

Service Manual
PL12-1014EN
10/16/2014

Cleco®

19RA Series
Right Angle Nutrunner



For additional product information visit our website at <http://www.apextoolgroup.com>

For this Instruction Manual

This Instruction Manual is the Original Instruction Manual intended for all persons who will operate and maintain these tools.

This Instruction Manual

- provides important notes for the safe and efficient use of these tools.
- describes the function and operation of the 19RA series tools.
- serves as a reference guide for technical data, service intervals and spare parts ordering.
- provides information on optional equipment.

Identification text:

19RA represents all models of the right angle pneumatic nutrunner as described in this manual

→ indicates a required action

• indicates a list

<.> indicates a reference number from the exploded parts drawings

Arial indicates an important feature or instruction written in **Arial Bold**

Identification graphic:

→ indicates a directional movement

↓ indicates a function or force

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	19	R	A	X	XX	XX	X																				
Tool Series	19																										
Tool Style	R = Reversible Nutrunner																										
Tool Configuration	A = Right Angle - Lever																										
Torque Control Mechanism	A = Clecomatic Clutch S = Stall																										
Maximum Torque	<table border="0"> <tr> <td>19RAA</td> <td>19RAS</td> </tr> <tr> <td>02 = 2.1 Nm</td> <td>02 = 2.7 Nm</td> </tr> <tr> <td>03 = 3.1 Nm</td> <td>03 = 3.2 Nm</td> </tr> <tr> <td>04 = 4.8 Nm</td> <td>04 = 3.6 Nm</td> </tr> <tr> <td>05 = 5.7 Nm</td> <td>05 = 5.2 Nm</td> </tr> <tr> <td>06 = 6.0 Nm</td> <td>06 = 6.2 Nm</td> </tr> <tr> <td>07 = 6.8 Nm</td> <td></td> </tr> <tr> <td>09 = 8.5 Nm</td> <td></td> </tr> <tr> <td>11 = 11 Nm</td> <td></td> </tr> <tr> <td>12 = 11 Nm</td> <td></td> </tr> </table>							19RAA	19RAS	02 = 2.1 Nm	02 = 2.7 Nm	03 = 3.1 Nm	03 = 3.2 Nm	04 = 4.8 Nm	04 = 3.6 Nm	05 = 5.7 Nm	05 = 5.2 Nm	06 = 6.0 Nm	06 = 6.2 Nm	07 = 6.8 Nm		09 = 8.5 Nm		11 = 11 Nm		12 = 11 Nm	
19RAA	19RAS																										
02 = 2.1 Nm	02 = 2.7 Nm																										
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06 = 6.0 Nm	06 = 6.2 Nm																										
07 = 6.8 Nm																											
09 = 8.5 Nm																											
11 = 11 Nm																											
12 = 11 Nm																											
Right Angle Head	AM = Medium Duty AH = Heavy Duty																										
Output Drive	2 = 1/4" Square Drive (AM & AH) * 3 = 3/8" Square Drive (AH) 516 = 5/16" Internal Hex (AM) Q = Quick Change Spindle (AH)																										
	* AH2 Head max torque 50 in. lbs.																										

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1 Safety

1.1 Warnings and notes

Warning notes are identified by a signal word and a pictogram.

- The signal word indicates the severity and probability of the impending danger.
- The pictogram indicates the type of danger.

WARNING!



WARNING identifies a potentially **hazardous** situation which, if not avoided, may result in serious injury.

CAUTION!



CAUTION identifies a potentially **hazardous** situation which, if not avoided, may result in minor or moderate injury or property and environmental damage.

NOTE



NOTE identifies general information which may include application tips or useful information but no hazardous situations.



Important information that must be read and understood by all personnel installing, operating or maintaining this equipment.

1.2 Basic requirements for safe working practices



All personnel involved with the installation, operation or maintenance of these tools must read and understand all safety instructions contained in this manual. Failure to comply with these instructions could result in serious injury or property damage.

These safety instructions are not intended to be all inclusive. Study and comply with all applicable National, State and Local regulations.

CAUTION!



Work Area:

- Ensure there is enough space in the work area.
- Keep the work area clean.
- Keep the work area well ventilated.

Personnel Safety:

- Inspect the air supply hoses and fittings. Do not use damaged, frayed or deteriorated hoses.
- Make sure the air supply hose is securely attached to the tool.
- Ensure a secure standing position and maintain balance.
- Make sure the throttle is positioned relative to the head so the throttle will not become wedged against an adjacent object in the ON position due to torque reaction.
- If the tool is to be reversed, locate the throttle in a neutral position to prevent entrapment.

- Keep the tool clean and dry to provide the best possible grip.
- Firmly grasp the handle of the 19RA and apply the socket or bit to the application before starting.
- Be prepared for high short-term reaction torques.

Safety working with and around fastening tools:

- Use only power tool sockets and bits available from Apex Tool Group.
- Inspect socket or bit for visible damage and cracks. Replace damaged items immediately.
- Disconnect the air supply before installing or replacing the socket or bit.
- Do not attach the socket or bit at a slant.
- Make sure the socket or bit is fully assembled on the drive and locked in position.

1.3 Operator training

All personnel must be properly trained before operating the 19RA tools. The 19RA tools are to be repaired by fully trained personnel only.

1.4 Personal protective equipment



When working

- Wear eye protection to protect against flying metal splinters.
- Wear hearing protection

Danger of injury by being caught by moving equipment.



- Wear a hairnet
- Wear close fitting clothing
- Do not wear jewelry

1.5 Designated use

The 19RA is designed exclusively for fastening and releasing threaded fasteners.

The 19RAA series nutrunners are equipped with an adjustable Clecomatic clutch. The tool will shut off the instant the clutch reaches its adjustable preset torque. This action provides an accurate method of controlling torque without sacrificing tool speed.

The 19RAS series are stall type nutrunners. The tool runs down the fastener until the torque resistance in the fastener causes the tool to stall. When the tool stalls, the throttle is released by the operator and the tool is removed from the application. Stall type tools can produce accurate torques, especially on applications with varying torque rates; however, their torque output can be easily influenced by the operator and by fluctuations in the air line pressure. Operators should be instructed to allow the tool to stall before releasing the throttle and to avoid pulling or wrenching the tool after it stalls.

- Do not modify the 19RA, any guard or accessory.
- Use only with accessory parts which are approved by the manufacturer.
- Do not use as a hammer, pry-bar or any other improper usage.

1.6 Codes and standards

It is mandatory that all national, state and local codes and standards be followed.

1.7 Noise and vibration

Noise level ≤ 75 dB(A) free speed (without load) according to ISO 12100: 2011
Vibration values < 2.5 m/s² according to ISO 12100: 2011

2 Scope of supply, transport and storage

2.1 Items supplied

Check shipment for transit damage and ensure that all items have been supplied:

- 1 19RA
- 1 PL12-1014EN instruction manual
- 1 Declaration of Conformity
- 1 Lubrication sheet
- 1 Warranty statement

2.2 Transport

Transport and store the 19RA in the original packaging. The packaging is recyclable.

2.3 Storage

For short term storage (less than 2 hours) and protection against damage:

- Place the 19RA in a location on the workbench to avoid accidental depression of the lever.
or
- Suspend the 19RA from a suitable balancer or tool positioner.

For storage longer than 2 hours:

- Disconnect the air supply from the 19RA

Object	Time Period	Storage Temperature
19RA without air supply	No guideline	-13°F to 104°F (-25°C to 40°C)

3 Product description


3.1 General description

- Right angle pneumatic powered nutrunner
- Lever actuated
- Clockwise/counterclockwise rotation
- 19RAA models: adjustable Clecomatic clutch
19RAS models: stall torque shutoff
- Low vibration level

Scope of Supply, Transport and Storage


3.2 Operation and functional elements

This section describes the operational and functional elements of the 19RA.



Ref.	Description
1	Air Inlet
2	Reversing Ring
3	Throttle Lever
4	Motor and Gearing
5	Clecomatic Clutch (19RAA models)
6	Right Angle Nutrunner Attachment
7	Square Drive Output Spindle

4 Accessories



Non-Reversible Kit
Part Number: 207030



Exhaust Overhose
Part Number: 207019



Torque Signal Kit
19RAA Clecomatic clutch models only
Part Number: 301106



TVP-100 Series Torque Verifier
Part Number:
TVP-110-15-U (115VAC) EN
TVP-110-30-U (230 VAC) EN

5 Before initial operation

5.1 Ambient conditions

Ambient temperature: 41°F (5°C) to a maximum of 104°F (40°C)
Acceptable relative humidity: 25% to 90%, non-condensing

5.2 Air supply

Parameter	Description
Air Hose	Minimum inside diameter: 3/16" (4,7 mm) Maximum length: 16.4' (5 m)
Working pressure range	58 to 101.5 psi (400 to 700 kPa) Recommended: 90 psi (620 kPa)
Compressed air	Air quality according to ISO 8573-1, quality class 2.4.3 The compressed air must be clean and dry.

NOTE



To attain consistent results, maintain a constant working pressure using a suitable air line unit consisting of a filter, regulator and lubricator.

- The inside diameter of the air hose must be free of residue, clean if necessary.
- Spray a few drops of light air tool oil into the air inlet adapter.
- Adjust the lubricator to a minimum setting to reduce the amount of excess oil in the exhaust air.

Oil identification

Part No.	Packaged	Designation	Vendor
540397	1 Quart (0.94 liter)	Airlube 10W/NR-420LB DR	Fuchs Lubricants Co.
533485	1 US Gallon (3.78 liter)	Airlube 10W/NR-420LB DR	Fuchs Lubricants Co.

5.3 Connecting the air supply to the tool

WARNING! The air hose can disconnect from the tool by itself and whip around uncontrollably.



- Turn off the compressed air before connecting to the tool.
- Securely connect the air hose to the tool.
- Turn on the compressed air.

5.4 Tool set up

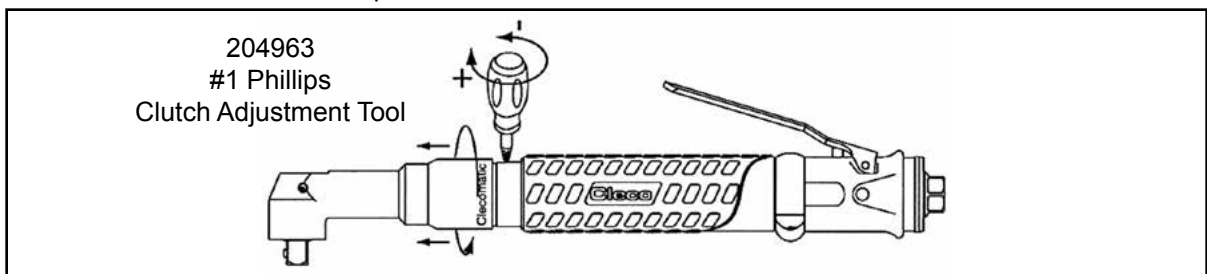
The tool must be configured for the application.

5.4.1 Setting the torque

CAUTION! Danger of injury from accidental start up.
Turn off the compressed air before adjusting the clutch.



- Using the clutch adjustment tool provided, turn clockwise for maximum torque or counter-clockwise for minimum torque.



Note: For best results, start from minimum torque and adjust in the maximum direction until desired torque is achieved.

6 First operation

6.1 Putting into use



We recommend the use of a reaction bar for higher torque applications to prevent uncontrollable reaction of the tool when rundown shut off is achieved. This use is dependent on the following factors: torque, joint, air pressure, form of tool, and the operator. Consider the use of a reaction bar to prevent personal injury.

