

**Instruction Manual**

**PL70EN-A6**

03/20/2014

**Cleco®**

**A6R Series**  
**Reversible Axial Piston Power Motors**



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

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
A6R308M	1820	3500	1	15	8	11	27	12.2	----	1000	454
A6R308M-NS	1820	3500	1	15	8	11	27	12.2	----	1000	454
A6R335M	535	1030	37	50	27	37	27	12.2	3.4:1	1000	454
A6R307M	315	605	64	87	48	65	27	12.2	5.8:1	1000	454
A6R332M	152	290	130	176	96	130	43	19.5	11.9:1	1000	454
A6R333M	89	170	223	302	163	221	43	19.5	20.3:1	1000	454
A6R331M	54	100	370	502	269	365	43	19.5	33.6:1	1000	454

\* Note: These motors must be operated with sufficient load to prevent speed from exceeding the maximum allowable free speed.

\*\* Note: All models assume overhung load located at 2.25" (57.15mm) from the face of the motor.

## Product Information

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.

## ⚠ WARNING

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 Irigireddy  
Director of Global R&D- Mechanical Engineering  
Apex Tool Group  
670 Industrial Drive  
Lexington, SC 29072

*I. Vishnu Irigireddy*

Signature: Vishnu Irigireddy  
Date: March 20, 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: 3/8" (9.5mm) 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 to the efficient operation of these air motors. Heavy oil will not flow through a lubricator at a satisfactory rate to insure proper lubrication to the motor. Greases that are too stiff will channel and fail to lubricate properly and greases that are too 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: 6 oz.
- Gearing assembly (each): 2 oz.

During normal operation, the motor will lose a small amount of grease through the exhaust making it necessary to add grease at regular intervals. After each 50 hours of operation add 2.0 oz. of A123771 (*High Temp 540450*) grease to the motor housing.

**⚠ CAUTION**

***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.***

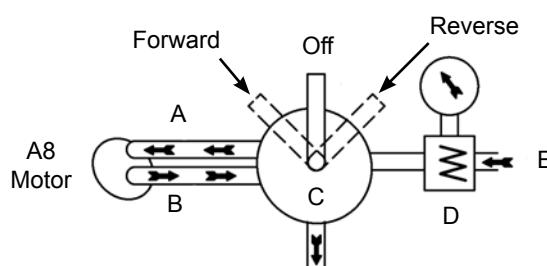
The gear case will lose grease through the motor. The motor will siphon gear grease, saturated with airline oil, through the exhaust. After 200 hours of operation, add 0.5 oz. of A123771 (*High Temp 540450*) grease into each gear housing.

