

Instruction Manual  
PL70EN-B4  
03/10/2014

**OMEGA TECHNOLOGIES**

**Cleco**<sup>®</sup>

**B4R Series**  
Reversible Axial Piston Power Motors



For additional product information visit our website at:  
<https://dotcotool.com/product-category/cleco-tools/cleco-air-motors/cleco-b4-series-axial-piston-air-motors/>

**Cleco®**  
Nomenclature

Model Number	Maximum Allowable RPM		Stall Torque		Starting Torque		Weight		Gear Ratio	Maximum Overhung Load @ Stall *	
	@ Max. HP	Free Speed	ft. lbs.	Nm	ft. lbs.	Nm	lbs.	kg		lbs.	kg
B4R321M	2150	4200	5	6.8	3.7	5.0	14.5	6.57	----	800	363
B4R319M	525	1020	21	28.0	15.0	20.0	14.5	6.57	4.1:1	800	363
B4R319M-NS	525	1020	21	28.0	15.0	20.0	14.5	6.57	4.1:1	800	363
B4R318M	270	525	40	54.0	30.0	41.0	14.5	6.57	8:1	800	363
B4R320M	154	300	70	95.0	52.0	71.0	22.5	10.21	13.9:1	800	363
B4R323M	90	175	119	161.0	88.0	119.0	22.5	10.21	23.8:1	800	363
B4R322M	79	150	136	184.0	101.0	137.0	22.5	10.21	27.2:1	800	363
B4R322M-NS	79	150	136	184.0	101.0	137.0	22.5	10.21	27.2:1	800	363
B4R317M	46	90	232	315.0	172.0	233.0	22.5	10.21	46.4:1	800	363

\* Note: All models assume overhung load located at 1.75" (44.45mm) from the face of the motor.

The original language of this manual is English.

**Product Safety Information:**

Intended Use:

This pneumatic motor is to be used exclusively as a power source to be integrated into an application.

For additional product safety information refer to Apex Tool Group, LLC or Apex Tool Group GmbH & Co. OHG document CE-2005, General Safety Instructions for Air Motors.



The motor must not be modified in any manner unless approved in writing by Apex Tool Group, LLC or Apex Tool Group GmbH & Co. OHG. All safety devices must be properly installed and maintained in good working order.

**Declaration of Incorporation:**

We affirm that this machine complies with the basic requirements of the following directives (2006/42/EC) and is intended for installation / assembly in a / with other machine(s). Commissioning of the incomplete machine is prohibited until such time that the incomplete machine has been incorporated in a machine that complies with the EC Machinery Directive 2006/42/EC and for which there is an EC Declaration of Conformity in accordance with Appendix II A. We furthermore declare that the special technical documentation for the incomplete machine is in accordance with Appendix VII Part B. We undertake to have it passed on to the market surveillance body upon request by our representative for the compilation of technical documentation. The following Sections of Appendix I of Directive 2006/42/EC have been fulfilled: 1.1.2, 1.1.3, 1.1.5, 1.3.2, 1.3.4, 1.5. Applied harmonized standards are ISO 12100-1: 2004-04, ISO 12100-2:2004-04.

The name, job function and address of the person authorized to compile the technical file.

Mr. Vishnu Irigreddy  
Director of Global R&D- Mechanical Engineering  
Apex Tool Group  
670 Industrial Drive  
Lexington, SC 29072

Signature: Vishnu Irigreddy  
Date: March 10, 2014

**Air Line Lubrication:**

Use Apex Tool Group, LLC or Apex Tool Group GmbH & Co. OHG's lightweight air tool oil 500021 (available in quantities shown in the following chart) or an SAE-5 lightweight spindle oil.

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

**Recommended Grease:**

Part No.	Packaged	Designation
A123771	16 oz. (0.45 kg)	Shell Alvania® EP 00
540450	16 oz. (0.45 kg)	Chevron Black Pearl® EP NLGI

**Air Supply Line:**

Parameter	Description
Air Hose	Minimum inside diameter: 1/2" (12.7mm) Maximum length: 16.4' (5 m)
Working pressure range	Performance rated at: 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.