- Make sure the air supply is securely attached and the compressor is turned on.
- Make sure the reverse ring is in the correct position.
- Place the socket or bit on the application and depress the lever to start the rundown.
- When the tool shuts off after reaching the set torque, release the lever.
- Remove the tool from the application.

7 Troubleshooting

Malfunction	Possible causes	Remedy
Tool does not start	No or low air pressure	→ Make sure there is adequate air pressure at the tool air inlet
	Reversing ring out of position	→ Make sure the reversing ring is in the clockwise or counterclockwise position
	Trip rod spring out of position	→ Tool disassembly required
	Broken gears	→ Tool disassembly required (parts replacement)
Tool does not shut off	Torque set to high	→ Reduce the torque setting
	Working pressure < 58 psi (400 kPa)	→ Increase the working air pressure
Unable to adjust torque	Teeth on adjusting wrench worn or broken	→ Replace adjusting wrench
	Teeth on adjustment nut worn or broken	→ Clutch disassembly required (parts replacement)
Tool loses power	Reduced air pressure	→ Check air supply line for any obstructions
	Lack of lubrication	→ Check the air line lubricator to make sure it is full of lubricant and is working properly
	Motor exhaust air is obstructed	→ Clean or replace bronze mufflers
	Swollen rotor blades from excessive moisture	→ Check the air line filter, empty reservoir if necessary
	Worn rotor blades	→ Tool disassembly required (parts replacement)
	Worn gears or bearings	→ Tool disassembly required (parts replacement)
Air leak at inlet adapter	Loose inlet adapter	→ Tighten inlet adapter
	Worn o-ring on inlet adapter	→ Replace o-ring

8 Maintenance

CAUTION!



Danger of injury from accidental start up.
Turn off the compressed air before performing any maintenance.

8.1 Service schedule

Only qualified and trained personnel are permitted to perform maintenance on these tools.

Regular maintenance reduces operating faults, repair costs and downtime. In addition to the following service schedule, implement a safety related maintenance program that takes the local regulations for repair and maintenance for all operating phases of the tool into account.

This maintenance schedule uses values that are valid for most applications. For a specific maintenance interval, refer to 8.1.1 Calculating a customer-specific maintenance plan.

Maintenance Interval	Rundowns	Designation
Daily	Daily	<ul style="list-style-type: none"> → Visual inspection of air supply hose and connections → Inspect airline filter, regulator and lubricator for proper operation → Check the tool excessive vibration or unusual noises → Visual inspection of all external components of the tool
W1	100,000	<ul style="list-style-type: none"> → Inspect the air hose for damage or wear → inspect the square drive output spindle for damage or wear → Inspect the air inlet adapter for a secure fit → Check the maximum free speed
W2	500,000	<ul style="list-style-type: none"> → Check individual parts and replace if necessary → Replace O-rings and seals → Clean bronze mufflers
W3	1,000,000	<ul style="list-style-type: none"> → Check individual parts and replace if necessary → Throttle valve → Motor → Gearing → Clutch (19RAA) → Angle attachment

8.1.1 Calculating a customer specific maintenance plan

A service interval W(1, 2, 3) depends on the following factors:

Factor	Value assumed in "Service Schedule"	Description
V	V1 = 100,000 V2 = 500,000 V3 = 1,000,000	Number of rundowns after a maintenance measure is prescribed by Apex Tool Group.
T1	1.8 seconds	Specific rundown time, measured in life and endurance tests.
T2	2 seconds	Actual rundown time, depending on the hardness of the joint.
S	1; 2; 3	Number of shifts per day.
VS	750	Number of rundowns per shift.

T2, S and VS are variable factors and can differ depending on the specific application.

Example for service interval W2:



After 500,000 rundowns (V),
a specific rundown time of 1.8 seconds (T1)
with an actual fastening time of 3 seconds (soft joint) and
3 completed shifts per day and 750 rundowns per shift.

$$W(1, 2, 3) = \frac{V \times T1}{T2 \times S \times VS} \qquad W2 = \frac{500000 \times 1.8}{3 \times 3 \times 750} = 133 \text{ (days)}$$

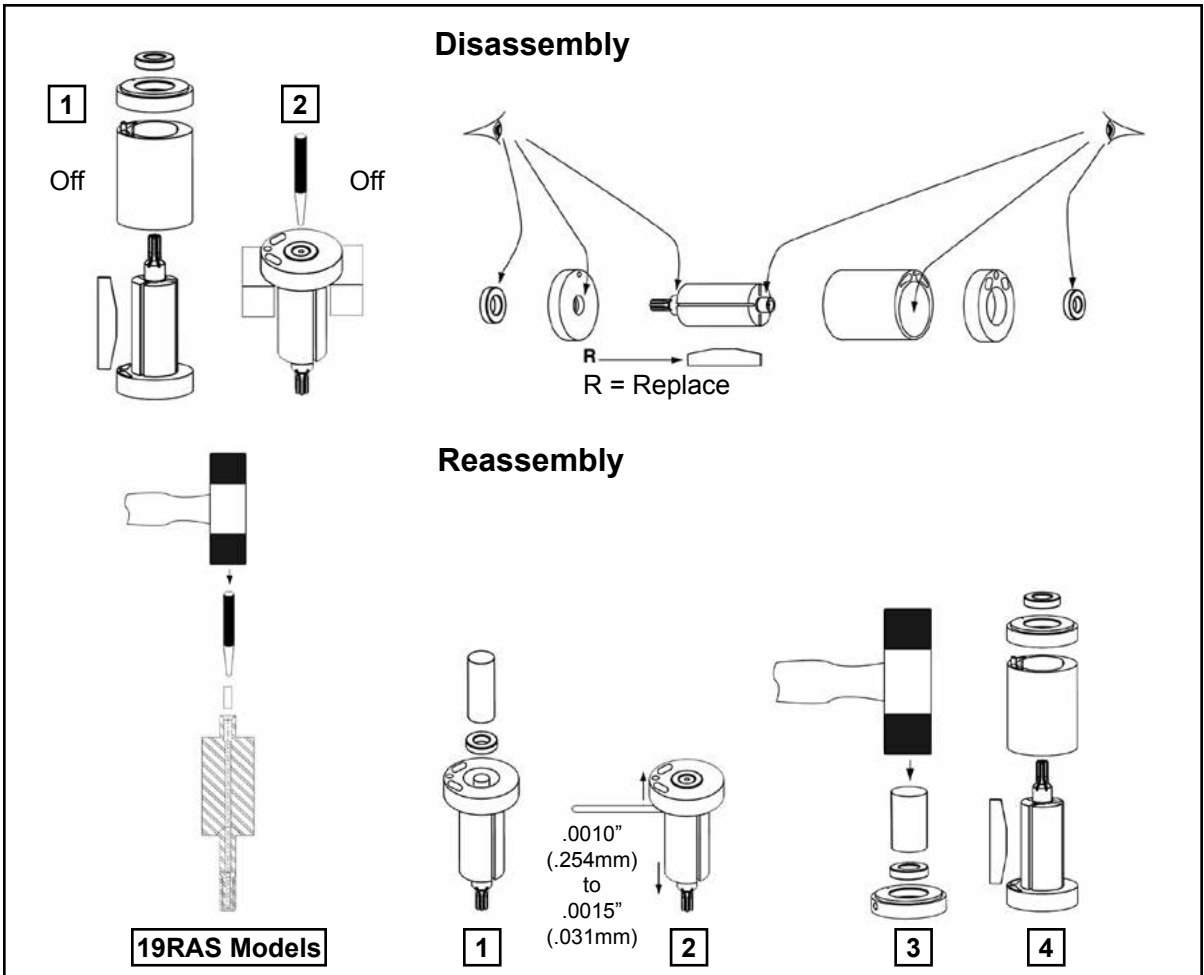
You will need to perform the maintenance indicated as W2 after an operating time of 133 days.)

8.2 Lubricants

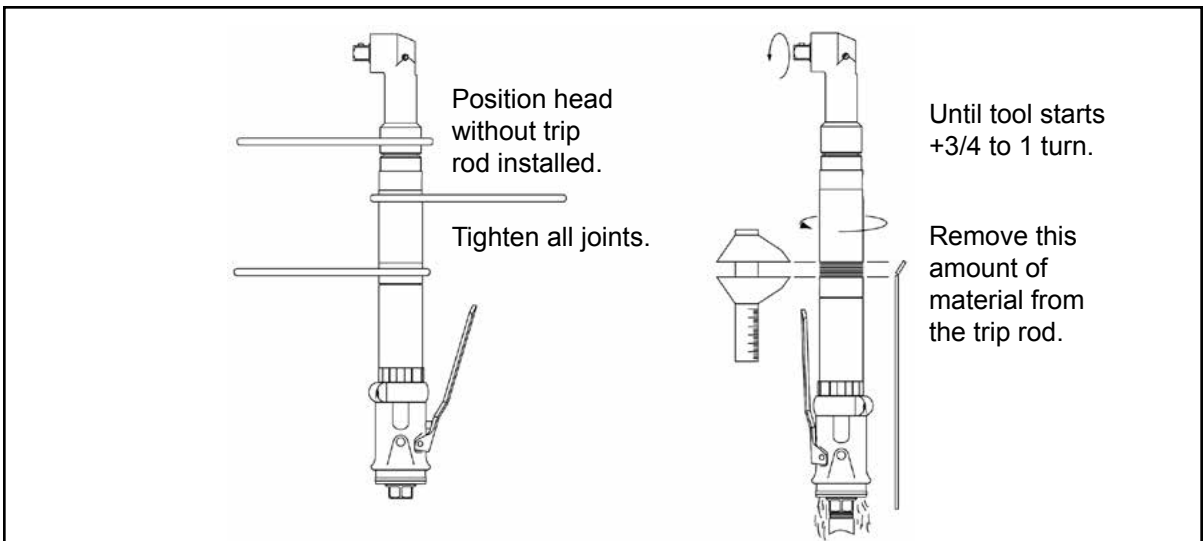
For proper function and long service life, use of the correct grease is essential.

Part No.	Packaged	Designation	Vendor
540450	18 oz. (0.51 kg)	Black Pearl EP-NLGI-0	Chevron
540395	2 oz. (0.06 kg)	Magnalube-G	Carleton-Stuart Corp.
513156	16 oz. (0.45 kg)	Magnalube-G	Carleton-Stuart Corp.
541444	2 oz. (0.06 kg)	Rheolube 363AX-1	Nye Lubricants, Inc.
541445	16 oz. (0.45 kg)	Rheolube 363AX-1	Nye Lubricants, Inc.