### Valving

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

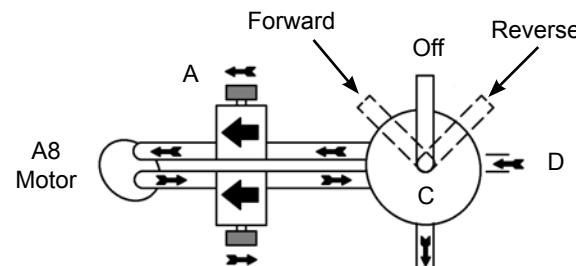
#### Torque Output Control

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



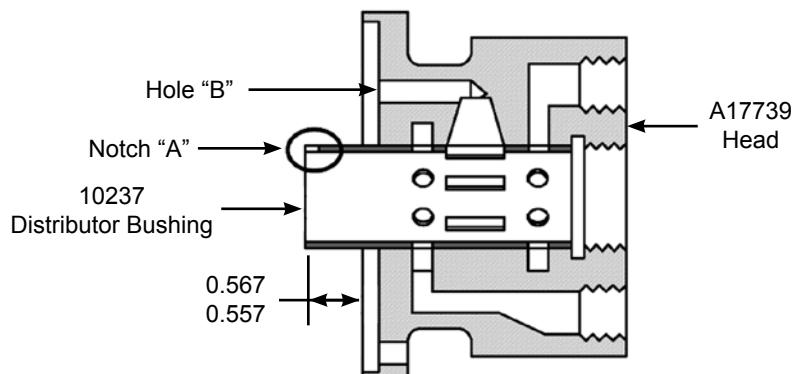
#### Control Forward and Reverse Speeds

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



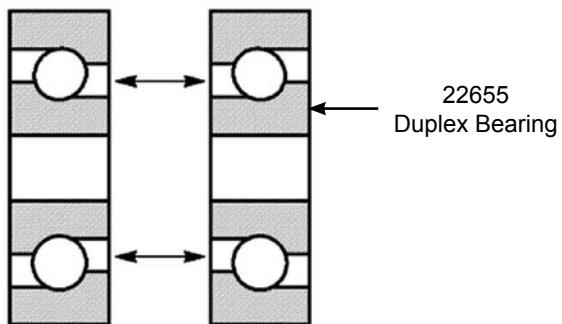
