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AUTOMATIC SETTING AND RESETTING TORQUE WRENCHES

CHECKING ACCURACY AND ADJUSTING TORQUE WRENCHES

Automatic setting and resetting torque wrenches

CHECKING ACCURACY AND ADJUSTING WRENCHES

R.304DA
Series 305DA, 305C, 305R
Series 309DA, 303U
Series 205, 206
Series 208, 208D
Serie 248D
Serie 306D, 306R, 306U

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CONTENTS

CHAPTER 1: REVIEW OF ISO 6789

CHECKING ACCURACY

1) ADJUSTABLE TORQUE SETTING TORQUE TOOLS WITH TYPE II GRADUATED SCALE, CLASS A

The acceptable deviation between the torque value indicated on the wrench's scale and the torque value indicated by the test test device is ± 4% of the indication on the test device for the maximal value of the torque > 10 N.m and of ± 6 % for the value of the torque = 10 N.m.

2) CONTROL EQUIPMENT

The control equipment must have a maximum tolerance limit of ± 1% of the measured value. The uncertainties must be calculated according to the « Guide for the expression of the uncertainty of measure « (GUN), with a factor of release k=2.
The control equipment must be set to zero before the start of the test.

3) MEASUREMENT TEMPERATURE

Measurements must be taken after the torque tool being tested and the test device have stabilized at an ambient temperature of between 18°C and 28°C, ± 1°C .

4) TEST PROCEDURE

4.1) Before starting the tests, for type II torque setting torque tools, ensure that five operations without measurements have been carried out in the direction of operation, at the maximum torque capacity or the rated torque capacity and that the load is applied in accordance with figures 1 and 2.

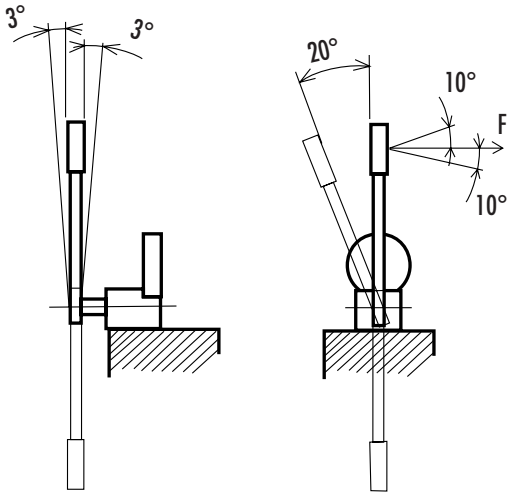


Figure 1- Wrench vertical

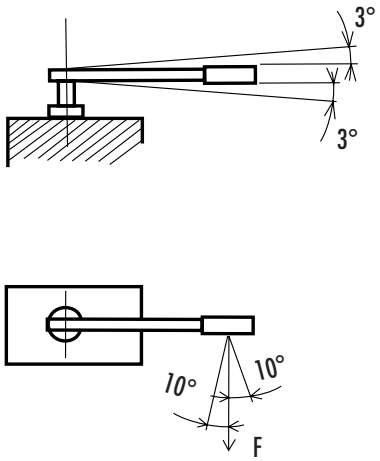


Figure 2 - Wrench horizontal

4.2) The torque tool must be subjected to an increasing load on the test device until the torque setting has been reached. From 80% of this setting onwards, the load must be applied slowly and without sudden movements for 0,5 to 4 seconds.

5) MEASUREMENT PROCEDURE

After the five preload settings (section 4.1) the tolerance limits defined in section 1 must be checked at 20%, then at 60% and at 100% of the maximum torque value of the tool concerned, in ascending torque setting values.
If the 20% graduation of the maximum torque value is not marked on the torque tool, the tolerance at the closest graduation below the 20% setting must be checked.
The number of measurements in each direction of operation must be as follows: 5 successive measurements at 20%
5 successive measurements at 60%
5 successive measurements at 100%

If all readings remain within the tolerance limits defined in section 1, the tool's accuracy is compliant.

CHAPTER 2
Automatic setting and resetting torque wrenches

R.304DA
Series 305DA, 305C, 305R
Series 309DA, 303U

CHAPTER 2: R.304DA TORQUE WRENCHES, series "305DA-305C-305R-309DA-303U"

1) Tools and accessories

Serie " 305DA "

	Nm mini		maxi	Nm	mm			
R.304DA	1	➡	5	0,05	9 x 12	R.372	1/4"	R.373
R.305DA	5	➡	25	0,1	9 x 12	R.372	1/4"	R.373
J.305DA	10	➡	50	1	9 x 12	J.372	3/8"	J.373
S.305DA	20	➡	100	1	9 x 12	S.372	1/2"	S.373
S.315DA	40	➡	200	1	14 x 18	S.382	1/2"	S.383
S.325DA	70	➡	350	2	14 x 18	S.382	1/2"	S.383
K.315D	120	➡	600	2	14 x 18	K.382	3/4"	K.383
K.325D	200	➡	1000	4	Ø 30	K.151A	3/4"	K.200E

Serie " 305C "

	Nm mini		maxi	Nm	mm			
R.305C	5	➡	25	0,1	Ø 11,8	R.372C	1/4"	R.373C
J.305C	10	➡	50	1	Ø 11,8	J.372C	3/8"	J.373C
S.305C	20	➡	100	1	Ø 19,2	S.372C	1/2"	S.373C
S.315C	40	➡	200	1	Ø 19,2	S.372C	1/2"	S.373C
S.325C	70	➡	350	2	Ø 19,2	S.372C	1/2"	S.373C

Serie " 305R "

	Nm mini		maxi	Nm	mm			
S.305R	20	➡	100	1	20 x 7	S.152	1/2"	S.203E
S.315R	40	➡	200	1	20 x 7	S.152	1/2"	S.203E
S.325R	70	➡	350	2	20 x 7	S.152	1/2"	S.203E

Serie " 309DA "

	lbs.in mini		lbs.ft maxi		mm			
R.309DA	50	➡	250 lbs.in	1 lbs.in	9 x 12	R.372	1/4"	R.373
J.309DA	120	➡	600 lbs.in	10 lbs.in	9 x 12	J.372	3/8"	J.373
S.309DA	20	➡	100 lbs.ft	1 lbs.ft	9 x 12	S.372	1/2"	S.373
S.319DA	35	➡	175 lbs.ft	1 lbs.ft	14 x 18	S.382	1/2"	S.383
S.329DA	50	➡	250 lbs.ft	1 lbs.ft	14 x 18	S.382	1/2"	S.383

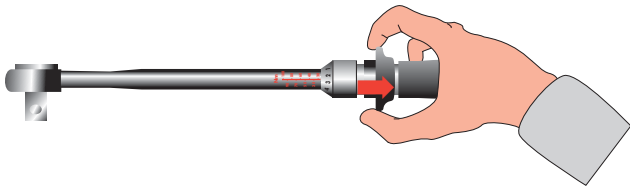
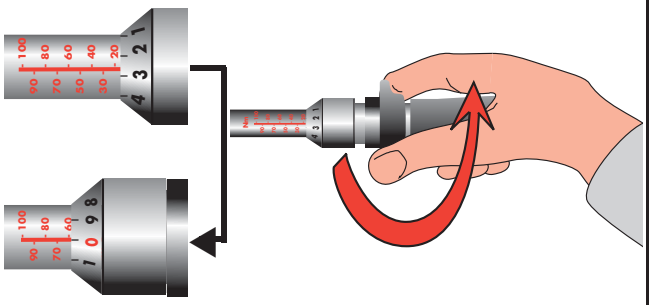
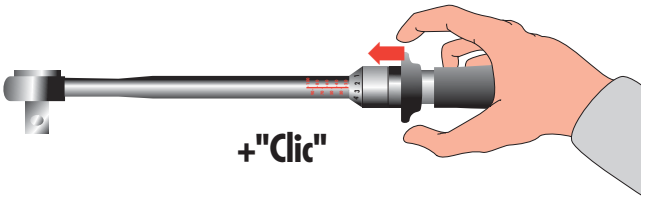
Serie " 303U "

	lbs.in mini		lbs.ft maxi		
R.303U	40	➡	200 lbs.in	1 lbs.in	1/4"
J.303U	200	➡	1000 lbs.in	5 lbs.in	3/8"
S.313U	40	➡	200 lbs.ft	1 lbs.ft	1/2"

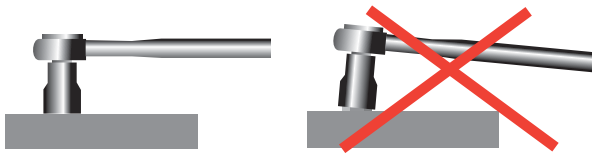
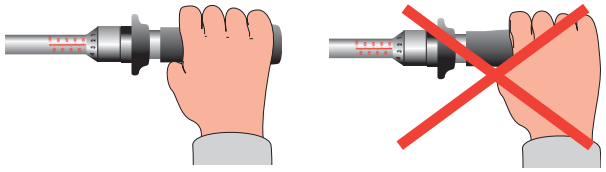
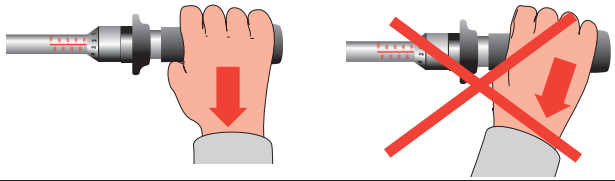
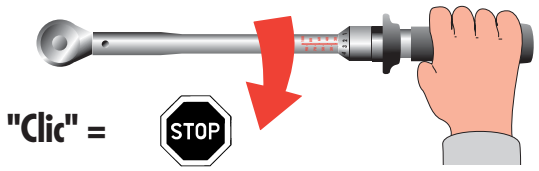
CHAPTER 2: R.304DA TORQUE WRENCHES, series "305DA-305C-305R-309DA-303U"

2) Préliminary actions

- Check that the product is complete and that there is no apparent damage.
- Check operation of the setting system.

	Pull the ring towards the handle.
	Turn the handle and stop the vernier at the desired graduation.
	Release the ring which should click into place.

- Check the setting and resetting mechanism of the wrench.

	Place your wrench at right angles to the tightening axis.
	Hold the wrench in the middle of the handle.
	Pull gradually and at right angles to the wrench.
	When the wrench "CLICKS", immediately stop applying force. The wrench resets automatically.

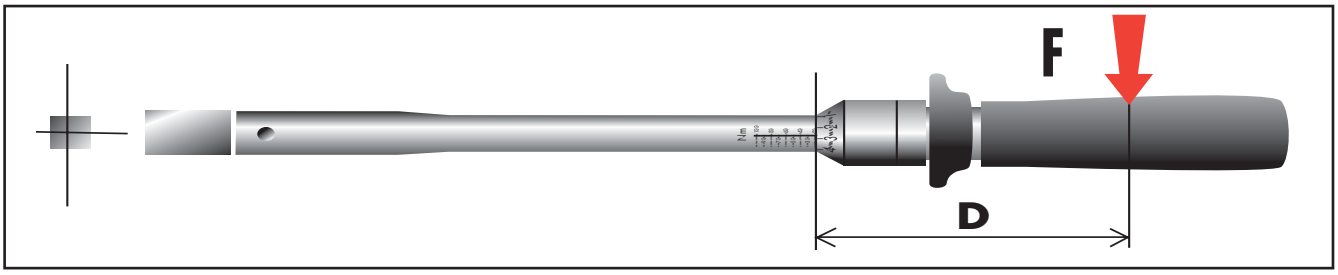
If the wrench is damaged, the setting system is stuck or the wrench no longer sets torque, it must be returned to FACOM After Sales Service for repair.

3) Checking accuracy

3.1) Setup:

The accuracy of the wrench will be measured using the accessory described in chapter 2. The force at 20%, 60% and 100% of the torque capacity will be applied at a distance from the vernier shown below for each reference number.

The R.304DA wrench has a notch on its handle indicating where the force is to be applied.



WRENCH REFERENCE NUMBERS					D mm
R.305DA	R.309DA	R.305C		R.303U	85
J.305DA S.305DA S.315DA S.325DA	J.309DA S.309DA S.319DA S.329DA	J.305C S.305C S.315C S.325C	S.305R S.315R S.325R	J.303U S.313U	97
K.315DA K.325D					160

3.2) Adjusting the wrenches

- The wrench must be tested by following the procedure described in chapter 1 on a test bench.

One to five preload operations at 100% of the rated torque capacity without measurement.
Two to five measurements at 20% of the rated torque capacity.
Three to five measurements at 60% of the rated torque capacity.
Four to five measurements at 100% of the rated torque capacity.

- If the tolerance limits of the wrench match those indicated in the table below (that is, ± 4% of the value set at 20%, 60% and 100% of the rated torque capacity), the wrench is declared SATISFACTORY, and the test report can be produced.

CHAPTER 2: R.304DA TORQUE WRENCHES, series "305DA-305C-305R-309DA-303U"

REFERENCE	% OF TORQUE	Nominal wrench setting N.m	The wrench is declared "satisfactory" between these values		
R.304DA	20% 60% 100%	1 3 5	0,96 2,88 4,80	to to to	1,04 3,12 5,20
R.305DA R.305C	20% 60% 100%	5 15 25	4,80 14,4 24	to to to	5,20 15,6 26
J.305DA J.305C	20% 60% 100%	10 30 50	9,60 28,8 48	to to to	10,4 31,2 52
S.305DA S.305C S.305R	20% 60% 100%	20 60 100	19,2 57,6 96	to to to	20,8 62,4 104
S.315DA S.315C S.315R	20% 60% 100%	40 120 200	38,4 115,2 192	to to to	41,6 124,8 208
S.325DA S.325C S.325R	20% 60% 100%	70 210 350	67,2 201,6 336	to to to	72,8 218,4 364
K.315DA	20% 60% 100%	120 360 600	115,2 345,6 576	to to to	124,8 374,4 624
K.325D	20% 60% 100%	200 600 1000	192 576 960	to to to	208 624 1040

CHAPTER 2: R.304DA TORQUE WRENCHES, series "305DA-305C-305R-309DA-303U"

REFERENCE	% OF TORQUE CAPACITY	Nominal wrench setting lbs.in	The wrench is declared "satisfactory" between these values		
R.309DA	20% 60% 100%	50 150 250	48 144 240	to to to	52 156 260
J.309DA	20% 60% 100%	120 360 600	115,2 345,6 576	to to to	124,8 374,4 624
R.303U	20% 60% 100%	40 120 200	38,4 115,2 192	to to to	41,6 124,8 208
J.303U	20% 60% 100%	200 600 1000	192 576 960	to to to	208 624 1040

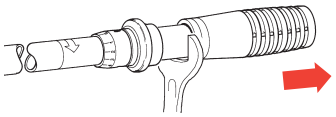
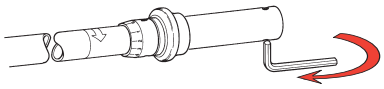
REFERENCE	% OF TORQUE CAPACITY	Nominal wrench setting lbs.in	The wrench is declared "satisfactory" between these values		
S.309DA	20% 60% 100%	20 60 100	19,2 57,6 96	to to to	20,8 62,4 104
S.319DA	20% 60% 100%	35 105 175	33,6 100,8 168	to to to	36,4 109,2 182
S.329DA	20% 60% 100%	50 150 250	48 144 240	to to to	52 156 260
S.313U	20% 60% 100%	40 120 200	38,4 115,2 192	to to to	41,6 124,8 208

4) ADJUSTING THE WRENCHES

Wrenches for which measurements fall outside the tolerance limits indicated in the tables above in section 3.2 must be adjusted to return them to within the ± 4% tolerance limits.

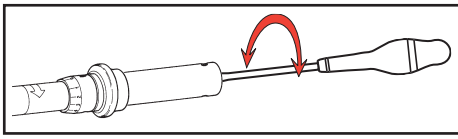
ADJUSTMENT PROCEDURE

1) Set the wrench's vernier to 20% of the rated torque capacity.

2) 	Remove the handle.
3) 	Use a 2 mm hex key to loosen the set screw.

4) Adjust the 20% of rated torque capacity setting.

a) Using a slotted screwdriver.



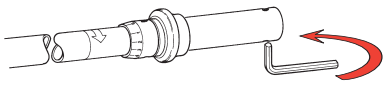
< or = - 4%	> or= + 4%
Screw in to increase the torque	Unscrew to decrease the torque

b) Adjust the 20% setting so that it is as close as possible to the rated value.
Carry out five torque-setting operations before taking measurements.

5) Set the wrench's vernier to 100% of the rated torque capacity and carry out ten torque-setting operations without taking measurements.
6) Take five measurements at 100% of the rated torque capacity.
7) Set the wrench's vernier to 20% of the rated torque capacity and take five measurements.

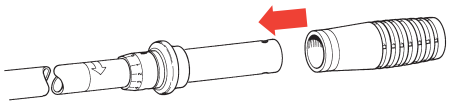
8)

Readings at 20%	Readings at 100%	Actions
Compliant with tables §3.2	Compliant with tables §3.2	Continue the procedure; go to step 9.
Compliant with tables §3.2	Out of tolerance > or = + 4%	Repeat the procedure from step 4 by reducing the adjusted value at the 20% setting. ⚠ Do not reduce the value beyond a -3% deviation relative to the set value.
	Out of tolerance < or = - 4%	Repeat the procedure from step 4 by increasing the adjusted value at the 20% setting. ⚠ Do not increase the value beyond a +3% deviation relative to the set value.
Out of tolerance	Out of tolerance	Repeat the procedure from step 4. If the wrench is still out of tolerance, it cannot be adjusted and must be returned to FACOM After Sales Service for repair.

9) 	Use a 2 mm hex key to tighten the set screw.

10) Produce a test report for the wrench on the test bench. The procedure for this is described in chapter 2 section 3 (Checking accuracy).
- 5 preload operations at 100% of the rated torque capacity without taking measurements.
- 5 measurements at 20% of the rated torque capacity.
- 5 measurements at 60% of the rated torque capacity.
- 5 measurements at 100% of the rated torque capacity.

11) Refit the wrench's handle.

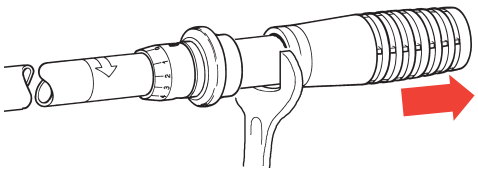


5) Recalibrating R.304DA, series"305", "309", ‘‘303’’ torque wrenches

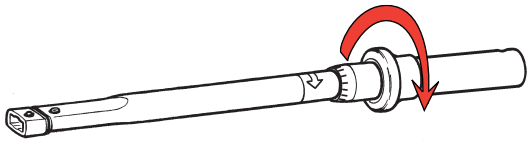
The wrench has been inspected and adjusted according to the procedure detailed in the manual entitled "Checking accuracy and adjusting wrenches" but it is still outside the tolerance limits at 100% of its torque capacity. You must partially dismantle the wrench to change the rocker.

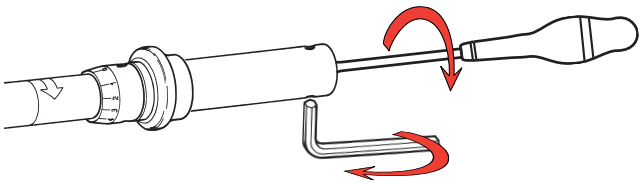
PROCEDURE TO CHANGE THE ROCKER OF R.304DA, AND SÉRIES "305","309", 303’’ TORQUE WRENCHES.

1- Set the wrench to its minimum setting (at the limit stop)

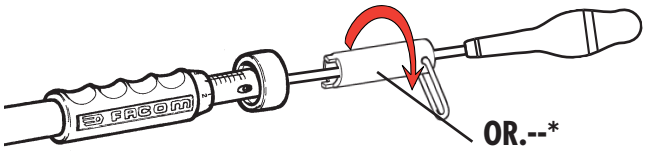


Remove the hadle.





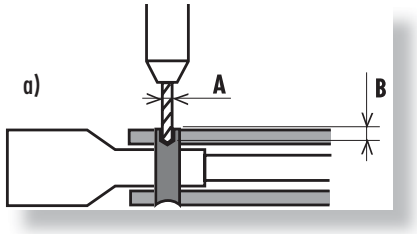
- Loosen the set screw using a hex key.
- Unscrew the 20% setting screw by 3 to 4 turns.

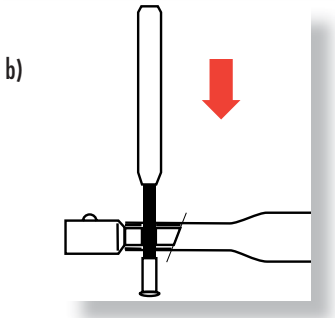


- Loosen the nut while holding the screw with a screwdriver.
- Unscrew the 20% setting screw by 3 to 4 turns.

* OR.S206-01 for J,S.206 wrenches.
OR.R206-01 for R.206 wrenches.

2- Remove the crimped pin



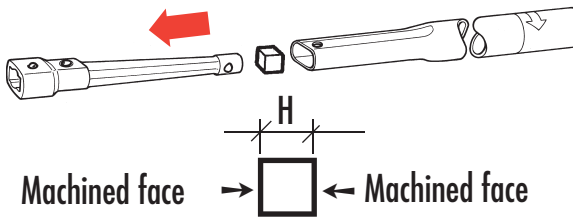


a) Align the wrench’s crimped pin centrally on the drill and drill the pin.

WRENCHES	A	B
R.304DA, R.305DA, R.305C, R.309DA, R.303U	Ø 3,8	3
J,S"305", J,S’’309DA’’, J,S’’303U’’	Ø 5,8	4
K.315DA, K.325D	Ø 7,8	5

b) Remove the crimped pin using a drift punch.

3- Remove the arm and the rocker

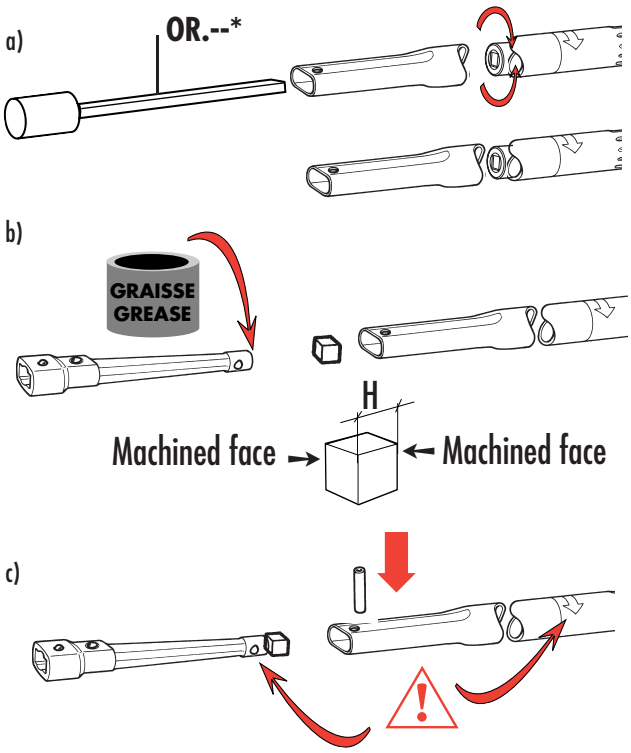


Measure the H dimension of the rocker.
This measurement will be used to choose the new rocker.

4- Choose the new rocker

- If the wrench at 100% of its torque capacity is > +4%: from the repair kit, select the rocker whose H dimension is the next size up.
- If the wrench at 100% of the capacity is < -4%: from the repair kit, select the rocker whose H dimension is the next size down.

5- Refit the arm and the rocker



a) Check the orientation of the thruster inside the tube.
Use tool OR. --*

WRENCHES	Tool *
R."305"	OR.R305-01
J,S"305"	OR.S305-01
K."305"	OR.K315-01

b) Apply MOLYKOTE Multilub grease
on the end of the arm to hold the rocker.

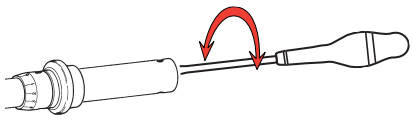
c) Fit the arm + rocker assembly into place and insert a new pin from the repair kit.

⚠ Pay attention to the orientation.

d) Check the torque-setting operation of the wrench.

6- Presetting the wrenches

1- Set the wrench's vernier to 20% of its rated torque capacity.
2- Using a slotted screwdriver, adjust the 20% of rated torque capacity setting so that it is as close as possible to the rated value.
Carry out five torque-setting operations before taking measurements.

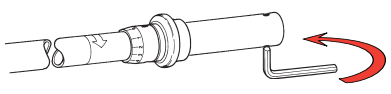
< or = - 3%	> or = +3%		
Screw in to increase the torque	Unscrew to reduce the torque		

3- Set the wrench's vernier to 100% of the rated torque capacity and carry out ten torque-setting operations without taking measurements.
4- Take five measurements at 100% of the rated torque capacity.
5- Set the wrench's vernier to 20% of the rated torque capacity and take five measurements.

6 -

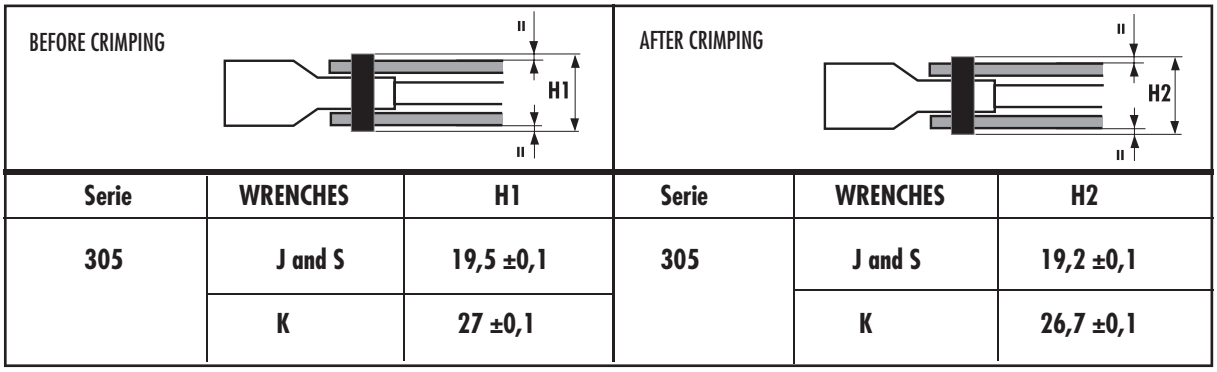
Readings at 20%	Readings at 100%	Actions
Within ± 3% tolerance	Within ± 3% tolerance	Continue the procedure.
Within ± 3% tolerance	Out of tolerance > +3%	Repeat the procedure from step 2, section 6-1, reducing the value adjusted at the 20% setting. ⚠ Do not reduce the value beyond a -3% deviation relative to the set value.
	Out of tolerance < - 3%	Repeat the procedure from step 2, section 6-1, increasing the value adjusted at the 20% setting. ⚠ Do not increase the value beyond a +3% deviation relative to the set value.
Out of tolerance	Out of tolerance	Repeat the procedure from step 2, section 6-1. If the wrench is still outside the tolerance limits, restart the procedure at step 3 and change the rocker.

7-

Use hex key to tighten the set screw.		

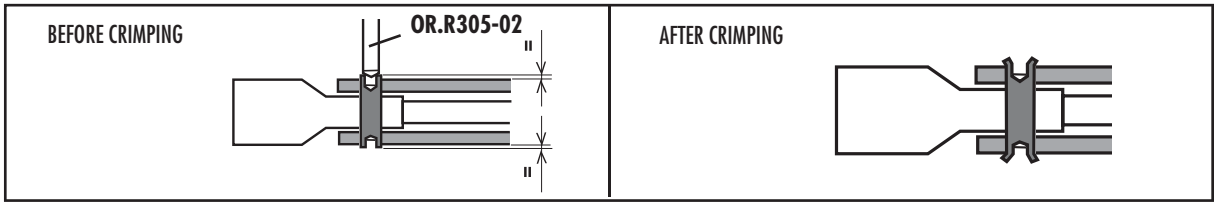
7- Crimping the pin

7-1 Series "305" wrenches J,S,K



Serie	WRENCHES	H1	Serie	WRENCHES	H2
305	J and S	19,5 ±0,1	305	J and S	19,2 ±0,1
	K	27 ±0,1		K	26,7 ±0,1

7-2 For R series ‘‘304DA "305" wrenches



8- Producing the test report

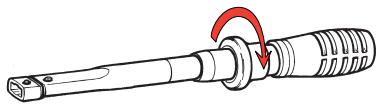
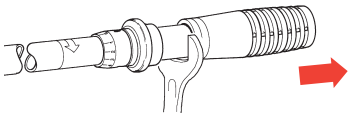
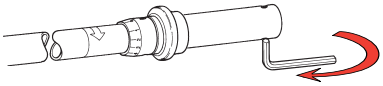
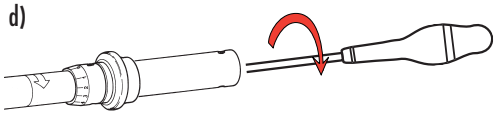
The procedure is described in the manual entitled "Checking accuracy and adjusting wrenches".

5) Recalibrating R.304DA, series"305", "309", ‘‘303’’ torque wrenches

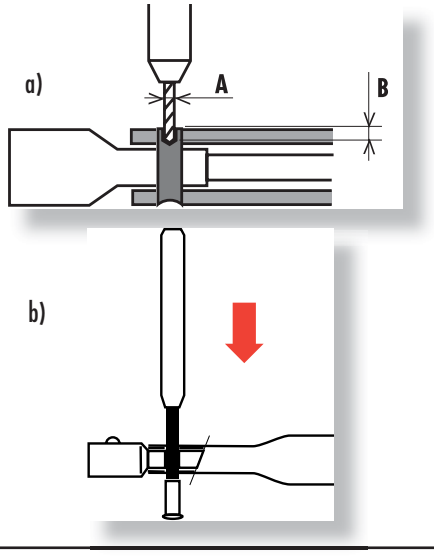
The wrench no longer sets torque; the arm is broken; the setting system is stuck or not working properly; after changing the rocker the wrench is still out of tolerance. You must completely dismantle the wrench.

1- PROCEDURE TO DISMANTLE WRENCHES

1-

a) 	Set the wrench to its minimum setting (at the limit stop).
b) 	Remove the handle.
c) 	Use a hex key to loosen the set screw.
d) 	Use a screwdriver to unscrew the 20% setting screw by 3 to 4 turns.

2- Remove the crimped pin

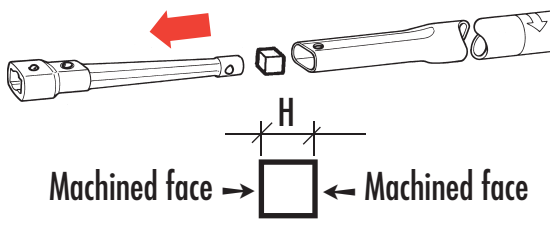


a) Align the wrench’s crimped pin centrally on the drill and drill the pin.

WRENCHES	A	B
R.304DA, R.305DA, R.305C, R.303U	Ø 3,8	3
J,S"305", J,S‘‘309’’, J,S‘‘303’’	Ø 5,8	4
K.315DA, K.325D	Ø 7,8	5

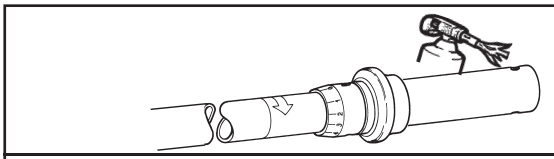
b) Remove the crimped pin using a drift punch.