9 Repair instructions
9.1 Motor disassembly and reassembly



9.2 Trip rod sizing

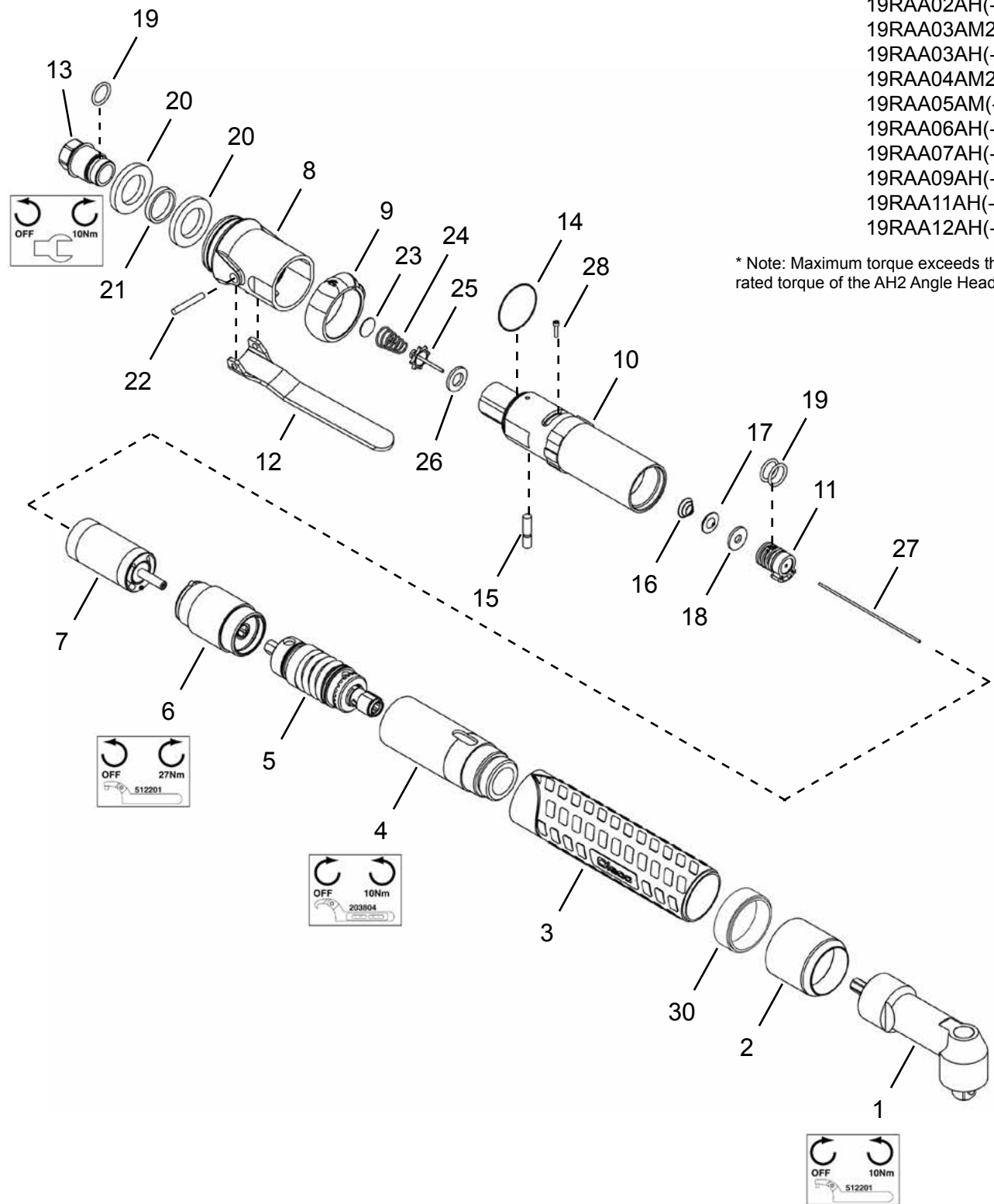


10.1 19RAA Series Nutrunner

Models

- 19RAA02AM2
- 19RAA02AH(-)
- 19RAA03AM2
- 19RAA03AH(-)
- 19RAA04AM2
- 19RAA05AM(-)
- 19RAA06AH(-) *
- 19RAA07AH(-) *
- 19RAA09AH(-) *
- 19RAA11AH(-) *
- 19RAA12AH(-) *

* Note: Maximum torque exceeds the rated torque of the AH2 Angle Head.



10.1 19RAA Series Nutrunner

Ref	Number	#	X	EN	
					Description
1	936566PT	1			Attachment (1/4" Square Drive)
	936530PT	1			Attachment (1/4" Square Drive)
	936531PT	1			Attachment (3/8" Square Drive)
	201711	1			Attachment (5/16" Internal Hex)
	302030PT	1			Attachment (Quick Change)
2	Table 10.1	1			Clutch Cover
3	207792PT	1			Plastic Body
4	207582PT	1			Clutch Housing
5	301982PT	1			Clecomatic Clutch Assembly
	301992PT	1			Clecomatic Clutch Assembly
	301978PT	1			Clecomatic Clutch Assembly
6	301967PT	1			Gearing Assembly
	301086	1			Gearing Assembly
	301968PT	1			Gearing Assembly
	301969PT	1			Gearing Assembly
	302016PT	1			Gearing Assembly
	301970PT	1			Gearing Assembly
7	301972PT	1			Motor Assembly
	301973PT	1			Motor Assembly
	301974PT	1			Motor Assembly
8	205970	1			Exhaust Housing
9	205959	1			Reversing Ring
10	205967	1			Motor Housing
11	205984PT	1			Reversing Valve
12	203528PT	1	1		Lever
13	205968	1	1		Inlet Adapter
14	207035	1	3		O-Ring
15	205971	1	1		Actuator Pin
16	203525	1	3		Shut-Off Spring
17	203529	1	1		Shut-Off Valve
18	869201	1	3		Shut-Off Valve Seal
19	60351	3	9		O-Ring
20	205969	2	2		Bronze Muffler
21	205996	1	1		Muffler Spacer
22	844083	1	1		Lever Pin
23	869171	1	3		Screen
24	1001234	1	3		Compression Spring
25	01-2518	1	1		Poppet Valve
26	847675	1	3		Valve Seal
27	Table 10.1	1	1		Trip Rod
28	B141L	1	1		Screw
29	931962	1	1		Suspension Bail (not shown)
30	Table 10.1	1			Spacer

(#) Quantity

(X) Recommended Spare Parts (quantity shown based on 1-5 tools in operation)

Table 10.1

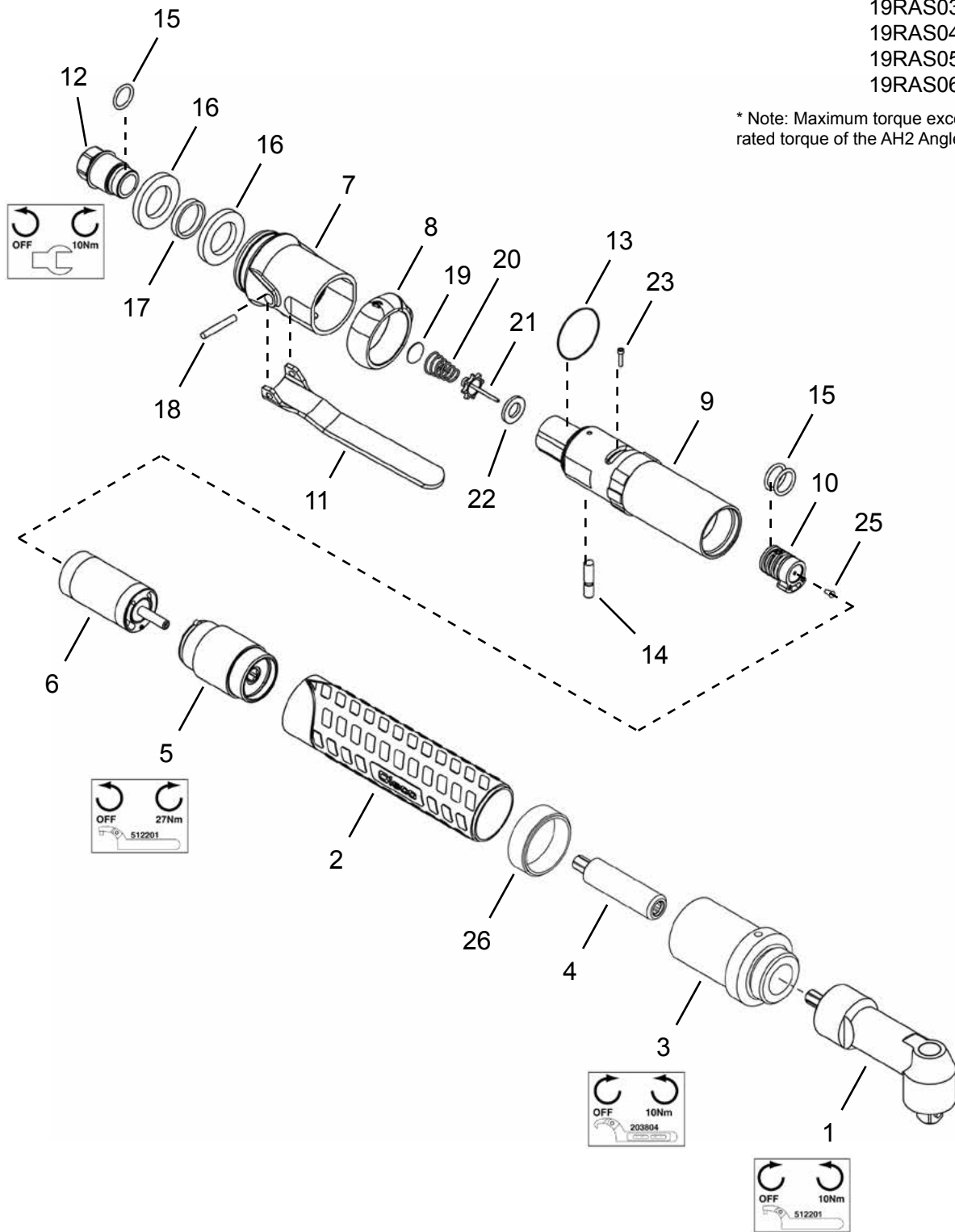
Ref.	Description	#	19RAA02AM2 19RAA02AH(-) 19RAA04AM2 19RAA06AH(-)	#	19RAA05AM(-) 19RAA07AH(-) 19RAA09AH(-) 19RAA12AH(-)	#	19RAA03AM2 19RAA03AH(-)	#	19RAA11AH(-)
2	Clutch Cover	1	207583PT	1	207583PT	1	207583PT	1	207703PT
27	Trip Rod	1	203586PT	1	203586PT	1	203586PT	1	207704PT
30	Spacer		----		205974	1	205975PT	1	205974

10.2 19RAS Series Nutrunner

Models

- 19RAS02AH3
- 19RAS03AM2
- 19RAS04AH(-)
- 19RAS05AM2
- 19RAS06AH(-) *

* Note: Maximum torque exceeds the rated torque of the AH2 Angle Head.



