

Parts Manual
PL12EN-18EA
11/20/2015

Cleco®

18EA Series
Electronically Controlled Right Angle Nutrunner



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

“A”

18	E	A	X	XX	XXX	X
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Tool Series

18

Motor Style

E = Brushless Electric Motor

Tool Type

A = Right Angle

Feature

- = Matrix Tool Connector (Standard)

E = Air LB Connector

Maximum Torque Nm (rounded to nearest Nm)

08 = 7.8 Nm

15 = 15 Nm

22 = 22 Nm

28 = 28 Nm

Attachment

AL2 = 1/4" Square Drive - Right Angle

AM3 = 3/8" Square Drive - Right Angle

Spindle Type

- = Pin Retainer (Standard)

B = Ball Retainer

18EA Series Specifications - Matrix Tool Connector

Model Number	Tool Range				Max. Speed (rpm)	Length		Weight		Head Height		Side to Center		Output Drive Size
	Max Tq		Min Tq			in	mm	lbs	kg	in	mm	in	mm	
	ft-lb	Nm	ft-lb	Nm										
18EA08AL2(B)	5.9	8	1.5	2	3000	13.6	345	2.9	1.3	1.4	36	0.51	13	1/4"
18EA15AM3(B)	11.1	15	3.0	4	1300	14.8	376	3.3	1.5	1.6	41	0.59	15	3/8"
18EA22AM3(B)	16.2	22	3.7	5	920	14.8	376	3.3	1.5	1.6	41	0.59	15	3/8"
18EA28AM3(B)	20.7	28	4.4	6	700	14.8	376	3.3	1.5	1.6	41	0.59	15	3/8"

18EA Series Tool Memory Parameters - Matrix Tool Connector

Model Number	Max Speed [RPM]	Max Torque [Nm]	Torque Cal [Nm]	Transducer Type	Angle Cal [PPD]	Static Current Factor [Nm/A]
18EA08AL2(B)	3000	7.8	8.5616	542846-6	28.4440	0.6520
18EA15AM3(B)	1300	15	16.5705	542846-12	65.6023	1.4286
18EA22AM3(B)	920	22	22.9919	542846-17	92.5692	2.0158
18EA28AM3(B)	700	28	41.4362	542846-31	131.2216	2.6398

18EAE Series Specifications - Air LB Tool Connector

Model Number	Tool Range				Max. Speed (rpm)	Length		Weight		Head Height		Side to Center		Output Drive Size
	Max Tq		Min Tq			in	mm	lbs	kg	in	mm	in	mm	
	ft-lb	Nm	ft-lb	Nm										
18EAE08AL2(B)	5.9	8	1.5	2	3000	13.6	345	2.9	1.3	1.4	36	0.51	13	1/4"
18EAE15AM3(B)	11.1	15	3.0	4	1300	14.8	376	3.3	1.5	1.6	41	0.59	15	3/8"
18EAE22AM3(B)	16.2	22	3.7	5	920	14.8	376	3.3	1.5	1.6	41	0.59	15	3/8"
18EAE28AM3(B)	20.7	28	4.4	6	700	14.8	376	3.3	1.5	1.6	41	0.59	15	3/8"

18EAE Series Tool Memory Parameters - Air LB Tool Connector

Model Number	Max Speed [RPM]	Max Torque [Nm]	Torque Cal [Nm]	Transducer Type	Angle Cal [PPD]	Static Current Factor [Nm/A]
18EAE08AL2(B)	3000	7.8	8.5616	542846-6	28.4440	0.6520
18EAE15AM3(B)	1300	15	16.5705	542846-12	65.6023	1.4286
18EAE22AM3(B)	920	22	22.9919	542846-17	92.5692	2.0158
18EAE28AM3(B)	700	28	41.4362	542846-31	131.2216	2.6398

The original language of this manual is English.

Product Safety Information:

Intended Use:

These DC electric tools are intended for tightening of threaded joints or running down fasteners. Use only for their designated purpose. Do not use in any improper manner that could cause damage to the tool or injure the operator.

For additional product safety information refer to Apex Tool Group, LLC or Apex Tool Group GmbH & Co. OHG document CE-2002, General Safety Instructions Electric Assembly Tools.