**Service and Repair:**

Tool service and repair should be performed by an authorized Apex Tool Group, LLC or Apex Tool Group GmbH & Co. OHG Center. Refer to the last page of this manual for locations.

**Disposal:**



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

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## Repair instructions

### Lubrication

#### **“DO NOT SUBSTITUTE LUBRICANTS”**

The proper grades of oil and grease are essential too the efficient operation of these air motors. Heavy oil will not flow through a lubricator at a satisfactory rate too insure proper lubrication to the motor. Greases that are too stiff will channel and fail to lubricate properly and greases that are tool thin will blow out of the motor. Improper lubrication or inadequate lubricants can cause extensive motor damage.

Grease fittings are located on the motor housing and the gear housing for each stage of gearing. The following quantities of A123771 (*High Temp 540450*) grease are provided during factory assembly and these same amounts must be provided whenever the air motor is disassembled.

- Motor assembly: 3 oz.
- Gearing assembly (each): 2 oz.

During normal operation, the motor wil loose a small amount of grease through the exhaust making it necessary to add grease at regular intervals. After each 50 hours of operation add 1.5 oz. of A123771 (*High Temp 540450*) grease to the motor housing.



**Excessive grease in the motor housing will cause a loss in motor performance. Not enough grease will cause premature motor failure.**

**Too much grease in the gear case will force the seal out of the front housing.**

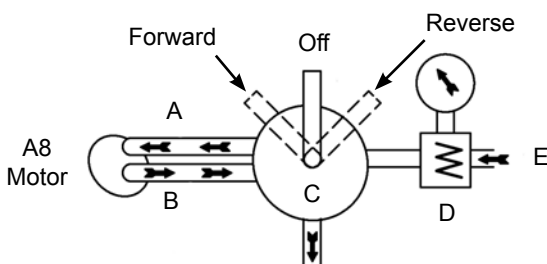
The gear case will lose grease through the motor. The motor will siphon gear grease, saturated with airline oil, through the exhaust. After 200 hours of operation, add 0.5 oz. of A123771 (*High Temp 540450*) grease into each gear housing.

### Valving

If a valve is used, it should have a full flow air passage to utilize full powe of the motor. For quick motor stops, an all-ports closed-in-neutral type valve with a spring return should be used.

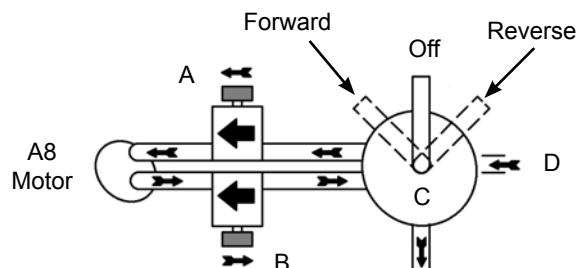
#### **Torque Output Control**

- A) When air enters from this side
- B) it must exhaust without restrictions.
- C) Four-Way valve
- D) Pressure regulator
- E) Air supply



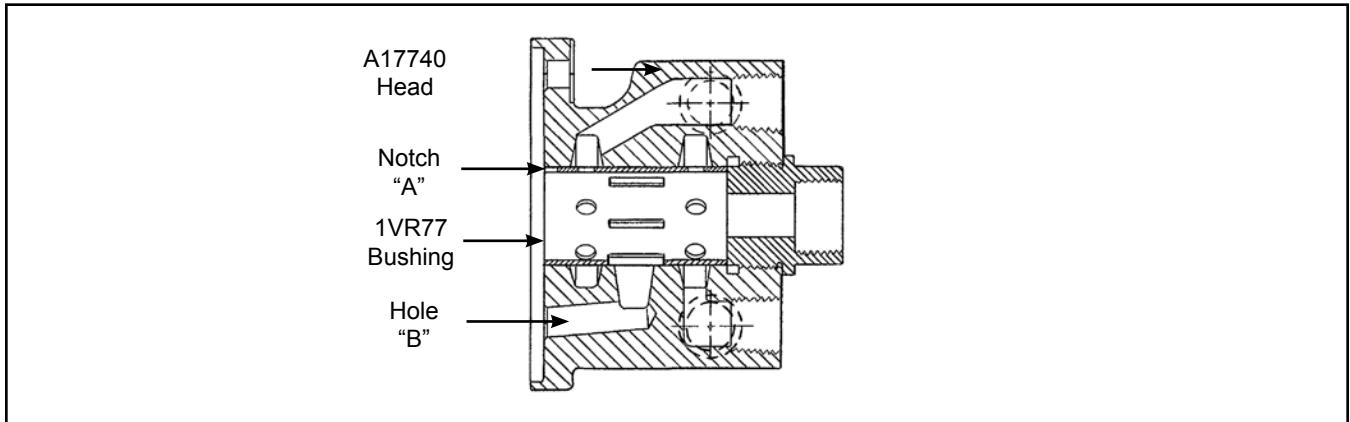
#### **Control Forward and Reverse Speeds**

