

Service Manual  
PL12EN-67EA  
06/04/2013

**OMEGA TECHNOLOGIES**

# Cleco®

**67EA Series**  
Electronically Controlled Right Angle Nutrunner



For additional product information visit our website at:  
<https://dotcotool.com/product-category/cleco-tools/cleco-corded-electric-nutrunners-cleco-air-tools/cleco-67-series-transducer-control-right-angle-corded-electric-nutrunners/>

## 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 67EA series tools.
- serves as a reference guide for technical data, service intervals and spare parts ordering.
- provides information on optional equipment.

### Identification text:

67EA represents all models of the DC electric right angle 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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**AL6** = 3/4" Square Drive - Right Angle  
**AM6** = 3/4" Square Drive - Right Angle  
**ML6** = 3/4" Square Drive - Right Angle  
**AH8** = 1" Square Drive - Right Angle

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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 power cable for damage.
- Make sure the power cable 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.

## 1.2 Basic requirements for safe working practices (continued)

**CAUTION!**



- Keep the tool clean and dry to provide the best possible grip.
- Firmly grasp the handle of the 67EA 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 power 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 67EA tools. The 67EA 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 67EA is designed exclusively for fastening and releasing threaded fasteners. The 67EA is used in conjunction with the following controllers:

- Do not modify the 67EA, any guard or accessory.

| Nutrunner   | Controller                                                     |
|-------------|----------------------------------------------------------------|
| 67EA series | m-Pro-400GC controller with m-Pro-400-IT isolation transformer |

- Use only with accessory parts which are approved by the manufacturer.
- Do not use as a hammer, pry-bar or any other improper usage.
- Do not use in areas where there is a risk of explosion.

## 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  $\leq 75$  dB(A) free speed (without load) according to ISO 12100: 2011

Vibration values  $< 2.5$  m/s<sup>2</sup> 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 67EA
- 1 PL12EN-67EA instruction manual
- 1 Declaration of Conformity
- 1 Lubrication sheet
- 1 Warranty statement

### **2.2 Transport**

Transport and store the 67EA 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 67EA in a location on the workbench to avoid accidental depression of the button.  
or
- ➔ Suspend the 67EA from a suitable balancer or tool positioner.

For storage longer than 2 hours:

- ➔ Disconnect the power supply from the 67EA

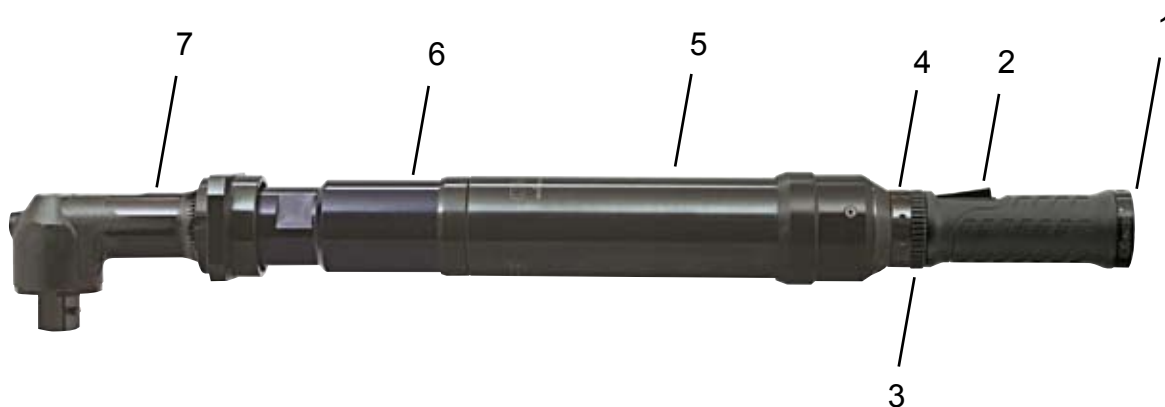
### 3 Product description

#### 3.1 General description

- Right angle DC electric powered nutrunner
- Low inertia brushless motor
- Clockwise/counterclockwise rotation
- High visibility LEDs

#### 3.2 Operation and functional elements

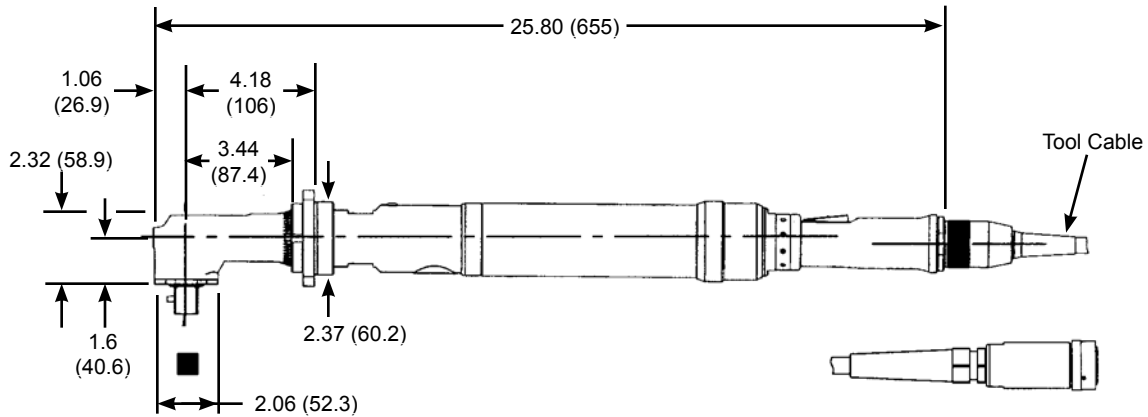
This section describes the operational and functional elements of the 67EA.



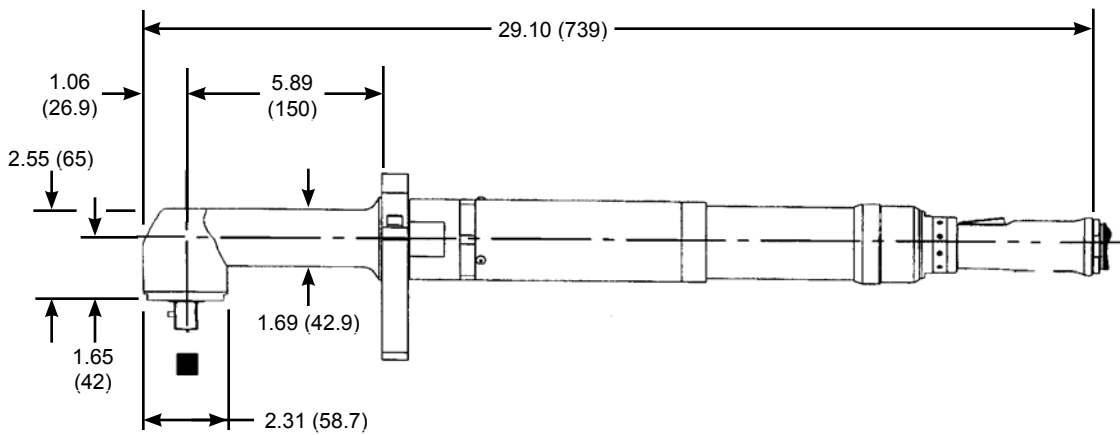
| Ref. | Description            |
|------|------------------------|
| 1    | Power Connection       |
| 2    | Start Button           |
| 3    | Reversing Ring         |
| 4    | LED Light Ring         |
| 5    | Motor Assembly         |
| 6    | Gearing                |
| 7    | Right Angle Attachment |

### 3.3 Dimensional data

inches (mm)



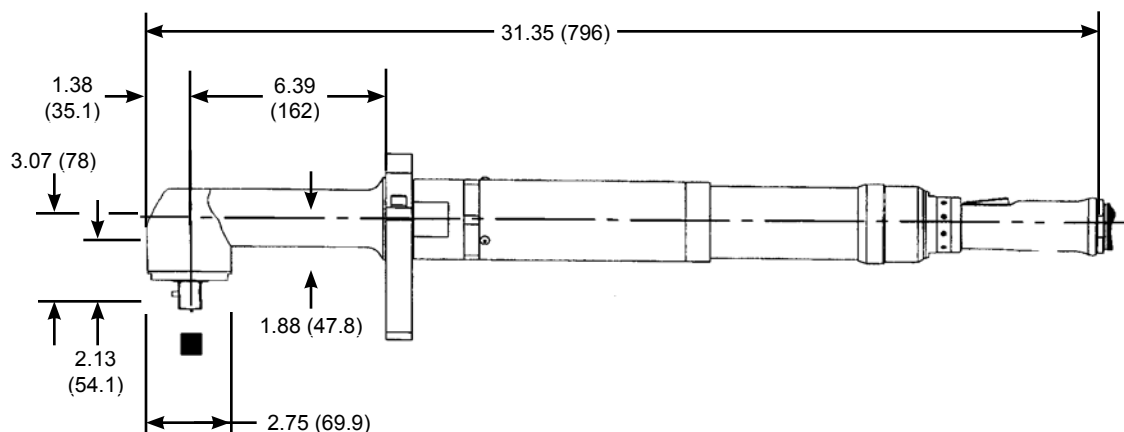
**67EA235AL6**  
**67EA255AL6**  
(3/4" Square Drive Output)



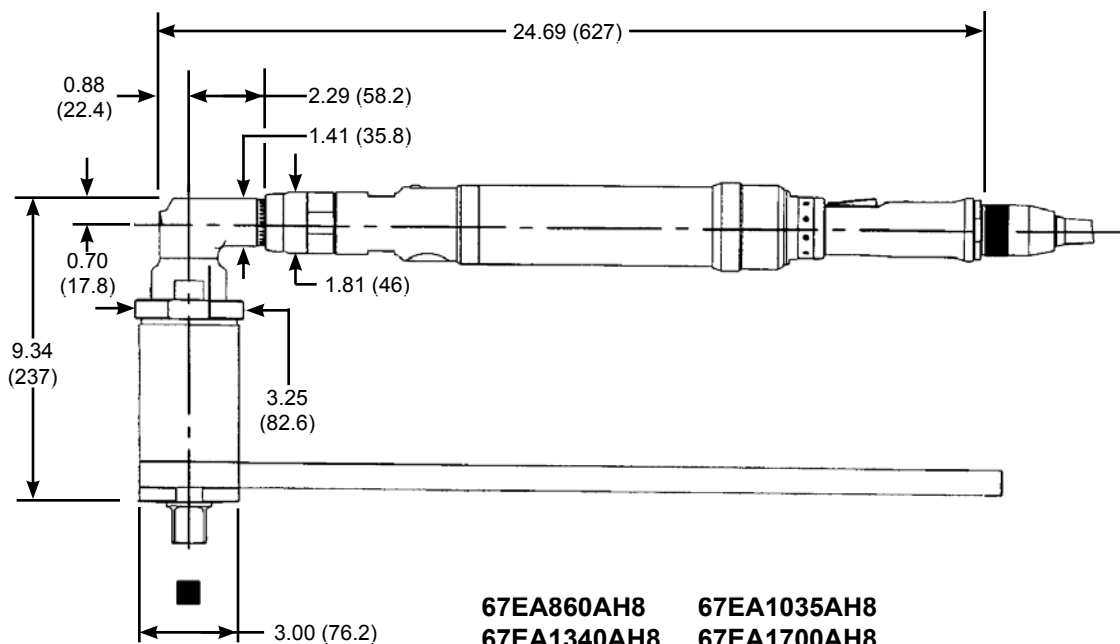
**67EA310ML6**  
(3/4" Square Drive Output)

### 3.3 Dimensional data (continued)

inches (mm)



**67EA340AM6    67EA460AM6**  
**67EA570AM6    67EA730AM6**  
(3/4" Square Drive Output)



**67EA860AH8    67EA1035AH8**  
**67EA1340AH8    67EA1700AH8**  
**67EA2010AH8**  
(1" Square Drive Output)

## 4 Accessories



**Tool Cable** (optional length)

**Tool Cable** - Inline Swivel (optional length)

**Tool Cable** - Right Angle Swivel (optional length)

**Tool Cable Extension** (optional length)

*Refer to section 10.4 for part numbers*



**Tool and Cable Tester**

Part Number: 961024

Tool and cable tester (tool memory programming)

Part Number: 542991

Tool and cable tester



**Lever Extension Kit**

Part Number: 541757 (non-swivel)

Part Number: 543414 (swivel)



**Suspension Bail**

Part Number: 1110909



**Swivel Suspension Bail**

Part Number: 35007004 (67EA...AL6)

Part Number: 48A17006 (67EA...ML6)

Part Number: 48A17006 (67EA...AM6)

## 4 Accessories (continued)



### Angle Head Cover

Part Number: 205838 (67EA...AL6)



### Extension Assembly

Part Number: 48316033 (67EA...AL6)



### Test Fixture

Part Number: 536185

#### Medium to Hard Torque

Belleville washer test fixture is clamped in a vise and used to test tools. Washers can be rearranged to simulate "hard" or "soft" joints.

Range: 10 in.lbs (1.13Nm) - 100 ft.lbs. (135.6Nm)



### Joint Simulator

Joint simulators are most frequently used to certify the repeatability of nutrunners before being installed on a production line and are also an excellent means of testing nutrunners following repair.

The joint simulator can simulate and test the torque output of nutrunners on both hard and soft joints. Each joint simulator is supplied with a quantity of spring washers which are used to test tool accuracy. Torque per revolution is varied by stacking the spring washers in different combinations.

| Part Number | Torque Range |        | Width |     | Height |     | Length |     |
|-------------|--------------|--------|-------|-----|--------|-----|--------|-----|
|             | Ft. Lbs.     | Nm     | in.   | mm  | in.    | mm  | in.    | mm  |
| 550006      | 12-220       | 15-300 | 10.4  | 264 | 16.0   | 406 | 26.5   | 667 |

## 5 Before initial operation

### 5.1 Ambient conditions

**NOTE**

|                               |                                         |
|-------------------------------|-----------------------------------------|
| Ambient temperature:          | 32°F (0°C) to a maximum of 104°F (40°C) |
| Acceptable relative humidity: | 0% to 80%, non-condensing               |
| Working altitude              | up to 3281 ft. (1000m) above sea level  |

### 5.2 Power supply

Power for the 67EA series nutrunner is provided by networking it with a tool controller.

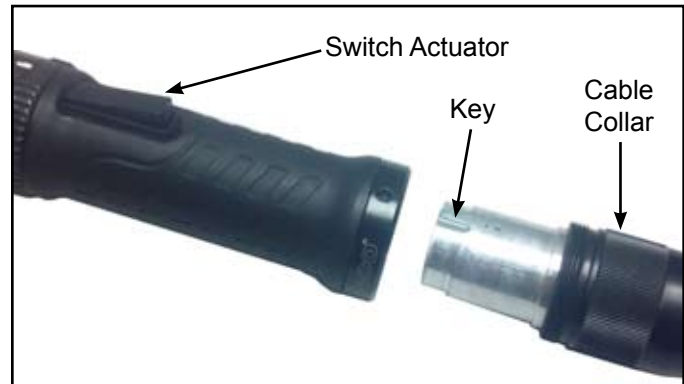
#### 5.2.1 m-Pro-400GC series global controller



### 5.3 Tool cable connection

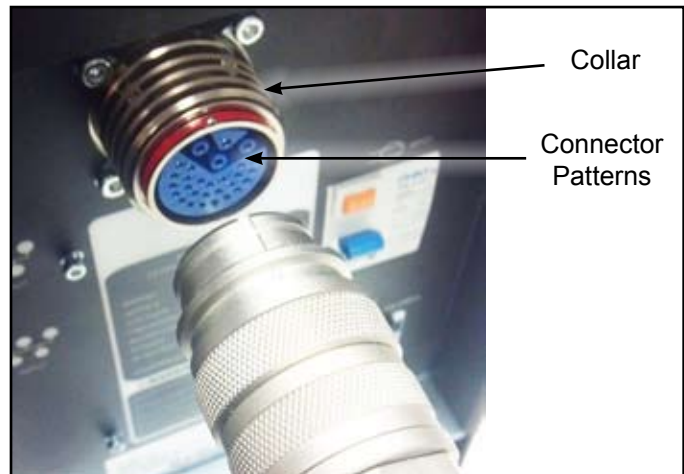
#### 5.3.1 Cable connection to 67EA

Insert the tool connection end of the cable into the 67EA handle. Align the key on the cable connector with the switch actuator on the tool handle. This will allow the key to engage the mating slot inside the handle. Thread the cable collar into the tool handle and tighten securely.



#### 5.3.2 Cable connection to controller

Connect the other end of the cable to the tool connector on the controller. Make certain the collar on the controller tool connector is pushed in towards the controller. Align the connector patterns of the tool cable and controller connector. Push the cable connector into the controller connector and pull the collar towards the cable to lock the cable connector in position.



