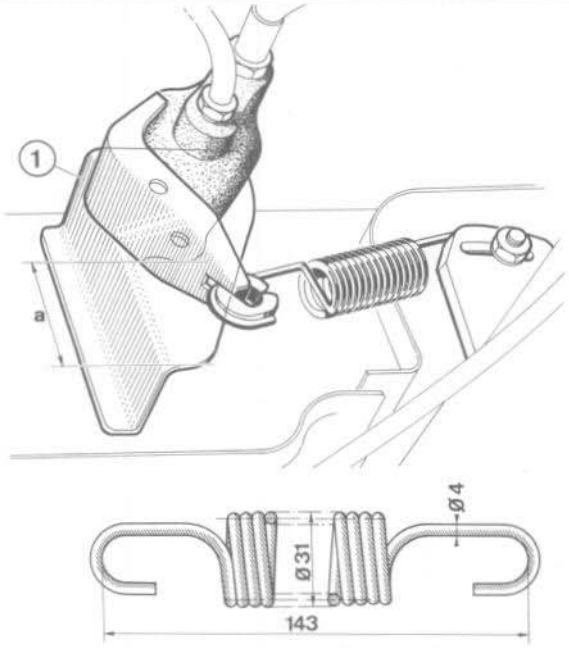


II - SPRING RESTRAINED COMPENSATOR

TOOL TO BE MADE

8.0803

– Wedge - hull/diff,
- length of gas pipe, 15 x 21,
- red paint,
- red signal flag (skai),



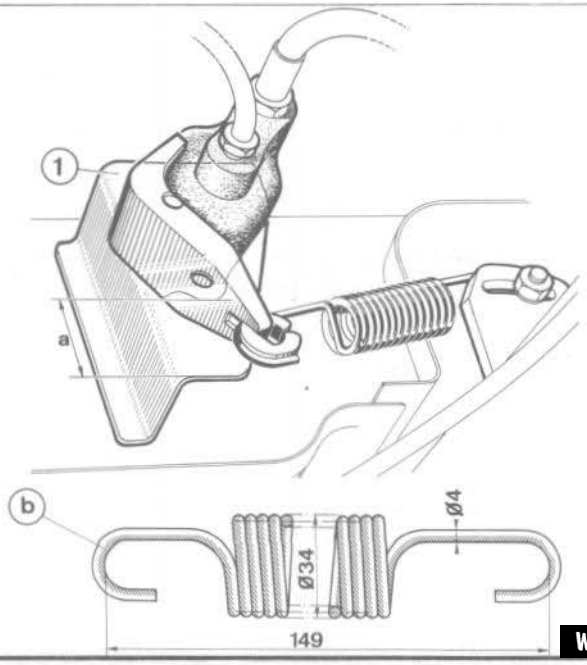
WARNING

TWO DIFFERENT ASSEMBLIES REQUIRING DIFFERENT ADJUSTMENT

1st assembly

– *Compensator mounted on bracket* **(1)** *at* ≃ *45 mm.* **(a).**

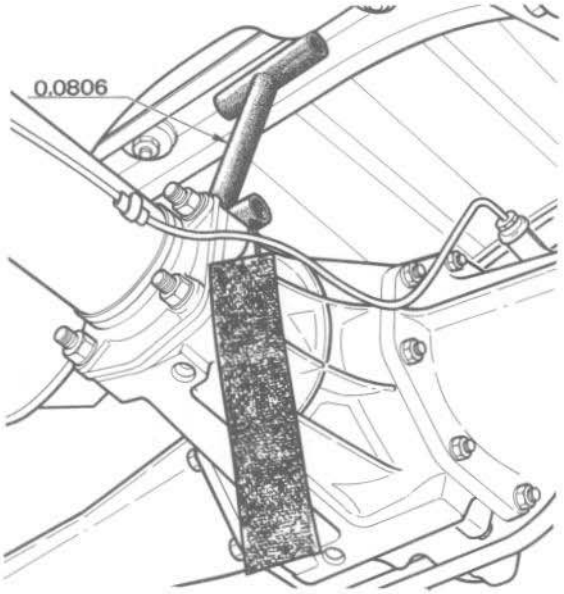
– *Restraining spring,*
- *no identification mark,*
- *dimensions as illustrated*