- A) Metered flow control (inlet)
- B) Free (open) flow control (exhaust)
- C) Four-Way valve
- D) Air supply



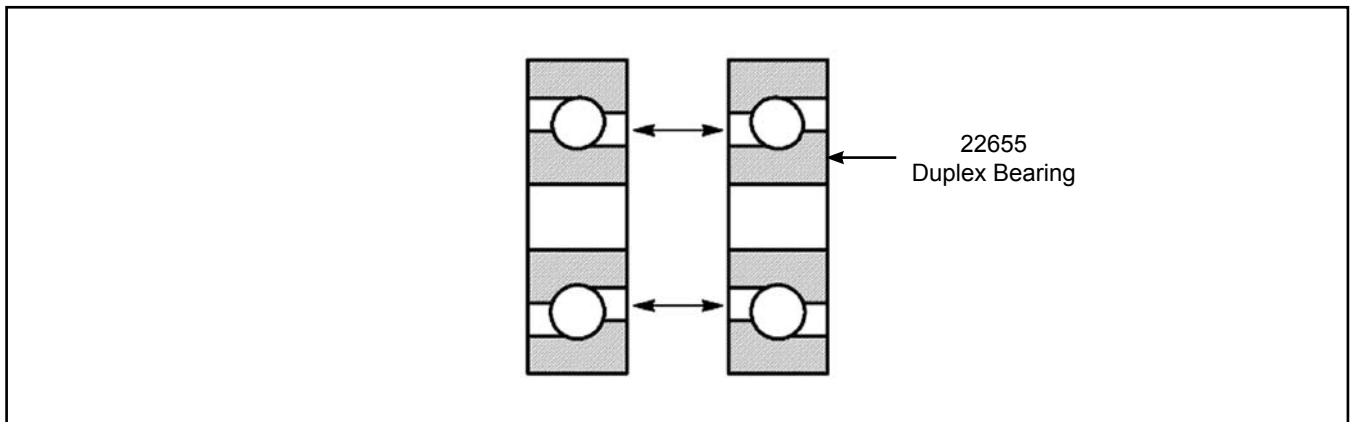
### Distributor bushing assembly

Press the new bushing into the head as shown. Notch "A" in the bushing must be opposite hole "B" in the head.



