2 - CLUTCH

PLATE CLUTCH

Technical description 56

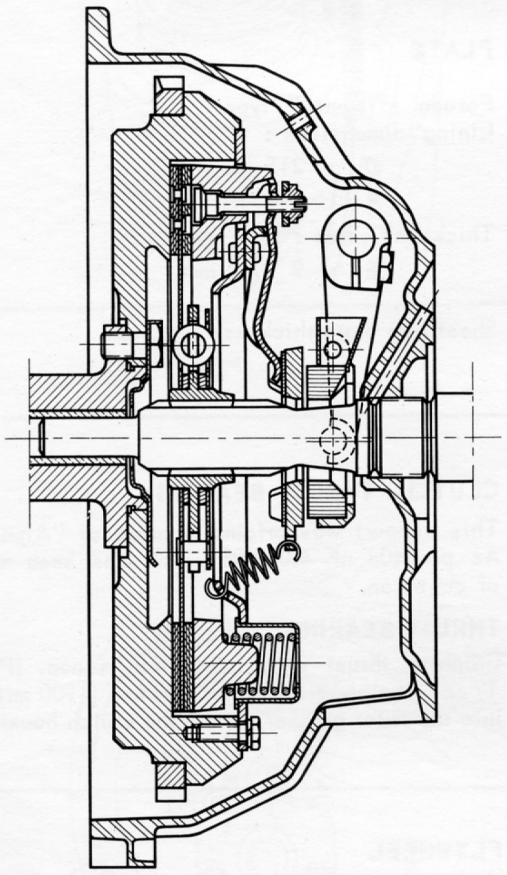
JAEGER MAGNETIC COUPLER

Technical description 58

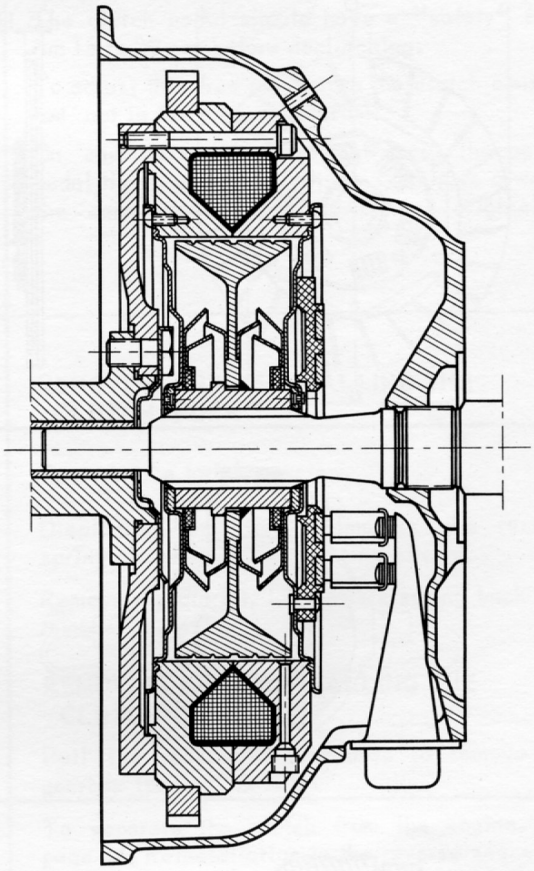
Repair Methods 61

Repair diagram 65

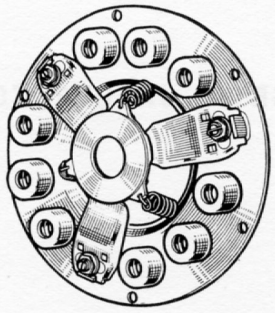
PLATE CLUTCH



MAGETIC JAEGER COUPLER



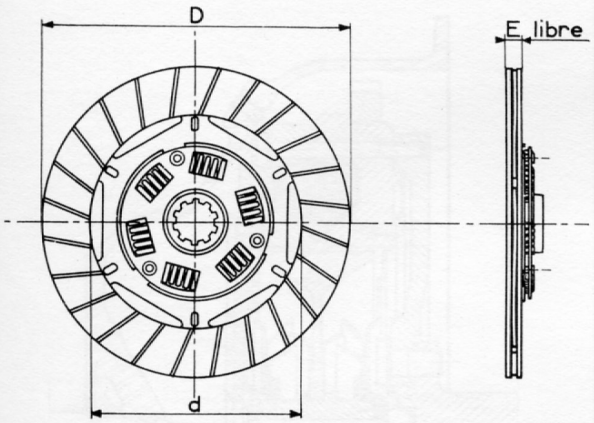
MECHANICAL CLUTCH



TECHNICAL DESCRIPTION

MECHANISM

Ferodo "Planet PKSC 14" type, 9 springs.
Average rate : 450 kgs (1002 lbs).



PLATE

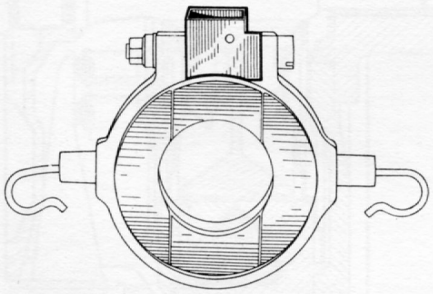
Ferodo - "Dentel" type
Lining dimensions :

D : 215 mm
d : 145 mm

Thickness, free :

E : $9^{+0,5}_{-0,1}$ mm

Sheet iron plate thickness : 1,3 mm.

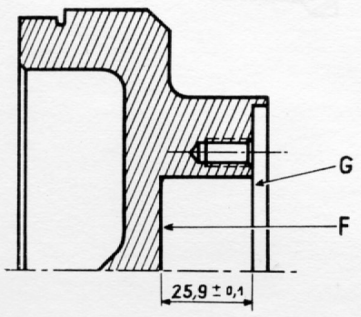


CLUTCH THRUST BEARING

This support was originally made of "Alpax". As per 404 n° 4.069.051, this has been made of cast iron.

THRUST BEARING

Graphite thrust with lubrication scoop. (Pour 1 cc engine oil every 3000 km (1900 miles) into the outer greaser, above the clutch housing).

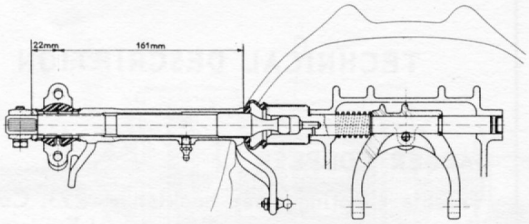


FLYWHEEL

During a repair job, after prolonged slipping and wear of the linings, the bottom of the flywheel **F** may be found to be seized.