3- Remove the arm and the rocker



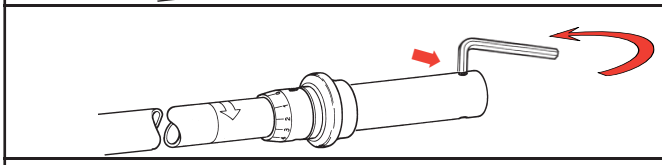
Measure the H dimension of the rocker.
This measurement will be used to choose the new rocker.

4-



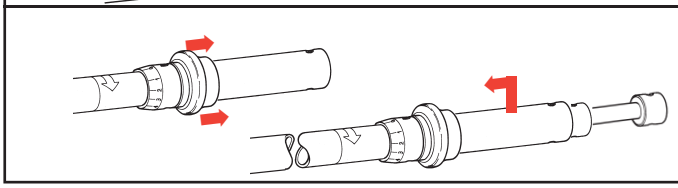
Heat the high-strength threadlocked countersunk hexagon head screw.

5-



Use hex key to undo the screw.

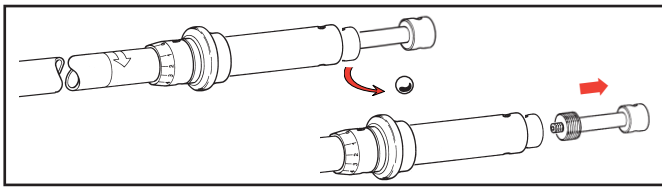
6-



Pull the unlocking ring and push the handle assembly towards the front of the wrench.

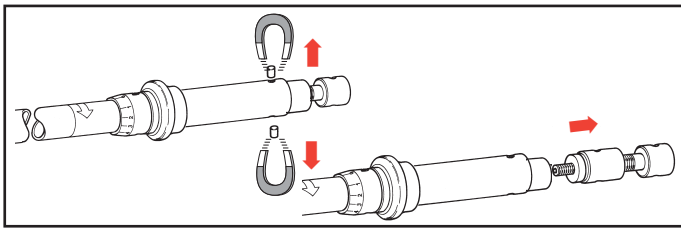
7- Dismantling setting screw subassemblies

7.1- Procedure for series "R" wrenches



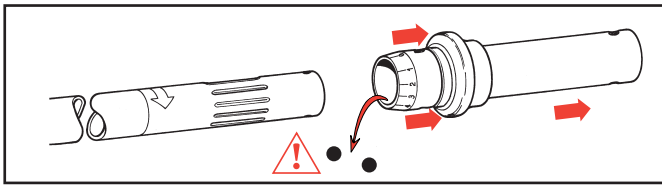
Remove the ball and unscrew the setting screw assembly.

7.2- Procedure for series "J, S, K" wrenches



Remove the locating dowels using a magnet and pull out the setting screw assembly.

8-

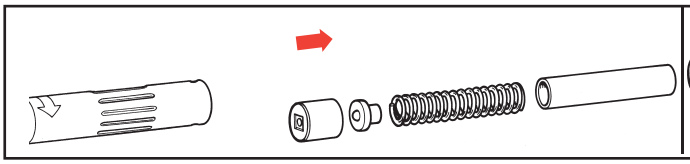


Pull the unlocking ring and remove the setting handle assembly.

⚠ WATCH OUT for the balls

9- Empty the tube

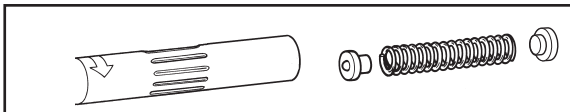
9.1- Procedure for series "J, S, K" wrenches



From the tube, pull out the disc, the spacer, the spring and its end-piece, and the thruster.

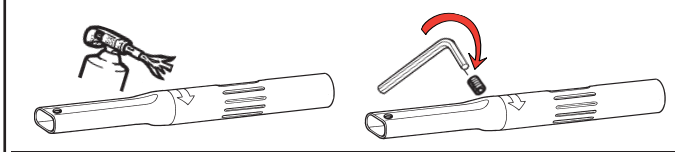
⚠ KEEP the parts for reassembly in a safe place.

9.2- Procedure for series "R" wrenches

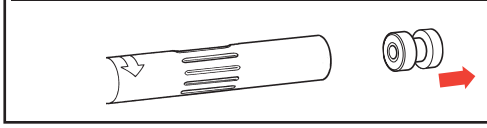


From the tube, pull out the spring and its end-pieces.

⚠ KEEP the parts for reassembly in a safe place.



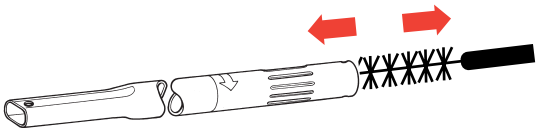
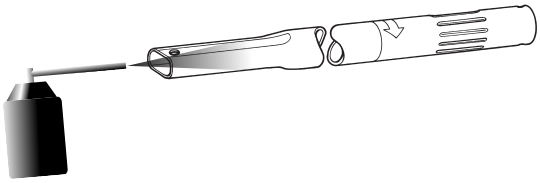
Heat the high-strength threadlocked screw and use a hex key to unscrew it.



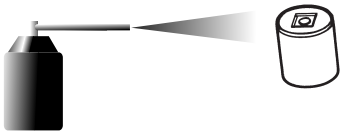
Pull out the thruster.

2- CHECKING AND PREPARING THE PARTS BEFORE ASSEMBLY

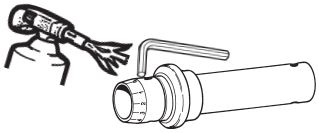
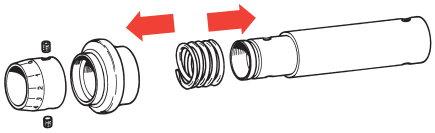
2.1- Tube

	Degrease the tube.
	When dried, spray the inside of the tube (arm end) with "TEFLISS2". Leave it to dry for at least 15 minutes.

2.2- Thruster

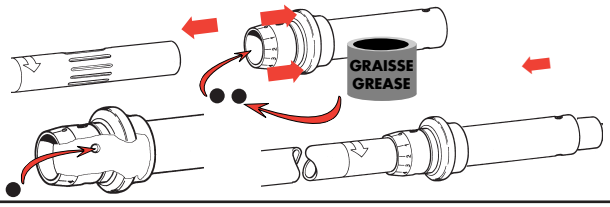
	Obtain a new thruster* and spray it with "TEFLISS2". Leave it to dry for at least 15 minutes.

2.3- Setting handle assembly, if the ring does not unlock properly

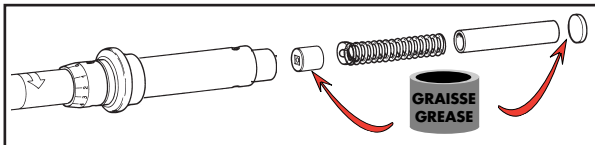
	Heat the two high-strength threadlocked screws and use a hex key to unscrew them.
	- Remove the vernier, locking ring and spring. - Reassemble using a new spring. - Do not glue the new screws*. - The screws will be glued after fitting the handle to the tube.

3- PROCEDURE TO ASSEMBLE WRENCHES

1-

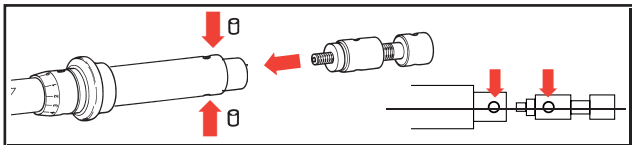
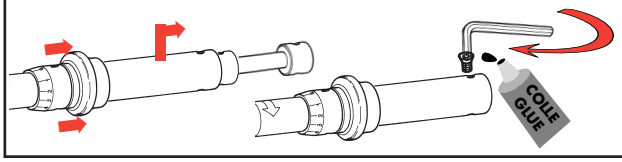
	Fit the setting handle to the tube. - Apply a drop of MOLYKOTE Multilub grease to the balls. - Place the balls in the two holes inside the handle while pulling the unlocking ring. - Slide the setting handle over the tube.

2-

	- Grease the new thruster* with MOLYKOTE Longterm and slide it into the tube. - Fit the spring assembly with its end-piece, the spacer and the disc bonded to the spacer with a little MOLYKOTE Multilub grease.

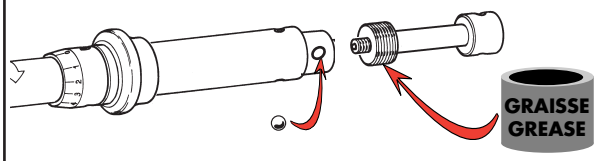
3- Fitting the setting screw subassemblies

3.1- Series "J, S" wrenches

	- Fit the setting screw, lining up its holes with those on the tube and insert the locating dowels.
	- Pull the unlocking ring and position the setting handle with its holes aligned. Apply a drop of high-strength threadlock to the new screws* and then screw them in.

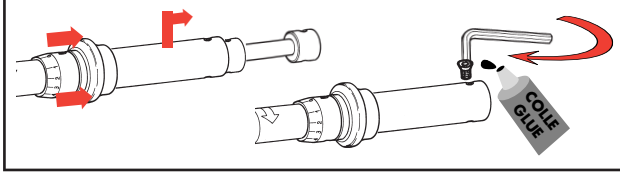
* **Individual parts:** Refer to the manual setting out the part references according to wrench type.

3.2- Series "R" wrenches



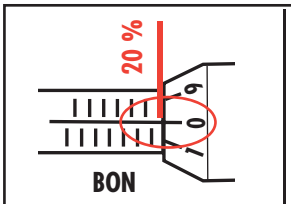
- Grease the setting screw and screw it into the tube.
(Screw it in past the hole in which the ball sits)

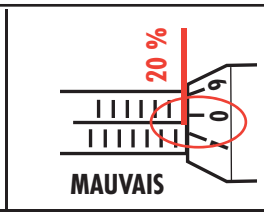
- Insert the ball.



- Pull the unlocking ring and position the setting handle with its holes aligned.
- Apply a drop of high-strength threadlock to the new screw* and then screw it in.

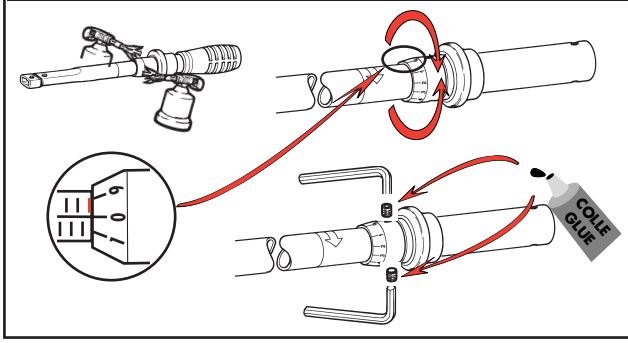
3.3





- Set the vernier to 20% of its rated torque capacity.

- Check that the vernier’s zero mark lines up with the graduation scale line on the tube.



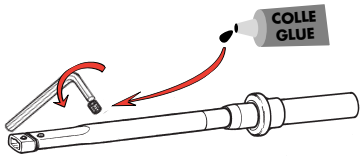
If the vernier’s zero mark is offset:
- Heat both the high-strength threadlocked screws, and use a hex key to unscrew them.
- Turn the vernier and position its zero mark in line with the vertical line of the graduation scale.
- Screw in both the new screws*, applying a drop of high-strength threadlock.

3.4- Fitting the arm and rocker

See chapter 1: Procedure to change the rocker, from step 4 (choosing the new rocker).

NOTE: - For wrenches with broken arms, or ones that no longer set torque, or if the setting handle is stuck, you must fit a new rocker that has the same height H as the old one.

- For series "R" wrenches, before crimping:



- Screw in the new screw*, applying a drop of high-strength threadlock in the tube.

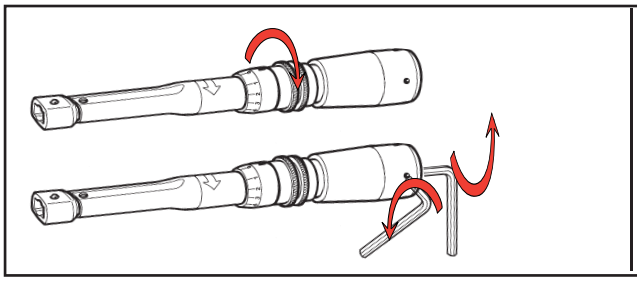
* Individual parts: Refer to the manual setting out the part references according to wrench type.

4- PROCEDURE FOR R.304DA WRENCHES

The procedure below also applies to the updated versions of R.304D wrenches (R.304DA).

4.1- Dismantling the wrenches

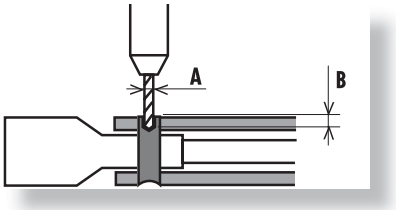
1-



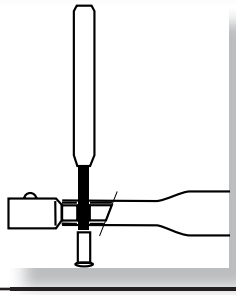
- Set the wrench to its minimum setting (at the limit stop).
- Use a hex key to loosen the set screw.
- Use a hex key to unscrew the 20% setting screw by three turns.

2- Remove the crimped pin

a)



b)

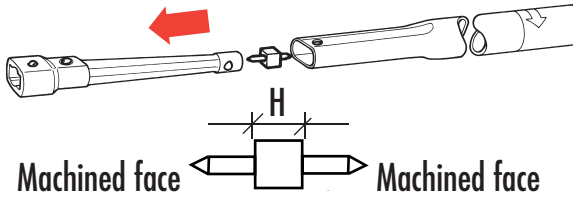


a) Align the wrench's crimped pin centrally on the drill and drill the pin.

WRENCHES	A	B
R.304DA	Ø 3,8	3

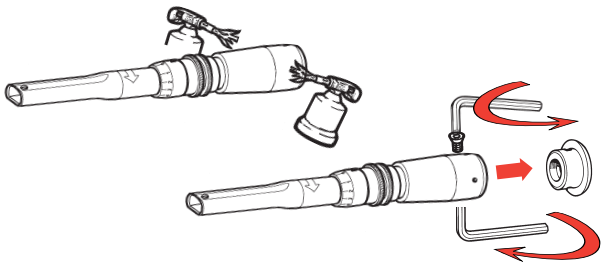
b) Remove the crimped pin using a drift punch.

3- Remove the arm and the rocker.



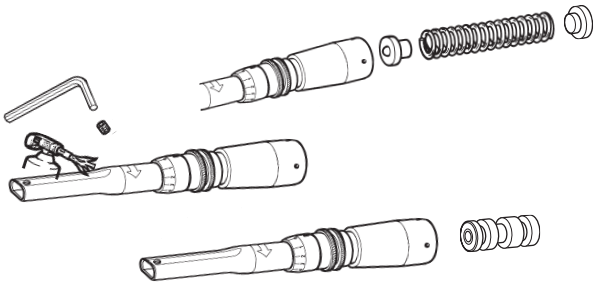
⚠ Measure the H dimension of the rocker. This measurement will be used to choose the new rocker.

4-



Heat the two high-strength threadlocked countersunk hexagon head screws.
Use a hex key to undo the screws and remove the cap.

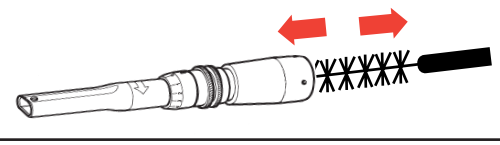
5-



- Pull out the spring with its end-pieces.
- Heat the high-strength threadlocked set screw and use a hex key to unscrew it.
- Pull out the thruster.

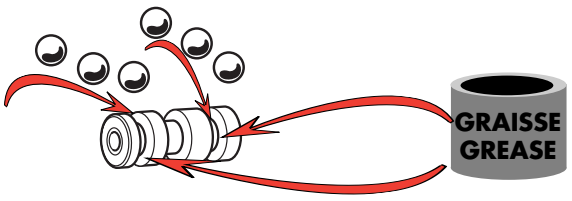
4.2- Checking and preparing the parts before assembly

1-



Degrease the tube.

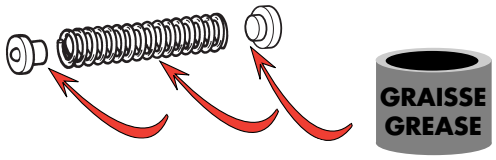
2-



Insert the 3 mm diameter balls in the new thruster's* grooves.
- Apply a some MOLYKOTE Multilub grease to the thruster's grooves.
- Insert the balls one by one into the groove.

Ten balls fit in each groove.

3-

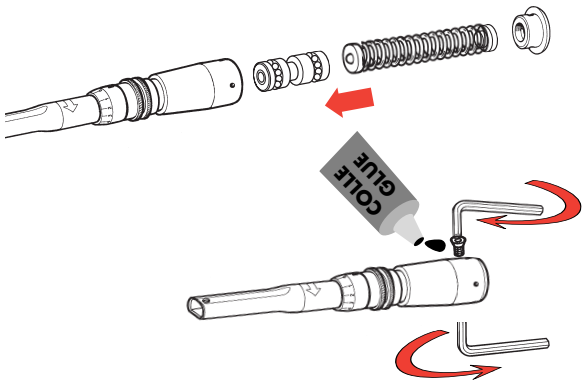


- Grease the new spring*.
- Apply some MOLYCOTE Longterm grease to the spring end-pieces and fit them to the spring.

⚠ Reuse the end-pieces from the removed spring.

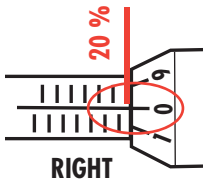
4.3- Reassembling the wrenches

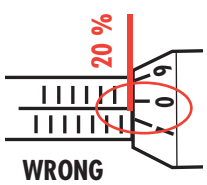
1-



- Assemble in the following order:
  - thruster
  - spring with its end pieces
  - cap
- Screw in both the new countersunk head screws*, applying a drop of high-strength threadlock.

2-





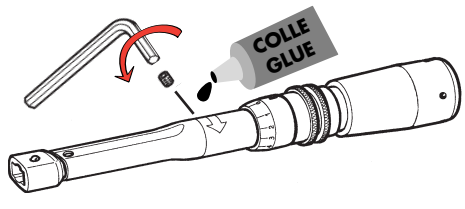
- Set the vernier to 20% of its rated torque capacity.

- Check that the vernier's zero mark lines up with the graduation scale line on the tube.

4.4 Fitting the arm and rocker

See chapter 1: Procedure to change the rocker, from step 4 (choosing the new rocker).

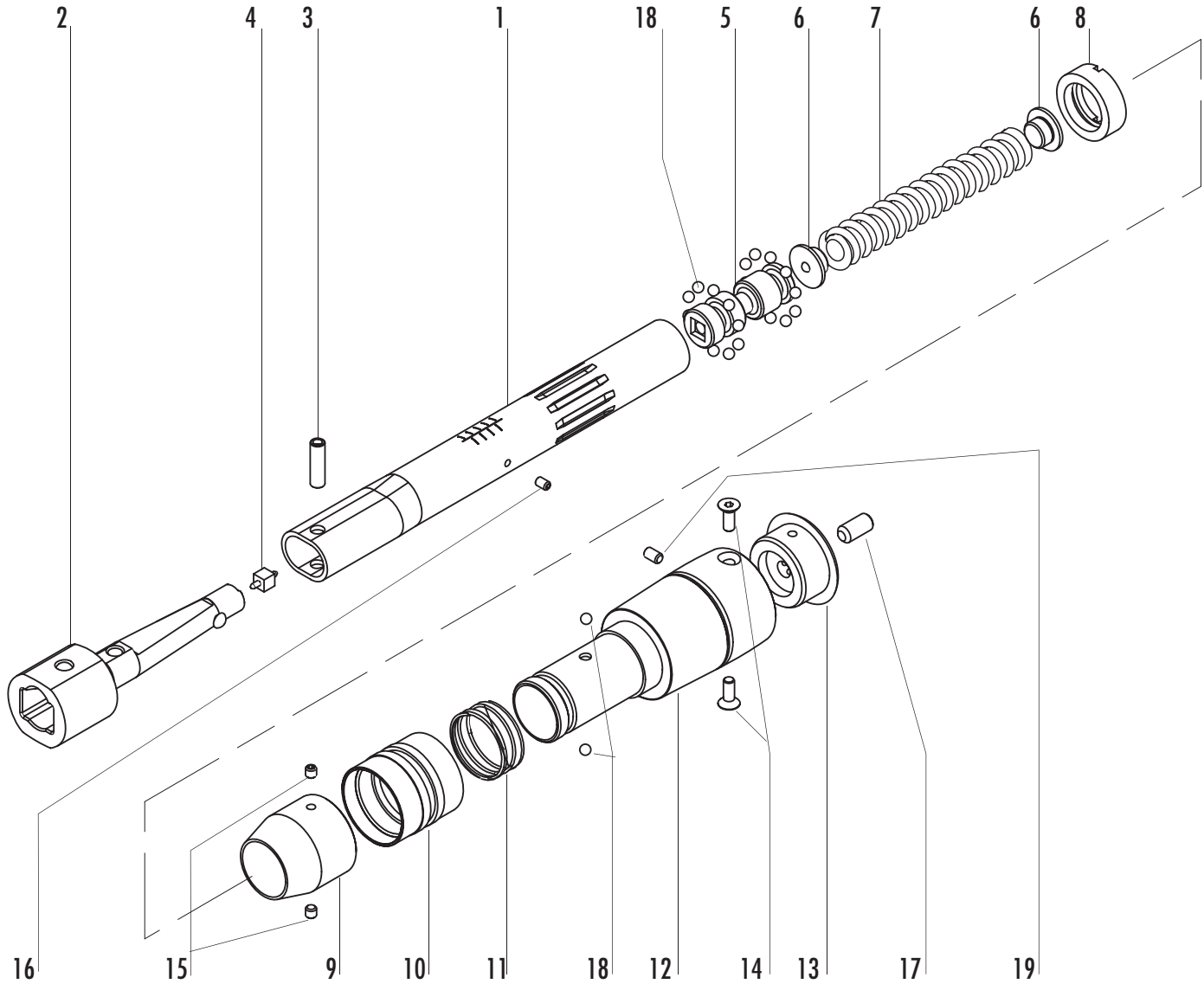
Before crimping the arm's pin:



- Screw in the new screw*, applying a drop of high-strength threadlock in the tube.

* Individual parts: Refer to the manual setting out the part references according to wrench type.

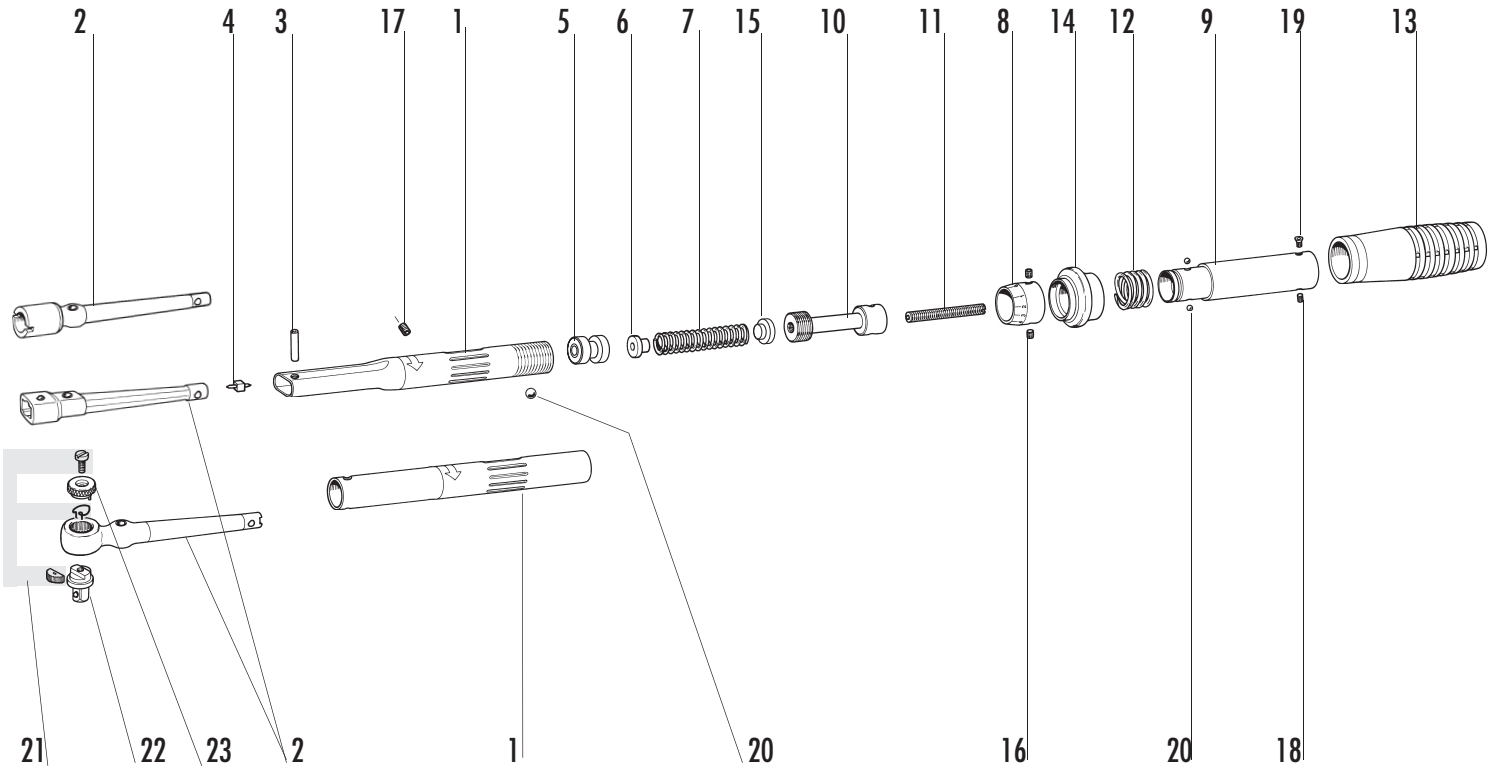
6) Spare parts R.304DA wrench



REP	DESIGNATION	R.304DA	Qty
1	Tube body	R.304D01	1
2	Arm	R.304D02	1
3	Pin	R.305D03R	1
4	Rocker	R.304D05..... #	1
5	Thruster	R.304D06	1
6	Spring end piece	R.305D20	2
7	Compression spring	R.304D07	1
8	Nut	R.304D10	1
9	Vernier	R.304D09	1
10	Locking ring	R.305D13	1
11	Handle spring	R.305D15	1
12	Handle	R.304D08	1
13	Cap	R.304D03	1
14	Screw	FHc,M3-8	2
15	Screw	STHc,M3-3-45Cu	2
16	Screw	STHc,M2,5-4-45BP	1
17	Screw	STHc,M6-12	1
18	Ball	RB3	22
19	Screw	STHc,M3-5-45Cu	1

Rep.	Reference	H mm	Ref.
4	# R.304D05.....	4,25 4,30 4,35 4,40	R.304D05-425 R.304D05-430 R.304D05-435 R.304D05-440

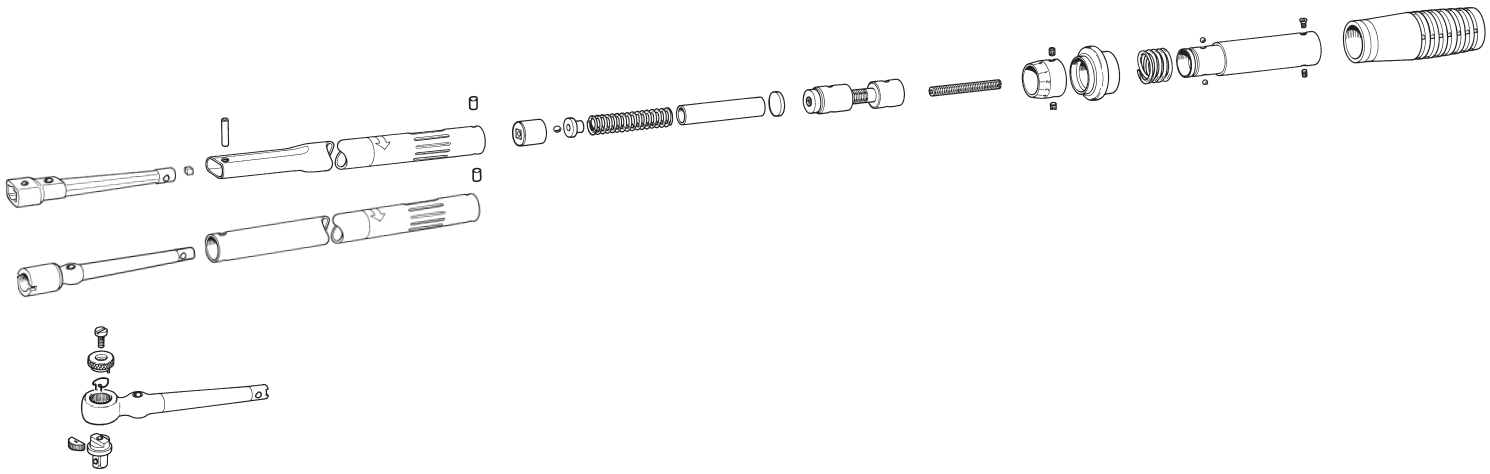
6) Spare parts R.305DA, R.305C, R.309DA, R.303U wrenches



Rep.	eference	H mm	Ref.
4	# R.305D05.....	3,95	R.305D05-395
		4,00	R.305D05-400
		4,05	R.305D05-405
		4,10	R.305D05-410
		4,15	R.305D05-415
		4,20	R.305C05-420
		4,25	R.305D05-425
		4,30	R.305D05-430
		4,35	R.305D05-435
		4,40	R.305D05-440