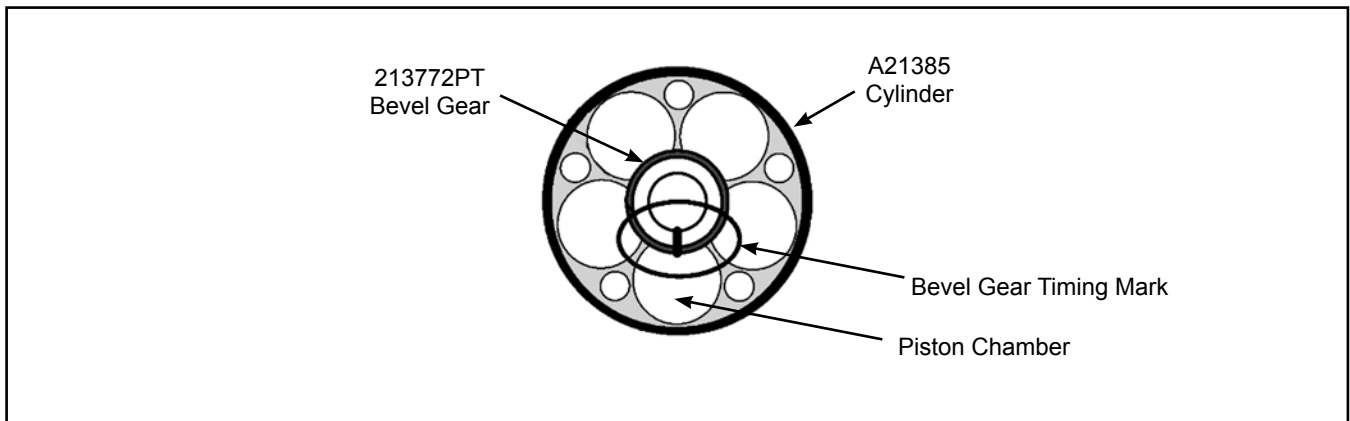
### Duplex bearing assembly

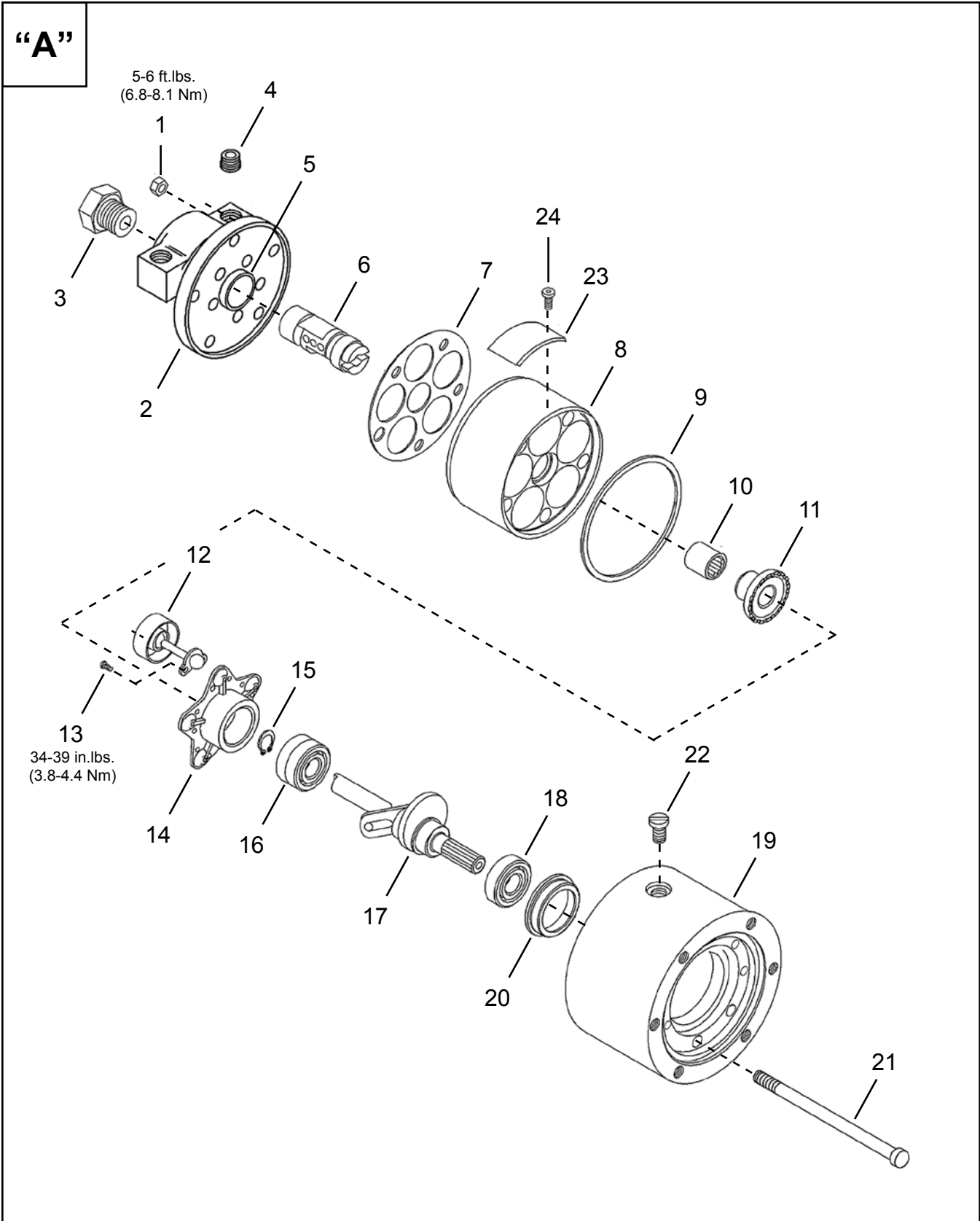
The small diameters of the bearings must face each other when assembled.



