

DESCRIPTION

7 - STEERING GEAR

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DESCRIPTION

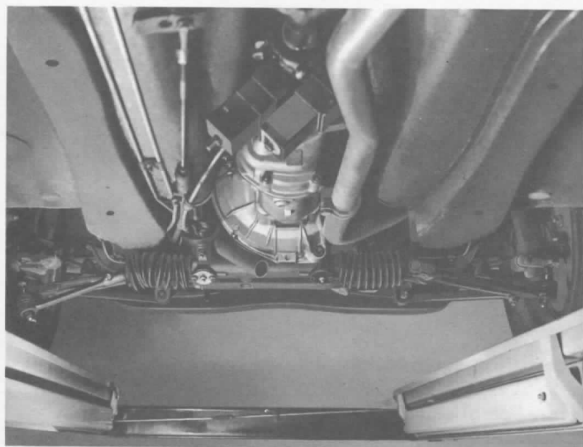
- Rack and pinion type with automatic play take-up provisions.
- Rack connected to steering levers by means of two adjustable connecting links.
- Connection ensured as follows :
Left hand side : through a ball head fitting housed within the rack.
Right hand side : through an eye fitting screwed into the rack.
- The ball head permits accurate parallelism adjustment by fractions of a turn.
- 1 full turn of the ball head = 3 mm toe in or flare according to direction of rotation.



CHARACTERISTICS

Description	Earlier type installation	Later type installation	Application	
Number of teeth - rack	25	30	Later type installation as from the following numbers :	
Number of teeth - pinion	6	8		
Ratio	1 : 20	1 : 18.6		
Turning radius	4,82 m (15'9 3/4")	4,82 m (15'9 3/4")	404	4.025.423
Number of steering wheel turns between stops	4 turns	3.75 turns	404 J	4.501.173

STEERING GEAR



REPAIR METHODS

REMOVAL

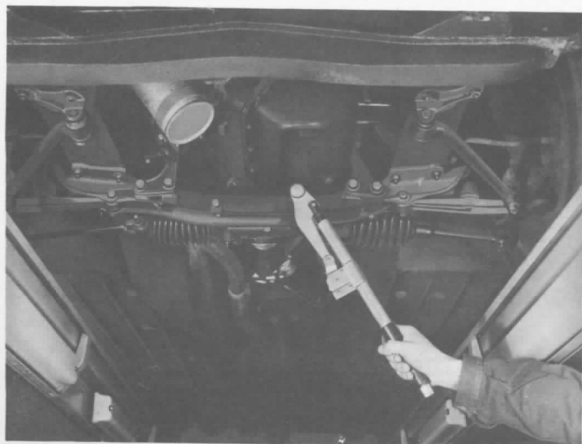
- 1 - Place car on pit or ramp, with front wheels straight ahead.
- 2 - Disconnect battery.
- 3 - Remove upper yoke bolt to disconnect steering column from flector.
- 4 - Using a ball head remover, disconnect steering gear connecting links from steering levers.
- 5 - Unscrew the two steering gear housing attachment screws.
- 6 - Remove steering gear assembly.



REINSTALLATION

Disconnect front engine mount supports.

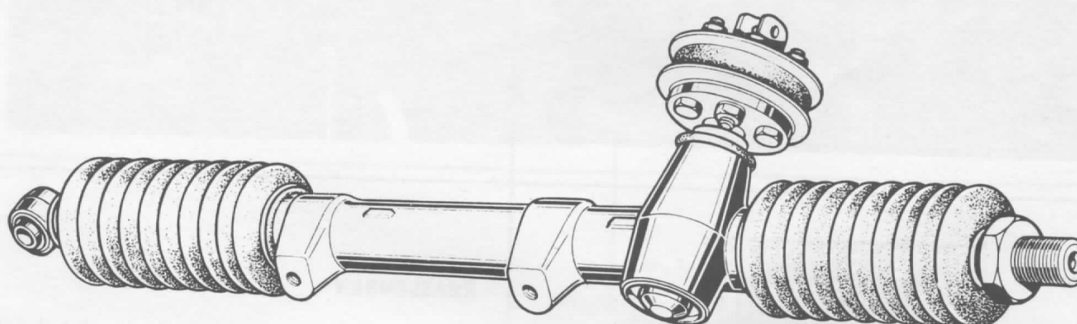
- 1 - Lift engine slightly to provide clearance for the torque wrench.