6) Spare parts R.305DA, R.305C, R.309DA, R.303U wrenches

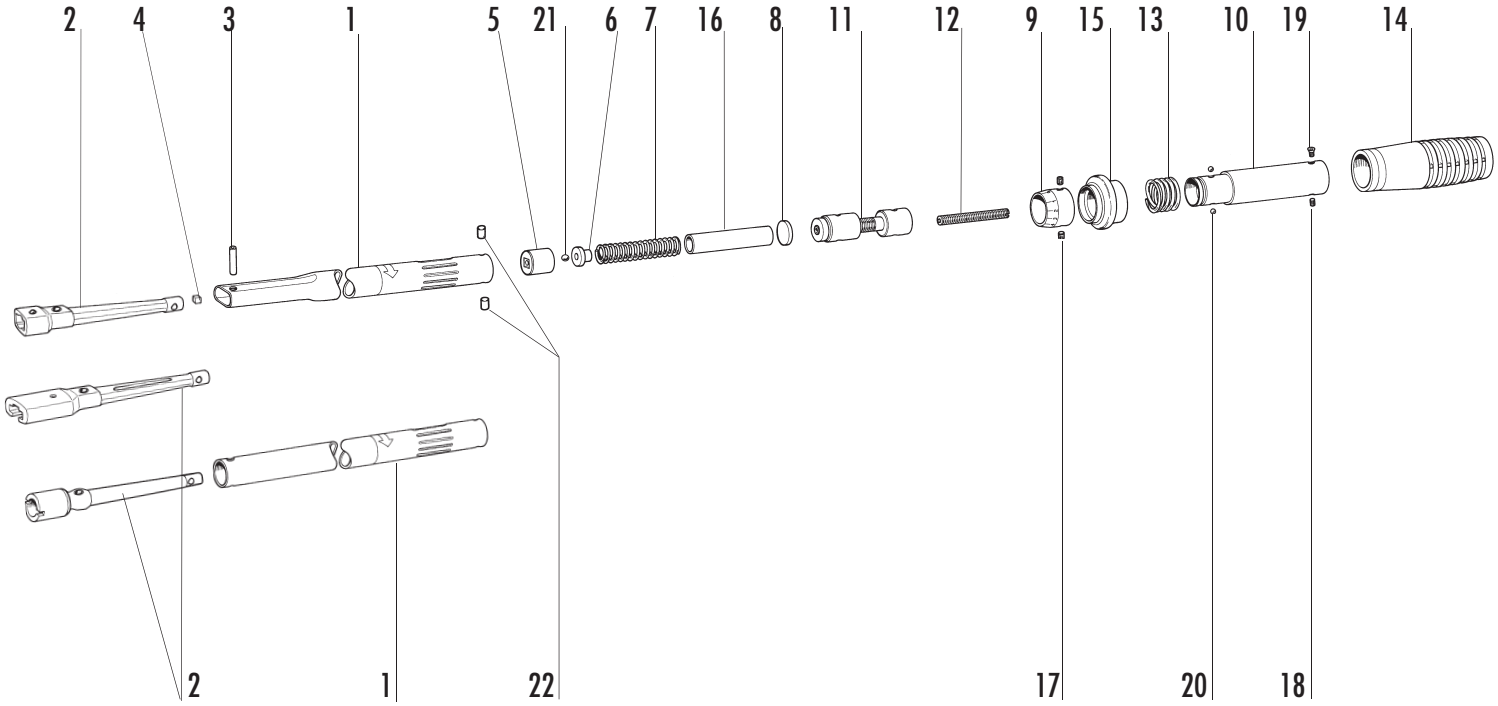
Rep	Désignation	Designation	R.305DA	R.305C	R.309DA	R.303U	
1	Tube corps	Tube body	R.305D01	R.305C01	R.309D01	R.303U01	1
2	Bras	Arm	R.305D02	R.305C02	R.305D02	R.303U02	1
3	Axe	Pin	R.305D03	R.305C03	R.305D03	R.305D03	1
4	Basculeur	Rocker	R.305D05-..... #	R.305D05-..... #	R.305D05-..... #	R.305D05-.... #	1
5	Poussoir	Thruster	R.344D06	R.305C06	R.344D06	R.344D06	1
6	Embout de ressort	Spring end piece	R.305D06	R.305D06	R.305D06	R.305D06	1
7	Ressort de pression	Compression spring	A.202B01-05	A.202B01-05	A.202B01-05	A.202B01-05	1
8	Vernier	Vernier	R.305D09	R.305D09	R.305D09	R.305D09	1
9	Poignée tube	Handle	R.305D11	R.305D11	R.305D11	R.305D11	1
10	Vis de commande	Controle screw assembly	R.305D16	R.305D16	R.303U04	R.303U04	1
11	Tige de poussée	Thrust rod	R.305D14	R.305D14	R.305D14	R.305D14	1
12	Ressort de poignée	Spring handle	R.305D15	R.305D15	R.305D15	R.305D15	1
13	Poignée	Handle	R.305D17	R.305D17	R.305D17	R.305D17	1
14	Bague de blocage	Locking ring	R.305D19A	R.305D19A	R.305D19A	R.305D19A	1
15	Embout de ressort	Spring end piece	R.305D20	R.305D20	R.305D20	R.305D20	1
16	Vis sans tête	Screw	STHc,M3-3-45Cu	STHc,M3-3-45Cu	STHc,M3-3-45Cu	STHc,M3-3-45Cu	2
17	Vis sans tête	Screw	STHc,M2,5-4-45BP	STHc,M2,5-4-45BP	STHc,M2,5-4-45BP	STHc,M2,5-4-45BP	1
18	Vis sans tête	Screw	STHc,M3-5-45Cu	STHc,M3-5-45Cu	STHc,M3-5-45Cu	STHc,M3-3-45Cu	1
19	Vis à tête fraisée	Screw	FHc,M3-6	FHc,M3-6	FHc,M3-6	FHc,M3-6	1
20	Bille	Ball	N411-7 RB3	N411-7 RB3	N411-7 RB3	N411-7 RB3	3
21	Vis + Ressort + Doigt	Screw + Spring + Retriever				R.151RN	1
22	Rotor	Rotor				R.151RSE	1
23	Chapeau cliquet	Knurl cap				R.151C2	1



6) Spare parts R.305DA, R.305C, R.309DA, R.303U wrenches

Rep	Désignation	Designation	J.305DA	J.305C	J.309DA	J.303U	
1	Tube corps	Tube body	J.305D01	J.305C01	J.309D01	J.303U01	1
2	Bras	Arm	S.305D02	J.305C02	S.305D02	J.303U02	1
3	Axe	Pin	S.313-05	S.206-100-03	S.313-05	S.313-05	1
4	Basculeur	Rocker	S.206-100-15..... #	S.206-100-15..... #	S.206-100-15..... #	S.206-100-15.. .. #	1
5	Poussoir	Thruster	S.325D4	S.325D4	S.325D4	S.325D4	1
6	Embout de ressort	Spring end piece	S.313-14	S.313-14	S.313-14	S.313-14	1
7	Ressort de pression	Compression spring	J.305D07	J.305D07	J.305D07	S.303-09	1
8	Disque	Disc	S.313-08	S.313-08	S.313-08	S.313-08	1
9	Vernier	Vernier	J.305D09	J.305D09	J.309D09	J.309D09	1
10	Poignée tube	Handle tube	S.313-15	S.313-15	S.313-15	S.313-15	1
11	Vis de commande	Controle screw assembly	S.305D16SE	S.305D16SE	S.309D16SE	S.325D16SE	1
12	Tige de poussée	Thrust rod	S.313-10	S.313-10	S.313-10	S.313-10	1
13	Ressort de poignée	Spring handle	S.313-16	S.313-16	S.313-16	S.313-16	1
14	Poignée	Handle	S.305D17	S.305D17	S.305D17	S.305D17	1
15	Bague de blocage	Locking ring	S.305D19A	S.305D19A	S.305D19A	S.313-17	1
16	Entretoise	Spacer				J.303U20	1
17	Vis sans tête	Screw	STHc,M3-3-45Cu	STHc,M3-3-45Cu	STHc,M3-3-45Cu	STHc,M3-3-45Cu	2
18	Vis sans tête	Screw	STHc,M4-6-45Cu	STHc,M4-6-45Cu	STHc,M4-6-45Cu	STHc,M4-6-45Cu	1
19	Vis à tête fraisée	Screw	FHc,M4-8	FHc,M4-8	FHc,M4-8	FHc,M4-8	1
20	Bille	Ball	N411-7 RB3	N411-7 RB3	N411-7 RB3	N411-7 RB3	2
21	Bille	Ball	N411-25 RB5,55	N411-25 RB5,55	N411-25 RB5,55	N411-25 RB5,55	1
22	Pied	Pin	RC-3-5	RC-3-5	RC-3-5	RC-3-5	2
23	Vis + Ressort + Doigt	Screw + Spring + Retriever				S.151RN	1
24	Rotor	Rotor				J.372-03	1
25	Chapeau de cliquet	Knurl cap				S.151C2	1

6) Spare parts R.305DA, R.305C, R.309DA, R.303U wrenches

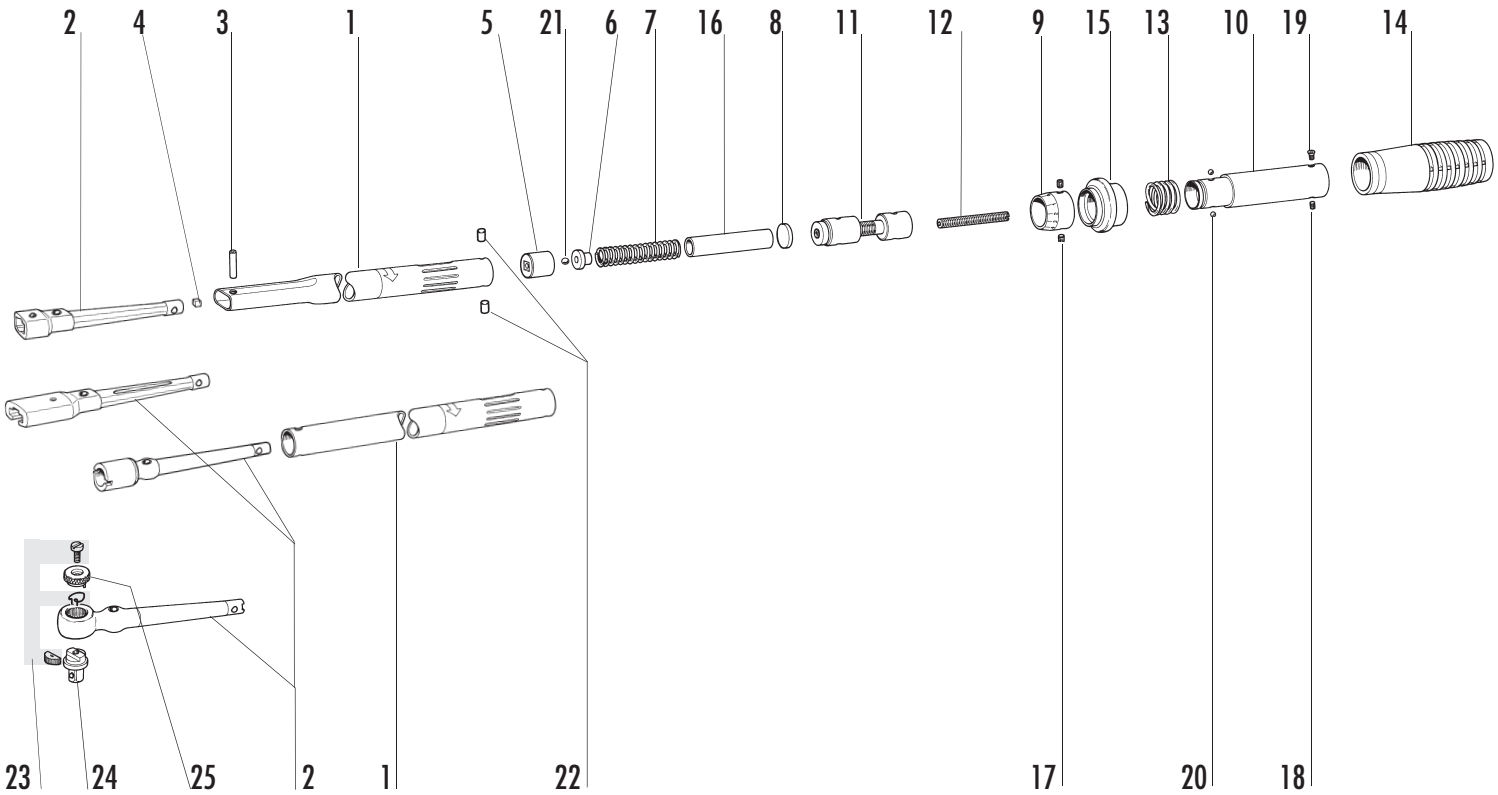


Rep.	Reference	h(mm) □ □ ⊠6 h	Ref.
4	S.206-100-..... #	5,5	S.206-100-55
		5,6	S.206-100-56
		5,7	S.206-100-57
		5,8	S.206-100-58
	S.206-100-..... #	4,2	S.206-100-42
		4,3	S.206-100-43
		4,4	S.206-100-44
		4,5	S.206-100-45
	S.206-100-..... #	6,3	S.206-100-63
		6,4	S.206-100-64
		6,5	S.206-100-65
		6,6	S.206-100-66
	S.206-100-15..... #	6,8	S.305R05-68
		6,9	S.305R05-69
		7,0	S.305R05-70
		7,1	S.305R05-71

6) Spare parts R.305DA, R.305C, R.309DA, R.303U wrenches

Rep	Désignation	Designation	S.305DA	S.305C	S.305R	S.309DA	
1	Tube corps	Tube body	S.305D01	S.305C01	S.305R01	S.309D01	1
2	Bras	Arm	S.305D02	S.305C02	S.305R02	S.305D02	1
3	Axe	Pin	S.313-05	S.206-100-03	S.313-05	S.313-05	1
4	Basculeur	Rocker	S.206-100-..... #	S.206-100-..... #	S.206-100-..... #	S.206-100-..... #	1
5	Poussoir	Thruster	S.325D4	S.325D4	S.325D4	S.325D4	1
6	Embout de ressort	Spring end piece	S.313-14	S.313-14	S.313-14	S.313-14	1
7	Ressort de pression	Compression spring	S.313-09	S.313-09	S.313-09	S.313-09	1
8	Disque	Disc	S.313-08	S.313-08	S.313-08	S.313-08	1
9	Vernier	Vernier	S.313-18	S.313-18	S.313-18	S.313-18	1
10	Poignée tube	Handle tube	S.313-15	S.313-15	S.313-15	S.313-15	1
11	Vis de commande	Controle screw assembly	S.305D16SE	S.305D16SE	S.305D16SE	S.305D16SE	1
12	Tige de poussée	Thrust rod	S.313-10	S.313-10	S.313-10	S.313-10	1
13	Ressort de poignée	Spring handle	S.313-16	S.313-16	S.313-16	S.313-16	1
14	Poignée	Handle	S.305D17	S.305D17	S.305D17	S.305D17	1
15	Bague de blocage	Locking ring	S.305D19A	S.305D19A	S.305D19A	S.305D19A	1
16	Entretoise	Spacer	S.305D20	S.305C20	S.305D20	S.305D20	1
17	Vis sans tête	Screw	STHc,M3-3-45Cu	STHc,M3-3-45Cu	STHc,M3-3-45Cu	STHc,M3-3-45Cu	2
18	Vis sans tête	Screw	STHc,M4-6-45Cu	STHc,M4-6-45Cu	STHc,M4-6-45Cu	STHc,M4-6-45Cu	1
19	Vis à tête fraisée	Screw	FHc,M4-8	FHc,M4-8	FHc,M4-8	FHc,M4-8	1
20	Bille	Ball	N411-7 RB3	N411-7 RB3	N411-7 RB3	N411-7 RB3	2
21	Bille	Ball	N411-25 RB5,55	N411-25 RB5,55	N411-25 RB5,55	N411-25 RB5,55	1
22	Pied	Pin	RC-3-5	RC-3-5	RC-3-5	RC-3-5	2

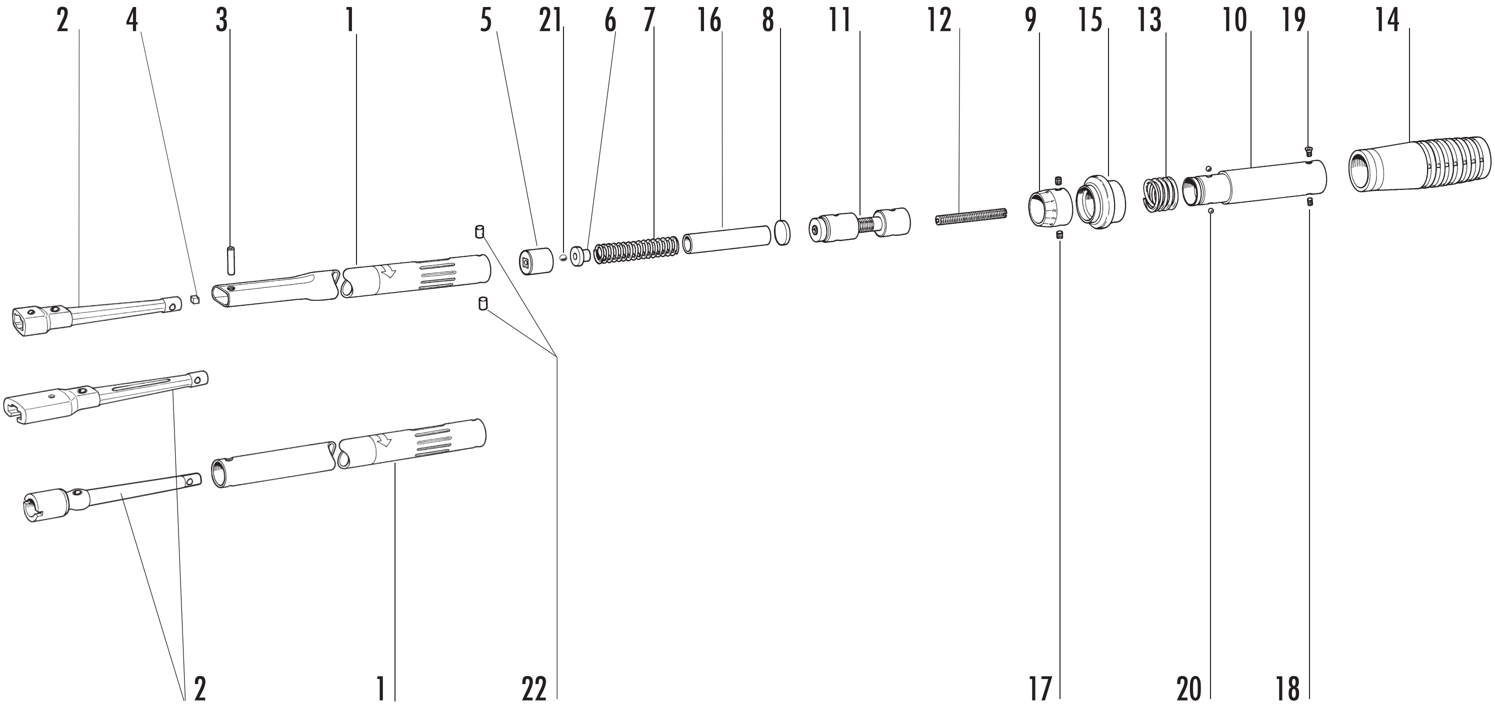
6) Spare parts R.305DA, R.305C, R.309DA, R.303U wrenches



Rep.	Reference	h(mm) □ ⍁ 6 h	Ref.
4	S.315D05..... #	6,2 6,3 6,4 6,5	S.315D05-62 S.315D05-63 S.315D05-64 S.315D05-65
	S.206-100-..... #	6,5 6,6 6,7 6,8	S.206-100-65 S.206-100-66 S.206-100-67 S.206-100-68
	S.206-100-..... #	5,9 6,0 6,1 6,2	S.206-100-59 S.206-100-60 S.206-100-61 S.206-100-62
	S.206-100-..... #	4,7 4,8 4,9 5,0	S.206-100-47 S.206-100-48 S.206-100-49 S.206-100-50
	S.206-100-..... #	4,30 4,35 4,40 4,45	S.206-100-430 S.206-100-435 S.206-100-440 S.206-100-445

6) Spare parts R.305DA, R.305C, R.309DA, R.303U wrenches

Rep	Désignation	Designation	S.315DA	S.315C	S.319DA	S.315R	S.313U	
1	Tube corps	Tube body	S.315D01	S.315C01	S.319D01	S.315R01	S.313D01	1
2	Bras	Arm	S.325D02	S.325C02	S.325D02	S.325R02	S.313U-02	1
3	Axe	Pin	S.313-05	S.206-100-03	S.313-05	S.313-05	S.313-05	1
4	Basculeur	Rocker	S.315D05-..... #	S.206-100-..... #	S.206-100-..... #	S.206-100-..... #	S.206-100-..... #	1
5	Poussoir	Thruster	S.325D4	S.325D4	S.325D4	S.325D4	S.325D4	1
6	Embout de ressort	Spring end piece	S.313-14	S.313-14	S.313-14	S.313-14	S.313-14	1
7	Ressort de pression	Compression spring	S.313-09	S.313-09	S.313-09	S.313-09	S.325-07	1
8	Disque	Disc	S.313-08	S.313-08	S.313-08	S.313-08	S.313-08	1
9	Vernier	Vernier	S.313-18	S.313-18	S.313-18	S.313-18	S.313-18	1
10	Poignée tube	Handle tube	S.313-15	S.313-15	S.313-15	S.313-15	S.313-15	1
11	Vis de commande	Controle screw assembly	S.315D16SE	S.315D16SE	S.315D16SE	S.315D16SE	S.315D16SE	1
12	Tige de poussée	Thrust rod	S.313-10	S.313-10	S.313-10	S.313-10	S.313-10	1
13	Ressort de poignée	Spring handle	S.313-16	S.313-16	S.313-16	S.313-16	S.313-16	1
14	Poignée	Handle	S.305D17	S.305D17	S.305D17	S.305D17	S.305D17	1
15	Bague de blocage	Locking ring	S.305D19A	S.305D19A	S.305D19A	S.305D19A	S.313-17	1
16	Entretoise	Spacer	S.315D20	S.315C20	S.315D20	S.315R20	S.313U-20	1
17	Vis sans tête	Screw	STHc,M3-3-45Cu	STHc,M3-3-45Cu	STHc,M3-3-45Cu	STHc,M3-3-45Cu	STHc,M3-3-45Cu	2
18	Vis sans tête	Screw	STHc,M4-6-45Cu	STHc,M4-6-45Cu	STHc,M4-6-45Cu	STHc,M4-6-45Cu	STHc,M4-6-45Cu	1
19	Vis à tête fraisée	Screw	FHc,M4-8	FHc,M4-8	FHc,M4-8	FHc,M4-8	FHc,M4-8	1
20	Bille	Ball	N411-7 RB3	N411-7 RB3	N411-7 RB3	N411-7 RB3	N411-7 RB3	2
21	Bille	Ball	N.411-25 RB5,55	N.411-25 RB5,55	N411-25 RB5,55	N.411-25 RB5,55	N.411-25 RB5,55	1
22	Pied	Pin	RC-3-5	RC-3-5	RC-3-5	RC-3-5	RC-3-5	2
23	Vis + Ressort + Doigt	Screw + Spring + Retriever					S.151RN	1
24	Rotor	Rotor					S.382-03	1
25	Chapeau cliquet	Knurl cap					S.151C2	1

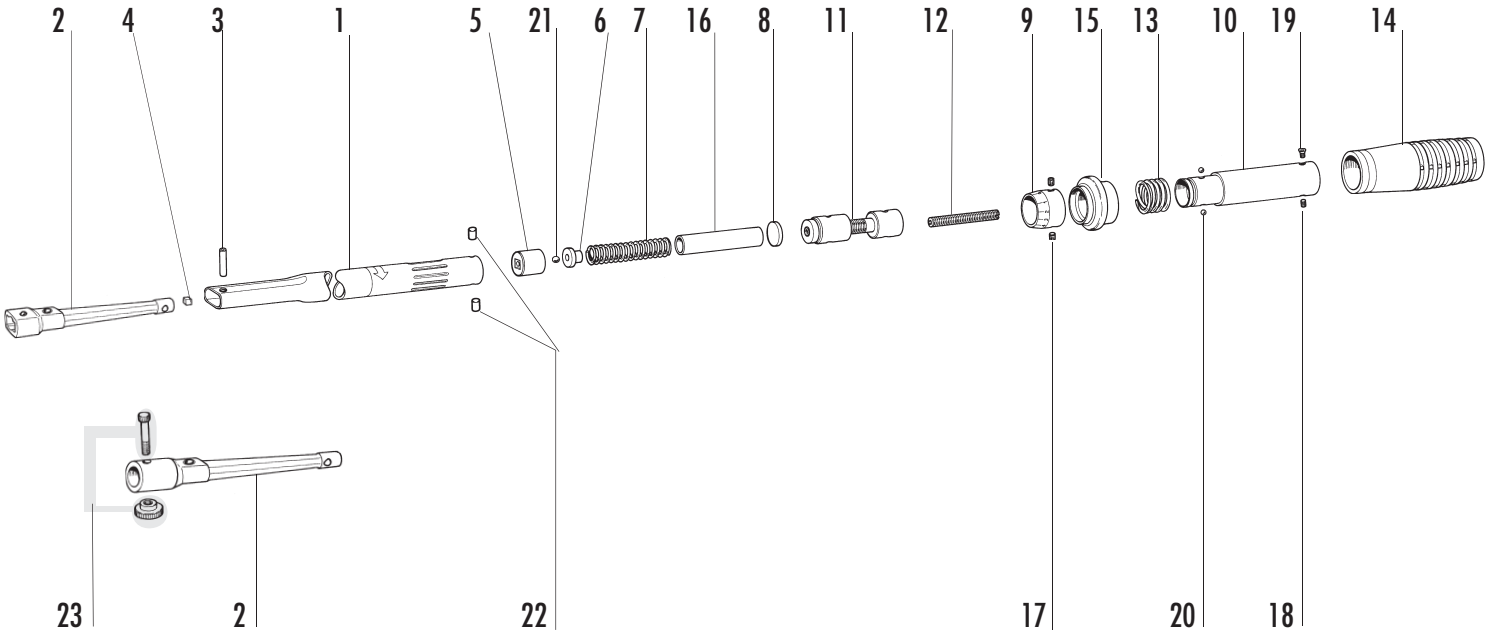


Rep.	Reference	h(mm)	⌀ 6
		h	Ref.
4	S.325D05..... #	4,3	S.325D05-43
		4,4	S.325D05-44
		4,5	S.325D05-45
		4,6	S.325D05-46
	S.206-100-..... #	5,5	S.206-100-55
		5,6	S.206-100-56
		5,7	S.206-100-57
		5,8	S.206-100-58
	S.206-100-.... #	4,8	S.206-100-48
		4,9	S.206-100-49
		5,0	S.206-100-50
		5,1	S.206-100-51
	S.206-100-..... #	4,2	S.206-100-42
		4,3	S.206-100-43
		4,4	S.206-100-44
		4,5	S.206-100-45

6) Spare parts R.305DA, R.305C, R.309DA, R.303U wrenches

Rep	Désignation	Designation	S.325DA	S.325C	S.325R	S.329DA	
1	Tube corps	Ttube body	S.325D01	S.325C01	S.325R01	S.329D01	1
2	Bras	Arm	S.325D02	S.325C02	S.325R02	S.325D02	1
3	Axe	Pin	S.323-09	S.206-100-03	S.323-09	S.323-09	1
4	Basculeur	Rocker	S.325D05-..... #	S.206-100-..... #	S.206-100-..... #	S.206-100-..... #	1
5	Poussoir	Thruster	S.325D4	S.325D4	S.325D4	S.325D4	1
6	Embout de ressort	Spring end piece	S.313-14	S.206-350-17	S.206-350-17	S.313-14	1
7	Ressort de pression	Compression spring	S.325D07	S.206-350-07	S.206-350-07	S.325D07	1
8	Disque	Disc	S.313-08	S.313-08	S.313-08	S.313-08	1
9	Vernier	Vernier	S.325D08	S.325D08	S.325D08	S.313-18	1
10	Poignée tube	Handle tube	S.313-15	S.313-15	S.313-15	S.313-15	1
11	Vis de commande	Controle screw assembly	S.325D16SE	S.325D16SE	S.325D16SE	S.329D16SE	1
12	Tige de poussée	Thrust rod	S.313-10	S.313-10	S.313-10	S.313-10	1
13	Ressort de poignée	Spring handle	S.313-16	S.313-16	S.313-16	S.313-16	1
14	Poignée	Handle	S.305D17	S.305D17	S.305D17	S.305D17	1
15	Bague de blocage	Locking ring	S.305D19A	S.305D19A	S.305D19A	S.305D19A	1
16	Entretoise	Spacer	S.325D20	S.325C20	S.325R20	S.325D20	1
17	Vis sans tête	Screw	STHc,M3-3-45Cu	STHc,M3-3-45Cu	STHc,M3-3-45Cu	STHc,M3-3-45Cu	2
18	Vis sans tête	Screw	STHc,M4-6-45Cu	STHc,M4-6-45Cu	STHc,M4-6-45Cu	STHc,M4-6-45Cu	1
19	Vis à tête fraisée	Screw	FHc,M4-8	FHc,M4-8	FHc,M4-8	FHc,M4-8	1
20	Bille	Ball	N411-7 RB3	N411-7 RB3	N411-7 RB3	N411-7 RB3	2
21	Bille	Ball	N411-25 RB5,55	N411-25 RB5,55	N411-25 RB5,55	N411-25 RB5,55	1
22	Pied	Pin	RC-3-5	RC-3-5	RC-3-5	RC-3-5	2

6) Spare parts R.305DA, R.305C, R.309DA, R.303U wrenches



Rep.	Reference	h(mm) □ ⊠ 10 h	Ref.
4	K.315D05..... #	7,7	K.315D05-77
		7,8	K.315D05-78
		7,9	K.315D05-79
		8,0	K.315D05-80
		8,1	K.315D05-81
		8,2	K.315D05-82
		8,3	K.315D05-83
		8,4	K.315D05-84
		8,5	K.315D05-85
		8,6	K.315D05-86
		8,7	K.315D05-87
		8,8	K.315D05-88
		8,9	K.315D05-89
		9,0	K.315D05-90
		9,1	K.315D05-91
		9,2	K.315D05-92
		9,3	K.315D05-93
		9,4	K.315D05-94
		9,5	K.315D05-95
		9,6	K.315D05-96
		9,7	K.315D05-97

Rep.	Reference	h(mm) □ ⊠ 10 h	Ref.
4	K.325D05..... #	7,7	K.325D05-77
		7,8	K.325D05-78
		7,9	K.325D05-79
		8,0	K.325D05-80
		8,1	K.325D05-81
		8,2	K.325D05-82
		8,3	K.325D05-83
		8,4	K.325D05-84
		8,5	K.325D05-85
		8,6	K.325D05-86
		8,7	K.325D05-87
		8,8	K.325D05-88
		8,9	K.325D05-89
		9,0	K.325D05-90
		9,1	K.325D05-91
		9,2	K.325D05-92
		9,3	K.325D05-93
		9,4	K.325D05-94
		9,5	K.325D05-95
		9,6	K.325D05-96
		9,7	K.325D05-97

Rep	Désignation	Designation	K.315DA	K.325D	
1	Tube corps	Tube body	K.315D01	K.325D01	1
2	Bras	Arm	K.315D02	K.325D02	1
3	Axe	Pin	K.315D03	K.315D03	1
4	Basculeur	Rocker	K.315D05..... #	K.325D05..... #	1
5	Poussoir	Thruster	K.315D04	K.315D04	1
6	Embout de ressort	Spring end piece	K.315D06	K.315D06	1
7	Ressort de pression	Compression spring	K.315D07	K.315D07	1
8	Disque	Disc	K.315D08	K.315D08	1
9	Vernier	Vernier	K.315D09	K.325D09	1
10	Poignée tube	Handle tube	K.315D11	K.315D11	1
11	Vis de commande	Controle screw assembly	K.315D16SE	K.325D16SE	1
12	Tige de poussée	Thrust rod	K.315D14	K.315D14	1
13	Ressort de poignée	Spring handle	K.315D15	K.315D15	1
14	Poignée	Handle	K.315D17	K.315D17	1
15	Bague de blocage	Locking ring	K.315D19	K.315D19	1
16	Entretoise	Spacer	K.315D18	K.325D18	1
17	Vis sans tête	Screw	STHc,M3-5-45Cu	STHc,M3-5-45Cu	2
18	Vis sans tête	Screw	STHc,M5-10-45BP	STHc,M5-10-45BP	1
19	Vis à tête fraisée	Screw	FHc,M5-12	FHc,M5-12	1
20	Bille	Ball	N411-15 RB4	N411-15 RB4	2
21	Bille	Ball	N411-25 RB5,55	N411-25 RB5,55	1
22	Pied	Pin	RC-6-6	RC-6-6	2
23	Axe d'arrêt + écrou	Stop axle + nut		K.325D20	1

CHAPTER 3
Automatic setting and resetting torque wrenches

Serie 205
Serie 206

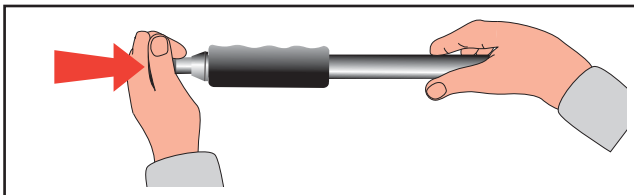
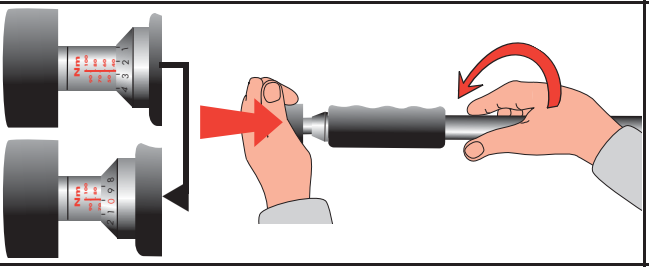
CHAPTER 3: Series "205", "206" TORQUE WRENCHES

1) Tools Series "205", "206"

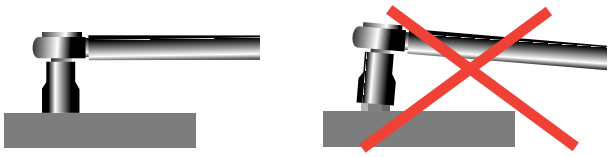
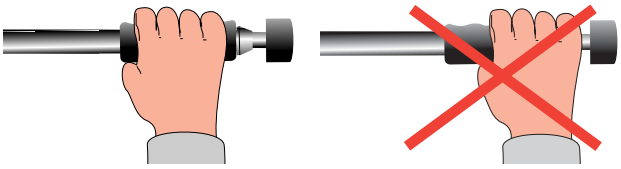
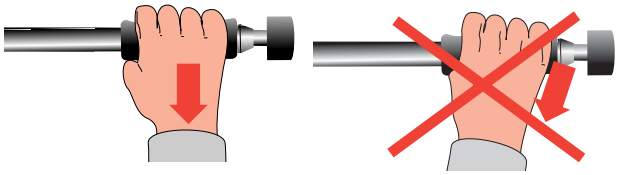
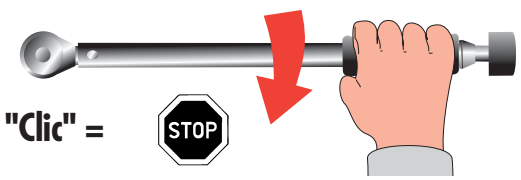
		Nm mini		maxi	Nm	
R.205-25	R.206-25	5	➡	25	0,1	1/4"
J.205-50	J.206-50	10	➡	50	1	3/8"
S.205-100	S.206-100	20	➡	100	1	1/2"
S.205-200	S.206-200	40	➡	200	1	1/2"
S.205-350	S.206-350	70	➡	350	2	1/2"

2) Préliminary actions

- Check that the product is complete and that there is no apparent damage.
- Check operation of the setting system.