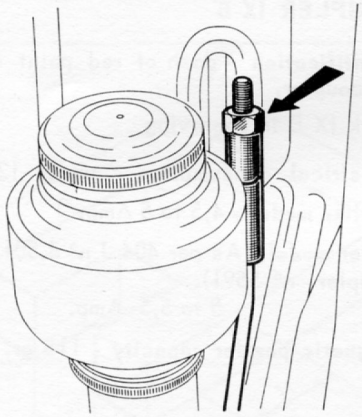
This part may be rectified on the lathe but the same thickness of metal will then have to be taken off from the part of the flywheel **G** where the clutch mechanism rests on, so as not to alter the springs tension.

Depth : 25,9 ± 0,1 mm



CLUTCH CONTROL ADJUSTMENT

Adjust the clutch control, respecting the dimensions given in the sketch herenext.

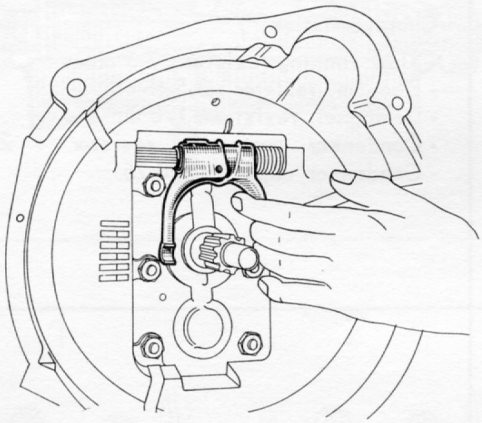


CLUTCH SAFETY ADJUSTMENT

The clutch pedal should have a "safety" free run 15 to 20 mm before declutching.

To adjust this free run, rotate the clutch control rod nut in the proper direction.

On cars with coconut-fibre mats, the upper pedal thrust should be adjusted, to have always the same useful displacement as originally.



REMOVING AND REINSTALLING THE CLUTCH FORK

Remove the fork key-screw.

Displacing the fork, compress the resting spring and release the locating circlip.

Remove the circlet, let the fork spring back and remove the axle.

REMOVING AND REINSTALLING THE CLUTCH

Pull the rear axle rearwards to remove the gearbox (page 72 & 73).

To separate the clutch from the engine, see page 44. Reinstallation in the reverse sequence.

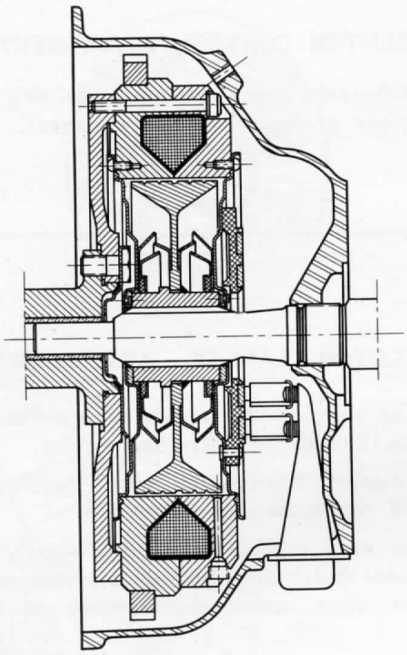
TIGHTENING TORQUES

Clutch housing to gearbox housing attachment stud **18/19,9 ft/lbs.**

Clutch housing to cylinderblock screw : **36,1 to 47 ft/lbs.**

Clutch mechanism to flywheel attachment screw : **10,8 to 18 ft/lbs.**

2 ELECTRO-MAGNETICAL JEAGER COUPLER



TECHNICAL DESCRIPTION

JAEGER COUPLER

Trouble shooting : see booklet n° 293. Coupler electrical diagram : see "Electrical Equipment" pages 175 and 176.

COUPLER IX B

Identification - dash of red paint on rear face of coupler.

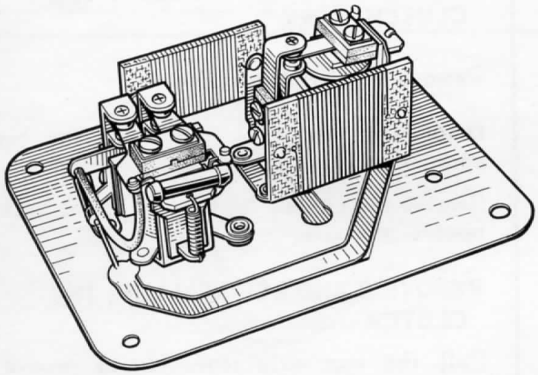
Mark IX B in engraving

Electrical consumption - under 12 V tension.

Earlier model - 4,5 to 5 Amp.

Later model - As per 404 J n° 4.501.893 (Jaeger coupler n° 5591).
5 to 5,5 Amp.

Magnetic powder capacity - 115 gr. red colored.

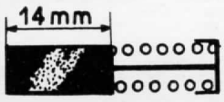


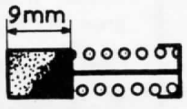
COREL

Identification : Letter "S" on cover.

Characteristics :

- Slow running resistor : 7,5 ohms
- Economy resistor : 2,5 ohms
- Demagnet resistor : 170 ohms
- Condensor portection resistor : 250 ohms
- Condensor capacity : 0,25

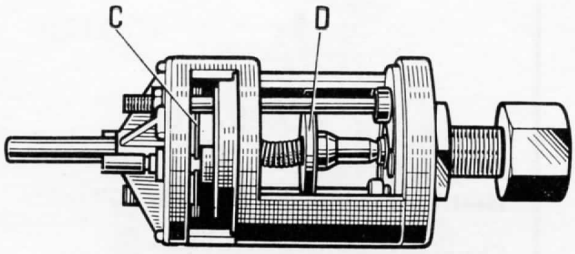




SUBAL

Check and clean brushes every 11.000 miles.

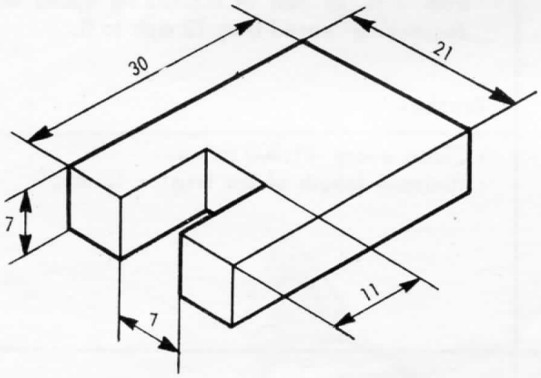
Maximum permissible wear for each brush : 5 mm.



CONAC

Double switch attached on scuttle and installed on accelerator switch.

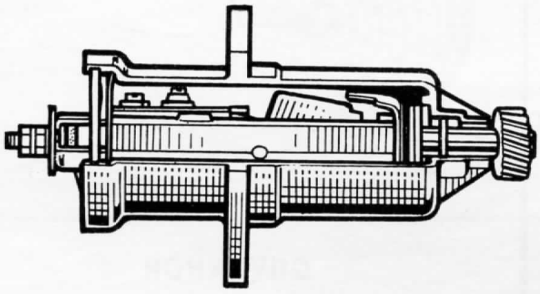
Check the slow running resistor and economy resistor, according to the position of the accelerator pedal.