2nd assembly

– *Compensator mounted on bracket* **(1)** *at* ≃ *25 m/m* **(a).**

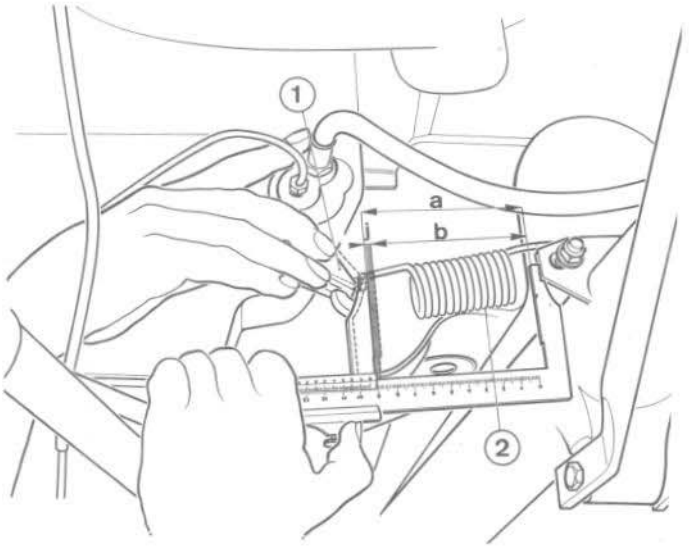
– *Restraining spring*
- *identification - blue flash* **(b).**
- *dimensions as illustrated.*



CHECK - ADJUSTMENT

– Position vehicle over a pit or on a horizontal ramp.

– Insert wedge between hull crossmember and diff. housing, as illustrated.



CHECKING

– Take the measurements at **(a)** and **(b)** with a vernier caliper.

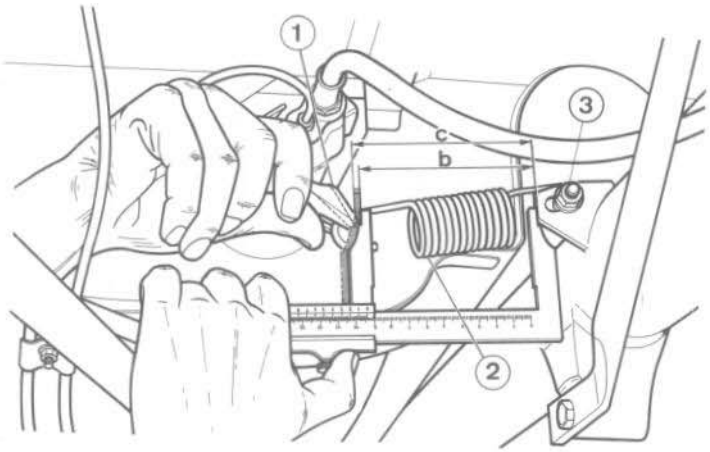
a - lever **(1)** moved, **but spring to be without tension or play,**

b - lever **(1)** pressed in direction of torque tube.

PLAY :

1st Assembly
J = **(a) – (b)** = 1,2 to 2,2 m/m.

2nd Assembly
J = **(a) – (b)** = 2,2 to 3,2 m/m.



ADJUSTMENT

– Slacken the slot nut **(3).**

– Measure :
b - lever **(1)** pressed in direction of torque t ıbe.

– Adjust :
- caliper pre-set, and held in place, at :

1st Assembly
(c) = (b) + 1,7 m/m,

2nd Assembly
(c) = (b) + 2,7 m/m.
- ensure that the **spring (2) is without tension or play** by adjusting the slot bolt **(3).**

– **Remove the wedge, 0.0806.**

– Road test the vehicle in order to ascertain if there is any appreciable difference in braking effort as between front and rear.