10.2 RAS Series Nutrunner

Ref	Number	#	X	EN
				Description
1	936566PT	1		Attachment (1/4" Square Drive)
	936530PT	1		Attachment (1/4" Square Drive)
	936531PT	1		Attachment (3/8" Square Drive)
2	207792PT	1		Plastic Body
3	207367	1		Housing Adapter
4	207368	1		Spindle Extension
5	301967PT	1		Gearing Assembly
	301086	1		Gearing Assembly
	301968PT	1		Gearing Assembly
6	301972PT	1		Motor Assembly
	301973PT	1		Motor Assembly
	301974PT	1		Motor Assembly
7	205970	1		Exhaust Housing
8	205959	1		Reversing Ring
9	205967	1		Motor Housing
10	205984PT	1		Reversing Valve
11	203528PT	1	1	Lever
12	205968	1	1	Inlet Adapter
13	207035	1	3	O-Ring
14	205971	1	1	Actuator Pin
15	60351	3	9	O-Ring
16	205969	2	2	Bronze Muffler
17	205996	1	1	Muffler Spacer
18	844083	1	1	Lever Pin
19	869171	1	3	Screen
20	1001234	1	3	Compression Spring
21	01-2518	1	1	Poppet Valve
22	847675	1	3	Valve Seal
23	B141L	1	1	Screw
24	931962	1	1	Suspension Bail (not shown)
25	540843	1	3	Drive Screw
26	Table 10.2	1		Spacer

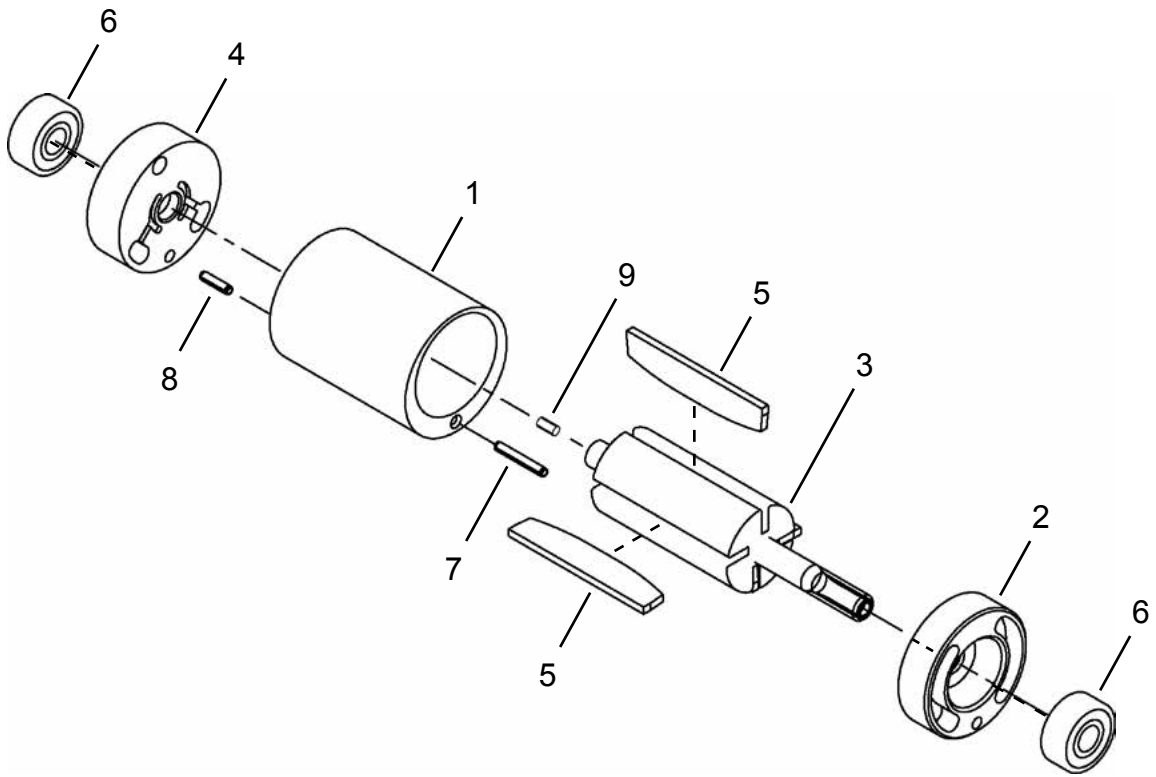
(#) Quantity

(X) Recommended Spare Parts (quantity shown based on 1-5 tools in operation)

Table 10.2

Ref.	Description	#	19RAS02AH3	#	19RAS03AM2
			19RAS05AM2		19RAS04AH(-)
26	Spacer		-----	1	205975PT

10.3 Motor Assembly



10.3 Motor Assembly

Ref	Number	#	X	EN	
				Description	
--	Table 10.3	1		Motor Assembly	
1	203504	1		Cylinder	
2	205960	1		Rear Bearing Plate	
3	Table 10.3	1		Rotor	
4	203641	1		Front Bearing Plate	
5	203615PT	4	12	Rotor Blade	
6	842768	2	4	Ball Bearing	
7	844897	1	2	Front Cylinder Pin	
8	847548	1	2	Rear Cylinder Pin	
9	Table 10.3	1	2	Pin	

(#) Quantity

(X) Recommended Spare Parts (quantity shown based on 1-5 tools in operation)

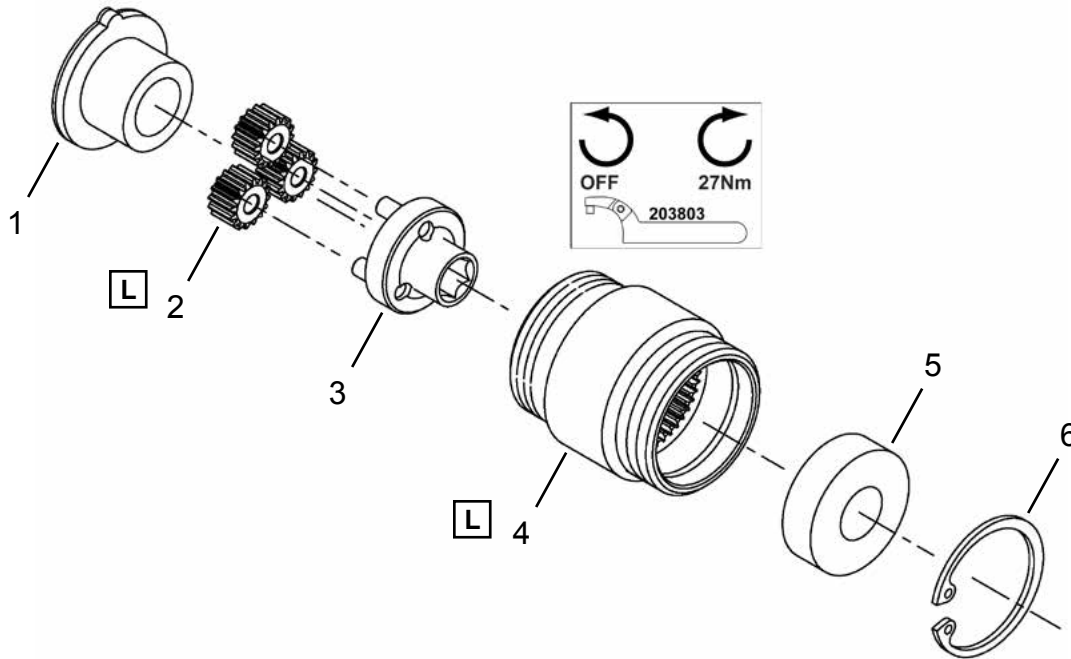
Table 10.3

Ref.	Description	19RAA04AM2		19RAA02AM2		19RAA03AM2		19RAS02AH3		19RAS03AM2		19RAS05AM2	
		#	19RAA06AH(-) 19RAA12AH(-)	#	19RAA02AH(-) 19RAA05AM(-) 19RAA07AH(-) 19RAA09AH(-)	#	19RAA03AH(-) 19RAA11AH(-)	#		#	19RAS04AH(-)	#	19RAS06AH(-)
--	Motor Assembly	1	301974PT	1	301972PT	1	301973PT	1	301972PT	1	301973PT	1	301974PT
3	Rotor	1	203546	1	203545	1	203547	1	203545	1	203547	1	203546
9	Pin		----		----		----	1	92570018	1	92570018	1	92570018

10.4 301967PT Gearing Assembly

Models

19RAA02AM2
19RAA02AH(-)
19RAS02AH3

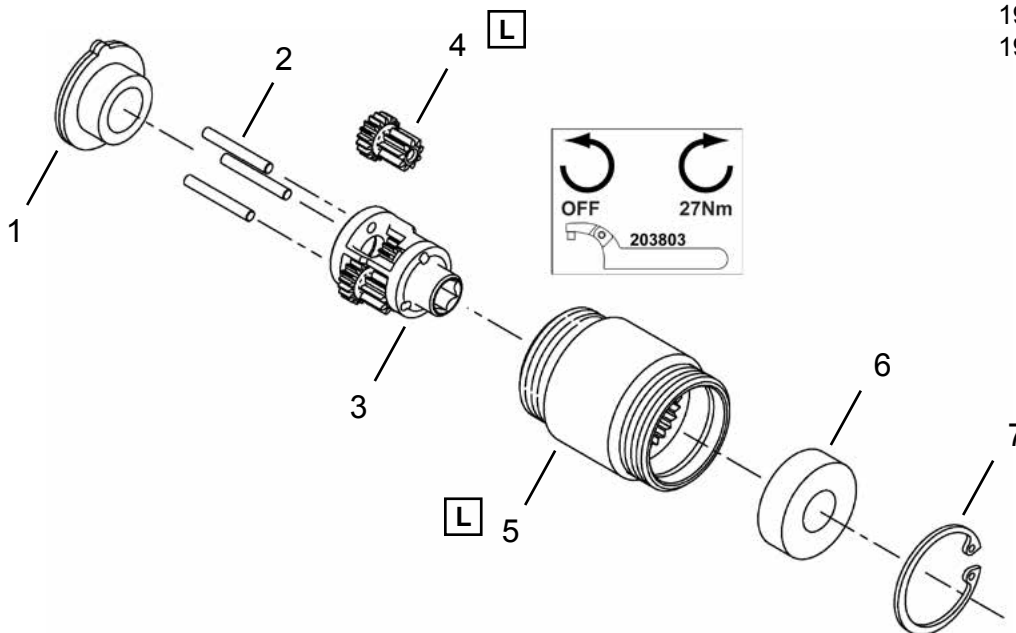


L Lubricate with 540450 Grease (18 oz. can)

10.5 301086 Gearing Assembly

Models

19RAA03AM2
19RAA03AH(-)
19RAS03AM2
19RAS04AH(-)



L Lubricate with 540450 Grease (18 oz. can)

10.4 301967PT Gearing Assembly

Ref	Number	#	X	EN
				Description
--	301967PT	1		Gear Case Assembly (6.875:1)
1	204136PT	1		End Plate Spacer
2	207619PT	3	6	Idler Gear (16T)
3	207620PT	1		Open Spider
4	205964	1		Gear Case
5	847595	1	2	Ball Bearing
6	619017	1	2	Retaining Ring

(#) Quantity

(X) Recommended Spare Parts (quantity shown based on 1-5 tools in operation)

(T) Teeth

10.5 301086 Gearing Assembly

Ref	Number	#	X	EN
				Description
--	301086	1		Gear Case Assembly
1	203646	1		End Plate Spacer
2	833862	3	6	Needle Roller
3	869155	1		Spider
4	869163	3	6	Idler Gear (18/9T)
5	205966	1		Gear Case
6	847595	1	2	Ball Bearing
7	619017	1	2	Retaining Ring

(#) Quantity

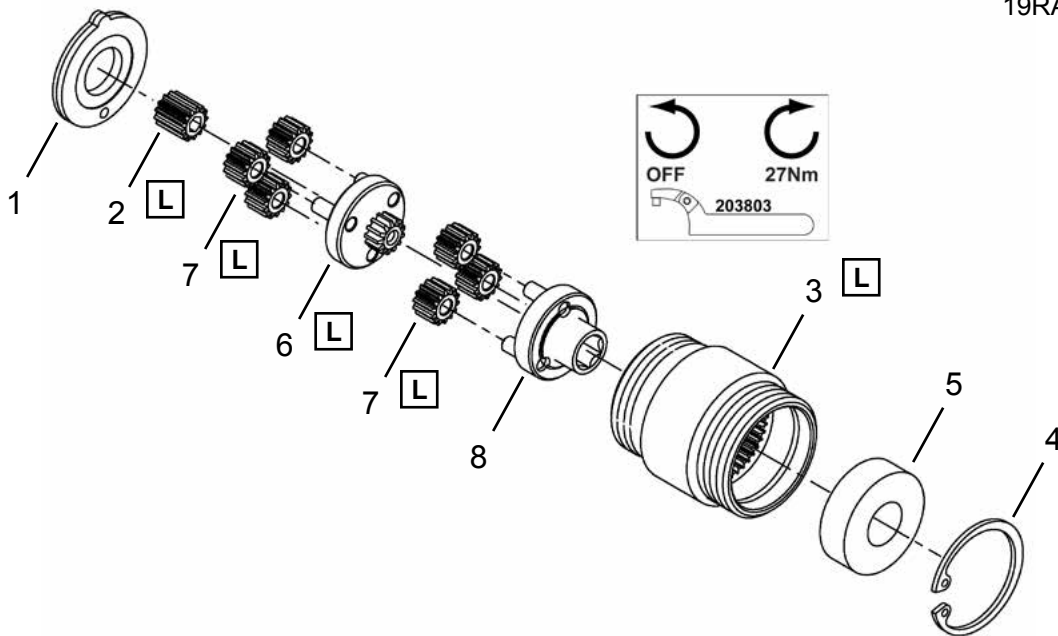
(X) Recommended Spare Parts (quantity shown based on 1-5 tools in operation)