### Bevel gear timing mark

Make sure the timing mark on the bevel gear is aligned with the center of a piston chamber before assembling the driveshaft assembly into the cylinder.





**Illustration "A": Power Unit**

Ref	Number	#	X	EN
				Description
--	507489	1		Power Unit (includes Ref. 1-22)
1	C109C	5	10	Head Assembly Nut
2	A17740	1		Head Assembly (includes Ref. 3-5)
3	17747	1	1	Reducer Bushing
4	B112E	2	2	Pipe Plug
5	1VR77	1	1	Bushing
6	10100	1		Distributor
7	1V189	1	3	Head Gasket
8	A21385	1		Cylinder (includes Ref. 10)
9	9D7916	1	3	Cylinder Gasket
10	535712	1	2	Needle Bearing
11	213772PT	1	1	Bevel Gear
--	511503	1		Socket Plate Assembly (includes Ref. 12-14)
12	511504	5	5	Piston Assembly
13	B122R	10	10	Screw
14	511505	1		Socket Plate
15	500740	1	3	Retaining Ring
16	22655	1	2	Duplex Bearing
17	511511	1		Driveshaft
18	1V155	1	2	Ball Bearing
19	520293	1		Rear Housing (includes Ref. 20-21)
20	22761	1	1	Bearing Liner
21	520294	4	4	Stud
22	30775PT	1	1	Flush Type Grease Fitting
23	530322	1		Nameplate (not included in 507488 power unit)
24	1443700	2		Drive Screw (not included in 507488 power unit)