## Distributor bushing assembly

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



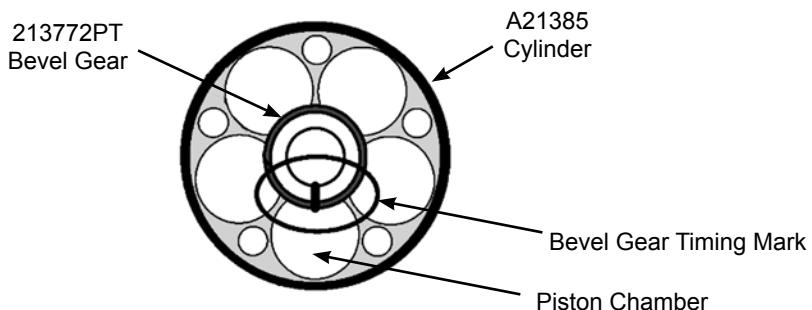
## Duplex bearing assembly

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

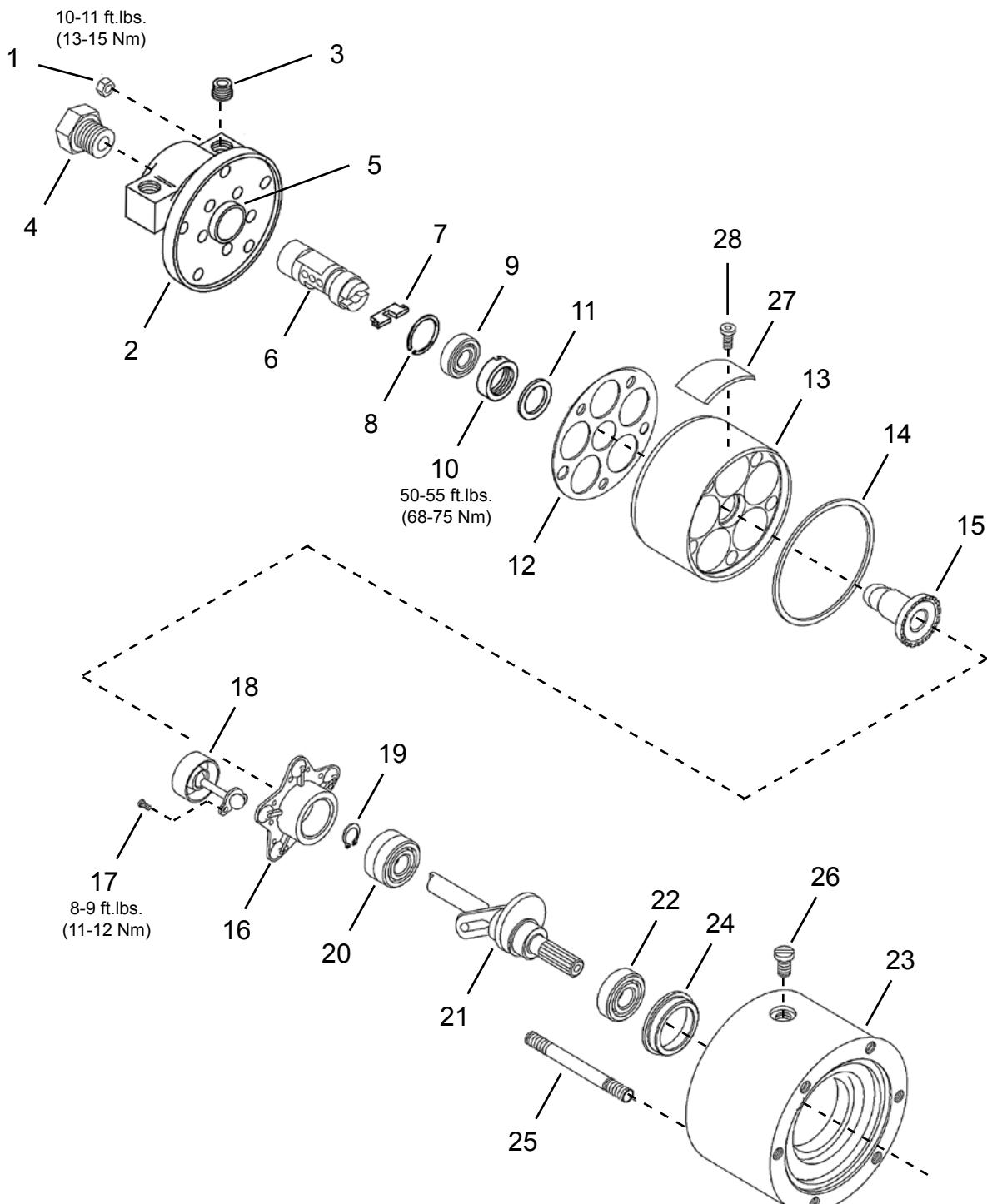


## Bevel gear timing mark

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.



"A"