(T) Teeth

10.6 301968PT Gearing Assembly

Models

- 19RAA04AM2
- 19RAA06AH(-)
- 19RAS05AM2
- 19RAS06AH(-)

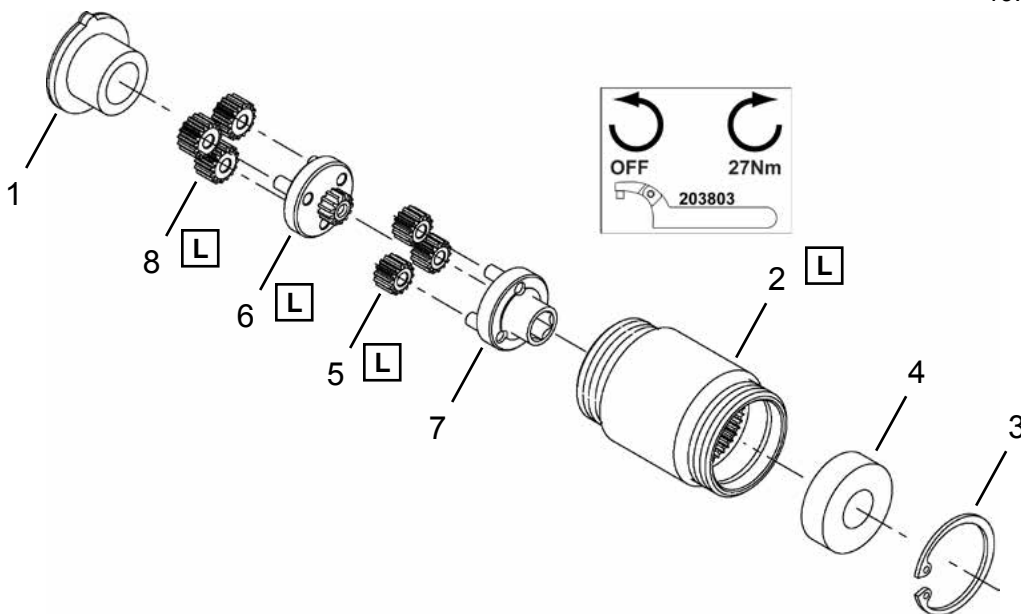


L Lubricate with 540450 Grease (18 oz. can)

10.7 301969PT Gearing Assembly

Models

- 19RAA05AM(-)
- 19RAA07AH(-)
- 19RAA09AH(-)



L Lubricate with 540450 Grease (18 oz. can)

10.6 301968PT Gearing Assembly

Ref	Number	#	X	EN
				Description
--	301968PT	1		Gear Case Assembly (17.256:1)
1	203644PT	1		End Plate Spacer
2	203919	1	2	Pinion Gear
3	205964	1		Gear Case
4	619017	1	2	Retaining Ring
5	847595	1	2	Ball Bearing
6	207615PT	1		Open Spider
7	207616PT	6	12	Idler Gear (14T)
8	207618PT	1		Open Spider

(#) Quantity

(X) Recommended Spare Parts (quantity shown based on 1-5 tools in operation)

(T) Teeth

10.7 301969PT Gearing Assembly

Ref	Number	#	X	EN
				Description
--	301969PT	1		Gear Case Assembly (28.484:1)
1	204136PT	1		End Plate Spacer
2	205963	1		Gear Case
3	619017	1	2	Retaining Ring
4	847595	1	2	Ball Bearing
5	207616PT	3	6	Idler Gear (14T)
6	207617PT	1		Open Spider
7	207618PT	1		Open Spider
8	207619PT	3	6	Idler Gear (16T)

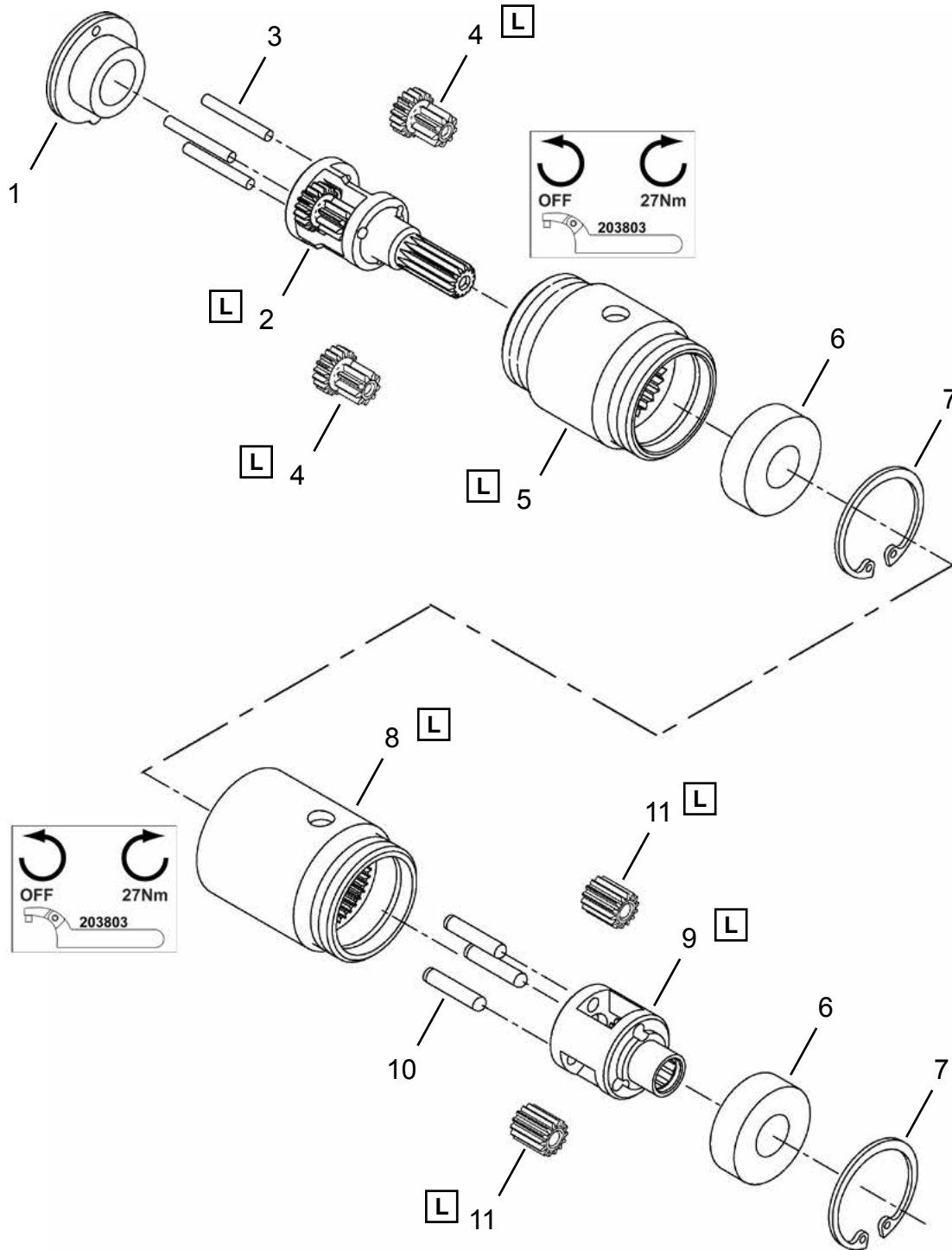
(#) Quantity

(X) Recommended Spare Parts (quantity shown based on 1-5 tools in operation)

(T) Teeth

10.8 302016PT Gearing Assembly

Models
19RAA11AH(-)



L Lubricate with 540450 Grease (18 oz. can)

10.8 302016PT Gearing Assembly

Ref	Number	#	X	EN
				Description
--	302016PT	1		Gear Case Assembly (41.538:1)
1	203646	1		End Plate Spacer
2	207701PT	1		Spider
3	833862	3	6	Needle Roller
4	207691PT	3	6	Idler Gear (18T and 9T)
5	205966	1		Gear Case
6	847595	2	4	Ball Bearing
7	619017	2	4	Retaining Ring
8	207702PT	1		Gear Case
9	204282	1		Gear Cage Spider
10	844111	3	6	Dowel Pin
11	203623PT	3	6	Idler Gear (14T)

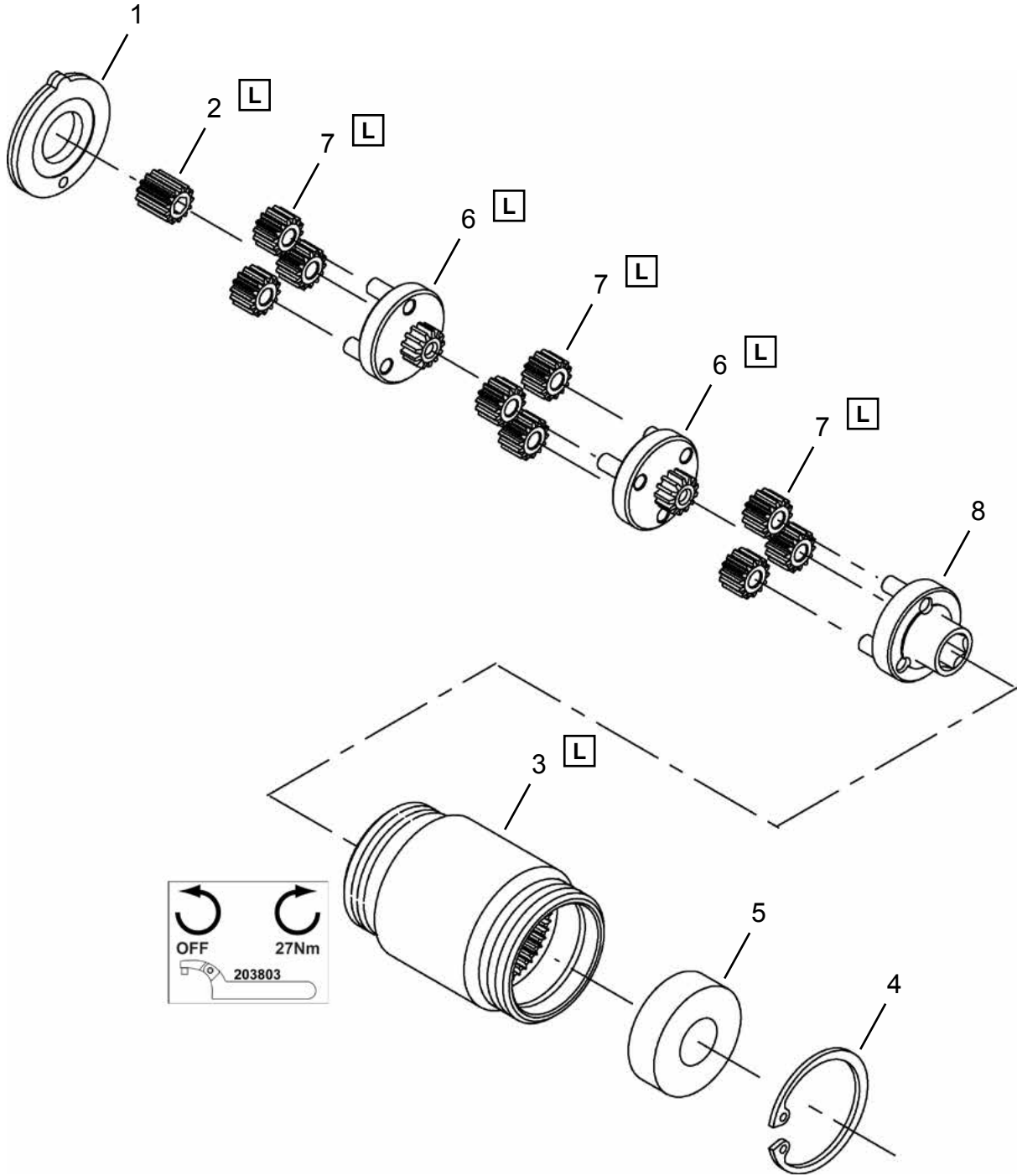
(#) Quantity

(X) Recommended Spare Parts (quantity shown based on 1-5 tools in operation)