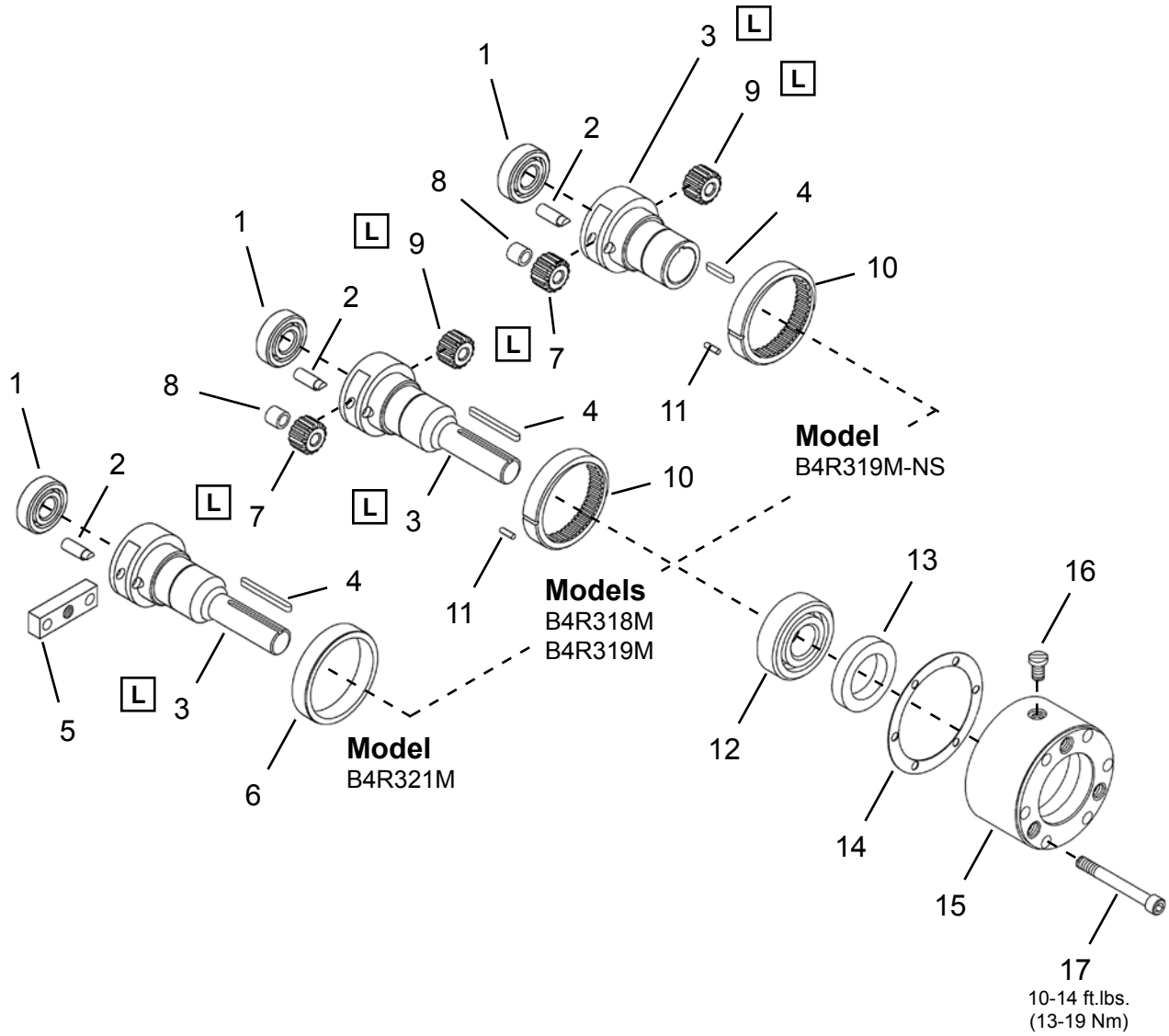
(#) Quantity

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

**Cleco®**  
Direct Drive & Single Stage Gearing

**“B”**

**Models**  
B4R318M  
B4R319M  
B4R319M-NS  
B4R321M



**L** Lubricate with A123771 Grease (16 oz. can)



**Direct Drive & Single Stage Gearing**

**Illustration "B": Direct Drive and Single Stage Gearing Assemblies**

Ref	Number	#	X	EN	
				Description	
1	RS196	1	2	Ball Bearing	
2	9D7890	2	4	Planetary Gear Pin	
3	Table "B"	1		Gear Cage Output Spindle	
4	Table "B"	1	2	Gear Cage Output Spindle Key	
5	18311	1		Drive Block	
6	18305	1		Locating Ring	
7	Table "B"	2	4	Planetary Gear (includes Ref. 8)	
8	16113	2	4	Planetary Gear Bearing	
9	Table "B"	1	2	Pinion Gear	
10	9D7892	1		Ring Gear	
11	80G216	1	2	Ring Gear Pin	
12	18304	1	2	Ball Bearing	
13	18307	1	3	Oil Seal	
14	9D7908	1	3	Front Housing Gasket	
15	18296	1		Front Housing	
16	30775PT	1	1	Grease Fitting	
17	B117B	6	6	Front Housing Bolt	