	Pull the ring towards the handle.
	Turn the handle and stop the vernier at the desired graduation.
	Release the ring which should click into place.

- Check the setting and resetting mechanism of the wrench.

	Place your wrench at right angles to the tightening axis.
	Hold the wrench in the middle of the handle.
	Pull gradually and at right angles to the wrench.
	When the wrench "CLICKS", immediately stop applying force. The wrench resets automatically.

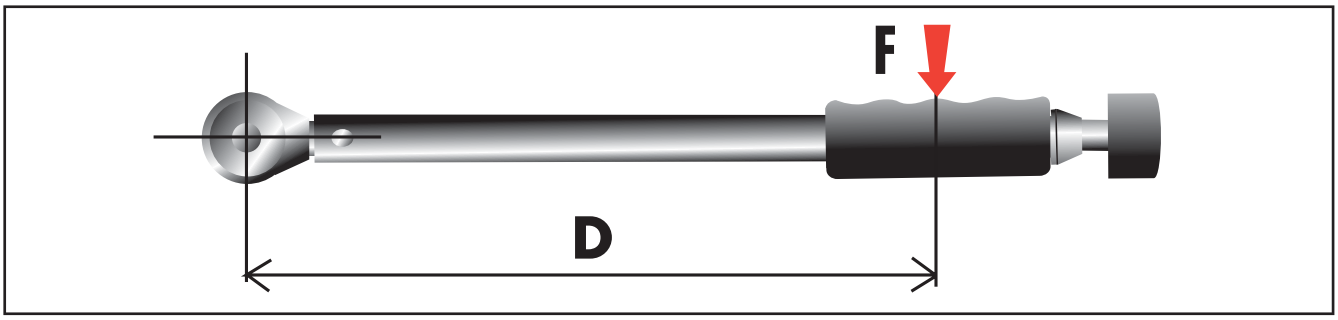
If the wrench is damaged, the setting system is stuck or the wrench no longer sets torque, it must be returned to FACOM After Sales Service for repair.

3) Checking accuracy

3.1) Setup:

The accuracy of the wrench will be measured using the accessory described in chapter 2. The force at 20%, 60% and 100% of the torque capacity will be applied at a distance from the vernier shown below for each reference number.

The R.304DA wrench has a notch on its handle indicating where the force is to be applied.



WRENCHES REFERENCE NUMBERS		D mm
R.205-25	R.206-25	190
J.205-50	J.206-50	280
S.205-100	S.206-100	370
S.205-200	S.2056-200	460
S.205-350	S.206-350	650

3.2) Adjusting the wrenches

- The wrench must be tested by following the procedure described in chapter 1 on a test bench.

One to five preload operations at 100% of the rated torque capacity without measurement.
Two to five measurements at 20% of the rated torque capacity.
Three to five measurements at 60% of the rated torque capacity.
Four to five measurements at 100% of the rated torque capacity.

- If the tolerance limits of the wrench match those indicated in the table below (that is, ± 4% of the value set at 20%, 60% and 100% of the rated torque capacity), the wrench is declared SATISFACTORY, and the test report can be produced.

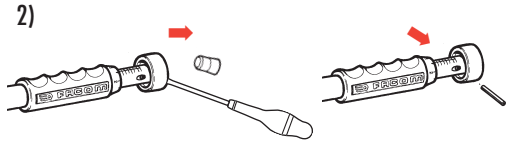
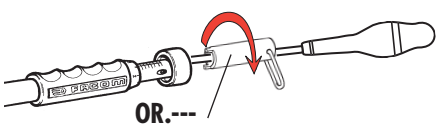
REFERENCE		% OF TORQUE CAPACITY	Nominal wrench setting N.m	The wrench is declared "satisfactory" between these values		
R.205-25	R.206-25	20% 60% 100%	5 15 25	4,8 14,4 24	to to to	5,20 15,6 26
J.205-50	J.206-50	20% 60% 100%	10 30 50	9,60 28,8 48	to to to	10,4 31,2 52
S.205-100	S.206-100	20% 60% 100%	20 60 100	19,2 57,6 96	to to to	20,8 62,4 104
S.205-200	S.206-200	20% 60% 100%	40 120 200	38,4 115,2 192	to to to	41,6 124,8 208
S.205-350	S.206-350	20% 60% 100%	70 210 350	67,2 201,6 336	to to to	72,8 218,4 364

4) ADJUSTING THE WRENCHES

Wrenches for which measurements fall outside the tolerance limits indicated in the tables above in section 3.2 must be adjusted to return them to within the ± 4% tolerance limits.

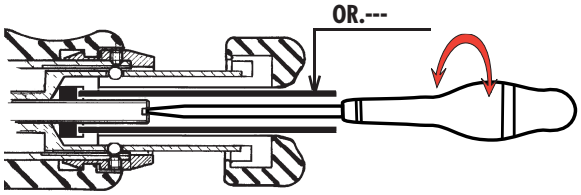
ADJUSTMENT PROCEDURE

1) Set the wrench's vernier to 20% of the rated torque capacity.

2) 	Remove the cap at the centre of the unlocking device and the spring pin.
3)  OR.---	Loosen the nut using the tool OR.—(*) while holding the setting screw with a slotted screwdriver.

4) Adjust the 20% of rated torque capacity setting

a) Using a slotted screwdriver and holding the nut using the tool OR. ....



< or = - 4%	> or = +4%
Screw in to increase the torque	Unscrew to reduce the torque

b) Adjust the 20% setting so that it is as close as possible to the rated value.
Carry out five torque-setting operations before taking measurements.

(*) For J,S.206 wrenches, the tool reference will be OR.S206-01
For R.206 wrenches, the tool reference will be OR.S206-01

5) Set the wrench's vernier to 100% of the rated torque capacity using a smooth pin or a small screwdriver in the place of the spring pin. Carry out ten torque-setting operations without taking measurements.

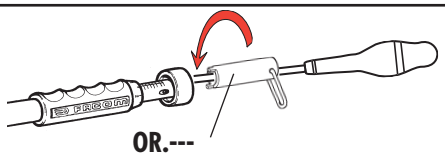
6) Take five measurements at 100% of the rated torque capacity.

7) Set the wrench's vernier to 20% of the rated torque capacity and take five measurements.

8)

Readings at 20%	Readings at 100%	Actions
Compliant with tables §3.2	Compliant with tables §3.2	Continue the procedure; go to step 9.
Compliant with tables §3.2	Out of tolerance > or = + 4%	Repeat the procedure from step 4 by reducing the adjusted value at the 20% setting. ⚠ Do not reduce the value beyond a -3% deviation relative to the set value.
	Out of tolerance < or = - 4%	Repeat the procedure from step 4 by increasing the adjusted value at the 20% setting. ⚠ Do not increase the value beyond a +3% deviation relative to the set value.
Out of tolerance	Out of tolerance	Repeat the procedure from step 4. If the wrench is still out of tolerance, it cannot be adjusted and must be returned to FACOM After Sales Service for repair.

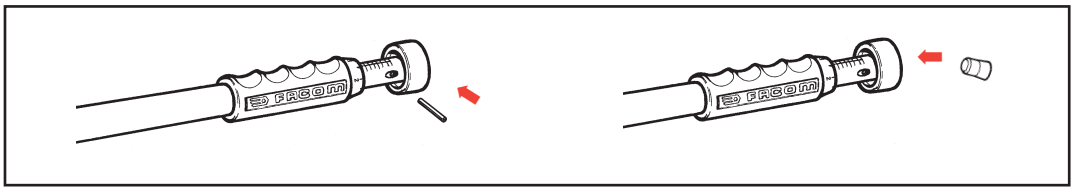
9)



Loosen the nut using the tool OR.—(*) while holding the setting screw with a slotted screwdriver.

10) Produce a test report for the wrench on the test bench. The procedure for this is described in chapter 3 section 4 (Checking accuracy).
- 5 preload operations at 100% of the rated torque capacity without taking measurements.
- 5 measurements at 20% of the rated torque capacity.
- 5 measurements at 60% of the rated torque capacity.
- 5 measurements at 100% of the rated torque capacity.

11) Refit the spring pin and the cap of the unlocking device.



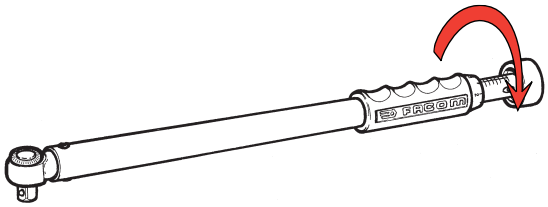
(*) For J,S.206 wrenches, the tool reference will be OR.S206-01
For R.206 wrenches, the tool reference will be OR.S206-01

5) Recalibrating series "205", ''206'' torque wrenches

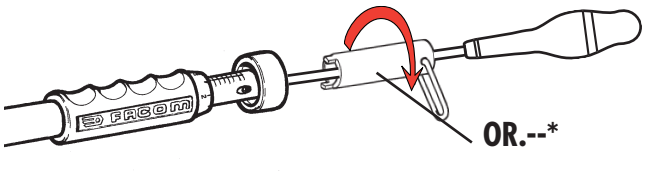
The wrench has been inspected and adjusted according to the procedure detailed in the manual entitled "Checking accuracy and adjusting wrenches" but it is still outside the tolerance limits at 100% of its torque capacity. You must partially dismantle the wrench to change the rocker.

PROCEDURE TO CHANGE ROCKER SERIES ''205'', ''206'' WRENCHES

1- Set the wrench to its minimum setting (at the limit stop)



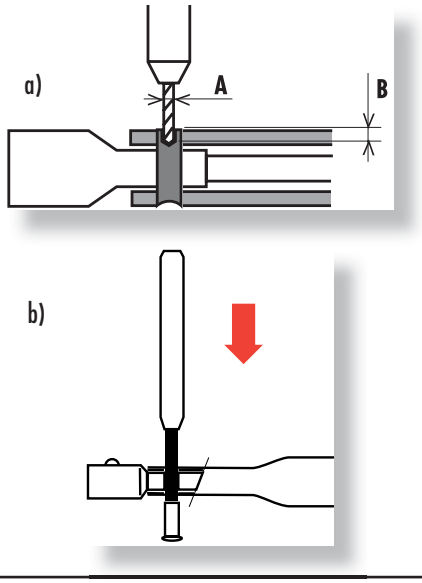
Remove the cap at the centre of the unlocking device and the spring pin.



Loosen the nut while holding the screw with a screwdriver.
Unscrew the 20% setting screw by 3 to 4 turns.

* OR.S206-01 for J,S.206 wrenches.
OR.R206-01 for R.206 wrenches.

2- Remove the crimped pin

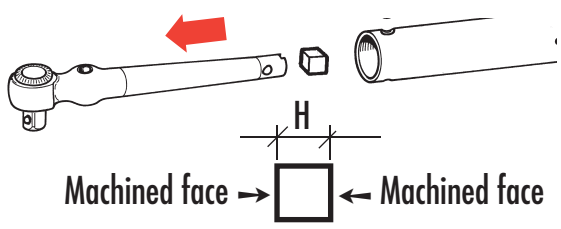


a) Align the wrench's crimped pin centrally on the drill and drill the pin.

WRENCHES	A	B
R.205-25, R.206-25	Ø 3,8	3
J,S"205", J,S''206''	Ø 5,8	4

b) Remove the crimped pin using a drift punch.

3- Remove the arm and the rocker

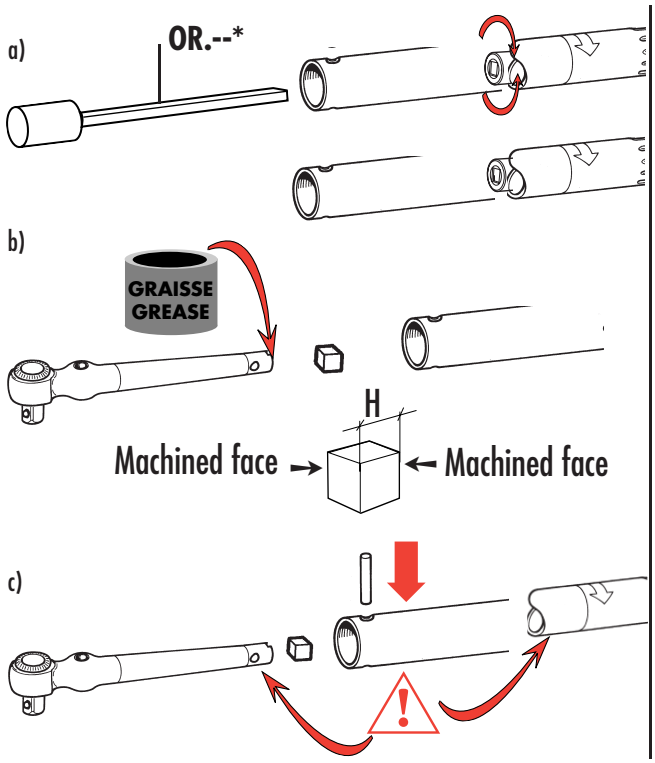


Measure the H dimension of the rocker.
This measurement will be used to choose the new rocker.

4- Choose the new rocker

- If the wrench at 100% of its torque capacity is > +4%: from the repair kit, select the rocker whose H dimension is the next size up.
- If the wrench at 100% of its torque capacity is < - 4%: from the repair kit, select the rocker whose H dimension is the next size down.

5- Refit the arm and the rocker



a) Check that all the components are correctly placed in the tube body. And position the thruster at the entry to the tube in such a way as to see its orientation.

WRENCHES	Tools *
R."205", R."206"	OR.R305-01
J,S"205", J,S"206"	OR.S305-01

b) Apply MOLYKOTE Multilub grease on the end of the arm to hold the rocker.

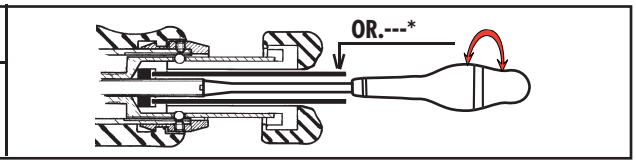
c) Fit the arm + rocker assembly into place and insert a new pin from the repair kit.

Pay attention to the orientation.

d) Check the torque-setting operation of the wrench.

6- Presetting the wrenches

1- Set the wrench's vernier to 20% of its rated torque capacity.
2- Using a slotted screwdriver, adjust the 20% of rated torque capacity setting so that it is as close as possible to the rated value.
Carry out five torque-setting operations before taking measurements.

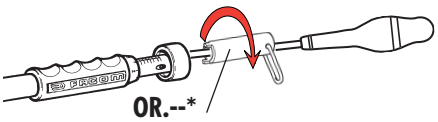
< or = - 3%	> or = +3%	
Screw in to increase the torque	Unscrew to reduce the torque	

3- Set the wrench's vernier to 100% of the rated torque capacity and carry out ten torque-setting operations without taking measurements.
4- Take five measurements at 100% of the rated torque capacity.
5- Set the wrench's vernier to 20% of the rated torque capacity and take five measurements.

6 -

Readings at 20%	Readings at 100%	Actions
Within ± 3% tolerance	Within ± 3% tolerance	Continue the procedure.
Within ± 3% tolerance	Out of tolerance > +3%	Repeat the procedure from step 2, section 6-2, reducing the value adjusted at the 20% setting. ⚠ Do not reduce the value beyond a -3% deviation relative to the set value.
	Out of tolerance < - 3%	Repeat the procedure from step 2, section 6-2, increasing the value adjusted at the 20% setting. ⚠ Do not increase the value beyond a +3% deviation relative to the set value.
Out of tolerance	Out of tolerance	Repeat the procedure from step 2, section 6-2. If the wrench is still outside the tolerance limits, restart the procedure at step 3 and change the rocker.

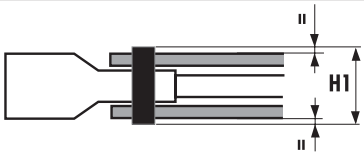
7-

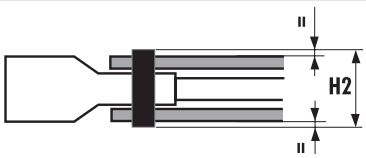
Loosen the nut using the tool OR.—(*) while holding the setting screw with a slotted screwdriver.	

(*) For J,S.205, J,S.206 wrenches, the tool reference will be OR.S206-01
For R.205, R.206 wrenches, the tool reference will be OR.R206-01

7- Crimping the pin

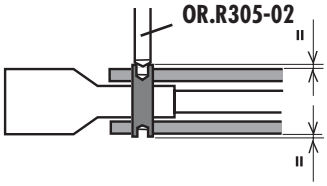
7-1 For J, S series "205" , "206" wrenches

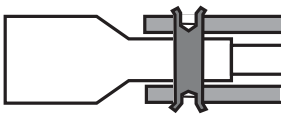
BEFORE CRIMPING 

AFTER CRIMPING 

Serie	Wrenches	H1	Serie	Wrenches	H2
205 , 206	J and S	23,5 ±0,1	205 , 206	J and S	23,2 ±0,1

7-2 For R series "205" , "206" wrenches

BEFORE CRIMPING 

AFTER CRIMPING 

8- Producing the test report

The procedure is described in the manual entitled "Checking accuracy and adjusting wrenches".

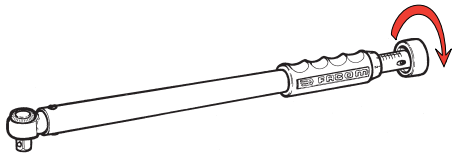
5) Recalibrating series "205", ‘‘206’’ torque wrenches

The wrench no longer sets torque; the arm is broken; the setting system is stuck or not working properly; after changing the rocker the wrench is still out of tolerance. You must completely dismantle the wrench.

1- PROCEDURE TO DISMANTLE WRENCHES

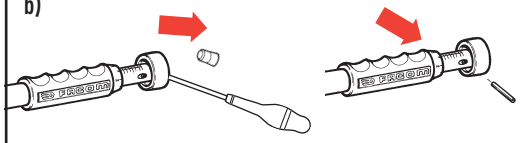
1-

a)



Set the wrench to its minimum setting (at the limit stop).

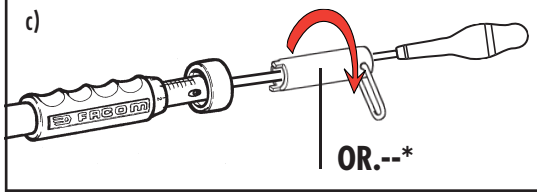
b)



Remove the handle.

Use a hex key to loosen the set screw.

c)

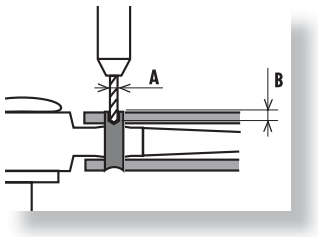


Use a screwdriver to unscrew the 20% setting screw by 3 to 4 turns.

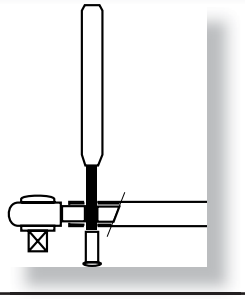
* OR.S206-01 for J,S.205, J,S.206 wrenches
OR.R206-01 for R.205, R.206 wrenches

2- Remove the crimped pin

a)



b)

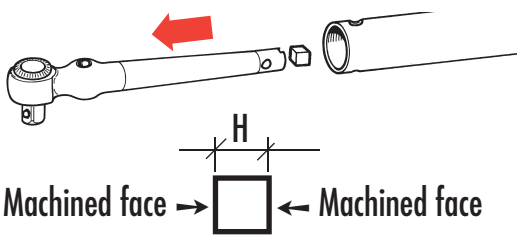


a) Align the wrench’s crimped pin centrally on the drill and drill the pin.

WRENCHES	A	B
R.205-25 , R.206-25	Ø 3,8	3
J,S"205“, J,S"206“	Ø 5,8	4

b) Remove the crimped pin using a drift punch.

3- Remove the arm and the rocker

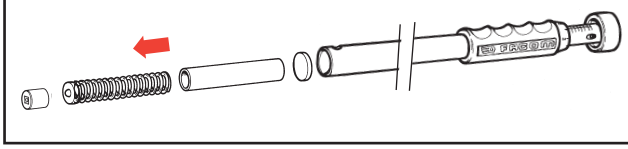


⚠ Measure the H dimension of the rocker.
This measurement will be used to choose the new rocker.

5) Recalibrating series "205", ''206'' torque wrenches

4- Empty the tube

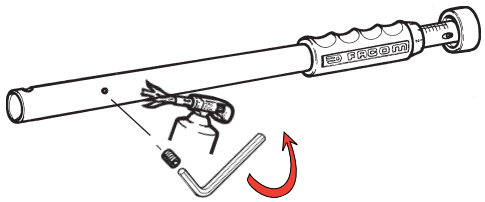
4.1- Procedure for series "J, S" wrenches



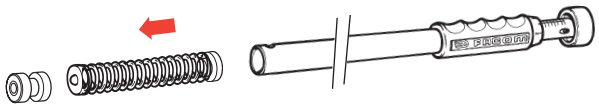
From the tube, pull out the thruster, the spring with its end-piece and the disc.

KEEP the parts for reassembly in a safe place.

4.2- Procedure for series "R" wrenches



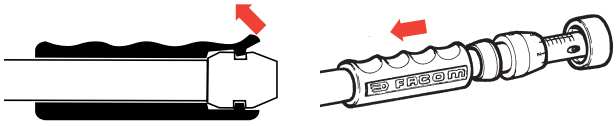
Heat the high-strength threadlocked screw and use a hex key to unscrew it.



From the tube, pull out the thruster, the spring with its end-piece, the spacer and the disc.

KEEP the parts for reassembly in a safe place.

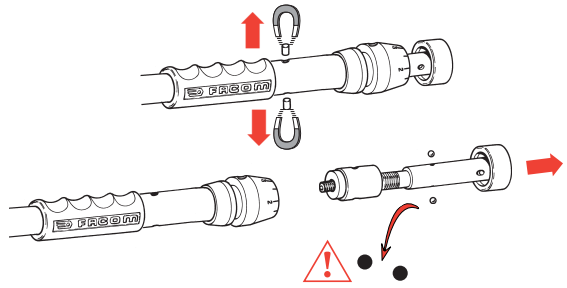
5-



Push the handle to release the locating dowels.

6- Dismantling setting screw subassemblies

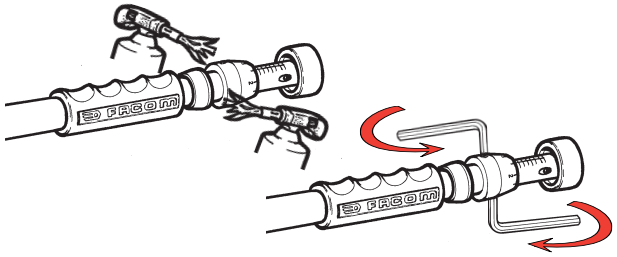
6.1- Procedure for series "J,S" wrenches



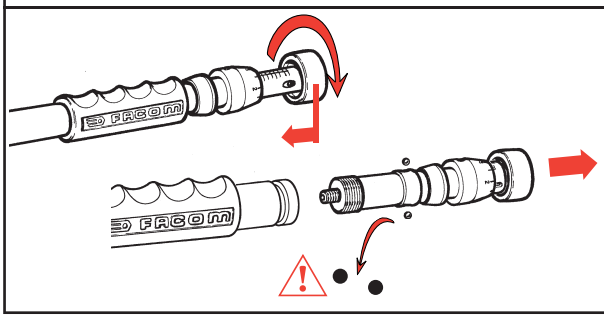
Remove the locating dowels using a magnet.
Pull out the setting assembly.
Insert a plain pin or a small screwdriver in place of the spring pin.

WATCH OUT for the balls

6.2- Procedure for series "R" wrenches



Heat the two high-strength threadlocked screws and use a hex key to unscrew them.



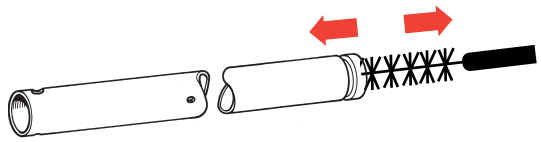
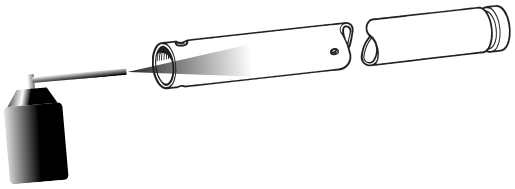
Replace the spring pin with a plain pin
or a small screwdriver.

Unscrew the setting assembly while pressing the unlocking device to pull it out.

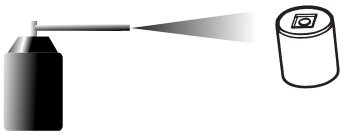
WATCH OUT for the balls

2- CHECKING AND PREPARING THE PARTS BEFORE ASSEMBLY

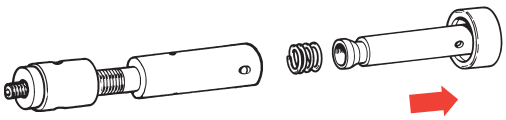
2.1- Tube

	Degrease the tube.
	When dried, spray the inside of the tube (arm end) with "TEFLISS2". Leave it to dry for at least 15 minutes.

2.2- Thruster

	Obtain a new thruster* and spray it with "TEFLISS2". Leave it to dry for at least 15 minutes.

2.3- Setting handle assembly, if the ring does not unlock properly

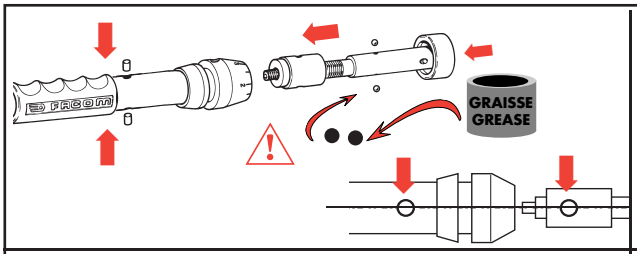
	- Remove the unlocking device. - Pull out the spring and replace it with a new spring*.

* Individual parts: Refer to the manual setting out the part references according to wrench type.

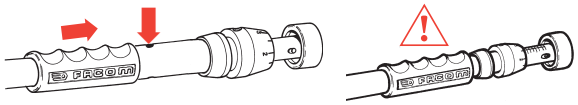
3- PROCEDURE TO ASSEMBLE WRENCHES

1- Fitting the setting screw subassemblies

1.1- Series "J, S" wrenches



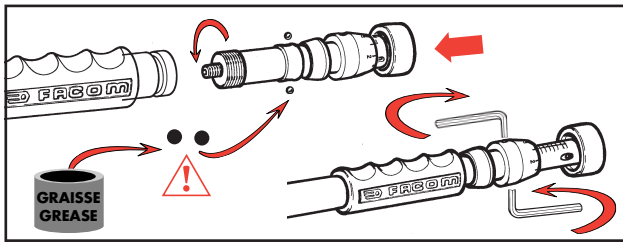
Replace the spring pin with a plain pin or a small screwdriver.
- Apply a drop of MOLYKOTE Multilub grease to the balls and insert them in each seat.
- While pressing the unlocking device, fit the assembly, lining up its holes with those on the tube.
- Insert the locating dowels.



Push the handle back in to hold the locating dowels in place.

⚠ DO NOT position the handle over the vernier.

1.2- Series "R" wrenches

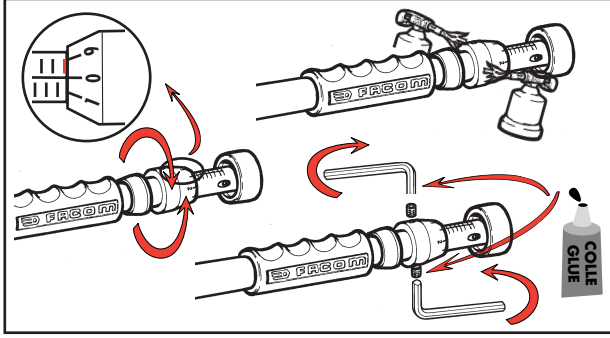


Replace the spring pin with a plain pin or a small screwdriver.
- Grease the screw thread.
- Apply a drop of MOLYKOTE Multilub grease to the balls and insert them in each seat.
- While pressing the unlocking device, screw the assembly into the tube.
- Screw the vernier on the tube.