(T) Teeth

10.9 301970PT Gearing Assembly

Models
19RAA12AH(-)



L Lubricate with 540450 Grease (18 oz. can)

10.9 301970PT Gearing Assembly

Ref	Number	#	X	EN
				Description
--	301970PT	1		Gear Case Assembly (70.680:1)
1	203644PT	1		End Plate Spacer
2	203919	1	2	Pinion Gear
3	205963	1		Gear Case
4	619017	1	2	Retaining Ring
5	847595	1	2	Ball Bearing
6	207615PT	2		Open Spider
7	207616PT	9	18	Idler Gear (14T)
8	207618PT	1		Open Spider

(#) Quantity

(X) Recommended Spare Parts (quantity shown based on 1-5 tools in operation)

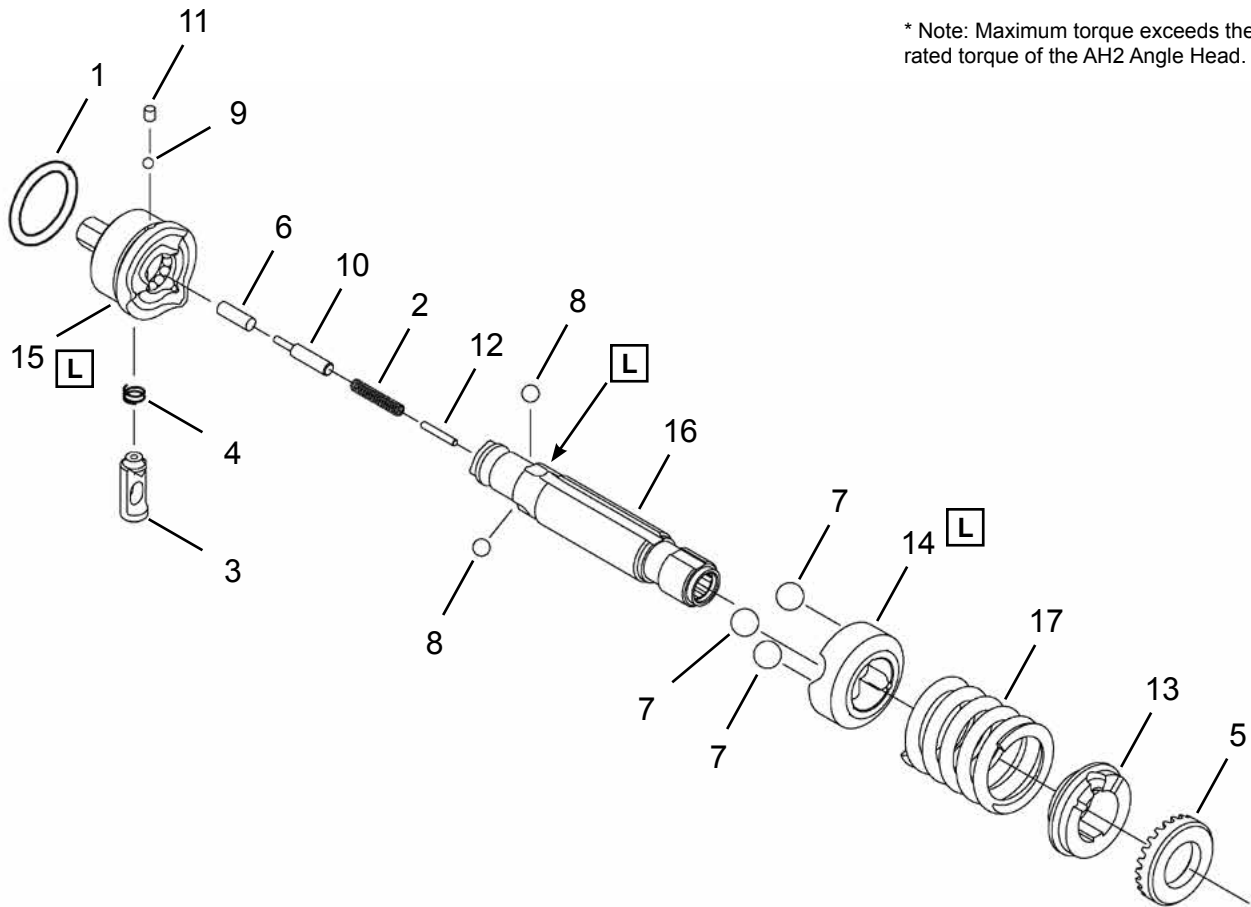
(T) Teeth

**10.10 301982PT Clecomatic Clutch Assembly
301992PT Clecomatic Clutch Assembly**

Models

- 19RAA02AM2
- 19RAA02AH(-)
- 19RAA03AM2
- 19RAA03AH(-)
- 19RAA04AM2
- 19RAA05AM(-)
- 19RAA06AH(-) *
- 19RAA07AH(-) *

* Note: Maximum torque exceeds the rated torque of the AH2 Angle Head.



L Lubricate with 540450 Grease (18 oz. can)

10.10 301982PT Clecomatic Clutch Assembly
301992PT Clecomatic Clutch Assembly

Ref	Number	#	X	EN
				Description
--	Table 10.10	1		Clutch Assembly
1	847411	1	3	O-Ring
2	203585PT	1	3	Clutch Reset Sprig
3	203612	1	1	Trip Slide
4	203613	1	3	Slide Reset Spring
5	869123	1		Adjustment Nut
6	207651PT	1		Dowel Pin
7	842162	3	9	Steel Ball (.250 diameter)
8	842274	3	9	Steel Ball (.156 diameter)
9	842980	13	26	Steel Ball (.094 diameter)
10	869112	1		Reset Pin
11	869149	1	3	Ball Retainer Plug
12	869424	1		Reset Pin Stop
13	207579PT	1		Lock Ring
14	207589PT	1		Driven Cam
15	207591PT	1		Clutch Cam
16	207593PT	1		Clutch Spindle
17	Table 10.10	1		Torque Spring

(#) Quantity

(X) Recommended Spare Parts (quantity shown based on 1-5 tools in operation)

Table 10.10

Ref.	Description	#	19RAA02(---)	#	19RAA04(---)
			19RAA03(---)		19RAA05(---)
--	Clutch Assembly	1	301992PT	1	301982PT
17	Torque Spring (Green)	1	207652PT		-----
	Torque Spring (White)		-----	1	207596PT

10.11 301978PT Clecomatic Clutch Assembly

Ref	Number	#	X	EN
				Description
--	301978PT	1		Clutch Assembly
1	847411	1	3	O-Ring
2	203585PT	1	3	Clutch Reset Sprig
3	203612	1	1	Trip Slide
4	203613	1	3	Slide Reset Spring
5	869123	1		Adjustment Nut
6	207651PT	1		Dowel Pin
7	842162	3	9	Steel Ball (.250 diameter)
8	842274	3	9	Steel Ball (.156 diameter)
9	842980	13	26	Steel Ball (.094 diameter)
10	869112	1		Reset Pin
11	869149	1	3	Ball Retainer Plug
12	869424	1		Reset Pin Stop
13	207579PT	1		Lock Ring
14	207695PT	1		Driven Cam
15	207694PT	1		Clutch Cam
16	207593PT	1		Clutch Spindle
17	207696PT	1		Torque Spring (Orange)

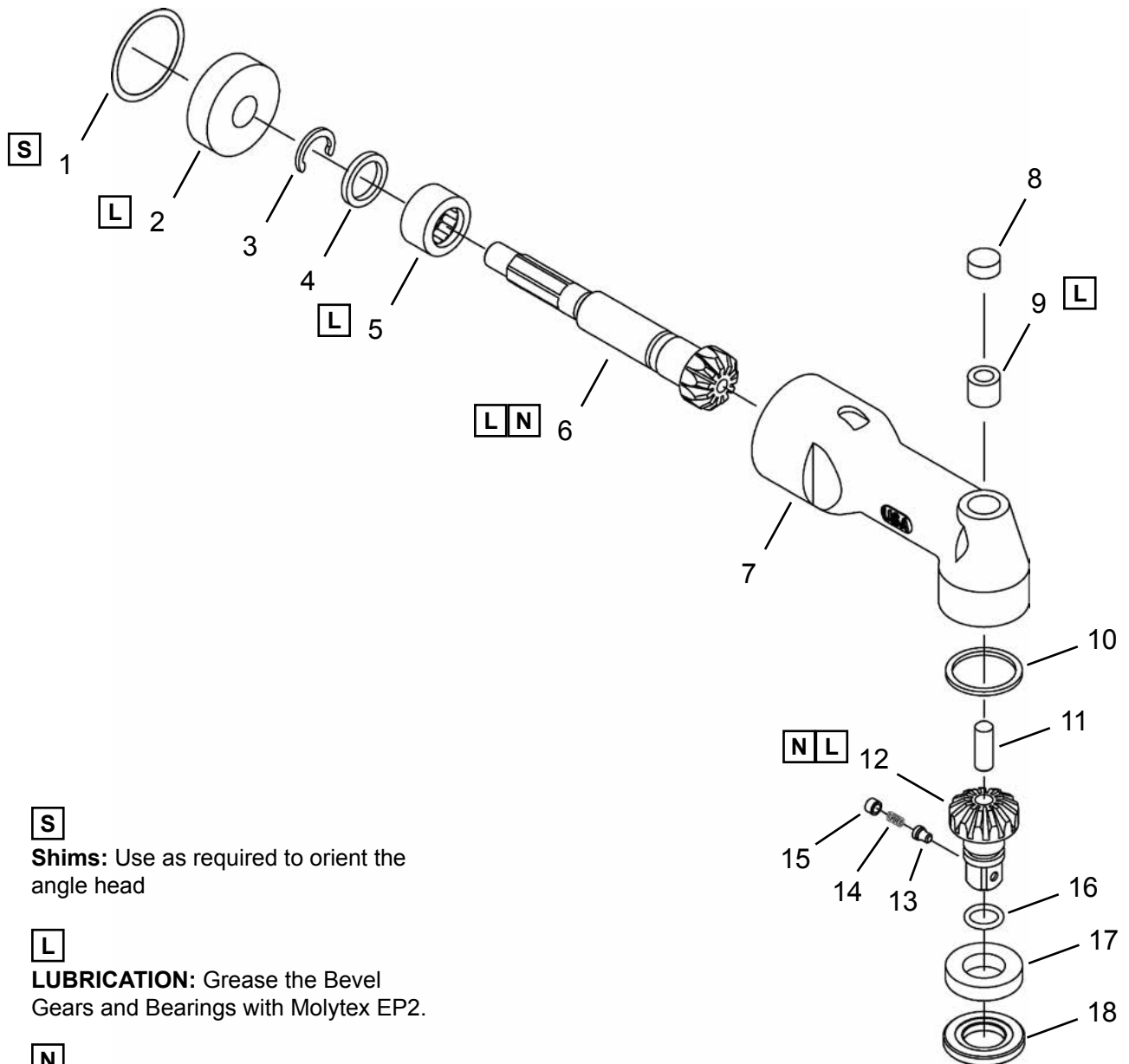
(#) Quantity

(X) Recommended Spare Parts (quantity shown based on 1-5 tools in operation)

10.12 936566PT AM2 Attachment (1/4" Square Drive)

Models

- 19RAA02AM2
- 19RAA03AM2
- 19RAA04AM2
- 19RAA05AM2
- 19RAS03AM2
- 19RAS05AM2



S

Shims: Use as required to orient the angle head

L

LUBRICATION: Grease the Bevel Gears and Bearings with Molytex EP2.