- 2 - Bring steering gear housing in position against crossmember, and torque the two attachment screws to 22 - 32 ft/lbs. Refit engine front mount supports.
- 3 - Re-connect steering column, torque flector collar new bolt to 5.5 - 9 ft/lbs and peen screw.
- 4 - Secure connecting links to steering levers torque ball head nuts to 36 - 40 ft/lbs and install pins.
- 5 - Bring R.H. connecting link yoke in position and torque eye locknut.



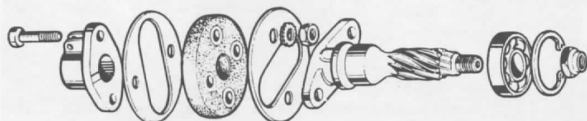
- 6 - Torque R.H. connecting link yoke stud and install pin.
- 7 - Adjust front wheel toe-in to 2 ± 1 mm by screwing ball head in or out within L.H. connecting link ; torque locknut against connecting link.
- 8 - Secure rubber protectors on rack.
- 9 - Turn steering gear fully in both directions to check for interference between wheels and spars.
- 10 - Lubricate steering gear assembly.
- 11 - Conduct a driving test on the road to check steering wheel for proper position on a straight line. Correct steering wheel position as necessary by removing wheel using tool n° 8.0703 A and reinstalling it correctly.



DISASSEMBLY

- 1 - Remove yoke pin from R.H. connecting link.
- 2 - Remove rubber protector clamps, at connecting link ends.
- 3 - Unlock locknut and remove rack eye.
- 4 - Unlock ball head locknut and remove L.H. connecting link.
- 5 - Remove rubber protectors
- 6 - Remove housing cap.
- 7 - Unlock and remove pinion nut,
- 8 - Remove the two plungers ; the plunger thrust spacer and plunger. Adjustment shims at pinion end should be set aside for further use.
- 9 - Remove rack pinion.

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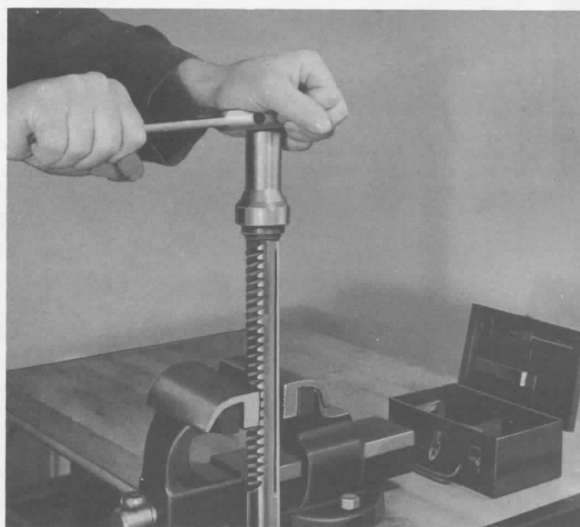


10 - Remove rack.

11 - Remove the following from pinion :

- flector
- rubber stop
- "O" ring seal.

12 - Remove circlips and bearing from steering gear housing.



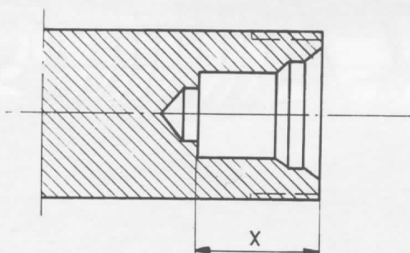
13 - Hold rack in a vice fitted with lead jaws.

14 - Unscrew ball head housing using wrench N° 8.0703 B.

15 - Remove ball head, adjustment shim, shell and backing spring or "Belleville" washers.

NOTE - "Belleville" washers have been fitted to replace backing spring as from the following serial numbers :

404	4.019.543
404 J	4.500.793



UP TO Nos :		AS FROM Nos :	
404	4.019.542	404	4.019.543
404 J	4.500.792	404 J	4.500.793
X = 22,5 mm		X = 23 mm	

REASSEMBLY

1 - Place rack vertically in a vice fitted with lead jaws.

2 - Determine thickness of ball head housing adjustment shim (see page 129).

3 - Check depth of recess X.