2-

- Set the vernier to 20% of its rated torque capacity.

- Check that the vernier's zero mark lines up with the graduation scale line on the the control screw.

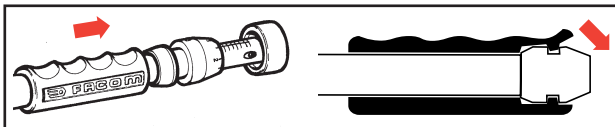


If the vernier's zero mark is offset:
- Heat the two high-strength threadlocked screws and use a hex key to unscrew them.

- Turn the vernier and position its zero mark in line with the vertical line of the graduation scale.

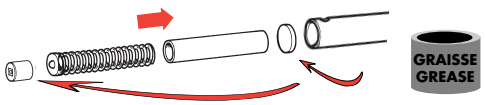
- Screw in both the new screws*, applying a drop of high-strength threadlock.

3-



Attach the handle.

4-



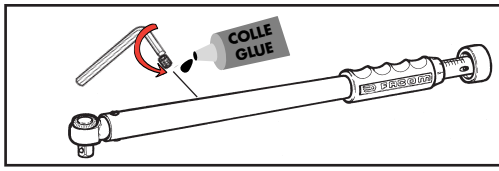
- Fit the spacer and the disc bonded to the spacer with a little MOLYCOTE Multilub grease, and the spring assembly with its end-piece.
- Grease the new thruster* with MOLYCOTE Longterm Plus and slide it into the tube.

5- Fitting the arm and rocker

See chapter 1: Procedure to change the rocker, from step 4 (choosing the new rocker).

NOTE: - For wrenches with broken arms, or ones that no longer set torque, or if the setting handle is stuck, you must fit a new rocker that has the same height H as the old one.

- For series "R" wrenches, before crimping:



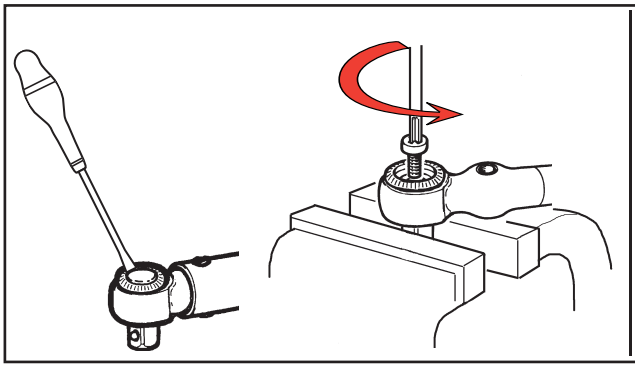
Screw in the new screw*, applying a drop of high-strength threadlock in the tube.

* Individual parts: Refer to the manual setting out the part references according to wrench type.

4- PROCEDURE TO REPAIR A WRENCH’S ONE-WAY RATCHET MECHANISM

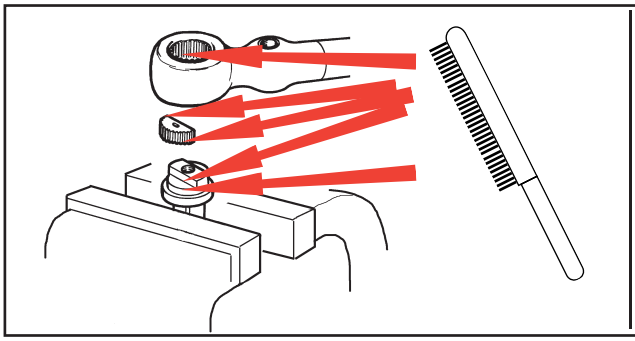
The ratchet does not work, the drive square is broken.

1-



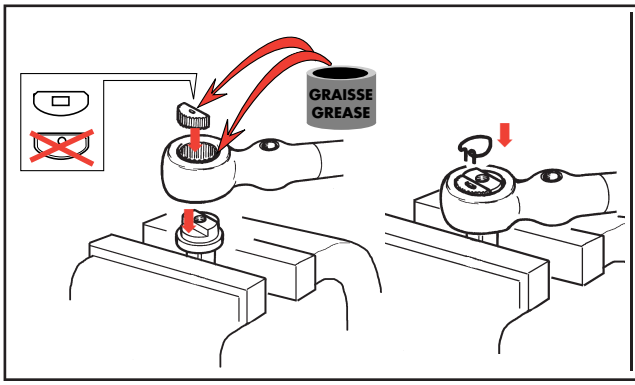
- Remove the red cap, undo the screw using a "TORX" driver and remove the cover.

2-



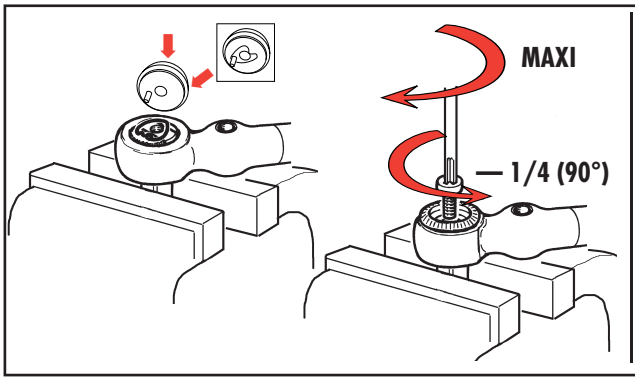
- Dismantle the parts and clean them.

3-



- Replace any worn or broken parts.
- Grease and assemble the parts.

4-

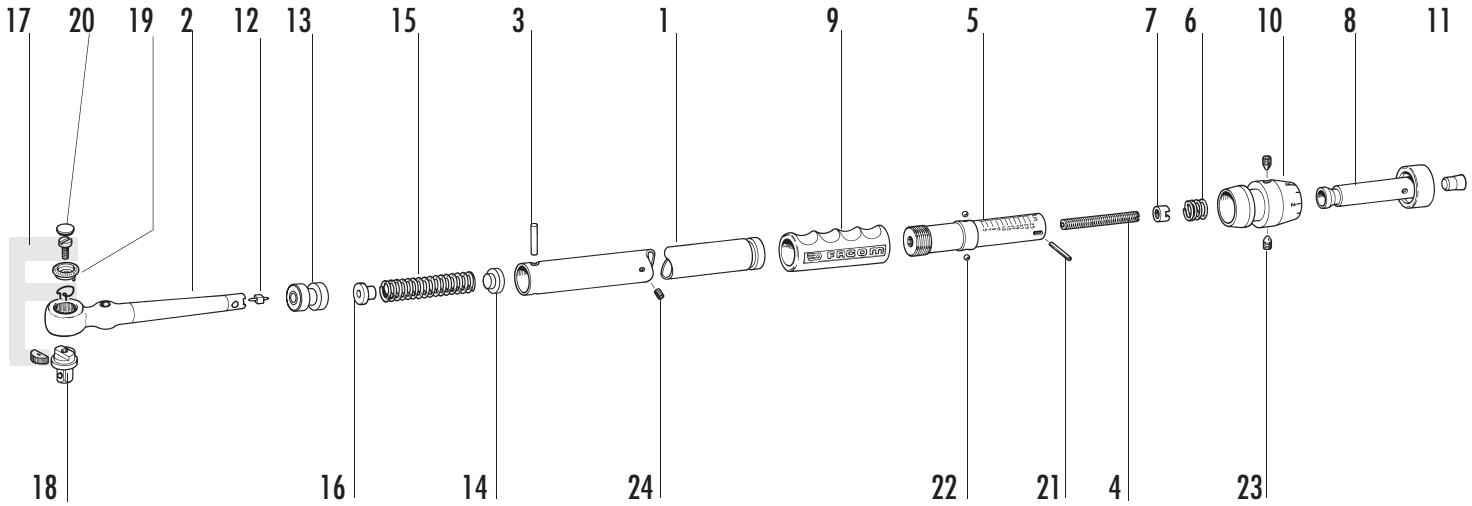


- Reattach the cover S.151C.

- Screw in the screw completely and then unscrew it by a quarter turn.

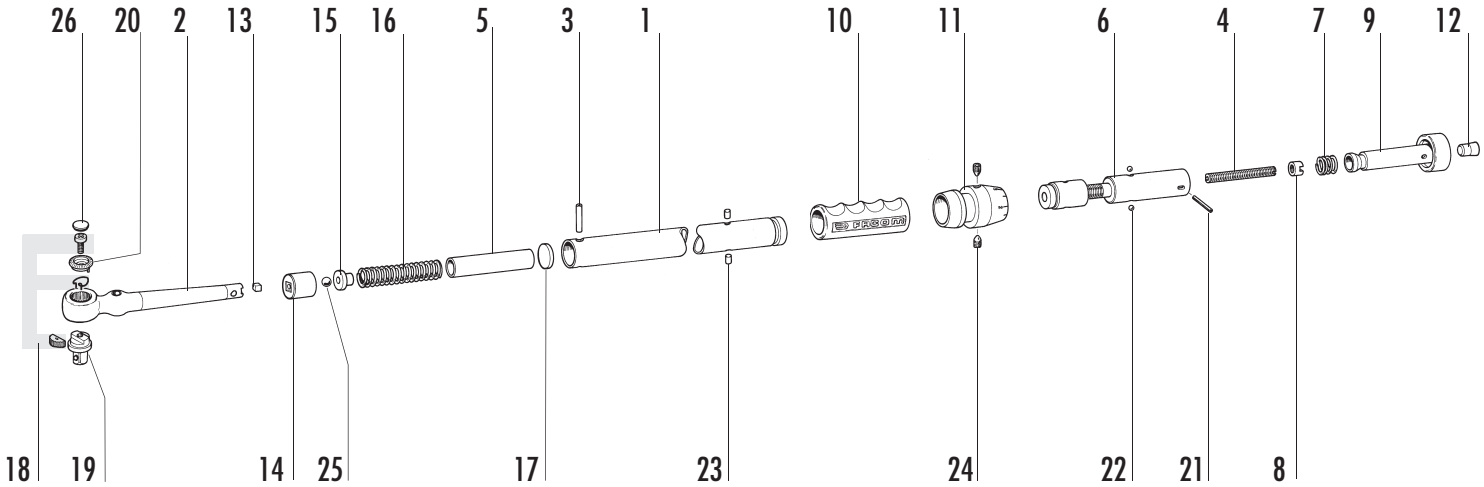
- Check the operation of the ratchet mechanism in the tightening direction before securing the screw.

6) Spare parts R.205-25, R.206-25 wrenches



REP	DESIGNATION	DESIGNATION	REFERENCE	Qté
1	Tube corps	Tube body	R.205-25-01	1
2	Bras	Arm	R.205-25-02	1
3	Axe	Pin	R.205-25-03	1
4	Tige de poussée	Thrust rod	R.205-25-04	1
5	Vis de commande	Controle screw assembly	R.205-25-08	1
6	Ressort	Spring	R.205-25-09	1
7	Ecrou de blocage	Nut	R.205-25-10	1
8	Déverrouilleur	Unlocking	R.205-25-11	1
9	Poignée	Handle	R.205-25-12	1
10	Vernier	Vernier	R.205-25-13	1
11	Bouchon	Cap	R.205-25-16	1
12	Basculeur	Rocker	R.206-25-15..... #	1
13	Poussoir	Thruster	R.344D06	1
14	Embout de ressort	Spring end piece	R.305D06	1
15	Ressort de pression	Compression spring	A.202B01-05	1
16	Embout de ressort	Spring end piece	R.305D20	1
17	Vis + ressort en cœur + doigt	Screw + spring + retrier	R.161RN	1
18	Rotor	Rotor	R.151SE	1
19	Chapeau cliquet	Knurl cap	R.161-09	1
20	Bouchon 237 3/8''	Stopper 237 3/8''	R.161-10	1
21	Goupille mécanindus	Pin spring mécanindus	GOUP.E,2-12	1
22	Bille	Ball	N411-7 RB3	2
23	Vis sans tête	Screw	STHc,M3-3-45Cu	2
24	Vis sans tête	Screw	STHc,M2,5-4-BP	1

Rep.	Reference	H mm	Ref.
12	# R.206-25-15.....	4,20 4,25 4,30	R.206-25-15-420 R.206-25-15-425 R.206-25-15-430



Rep.	Reference	h(mm) □ ⍁6 h	Ref.
13	# J.206-100-.....	6,3 6,4 6,5 6,6	S.206-100-630 S.206-100-640 S.206-100-650 S.206-100-660
	# S.206-100-.....	5,6 5,7 5,8 5,9	S.206-100-560 S.206-100-570 S.206-100-580 S.206-100-590
	# S.206-100-.....	5,2 5,3 5,4 5,5	S.206-100-520 S.206-100-530 S.206-100-540 S.206-100-550
	# S.206-100-.....	4,8 4,9 5,0 5,1	S.206-100-480 S.206-100-490 S.206-100-500 S.206-100-510

6) Spare parts J,S.205 wrenches

Rep	Désignation	Designation	J.205-50	S.205-100	S.205-200	S.205-350	
1	Tube corps	Tube body	J.205-50-01	S.205-100-01	S.205-200-01	S.205-350-01	1
2	Bras	Arm	S.206-100-02	S.206-100-02	S.206-350-02	S.206-350-02	1
3	Axe	Pin	S.206-100-03	S.206-100-03	S.206-100-03	S.205-350-03	1
4	Tige de poussée	Thrust rod	S.206-100-04	S.206-100-04	S.206-100-04	S.206-100-04	1
5	Entretoise	Spacer	J.206-50-05	S.206-100-05	S.206-200-05	S.206-350-05	1
6	Vis de commande	Controle screw assembly	J.205-50-08SE	S.205-100-08SE	S.205-200-08SE	S.205-200-08SE	1
7	Ressort	Spring	S.206-100-09	S.206-100-09	S.206-100-09	S.206-100-09	1
8	Ecrou de blocage	Nut	S.206-100-10	S.206-100-10	S.206-100-10	S.206-100-10	1
9	Déverrouilleur	Unlocking	S.205-100-11	S.205-100-11	S.205-100-11	S.205-350-11	1
10	Poignée	Handle	S.205-100-12	S.205-100-12	S.205-100-12	S.205-100-12	1
11	Vernier	Vernier	J.205-50-13	S.205-100-13	S.205-100-13	S.205-350-13	1
12	Bouchon + anneau	Cap + ring	S.205-100-14	S.205-100-14	S.205-100-14	S.205-100-14	1
13	Basculeur	Rocker	S.206-100-15.....#	S.206-100-15 .... #	S.206-100-15 .... #	S.206-100-15 .... #	1
14	Poussoir	Thruster	S.325D4	S.325D4	S.325D4	S.325D4	1
15	Embout de ressort	Spring end piece	S.313-14	S.313-14	S.313-14	S.206-350-17	1
16	Ressort de pression	Compression spring	J.305D07	S.313-09	S.325D07	S.206-350-07	1
17	Disque	Disc	S.313-08	S.313-08	S.313-08	S.313-08	1
18	Vis + ressort en cœur + doigt	Screw + Spring + Retriever	J.161RN	S.161RN	S.161RN	S.161RN	1
19	Rotor	Rotor	J.372-03	S.382-03	S.382-03	S.382-03	1
20	Chapeau	Knurl cap	S.161-09	S.161-09	S.161-09	S.161-09	1
21	Goupille mécanindus épaisse	Pin spring mécanindus	GOUP.E,4-18	GOUP.E,4-18	GOUP.E,4-18	GOUP.E,4-18	1
22	Bille	Ball	N411-7 RB3	N411-7 RB3	N411-7 RB3	N411-7 RB3	2
23	Pied	Pin	RC-3-6	RC-3-6	RC-3-6	RC-3-6	2
24	Vis sans tête	Screw	STHc,M3-3-45Cu	STHc,M3-3-45Cu	STHc,M3-3-45Cu	STHc,M3-3-45Cu	2
25	Bille	Ball	N411-25 RB5,55	N411-25 RB5,55	N411-25 RB5,55	N411-25 RB5,55	1
26	Coupelle	Stopper	S.161-10	S.161-10	S.161-10	S.161-10	1

6) Spare parts J,S.206 wrenches

Rep	Désignation	Designation	J.206-50	S.206-100	S.206-200	S.206-350	
1	Tube corps	Tube body	J.206-50-01	S.206-100-01	S.206-200-01	S.206-350-01	1
2	Bras	Arm	S.206-100-02	S.206-100-02	S.206-350-02	S.206-350-02	1
3	Axe	Pin	S.206-100-03	S.206-100-03	S.206-100-03	S.205-350-03	1
4	Tige de poussée	Thrust rod	S.206-100-04	S.206-100-04	S.206-100-04	S.206-100-04	1
5	Entretoise	Spacer	J.206-50-05	S.206-100-05	S.206-200-05	S.206-350-05	1
6	Vis de commande	Controle screw assembly	J.206-50-08SE	S.206-100-08SE	S.206-200-08SE	S.206-200-08SE	1
7	Ressort	Spring	S.206-100-09	S.206-100-09	S.206-100-09	S.206-100-09	1
8	Ecrou de blocage	Nut	S.206-100-10	S.206-100-10	S.206-100-10	S.206-100-10	1
9	Déverrouilleur	Unlocking	S.206-100-11	S.206-100-11	S.206-100-11	S.206-350-11	1
10	Poignée	Handle	S.206-100-12	S.206-100-12	S.206-100-12	S.206-100-12	1
11	Vernier	Vernier	J.206-50-13	S.206-100-13	S.206-100-13	S.206-350-13	1
12	Bouchon	Cap	S.206-100-14	S.206-100-14	S.206-100-14	S.206-100-14	1
13	Basculeur	Rocker	S.206-100-15.....#	S.206-100-15 .... #	S.206-100-15 .... #	S.206-100-15 .... #	1
14	Poussoir	Thruster	S.325D4	S.325D4	S.325D4	S.325D4	1
15	Embout de ressort	Spring end piece	S.313-14	S.313-14	S.313-14	S.206-350-17	1
16	Ressort de pression	Compression spring	J.305D07	S.313-09	S.325D07	S.206-350-07	1
17	Disque	Disc	S.313-08	S.313-08	S.313-08	S.313-08	1
18	Vis + ressort en cœur + doigt	Screw + Spring + Retriever	J.151RN	S.151RN	S.151RN	S.151RN	1
19	Rotor	Rotor	J.372-03	S.382-03	S.382-03	S.382-03	1
20	Chapeau	Knurl cap	S.206-100-16	S.206-100-16	S.206-100-16	S.206-100-16	1
21	Goupille mécanindus épaisse	Pin spring mécanindus	GOUP.E,4-18	GOUP.E,4-18	GOUP.E,4-18	GOUP.E,4-18	1
22	Bille	Ball	N411-7 RB3	N411-7 RB3	N411-7 RB3	N411-7 RB3	2
23	Pied	Pin	RC-3-6	RC-3-6	RC-3-6	RC-3-6	2
24	Vis sans tête	Screw	STHc,M3-3-45Cu	STHc,M3-3-45Cu	STHc,M3-3-45Cu	STHc,M3-3-45Cu	2
25	Bille	Ball	N411-25 RB5,55	N411-25 RB5,55	N411-25 RB5,55	N411-25 RB5,55	1
26	Bouchon 237 1/2 - 3/4	Stopper 237 1/2 - 3/4	Q 237 1370/0	Q 237 1370/0	Q 237 1370/0	Q 237 1370/0	1

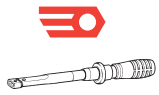
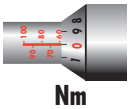
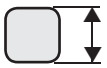
CHAPTER 4
Automatic setting and resetting torque wrenches

Series 208, 208D

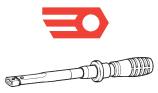
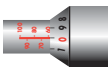
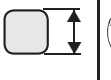
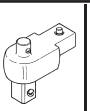
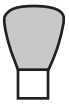
CHAPTER 4: Series "208" and "208D" TORQUE WRENCHES

1) Tools and accessories

Série " 208 "

	Nm mini		maxi	 Nm		 mm
R.208-25	5	➡	25	0,1	1/4"	-
J.208-50	10	➡	50	1	3/8''	-
S.208-100	20	➡	100	1	1/2''	-
S.208-200	40	➡	200	1	1/2''	-
S.208-340	60	➡	340	2	1/2''	-

Série " 208D "

	Nm mini	maxi	 Nm		 mm					
J.208-50D	10 ➡	50	1	-	9 x 12	J.372	3/8"	J.373	S.305P	10 7 - 19 mm 1/4 - 3/4''
S.208-100D	20 ➡	100	1	-	9 x 12	S.372	3/8"	S.373		12 7 - 19 mm 1/4 - 3/4''
S.208-200D	40 ➡	200	1	-	14 x 18					11 13 - 32 mm 1/2 - 1''7/16
S.208-340D	60 ➡	340	2	-	14 x 18	S.382	1/2"	S.383		13 13 - 36 mm 1/2 - 1''7/16

2) CHECKING ACCURACY

2.1) Setup:

The accuracy of the wrench will be measured using the accessory described in chapter 2, section 1.
Series 208 and 208D wrenches have a notch on the handle indicating where the force is to be applied.

2.2) Testing the wrench:

- The wrench must be tested by following the procedure described in chapter 1: Review of ISO 6789.

a) - 10 preload operations at 100% of the rated torque capacity without taking measurements.
b) - 10 measurements at 20% of the rated torque capacity.
c) - 10 measurements at 60% of the rated torque capacity.
d) - 10 measurements at 100% of the rated torque capacity.

- If the tolerance limits of the wrench match those indicated in the table below (that is, ± 4% of the value set at 20%, 60% and 100% of the rated torque capacity), the wrench is declared SATISFACTORY, and the test report can be produced.

REFERENCE	% OF TORQUE CAPACITY	Nominal wrench in N.m	The wrench is declared "satisfactory" between these values		
R.208-25	20%	5	4,8	to	5,2
	60%	15	14,4	to	15,6
	100%	25	24	to	26
J.208-50 J.208-50D	20%	10	9,6	to	10,4
	60%	30	28,8	to	31,2
	100%	50	48	to	52
S.208-100 S.208-100D	20%	20	19,2	to	20,8
	60%	60	57,6	to	62,4
	100%	100	96	to	104
S.208-200 S.208-200D	20%	40	38,4	to	41,6
	60%	120	115,2	to	124,8
	100%	200	192	to	208
S.208-340 S.208-340D	20%	60	57,6	to	62,4
	60%	200	192	to	208
	100%	340	326,4	to	353,6

3) Adjusting the wrenches J,S.208, J,S.208D

BEFORE CHECKING THE ACCURACY OF THE WRENCH:
- Check that the wrench is complete and that there is no apparent damage.
- Check operation of the setting system.
- Check the setting and resetting mechanism of the wrench.

Check the wrench on a test bench having a maximum tolerance limit of ± 4% of the measured value.

Set the wrench's vernier to 20%.
Perform 5 measurements.

OK

NO

Set the wrench's vernier to 100%.
Perform 5 measurements.

OK

NO

Set the wrench's vernier to 100%.
Carry out 5 torque-setting operations (preload).

Set the wrench's vernier to 20%.
Perform 5 measurements.

Set the wrench's vernier to 60%.
Perform 5 measurements.

Set the wrench's vernier to 100%.
Perform 5 measurements.

The measurements taken at 20%, 60% and 100% are within the ± 4% tolerance limit.
The wrench is declared SATISFACTORY.

DRAW UP INSPECTION REPORT

1) Remove the front FACOM cover using tool...
2) Remove the vernier label.

3) Screw or unscrew the handle to adjust the 20% setting using a test bench.
Perform 5 measurements.

Make a mark on the handle opposite the graduated scale.

4) Rotate the handle through n turns.
(see table of displacement values)

OK

5) Set the wrench to the mechanical 20% setting.
Perform 5 measurements.

Are all measurements within the specified tolerance?

NO

YES

6) Mark another red line opposite the measured value.
7) Place a new vernier, aligning the zero with the graduated scale mark.
8) Replace the FACOM front cover.

REPEAT THE PROCEDURE FROM THE BEGINNING

The wrench is damaged, the setting system is stuck or the wrench no longer sets torque.

REPAIR

Change the rocker.

3) Adjusting the wrench R.208-25

BEFORE CHECKING THE ACCURACY OF THE WRENCH:
- Check that the wrench is complete and that there is no apparent damage.
- Check operation of the setting system.
- Check the setting and resetting mechanism of the wrench.

Check the wrench on a test bench having a maximum tolerance limit of ± 1 % of the measured value.

Set the wrench to 100 % of the rated torque capacity.
Carry out five torque-setting operations without taking measurements.

Set the wrench to 20 % of the rated torque capacity.
Perform 5 successive measurements.

The 5 measurement must be within ± 4% of the set value.

OUT OF TOLERANCE

Set the wrench to 60 % of the rated torque capacity.
Perform 5 successive measurements.

The 5 measurement must be within ± 4% of the set value.

OUT OF TOLERANCE

Set the wrench to 100 % of the rated torque capacity.
Perform 5 successive measurements.

The 5 measurement must be within ± 4% of the set value.

OUT OF TOLERANCE

The measurements taken at 20 %, 60 % and 100 % are within the ± 4 % tolerance limit.
The wrench is declared SATISFACTORY.

DRAW UP INSPECTION REPORT

Wrench adjusted within the ± 4 % tolerance limits.

1- Remove the pin. (see 1)
2- Remove the handle. (see 2)
3- Use a 2 mm hex key to loosen the set screw. (see 3)
4- Using a screwdriver, screw in to increase the torque, unscrew to reduce the torque. (see 4)
5- Adjust the 20 % setting so that it is as close as possible to the rated value. Carry out five torque-setting operations before taking measurements.
6- Set the wrench to 100 % of capacity and carry out ten torque-setting operations.
7- Take five measurements at 100 % of the rated torque capacity.
8- Set the wrench to 20 % of capacity and take five measurements.

All measurements are within tolerance limits. If not, repeat from step 4.

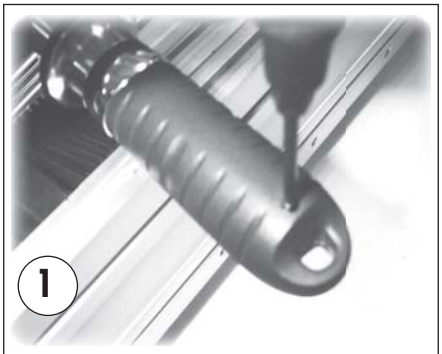
The wrench remains Out of Tolerance

REPAIR

Tighten the set screw.
Refit the handle.
Refit the pin.

The wrench is damaged, the setting system is stuck or the wrench no longer sets torque.

REPAIR

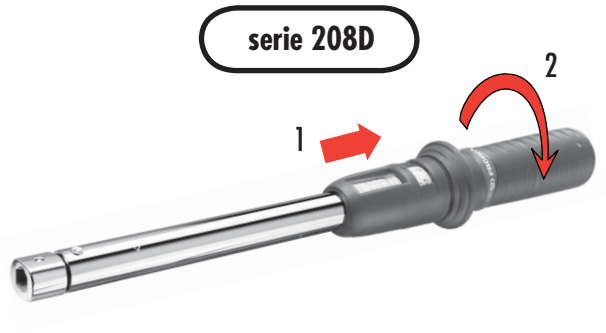


4) Recalibrating series "208", ‘‘208D’’ torque wrenches

1) PROCEDURE TO CHANGE THE ROCKER.

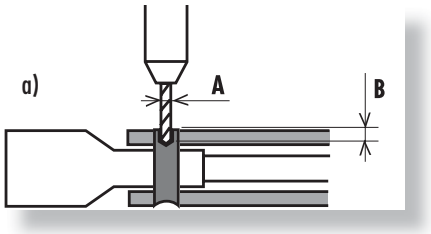
The wrench has been inspected and adjusted according to the procedure detailed in the manual entitled "Checking accuracy and adjusting wrenches" but it is still outside the tolerance limits at 100% of its torque capacity. You must partially dismantle the wrench to change the rocker.

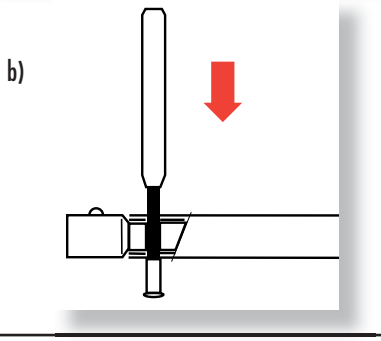
1.1- Set the wrench to its minimum setting (at the limit stop)



1)- Release the locking ring by pulling it towards the handle.
2)- Turn the handle as far as it will go (back limit stop).

1.2- Remove the crimped pin



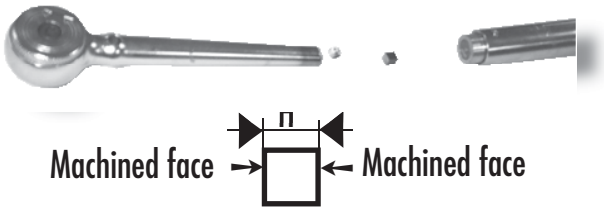


a) Align the wrench's crimped pin centrally on the drill and drill the pin.

WRENCHES	A	B
J./S.208 - J./S.208D	Ø 5,8	4

b) Remove the crimped pin using a drift punch.

1.3- Remove the arm and the rocker



⚠ Measure the H dimension of the rocker.
This measurement will be used to choose the new rocker.

1.4- Choose the new rocker

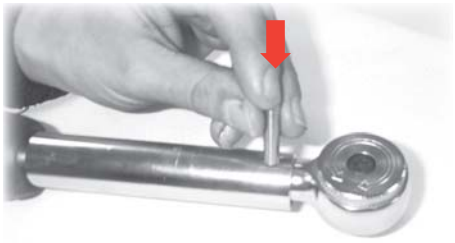
- If the wrench at 100% of its torque capacity is > +4%: from the repair kit, select the rocker whose H dimension is the next size up.
- If the wrench at 100% of its torque capacity is < - 4%: from the repair kit, select the rocker whose H dimension is the next size down.

1.5- Refit the arm and the rocker

a)

b)

c)



a) Check that all the components are correctly placed in the tube body. And position the thruster at the entry to the tube in such a way as to see its orientation.

b) Apply MOLYKOTE Multilub grease on the end of the arm to hold the rocker.

c) Fit the arm + rocker assembly into place and insert a new pin from the repair kit.

Pay attention to the orientation.

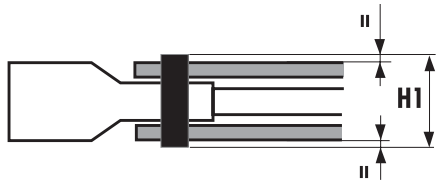
d) Check the torque-setting operation of the wrench.

1.6- Presetting the wrenches

See adjustment procedure for series 208 and 208D wrenches. (manual entitled "Checking accuracy and adjusting wrenches", chapter 1, section 3).