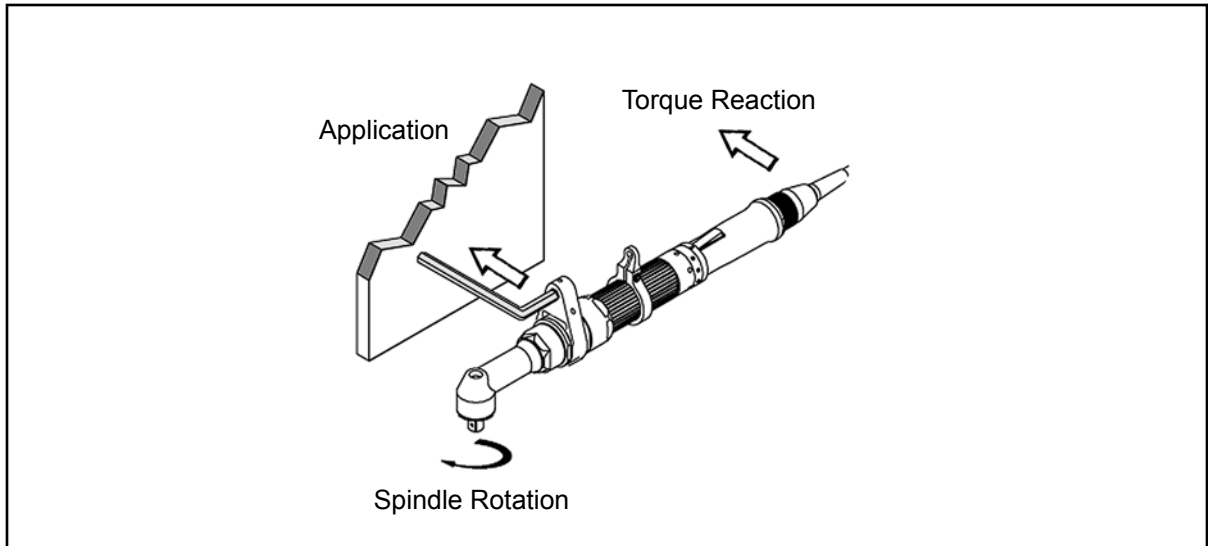
#### 5.3.3 Apply power to the tool

Refer to the controller manual for tool operation.

## 6 First operation

### 6.1 Putting into use

A reaction bar and bracket must always be used in high torque applications above 50 ft.-lbs. (68 Nm) or in closed-quarter areas where entrapment and injury to hands or fingers could occur.



- ➔ Make sure the tool cable is securely attached to the tool and controller.
- ➔ Make sure controller is powered on and properly programmed (refer to controller manual)
- ➔ Make sure the reverse ring is in the correct position.
- ➔ Place the socket or bit on the application and depress the switch actuator to start the rundown.
- ➔ When the tool shuts off, release the switch actuator.
- ➔ Remove the tool from the application.

## 7 Troubleshooting

| Malfunction                                                                                   | Possible causes                                                                                                                                                                    | Remedy                                                                                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tool does not start                                                                           | Start switch faulty                                                                                                                                                                | → Replace start switch                                                                                                                                                                                                                                                   |
|                                                                                               | No speed (RPM) programmed                                                                                                                                                          | → Program a speed for all active stages                                                                                                                                                                                                                                  |
|                                                                                               | Controller is waiting for a Tool Enable                                                                                                                                            | → Make the Tool Enable connection or disable Tool Enable if not required                                                                                                                                                                                                 |
|                                                                                               | Faulty cable                                                                                                                                                                       | → Replace or repair cable                                                                                                                                                                                                                                                |
|                                                                                               | Bent pins in cable or tool                                                                                                                                                         | → Straighten pins or replace faulty connector                                                                                                                                                                                                                            |
| Tool runs forward but not Reverse                                                             | No speed programmed for Reverse                                                                                                                                                    | → Enter a speed (RPM) for Reverse                                                                                                                                                                                                                                        |
|                                                                                               | Faulty reverse switch                                                                                                                                                              | → Replace Start/Reverse switch assembly                                                                                                                                                                                                                                  |
|                                                                                               | Faulty cable                                                                                                                                                                       | → Replace or repair cable                                                                                                                                                                                                                                                |
|                                                                                               | Bent pins in cable or tool                                                                                                                                                         | → Straighten pins or replace faulty connector                                                                                                                                                                                                                            |
| Tool shuts off at desired torque but reports no angle                                         | Angle Threshold value is set to high                                                                                                                                               | → Correct fastening strategy programming to include a low Angle threshold value                                                                                                                                                                                          |
| Tool shuts off prematurely                                                                    | Operator is releasing the start switch before the controller stops the tool                                                                                                        | → Verify that the operator is keeping the start switch depressed through the entire rundown                                                                                                                                                                              |
|                                                                                               | Rundown time exceeds the default time value of 10 seconds                                                                                                                          | → Increase the rundown timer to exceed the rundown time required                                                                                                                                                                                                         |
|                                                                                               | Tool has reached Angle High Limit before reaching the Torque target                                                                                                                | → Check the fastening strategy programming to verify that the Torque target and Angle High Limit are correct. If the parameters are correct, see if something has changed in the assembly that would cause an incorrect torque/angle relationship.                       |
| Tool won't change speeds                                                                      | Speeds are the same in all applicable stages                                                                                                                                       | → Verify that all speeds and shift points are correct in the stages that are being used.                                                                                                                                                                                 |
| All the lights on the tool begin flashing when the reverse collar/switch is put in reverse    | This is a normal function as set by the default parameters. If the lights are not flashing when the tool is in reverse the "Blinking Lights in Reverse" check box is not selected. | → Check selections in the ADVANCED menu, Tool Settings tab.                                                                                                                                                                                                              |
| Warning message in the RUN screen reports "Transducer Offset Error"                           | The tool transducer is not returning to a zero torque condition                                                                                                                    | → Transducer has been over-stressed and needs replacement                                                                                                                                                                                                                |
|                                                                                               | Faulty wiring in tool or cable                                                                                                                                                     | → Check tool with different cable to see if the condition remains. Transducer offset and full scale voltages can be seen in the DIAGNOSTICS menu.                                                                                                                        |
| "Tool Not Connected" message appears in the RUN screen                                        | Tool has not been accepted in the TOOL SETUP screen                                                                                                                                | → Verify that the tool has been accepted in the TOOL SETUP screen. Before accepting the tool, the message "Needs User Acceptance" should appear in the tool overview screen. Verify that the correct tool is highlighted when going to Tool Settings to accept the tool. |
|                                                                                               | Faulty cable is preventing the tool from being "seen" by the controller                                                                                                            | → Replace or repair cable                                                                                                                                                                                                                                                |
| Torque reported by the controller doesn't match the torque reported by an external transducer | Torque calibration factor in Tool Settings in the TOOL SETUP menu needs to be adjusted                                                                                             | → Adjust torque calibration factor using the formula below:<br>New Cal Factor = (External Reading/Tool Reading) x Existing Torque Calibration Factor                                                                                                                     |
|                                                                                               | Custom head has been added to the tool and the tool needs updated tool memory information                                                                                          | → Tool memory must be programmed to accommodate new attachment                                                                                                                                                                                                           |
| Tool cable will not fit in tool handle                                                        | Wrong cable. Tools used with Global Controller utilize an Air-Ib connector, which has a smaller ID housing in the tool than previous Matrix style connector housings.              | → Utilize the correct cable for the tool being used.                                                                                                                                                                                                                     |

## 8 Maintenance



Danger of injury from accidental start up or electrical shock.  
Disconnect the tool cable from the tool and controller 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.

| Maintenance Interval | Rundowns  | Designation                                                                                                                                                                                                                                                                                                   |
|----------------------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Daily                | Daily     | <ul style="list-style-type: none"> <li>→ Visual inspection of all cables and connections</li> <li>→ Visual inspection of the 67EA tool</li> <li>→ Check the tool for excessive vibration or unusual noises</li> <li>→ Visual inspection of all external components of the tool</li> </ul>                     |
| W1                   | 100,000   | <ul style="list-style-type: none"> <li>→ Inspect the tool cable for damage or wear</li> <li>→ inspect the square drive output spindle for damage or wear</li> <li>→ Inspect the tool cable connection for a secure fit</li> <li>→ Check the maximum free speed</li> </ul>                                     |
| W2                   | 500,000   | <ul style="list-style-type: none"> <li>→ Visual inspection of disassembled 67EA tool</li> <li>→ Check individual parts for wear or damage and replace if necessary</li> <li>→ Clean and lubricate angle head, gearing and motor bearings</li> <li>→ Check and recalibrate transducer (67EA models)</li> </ul> |
| W3                   | 1,000,000 | <ul style="list-style-type: none"> <li>→ Visual inspection of disassembled 67EA tool</li> <li>→ Check individual parts for wear or damage and replace if necessary</li> <li>→ Clean and lubricate angle head, gearing and motor bearings</li> <li>→ Check and recalibrate transducer (67EA models)</li> </ul> |

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.

### 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                                                                      |
|-----------|------------------------------------------------|----------------------------------------------------------------------------------|
| <b>V</b>  | V1 = 100,000<br>V2 = 500,000<br>V3 = 1,000,000 | Number of rundowns after a maintenance measure is prescribed by Apex Tool Group. |
| <b>T1</b> | 1.8 seconds                                    | Specific rundown time, measured in life and endurance tests.                     |
| <b>T2</b> | 2 seconds                                      | Actual rundown time, depending on the hardness of the joint.                     |
| <b>S</b>  | 1; 2; 3                                        | Number of shifts per day.                                                        |
| <b>VS</b> | 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.

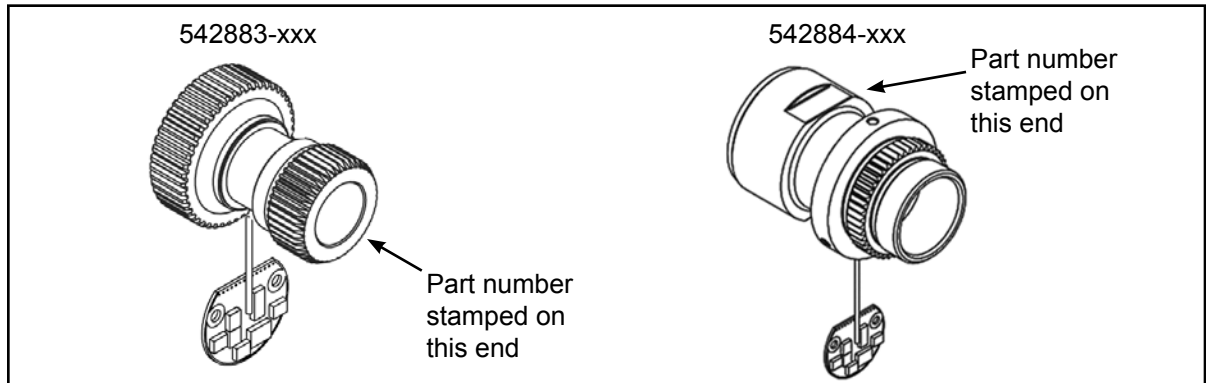
**Grease lubricants recommended for this tool.**

| Part No. | Packaged         | Designation      | Vendor                |
|----------|------------------|------------------|-----------------------|
| 544076   | 2 oz. (0.06 kg)  | Molytex EP2      | Texaco                |
| 544077   | 16 oz. (0.45 kg) | Molytex EP2      | Texaco                |
| 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 Transducer identification

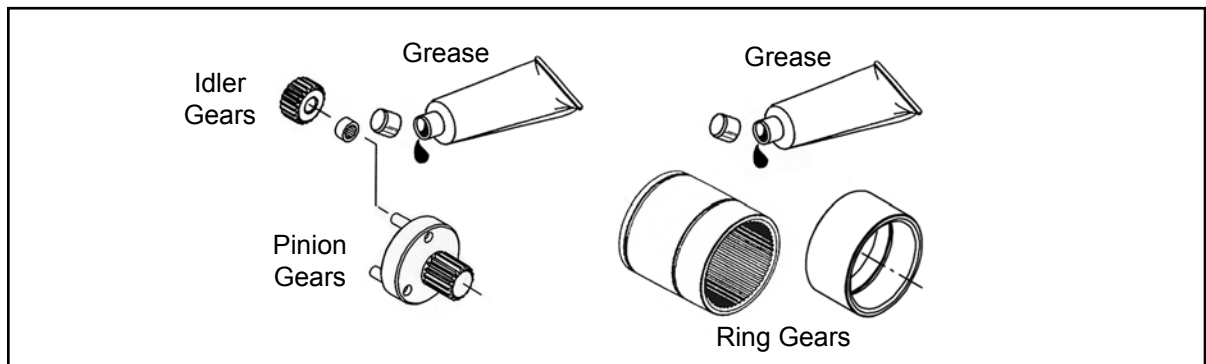
Transducers are not interchangeable. Verify the part number stamped on the transducer with the transducer part number indicated in the parts list to assure the correct transducer is being used.



### 9.2 Gear train lubrication

Lubricate the gearing components with the grease recommended on the gearing parts list pages.

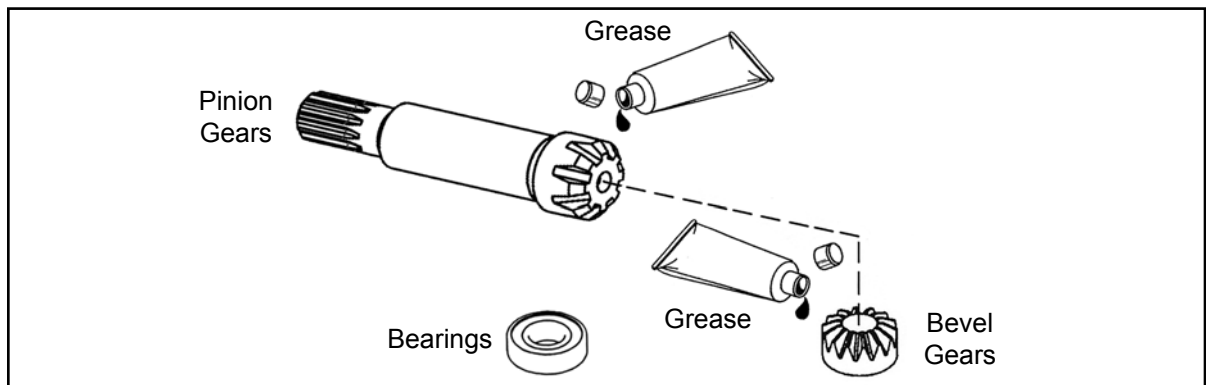
**DO NOT SUBSTITUTE GREASES**



### 9.3 Angle head lubrication

Lubricate the angle head components with the grease recommended on the angle head parts list pages.

**DO NOT SUBSTITUTE GREASES**



## 9.4 Throttle lever alignment

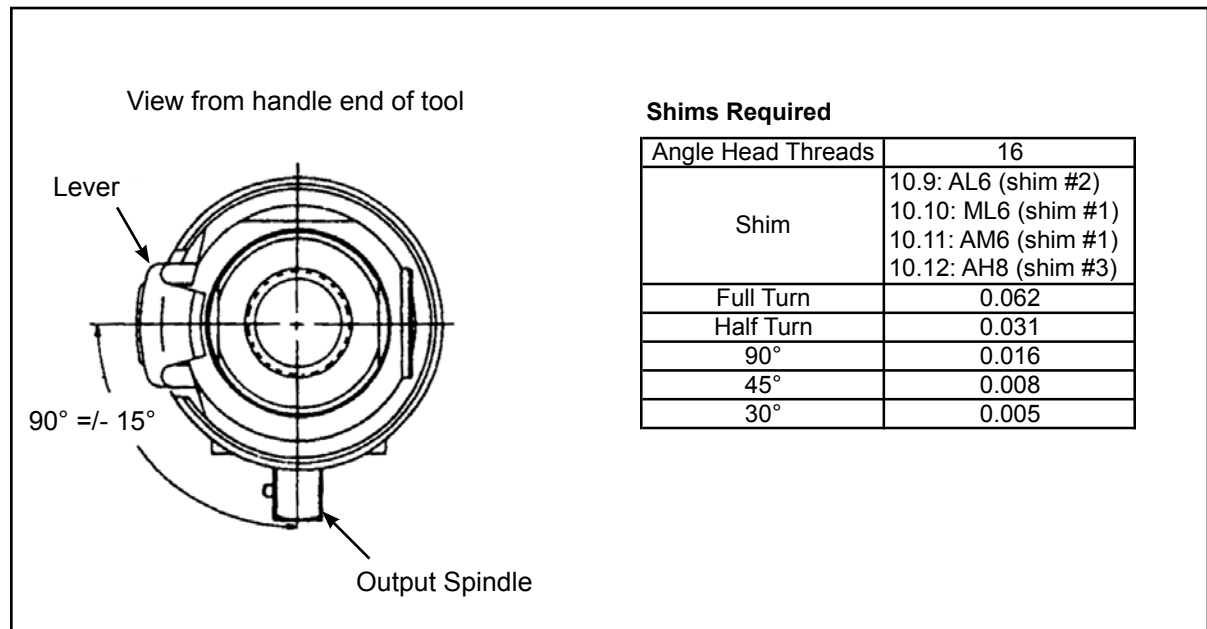
Assemble shims as required to attain the proper orientation of the handle lever with the angle attachment output spindle.