Adjustment

The "Conac" does not require any adjustment, even after an adjustment of the idling speed.

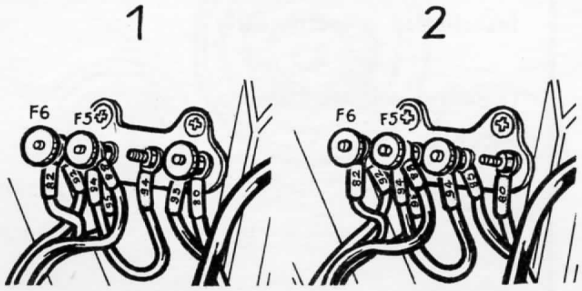
- Only a 7 mm clearance should be respected between the accelerator cable sheath arrest and its thrust on carburettor.
- To check this clearance, use shim shown herenext.



GOVERNOR

Centrifugal switch fixed on gearbox, driven by the output shaft.

It opens in increasing speed at about 16 mph and closes in decreasing speed, from about 12.5 mph, thus controlling the inner switch which is connected with the R 1, relay of the COREL which feeds the coupler either from generator or from battery.

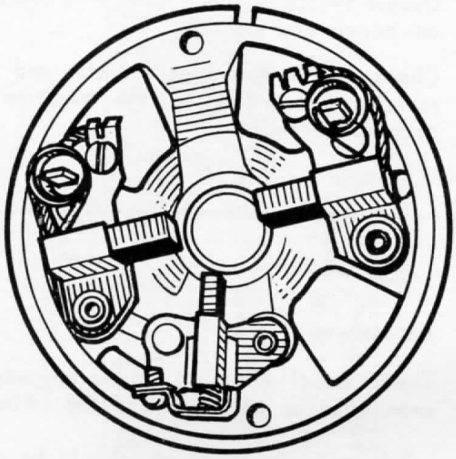


TERMINAL PLATE

Located on the front left wing valance ; bears two fuses : F5 & F6 (1).

It permits the emergency connection in case of breakdown ;the circuit is then directly connected with the battery (2).

2 ELECTRO-MAGNETICAL JEAGER COUPLER



GENERATOR

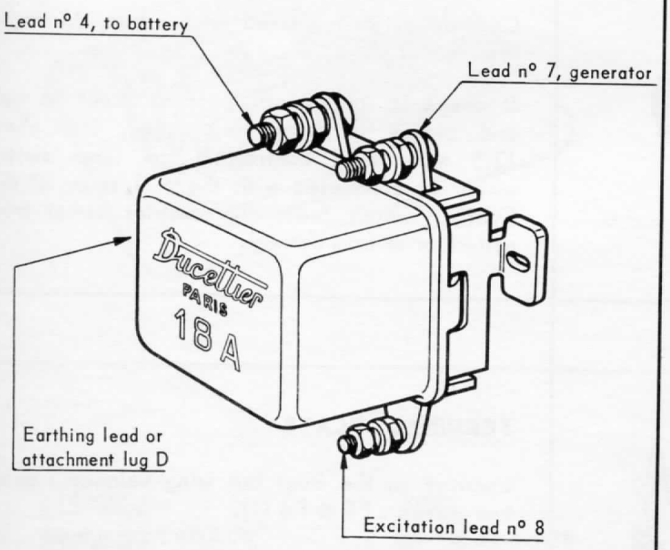
Identification : "Ducellier 7229 G"

Characteristics :

- Dynamo 300 Watts - three brushes
- Conjunction speed : 1200/1300 rpm.
- The 3rd brush is meant to feed the coupler from 0 to 16 mph in increasing speed and in decreasing speed from 12 mph to 0.

Brushes

- Clean every 11.000 miles.
- Minimum length of 3rd brush : 12 mm.



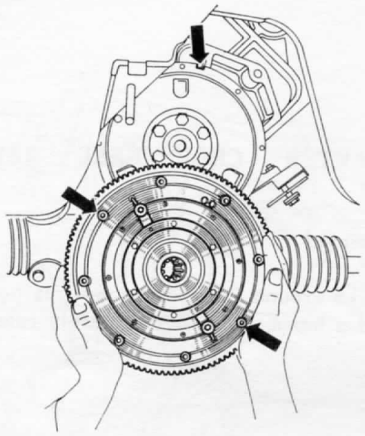
GOVERNOR

Identification : "Ducellier 8198 A"

Characteristic : 18A governor.

Installation Indifferently :

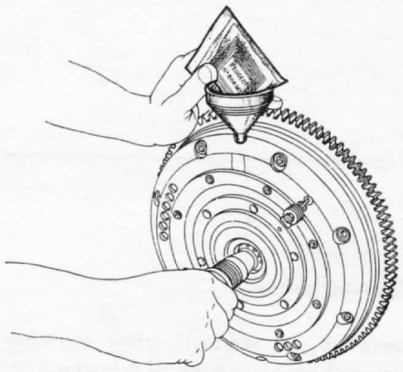
Ducellier or Paris-Rhône.



REPAIR METHOD

Coupler removal

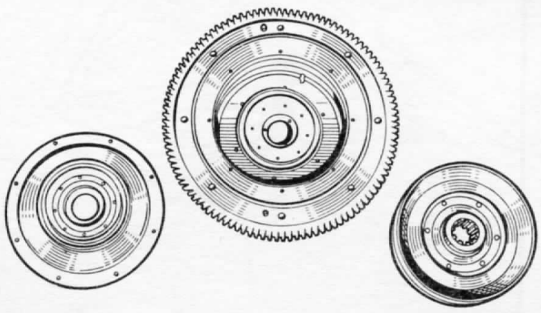
- Disconnect and remove the SUBAL,
- Remove the gearbox, following usual method.
- Remove the six 6 mm Allen screws (leaving the yellow marked opposed screws untouched).
- Remove the coupler by hand, striking with a mallet on the periphery.
- Unscrew the 6 flywheel attachment screws.
- Mark on the flywheel the distributor setting notch.
- Remove the flywheel (paired with the coupler).



Magnetic powder introduction (on brand new coupler).

- Unscrew the non painted plug (Allen key 5).
- Hold the coupler vertically.
- Drop the whole of the powder into the coupler, using a **non metallical** funnel. Use a drive shaft to rotate the pole piece and distribute the powder all over.
- Clean the thread and screw up the plug again.

NOTE - A coupler filled up with powder should always be held vertically.



Powder Exchange

(on coupler being repaired)

- Unscrew on the side of the flywheel, the 8 screws with cross-shaped slot head, and remove the coupler lid.
- Take out the removable armature and the whole of the powder, cleaning the inside ot the coupler with a dry clean brush.
- Replace the armature and the lid.
- Refit the 8 cross-shaped headed screws. Drop a bagfull of powder into the coupler as above.