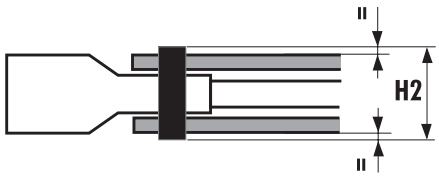
1.7- Crimping the pin

BEFORE CRIMPING



H1 = **23,5 ±0,1**

AFTER CRIMPING



H2 = **23,2 ±0,1**

2) PROCEDURE TO DISMANTLE WRENCHES

The wrench no longer sets torque; the arm is broken; the setting system is stuck or not working properly; after changing the rocker the wrench is still out of tolerance.
You must completely dismantle the wrench.

2.1- Set the wrench to its minimum setting (at the limit stop).

	Unclip the FACOM front cover using a screwdriver.

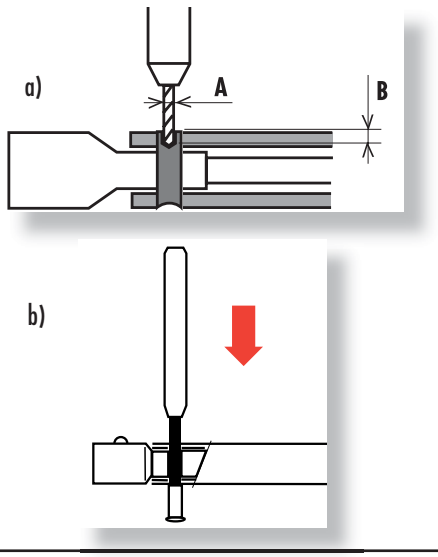
2.2- Remove the handle assembly.

	Remove the pin using a drift punch.
	Remove the handle, locking spring and locking ring assembly.

2.3- Remove the "vernier" assembly.

	Remove the retainer.
a) b)  	a) Remove the retainer. b) Remove the fixed handle by spreading the lugs
	Remove the FACOM front cover.

2.4- Remove the crimped pin

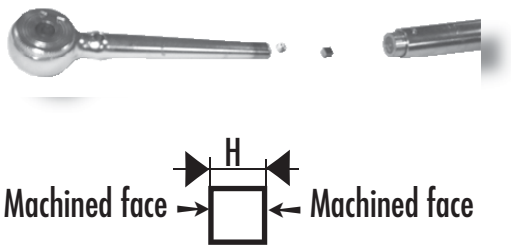


a) Align the wrench's crimped pin centrally on the drill and drill the pin.

WRENCHES	A	B
J./S.208 - J./S.208D	Ø 5,8	4

b) Remove the crimped pin using a drift punch.

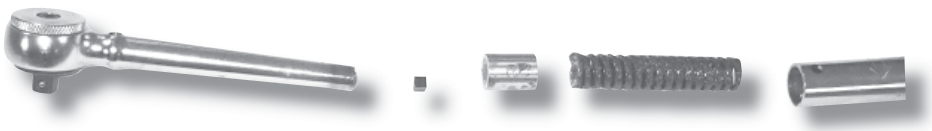
2.5- Remove the arm and the rocker.



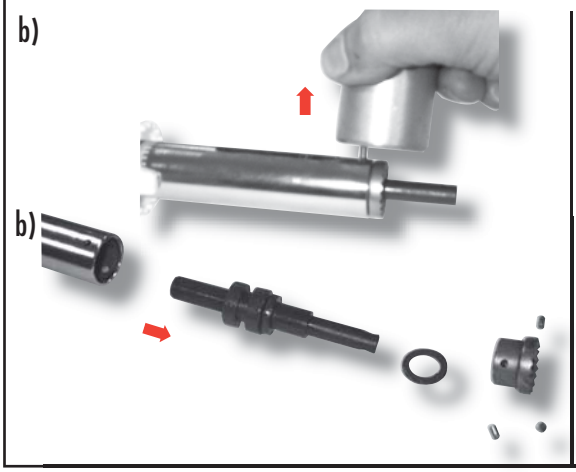
⚠ Measure the H dimension of the rocker.
This measurement will be used to choose the new rocker.

2.6- Empty the contents of the tube body.

Remove the internal components from the tube body.



2.7- Remove the setting screw assembly.

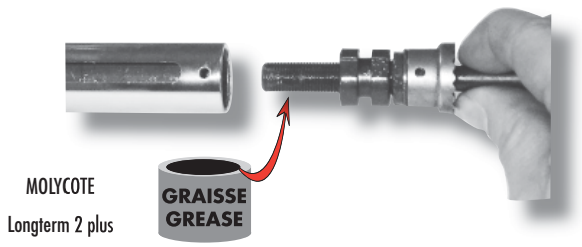


a) Remove both dowels using a magnet.

b) Remove the setting screw from the tube body.

3) PROCEDURE TO ASSEMBLE WRENCHES

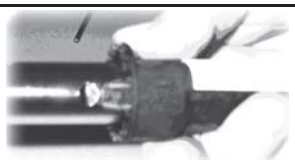
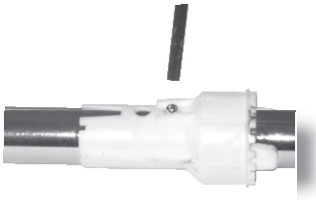
3.1- Fitting the internal mechanism

	Grease and then fit the setting screw.
	Align the holes and position the screw using the two locating dowels.
	Assemble in the following order: - space - compression spring - spring end-piece - 5.55 diameter ball - thruster after first having greased them.

3.2- Fitting the arm and rocker

See chapter 1, section 4: Procedure to change the rocker, from step 4 (choose the new rocker).

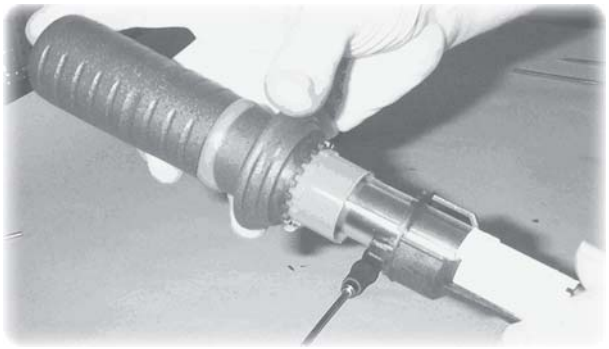
3.3- Fit the "vernier" assembly

	Place the FACOM front cover. If the window needs changing, see paragraph 3.4 below.
	Place the fixed handle.
	Clip the fixed handle on the tube body.
a)  b) 	a) Place the retainer b) Inserting the stud into the groove of the setting screw, using a drift punch to turn the setting screw.

3.4- Changing the window

	Remove the window to be changed and replace with a new one.

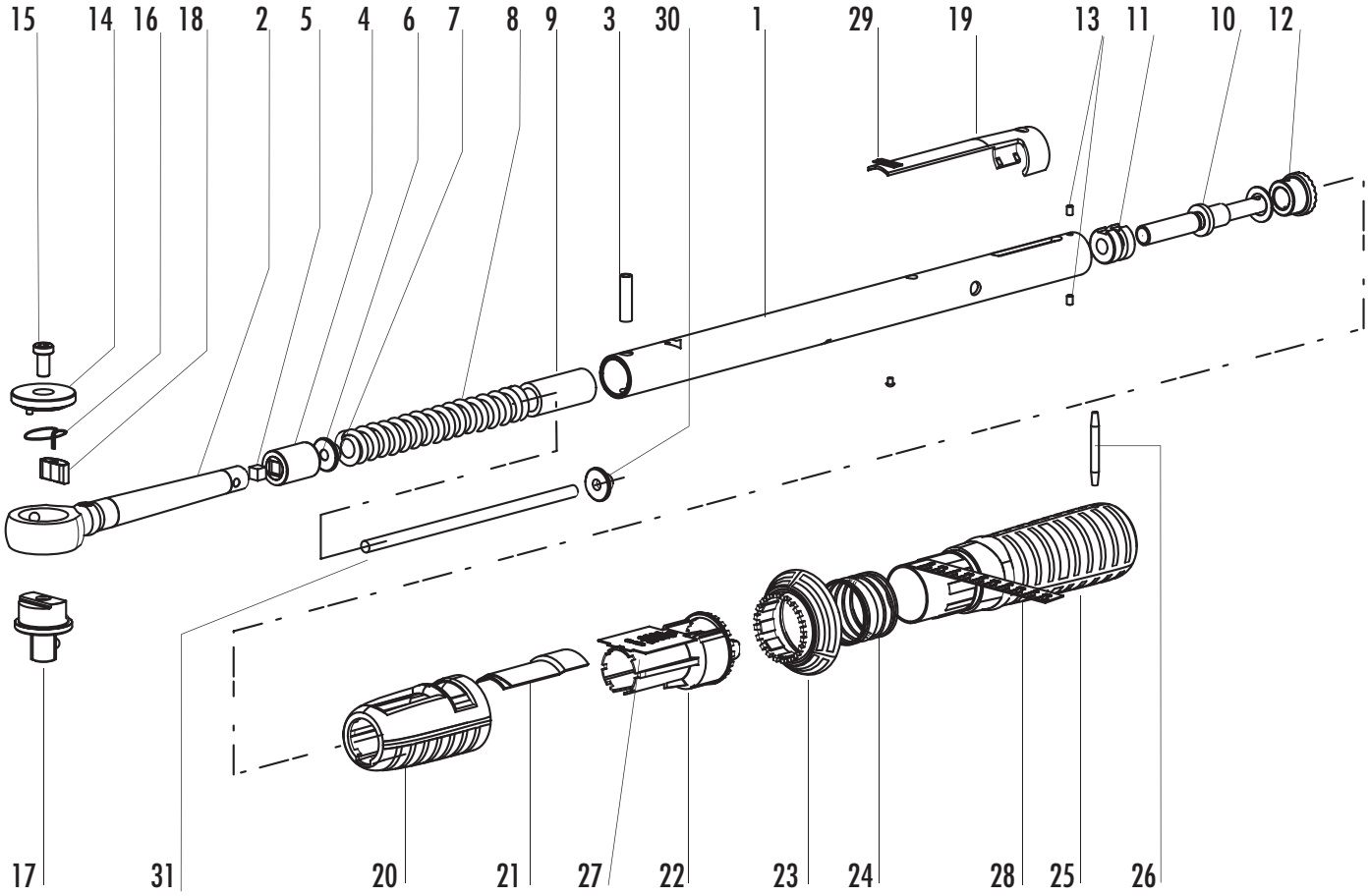
3.5- Fitting the handle assembly

	Fit the handle assembly: - handle - locking spring - locking ring
	Place the handle, assembly on the tube body.
	Insert the handle retaining pin, aligning with the hole in the setting screw.

4) PROCEDURE TO REPAIR RATCHETS

4.1- Unscrew the screw using a suitable screwdriver.
4.2- Remove and clean the heart-shaped spring, the finger and the rotor.
4.3- Replace any worn or broken parts.
4.4- Grease the contact areas of the finger and rotor with Molycote DX.
4.5- Refit the rotor, the finger and the heart-shaped spring.
4.6- Place the cap, inserting the lug in the heart-shaped spring.
4.7- Screw in the screw completely and then unscrew it by a quarter turn.
4.8- Check operation of the ratchet mechanism.

Repair of the ratchet assembly is carried out in the same way as for type 206 wrenches, described in the general manual entitled "Automatic setting and resetting torque wrenches (Repair)".

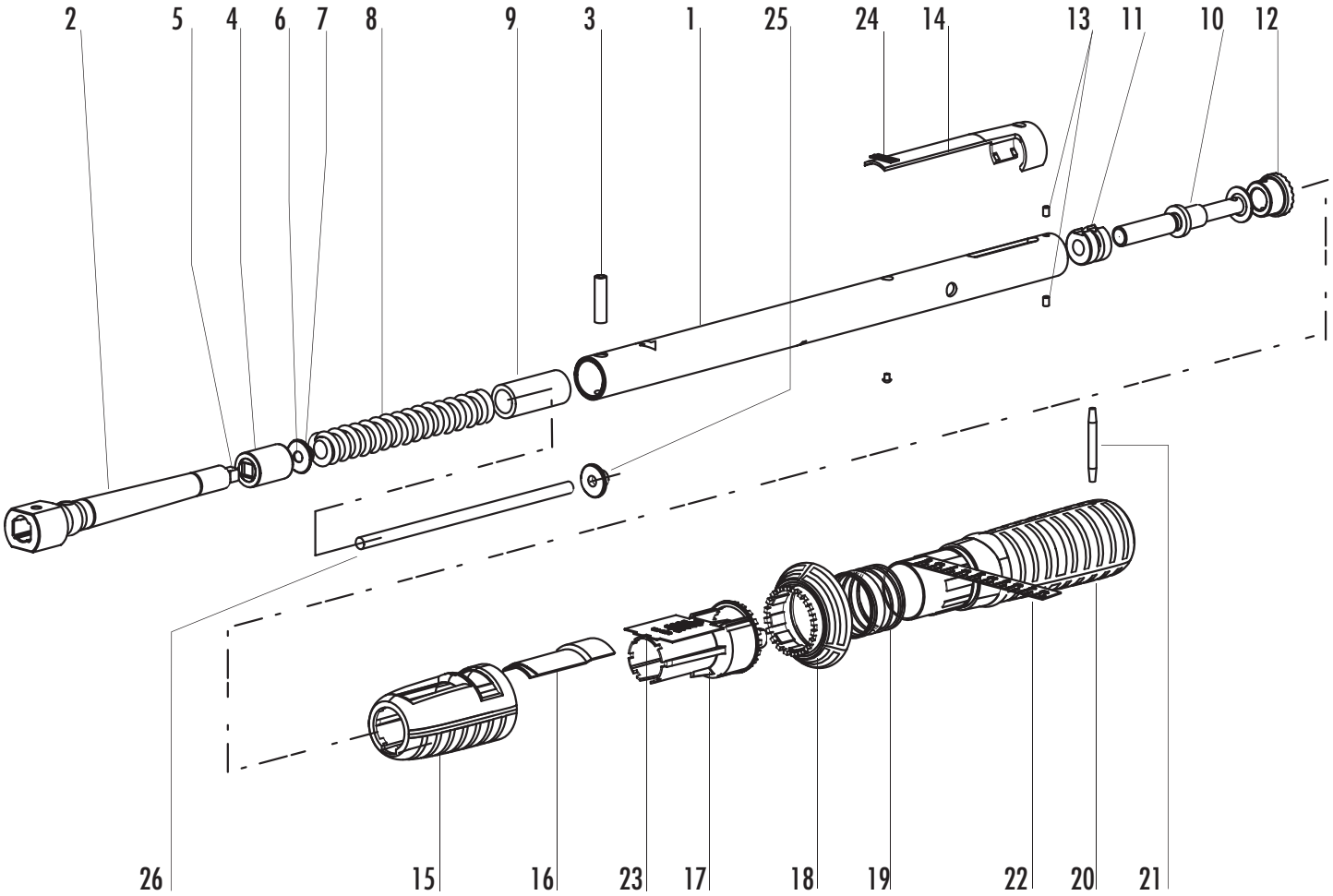


REPERE	REFERENCE OUTIL	H (mm)	REFERENCE BASCULEUR	REPERE	REFERENCE OUTIL	H (mm)	REFERENCE BASCULEUR
MARK	REFERENCE T OOL	H (mm)	REFERENCE ROCKER	MARK	REFERENCE T OOL	H (mm)	REFERENCE ROCKER
5	J.208-50	5,90	S.206-100-590	5	S.208-200	6,10	S.206-100-610
		6,00	S.206-100-600			6,20	S.206-100-620
		6,10	S.206-100-610			6,30	S.206-100-630
		6,20	S.206-100-620			6,40	S.206-100-640
	S.208-100	6,30	S.206-100-630		S.208-340	5,10	S.206-100-510
		6,40	S.206-100-640			5,20	S.206-100-520
		6,50	S.206-100-650			5,30	S.206-100-530
		6,60	S.206-100-660			5,40	S.206-100-540

5) Spare parts serie "208" wrenches

REPERE	DESIGNATION	DESIGNATION	REFERENCE				
			J.208-50	S.208-100	S.208-200	S.208-340	
1	Tube clé	Wrench tube	767-001CHR	767-002CHR	767-003CHR	767-004CHR	1
2	Bras cliquet	Arm ratchet	S.206-100-02	S.206-100-02	S.206-350-02	S.206-350-02	1
3	Axe	Pin	S.206-100-03	S.206-100-03	S.206-100-03	S.206-100-03	1
4	Poussoir	Thruster	S.325D4	S.325D4	S.325D4	S.325D4	1
5	Basculeur	Rocker	S.206-100-15	S.206-100-15	S.206-100-15	S.206-100-15	1
6	Bille	Ball	N411-25 RB.5,55	N411-25 RB.5,55	N411-25 RB.5,55	N411-25 RB.5,55	1
7	Embout ressort	Spring end piece	S.313-14	S.313-14	S.313-14	S.206-350-17	1
8	Ressort de pression	Compression spring	767-011	767-012	767-013	767-014	1
9	Entretoise	Spacer	767-110	767-111	767-111	767-112	1
10	Ensemble vis de commande	Control screw assembly	SP.15804	SP.15805	SP.15805	SP.15806	1
11							
12							
13	Pied	Pin	RC.3-5	RC.3-5	RC.3-5	RC.3-5	2
14	Chapeau inverseur	Reverse cap	S.151C2	S.151C2	S.151C2	S.151C2	1
15	Vis	Screw	S.151-05	S.151-05	S.151-05	S.151-05	1
16	Ressort en cœur	Spring (heart)	S.151-6	S.151-6	S.151-6	S.151-6	1
17	Rotor cliquet	Rotor ratchet	J.372-03	S.382-03	S.382-03	S.382-03	1
18	Doigt	Retriever	S.151-3	S.151-3	S.151-3	S.151-3	1
19	Clavette curseur	Slide key	767-042	767-042	767-042	767-042	1
20	Cache avant FACOM	FACOM front cover	767-045	767-045	767-045	767-045	1
21	Fenêtre	Window	767-043	767-043	767-043	767-043	1
22	Poignée fixe	Fixed handle	767-041	767-041	767-041	767-041	1
23	Bague de déverrouillage FACOM	FACOM locking ring	767-046	767-046	767-046	767-046	1
24	Ressort bague de verrouillage	Locking ring spring	767-029	767-029	767-029	767-029	1
25	Poignée grip tournante FACOM	Turning grip handle FACOM	767-044	767-044	767-044	767-044	1
26	Axe poignée	Handle pin	767-028	767-028	767-028	767-028	1
27	Etiquette vernier	Vernier label	767-035	767-035	767-034	767-033	1
28	Etiquette échelle graduée	Scale graduate label	767-050	767-051	767-052	767-053	1
29	Etiquette trait rouge	Red line label	767-126	767-126	767-126	767-126	1
30	Embout ressort	Spring en piece	-	-	-	S.206-350-17	1
31	Butée	Stop	-	-	-	767-128	1

5) Spare parts serie "208D" wrenches



REPERE	REFERENCE OUTIL	H (mm)	REFERENCE BASCULEUR	REPERE	REFERENCE OUTIL	H (mm)	REFERENCE BASCULEUR
MARK	REFERENCE T OOL	H (mm)	REFERENCE ROCKER	MARK	REFERENCE T OOL	H (mm)	REFERENCE ROCKER
5	J.208-50D	5,90	S.206-100-590	5	S.208-200D	6,10	S.206-100-610
		6,00	S.206-100-600			6,20	S.206-100-620
		6,10	S.206-100-610			6,30	S.206-100-630
		6,20	S.206-100-620			6,40	S.206-100-640
	S.208-100D	6,30	S.206-100-630		S.208-340D	5,10	S.206-100-510
		6,40	S.206-100-640			5,20	S.206-100-520
		6,50	S.206-100-650			5,30	S.206-100-530
		6,60	S.206-100-660			5,40	S.206-100-540

5) Spare parts serie "208D" wrenches

REPERE	DESIGNATION	DESIGNATION	REFERENCE				
			J.208-50D	S.208-100D	S.208-200D	S.208-340D	
1	Tube clé	Tube wrench	767-001CH	767-002CHR	767-003CHR	767-004	1
2	Bras	Arm	767-008	767-008	767-009U	767-009U	1
3	Axe	Pin	S.206-100-03	S.206-100-03	S.206-100-03	S.206-350-03	1
4	Poussoir	Thruster	S.325D4	S.325D4	S.325D4	S.325D4	1
5	Basculeur	Rocker	S.206-100-15	S.206-100-15	S.206-100-15	S.206-100-15	1
6	Bille	Ball	N411-25 RB.5,55	N411-25 RB.5,55	N411-25 RB.5,55	RB.5,55 RB.5,55	1
7	Embout ressort	Spring end piece	S.313-14	S.313-14	S.313-14	S.206-350-17	1
8	Ressort de pression	Compression spring	767-011	767-012	767-013	767-014	1
9	Entretoise	Spacer	767-110	767-111	767-111	767-112	1
10	Vis de réglage	Setting screw	767-021	767-019	767-019	767-020	1
11	Ecrou de réglage	Setting nut	767-024	767-022	767-022	767-023	1
12	Butée vis de réglage	Stop setting screw	767-017	767-017	767-017	767-017	1
13	Pied	Pin	RC.3-5	RC.3-5	RC.3-5	RC.3-5	2
14	Clavette curseur	Cursor key	767-042	767-042	767-042	767-042	1
15	Cache avant FACOM	FACOM front cover	767-045	767-045	767-045	767-045	1
16	Fenêtre	Window	767-043	767-043	767-043	767-043	1
17	Poignée fixe	Fixed handle	767-041	767-041	767-041	767-041	1
18	Bague de déverrouillage FACOM	Unlocking ring FACOM	767-046	767-046	767-046	767-046	1
19	Ressort bague de déverrouillage	Unlocking ring spring	767-029	767-029	767-029	767-029	1
20	Poignée grip tournante FACOM	Turning grip handle FACOM	767-044	767-044	767-044	767-044	1
21	Axe poignée	Handle pin	767-028	767-028	767-028	767-028	1
22	Etiquette vernier	Vernier label	767-035	767-035	767-034	767-033	1
23	Etiquette échelle graduée	Scale graduate label	767-037	767-051	767-052	767-053	1
24	Etiquette trait rouge	Red line label	767-126	767-126	767-126	767-126	1
25	Rondelle de frottement	Scraping washer	767-060	767-060	767-060	767-060	1
26	Entretoise butée	Stop spacer	-	-	-	767-128	1

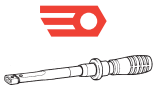
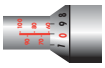
CHAPTER 5
Automatic setting and resetting torque wrenches

Serie 248D

CHAPTER 5: Serie "248D" TORQUE WRENCHES

1) Tools and accessories

Série " 248D "

	Nm mini maxi	 Nm		 mm						
R.248-25D	5 ➡ 25	-	-	9 x 12	R. 372	1/4"	R. 373	S.305P	10 7 - 19 mm 1/4 - 3/4''	12 7 - 19 mm 1/4 - 3/4''
J.248-50D	10 ➡ 50	-	-	9 x 12	J.372	3/8"	J.373			
S.248-100D	20 ➡ 100	-	-	9 x 12	S.372	3/8"	S.373			
S.248-200D	40 ➡ 200	-	-	14 x 18					11 13 - 32 mm 1/2 - 1''7/16	13 13 - 36 mm 1/2 - 1''7/16
S.248-340D	60 ➡ 340	-	-	14 x 18	S.382	1/2"	S.383			

2) CHECKING ACCURACY

2.1) Setup:

The accuracy of the wrench will be measured using the accessory described in chapter 3, section 1.
Series 248D wrenches have a notch on the handle indicating where the force is to be applied.

2.2) Testing the wrench:

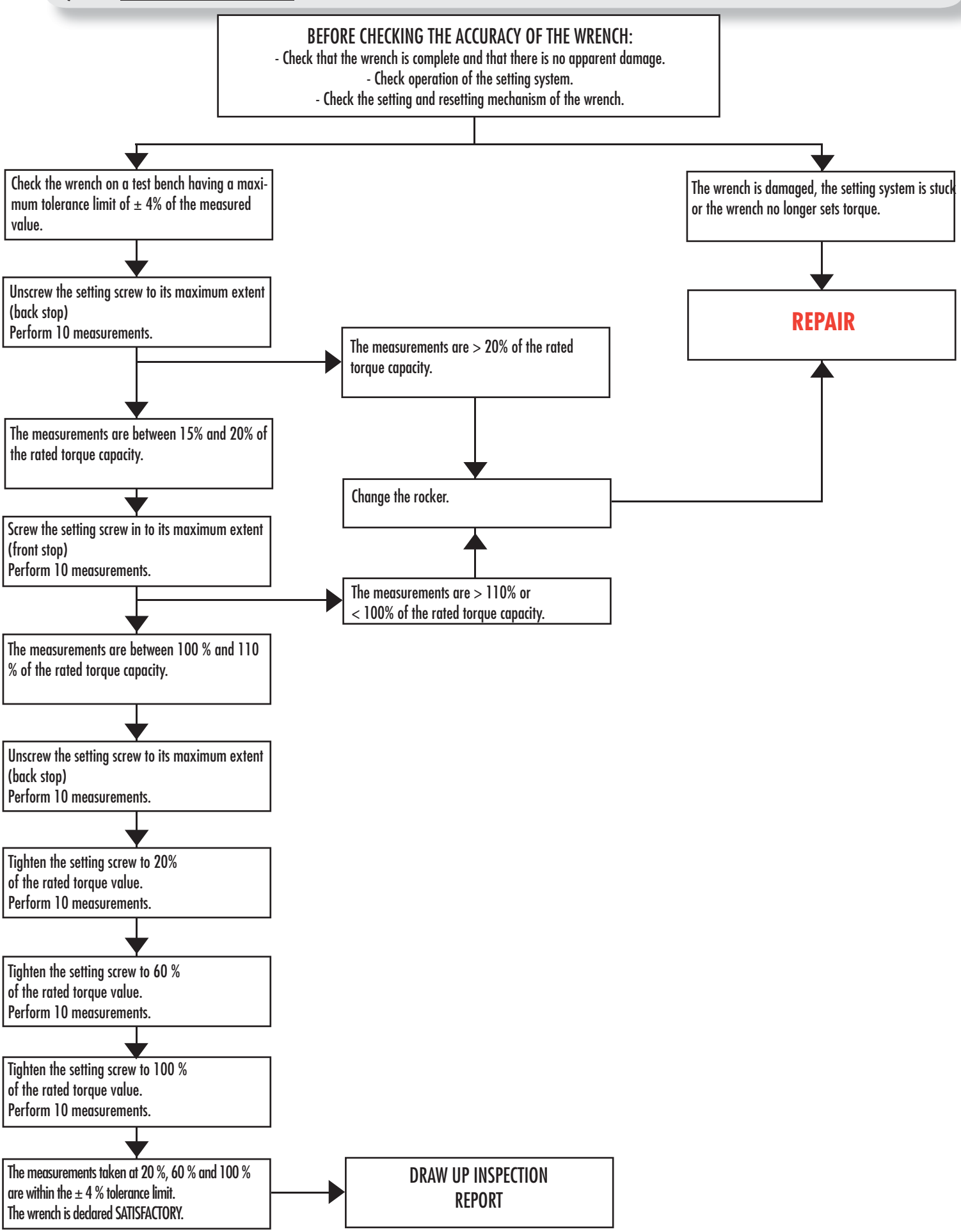
- The wrench must be tested by following the procedure described in chapter 1: Review of ISO 6789.

a) - 10 preload operations at 100% of the rated torque capacity without taking measurements.
b) - 10 measurements at 20% of the rated torque capacity.
c) - 10 measurements at 60% of the rated torque capacity.
d) - 10 measurements at 100% of the rated torque capacity.

- If the tolerance limits of the wrench match those indicated in the table below (that is, ± 4% of the value set at 20%, 60% and 100% of the rated torque capacity), the wrench is declared SATISFACTORY, and the test report can be produced.

REFERENCE	% OF TORQUE CAPACITY	Nominal wrench in N.m	The wrench is declared "satisfactory" between these values		
R.248-25	20% 60% 100%	5 15 25	4,8 14,4 24	to to to	5,2 15,6 26
J.248-50D	20% 60% 100%	10 30 50	9,6 28,8 48	to to to	10,4 31,2 52
S.248-100D	20% 60% 100%	20 60 100	19,2 57,6 96	to to to	20,8 62,4 104
S.248-200D	20% 60% 100%	40 120 200	38,4 115,2 192	to to to	41,6 124,8 208
S.248-340D	20% 60% 100%	60 200 340	57,6 192 326,4	to to to	62,4 208 353,6

3) ADJUSTING THE WRENCHES

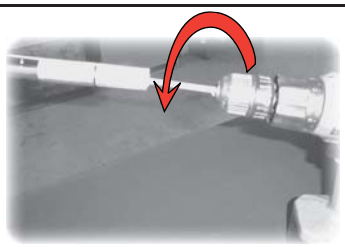


1) PROCEDURE TO CHANGE THE ROCKER.

The wrench has been inspected and adjusted according to the procedure detailed in the manual entitled "Checking accuracy and adjusting wrenches" but it is still outside the tolerance limits at 100% of its torque capacity. You must partially dismantle the wrench to change the rocker.

1.1- Set the wrench to its minimum setting (at the limit stop)

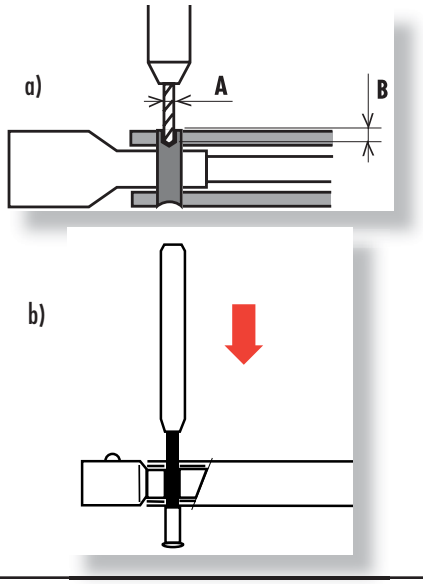
2



1) Remove the cap

2) Fully undo the setting screw (back limit stop)

1.2- Remove the crimped pin

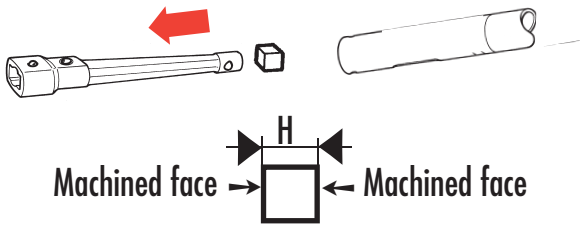


a) Align the wrench's crimped pin centrally on the drill and drill the pin.

WRENCHES	A	B
J./S.248D	Ø 5,8	4

b) Remove the crimped pin using a drift punch.