WARNING

These DC electric assembly tools 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. Abuse, misuse, or failure to obey this and any other issued warnings may result in injury or death.

EC Declaration of Conformity:

We affirm that the product specified herein is to be considered a machine in conjunction with a fastening control from Apex Tool Group. We further declare that this machine is in accordance with the following EC Regulations, 2006/42/EC and 2004/108/EC. Applied harmonized standards are ISO 12100:2010.

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



Signature: Vishnu Irigireddy
Date: September 02, 2015

Noise and Vibration:

18EA Series: Noise Level ≤ 68 dB(A)
18EAE Series: Noise Level ≤ 68 dB(A)
18EA Series: Vibration < 2.5 m/s²
18EAE Series: Vibration < 2.5 m/s²

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.

Copyright Protection:

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Gearing and angle head grease:

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

Part No.	Packaged	Designation
544076	2 oz. (0.06 kg)	Molytex EP2
544077	16 oz. (0.45 kg)	Molytex EP2
541444	2 oz. (0.06 kg)	Rheolube 363AX-1
541445	16 oz. (0.45 kg)	Rheolube 363AX-1

“B”

**m-Pro-400 Series
Controller**



**TME-200 Series
Controller**



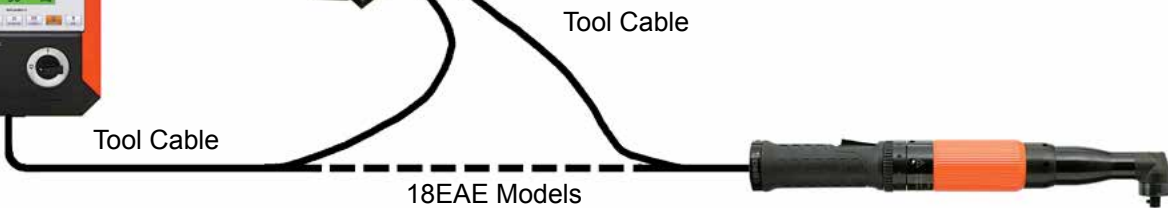
Complete Tool Order Number	Angle Attachment Order Number
18EA(E)08AL2	201901
18EA(E)08AL2B	543367
18EA(E)15AM3	301674
18EA(E)15AM3B	301675
18EA(E)22AM3	301674
18EA(E)22AM3B	301675
18EA(E)28AM3	301674
18EA(E)28AM3B	301675