N

Note: **ALWAYS** replace the Bevel Gear and Pinion Gear at the same time since both should wear equally.

10.12 936566PT AM2 Attachment (1/4" Square Drive)

Ref	Number	#	X	EN
				Description
--	936566PT	1		Angle Head Assembly
1	614263	AR	AR	Shim (.002")
	863216	AR	AR	Shim (.005")
	614264	AR	AR	Shim (.010")
2	847846	1	2	Ball Bearing
3	207639PT	1	3	Retaining Ring
4	207638PT	1	1	Washer
5	612229	1	2	Needle Bearing
6	207637PT	1	1	Pinion Gear
7	936567PT	1		Angle Head
8	202988	1	2	Bearing Cap
9	867921	1	2	Needle Bearing
10	936572PT	1		Spacer
11	867922	1	1	Roller
12	936570PT	1	1	1/4" Square Drive Spindle Assembly (includes Ref. 11, 13, 14, 15, 16)
13	202987	1	3	Socket Lock Pin
14	847853	1	3	Socket Lock Spring
15	202986	1	3	Square Drive Plug
16	207640PT	1	3	O-Ring
17	204920	1	2	Ball Bearing
18	936569PT	1		Lock Ring

(#) Quantity

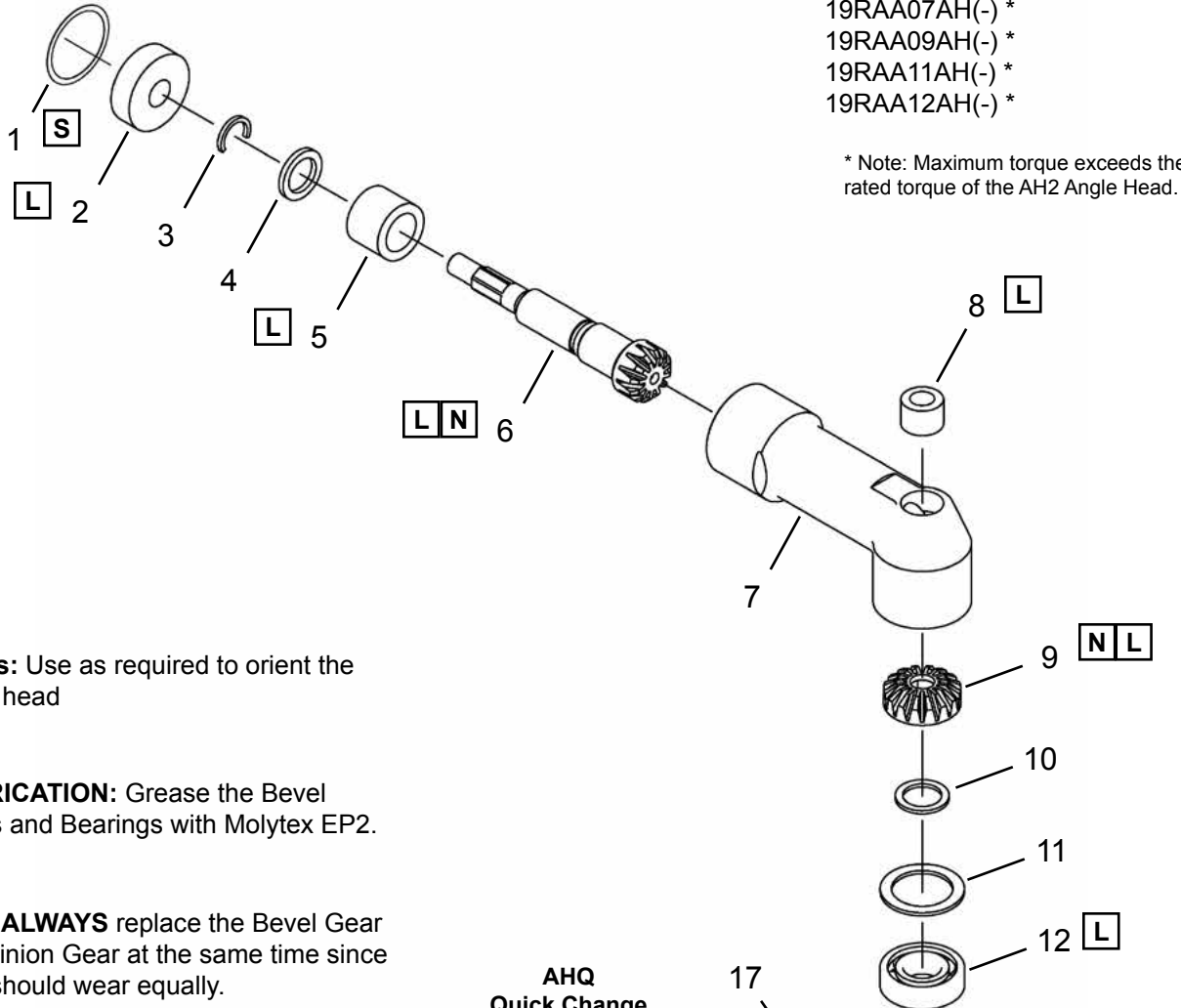
(X) Recommended Spare Parts (quantity shown based on 1-5 tools in operation)

**10.13 936530PT AH2 Attachment (1/4" Square Drive)
936531PT AH3 Attachment (3/8" Square Drive)
302030PT AHQ Attachment (Quick Change)**

Models

19RAA02AH(-)	19RAS02AH3
19RAA03AH(-)	19RAS04AH(-)
19RAA06AH(-)	19RAS06AH(-)
19RAA07AH(-) *	
19RAA09AH(-) *	
19RAA11AH(-) *	
19RAA12AH(-) *	

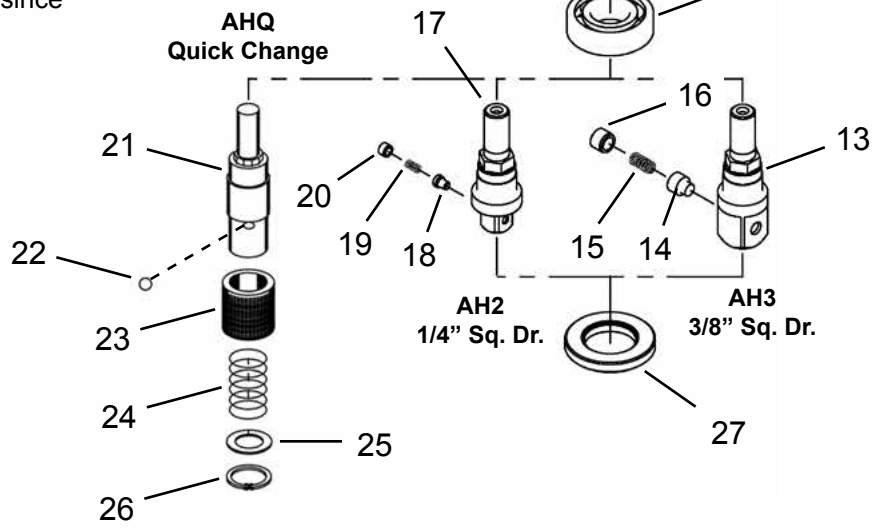
* Note: Maximum torque exceeds the rated torque of the AH2 Angle Head.



S
Shims: Use as required to orient the angle head

L
LUBRICATION: Grease the Bevel Gears and Bearings with Molytex EP2.

N
Note: **ALWAYS** replace the Bevel Gear and Pinion Gear at the same time since both should wear equally.



**10.13 936530PT AH2 Attachment (1/4" Square Drive)
936531PT AH3 Attachment (3/8" Square Drive)
302030PT AHQ Attachment (Quick Change)**

Ref	Number	#	X	EN	
				Description	
--	Table 10.13	1		Angle Head Assembly	
1	614263	AR	AR	Shim (.002")	
	863216	AR	AR	Shim (.005")	
	614264	AR	aR	Shim (.010")	
2	847846	1	2	Ball Bearing	
3	207629PT	1	3	Retaining Ring	
4	207628PT	1	1	Washer	
5	845845	1	2	Needle Bearing	
6	207630PT	1	1	Pinion Gear	
7	936532PT	1		Angle Head Housing	
8	617600	1	2	Needle Bearing	
9	869028	1	1	Bevel Gear (Driven)	
10	936534PT	1		Spacer	
11	936533PT	1		Spacer	
12	936539PT	1	2	Ball Bearing	
13	Table 10.13	1		3/8" Square Drive Spindle Assembly (includes Ref. 14, 15, 16)	
14	24499	1	3	Socket Lock Pin	
15	9D6481	1	3	Socket Lock Spring	
16	26989PT	1	3	Retainer	
17	Table 10.13	1		1/4" Square Drive Spindle Assembly (includes Ref. 18, 19, 20)	
18	202987	1	3	Socket Lock Pin	
19	847853	1	3	Socket Lock Spring	
20	202986	1	3	Square Drive Plug	
21	207712PT	1		Quick Change Spindle	
22	844265	1	3	Steel Ball (1/8")	
23	202833PT	1		Release Sleeve	
24	202842PT	1	3	Spring	
25	864249	1	3	Washer	
26	833688	1	3	Retaining Ring	
27	936538PT	1		Lock Ring	