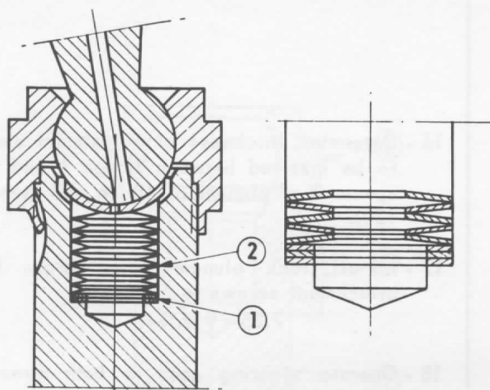
4 - If X = 23 mm, install the 0.5 mm thick shim P/N 3839.05 in bottom of recess.

IMPORTANT NOTE - The 0.5 mm thick shim should not be installed except on rack having a 23 mm deep recess.

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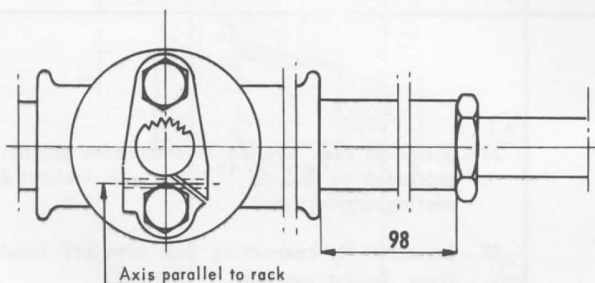
5 - From envelope P/N 3839.02, take shims 1 if any, and place them in bottom of rack recess ; then pile up the 13 "Belleville" washers, 2 as per sketch opposite.

6 - Place adjustment shim of pre-determined thickness.

7 - Install ball head and shell which is centered by means of pin N° 8.0703 D.



8 - Screw in new ball head housing, torque to 30-36 ft.lbs using wrench N° 8.0703 B, and stake in place.



9 - Install bearing and circlips in housing.

10 - Assemble flector and flector collar on pinion.

11 - Screw in new bolts, torque nuts to 11-14 ft.lbs and safety.

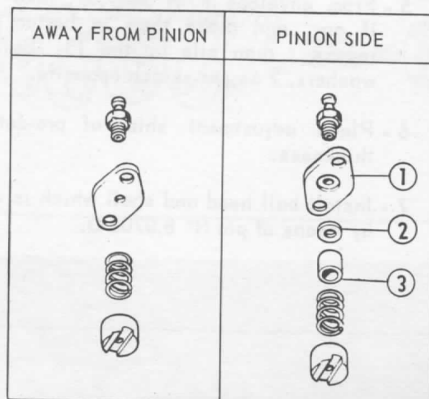
12 - Engage rack into steering gear housing, so that rack is protruding by 98 mm at end opposite to ball head.

13 - Engage pinion fitted with its "O" ring seal so that yoke holes are aligned along and axis parallel to the rack.

14 - Torque pinion, new, to 30 ft.lbs, and safety.

15 - Install housing cap.

STEERING GEAR

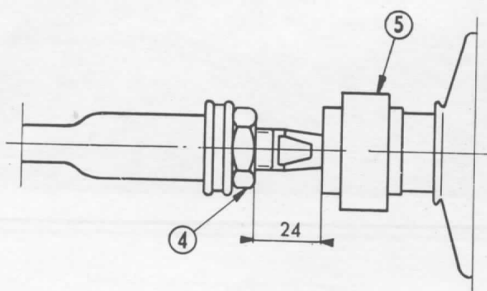


16 - Determine thickness of adjustment shims 2 to be inserted between flange 1 and thrust spacer 3 of plunger at pinion end (see page 130).

17 - Install rack plungers and torque flange attachment screws to :
7.25 - 9 ft.lbs.

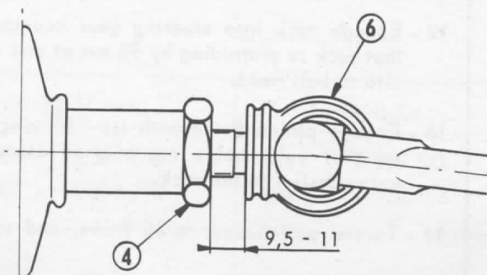
18 - Operate steering gear in both directions, and check for local stiffness.

19 - Secure rubber protectors on housing.



20 - Screw in locknut 4 and L.H. connecting link on ball shank so that a 24 mm dimension is obtained between ball head housing 5 and locknut, with connecting link aligned with rack centre line.