**Illustration "A": Power Unit**

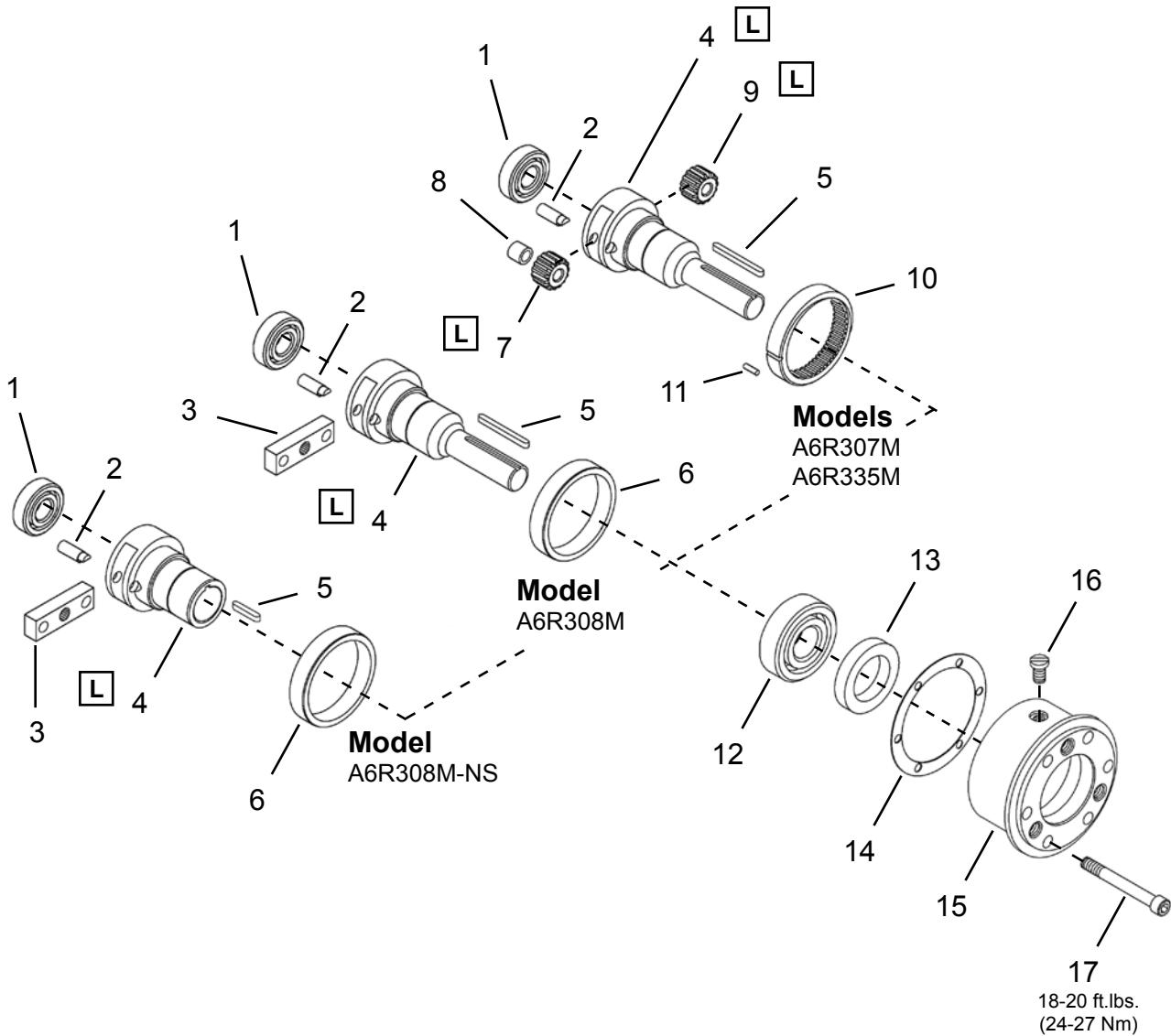
Ref	Number	#	X	EN
				Description
--	507490	1		Power Unit (includes Ref. 1-26)
1	C108S	5	10	Head Assembly Nut
2	A17739	1		Head Assembly (includes Ref. 3-5)
3	B112E	2	2	Square Head Pipe Plug (3/8 NPT)
4	17748	1	1	Reducer Bushing
5	10237	1	1	Distributor Bushing
6	A10226	1		Distributor (includes Ref. 7-8)
7	2VR43	1	1	Drive Key
8	800090	1	3	Retaining Ring
9	2V85	1	2	Ball Bearing
10	2V169	1		Lock Nut
11	2V272	1		Washer
12	2V1891	1	3	Head Gasket
13	A2V1	1		Cylinder
14	10027	1	3	Cylinder Gasket
15	A17605	1	1	Bevel Gear
--	533944	1		Socket Plate Assembly (includes Ref. 16-18)
16	507692	1		Socket Plate
17	B135Z	10	20	Socket Head Cap Screw (10-24 NC-2 x 1/4)
18	A2V2	5	5	Piston Assembly
19	800251	1	3	Retaining Ring
20	507806	1	2	Duplex Ball Bearing
21	507808	1		Driveshaft
22	22G155	1	2	Ball Bearing
23	A18317	1		Rear Housing (includes Ref. 24-25)
24	18364PT	1	1	Rear Housing Bearing Liner
25	27401PT	5	5	Rear Housing Stud (5/16-24 x 6.188)
26	30775PT	1	1	Flush Type Grease Fitting
27	530322	1		Nameplate (not included in 507490 power unit)
28	534820	2		Drive Screw (not included in 507490 power unit)