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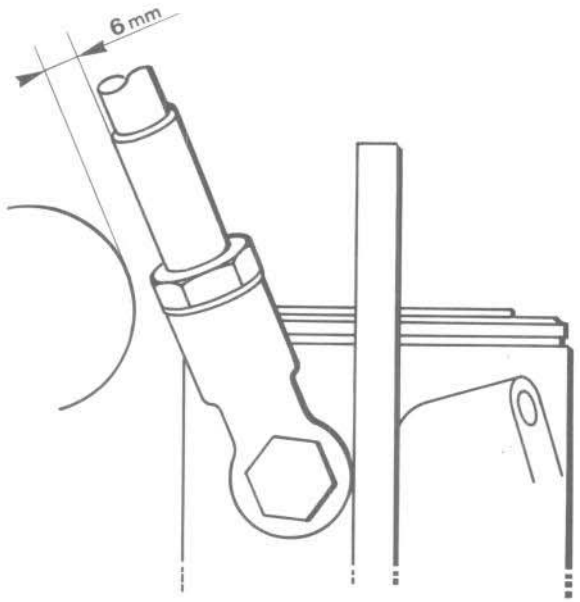
FLEXIBLE HOSES

The brake hoses are susceptable to attack by hydrocarbons, hence avoid contact with grease, lubricating oil, petrol, etc...

The condition of hoses must be checked under maximum pressure by hard application of the brake pedal, with engine running.

Hoses must be fitted without distortion as indicated below, ensuring that there is no risk of contact with the bodywork or with mechanical parts when,

- operating the steering,
- action of the suspension.



FRONT HOSES

– 6 m/m between union and knuckle.

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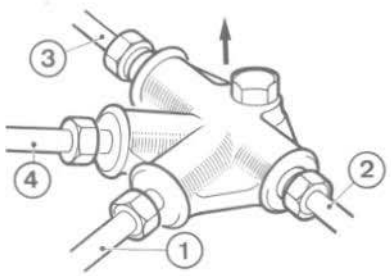
METALLIC PIPES

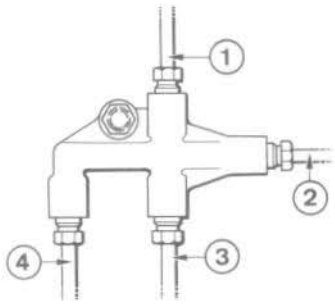
Conform rigidly to the original size, shape, run and fixing of pipes.

Brake pipes can be formed by hand without risk or distortion, always provided that they are not bent several times in the same place, or efforts made to produce small radius bends (use a pattern the displaced pipe, or a pipe in good condition).

Assuming that all fastenings are tight, ensure there is no vibration or contact with metal parts when the steering mechanism is in any position, or during any action of the suspension.

Torque copper pipe union nuts to,9,3 ft/lbs. **(1.3 m.kg.).**





PIPE CONNECTIONS

Single circuit brake system

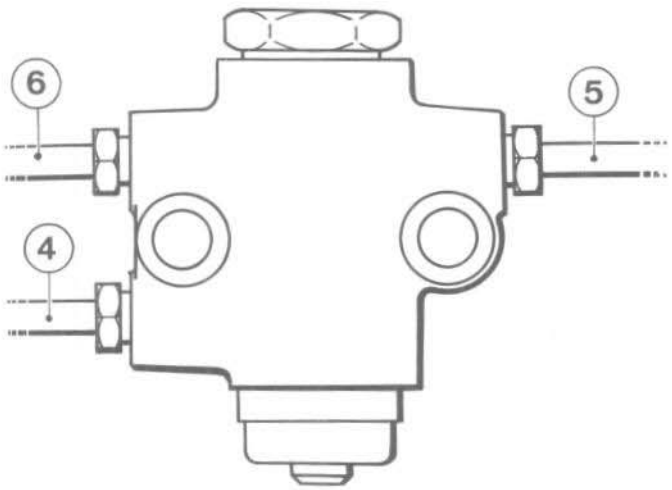
– 4 - Way union fixed to front cross-member,

1 - main feed-pipe to master-cylinder,

2 - to front RH. brake,

3 - to front LH. brake,

4 - rear brakes feed-pipes.