1.3- Remove the arm and the rocker

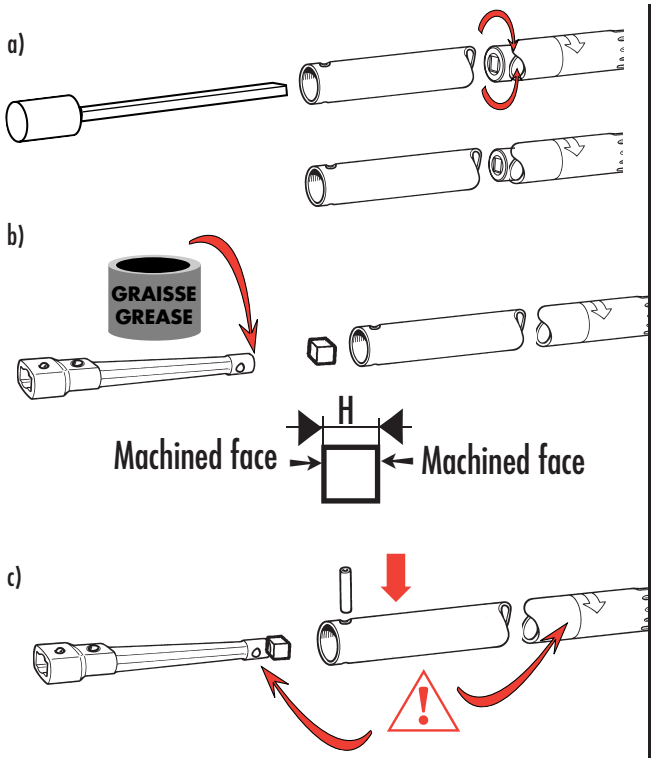


⚠ Measure the H dimension of the rocker.
This measurement will be used to choose the new rocker.

1.4- Choose the new rocker.

- If the wrench at 100% of its torque capacity is > +4%: from the repair kit, select the rocker whose H dimension is the next size up.
- If the wrench at 100% of its torque capacity is < - 4%: from the repair kit, select the rocker whose H dimension is the next size down.

1.5- Refit the arm and the rocker.



a) Check that all the components are correctly placed in the tube body.
And position the thruster at the entrance of the tube in such a way as to see its orientation.

b) Apply MOLYKOTE Multilub grease on the end of the arm to hold the rocker.

c) Fit the arm + rocker assembly into place and insert a new pin from the repair kit.

Pay attention to the orientation.

d) Check the torque-setting operation of the wrench.

1.6- Presetting the wrenches

1.6.1 Remove the cap from the back of the wrench.
1.6.2 Fully unscrew the screw (back limit stop).
Carry out ten torque-setting operations before taking measurements.

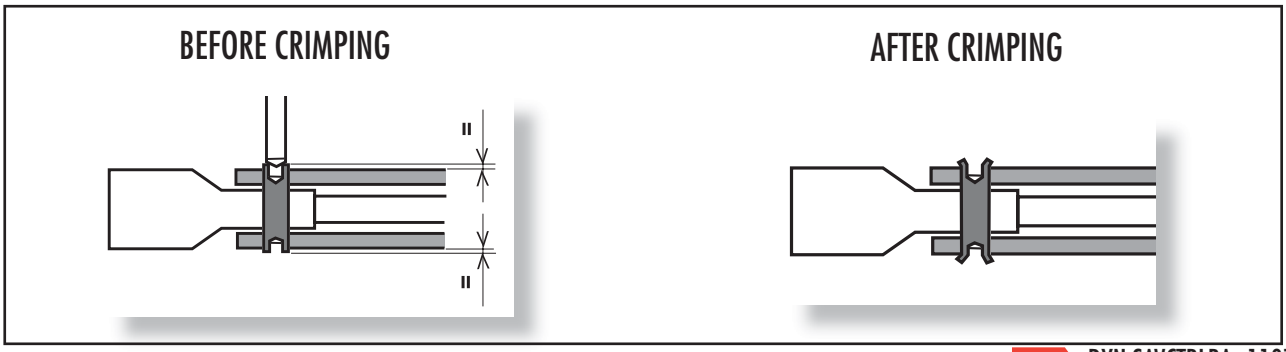
Between 10% and 20%	> 20%
Continue the procedure.	CHANGE THE ROCKER

1.6.2 Fully screw in the screw (front limit stop).
Carry out ten torque-setting operations before taking measurements.

Between 100% and 110%	> 110% or < 100%
Continue the procedure.	CHANGE THE ROCKER

1.6.2 Fully unscrew the screw (back limit stop).
Carry out ten torque-setting operations before taking measurements.
1.6.5 Screw in to 60% of the wrench's rated torque capacity.
Carry out ten torque-setting operations before taking measurements.
1.6.2 Fully screw in the screw (front limit stop).
Carry out ten torque-setting operations before taking measurements.
1.6.7 Produce the Test Report.
1.6.8 Refit the cap on the end of the wrench.

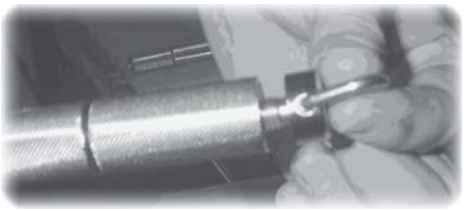
1.7- Crimping the pin



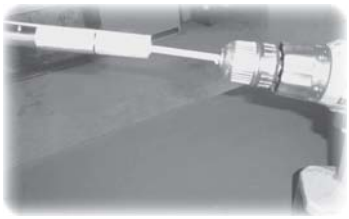
2) PROCEDURE TO DISMANTLE WRENCHES

The wrench no longer sets torque; the arm is broken; the setting system is stuck or not working properly; after changing the rocker the wrench is still out of tolerance. You must completely dismantle the wrench.

2.1- Set the wrench to its minimum setting (at the limit stop)

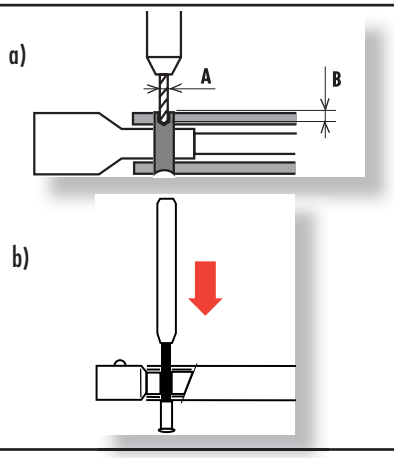


1) Remove the cap.



2) Fully unscrew the setting screw.

2.2- Remove the crimped pin

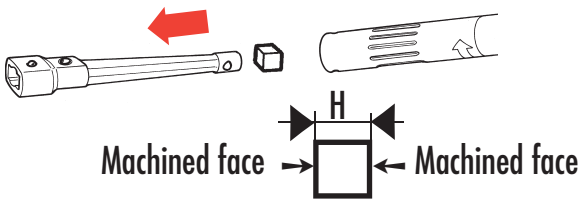


a) Align the wrench's crimped pin centrally on the drill and drill the pin.

WRENCHES	A	B
J./S.248D	Ø 5,8	4

b) Remove the crimped pin using a drift punch.

2.3- Remove the arm and the rocker



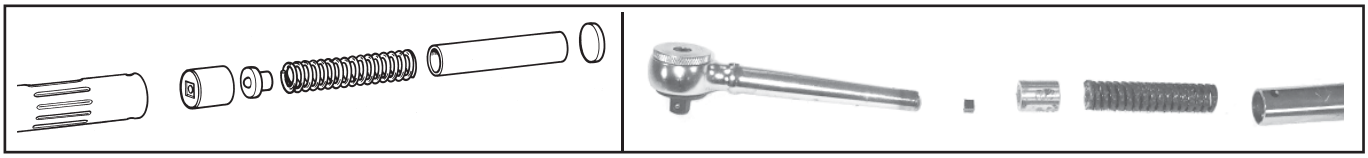
⚠ Measure the H dimension of the rocker.
This measurement will be used to choose the new rocker.

2.4- Dismantling the setting screw subassembly

Unscrew the setting screw limit stop using a suitable screwdriver.

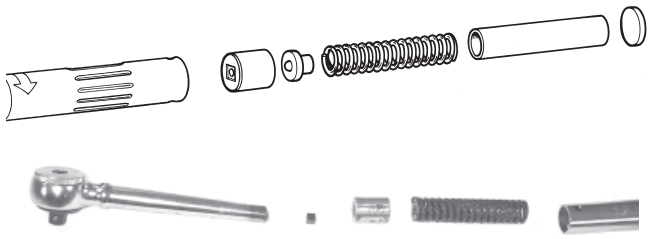
Unscrew the setting screw.

2.5- Empty the tube body



3) PROCEDURE TO ASSEMBLE WRENCHES

3.1- Fitting the internal mechanism

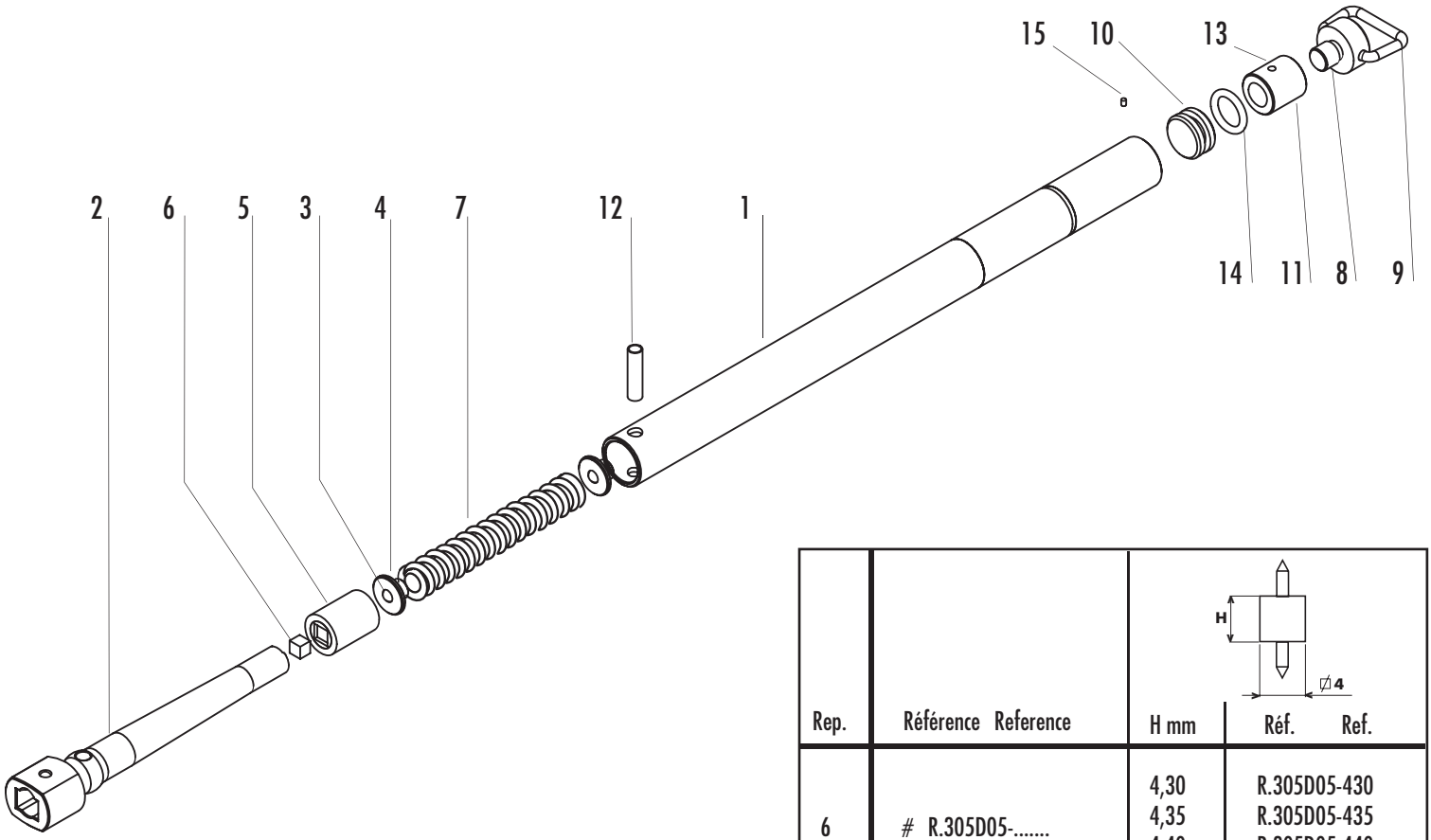
	Grease the tube and screw the setting screw.
	Screw in the setting screw limit stop.
	Assemble in the following order: - space - compression spring - spring end-piece - 5.55 diameter ball - thruster after first having greased them.

3.2- Fitting the arm and rocker

See chapter 1: Procedure to change the rocker, from step 1.4 (choose the new rocker).

The cap will be refitted last of all, after having adjusted the wrench. (To have access to the setting screw).

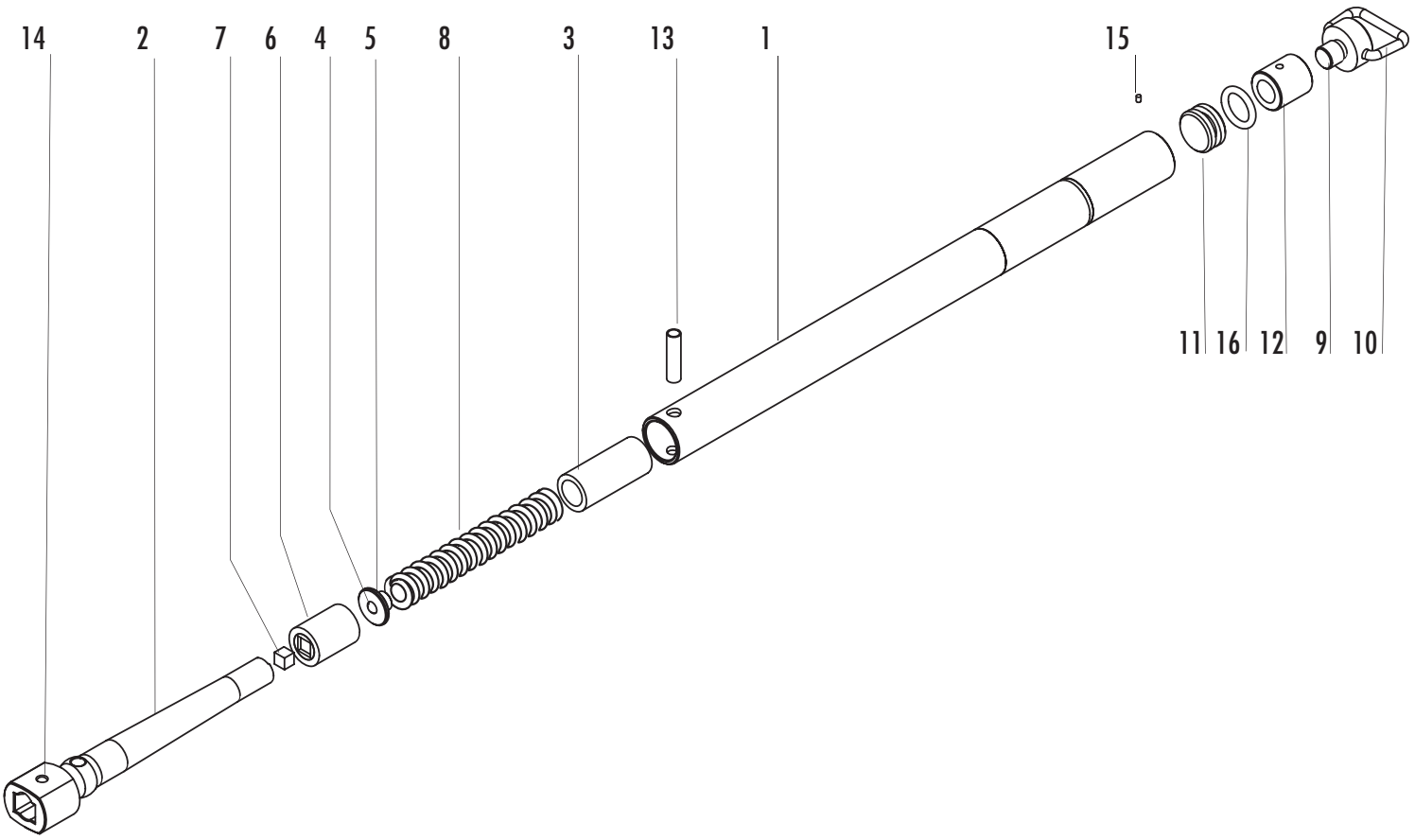
5) Spare parts R.248-25D wrench



Rep.	Référence Reference	H mm	Réf. Ref.
6	# R.305D05-.....	4,30	R.305D05-430
		4,35	R.305D05-435
		4,40	R.305D05-440
		4,45	R.305D05-445
		4,50	R.305D05-450

REPERE	DESIGNATION	DESIGNATION	REFERENCE R.248-25D	
1	Tube corps	Tube body	914-013CHR	1
2	Bras attachement	Arm	914-010UHF	1
3	Bille	Ball	N411-7 RB.3	1
4	Embout ressort	Spring end piece	R.305D20	2
5	Poussoir	Thruster	R.344D06	1
6	Basculeur	Rocker	R.305D05-01	1
7	Ressort de pression	Compression spring	A.202B01-05	1
8	Ensemble bouchon	Cap assembly	R.345DA03	1
9				
10	Vis de réglage	Setting screw	914-023	1
11	Butée vis de réglage	Setting screw stop	R.345D12	1
12	Axe	Pin	R.305C03	1
13	Goupille ISO8742 1,5x10	Pin ISO8742 1,5x10	R.344D07	1
14	Joint torique	O-Ring	8.9-2.7	1
15	Vis	Ssrew	STHc,M2,5-4,45BP	1

5) Spare parts serie J,S..248D wrenches



REPERE	REFERENCES OUTILS	H (mm) H(mm) ⌐ 6	REFERENCE BASCULEUR	REPERE	REFERENCE OUTIL	H (mm) H(mm) ⌐ 6	REFERENCE BASCULEUR
MARK	REFERENCE TOOL	H (mm) H(mm) ⌐ 6	REFERENCE ROCKER	MARK	REFERENCE TOOL	H (mm) H(mm) ⌐ 6	REFERENCE ROCKER
7	J.248-50D	6,20	S.206-100-620	7	S.248-200D	6,20	S.206-100-620
	S.248-100D	5,50	S.206-100-550		S.248-350D	5,50	S.206-100-550

5) Spare parts serie J,S..248D wrenches

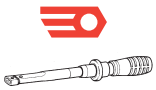
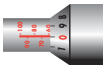
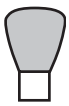
REPERE	DESIGNATION	DESIGNATION	REFERENCE				
			J.248-50D	S.248-100D	S.248-200D	S.248-340D	
1	Tube corps	Tube body	767-098CHR	767-099CHR	767-100CHR	767-101CHR	1
2	Bras attachement	Arm	767-008U	767-008U	767-009U	767-009U	1
3	Entretoise	Spacer	767-111	767-096	767-096	767-097	1
4	Bille	Ball	N411-25 RB.5,55	N411-25 RB.5,55	N411-25 RB.5,55	N411-25 RB.5,55	1
5	Embout ressort	Spring end piece	S.313-14	S.313-14	S.313-14	S.206-350-17	1
6	Poussoir	Thruster	S.325D4	S.325D4	S.325D4	S.325D4	1
7	Basculeur	Rocker	S.206-100-15	S.206-100-15	S.206-100-15	S.206-100-15	1
8	Ressort de pression	Compression spring	767-011	767-012	767-013	767-014	1
9	Bouchon	Cap	S.365DA03	S.365DA03	S.365DA03	S.365DA03	1
10							
11	Vis de réglage	Setting screw	767-090	767-090	767-090	767-090	1
12	Butée vis de réglage	Setting screw stop	S.365D12	S.365D12	S.365D12	S.365D12	1
13	Axe	Pin	S.206-100-03	S.206-100-03	S.206-100-03	S.206-100-03	1
14	Bille	Ball	N411-25 RB.5,55	N411-25 RB.5,55	N411-25 RB.5,55	N411-25 RB.5,55	1
15	Goupille	Splined pin	GOUP.2x4	GOUP.2x4	GOUP.2x4	GOUP.2x4	1
16	Joint torique	O-Ring	-	-	-	13 x 3	1

CHAPTER 6
Automatic setting and resetting torque wrenches

Serie 306D

1) Tools and accessories

Série " 306D "

	Nm mini maxi	 Nm		 mm						
R.306-25D	5 ➡ 25	0,1	-	9 x 12	R.372	1/4"	R.373		10 7 - 19 mm 1/4 - 3/4''	12 7 - 19 mm 1/4 - 3/4''
J.306-50D	10 ➡ 50	1	-	9 x 12	J.372	3/8"	J.373	S.305P		
S.306-100D	20 ➡ 100	1	-	9 x 12	S.372	1/2"	S.373			
S.306-200D	40 ➡ 200	1	-	14 x 18	S.382	1/2"	S.383		11 13 - 32 mm 1/2 - 1''7/16	13 13 - 36 mm 1/2 - 1''7/16
S.306-350D	70 ➡ 350	2	-	14 x 18		1/2"				

2) CHECKING ACCURACY

2.1) Setup:

The accuracy of the wrench will be measured using the accessory described in chapter 4, section 1.
Series 306D wrenches have a notch on the handle indicating where the force is to be applied.

2.2) Testing the wrench:

- The wrench must be tested by following the procedure described in chapter 1: Review of ISO 6789.

a) - 10 preload operations at 100% of the rated torque capacity without taking measurements.
b) - 10 measurements at 20% of the rated torque capacity.
c) - 10 measurements at 60% of the rated torque capacity.
d) - 10 measurements at 100% of the rated torque capacity.

- If the tolerance limits of the wrench match those indicated in the table below (that is, ± 4% of the value set at 20%, 60% and 100% of the rated torque capacity), the wrench is declared SATISFACTORY, and the test report can be produced.

REFERENCE	% OF TORQUE CAPACITY	Nominal wrench in N.m	The wrench is declared "satisfactory" between these values		
R.306-25D	20% 60% 100%	5 15 25	4,80 14,40 24,00	to to to	5,20 15,60 26,00
J.306-50D	20% 60% 100%	10 30 50	9,60 28,80 48,00	to to to	10,40 31,20 52,00
S.306-100D	20% 60% 100%	20 60 100	19,20 57,60 96,00	to to to	20,80 62,40 104,00
S.306-200D	20% 60% 100%	40 120 200	38,40 115,20 192,00	to to to	41,60 124,80 208,00
S.306-350D	20% 60% 100%	70 210 350	67,20 201,60 336,00	to to to	72,80 218,40 364,00

3) ADJUSTING THE WRENCHES

BEFORE CHECKING THE ACCURACY OF THE WRENCH:
- Check that the wrench is complete and that there is no apparent damage.
- Check operation of the setting system.
- Check the setting and resetting mechanism of the wrench.

Check the wrench on a test bench having a maximum tolerance limit of ± 1 % of the measured value.

Set the wrench to 100 % of the rated torque capacity.
Carry out five torque-setting operations without taking measurements.

Set the wrench to 20 % of the rated torque capacity.
Perform 5 successive measurements.

The 5 measurement must be within ± 4% of the set value.

OUT OF TOLERANCE → Wrench adjusted within the ± 4 % tolerance limits.

1- Remove the pin. (see 1)
2- Remove the handle. (see 2)
3- Use a 2 mm hex key to loosen the set screw. (see 3)
4- Using a screwdriver, screw in to increase the torque, unscrew to reduce the torque. (see 4)
5- Adjust the 20 % setting so that it is as close as possible to the rated value. Carry out five torque-setting operations before taking measurements.
6- Set the wrench to 100 % of capacity and carry out ten torque-setting operations.
7- Take five measurements at 100 % of the rated torque capacity.
8- Set the wrench to 20 % of capacity and take five measurements.

All measurements are within tolerance limits.
If not, repeat from step 4.

The wrench remains Out of Tolerance → REPAIR

Tighten the set screw.
Refit the handle.
Refit the pin.

Set the wrench to 60 % of the rated torque capacity.
Perform 5 successive measurements.

The 5 measurement must be within ± 4% of the set value.

OUT OF TOLERANCE

Set the wrench to 100 % of the rated torque capacity.
Perform 5 successive measurements.

The 5 measurement must be within ± 4% of the set value.

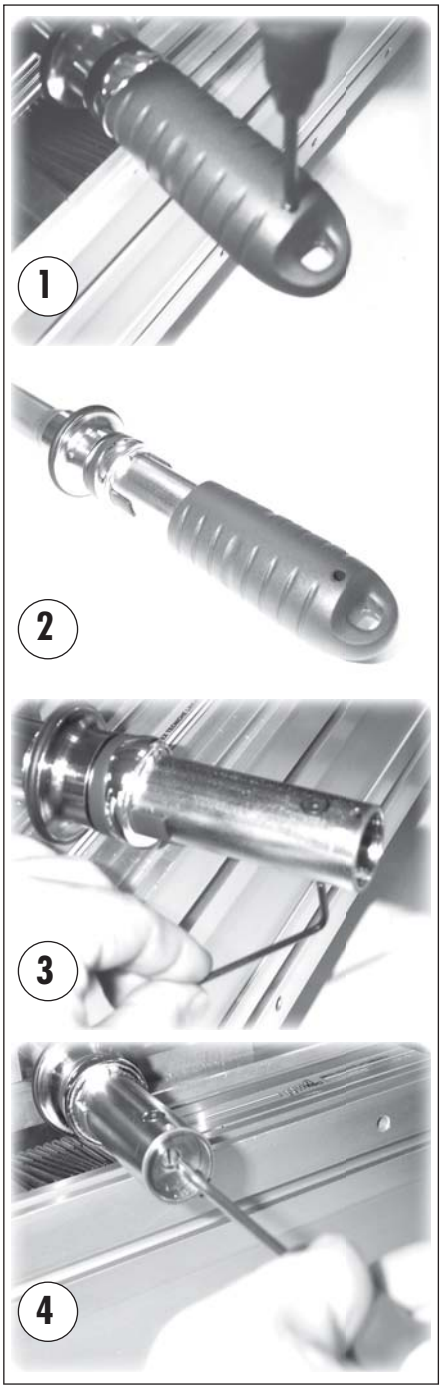
OUT OF TOLERANCE

The measurements taken at 20 %, 60 % and 100 % are within the ± 4 % tolerance limit.
The wrench is declared SATISFACTORY.

DRAW UP INSPECTION REPORT

The wrench is damaged, the setting system is stuck or the wrench no longer sets torque.

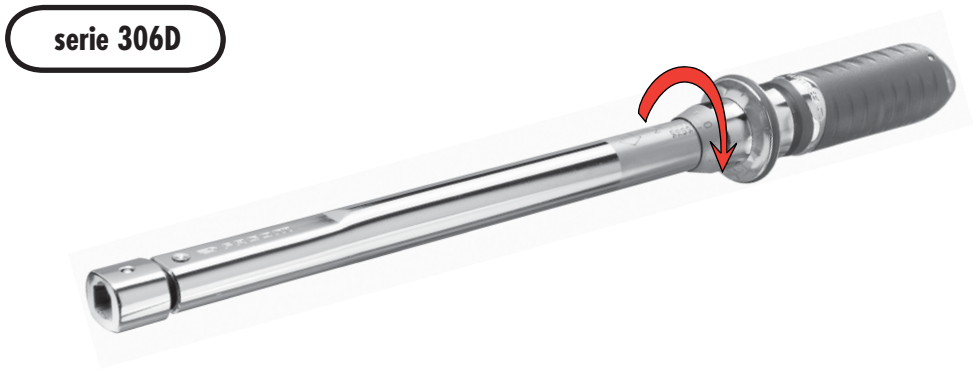
REPAIR



1) PROCEDURE TO CHANGE THE ROCKER.

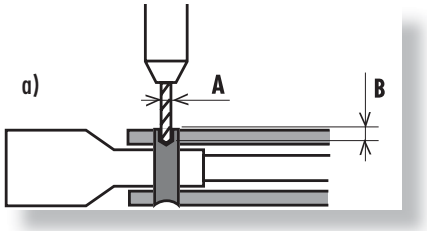
The wrench has been inspected and adjusted according to the procedure detailed in the manual entitled "Checking accuracy and adjusting wrenches" but it is still outside the tolerance limits at 100% of its torque capacity. You must partially dismantle the wrench to change the rocker.

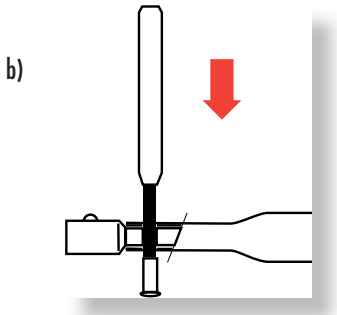
1.1- Set the wrench to its minimum setting (at the limit stop)



Set the vernier to wrench's maximum rated torque capacity. (at the back limit stop).

1.2- Remove the crimped pin



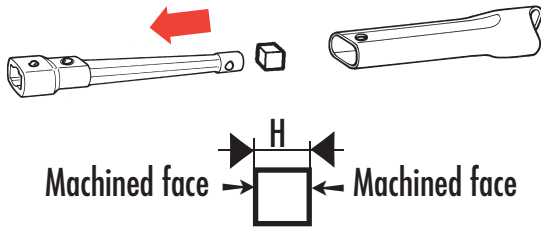


a) Align the wrench's crimped pin centrally on the drill and drill the pin.

WRENCHES	A	B
R.306D	Ø 3,8	3
J,S.306D	Ø 5,8	4

b) Remove the crimped pin using a drift punch.

1.3- Remove the arm and the rocker

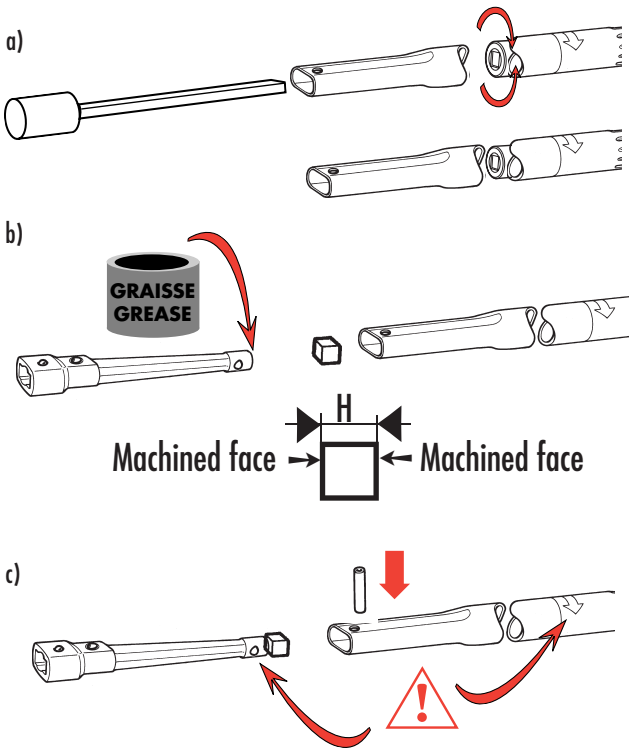


Measure the H dimension of the rocker.
This measurement will be used to choose the new rocker.

1.4- Choose the new rocker

- If the wrench at 100% of its torque capacity is > +4%: from the repair kit, select the rocker whose H dimension is the next size up.
- If the wrench at 100% of its torque capacity is < - 4%: from the repair kit, select the rocker whose H dimension is the next size down.

1.5- Refit the arm and the rocker



a) Check that all the components are correctly placed in the tube body.
And position the thruster at the entrance of the tube in such a way as to see its orientation.

b) Apply MOLYKOTE Multilub grease on the end of the arm to hold the rocker.

c) Fit the arm + rocker assembly into place and insert a new pin from the repair kit.

Pay attention to the orientation.

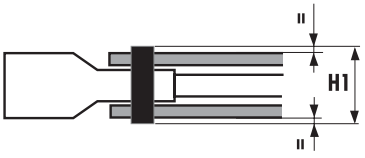
d) Check the torque-setting operation of the wrench.