2 ELECTRO-MAGNETICAL JEAGER COUPLER

STARTER CROWNWHEEL REPLACEMENT

Removal

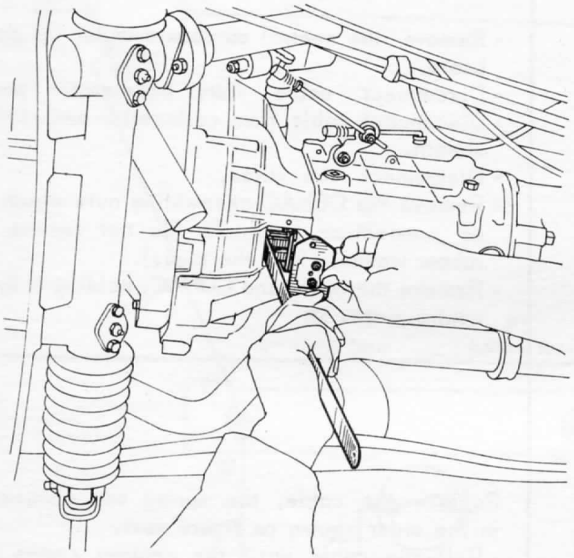
Strike around the crownwheel, using a bronze bar and a hammer, until completely released.

Reinstallation

Same as per removal, after warming up the new crownwheel by means of a brazing lamp.

NOTE - The coupler should lay on wood blocks, so as not to damage the terminals or the collector rings.

Replace the powder, before reinstalling on engine.

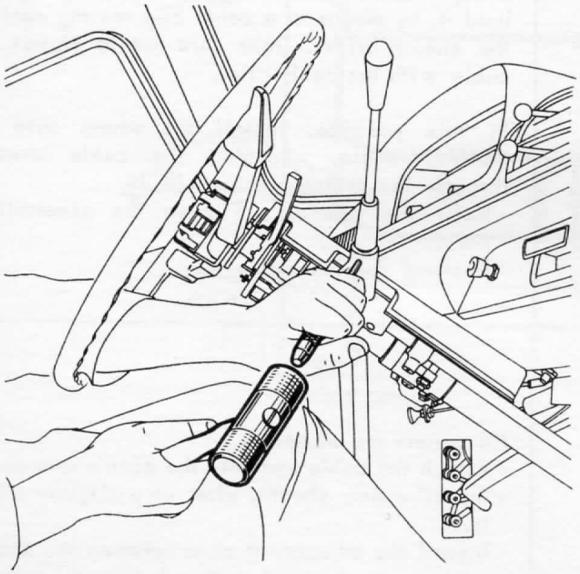


Coupler reinstallation

Install the flywheel paired with the coupler, paying attention to the reference mark (distributor setting notch) left on crankshaft when dismantling.

Replace the screw-locks, torque the 6 flywheel attachment screws to **43,7 ft.lbs** and lock them carefully.

- Place the coupler over the flywheel ; it is located by two location studs.
- Replace the 7 mm blocfor washers and torque to about **7,2 ft.lbs** the 6 fixation screws.
- Slightly tallow the channelling of the drive shaft.
- Refit the gearbox.
- To install the **Subal,** use a thin blade to hold the 4 carbons into their housings ; connect the SUBAL wires (in any position).



POGEL REPLACEMENT

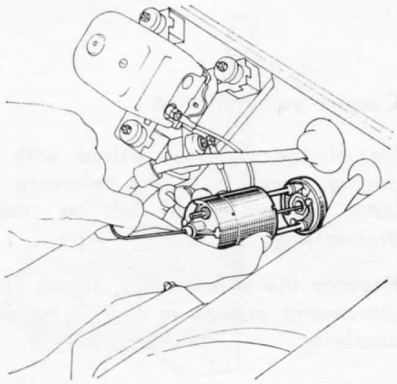
Removal

- Remove the horn circle, the cover holding circlet and the lower cover.
- Engage the reverse gear.
- Using a punch with a 6,5 mm drill, erase the lower riveting on joint pin of the lever.
- Remove the pin, using a 6 mm dia. drift.
- Disconnect the "dips" connection from the POGEL.
- Remove the plastic collar and release the wire.
- Remove the POGEL with its silencing ring.

Reinstallation

- Smear the POGEL ball-head with thick grease.
- Change the lever joint pin (6 × 25).
- Carefully rivet, using a thick punch.
- Reinstall POGEL in the reverse sequence.

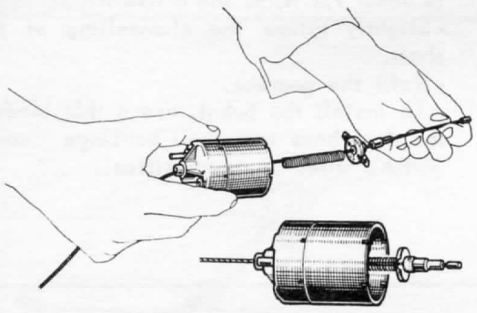
2 ELECTRO-MAGNETICAL JEAGER COUPLER



CONAC

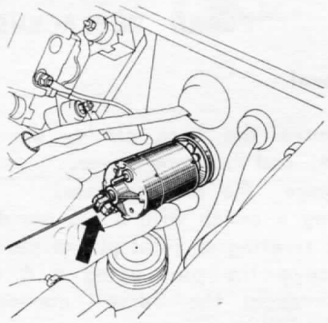
Accelerator cable replacement

- Remove the central cardboard under the dash-board.
- Disconnect cable from accelerator pedal.
- Disconnect cable from carburetter and remove sheath.
- Disconnect the wires.
- Remove the CONAC assembling nuts which act as connection terminals (do not remove the rubber washers from the studs).
- Remove the cable and CONAC, holding it by the centre piece.



Replace the cable, the spring and connection in the order shown on figure next.

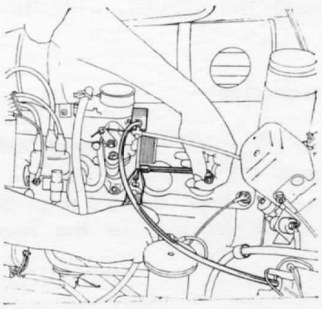
- Pull the cable until the contact comes into its location grooves, making sure that the contact resting spring is correctly fitted into its recesses.



Bring the switch in bottom of the casing and hold it, by means of a cable clip resting against the sheath arrest. (take care not to distort the cable with the cable clip).

In this position, install the whole onto the CONAC socle, engaging the cable arrester through the centre of the socle.