– 504 GL compensator,

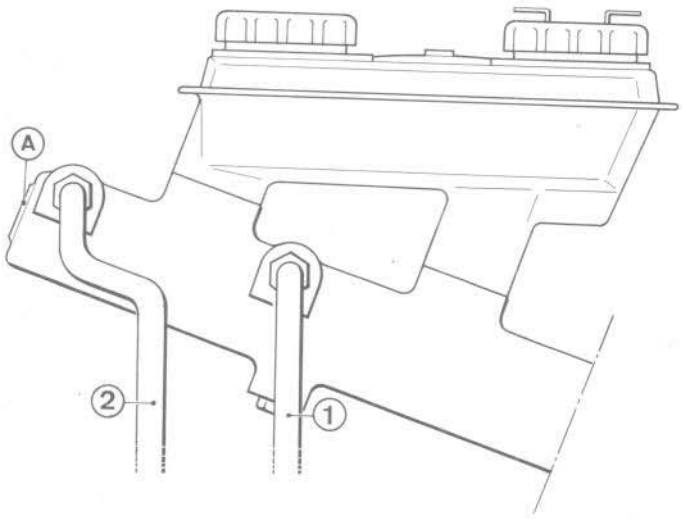
4 - rear brakes feed-pipe,

5 - to rear RH brake,

6 - to rear LH brake.

BRAKES

HYDRAULIC LINES



DUAL CIRCUIT BRAKE SYSTEM

A - Lockheed tandem master-cylinder.

B - Teves tandem master-cylinder.

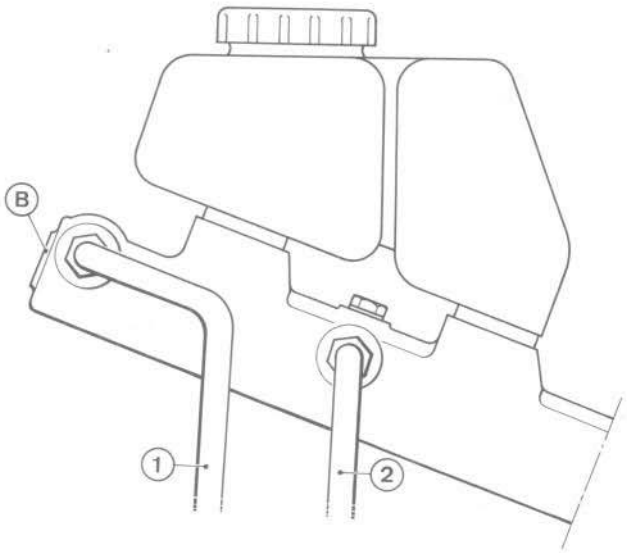
Connection :

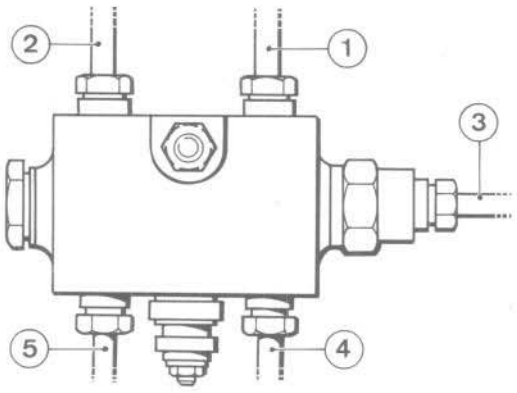
1 - to brake pressure warning light transmittor, or 5 - way union,

feeds front brakes.

2 - to brake pressure warning light transmittor, or 5 - way union,

feeds rear brakes.