(#) Quantity

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

**Table "B"**

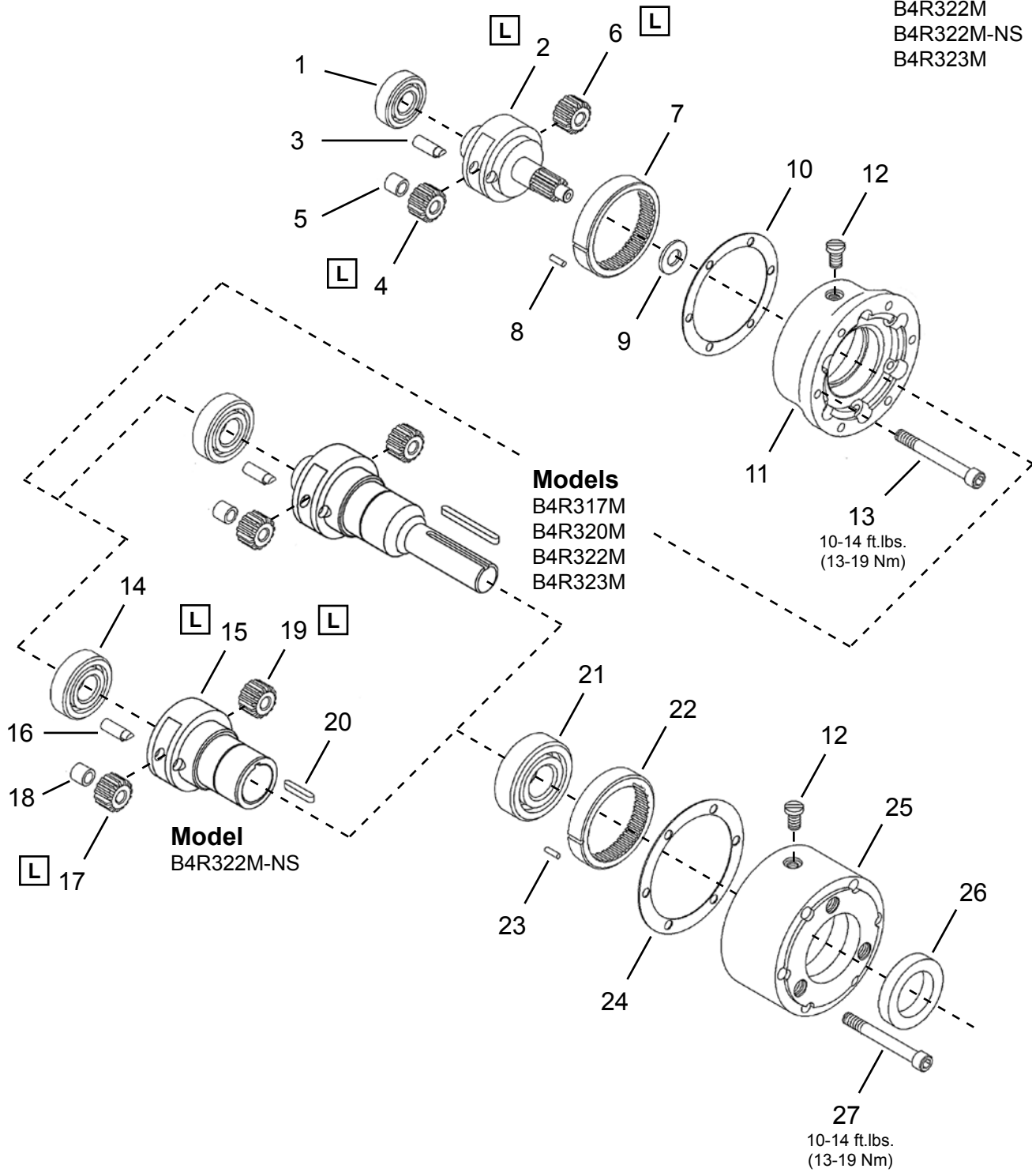
Ref.	Description	#	B4R318M	#	B4R319M	#	B4R319M-NS	#	B4R321M
3	Gear Cage Output Spindle	1	544040	1	544119PT	1	18310	1	544119PT
4	Gear Cage Output Spindle Key	1	18308	1	18308	1	512089	1	18308
7	Planetary Gear	2	A9D7891(24T)	2	A18301(19)	2	A18301(19)		---
9	Pinion Gear		---	1	18312	1	18312		----