1.6- Presetting the wrenches

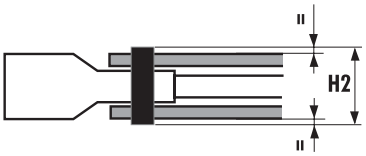
See adjustment procedure for series 308D wrenches. (manual entitled "Checking accuracy and adjusting wrenches", chapter 3, section 3).

1.7- Crimping the pin.

BEFORE CRIMPING



AFTER CRIMPING



Serie	Wrenches	H1	Serie	Wrenches	H2
306	J and S	19,5 ±0,1	306	J et S	19,2 ±0,1
	K	27 ±0,1		K	26,7 ±0,1

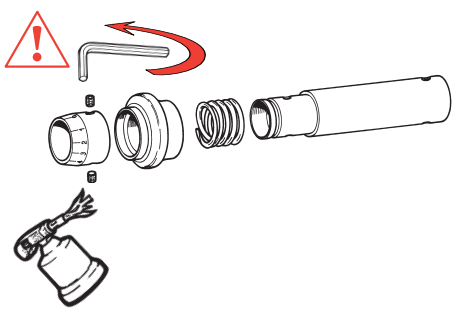
2) PROCEDURE TO DISMANTLE WRENCHES

The wrench no longer sets torque; the arm is broken; the setting system is stuck or not working properly; after changing the rocker the wrench is still out of tolerance. You must completely dismantle the wrench.

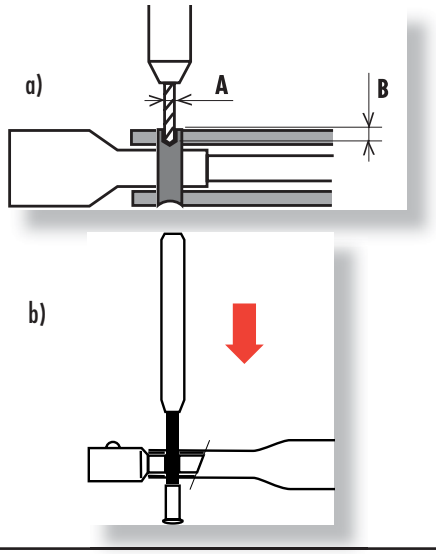
2.1- Removing the plastic handle.

	Remove the splined pin using a drift punch.
	Remove the plastic handle.
	Remove the FACOM ring.
	Remove the plastic ring.

2.2- Remove the "vernier" assembly.

	If necessary (bad functioning of the ring) ⚠ Heat the hex screw to assist removal. Remove the components from the handle tube.

2.3- Remove the crimped pin

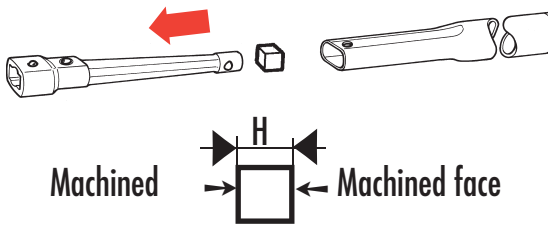


a) Align the wrench's crimped pin centrally on the drill and drill the pin.

WRENCHES	A	B
R.306D, R.306U	Ø 3,8	3
J,S.306D, J,S.306R, J,S.306U	Ø 5,8	4

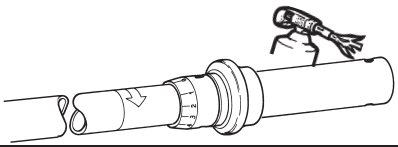
b) Remove the crimped pin using a drift punch.

2.4- Remove the arm and the rocker



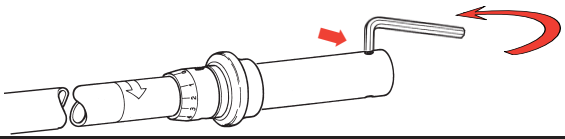
Measure the H dimension of the rocker.
This measurement will be used to choose the new rocker.

2.5-



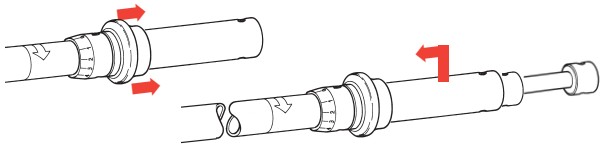
Heat the high-strength threadlocked countersunk hexagon head screw.

2.6-



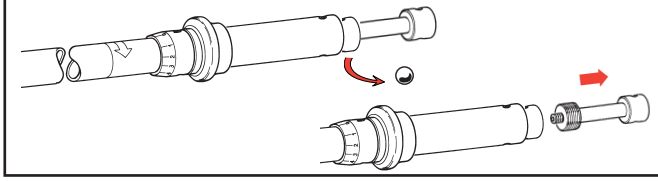
Use hex key to undo the screw.

2.7-



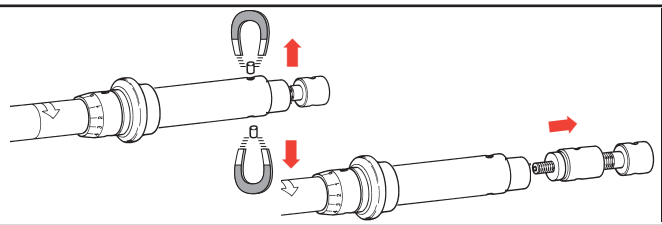
Pull the unlocking ring and push the handle assembly towards the front of the wrench.

2.8- Dismantling setting screw subassemblies
Procedure for series "R" wrenches

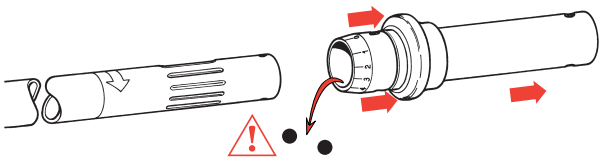


Remove the ball and unscrew the setting screw assembly.

Procedure for series "J, S, K" wrenches

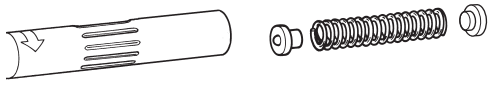
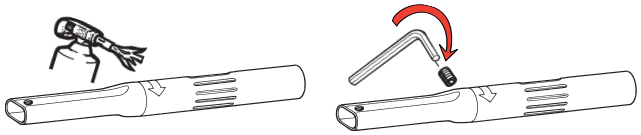
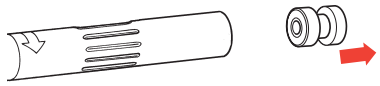
	Remove the locating dowels using a magnet and pull out the setting screw assembly.

2.9-

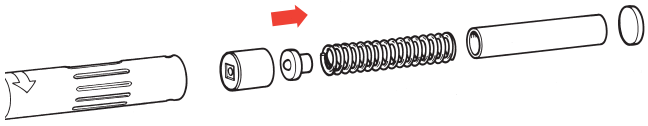
	Pull the unlocking ring and remove the setting handle assembly. ⚠ WATCH OUT for the balls

2.10- Empty the tube

Procedure for series "R" wrenches

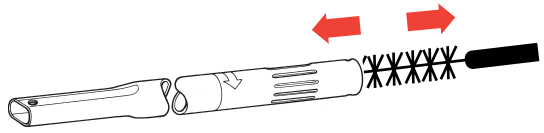
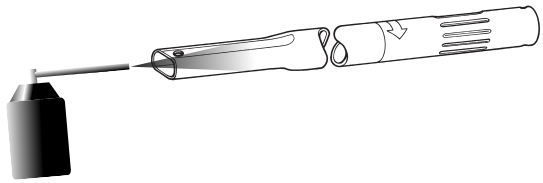
	From the tube, pull out the spring and its end-pieces. ⚠ KEEP the parts for reassembly in a safe place.
	Heat the high-strength threadlocked screw and use a hex key to unscrew it.
	Pull out the thruster.

Procedure for series "J, S, K" wrenches

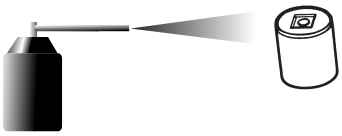
	From the tube, pull out the disc, the spacer, the spring and its end-piece, and the thruster. ⚠ KEEP the parts for reassembly in a safe place.

3- CHECKING AND PREPARING THE PARTS BEFORE ASSEMBLY

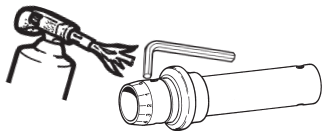
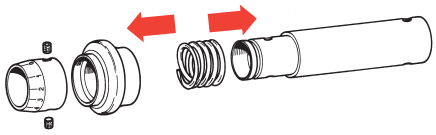
3.1- Tube

	Degrease the tube.
	When dried, spray the inside of the tube (arm end) with "TEFLISS2". Leave it to dry for at least 15 minutes.

3.2- Thruster

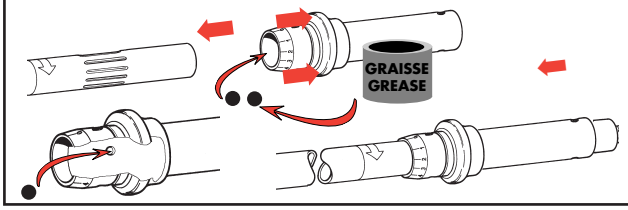
	Obtain a new thruster* and spray it with "TEFLISS2". Leave it to dry for at least 15 minutes.

3.3- Setting handle assembly, if the ring does not unlock properly

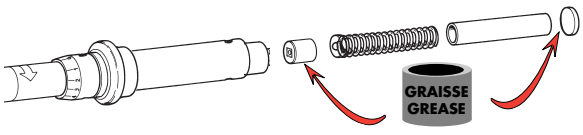
	Heat the two high-strength threadlocked screws and use a hex key to unscrew them.
	- Remove the vernier, locking ring and spring. - Reassemble using a new spring. - Do not glue the new screws*. - The screws will be glued after fitting the handle to the tube.

4- PROCEDURE TO ASSEMBLE WRENCHES

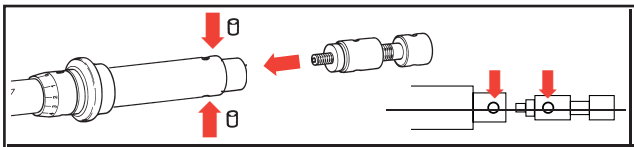
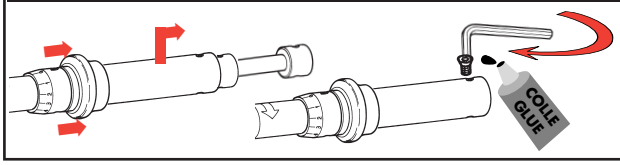
4.1-

	Fit the setting handle to the tube. - Apply a drop of MOLYKOTE Multilub grease to the balls. - Place the balls in the two holes inside the handle while pulling the unlocking ring. - Slide the setting handle over the tube.

4.2-

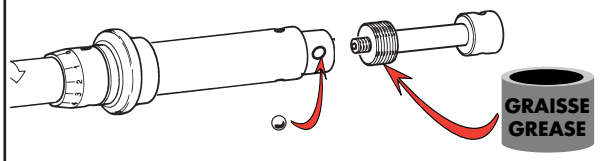
	- Grease the new thruster* with MOLYKOTE Longterm and slide it into the tube. - Fit the spring assembly with its end-piece, the spacer and the disc bonded to the spacer with a little MOLYKOTE Multilub grease.

4-3- Fitting the setting screw subassemblies
Series "J, S" wrenches

	- Fit the setting screw, lining up its holes with those on the tube and insert the locating dowels.
	- Pull the unlocking ring and position the setting handle with its holes aligned. Apply a drop of high-strength threadlock to the new screws* and then screw them in.

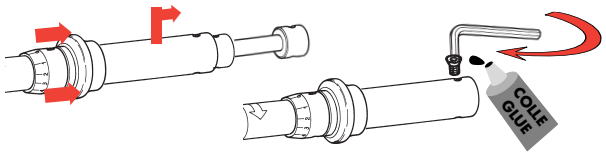
* **Individual parts:** Refer to the manual setting out the part references according to wrench type.

4.4- Series "R" wrenches



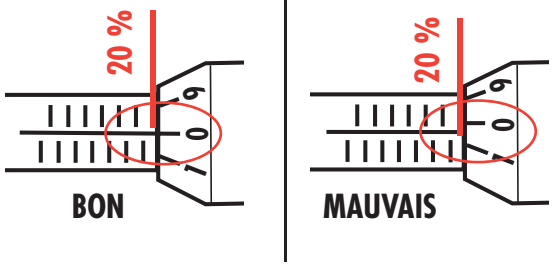
- Grease the setting screw and screw it into the tube.
(Screw it in past the hole in which the ball sits)

- Insert the ball.



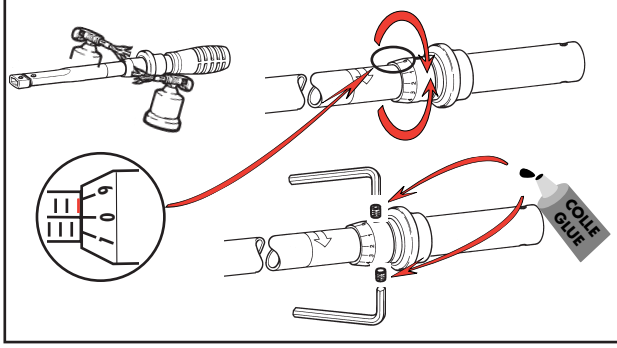
- Pull the unlocking ring and position the setting handle with its holes aligned.
- Apply a drop of high-strength threadlock to the new screw* and then screw it in.

4.5-



- Set the vernier to 20% of its rated torque capacity.

- Check that the vernier's zero mark lines up with the graduation scale line on the tube.



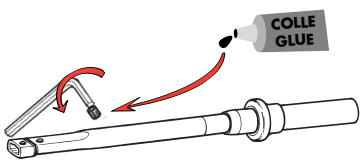
If the vernier's zero mark is offset:
- Heat both the high-strength threadlocked screws, and use a hex key to unscrew them.
- Turn the vernier and position its zero mark in line with the vertical line of the graduation scale.
- Screw in both the new screws*, applying a drop of high-strength threadlock.

4.6- Fitting the arm and rocker

See chapter 1: Procedure to change the rocker, from step 4 (choosing the new rocker).

NOTE: - For wrenches with broken arms, or ones that no longer set torque, or if the setting handle is stuck, you must fit a new rocker that has the same height H as the old one.

- For series "R" wrenches, before crimping:



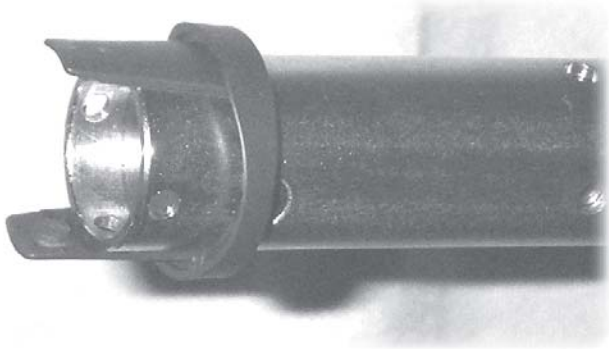
- Screw in the new screw*, applying a drop of high-strength threadlock in the tube.

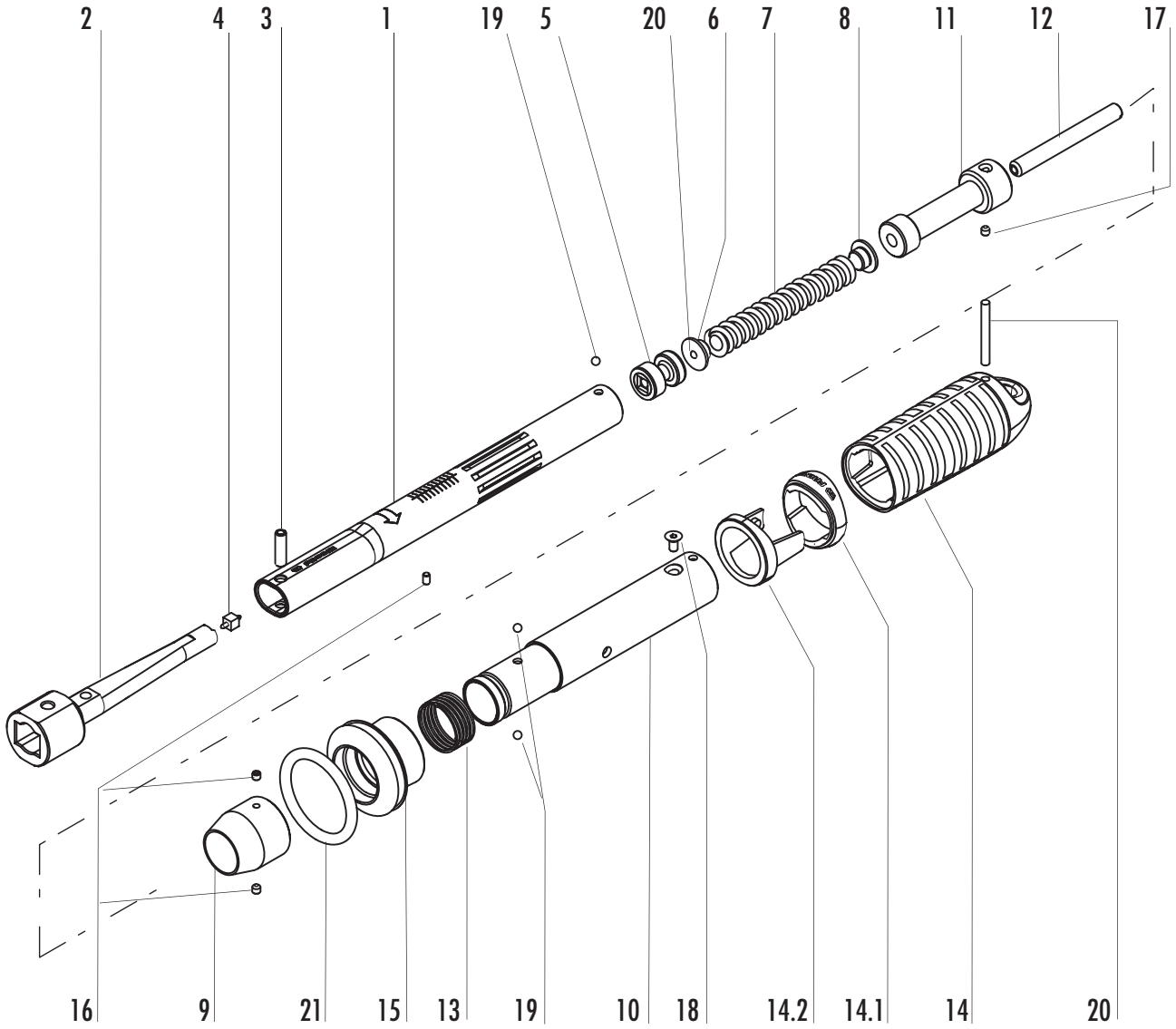
* Individual parts: Refer to the manual setting out the part references according to wrench type.

4.7- Adjusting the wrench

See adjustment procedure for series 306D wrenches (page 84).

4.8- Fitting the handle

	Insert the plastic ring in the back of the handle, clipping it into the holes in the tube handle.
	Fit the FACOM ring.
	Fit the plastic handle.
	Insert the splined pin using a drift punch.



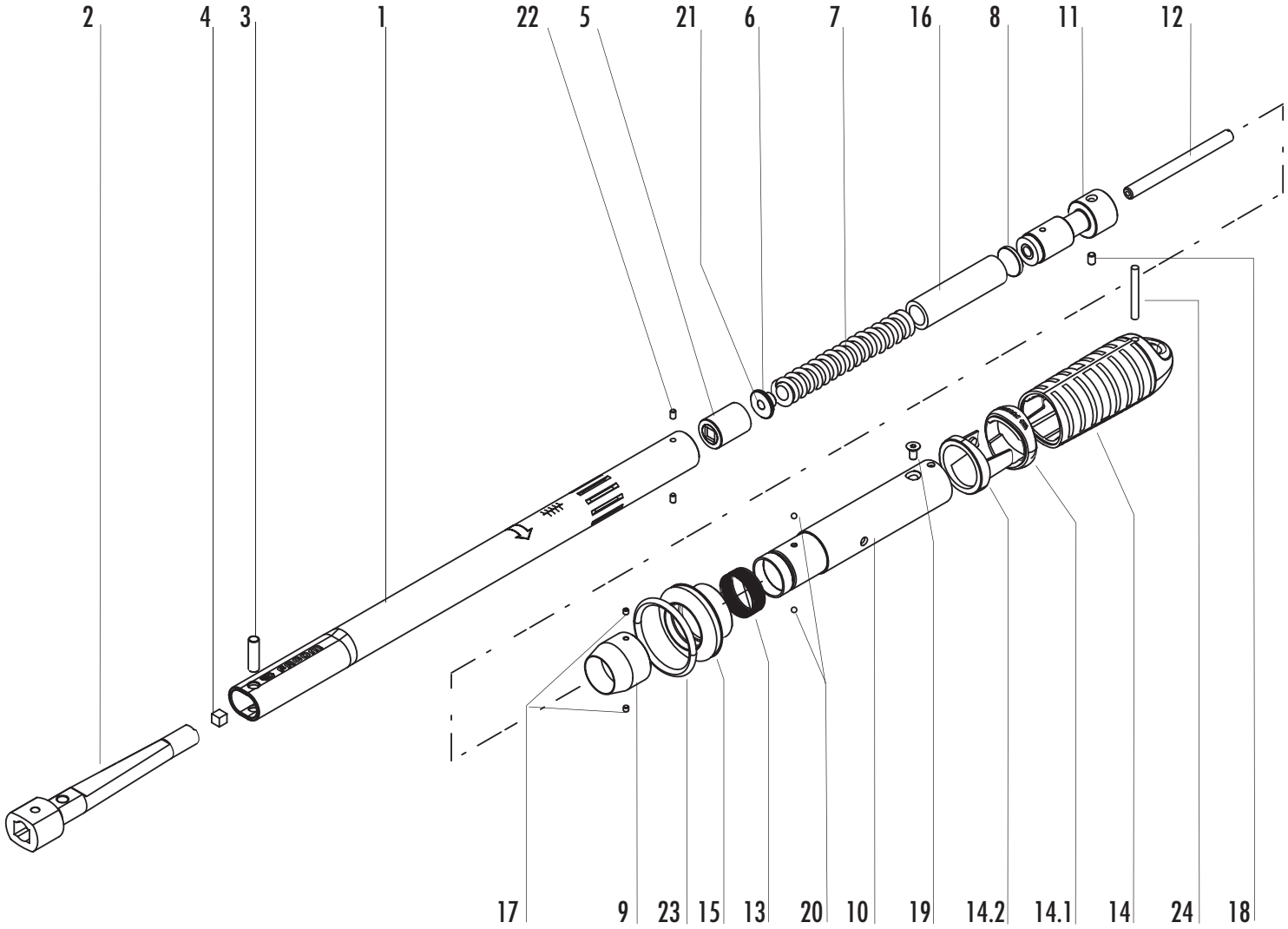
h(mm)

6

REPERE	REFERENCE OUTIL	H (mm)	REFERENCE BASCULEUR
MARK	REFERENCE TOOL	H (mm)	REFERENCE ROCKER
4	R.305D05-..	4,70	R.305D05-470
		4,80	R.305D05-470
		4,90	R.305D05-470
		5,00	R.305D05-470
		5,10	R.305D05-470

REPERE	DESIGNATION	DESIGNATION	REFERENCE R.306-25D	
1	Tube corps	Tube body	778-032VAPO	1
2	Bras	Arm	914-010UHF	1
3	Axe	Pin	R.305C03	1
4	Basculeur	Rocker	R.305D05	1
5	Poussoir	Thruster	R.344D06	1
6	Embout de ressort	Spring end piece	R.305D06	1
7	Ressort de pression	compression spring	A.202B01-05	1
8	Embout de ressort	Spring end piece	R.305D06	1
9	Vernier	Vernier	R.305D09	1
10	Poignée tube	Handle tube	778-009	1
11	Vis de commande	Control screw	R.305D16	1
12	Tige de poussée	Thrust rod	R.305D14	1
13	Ressort de poignée	Handle spring	R.305D15	1
14	Poignée	Handle	778-012	1
14.1	Bague FACOM	Ring FACOM	778-011	1
14.2	Bague clip avant	Front ring clip	778-013	1
15	Bague de verrouillage	Locking ring	778-010	1
16	Vis sans tête	Screw	STHc,M-3-3,45Cu	2
17	Vis sans tête	Screw	STHc,M2,5-4,45BP	1
18	Vis à tête fraisée	Screw	FHc,M3-6	1
19	Bille	Ball	N411-7 RB.3	3
20	Goupille	Pin	R.344D07	1
21	Joint torique	O-Ring	778-014	1

5) Spare parts series "J, S" 306D, S.306R wrenches



H(mm) 6

REPERE	REFERENCE OUTIL	H (mm)	REFERENCE BASCULEUR	REPERE	REFERENCE OUTIL	H (mm)	REFERENCE BASCULEUR
MARK	REFERENCE TOOL	H (mm)	REFERENCE ROCKER	MARK	REFERENCE TOOL	H (mm)	REFERENCE ROCKER
4	J.306-50D	6,10	J.206-100-610	4	S.306-200D S.306-200R	6,1	S.206-100-610
		6,20	J.206-100-620			6,2	S.206-100-620
		6,30	J.206-100-630			6,3	S.206-100-630
		6,40	J.206-100-640			6,4	S.206-100-640
	S.306-100D S.306-100R	5,5	S.206-100-550		S.306-350D S.306-350R	4,3	S.206-100-430
		5,6	S.206-100-560			4,4	S.206-100-440
		5,7	S.206-100-570			4,5	S.206-100-450
		5,8	S.206-100-580			4,6	S.206-100-460

5) Spare parts series "J, S" 306D, S.306R wrenches

REPERE	DESIGNATION	DESIGNATION	REFERENCE				
			J.306-50D	S.306-100D	S.306-200D	S.306-350D	
1	Tube corps	Tube body	778-022VAPO	778-023VAPO	778-024VAPO	778-025VAPO	1
2	Bras	Arm	S.305D02FUHF	S.305D02FUHF	S.325D02FUHF	S.325R02FUHF	1
3	Axe	Pin	S.313-05	S.313-05	S.313-05	S.323-09	1
4	Basculeur	Rocker	S.206-100-15	S.206-100-15	S.206-100-15	S.206-100-15	1
5	Poussoir	Thruster	S.325D4	S.325D4	S.325D4	S.325D4	1
6	Embout de ressort	Spring end piece	S.313-14	S.313-14	S.313-14	S.206-350-17	1
7	Ressort de pression	Compression spring	J.305D07	S.313-09	S.313-09	S.325D07	1
8	Disque	Disc	S.313-08	S.313-08	S.313-08	S.313-08	1
9	Vernier	Vernier	J.305D09	S.313-18	S.313-18	S.325D08	1
10	Poignée tube	Handle tube	778-001	778-001	778-001	778-001	1
11	Vis de commande	Control screw	S.305D16SE	S.305D16SE	S.315D16SE	S.325D16SE	1
12	Tige de poussée	Thrust rod	-	-	-	S.313-10	1
13	Ressort de poignée	Handle spring	S.313-16	S.313-16	S.313-16	S.313-16	1
14	Poignée	Handle	778-005	778-005	778-005	778-005	1
14.1	Bague FACOM	Ring FACOM	778-004	778-004	778-004	778-004	1
14.2	Bague clip avant	Front ring clips	778-006	778-006	778-006	778-006	1
15	Bague de verrouillage	Locking ring	778-003	778-003	778-003	778-003	1
16	Entretoise	Spacer	-	S.305D20	S.315D20	S.325D20	1
17	Vis sans tête	Screw	STHc,M3-3,45Cu	STHc,M3-3,45Cu	STHc,M3-3,45Cu	STHc,M3-3,45Cu	2
18	Vis sans tête	Screw	STHc,M4-6,45Cu	STHc,M4-6,45Cu	STHc,M4-6,45Cu	STHc,M4-6,45Cu	1
19	Vis à tête fraisée	Screw	FHc,M4-8	FHc,M4-8	FHc,M4-8	FHc,M4-8	1
20	Bille	Ball	N411-7 RB.3	N411-7 RB.3	N411-7 RB.3	N411-7 RB.3	3
21	Bille	Ball	N411-25 RB.5,55	N411-25 RB.5,55	N411-25 RB.5,55	N411-25 RB.5,55	1
22	Pied	Pin	RC.3-5	RC.3-5	RC.3-5	RC.3-5	2
23	Joint torique	O-Ring	778-008 39X4	778-008 39X4	778-008 39X4	778-008 39X4	1
24	Axe cannelé	Splined pin	778-007 4X35	778-007 4 x 35	778-007 4 x 35	778-007 4 x 35	1

REPERE	DESIGNATION	DESIGNATION	REFERENCE			
			S.306-100R	S.306-200R	S.306-350R	
1	Tube corps	Tube body	778-023VAPO	778-023VAPO	778-025VAPO	1
2	Bras	Arm	S.305R02FUHF	S.325R02FUHF	S.325R02FUHF	1
3	Axe	Pin	S.313-05	S.313-05	S.323-09	1
4	Basculeur	Rocker	S.206-100-15	S.206-100-15	S.206-100-15	1
5	Poussoir	Thruster	S.325D4	S.325D4	S.325D4	1
6	Embout de ressort	Spring end piece	S.313-14	S.313-14	S.206-350-17	1
7	Ressort de pression	Compression spring	S.313-09	S.313-09	S.325D07	1
8	Disque	Disc	S.313-08	S.313-08	S.313D08	1
9	Vernier	Vernier	S.313-18	S.313-18	S.325D08	1
10	Poignée tube	Handle tube	778-001	778-001	778-001	1
11	Vis de commande	Control screw	S.305D16SE	S.315D16SE	S.325D16SE	1
12	Tige de poussée	Thrust rod	-	-	S.313-10	1
13	Ressort de poignée	Handle spring	S.313-16	S.313-16	S.313-06	1
14	Poignée	Handle	778-005	778-005	778-005	1
14.1	Bague FACOM	Ring FACOM	778-004	778-004	778-004	1
14.2	Bague clip avant	Front ring clips	778-006	778-006	778-006	1
15	Bague de verrouillage	Locking ring	778-003	778-003	778-003	1
16	Entretoise	Spacer	S.305D20	S.315D20	S.325D20	1
17	Vis sans tête	Screw	STHc,M3-3,45Cu	STHc,M3-3,45Cu	STHc,M3-3,45Cu	2
18	Vis sans tête	Screw	STHc,M4-6,45Cu	STHc,M4-6,45Cu	STHc,M4-6,45Cu	1
19	Vis à tête fraisée	Screw	FHc,M4-8	FHc,M4-8	FHc,M4-8	1
20	Bille	Ball	N411-7 RB.3	N411-7 RB.3	N411-7 RB.3	3
21	Bille	Ball	N411-25 RB.5,55	N411-25 RB.5,55	N411-25 RB.5,55	1
22	Pied	Pin	RC-3-5	RC-3-5	RC-3-5	2
23	Joint torique	O-Ring	778-008 39X4	778-008 39X4	778-008 39X4	1
24	Axe cannelé	Splined pin	778-007 4 x 35	778-007 4 x 35	778-007 4 x 35	1

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