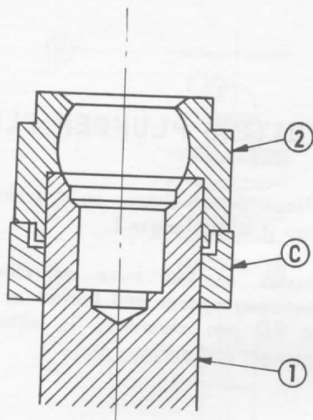
Do not torque locknut.



21 - Screw in rack eye so that threaded portion protrudes by 9.5 to 11 mm, with locknut 4 resting against rack.

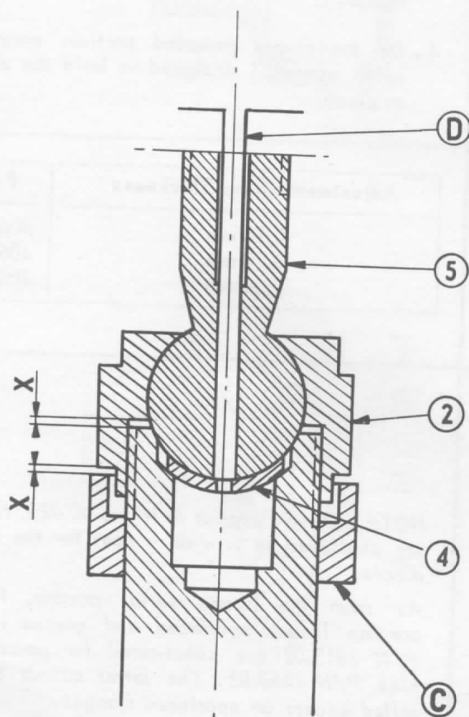
22 - Install R.H. connecting link with ball head cone facing upwards.

Do not torque stud.



ADJUSTING STEERING GEAR RACK BALL HEAD

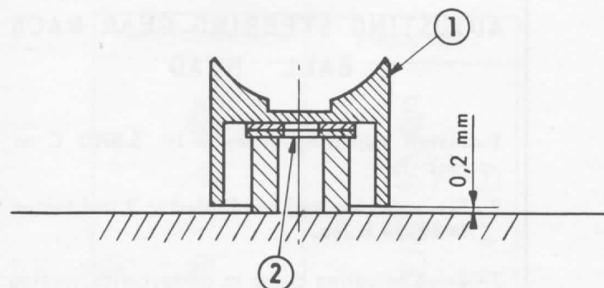
- 1 - Install adjusting clamp 3 N° 8.0703 C on rack 1,
- 2 - Screw in new ball head housing 2 and torque to 30-36 ft.lbs.
- 3 - Bring adjusting clamp in contact with housing 2 and torque lockscrew.



- 4 - Remove ball head housing without disturbing adjusting clamp which marks "max" torquing position.
- 5 - Install ball head shell 4 in place in rack.
- 6 - Install ball head 5, and engage pin 6 D into ball head centre bore.
Pin is meant to act as shell locator.
- 7 - Screw in housing 2, withdraw pin and go on screwing until ball head is no longer allowed to swing within its housing.
- 8 - Using a set of shims, determine clearance between housing 2 and adjusting clamp C.
- 9 - Add 0.05 mm to the figure thus found, this gives the thickness of the adjustment shim to be inserted between rack and bottom of housing in order to obtain 0.05 ± 0.02 mm axial play.

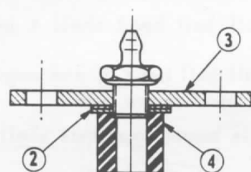
Adjustment shims Thickness	P/N
0,10 mm	3837.01
0,15 mm	3837.04
0,20 mm	3837.02
0,50 mm	3837.03

- 10 - Unscrew housing, remove ball head, ball head shell and adjusting clamp C.



ADJUSTING PLUNGER CLEARANCE

- 1 - Place thrust spacer on a surface plate and cap it with plunger 1.
- 2 - Insert one or more adjustment shims 2 between spacer and bottom of plunger until a 0,2 mm clearance is obtained between plunger and surface plate.