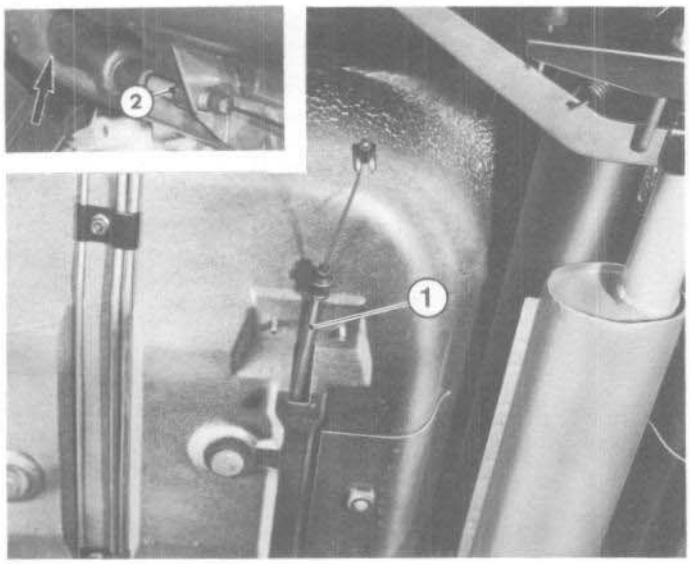
– Brake pressure warning or 5 - way union.

1
2 } to master-cylinder.

3 - to front RH brake,

4 - to front LH brake,

5 - rear brakes feed-pipe.



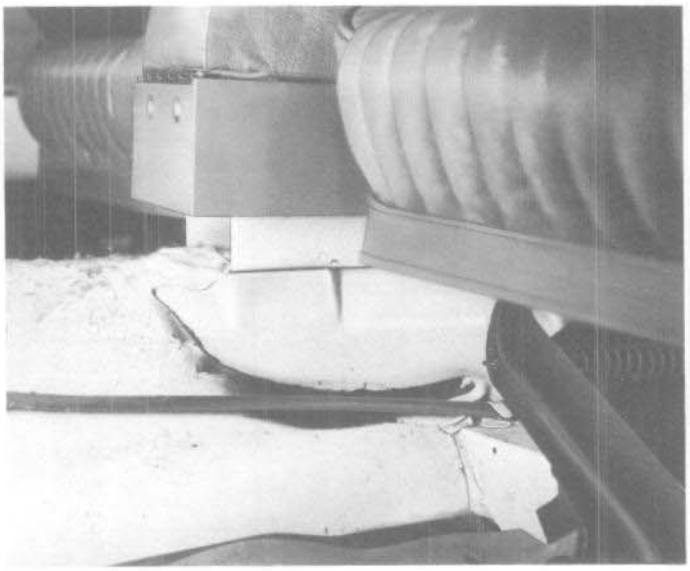
REMOVAL OF CABLE OUTER CASING

– Disconnect the operating cable.

– Remove rear clamp of cable tube.

1 - Saloons.

2 - Derivatives.

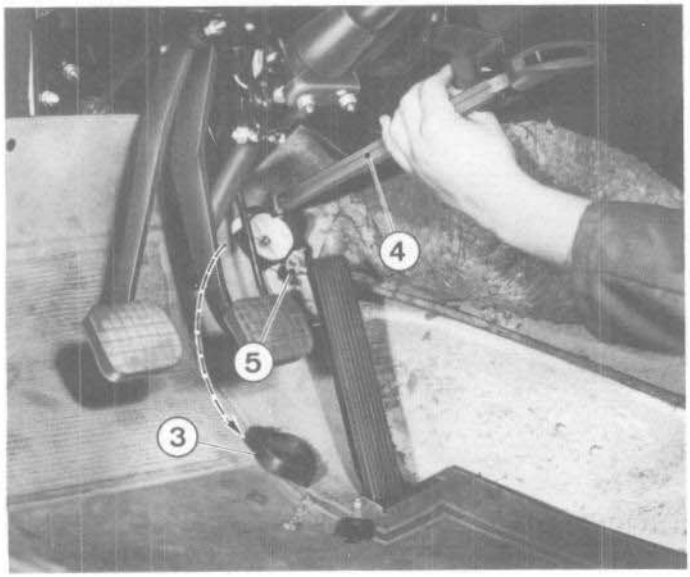


– Lift the carpet and sound proofing at gearbox tunnel.

On saloons

– Remove the mat and sound proofing material from the rear left hand floor.

– Unclip the cable beneath the front seat support.