Illustration 10.9: AL6 Attachment (shim number 2)

Illustration 10.10: ML6 Attachment (shim number 1)

Illustration 10.11: AM6 Attachment (shim number 1)

Illustration 10.12: AH8 Attachment (shim number 3)



## 9.5 Pinion gear setting (right angle attachments)

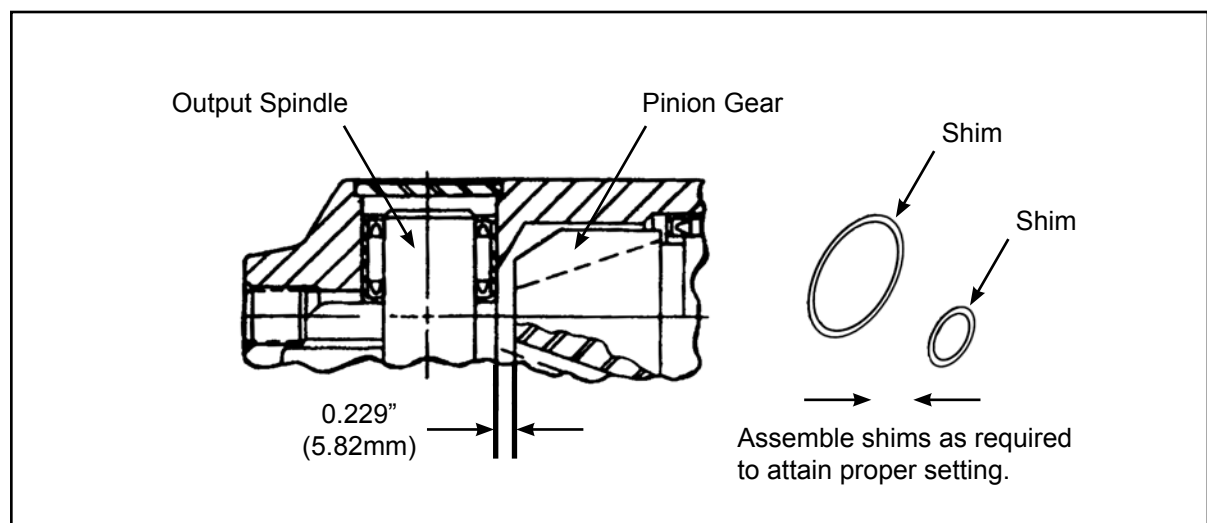
Assemble shims to attain the pinion gear setting of 0.229" (5.82mm) as shown below.

Illustration 10.9: AL6 Attachment (shim numbers 2 and 4)

Illustration 10.10: ML6 Attachment (shim numbers 1 and 4)

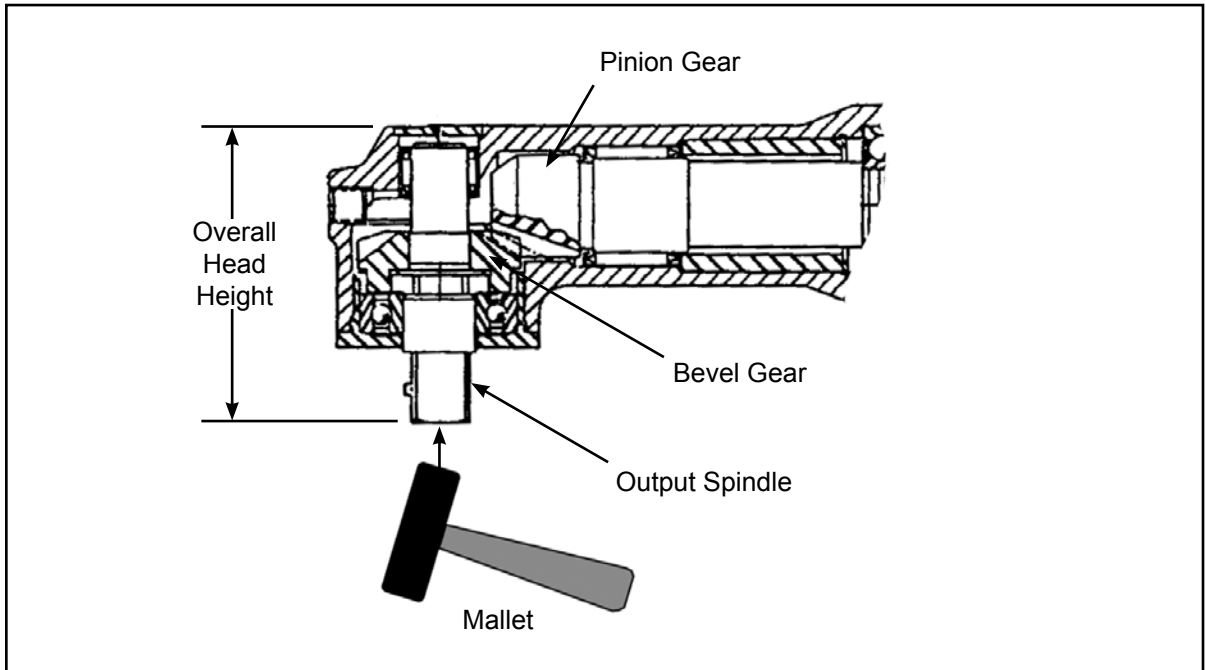
Illustration 10.11: AM6 Attachment (shim numbers 1 and 4)

Illustration 10.12: AH8 Attachment (shim numbers 3 and 4)

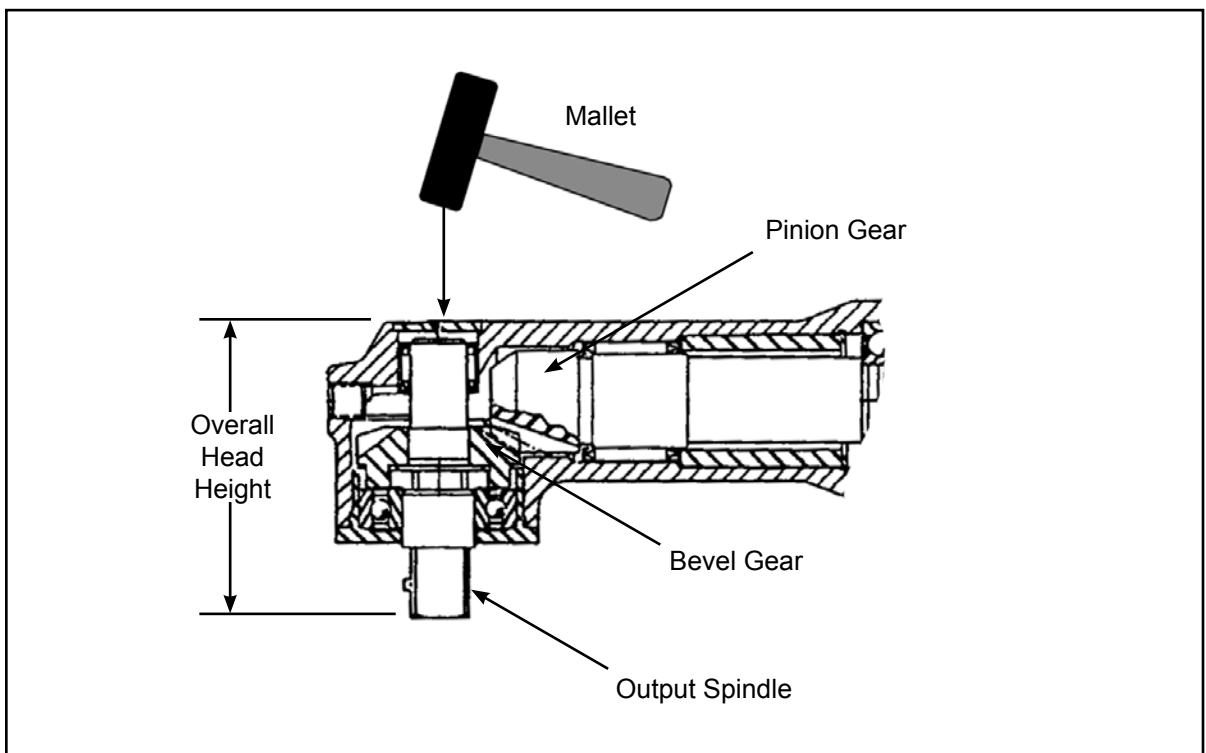


## 9.6 Backlash shim assembly

**Dimension 1:** Tap the output spindle with a hard rubber mallet. Measure the overall head height.



**Dimension 2:** Secure the angle head assembly in a smooth jawed vise. Using a hard rubber mallet, tap the top of the angle housing, near the output spindle. Measure the overall head height.



## 9.6 Backlash shim assembly (continued)

The difference between dimension 1 and dimension 2 should be 0.010"/0.012" (0.25/0.31mm)

$$\text{Dimension 2} - \text{Dimension 1} = 0.010/0.012 \text{ (0.25/0.31mm)}$$

Assemble the shims, as necessary, to provide this backlash dimension.

Illustration 10.9: AL6 Attachment

Shim number 15 decreases the dimension

Shim number 21 increases the dimension

Illustration 10.10: ML6 Attachment

Shim number 18 decreases the dimension

Shim number 20 increases the dimension

Illustration 10.11: AM6 Attachment

Shim number 20 decreases the dimension

Shim number 22 increases the dimension

Illustration 10.12: AH8 Attachment

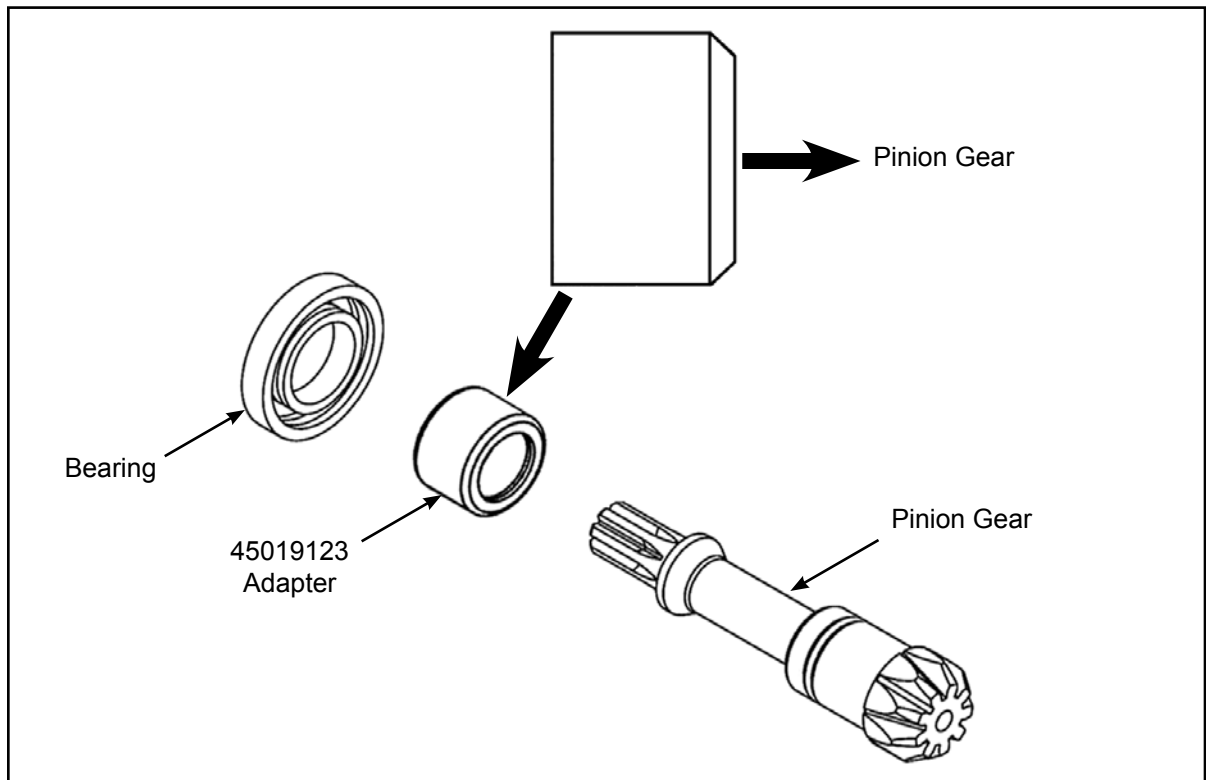
Shim number 15 used as necessary

## 9.7 45019123 Adapter assembly

Angle Attachment 45037012 (Illustration 10.10)

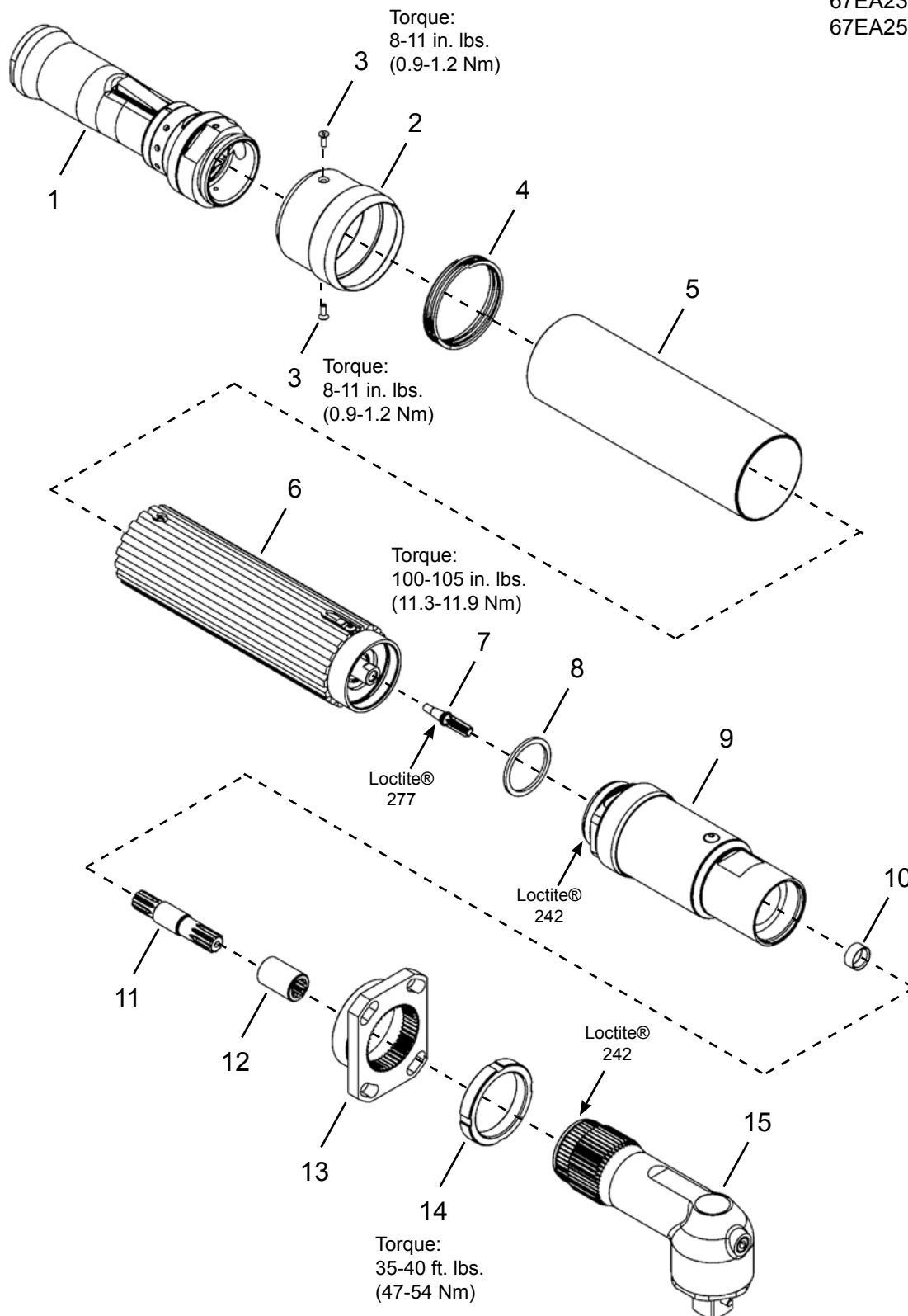
Angle Attachment 45017010 (Illustration 10.11)

Make certain the 45019123 adapter is properly positioned when assembled on the pinion gear. Improper assembly can cause extensive damage to the internal components of the angle head.