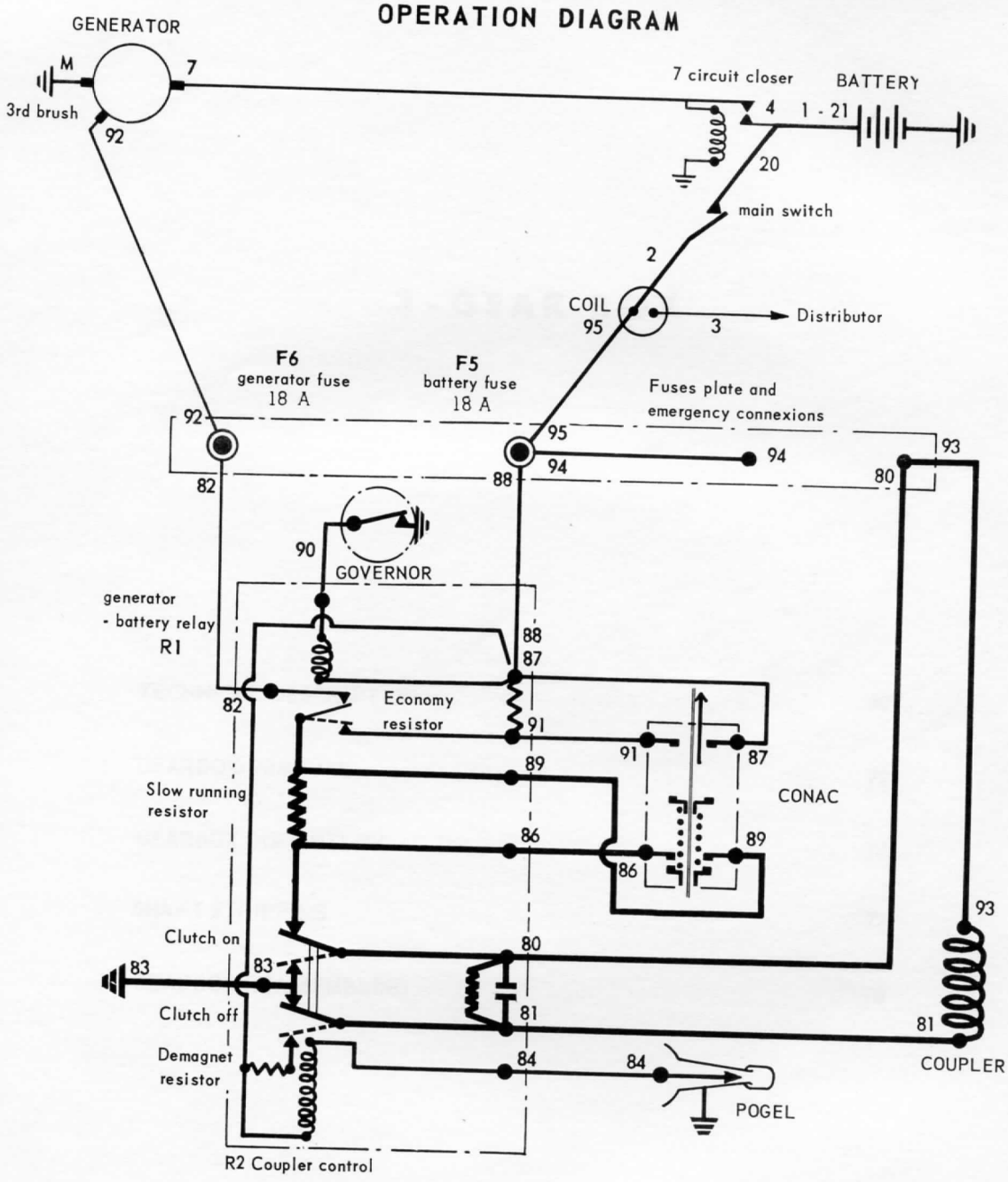
- Refit the washers. Tighten the assembling nuts.
- Remove the cable clip.



Reconnect the wires.

- Attach the cable end onto the accelerator pedal
- Install a new sheath, after very slightly oiling it.
- Install the adjustment shim between the sheath arrest and the carburetter before thightening the cable onto the accelerator control lever.

OPERATION DIAGRAM



Generator feeding only

Battery feeding only

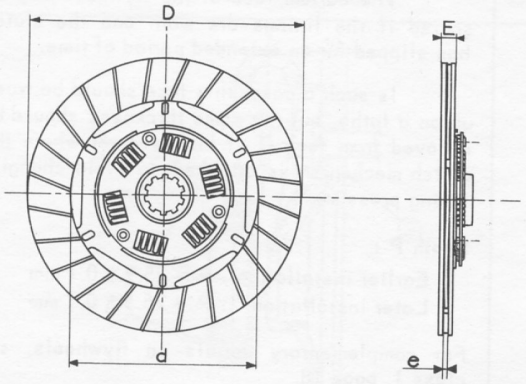
Generator feeding at speeds lower than 16 mph

Battery feeding at speeds above 16 mph

2 - CLUTCH

	Pages
Clutch mechanism	29
Driven disc	29
Clutch thrust bearing	30
Clutch housing	32
Clutch control	33
Clutch operating rod	35
Clutch pedal	36

Type PKSC 12	Type PKSC 14	Type PKSC 15
404 DA } From beginning **404 U6D** } of series **404 LD** From beginning of series to serial number 4.979.999 (XD 85 engines)	**404** **404 D** **404 C** **404 L** **404 U6** **404 KF** } From beginning of series **404 KF** - up to serial number 4.569.999 **404 CKF** - up to serial number 4.593.999 (XC.KF - XC.KF 1 engines) **404 LD** - from serial number 4.980.001 (XD 88 engine)	**404 KF** - From serial number 4.570.001 **404 CKF** - From serial number 4.594.001 (XC.KF 2 engine)

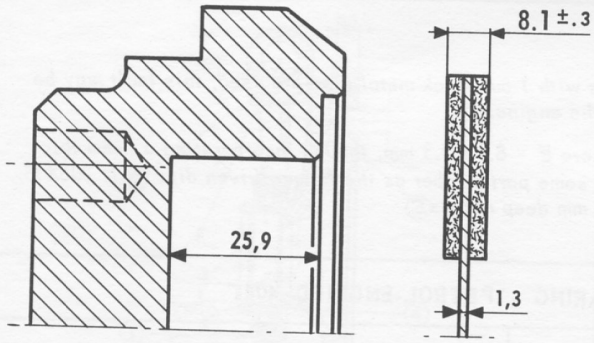


DRIVEN DISC

Ferodo, "Dentel" type

Lining dimensions :

D : 215 mm
d : 145 mm



Earlier installation

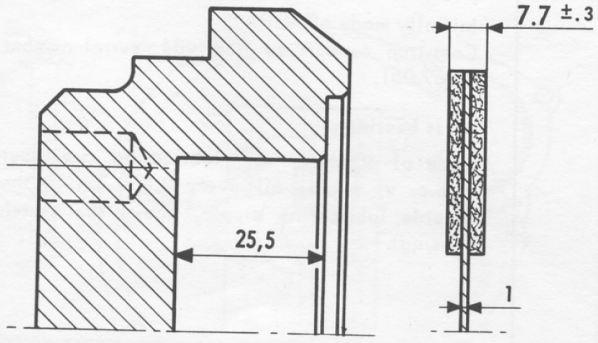
Up to serial numbers :

404 - 4.104.575
404 DA - 3.060.262
404 LD - 4.976.443
404 U6D - 4.902.930

Driven disc, P/N } 2054.15 (new)
2054.19 (exchange)

E = 8.1 mm
e = 1.3 mm

This type of driven disc is installed on flywheels with 25.9 mm deep recesses. Spare Parts Department supplies driven discs where e = 1 mm though equipped with thicker linings E = 8.1 mm).