(T) Teeth

# Cleco® Double Stage Gearing

**“C”**

**Models**  
B4R317M  
B4R320M  
B4R322M  
B4R322M-NS  
B4R323M



**L** Lubricate with A123771 Grease (16 oz. can)

**Cleco®**  
Double Stage Gearing

**PL70EN-B4**  
03/10/2014

**Illustration "C": Double Stage Gearing Assembly**

Ref	Number	#	X	EN
				Description
1	RS196	1	2	Ball Bearing
2	Table "C"	1		Gear Cage
3	9D7890	2	4	Planetary Gear Pin
4	Table "C"	2	4	Planetary Gear (includes Ref. 5)
5	16113	2	4	Planetary Gear Needle Bearing
6	Table "C"	1	2	Pinion Gear
7	9D7892	1		Ring Gear
8	80G216	1	2	Ring Gear Pin
9	12686	1	2	Washer
10	9D7908	1	3	Center Housing Gasket
11	30078PT	1		Center Housing
12	30775PT	2	2	Flush Type Grease Fitting
13	B115M	6	6	Socket Head Cap Screw
14	525424	1	2	Ball Bearing
15	Table "C"	1		Gear Cage Output Spindle
16	10032	2	4	Planetary Gear Pin
17	Table "C"	2	4	Planetary Gear (includes Ref. 18)
18	Table "C"	2	4	Planetary Gear Needle Bearing
19	Table "C"	1	2	Pinion Gear
20	Table "C"	1	3	Output Spindle Key
21	18304	1	2	Ball Bearing
22	10019	1		Ring Gear
23	DP120PT	1	2	Ring Gear Pin
24	29719PT	1	3	Front Housing Gasket
25	29715PT	1		Front Housing
26	18307	1	3	Oil Seal
27	B117B	6	6	Socket Head Cap Screw

(#) Quantity

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

**Table "C"**

Ref.	Description	#	B4R317M	#	B4R320M	#	B4R322M	#	B4R322M-NS	#	B4R323M
2	Gear Cage	1	507313	1	30079PT	1	30080PT	1	30080PT	1	30079PT
4	Planetary Gear	2	A9D7891(24T)	2	A18301(19T)	2	A9D7891(24T)	2	A9D7891(24T)	2	A18301(19T)
6	Pinion Gear		---	1	18312		----		----	1	18312
15	Gear Cage Output Spindle	1	544122PT	1	544121PT	1	544121PT	1	A29720	1	544122PT
17	Planetary Gear	2	540766(19T)	2	A18322(4T)	2	A18322(4T)	2	A18322(4T)	2	540766(19T)
18	Planetary Gear Bearing	2	845845	2	21155	2	21155	2	21155	2	845845
19	Pinion Gear		---	1	18323	1	18323	1	18323		----
20	Output Spindle Key	1	18308	1	18308	1	18308	1	29716PT	1	18308

(T) Teeth

## 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.

Detroit, Michigan

**Apex Tool Group  
Sales & Service Center**  
2630 Superior Court  
Auburn Hills, MI 48326  
Tel: (248) 393-5640  
Fax: (248) 391-6295

Houston, Texas

**Apex Tool Group  
Sales & Service Center**  
6550 West Sam Houston  
Parkway North, Suite 200  
Houston, TX 77041  
Tel: (713) 849-2364  
Fax: (713) 849-2047

Lexington, South Carolina

**Apex Tool Group**  
670 Industrial Drive  
Lexington, SC 29072  
Tel: (800) 845-5629  
Tel: (803) 951-7544  
Fax: (803) 358-7681

Los Angeles, California

**Apex Tool Group  
Sales & Service Center**  
6881 Stanton Avenue  
Unit B  
Buena Park, CA 90621  
Tel: (714) 994-1491  
Fax: (714) 994-9576

Seattle, Washington

**Apex Tool Group  
Sales & Service Center**  
2865 152nd Avenue N.E.  
Redmond, WA 98052  
Tel: (425) 497-0476  
Fax: (425) 497-0496

York, Pennsylvania

**Apex Tool Group  
Sales & Service Center**  
3990 East Market Street  
York, PA 17402  
Tel: (717) 755-2933  
Fax: (717) 757-5063

Brazil

**Apex Tool Group  
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Zona Industrial - Iporanga  
18087-170 Sorocaba  
SP Brazil  
Tel: +55 15 2383929  
Fax: +55 15 2383260

Canada

**Apex Tool Group  
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7631 Bath Road  
Mississauga  
Ontario L4T 3T1  
Canada  
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Tel: (905) 673-4400

China

**Apex Power Tool Trading  
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