(#) Quantity

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

**“B”**

**Models**  
A6R307M  
A6R308M  
A6R308M-NS  
A6R335M



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

Ref	Number	#	X	EN			
				Description			
1	525424	1	2	Ball Bearing			
2	10032	2	4	Planetary Gear Pin			
3	18324	1		Drive Block			
4	Table "B"	1		Gear Cage Output Spindle			
5	Table "B"	1	3	Output Spindle Key			
6	18320	1		Locating Ring			
7	Table "B"	2	4	Planetary Gear (includes Ref. 8)			
8	Table "B"	2	4	Planetary Gear Needle Bearing			
9	Table "B"	1	2	Pinion Gear			
10	10019	1		Ring Gear			
11	DP120PT	1	2	Ring Gear Pin			
12	18304	1	2	Ball Bearing			
13	18307	1	3	Oil Seal			
14	10026	1	3	Front Housing Gasket			
15	18316	1		Front Housing			
16	30775PT	1	1	Flush Type Grease Fitting			
17	B119S	6	6	Socket Head Cap Screw (5/16-18 x 2-1/2)			

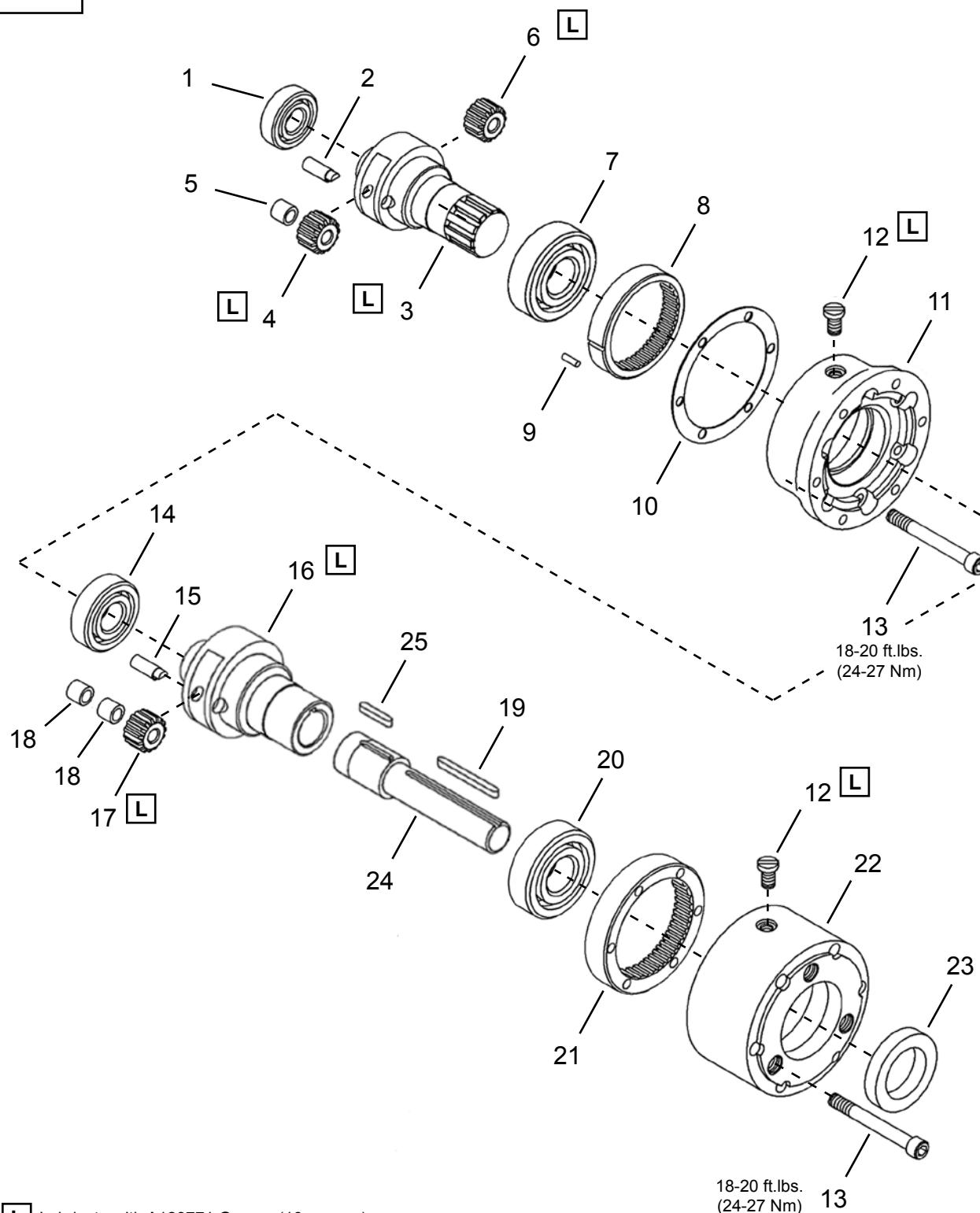
(#) Quantity

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

**Table "B"**

Ref.	Description	#	A6R307M	#	A6R308M	#	A6R308M-NS	#	A6R335M
4	Gear Cage Output Spindle	1	544024	1	544039	1	18318	1	544039
5	Output Spindle Key	1	18326	1	18326	1	512089	1	18326
7	Planetary Gear	2	540766 (19T)		----		----	2	A18322 (14T)
8	Needle Bearing	2	845845		----		----	2	21155
9	Pinion Gear		----		----		----	1	18323 (20T)

(T) Teeth

**"C"****L** Lubricate with A123771 Grease (16 oz. can)18-20 ft.lbs.  
(24-27 Nm) 13

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

Ref	Number	#	X	EN	
				Description	
1	525424	1	2	Ball Bearing	
2	10032	2	4	Planetary Gear Pin	