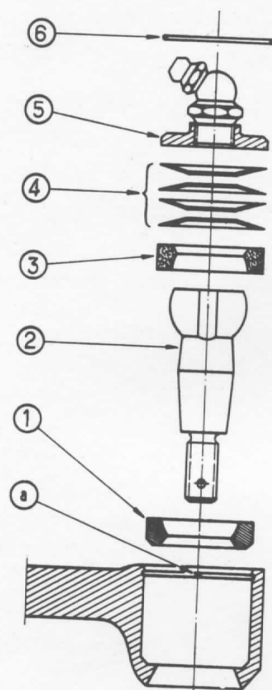
- 3 - On flange 3, install adjustment shims 2, as determined above, these will be located on the nipple threaded portion protruding from flange.
- 4 - On the nipple threaded portion, screw in nylon spacer 4 designed to hold the shims in place.

Adjustment shims Thickness	P/N
0,10 mm	4063.06
0,20 mm	4063.07
0,50 mm	4063.08

LUBRICATING NIPPLES	
EARLIER TYPE	LATER TYPE
N 2613.02	N 2613.03

NOTE - On 404's prior to N° 4.040.925, flanges are spotfaced to provide a seat for the grease nipple.

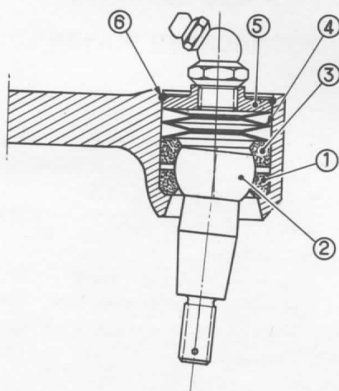
As from the above serial number, flanges are no longer spotfaced and grease nipples P/N 2613.02 are substituted for grease nipples P/N 2613.03. The latter cannot be installed except on spotfaced flanges.



CONNECTING LINK BALL HEADS

DISASSEMBLY

- 1 - Hold connecting link in a vice.
- 2 - Remove snapping 6 from ball head cap, using a punch and working through the hole provided for that purpose.
- 3 - Set the following aside for further use :
 - Ball head cap 5
 - The 4 "Belleville" washers 4
 - Lower nylon half bearing shell 3.
 - Ball head 2
 - Upper steel half bearing shell 1.



RE-ASSEMBLY

- 1 - Install steel half bearing shell 1 P/N 3821.05 in bottom of ball head housing.
- 2 - Install the following :
 - Ball head 2 P/N 3873.13 with lubricating land.
 - Nylon half bearing shell 3.
 - The 4 "Belleville" washers 4, observing the correct positioning.
 - Ball head cap 5.
- 3 - Compress "Belleville" washers and install new snapping 6 in position.
- 4 - Position ball head correctly : pin hole axis should be at right angles with connecting link centre line.
- 5 - Lubricate ball head housing.

NOTE - On the figure, View opposite to the sense of installation on car.

7 - STEERING GEAR

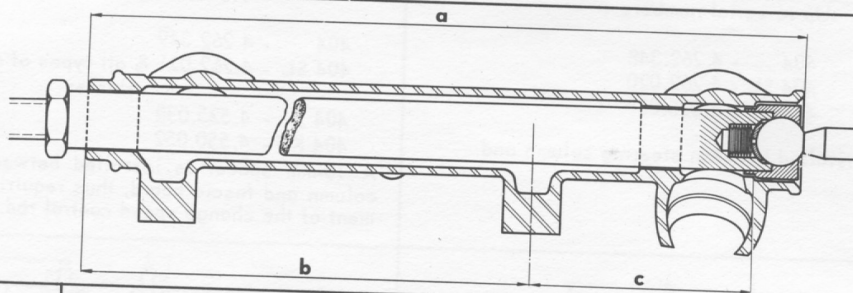
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STEERING GEAR HOUSING ASSEMBLY