Later installation

As from serial numbers ;

404 - 4.104.576
404 KF
404 C
404 CKF
404 U6
404 L
} From beginning of series
404 DA - 3.060.263
404 D - 4.600.001
404 LD - 4.976.444
404 U6D - 4.902.931

Driven disc, P/N } 2054.16 (new)
2054.21 (exchange)

E = 7.7 mm e = 1 mm

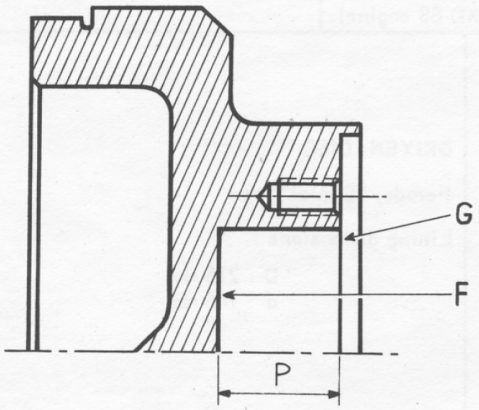
This type of driven disc is installed on flywheels with 25.5 mm deep recesses.

INTERCHANGEABILITY

Driven discs are not interchangeable separately.

Flywheels are interchangeable, provided the appropriate driven disc are used.

NOTE - *Spare Parts Department supplies flywheels with 25.5 mm recesses only.*



REPAIRS

The bottom face of the flywheel may be scored if the linings are worn and the clutch has slipped for an extended period of time.

Is such a case, this face should be trued up on a lathe, but the same thickness should be removed from face G of the flywheel where the clutch mechanism is attached, to avoid changing spring pressure.

Depth P :

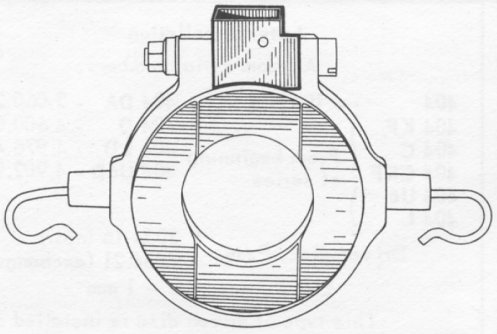
Earlier installation : P = 25.9 ± 0.1 mm
Later installation : P = 25.5 ± 0.1 mm

For complementary details on flywheels, see class 1, page 18.

NOTE - *Clutch chatter :*

- *If clutch chatter is experienced when driven discs with 1-mm thick metal disc are used, this fault may be lessened by installing new elastic front pads on the engine.*
- *Spare Parts Department supplies a driven disc where E = 8.1 ± 0.3 mm, though incorporating a 1-mm thick metal disc (i.e. with thicker linings) and with the same part number as the former driven disc P/N 2054.15, to be used with earlier installation flywheel (25.9 mm deep recess).*

CLUTCH THRUST BEARING - PETROL-ENGINED 404s



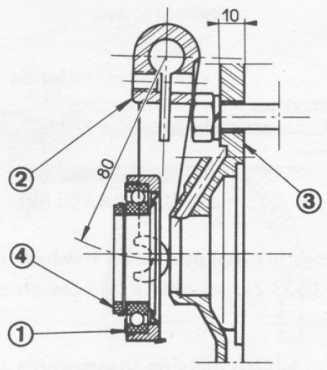
Clutch bearing support

Initially made of ALPAX.

- Cast-iron support as from 404, serial number 4.069.051.

Thrust bearing

- Made of graphite, with lubricating cup (pour 1 c.c. of engine oil every 3,000 km in the outside lubricating nipple, above the clutch housing).



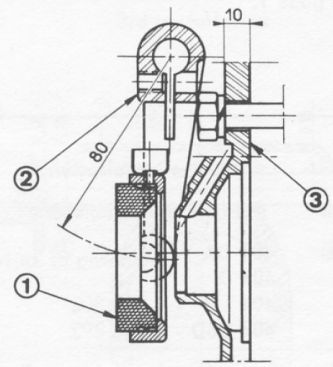
1st installation

Up to serial numbers :

404 LD - 4.975.287
404 U6D - 4.900.850

A ball-type thrust bearing is installed.

Description	P/N
1 - Thrust ball bearing, w/o chamfer on graphite-coated section 4	2034.09
2 - Clutch-release fork, 80 mm	2117.09
3 - Clutch housing	2102.46



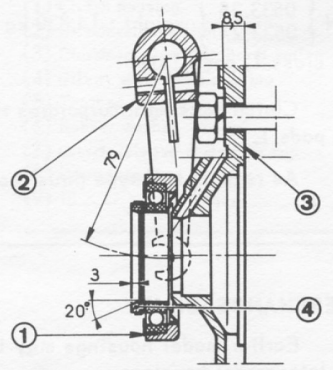
2nd installation

From serial numbers :

404 LD - 4.975.288 to 4.976.798
404 U6D - 4.900.851 to 4.903.649

The ball bearing has been removed.
A graphite-coated thrust bearing has been installed.

Description	P/N
1 - Graphite thrust bearing with lubricating scoop	2041.08
2 - Clutch-release fork, 80 mm	2117.09
3 - Clutch housing	2102.48



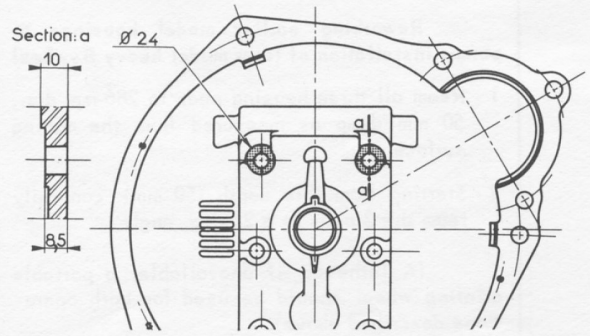
3rd installation

As from serial numbers :

404 LD - 4.976.799 **404 DA** - 3.060.001 } Beginning
404 U6D - 4.903.650 **404 D** - 4.600.001 } of series

A modified ball-type thrust bearing is again used ans installed with a modified clutch-release fork and clutch housing.