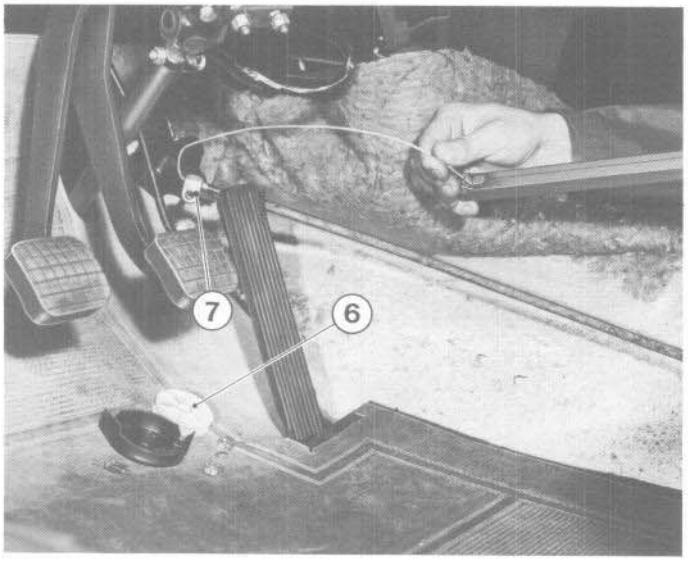
– Remove :

- remove the pulley shield **(3)**,
- lever casing fixing nuts **(4)**,
- the stop collar **(5)**,
- disengage the lever casing at the top and towards the pulley.

BRAKES

HANDBRAKE

DASHBOARD MOUNTED

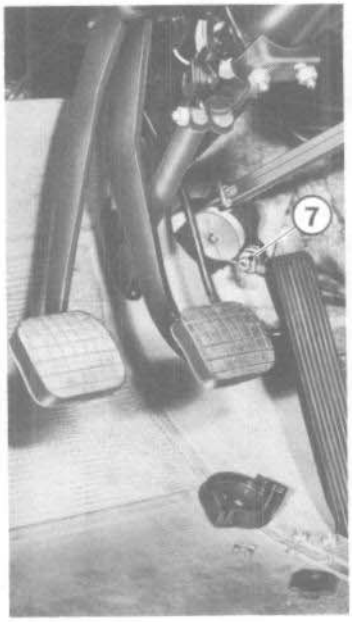


– Remove the pulley **(6)** and collar **(7).**

– Push-home the handbrake lever in its casing.

– Unhook the cable.

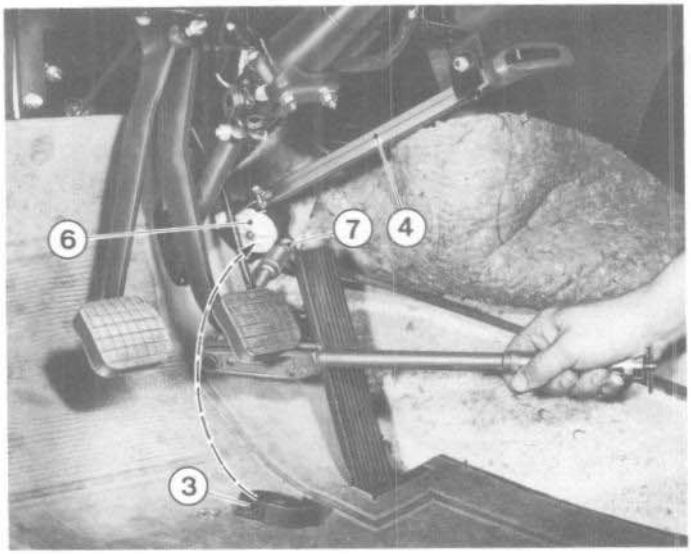
– Remove cable tube.



REPLACING THE OPERATING CABLE

– Insert the cable through the aperture in the underbody **(a).**

– Fit the collar **(7)** to the cable casing.