**10.1 67EA(---)AL6 Series Right Angle Nutrunner**

**Models**  
67EA235AL6  
67EA255AL6



**10.1 67EA(---)AL6 Series Right Angle Nutrunner**

| Ref | Number            | # | X | EN                                 |
|-----|-------------------|---|---|------------------------------------|
|     |                   |   |   | Description                        |
| 1   | Illustration 10.4 | 1 |   | Handle Assembly                    |
| 2   | 35177103          | 1 |   | Sleeve Adapter                     |
| 3   | 93380005          | 2 | 6 | Hex Socket Flat Head Screw (#5-40) |
| 4   | 35009107          | 1 | 2 | Spring                             |
| 5   | 542937            | 1 |   | Wire Sleeve                        |
| 6   | 542878            | 1 |   | Motor Assembly                     |
| 7   | Table 10.1        | 1 | 3 | Spindle Gear                       |
| 8   | 35019101          | 1 |   | Spacer                             |
| 9   | Table 10.1        | 1 |   | Gear Case Assembly                 |
| 10  | 48139113          | 1 |   | Spacer                             |
| 11  | 48138110          | 1 | 2 | Shaft                              |
| 12  | 48068103          | 1 |   | Splined Coupling                   |
| 13  | 49097101          | 1 |   | Mounting Plate                     |
| 14  | 49098103          | 1 |   | Lock Nut                           |
| 15  | Illustration 10.9 | 1 |   | Right Angle Attachment             |

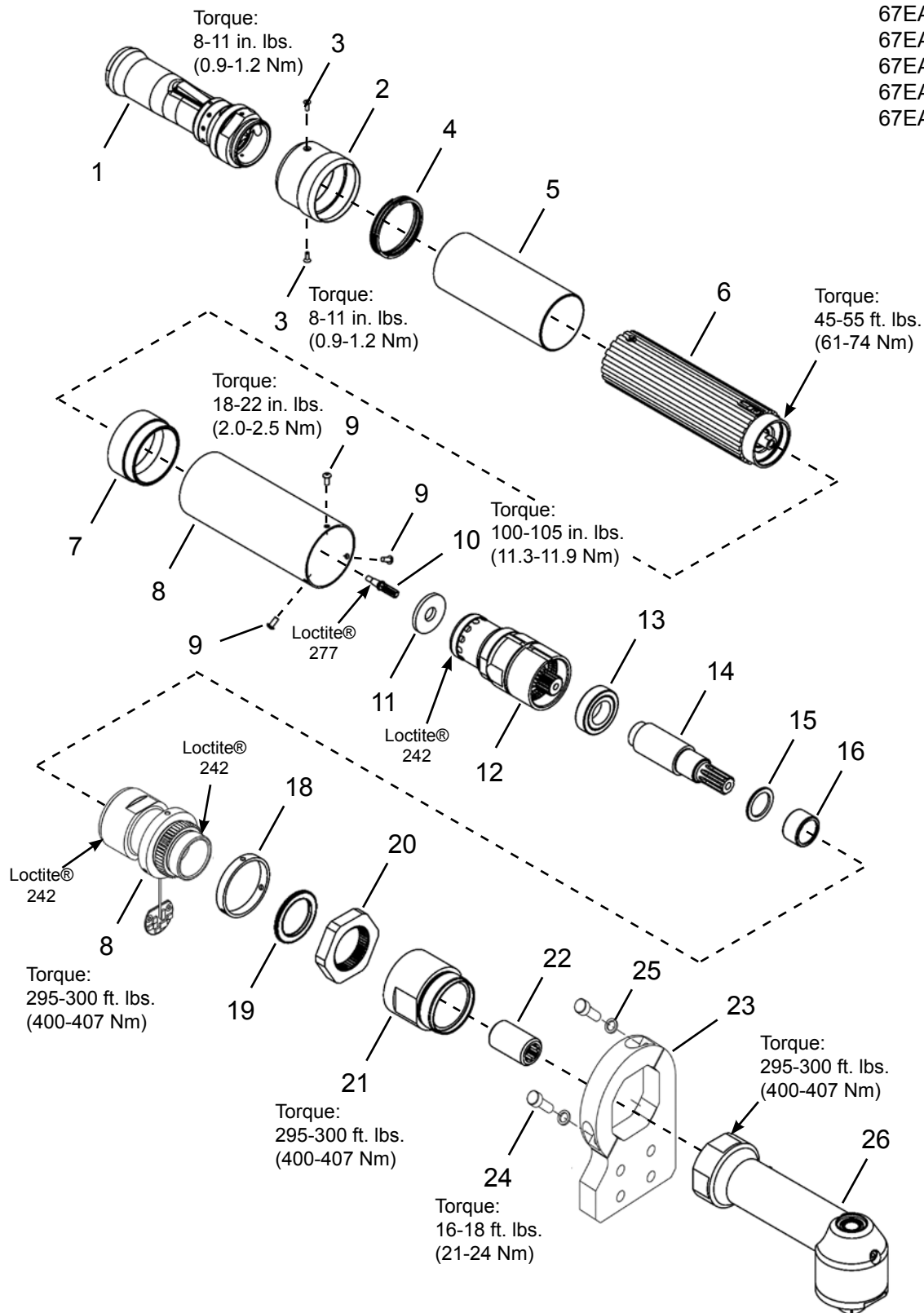
(#) Quantity

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

**Table 10.1**

| Ref. | Description                               | # | 67EA235       | # | 67EA255       |
|------|-------------------------------------------|---|---------------|---|---------------|
| 7    | Spindle Gear                              | 1 | 43288170 (7T) | 1 | 43288169 (5T) |
| 9    | Gear Case Assembly<br>(Illustration 10.5) | 1 | 43526009      | 1 | 435260100     |

**10.2 67EA(---)AM6 Series and 67EA310ML6 Right Angle Nutrunner**
**Models**

 67EA310ML6  
 67EA340AM6  
 67EA460AM6  
 67EA570AM6  
 67EA730AM6


**10.2 67EA(---)AM6 Series and 67EA310ML6 Right Angle Nutrunner**

| Ref | Number             | # | X | EN                                   |
|-----|--------------------|---|---|--------------------------------------|
|     |                    |   |   | Description                          |
| 1   | Illustration 10.4  | 1 |   | Handle Assembly                      |
| 2   | 35177103           | 1 |   | Sleeve Adapter                       |
| 3   | 93380005           | 2 | 6 | Hex Socket Flat Head Screw (#5-40)   |
| 4   | 35009107           | 1 | 2 | Spring                               |
| 5   | 542889             | 1 |   | Wire Sleeve                          |
| 6   | 542878             | 1 |   | Motor Assembly                       |
| 7   | 35098102           | 1 |   | Sleeve Adapter                       |
| 8   | 35127101           | 1 |   | Wire Adapter                         |
| 9   | 93300033           | 3 | 9 | Button Head Screw (8-32 x 3/8)       |
| 10  | Table 10.2         | 1 | 3 | Spindle Gear                         |
| 11  | 35129102           | 1 |   | Spacer                               |
| 12  | Table 10.2         | 1 |   | Gear Case Assembly                   |
| 13  | 92100031           | 1 | 2 | Ball Bearing                         |
| 14  | 48A17114           | 1 |   | Shaft                                |
| 15  | 48039132           | 1 |   | Spacer                               |
| 16  | 92000056           | 1 | 2 | Needle Bearing                       |
| 17  | Table 10.2         | 1 |   | Transducer                           |
| 18  | 48A18103           | 1 |   | Spacer                               |
| 19  | 542965             | 1 | 3 | Wave Washer                          |
| 20  | 542963             | 1 |   | Splined Spacer                       |
| 21  | 48A17113           | 1 |   | Adapter                              |
| 22  | 45138109           | 1 |   | Coupling                             |
| 23  | 544148PT           | 1 |   | Mounting Plate (includes Ref. 24-25) |
| 24  | 93310135           | 2 | 6 | Socket Head Cap Screw (5/16-18 x 1)  |
| 25  | 94140014           | 2 | 6 | Lock Washer                          |
| 26  | Illustration 10.10 | 1 |   | Right Angle Attachment (ML6)         |
|     | Illustration 10.11 | 1 |   | Right Angle Attachment (AM6)         |

(#) Quantity

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

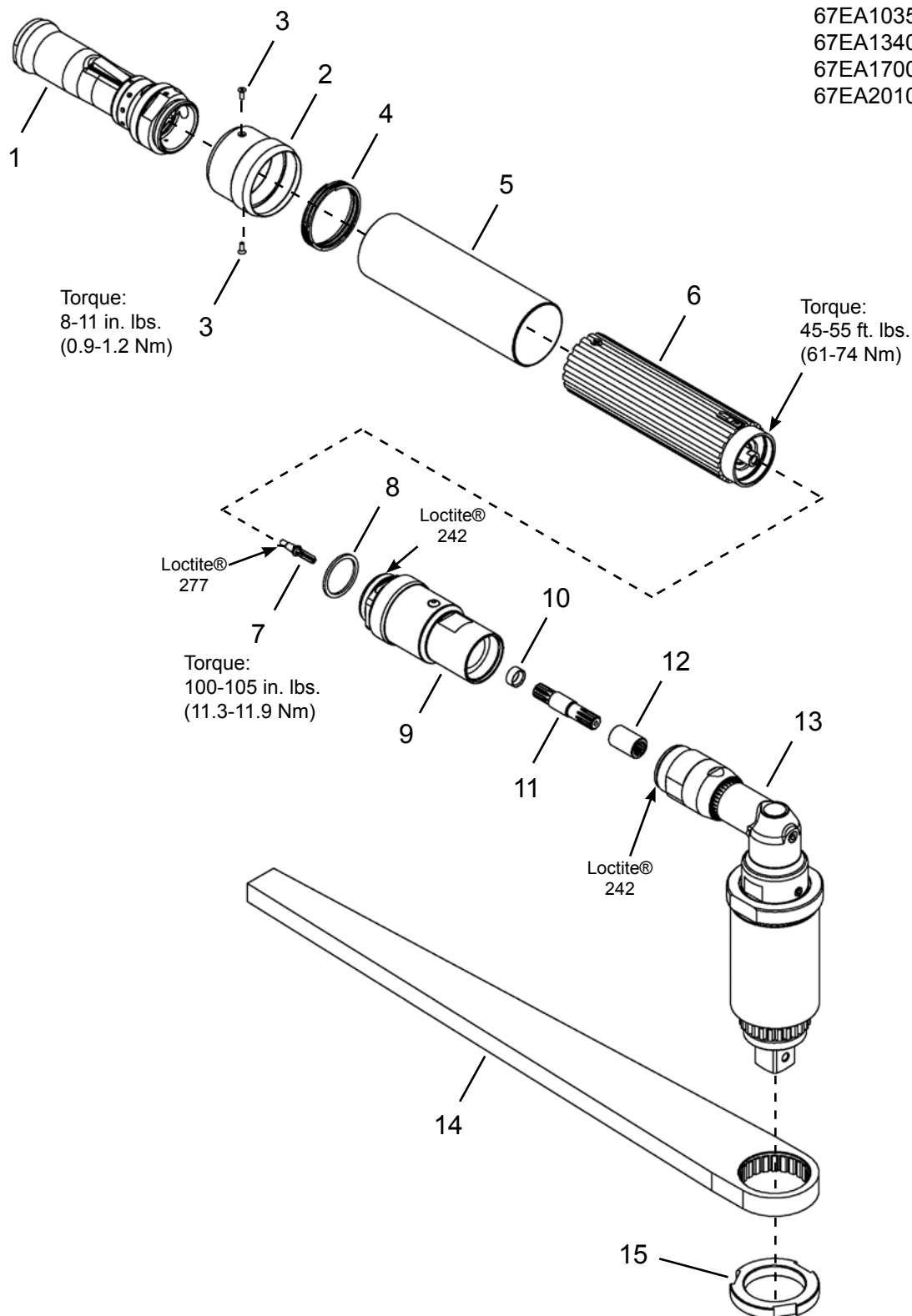
**Table 10.2**

| Ref. | Description                            | # | 67EA310       | # | 67EA340       | # | 67EA460       | # | 67EA570       | # | 67EA730       |
|------|----------------------------------------|---|---------------|---|---------------|---|---------------|---|---------------|---|---------------|
| 10   | Spindle Gear                           | 1 | 43288170 (7T) | 1 | 43288170 (7T) | 1 | 43288170 (7T) | 1 | 43288170 (7T) | 1 | 43288171 (9T) |
| 12   | Gear Case Assembly (Illustration 10.6) | 1 | 35646002      | 1 | 35646001      | 1 | 35646003      | 1 | 35646004      | 1 | 35646005      |
| 17   | Transducer                             | 1 | 542884-232    | 1 | 542884-232    | 1 | 542884-232    | 1 | 542884-353    | 1 | 542884-353    |

### 10.3 67EA(----)AH8 Series Right Angle Nutrunner

#### Models

67EA860AH8  
67EA1035AH8  
67EA1340AH8  
67EA1700AH8  
67EA2010AH8



### 10.3 67EA(----)AH8 Series Right Angle Nutrunner

| Ref | Number             | # | X | EN                                 |
|-----|--------------------|---|---|------------------------------------|
|     |                    |   |   | Description                        |
| 1   | Illustration 10.4  | 1 |   | Handle Assembly                    |
| 2   | 35177103           | 1 |   | Sleeve Adapter                     |
| 3   | 93380005           | 2 | 6 | Hex Socket Flat Head Screw (#5-40) |
| 4   | 35009107           | 1 | 2 | Spring                             |
| 5   | 542937             | 1 |   | Wire Sleeve                        |
| 6   | 542878             | 1 |   | Motor Assembly                     |
| 7   | Table 10.3         | 1 | 3 | Spindle Gear                       |
| 8   | 35019101           | 1 |   | Spacer                             |
| 9   | Table 10.3         | 1 |   | Gear Case Assembly                 |
| 10  | 48139113           | 1 |   | Spacer                             |
| 11  | 48138110           | 1 | 2 | Shaft                              |
| 12  | 48068103           | 1 |   | Splined Coupling                   |
| 13  | Illustration 10.12 | 1 |   | Right Angle Attachment             |
| 14  | 46036202           | 1 |   | Reaction Bar                       |
| 15  | 46038134           | 1 |   | Lock Nut                           |

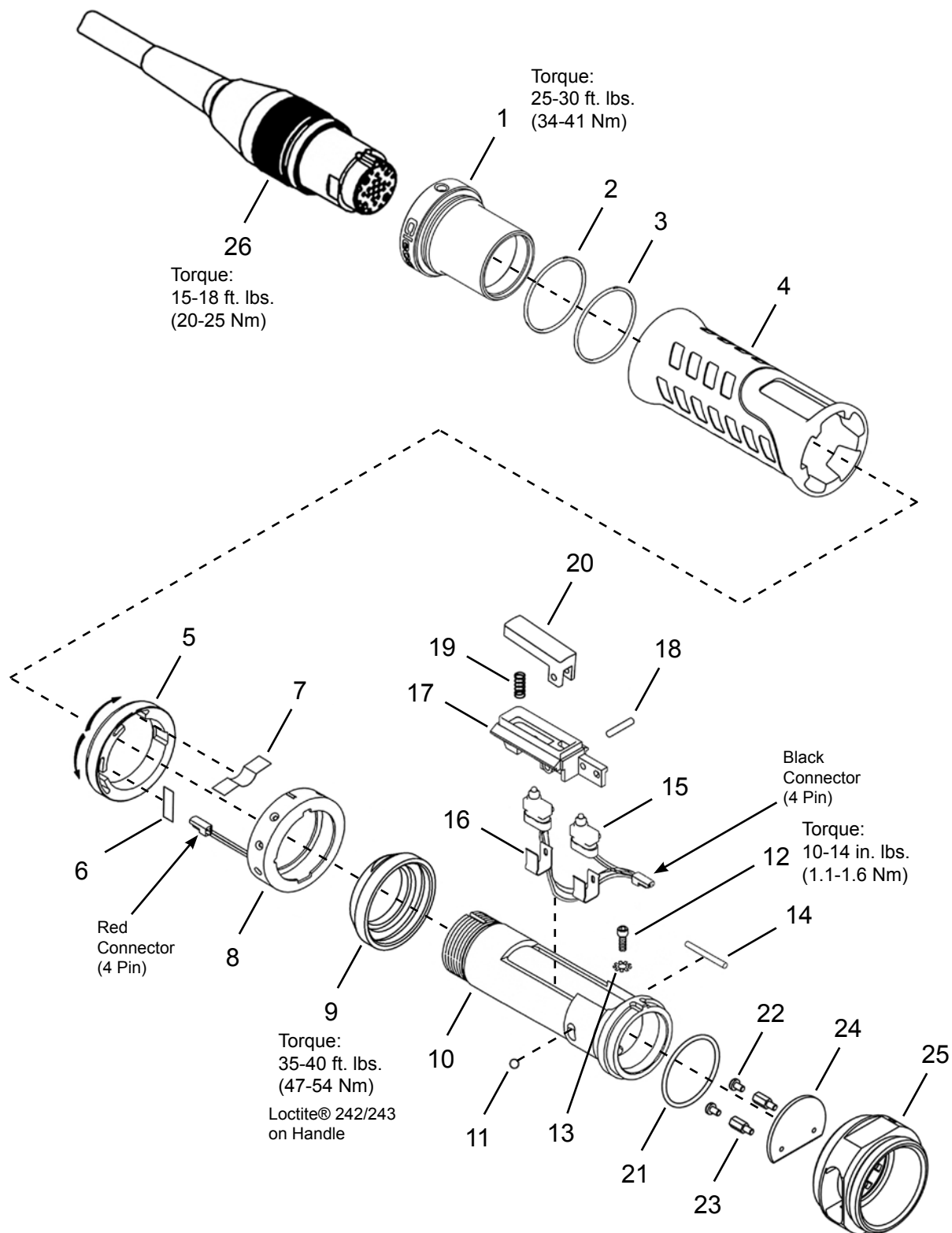
(#) Quantity

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

**Table 10.3**

| Ref. | Description                                        | # | 67EA860       | # | 67EA1035      | # | 67EA1340      | # | 67EA1700      | # | 67EA2010      |
|------|----------------------------------------------------|---|---------------|---|---------------|---|---------------|---|---------------|---|---------------|
| 7    | Spindle Gear                                       | 1 | 43288169 (5T) | 1 | 43288170 (7T) | 1 | 43288170 (7T) | 1 | 43288170 (7T) | 1 | 43288171 (9T) |
| 9    | Gear Case Assembly<br>(Illustrations 10.7 - 10.8)) | 1 | 35646002      | 1 | 35646001      | 1 | 35646003      | 1 | 35646004      | 1 | 35646005      |