(#) Quantity

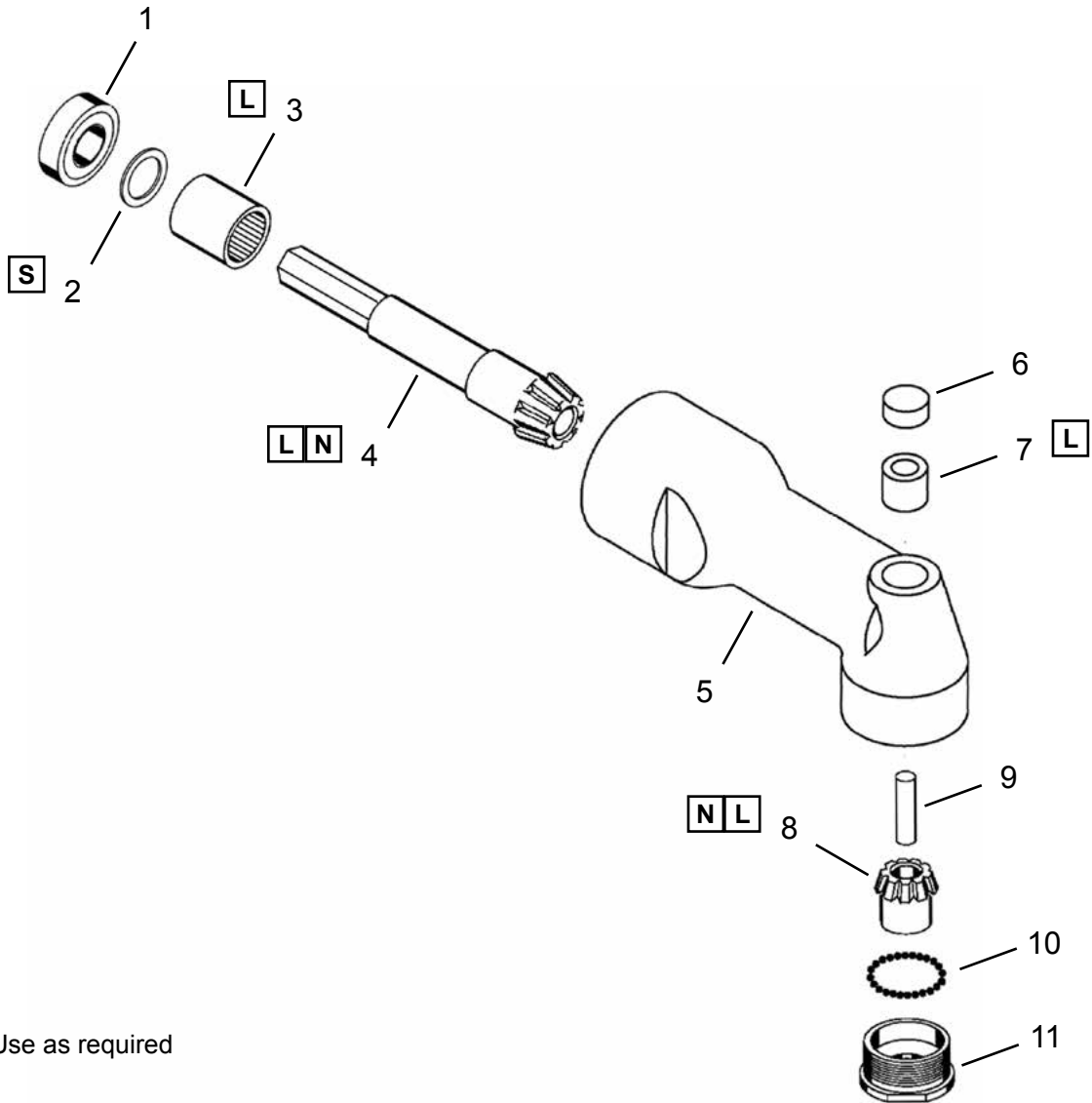
(X) Recommended Spare Parts (quantity shown based on 1-5 tools in operation)

Table 10.13

Ref.	Description	#	19RAA02AH2 19RAA03AH2 19RAA06AH2 19RAA07AH2 19RAA09AH2 19RAA11AH2 19RAA12AH2 19RAS04AH2 19RAS06AH2	#	19RAA02AH3 19RAA03AH3 19RAA06AH3 19RAA07AH3 19RAA09AH3 19RAA11AH3 19RAA12AH3 19RAS02AH3 19RAS04AH3 19RAS06AH3	#	19RAA07AHQ
--	Angle Head Assembly	1	936530PT	1	936531PT	1	302030PT
13	3/8" Spindle Assembly		-----	1	936537PT		-----
17	1/4" Spindle Assembly	1	936536PT		-----		-----

10.14 201711 AM516 Attachment (5/16" Internal Hex)

Models
19RAA05AM516



S

Shims: Use as required

L

LUBRICATION: Grease the Bevel Gears and Bearings with Molytex EP2.

N

Note: **ALWAYS** replace the Bevel Gear and Pinion Gear at the same time since both should wear equally.

10.14 201711 AM516 Attachment (5/16" Internal Hex)

Ref	Number	#	X	EN
				Description
--	201711	1		Angle Head Assembly
1	847946	1	2	Ball Bearing
2	208085PT	AR	AR	Shim (.002")
	208086PT	AR	AR	Shim (.004")
	208087PT	AR	aR	Shim (.007")
3	612229	1	2	Needle Bearing
4	202983	1	1	Pinion Gear
5	202984	1		Angle Head Housing
6	202988	1	2	Bearing Cap
7	867921	1	2	Needle Bearing
8	204391PT	1		5/16" Internal Hex Drive Spindle (includes Ref. 9)
9	867922	1		Gear Pin
10	863035	24	24	Steel Ball (.063")
11	202985	1		Gear Bushing

(#) Quantity

(X) Recommended Spare Parts (quantity shown based on 1-5 tools in operation)

11 Technical data

11.1 19RAA Specifications

Right Angle Clecomatic Clutch

Model Number	Tool Torque Range		Torque Range and Spring Selection								Free Speed (rpm)	Length		Weight		Head Height		Head to Center	
			Blue		Green		White		Orange			in	mm	lbs	kg	in	mm	in	mm
	in-lb	Nm	in-lb	Nm	in-lb	Nm	in-lb	Nm	in-lb	Nm									
19RAA02AM2	4-19	0.5-2.1	4-8.7	0.5-1.0	5-19	0.6-2.1	----	----	----	----	2400	11.9	303	1.7	0.8	1.06	27	0.36	9
19RAA02AH2	4-21	0.5-2.4	4-9.8	0.5-1.1	6-21	0.7-2.4	----	----	----	----	2100	12.5	316	1.8	0.8	1.19	30	0.50	13
19RAA02AH3	4-21	0.5-2.4	4-9.8	0.5-1.1	6-21	0.7-2.4	----	----	----	----	2100	12.5	316	1.8	0.8	1.19	30	0.50	13
19RAA03AM2	4-27	0.5-3.1	4-8.7	0.5-1.0	5-21	0.6-2.4	16-27	1.8-3.1	----	----	1650	12.2	310	1.8	0.8	1.06	27	0.36	9
19RAA03AH2	4-30	0.5-3.4	4-9.8	0.5-1.1	6-24	0.7-2.7	18-30	2.1-3.4	----	----	1450	12.7	321	1.9	0.9	1.19	30	0.50	13
19RAA03AH3	4-30	0.5-3.4	4-9.8	0.5-1.1	6-24	0.7-2.7	18-30	2.1-3.4	----	----	1450	12.7	321	1.9	0.9	1.19	30	0.50	13
19RAA04AM2	4-42	0.5-4.7	4-8.7	0.5-1.0	11-20	1.2-2.3	16-42	1.8-4.7	----	----	950	12.0	305	1.7	0.8	1.06	27	0.36	9
19RAA05AM2	4-50	0.5-5.7	4-8.7	0.5-1.0	11-20	1.2-2.3	16-42	1.8-4.7	22-50	2.5-5.7	570	12.4	316	1.8	0.8	1.06	27	0.36	9
19RAA05AM516	4-50	0.5-5.7	4-8.7	0.5-1.0	11-20	1.2-2.3	16-42	1.8-4.7	22-50	2.5-5.7	570	12.4	316	1.8	0.8	1.06	27	0.36	9
19RAA06AH2*	4-53	0.5-6.0	4-9.8	0.5-1.1	13-20	1.5-2.3	18-48	2.1-5.4	25-53	2.8-6.0	850	12.5	316	1.8	0.8	1.19	30	0.50	13
19RAA06AH3	4-53	0.5-6.0	4-9.8	0.5-1.1	13-23	1.5-2.6	18-48	2.1-5.4	25-53	2.8-6.0	850	12.5	316	1.8	0.8	1.19	30	0.50	13
19RAA07AH2*	13-60	1.5-6.8	----	----	13-23	1.5-2.6	18-48	2.1-5.4	25-60	2.8-6.8	500	12.9	326	1.9	0.9	1.19	30	0.50	13
19RAA07AH3	13-60	1.5-6.8	----	----	13-23	1.5-2.6	18-48	2.1-5.4	25-60	2.8-6.8	500	12.9	326	1.9	0.9	1.19	30	0.50	13
19RAA07AHQ	13-60	1.5-6.8	----	----	13-23	1.5-2.6	18-48	2.1-5.4	25-60	2.8-6.8	500	12.9	326	1.9	0.9	1.19	30	0.50	13
19RAA09AH2*	22-75	2.5-8.5	----	----	----	----	22-53	2.5-6.0	30-75	3.4-8.5	500	12.9	326	1.9	0.9	1.19	30	0.50	13
19RAA09AH3	22-75	2.5-8.5	----	----	----	----	22-53	2.5-6.0	30-75	3.4-8.5	500	12.9	326	1.9	0.9	1.19	30	0.50	13
19RAA11AH2*	22-100	2.5-11.3	----	----	----	----	22-53	2.5-6.0	30-100	3.4-11.3	340	12.3	312	2.1	1.0	1.19	30	0.50	13
19RAA11AH3	22-100	2.5-11.3	----	----	----	----	22-53	2.5-6.0	30-100	3.4-11.3	340	12.3	312	2.1	1.0	1.19	30	0.50	13
19RAA12AH2*	22-100	2.5-11.3	----	----	----	----	22-53	2.5-6.0	30-100	3.4-11.3	200	12.9	326	1.9	0.9	1.19	30	0.50	13
19RAA12AH3	22-100	2.5-11.3	----	----	----	----	22-53	2.5-6.0	30-100	3.4-11.3	200	12.9	326	1.9	0.9	1.19	30	0.50	13

* AH2 Angle Head maximum rated torque is 50 in-lbs. (5.7 Nm)

	Standard / Installed Spring
	Optional / Included Spring

11.2 19RAS Specifications

Right Angle Stall

Model Number	Tool Torque @ 90 PSIG		Tool Torque @ 60 PSIG		Free Speed (rpm)	Length		Weight		Head Height		Head to Center	
	Max Tq		Min Tq			in	mm	lbs	kg	in	mm	in	mm
	in-lb	Nm	in-lb	Nm									
19RAS03AM2	28	3.2	18	2.0	1600	11.4	290	1.3	0.6	1.06	27	0.36	9
19RAS04AH2	32	3.6	21	2.4	1500	11.2	284	1.4	0.6	1.19	30	0.50	13
19RAS05AM2	46	5.2	30	3.4	950	10.6	269	1.2	0.5	1.06	27	0.36	9
19RAS06AH3	55	6.2	36	4.1	840	11.0	279	1.3	0.6	1.19	30	0.50	13

12 Service

12.1 Replacement parts

NOTE



Use only original Cleco replacement parts. Failure to comply can result in reduced power and increased service requirements. The tool warranty may be voided if replacement parts are not manufactured or approved by Apex Tool Group.

12.2 Tool repairs

Only qualified and trained personnel are to repair this equipment.

12.3 Warranty repairs

All warranty repairs are to be performed by an authorized Apex Tool Group service center. Contact your local representative for assistance with warranty repair claims.

13 Disposal

CAUTION!

Injuries and environmental damage from improper disposal.



Components and auxiliary materials of the tool pose risks to health and the environment.

- Capture auxiliary materials (oils, greases) when drained and dispose of them properly.
- Separate the packaging components and dispose of them properly.
- Comply with all applicable local regulations.



Observe local disposal guidelines for all components of this tool and its packaging.

Sales & Service Centers

Note: All locations may not service all products. Please contact the nearest Sales & Service Center for the appropriate facility to handle your service requirements.

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