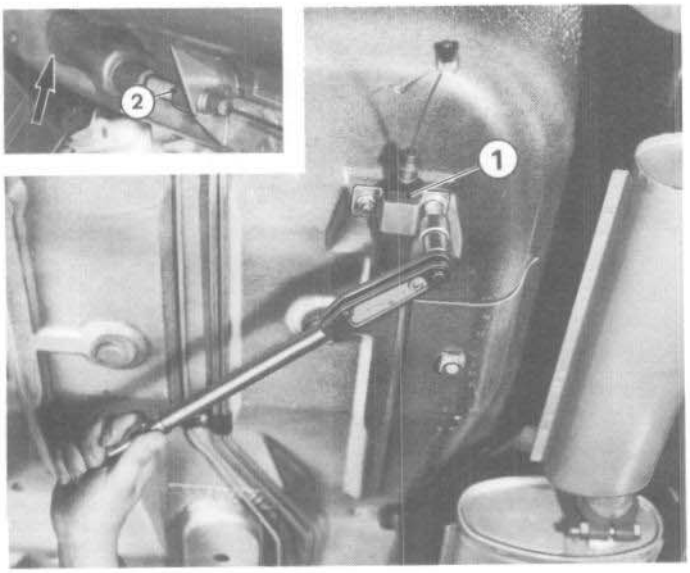


– Hook the cable to the lever.

– Replace the pulley **(6).**

– Fit the casing **(4)** and collar **(7).**

– Replace the shield **(3).**



– Clip cable casing to the front seat support.

– Replace the carpets.

– Fit :

- the operating cable,

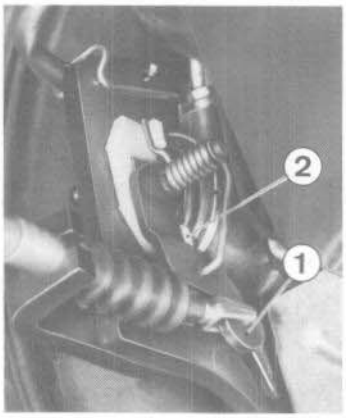
1 - saloons,
2 - derivatives.

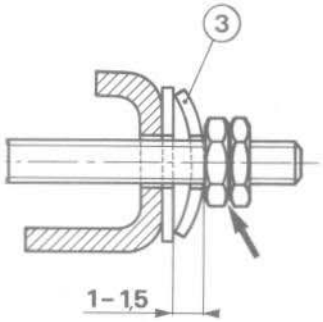
- fit a new split pin to the equalising arm clevis pivot.

BRAKES

HANDBRAKE

DASHBOARD MOUNTED



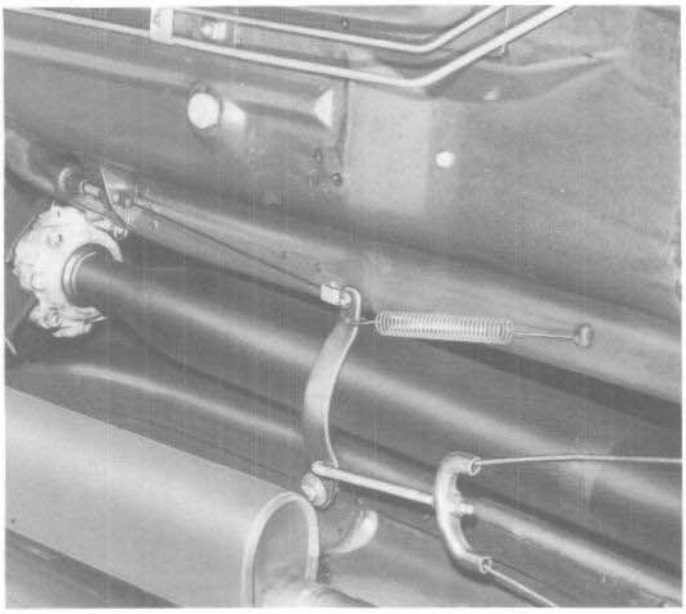


On saloon models check adjustment of the handbrake

Handbrake "off"

- the operating lever **(1)** of the rear brake mechanism should seat on the nylon block **(2).**

- If necessary, act on the nuts in order to obtain **a flexion of the spring washer (3) between 1 and 1,5 m/m.**



On derivatives :

– If necessary, adjust by acting on the nuts to give 4 - 7 notches of the handbrake.