## 10.4 67EA Series Handle Assembly



#### 10.4 67EA Series Handle Assembly

| Ref                                    | Number     | # | X | EN                     |
|----------------------------------------|------------|---|---|------------------------|
|                                        |            |   |   | Description            |
| 1                                      | 207325     | 1 |   | Connector Sleeve       |
| 2                                      | 524818     | 1 | 3 | O-Ring                 |
| 3                                      | 22598      | 1 | 3 | O-Ring                 |
| 4                                      | 207323     | 1 |   | Handle Sleeve          |
| 5                                      | 542938     | 1 |   | Reverse Ring           |
| 6                                      | 541624     | 1 | 2 | Forward/Reverse Spring |
| 7                                      | 541033     | 1 | 2 | Reverse Spring         |
| 8                                      | 542819     | 1 |   | Light Ring Assembly    |
| 9                                      | 542875     | 1 |   | Screw Cap              |
| 10                                     | 541015     | 1 |   | Inner Handle           |
| 11                                     | 1091PT     | 1 | 3 | Steel Ball - 3/16"     |
| 12                                     | B159V      | 1 | 3 | Cap Screw (#6-32)      |
| 13                                     | W115       | 1 | 3 | Lock Washer            |
| 14                                     | 1009089    | 1 | 3 | Housing Pin            |
| 15                                     | F900571    | 1 | 2 | Start/Reverse Switch   |
| 16                                     | 207317     | 2 | 2 | Switch Spring Clip     |
| 17                                     | 207316     | 1 |   | Switch Holder          |
| 18                                     | 541480     | 1 | 3 | Switch Pin             |
| 19                                     | 266255     | 1 | 3 | Switch Spring          |
| 20                                     | F900185    | 1 |   | Switch Actuator        |
| 21                                     | 902362     | 1 | 3 | O-Ring                 |
| 22                                     | 17-111     | 2 | 6 | Screw                  |
| 23                                     | 542244     | 2 | 6 | Standoff               |
| 24                                     | 542874     | 1 |   | Mounting Plate         |
| 25                                     | 542877     | 1 |   | Handle Adapter         |
| Tool Cable (Optional Length)           |            |   |   |                        |
| 26                                     | 542778-1M  | 1 |   | 1 meter cable          |
|                                        | 542778-2M  |   |   | 2 meter cable          |
|                                        | 542778-3M  |   |   | 3 meter cable          |
|                                        | 542778-6M  |   |   | 6 meter cable          |
|                                        | 542778-8M  |   |   | 8 meter cable          |
|                                        | 542778-10M |   |   | 10 meter cable         |
|                                        | 542778-15M |   |   | 15 meter cable         |
| Inline Swivel Cable (Optional Length)  |            |   |   |                        |
| 26                                     | 544056-1M  | 1 |   | 1 meter cable          |
|                                        | 544056-2M  |   |   | 2 meter cable          |
|                                        | 544056-3M  |   |   | 3 meter cable          |
|                                        | 544056-6M  |   |   | 6 meter cable          |
|                                        | 544056-8M  |   |   | 8 meter cable          |
|                                        | 544056-10M |   |   | 10 meter cable         |
| Angle Swivel Cable (Optional Length)   |            |   |   |                        |
| 26                                     | 544055-1M  | 1 |   | 1 meter cable          |
|                                        | 544055-2M  |   |   | 2 meter cable          |
|                                        | 544055-3M  |   |   | 3 meter cable          |
|                                        | 544055-6M  |   |   | 6 meter cable          |
|                                        | 544055-8M  |   |   | 8 meter cable          |
|                                        | 544055-10M |   |   | 10 meter cable         |
| Tool Cable Extension (Optional Length) |            |   |   |                        |
| 26                                     | 542779-1M  | 1 |   | 1 meter cable          |
|                                        | 542779-2M  |   |   | 2 meter cable          |
|                                        | 542779-3M  |   |   | 3 meter cable          |
|                                        | 542779-6M  |   |   | 6 meter cable          |
|                                        | 542779-10M |   |   | 10 meter cable         |
|                                        | 542779-15M |   |   | 15 meter cable         |
|                                        | 542779-50M |   |   | 50 meter cable         |

(#) Quantity

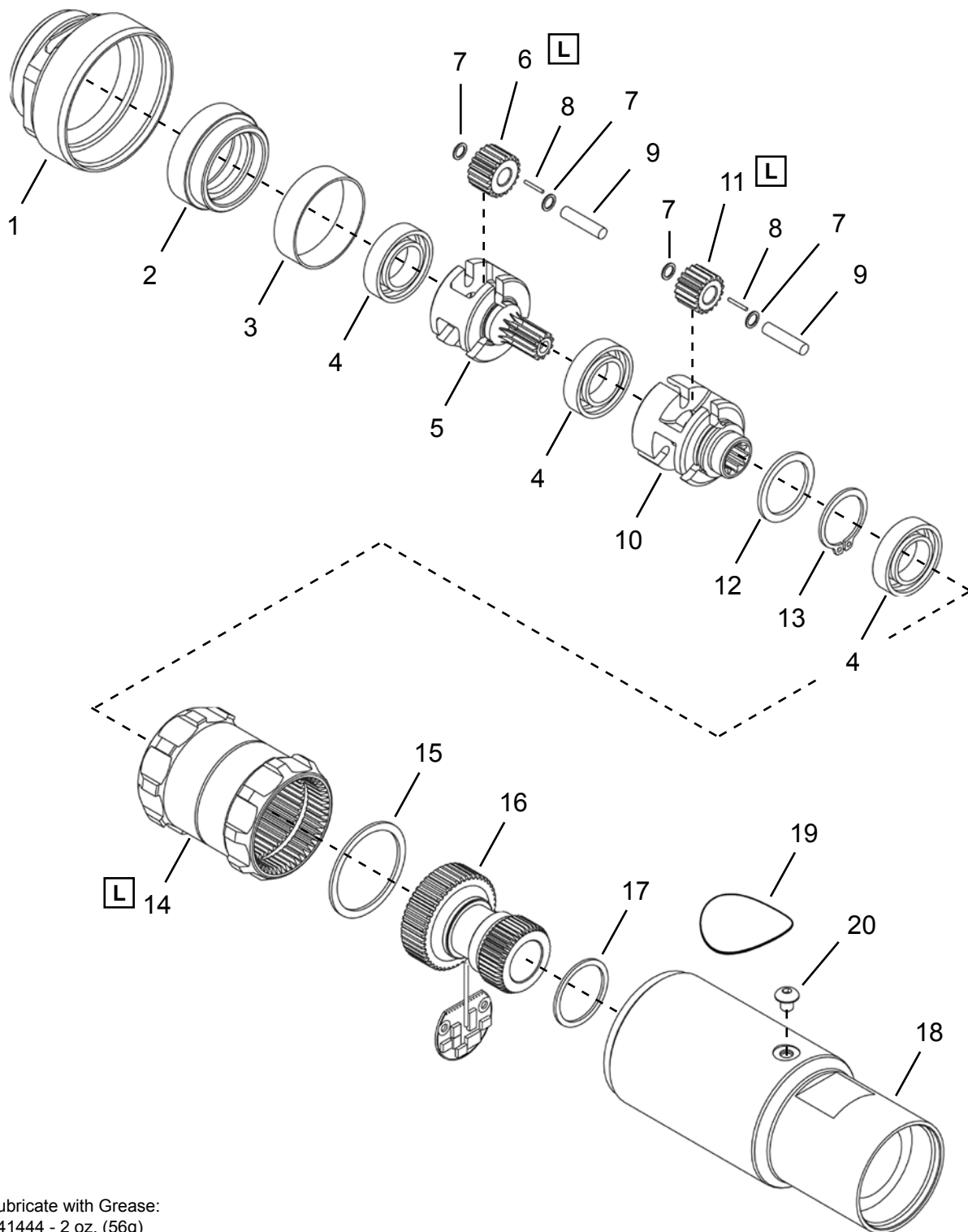
(X) Recommended Spare Parts (quantity shown based on 1-5 tools in operation)

# 10.5 67EA(---)AL6 Double Stage Gearing Assembly

## Models

67EA235AL6

67EA255AL6



**L** Lubricate with Grease:  
541444 - 2 oz. (56g)  
541445 - 16 oz. (0.45 kg)

### 10.5 67EA(---)AL6 Series Double Stage Gearing

| Ref | Number     | #  | X   | EN                              |
|-----|------------|----|-----|---------------------------------|
|     |            |    |     | Description                     |
| 1   | 542876     | 1  |     | Adapter                         |
| 2   | 48138114   | 1  |     | Bearing Housing                 |
| 3   | 43259102   | 1  |     | Protector Sleeve                |
| 4   | 92100071   | 3  | 6   | Ball Bearing                    |
| 5   | Table 10.5 | 1  |     | Upper Gear Cage                 |
| 6   | Table 10.5 | 3  | 6   | Upper Planetary Gear            |
| 7   | 48019118   | 12 | 24  | Planetary Gear Washer           |
| 8   | 92880015   | 90 | 180 | Planetary Gear Needle Roller    |
| 9   | 48019110   | 6  | 12  | Planetary Gear Pin              |
| 10  | Table 10.5 | 1  |     | Lower Gear Cage                 |
| 11  | Table 10.5 | 3  | 6   | Lower Planetary Gear            |
| 12  | 48019119   | 1  |     | Washer                          |
| 13  | 92840009   | 1  | 2   | Retaining Ring                  |
| 14  | 46067104   | 1  |     | Gear Housing                    |
| 15  | 92830026   | 1  |     | Retainer                        |
| 16  | 542883-135 | 1  |     | Transducer                      |
| 17  | 92830018   | 1  |     | Retainer                        |
| 18  | 43527118   | 1  |     | Housing                         |
| 19  | 43329171   | 1  |     | Decal                           |
| 20  | 93300040   | 1  | 3   | Button Head Screw (10-32 x 1/4) |

(#) Quantity

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

**Table 10.5**

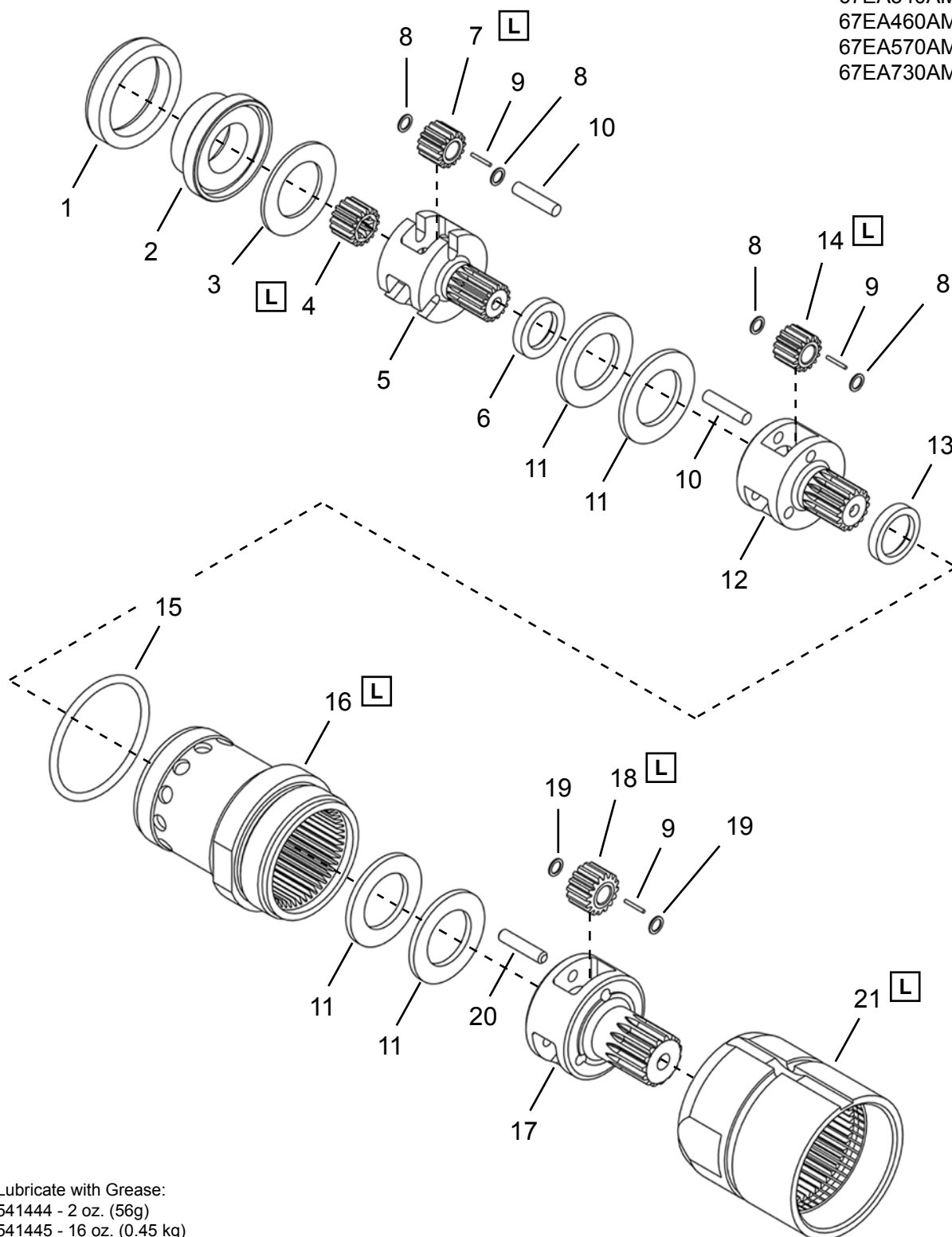
| Ref. | Description          | # | 67EA235        | # | 67EA255        |
|------|----------------------|---|----------------|---|----------------|
| --   | Gear Case Assembly   | 1 | 43526099       | 1 | 435260100      |
| 5    | Upper Gear Cage      | 1 | 43527128       | 1 | 43527158       |
| 6    | Upper Planetary Gear | 3 | 48048110 (20T) | 3 | 48038149 (21T) |
| 10   | Lower Gear Cage      | 1 | 48138104       | 1 | 48138106       |
| 11   | Lower Planetary Gear | 3 | 48018194 (18T) | 3 | 48048111 (17T) |

(T) Teeth

# 10.6 67EA(---)AM6 Series and 67EA310ML6 Triple Stage Gearing

## Models

67EA310ML6  
67EA340AM6  
67EA460AM6  
67EA570AM6  
67EA730AM6



**L** Lubricate with Grease:  
541444 - 2 oz. (56g)  
541445 - 16 oz. (0.45 kg)

**10.6 67EA(----)AM6 Series and 67EA310ML6 Triple Stage Gearing**

| Ref | Number     | #  | X   | EN                                                               |
|-----|------------|----|-----|------------------------------------------------------------------|
|     |            |    |     | Description                                                      |
| 1   | 11801172B  | 1  | 3   | Muffler                                                          |
| 2   | 48038117   | 1  |     | Deflector Ring                                                   |
| 3   | 92060023   | 1  |     | Thrust Race                                                      |
| 4   | Table 10.6 | 1  | 2   | Splined Pinion Gear                                              |
| 5   | Table 10.6 | 1  |     | Upper Gear Cage (includes Ref. 6)                                |
| 6   | Table 10.6 | 1  |     | Spacer                                                           |
| 7   | Table 10.6 | 3  | 6   | Upper Planetary Gear                                             |
| 8   | 48019118   | 12 | 24  | Planetary Gear Washer                                            |
| 9   | 92880015   | 45 | 90  | Upper Planetary Gear Roller (all models)                         |
|     | 92880015   | 45 | 90  | Middle Planetary Gear Roller (all models)                        |
|     | 92880015   | 45 | 90  | Lower Planetary Gear Roller (67EA340)                            |
|     | 92880015   | 60 | 120 | Lower Planetary Gear Roller (67EA310, 67EA460, 67EA570, 67EA730) |
| 10  | 48019110   | 6  | 12  | Planetary Gear Pin                                               |
| 11  | 92060018   | 4  |     | Thrust Race                                                      |
| 12  | Table 10.6 | 1  |     | Middle Gear Cage (includes Ref. 13)                              |
| 13  | Table 10.6 | 1  |     | Spacer                                                           |
| 14  | Table 10.6 | 3  | 6   | Middle Planetary Gear                                            |
| 15  | 93040014   | 1  | 3   | O-Ring                                                           |
| 16  | 48037107   | 1  |     | Gear Housing                                                     |
| 17  | Table 10.6 | 1  |     | Lower Gear Cage / Output Spindle                                 |
| 18  | Table 10.6 | 3  | 6   | Lower Planetary Gear                                             |
| 19  | Table 10.6 | 6  | 12  | Lower Planetary Gear Washer                                      |
| 20  | Table 10.6 | 3  | 6   | Lower Planetary Gear Pin                                         |
| 21  | 35647101   | 1  |     | Gear Housing                                                     |