Description	P/N
1 - Thrust bearing, ball, with chamfer on graphite-coated section 4	2034.09
2 - Clutch-release fork, 79-mm	2117.11
3 - Counterbored clutch housing	2102.49

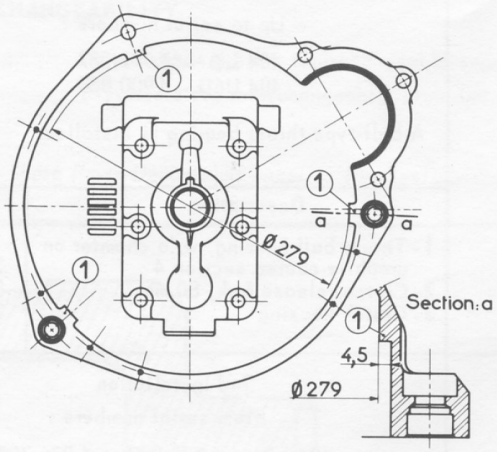


Installing the ball-type thrust bearing on Diesel-engined 404s

- Replace housing, P/N 2102.46 or 2102.48, with housing, P/N 2102.49, or rework housing per drawing opposite (24-mm dia., 1.5-mm deep counterbores).
- Replace clutch-release fork, P/N 2117.09 with fork, P/N 2117.11 (79-mm between centres).
- Install a chamfered ball-type thrust bearing, P/N 2034.09.

DISC CLUTCH

CLUTCH HOUSING - DIESEL ENGINED 404s



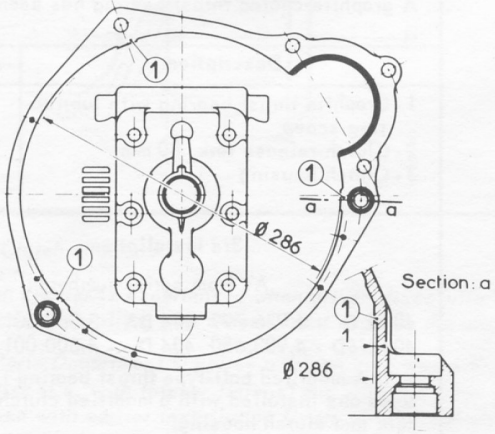
Earlier installation

Up to serial numbers :

404 LD - 4.975.301
404 U6D - 4.900.891

Engines are equipped with flywheel :
P/N 0533.24, weight 14 kg (see class 1, page 18)

Clutch housing incorporates three 4.5-mm high pads 1.



Later installation

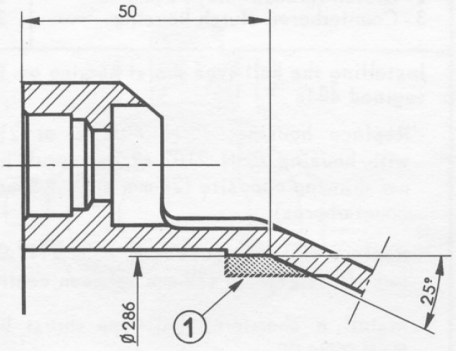
As from serial numbers :

404 DA } Beginning of series
404 D }
404 LD - 4.975.302
404 U6D - 4.900.892

Engines are equipped with heavy flywheel :
P/N { 0533.25 / 0533.27 } weight : 14.830 kg
(see class 1, page 18).

Clutch housing incorporates three 1-mm high pads 1.

As regards ball-type thrust bearing, see page 31.



INTERCHANGEABILITY

Earlier model housings may be replaced with later model housings.

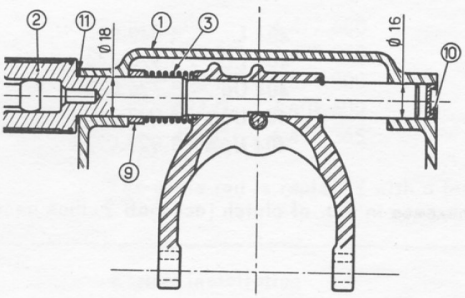
Reworking earlier model housings to permit installation of later model heavy flywheel

1 - Ream all three housing pads to 286-mm dia., 50 mm deep as measured from the mating surface.

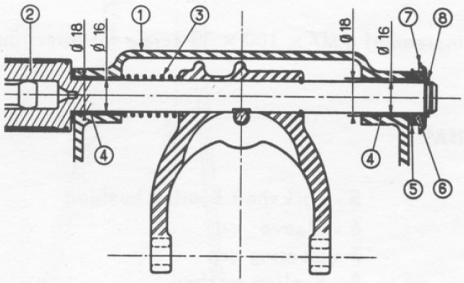
2 - Starting from this depth (50 mm), conically ream the 3 pads at a 25 deg. angle.

(A lathe or, if unavailable, a portable grinfing wheel should be used for both operations described above).

2nd installation



3rd installation



(1) Clutch housing
(2) Clutch release shaft
(3) Clutch release fork thrust spring
(4) Rilsan shouldered bushing
(5) Toothed lockwasher
(6) Rubber washer
(7) Clutch release shaft stop cup
(8) Shaft snap-ring
(9) 18 × 27 × 7 mm spacer

CLUTCH RELEASE SHAFT BEARING

1st installation

Beginning of series production

Clutch release fork thrust spring is installed without spacer 9.

2nd installation

As from serial numbers :

4.124.559

18 × 25 × 7 mm spacer 9 is installed between clutch housing and thrust spring.

3rd installation

As from serial numbers :

404	- 4.157.275	404 L	From beginning of series
404 J	- 4.505.546	404 U6	
404 KF	From beginning of series	404 LD	
404 D		404 U6D	
404 C			
404 CKF			

- Spacer has been removed.
- Release shaft is supported by graphite-coated Rilsan bushings.
- A rubber washer is installed between toothed lockwasher and stop cup on free end of release shaft.
- Clutch housing : 18-mm dia. bore on side opposite to control.

Clutch housing only has been reworked on 404 Js.

CLUTCH RELEASE SHAFT

As from serial numbers :

404	- 4.232.417	404 KF	From beginning of series
404 C	- 4.495.556	404 D	
404 CKF	- 4.590.273	404 L	
		404 U6	
		404 LD	
		404 U6D	

Clutch release shafts have been changed to permit installation of TRUARC snap-ring P/N 2121.11 instead of snap-ring 8.

Snap-rings and shafts are not inter-changeable separately.

As from serial numbers :

404	- 5.030.292	**404 L**	- 4.849.807
404 KF	- 4.566.037	**404 LD**	- 4.978.744
404 D	- 4.603.966	**404 U6**	- 4.736.072
404 C	- 4.497.543	**404 U6D**	- 4.907.760
404 CKF	- 4.593.377	**404 U6A**	- 1.923.027

Control has been strengthened through increase in dia. of clutch jackshaft 2, thus necessitating replacement of the following parts :

- Clutch jackshaft lever 1
- Change speed jackshaft 3
- Rubber protector 4
- Bushing 5 with sleeve 6
- Jackshaft bearing 7
- Sealing washer 8

A M8 × 125 × 35 screw should be used instead of a M7 × 100 × 30 screw for attaching lever to jackshaft.