	1st installation	2nd installation	3rd installation
Type of car	Up to serial numbers : 404 - 4.025.422 404 J - 4.501.172	From serial numbers : 404 - 4.025.423 to 4.034.274 404 J - 4.501.173 to 5.524.630 to serial numbers : 404 KF - 4.551.030 404 C - 4.495.795 404 C.KF - 4.590.829	As from serial numbers : 404 - 4.304.275 404 J - 4.525.631 404 KF - 4.551.031 404 C - 4.495.796 404 C.KF - 4.590.830 404 D - 4.600.001 and all types of 401 associated vehicles from beginning of series
Housing	P/N { L.H.D. 4004.13* R.H.D. 4004.14*		4004.15 4004.16
a	352 mm		355 mm
b	220 mm		223 mm
c	109 mm		112 mm
Rack	P/N { L.H.R. 4056.03* R.H.D. 4056.04* 25 complete teeth	P/N { L.H.D. 4056.05 R.H.D. 4056.06 30 complete teeth	
Driving pinion	P/N { L.H.D. 4048.15* R.H.D. 4048.16* 6 teeth	P/N { L.H.D. 4048.17 R.H.D. 4048.18 8 teeth	
Turning radius	4.82 mm		4.93 mm
Max. turning angle :			
- inner wheel	44° 20'		43° 30'
- outer wheel	35°		34°

INTERCHANGEABILITY - 1st model racks and pinions are not interchangeable separately.
3rd model housings may be used to replace 1st and 2nd model housings.

* These parts are no longer supplied by Spare Parts Department.

STEERING GEAR

STEERING COLUMN

Earlier installation

Up to serial numbers :

404 - 4.262.348
 404 SL - 4.262.020
 404 J - 4.525.037

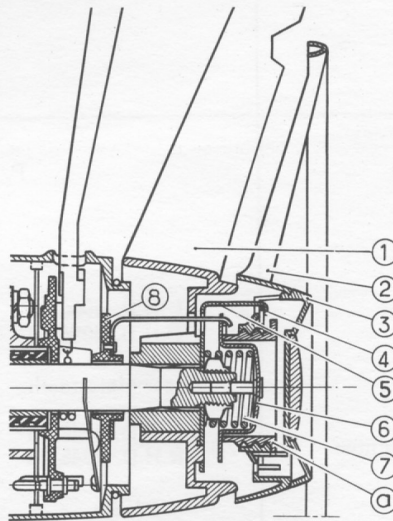
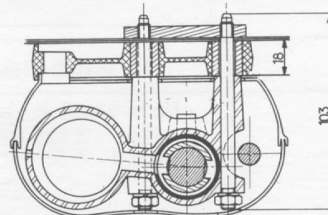
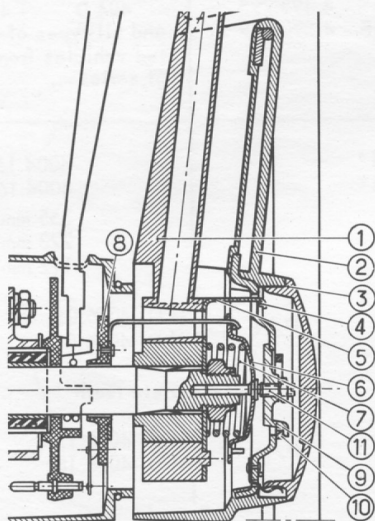
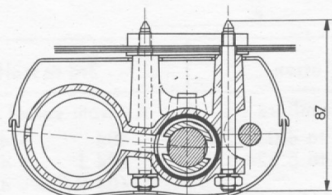
No spacer is installed between steering column and fascia board.

Later installation

As from serial numbers :

404 - 4.262.349
 404 SL - 4.262.021 & all types of associated vehicles
 404 J - 4.525.038
 404 KF - 4.550.052

A 18-mm spacer is installed between steering column and fascia board, thus requiring replacement of the change speed control rod.



Description	P/N	Description	P/N
1 - Wheel, steering	4108.36/37	1 - Wheel, steering	4108.39/40
2 - Ring, horn control	4112.30/31	2 - Ring, horn control, with Rilsan adjusting bushing a	4112.33
3 - Badge-cap	4111.07	3 - Badge-cap	4111.09
4 - Snap-ring, horn control ring locking	4113.02	4 - Snap-ring, horn control ring locking	4113.05
5 - Plate, fastening	4113.01	5 - Plate, fastening	4113.04
6 - Cup, with guide	6261.03	6 - Cup, with guide	6261.04
7 - Spring, return	6262.02	7 - Spring, return	6262.04
8 - Plate, push, with stirrup	6255.06	8 - Plate, push, with stirrup	6255.07
9 - Holder, adjusting screw	6263.07		
10 - Ring, adjusting screw	6264.02		
11 - Screw, adjusting, horn control	6265.03		

Change speed jackshaft control rod :	Change speed jackshaft control rod :
L = 100 mm	L = 105 mm
P/N 2444.16	P/N 2444.17