3	Table "C"	1		Gear Cage	
4	Table "C"	2	4	Planetary Gear (includes Ref. 5)	
5	Table "C"	2	4	Planetary Gear Needle Bearing	
6	Table "C"	1	2	Pinion Gear	
7	30075	1	2	Ball Bearing	
8	10019	1		Ring Gear	
9	DP120PT	1	2	Ring Gear Pin	
10	10026	1	3	Center Housing Gasket	
11	30062PT	1		Center Housing	
12	30775PT	2	2	Flush Type Grease Fitting	
13	B127D	12	12	Socket Head Cap Screw (5/16-18 x 3)	
14	30076PT	1	2	Ball Bearing	
15	30058PT	2	4	Planetary Gear Pin	
16	Table "C"	1		Output Gear Cage	
17	Table "C"	2	4	Planetary Gear (includes Ref. 18)	
18	11700	4	8	Planetary Gear Needle Bearing	
19	30072PT	1	3	Output Gear Cage Key	
20	30063PT	1	2	Ball Bearing	
21	30056PT	1		Ring Gear	
22	30049	1		Front Housing	
23	30057PT	1	3	Oil Seal	
24	30053PT	1		Output Spindle	
25	30071PT	1	3	Output Spindle Key	

(#) Quantity

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

**Table "C"**

Ref.	Description	#	A6R331M	#	A6R332M	#	A6R333M
3	Gear Cage	1	30060	1	30052PT	1	30739PT
4	Planetary Gear	2	540766 (19T)	2	A18322 (14T)	2	540766 (19T)
5	Needle Bearing	4	845845	4	21155	4	845845
6	Pinion Gear		----	1	18323 (20T)		----
16	Output Gear Cage	1	30059	1	30051	1	30051
17	Planetary Gear	2	A30061 (21T)	2	A30055 (16T)	2	A30055 (16T)

(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  
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Fax: (425) 497-0496

York, Pennsylvania

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

Brazil

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China

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