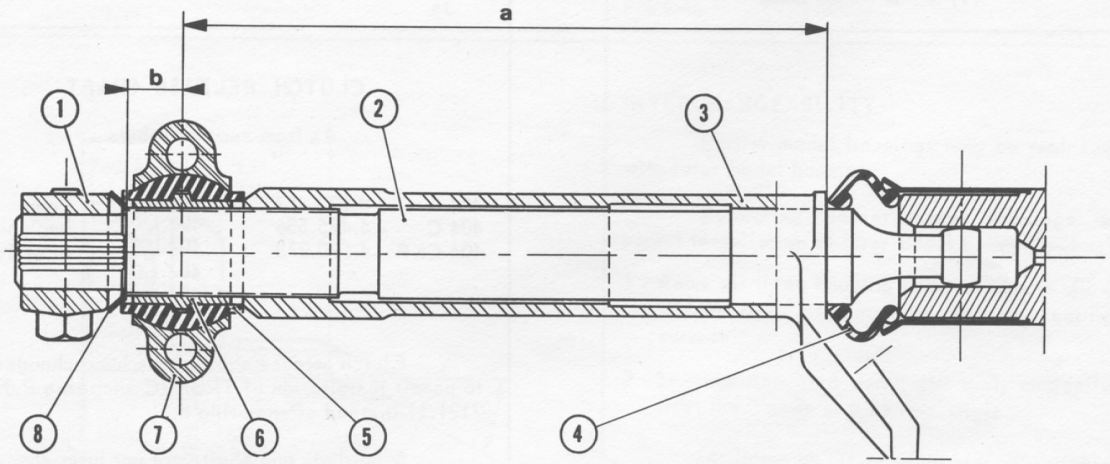
JACKSHAFT

1 - Clutch jackshaft lever
2 - Clutch jackshaft
3 - Change speed jackshaft
4 - Rubber protector
5 - Jackshaft bearing bushing
6 - Sleeve
7 - Bearing cap
8 - Sealing washer

Adjustment : Since change speed jackshaft 3 is 3-mm longer, dimensions a & b listed below must be respected :

a = 162 mm
b = 14 mm

NOTE. - *For all cars built prior to this modification, refer to document No. 472, page 57.*



INTERCHANGEABILITY

Parts from both installations are not interchangeable separately.

DISC CLUTCH

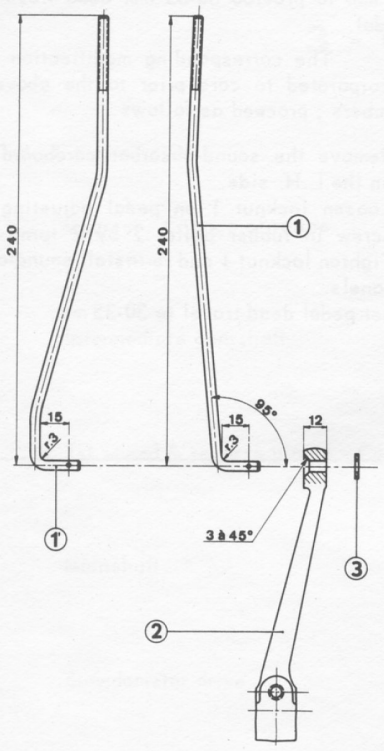
CLUTCH OPERATING ROD

As from serial numbers :

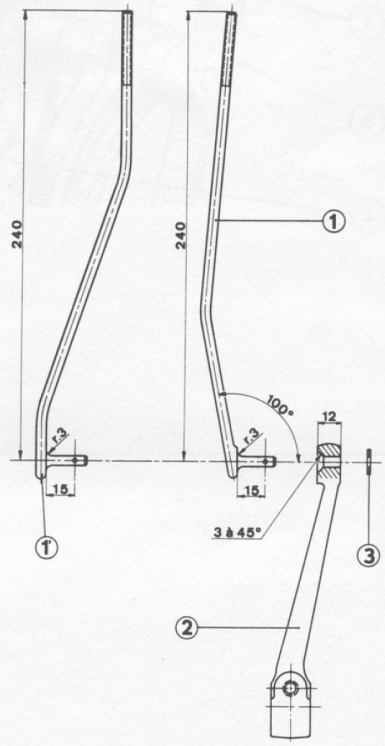
404	- 4.477.680	**404 CKF**	- 4.592.751
404 SL	- 4.473.360	**404 L**	- 4.845.600
404 KF	- 4.571.800	**404 LD**	- 4.978.023
404 D	- 4.601.500	**404 U6**	- 4.730.800
404 C	- 4.497.365	**404 U6D**	- 4.906.420

The angle rod is replaced with a forged rod.

Earlier installation



Later installation

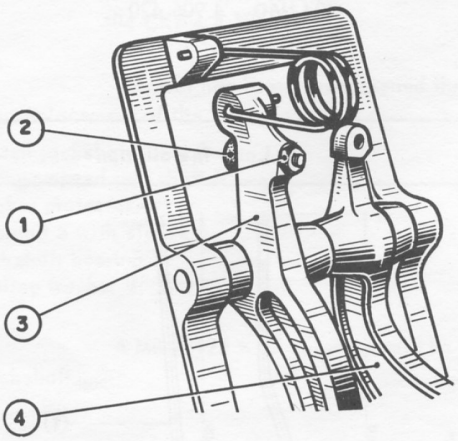


DESCRIPTION	P/N	
	Earlier installation	Later installation
1 - Clutch operating rod (L.H.D.)	2150.15	2150.24
1'- Clutch operating rod (R.H.D.)	2150.16	2150.23
2 - Clutch jackshaft lever	2171.02	2171.02
3 - Washer	6948.21	6948.21

NOTE. - *Operating rods for both installations are interchangeable.*

DISC CLUTCH

CLUTCH PEDAL



As from serial numbers :

404	- 4.218.973	404 L 404 U6 404 LD 404 U6D	From beginning of series
404 C	- 4.495.490		
404 CKF	- 4.590.185		

404 KF
404 D } From beginning of series

The clutch pedal has been raised by 13 mm to provide 30-35 mm dead travel at the pedal.

The corresponding modification may be incorporated to cars prior to the above serial numbers ; proceed as follows :

- Remove the sound-absorber cardboard panels on the L.H. side.
- Loosen locknut 1 on pedal adjusting screw.
- Screw in rubber buffer 2 by 2 turns approx.
- Tighten locknut 1 and re-install sound-abosrber panels.
- Set pedal dead travel to 30-35 mm.