(#) Quantity

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

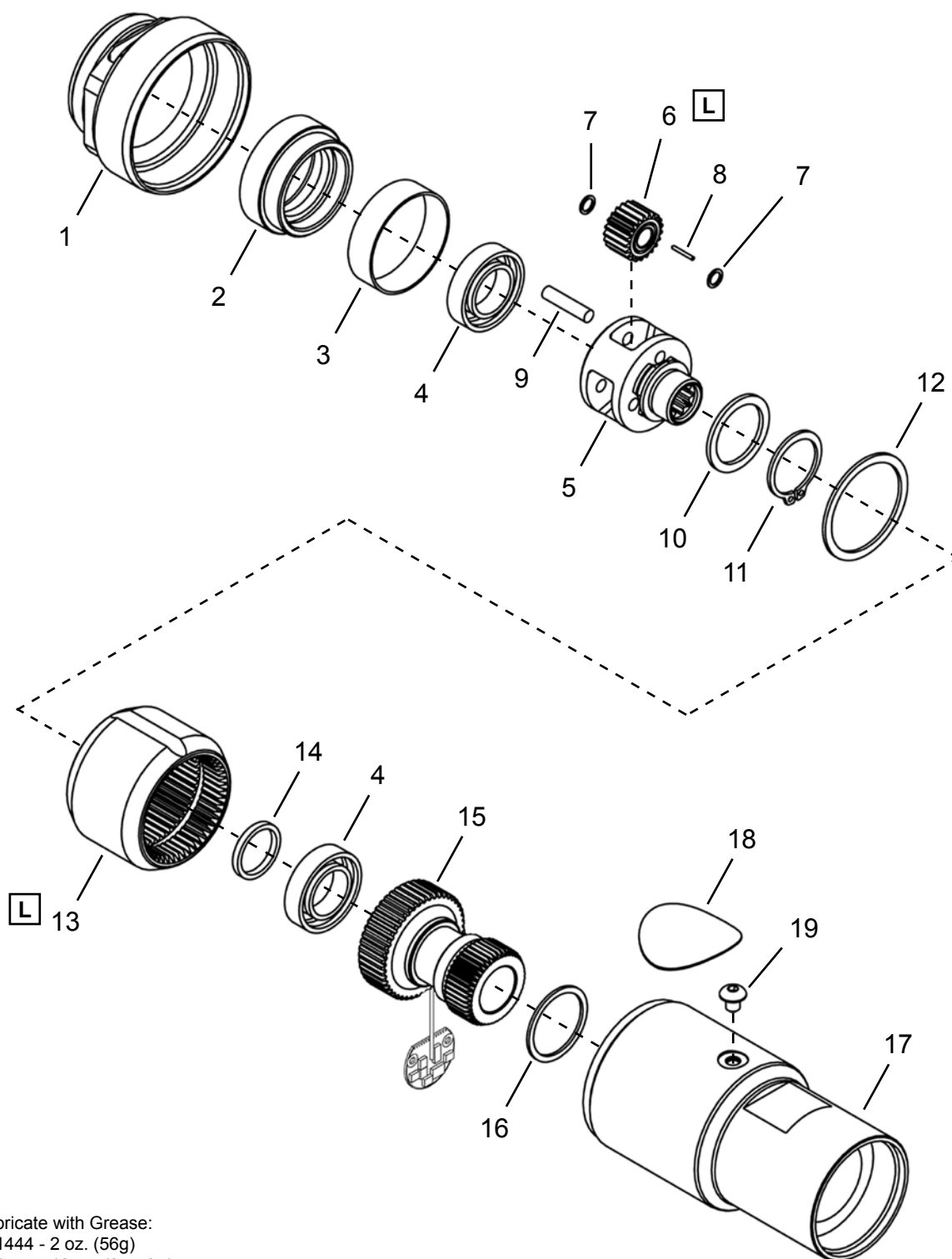
**Table 10.6**

| Ref. | Description                 | # | 67EA310        | # | 67EA340        | # | 67EA460        | # | 67EA570        | # | 67EA730        |
|------|-----------------------------|---|----------------|---|----------------|---|----------------|---|----------------|---|----------------|
| --   | Gear Case Assembly          | 1 | 35646002       | 1 | 35646001       | 1 | 35646003       | 1 | 35646004       | 1 | 35646005       |
| 4    | Splined Pinion Gear         | 1 | 48038118 (16T) | 1 | 48038118 (16T) | 1 | 48038118 (16T) | 1 | 48038118 (16T) | 1 | -----          |
| 5    | Upper Gear Cage             | 1 | 48037175       | 1 | 48037125       | 1 | 48037124       | 1 | 48037123       | 1 | 48037175       |
| 6    | Spacer                      | 1 | 48039178       | 1 | 48039178       | 1 | 48039176       | 1 | 48039177       | 1 | 48039176       |
| 7    | Upper Planetary Gear        | 3 | 48038129 (15T) | 3 | 48038129 (15T) | 3 | 48038129 (15T) | 3 | 48038129 (15T) | 3 | 48018117 (19T) |
| 12   | Middle Gear Cage            | 1 | 48037172       | 1 | 48037114       | 1 | 48037120       | 1 | 48037119       | 1 | 48037120       |
| 13   | Spacer                      | 1 | 48039157       | 1 | 48039158       | 1 | 48039157       | 1 | 48039157       | 1 | 48039157       |
| 14   | Middle Planetary Gear       | 3 | 48038129 (15T) | 3 | 48038129 (15T) | 3 | 48048111 (17T) | 3 | 48038128 (18T) | 3 | 48048111 (17T) |
| 17   | Lower Gear Cage / Spindle   | 1 | 48037110       | 1 | 48037111       | 1 | 48037110       | 1 | 48037110       | 1 | 48037110       |
| 18   | Lower Planetary Gear        | 3 | 48038104 (17T) | 3 | 48038112 (16T) | 3 | 48038104 (17T) | 3 | 48038104 (17T) | 3 | 48038104 (17T) |
| 19   | Lower Planetary Gear Washer | 6 | 48039115       | 6 | 48019118       | 6 | 48039115       | 6 | 48039115       | 6 | 48039115       |
| 20   | Lower Planetary Gear Pin    | 3 | 48039116       | 3 | 48039130       | 3 | 48039116       | 3 | 48039116       | 3 | 48039116       |

(T) Teeth

# 10.7 67EA860AH8 Single Stage Gearing

**Models**  
67EA860AH8



**L** Lubricate with Grease:  
541444 - 2 oz. (56g)  
541445 - 16 oz. (0.45 kg)

**10.7 67EA860AH8 Single Stage Gearing**

| Ref | Number    | #  | X  | EN                              |
|-----|-----------|----|----|---------------------------------|
|     |           |    |    | Description                     |
| 1   | 542876    | 1  |    | Adapter                         |
| 2   | 48138114  | 1  |    | Bearing Housing                 |
| 3   | 43259102  | 1  |    | Protector Sleeve                |
| 4   | 92100071  | 2  | 4  | Ball Bearing                    |
| 5   | 43527160  | 1  |    | Gear Cage                       |
| 6   | 48038149  | 3  | 6  | Planetary Gear                  |
| 7   | 48019118  | 6  | 12 | Planetary Gear Washer           |
| 8   | 92880015  | 45 | 90 | Planetary Gear Needle Roller    |
| 9   | 48019110  | 3  | 6  | Planetary Gear Pin              |
| 10  | 48019119  | 1  |    | Washer                          |
| 11  | 92840009  | 1  | 2  | Retaining Ring                  |
| 12  | 92830026  | 1  |    | Retainer                        |
| 13  | 43527114  | 1  |    | Gear Housing                    |
| 14  | 48139112  | 1  |    | Spacer                          |
| 15  | 542883-65 | 1  |    | Transducer                      |
| 16  | 92830018  | 1  |    | Retainer                        |
| 17  | 43527117  | 1  |    | Housing                         |
| 18  | 43329171  | 1  |    | Decal                           |
| 19  | 93300040  | 1  | 3  | Button Head Screw (10-32 x 1/4) |

(#) Quantity

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

(T) Teeth

## 10.8 67EA(----)AH8 Series Double Stage Gearing

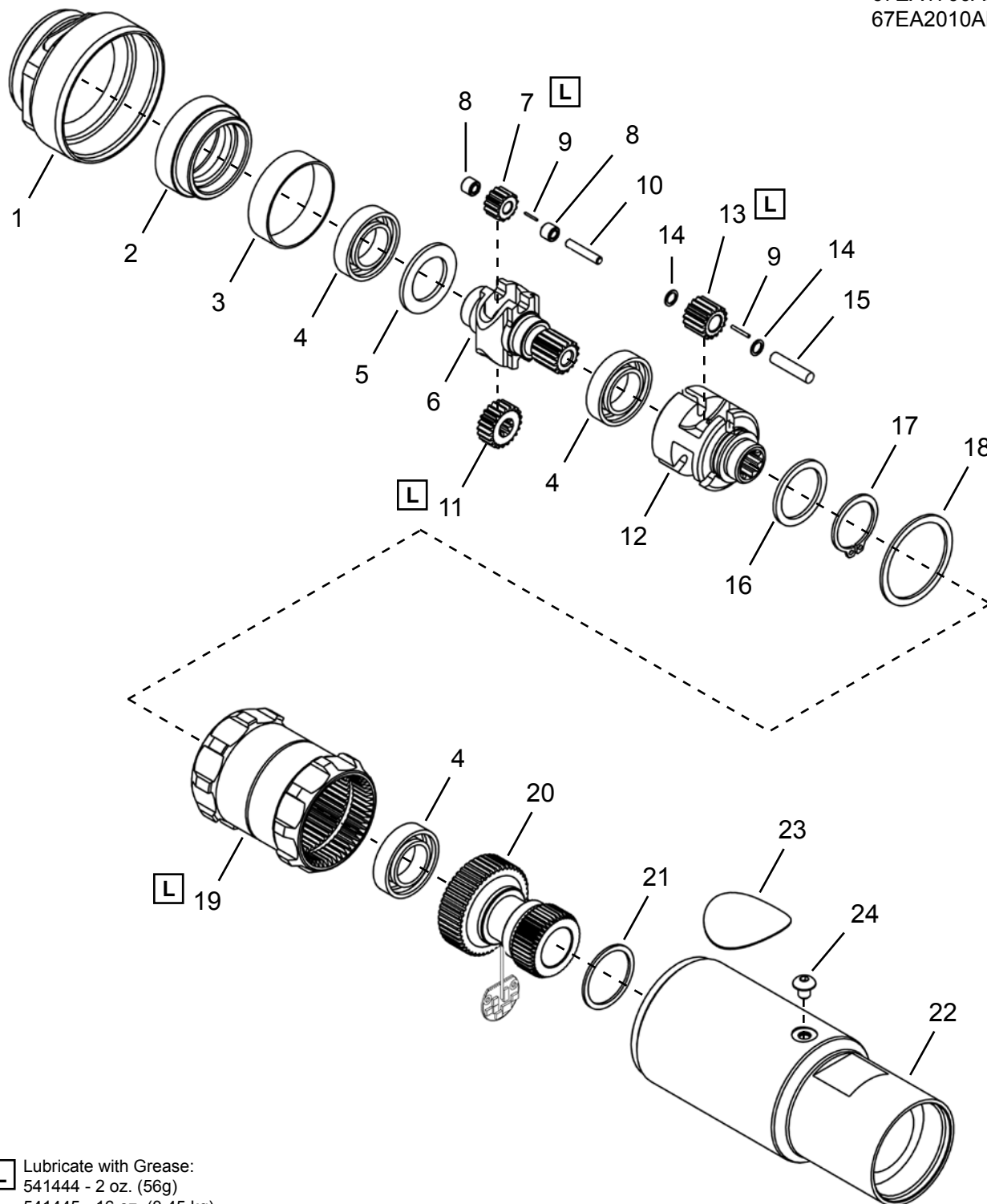
### Models

67EA1035AH8

67EA1340AH8

67EA1700AH8

67EA2010AH8



**L** Lubricate with Grease:  
541444 - 2 oz. (56g)  
541445 - 16 oz. (0.45 kg)

### 10.8 67EA(----)AH8 Series Double Stage Gearing

| Ref | Number     | #  | X  | EN                                                                |
|-----|------------|----|----|-------------------------------------------------------------------|
|     |            |    |    | Description                                                       |
| 1   | 542876     | 1  |    | Adapter                                                           |
| 2   | 48138114   | 1  |    | Bearing Housing                                                   |
| 3   | 43259102   | 1  |    | Protector Sleeve                                                  |
| 4   | 92100071   | 3  | 6  | Ball Bearing                                                      |
| 5   | Table 10.8 | 1  |    | Spacer                                                            |
| 6   | Table 10.8 | 1  |    | Upper Gear Cage                                                   |
| 7   | Table 10.8 | 3  | 6  | Upper Planetary Gear                                              |
| 8   | 43289151   | 4  | 8  | Upper Planetary Gear Bushing (67EA1035)                           |
|     | 48019118   | 4  | 8  | Upper Planetary Gear Washer (67EA1340, 67EA1700, 67EA2010)        |
| 9   | 92880006   | 32 | 64 | Upper Planetary Gear Needle Roller (67EA1035)                     |
|     | 92880015   | 30 | 60 | Upper Planetary Gear Needle Roller (67EA1340, 67EA1700, 67EA2010) |
|     | 92880015   | 45 | 90 | Lower Planetary Gear Needle Roller (all models)                   |
| 10  | Table 10.8 | 2  | 4  | Upper Planetary Gear Pin                                          |
| 11  | Table 10.8 | 1  | 2  | Splined Pinion Gear                                               |
| 12  | Table 10.8 | 1  |    | Lower Gear Cage                                                   |
| 13  | Table 10.8 | 3  | 6  | Lower Planetary Gear                                              |
| 14  | 48019118   | 6  | 12 | Lower Planetary Gear Washer                                       |
| 15  | 48019110   | 3  | 6  | Lower Planetary Gear Pin                                          |
| 16  | 48019119   | 1  |    | Washer                                                            |
| 17  | 92840009   | 1  | 2  | Retaining Ring                                                    |
| 18  | 92830026   | 1  | 2  | Retainer                                                          |
| 19  | 46067104   | 1  |    | Gear Housing                                                      |
| 20  | Table 10.8 | 1  |    | Transducer                                                        |
| 21  | 92830018   | 1  |    | Retainer                                                          |
| 22  | 43527118   | 1  |    | Housing                                                           |
| 23  | 43329171   | 1  |    | Decal                                                             |
| 24  | 93300040   | 1  | 3  | Button Head Screw (10-32 x 1/4)                                   |

(#) Quantity

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

**Table 10.8**

| Ref. | Description              | # | 67EA1035       | # | 67EA1340       | # | 67EA1700       | # | 67EA2010       |
|------|--------------------------|---|----------------|---|----------------|---|----------------|---|----------------|
| 5    | Spacer                   | 1 | 11221098       |   | -----          |   | -----          |   | -----          |
| 6    | Upper Gear Cage          | 1 | 43287153       | 1 | 48046129       | 1 | 48016112       | 1 | 48046129       |
| 7    | Upper Planetary Gear     | 2 | 43288152 (13T) | 2 | 48018113 (16T) | 2 | 48018113 (16T) | 2 | 48018117 (19T) |
| 10   | Upper Planetary Gear Pin | 2 | 43289150       | 2 | 48019110       | 2 | 48019110       | 2 | 48019110       |
| 11   | Splined Pinion Gear      | 1 | 43288115       | 1 | 11801184       | 1 | 11801184       |   | -----          |
| 14   | Middle Planetary Gear    | 3 | 48038129 (15T) | 3 | 48038129 (15T) | 3 | 48048111 (17T) | 3 | 48038128 (18T) |
| 12   | Lower Gear Cage          | 1 | 48138105       | 1 | 48138105       | 1 | 48138104       | 1 | 48138105       |
| 13   | Lower Planetary Gear     | 3 | 48018113 (16T) | 3 | 48018113 (16T) | 3 | 48018194 (18T) | 3 | 48018113 (16T) |
| 20   | Transducer               | 1 | 542883-65      | 1 | 542883-65      | 1 | 542883-65      | 1 | 542883-135     |

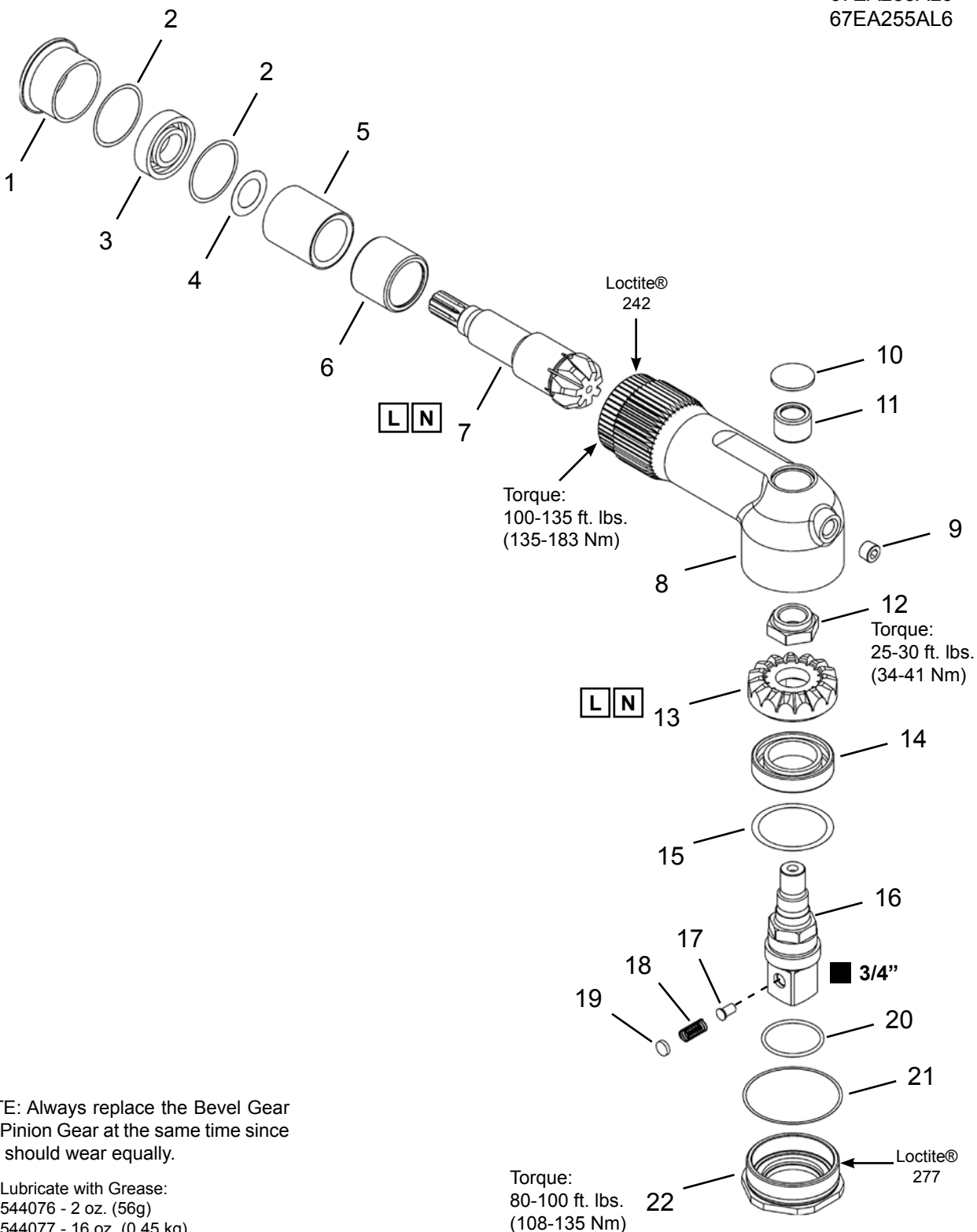
(T) Teeth

**10.9 48056032 AL6 Attachment (3/4" Square Drive)**

**Models**

67EA235AL6

67EA255AL6



**N**

NOTE: Always replace the Bevel Gear and Pinion Gear at the same time since they should wear equally.

**L**

Lubricate with Grease:  
544076 - 2 oz. (56g)  
544077 - 16 oz. (0.45 kg)

**10.9 48056032 AL6 Attachment (3/4" Square Drive)**

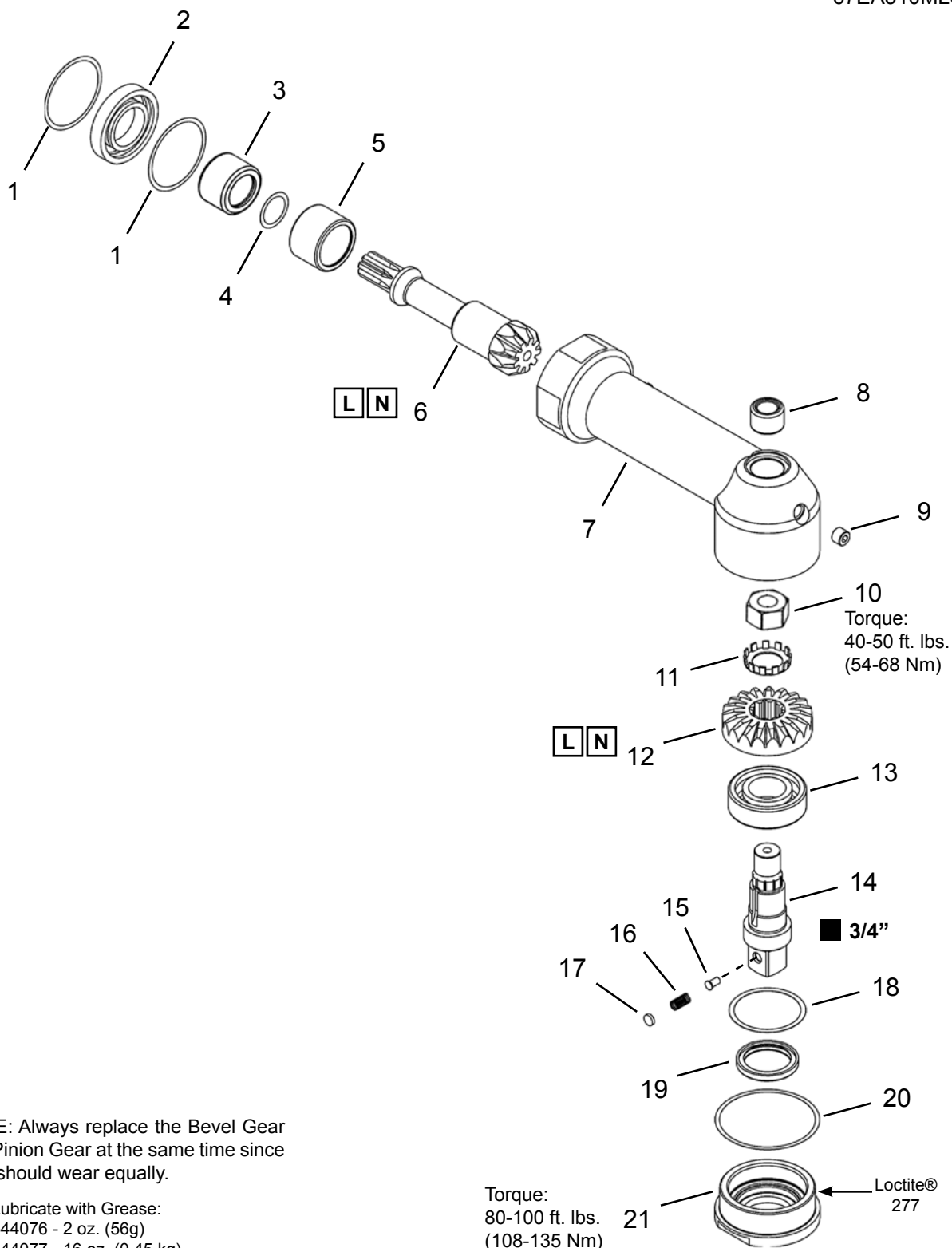
| Ref | Number     | #  | X  | EN                                   |
|-----|------------|----|----|--------------------------------------|
|     |            |    |    | Description                          |
| 1   | 48018105   | 1  |    | Spacer                               |
| 2   | 12601137A2 | AR | AR | Shim (.002)                          |
|     | 12601137A3 | AR | AR | Shim (.003)                          |
|     | 12601137A5 | AR | AR | Shim (.005)                          |
| 3   | 92100133   | 1  | 2  | Ball Bearing                         |
| 4   | 94200020   | AR | AR | Shim (.002)                          |
|     | 94200021   | AR | AR | Shim (.003)                          |
|     | 94200022   | AR | AR | Shim (.005)                          |
| 5   | 48019142   | 1  |    | Bearing Spacer                       |
| 6   | 92000057   | 1  | 2  | Needle Bearing                       |
| 7   | 48017139   | 1  | 2  | Pinion Gear                          |
| 8   | 49096102   | 1  |    | Angle Housing (includes Ref. 9)      |
| 9   | 93440006   | 1  |    | Plug                                 |
| 10  | 94190044   | 1  |    | Plug                                 |
| 11  | 92000145   | 1  | 2  | Needle Bearing                       |
| 12  | 93200022   | 1  | 2  | Lock Nut                             |
| 13  | 48017140   | 1  | 2  | Bevel Gear                           |
| 14  | 92100120   | 1  | 2  | Ball Bearing                         |
| 15  | 94200037   | AR | AR | Shim (.002)                          |
|     | 94200038   | AR | AR | Shim (.003)                          |
|     | 94200039   | AR | AR | Shim (.005)                          |
| 16  | 48057107   | 1  |    | Output Spindle (includes Ref. 17-19) |
| 17  | 12031048   | 1  | 3  | Pin                                  |
| 18  | 94070240   | 1  | 3  | Spring                               |
| 19  | 12601479A  | 1  | 3  | Plug                                 |
| 20  | 93010024   | 1  | 3  | O-Ring                               |
| 21  | 48019148   | AR | AR | Shim (.002)                          |
|     | 48019149   | AR | AR | Shim (.003)                          |
|     | 48019150   | AR | AR | Shim (.005)                          |
| 22  | 48017138   | 1  |    | Retaining Nut                        |

(#) Quantity

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

**10.10 45037012 ML6 Attachment (3/4" Square Drive)**

**Model**  
67EA310ML6



**N**

NOTE: Always replace the Bevel Gear and Pinion Gear at the same time since they should wear equally.

**L**

Lubricate with Grease:  
544076 - 2 oz. (56g)  
544077 - 16 oz. (0.45 kg)

**10.10 45037012 ML6 Attachment (3/4" Square Drive)**

| Ref | Number      | #  | X  | EN                                   |
|-----|-------------|----|----|--------------------------------------|
|     |             |    |    | Description                          |
| 1   | 74028123    | AR | AR | Shim (.002)                          |
|     | 74028124    | AR | AR | Shim (.003)                          |
|     | 74028125    | AR | AR | Shim (.005)                          |
| 2   | 92100118    | 1  | 2  | Ball Bearing                         |
| 3   | 45019123    | 1  |    | Spacer                               |
| 4   | 1684HS152A2 | AR | AR | Shim (.002)                          |
|     | 1684HS152A3 | AR | AR | Shim (.003)                          |
|     | 1684HS152A5 | AR | AR | Shim (.005)                          |
| 5   | 92190022    | 1  | 2  | Needle Bearing                       |
| 6   | 45037106    | 1  | 2  | Pinion Gear                          |
| 7   | 45036102    | 1  |    | Angle Housing                        |
| 8   | 882661      | 1  | 2  | Needle Bearing                       |
| 9   | 93440004    | 1  |    | Plug                                 |
| 10  | 45039121    | 1  | 2  | Lock Nut                             |
| 11  | 45039123    | 1  | 2  | Lock Washer                          |
| 12  | 45037105    | 1  | 2  | Bevel Gear                           |
| 13  | 92100121    | 1  | 2  | Ball Bearing                         |
| 14  | 45037126    | 1  |    | Output Spindle (includes Ref. 15-17) |
| 15  | 12031048    | 1  | 3  | Pin                                  |
| 16  | 94070240    | 1  | 3  | Spring                               |
| 17  | 12601479A   | 1  | 3  | Plug                                 |
| 18  | 94200037    | AR | AR | Shim (.002)                          |
|     | 94200038    | AR | AR | Shim (.003)                          |
|     | 94200039    | AR | AR | Shim (.005)                          |
| 19  | 93110033    | 1  | 3  | Seal                                 |
| 20  | 94200043    | AR | AR | Shim (.002)                          |
|     | 94200044    | AR | AR | Shim (.003)                          |
|     | 94200045    | AR | AR | Shim (.005)                          |
| 21  | 45037103    | 1  |    | Retaining Nut                        |

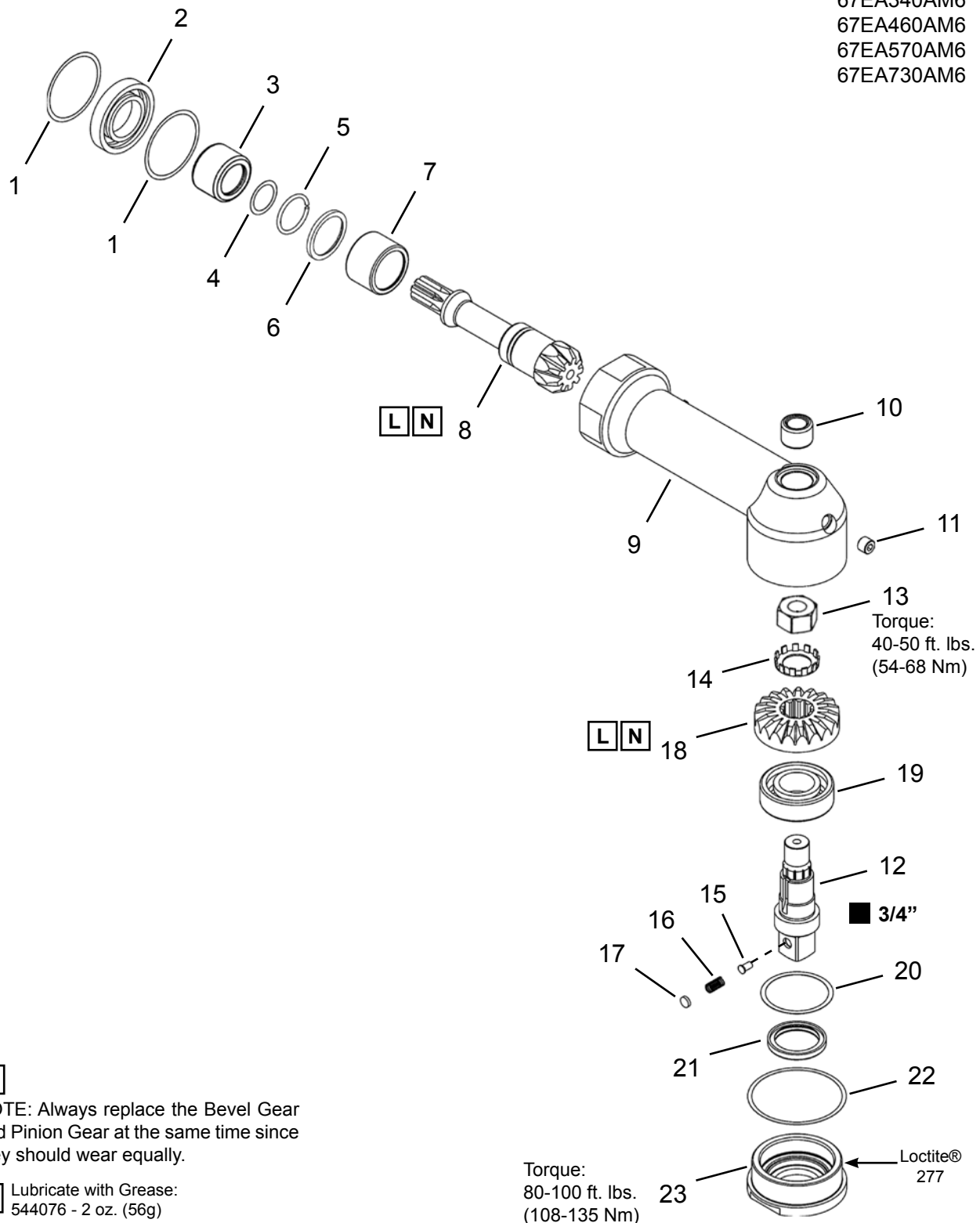
(#) Quantity

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

**10.11 45017010 AL6 Attachment (3/4" Square Drive)**

**Models**

67EA340AM6  
67EA460AM6  
67EA570AM6  
67EA730AM6



**10.11 45017010 AM6 Attachment (3/4" Square Drive)**

| Ref | Number      | #  | X  | EN                                   |
|-----|-------------|----|----|--------------------------------------|
|     |             |    |    | Description                          |
| 1   | 74028123    | AR | AR | Shim (.002)                          |
|     | 74028124    | AR | AR | Shim (.003)                          |
|     | 74028125    | AR | AR | Shim (.005)                          |
| 2   | 92100118    | 1  | 2  | Ball Bearing                         |
| 3   | 45019123    | 1  |    | Spacer                               |
| 4   | 1684HS152A2 | AR | AR | Shim (.002)                          |
|     | 1684HS152A3 | AR | AR | Shim (.003)                          |
|     | 1684HS152A5 | AR | AR | Shim (.005)                          |
| 5   | 45019197    | 1  | 2  | Retaining Ring                       |
| 6   | 45018196    | 1  | 2  | Locking Ring                         |
| 7   | 92000064    | 1  | 2  | Needle Bearing                       |
| 8   | 45017122    | 1  | 2  | Pinion Gear                          |
| 9   | 45016118    | 1  |    | Angle Housing                        |
| 10  | 92010038    | 1  | 2  | Needle Bearing                       |
| 11  | 93440004    | 1  |    | Plug                                 |
| 12  | 45017161    | 1  |    | Output Spindle (includes Ref. 13-17) |
| 13  | B111PT      | 1  | 2  | Lock Nut                             |
| 14  | 94160005    | 1  | 2  | Lock Washer                          |
| 15  | 12031048    | 1  | 3  | Pin                                  |
| 16  | 94070240    | 1  | 3  | Spring                               |
| 17  | 12601479A   | 1  | 3  | Plug                                 |
| 18  | 45017121    | 1  | 2  | Bevel Gear                           |
| 19  | 92100044    | 1  | 2  | Ball Bearing                         |
| 20  | 90751137B   | AR | AR | Shim (.002)                          |
|     | 90751137C   | AR | AR | Shim (.003)                          |
|     | 90751137D   | AR | AR | Shim (.005)                          |
|     | 90751137E   | AR | AR | Shim (.010)                          |
| 21  | 93110043    | 1  | 3  | Seal                                 |
| 22  | 94200027    | AR | AR | Shim (.002)                          |
|     | 94200028    | AR | AR | Shim (.003)                          |
|     | 94200029    | AR | AR | Shim (.005)                          |
| 23  | 45018119    | 1  |    | Retaining Nut                        |

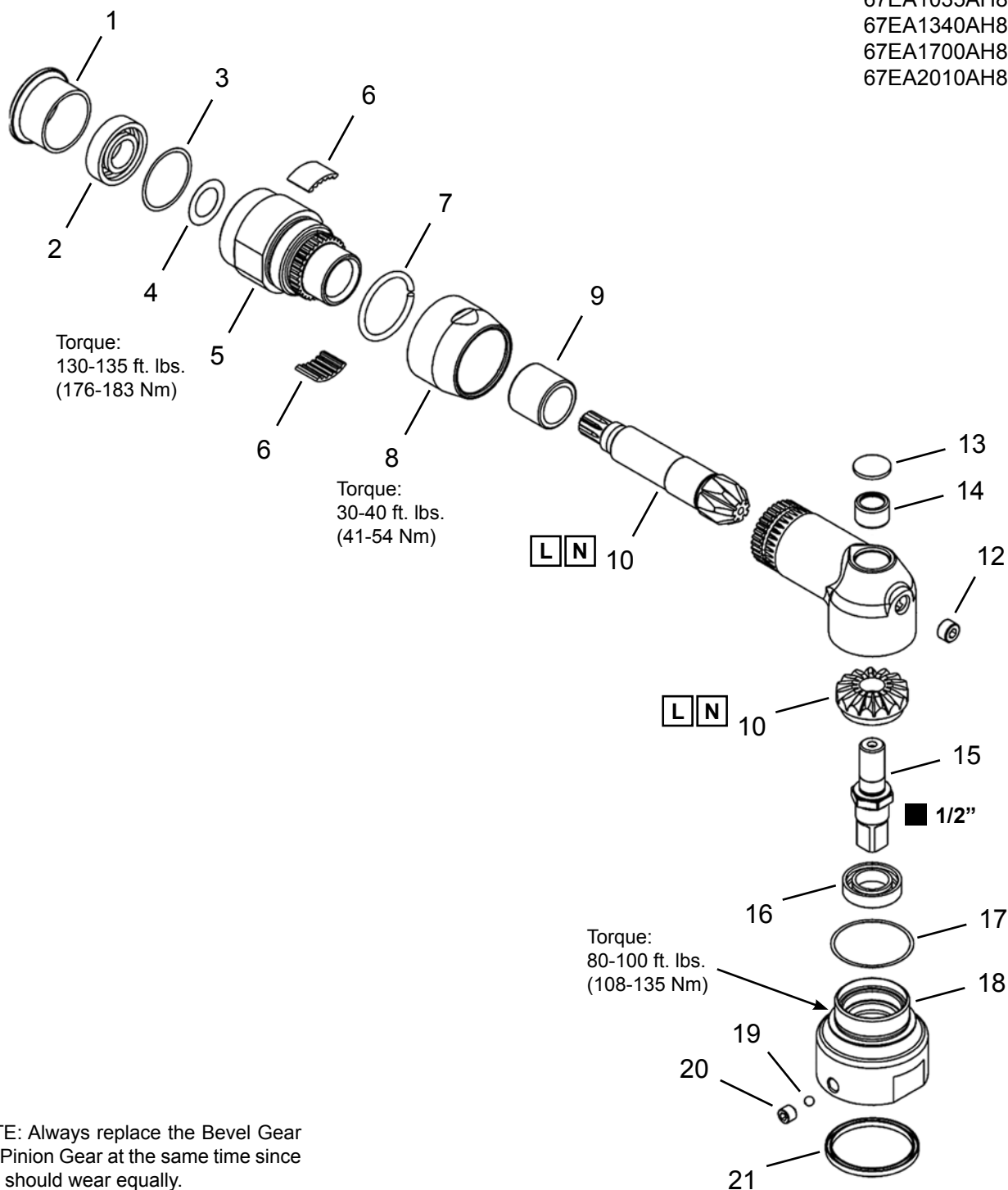
(#) Quantity

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

### 10.12.1 35A56033 AH8 Attachment (1/2" Square Drive) Angle Head Assembly

#### Models

67EA860AH8  
 67EA1035AH8  
 67EA1340AH8  
 67EA1700AH8  
 67EA2010AH8



**N**

NOTE: Always replace the Bevel Gear and Pinion Gear at the same time since they should wear equally.

**L**

Lubricate with Grease:  
 544076 - 2 oz. (56g)  
 544077 - 16 oz. (0.45 kg)

**10.12.1 35A56033 AH8 Attachment - Angle Head Assembly (1/2" Square Drive)**

| Ref | Number     | #  | X  | EN                               |
|-----|------------|----|----|----------------------------------|
|     |            |    |    | Description                      |
| 1   | 48018105   | 1  |    | Spacer                           |
| 2   | 92100133   | 1  | 2  | Ball Bearing                     |
| 3   | 12601137A2 | AR | AR | Shim (.002)                      |
|     | 12601137A3 | AR | AR | Shim (.003)                      |
|     | 12601137A5 | AR | AR | Shim (.005)                      |
| 4   | 94200020   | AR | AR | Shim (.002)                      |
|     | 94200021   | AR | AR | Shim (.003)                      |
|     | 94200022   | AR | AR | Shim (.005)                      |
| 5   | 57206142   | 1  |    | Right Angle Head Adapter         |
| 6   | 57207144   | 2  |    | Split Coupler                    |
| 7   | 57209145   | 1  | 2  | Retaining Clip                   |
| 8   | 57207143   | 1  |    | Adapter Nut                      |
| 9   | 92020046   | 1  | 2  | Needle Bearing                   |
| 10  | 301586     | 1  | 2  | Pinion Gear / Bevel Gear Set     |
| 11  | 57206141   | 1  |    | Angle Housing (includes Ref. 12) |
| 12  | 93440006   | 1  |    | Plug                             |
| 13  | 12601479   | 1  |    | Plug                             |
| 14  | 92000021   | 1  | 2  | Needle Bearing                   |
| 15  | 46607142   | 1  |    | Output Spindle                   |
| 16  | 92100071   | 1  | 2  | Ball Bearing                     |
| 17  | 12601137B2 | AR | AR | Shim (.002)                      |
|     | 12601137B3 | AR | AR | Shim (.003)                      |
|     | 12601137B5 | AR | AR | Shim (.005)                      |
| 18  | 46606141   | 1  |    | Right Angle Swivel Head          |
| 19  | 94010008   | 27 | 27 | Steel Ball                       |
| 20  | 12601432   | 1  |    | Plug                             |
| 21  | 93050015   | 1  | 3  | Seal                             |

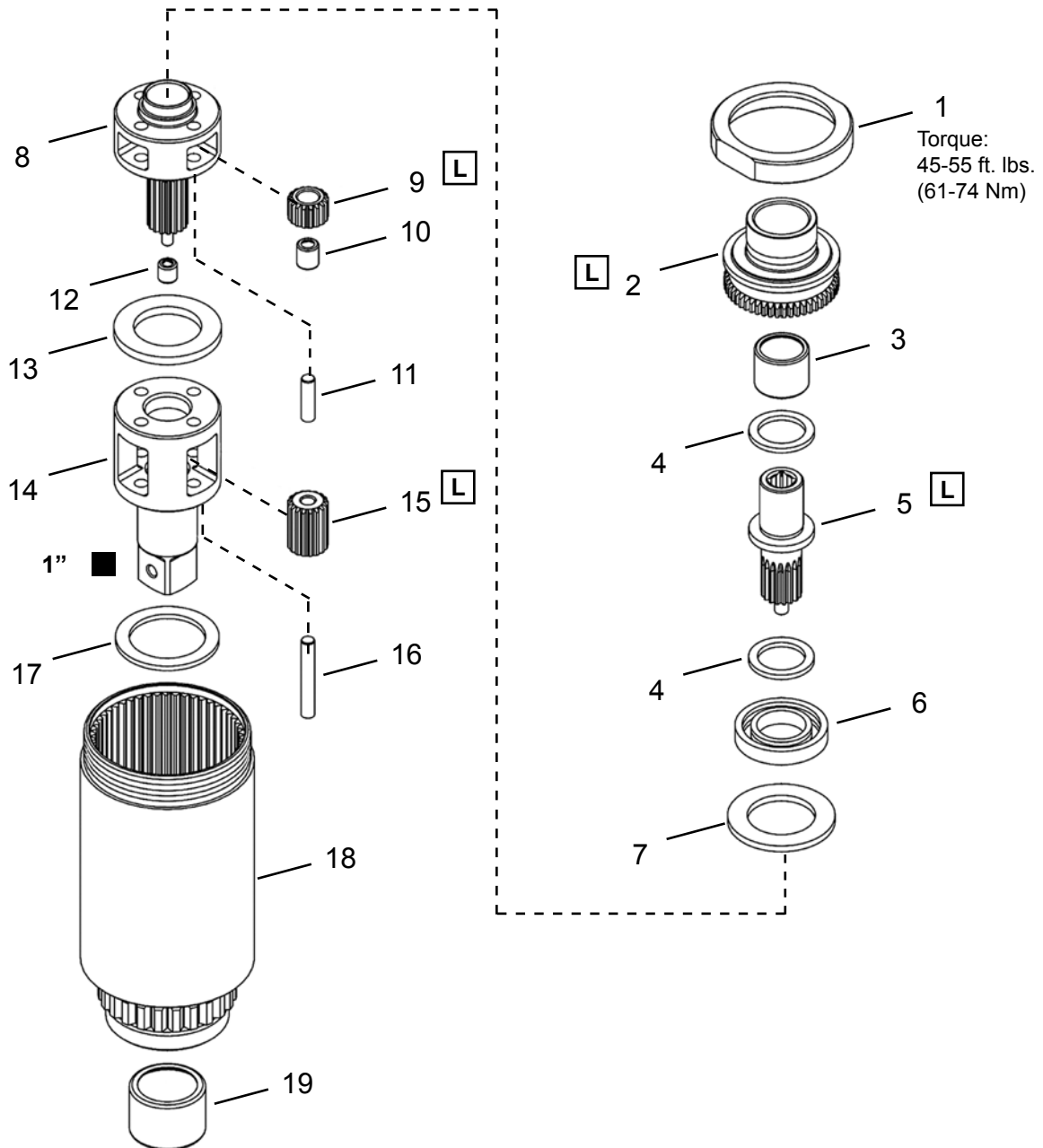
(#) Quantity

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

**10.12.2 35A56033 AH8 Attachment (1" Square Drive)  
Output Gearing Assembly**

**Models**

67EA860AH8  
67EA1035AH8  
67EA1340AH8  
67EA1700AH8  
67EA2010AH8



**L** Lubricate with Grease:  
544076 - 2 oz. (56g)  
544077 - 16 oz. (0.45 kg)

**10.12.2 35A56033 AH8 Attachment - Output Gearing Assembly (1" Square Drive)**

| Ref | Number   | # | X | EN                                       |
|-----|----------|---|---|------------------------------------------|
|     |          |   |   | Description                              |
| 1   | 46608148 | 1 |   | Clamp Nut                                |
| 2   | 46607149 | 1 |   | Swivel Gear                              |
| 3   | 92000057 | 1 | 2 | Needle Bearing                           |
| 4   | 46609146 | 2 |   | Thrust Washer                            |
| 5   | 46607147 | 1 |   | Square Drive Shaft                       |
| 6   | 92100118 | 1 | 2 | Ball Bearing                             |
| 7   | 46609150 | 1 |   | Spacer                                   |
| 8   | 46606151 | 1 |   | Upper Planetary Gear Cage Spindle        |
| 9   | 46608152 | 4 | 8 | Upper Planetary Gear (17T)               |
| 10  | 92000012 | 4 | 8 | Upper Planetary Gear Needle Bearing      |
| 11  | 46609153 | 4 | 8 | Upper Planetary Gear Pin                 |
| 12  | 92000008 | 1 | 2 | Needle Bearing                           |
| 13  | 46609154 | 1 |   | Thrust Washer                            |
| 14  | 46606156 | 1 |   | Lower Planetary Gear Cage Output Spindle |
| 15  | 46608121 | 4 | 8 | Lower Planetary Gear (17T)               |
| 16  | 46608122 | 4 | 8 | Lower Planetary Gear Pin                 |
| 17  | 46609119 | 1 |   | Thrust Washer                            |
| 18  | 46606155 | 1 |   | Gear Housing                             |
| 19  | 92190034 | 1 | 2 | Needle Bearing                           |

(#) Quantity

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

(T) Teeth

# 11 Technical data

## 11.1 67EA Specifications

### Right Angle DC Electric Nutrunner

| Model Number | Tool Range |      |        |     | Max. Speed<br>(rpm) | Length |     | Weight |      | Head Height |     | Side to Center |    | Ouput Drive Size |
|--------------|------------|------|--------|-----|---------------------|--------|-----|--------|------|-------------|-----|----------------|----|------------------|
|              | Max Tq     |      | Min Tq |     |                     | in     | mm  | lbs    | kg   | in          | mm  | in             | mm |                  |
|              | ft-lb      | Nm   | ft-lb  | Nm  |                     |        |     |        |      |             |     |                |    |                  |
| 67EA235AL6   | 169.6      | 230  | 33.9   | 46  | 135                 | 25.8   | 655 | 12.9   | 5.9  | 2.30        | 58  | 1.03           | 26 | 3/4"             |
| 67EA255AL6   | 188.1      | 255  | 40.6   | 55  | 115                 | 25.8   | 655 | 12.9   | 5.9  | 2.30        | 58  | 1.03           | 26 | 3/4"             |
| 67EA310ML6   | 229.0      | 310  | 44.0   | 60  | 100                 | 29.1   | 739 | 20.2   | 9.2  | 2.55        | 65  | 1.06           | 27 | 3/4"             |
| 67EA340AM6   | 247.1      | 335  | 51.6   | 70  | 90                  | 31.6   | 803 | 21.0   | 9.5  | 3.10        | 79  | 1.38           | 35 | 3/4"             |
| 67EA460AM6   | 339.3      | 460  | 70.1   | 95  | 66                  | 31.6   | 803 | 21.0   | 9.5  | 3.10        | 79  | 1.38           | 35 | 3/4"             |
| 67EA570AM6 * | 420.4      | 570  | 84.8   | 115 | 53                  | 31.6   | 803 | 21.0   | 9.5  | 3.10        | 79  | 1.38           | 35 | 3/4"             |
| 67EA730AM6 * | 538.4      | 730  | 110.6  | 150 | 46                  | 31.6   | 803 | 21.0   | 9.5  | 3.10        | 79  | 1.38           | 35 | 3/4"             |
| 67EA860AH8   | 634.3      | 860  | 129.1  | 175 | 33                  | 25.3   | 643 | 22.7   | 10.3 | 9.32        | 237 | 1.50           | 38 | 1"               |
| 67EA1035AH8  | 763.3      | 1035 | 154.9  | 210 | 25                  | 26.3   | 668 | 23.0   | 10.5 | 9.32        | 237 | 1.50           | 38 | 1"               |
| 67EA1340AH8  | 988.3      | 1340 | 199.1  | 270 | 20                  | 26.3   | 668 | 23.0   | 10.5 | 9.32        | 237 | 1.50           | 38 | 1"               |
| 67EA1700AH8  | 1253.8     | 1700 | 250.8  | 340 | 16                  | 26.3   | 668 | 23.0   | 10.5 | 9.32        | 237 | 1.50           | 38 | 1"               |
| 67EA2010AH8  | 1475.0     | 2000 | 295.0  | 400 | 13                  | 26.3   | 668 | 23.0   | 10.5 | 9.32        | 237 | 1.50           | 38 | 1"               |

\* Note: Contact Apex Tool Group for implementation assistance.

## **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.

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## 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  
Sales & Service Center**  
Av. Liberdade, 4055  
Zona Industrial - Iporanga  
18087-170 Sorocaba  
SP Brazil  
Tel: +55 15 2383929  
Fax: +55 15 2383260

Canada

**Apex Tool Group  
Sales & Service Center**  
7631 Bath Road  
Mississauga, Ont. L4T  
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Canada  
Tel: (866) 691-6212  
Tel: (905) 673-4400

China

**Cooper (China) Co., Ltd.**  
an Apex Tool Group, LLC  
company  
955 Sheng Li Road,  
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Tel: +86-21-28994176  
Fax: +86-21-51118446

England

**Apex Tool Group  
GmbH & Co. OHG**  
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