**m-Pro-400GC
Global Controller**



**m-Pro-400-IT
Isolation Transformer
(18EA Models)**



TME and m-Pro-400 Series Controllers

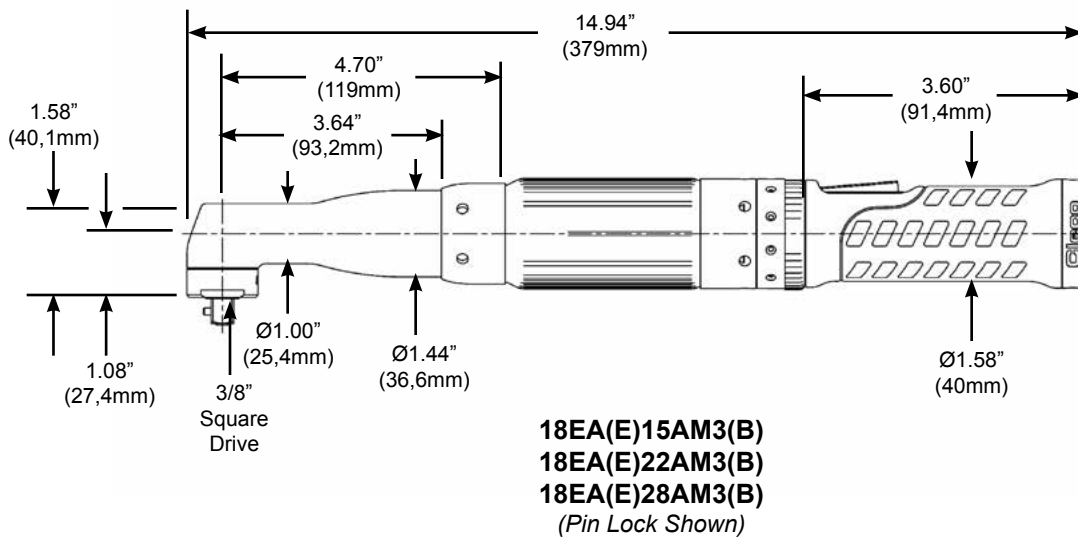
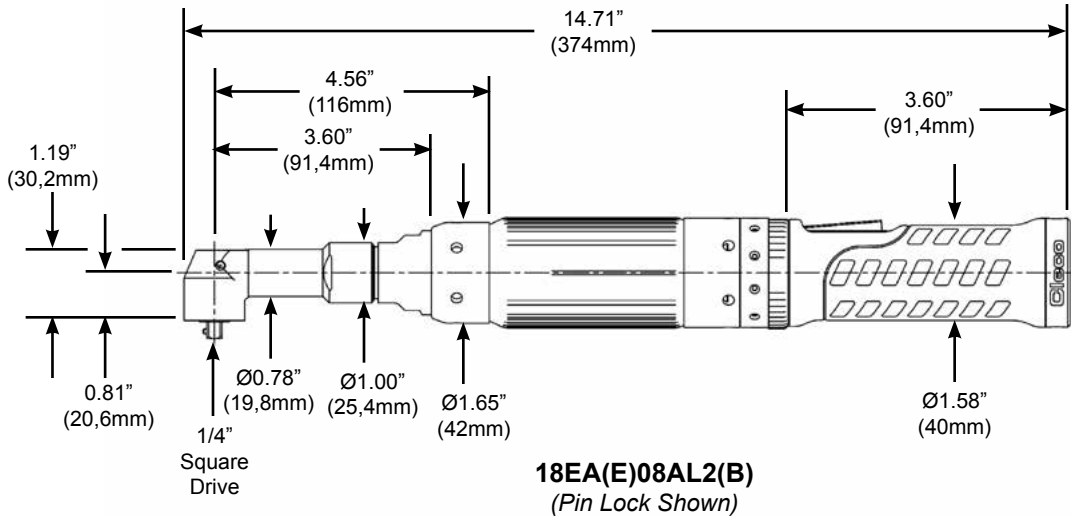
18EA	18EAE	EN	
		Description	
115 VAC	Standard	TMEI-114-15-U	
115 VAC	DeviceNet	TMEI-114-15-U-ED	
115 VAC	ProfiBus	TMEI-114-15-U-EP	
TME-200	m-Pro-400	Controller	
PL12()-1300	*	Programming Notes	
575708	*	Battery	
541683-01	*	Power Cord: 115VAC - USA	
541683-02	*	Power Cord: 230VAC - USA	
541683-03	*	Power Cord: 230VAC - Europe	
542779-XXX	301877-XXX	Extension Cable	
544056-XXX	301904-XXX	Swivel Cable	
544055-XXX	301903-XXX	Swivel Cable - Right Angle	
542778-XXX	301866-XXX	Tool Cable	

* Note: Contact Apex Tool Group

TME-200 Series Controller

Supply Voltage	EN	
	Order Number	
115 VAC	TME-211-15-U	
115 VAC	TME-221-15-U	
230 VAC	TME-211-30-U	
230 VAC	TME-221-30-U	

“C”



Cleco® 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: 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.

Maintenance:



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

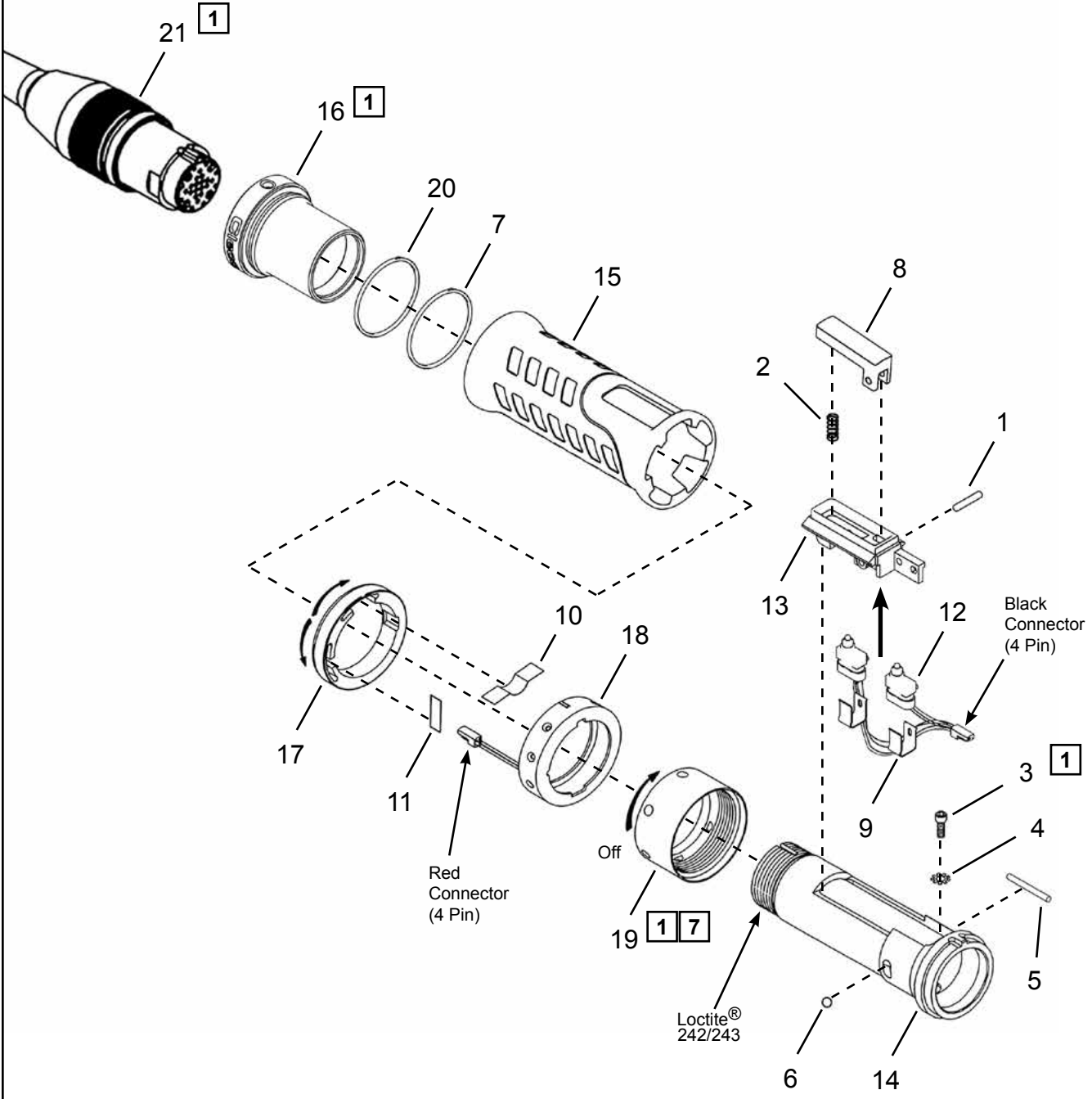
Regular maintenance reduces operating faults, repair costs and downtime. In addition to the following service schedule, implement a safety related maintenance program that takes the local regulations for repair and maintenance for all operating phases of the tool into account.

Maintenance Interval	Rundowns	Designation
Daily	Daily	<ul style="list-style-type: none"> → Visual inspection of all cables and connections → Visual inspection of the 48EA tool → Check the tool for excessive vibration or unusual noises → Visual inspection of all external components of the tool
Approximately	100,000	<ul style="list-style-type: none"> → Inspect the tool cable for damage or wear → inspect the square drive output spindle for damage or wear → Inspect the tool cable connection for a secure fit → Check the maximum free speed
Approximately	500,000	<ul style="list-style-type: none"> → Visual inspection of disassembled 48EA tool → Check individual parts for wear or damage and replace if necessary → Clean and lubricate angle head, gearing and motor bearings → Check and recalibrate transducer (48EA models)
Approximately	1,000,000	<ul style="list-style-type: none"> → Visual inspection of disassembled 48EA tool → Check individual parts for wear or damage and replace if necessary → Clean and lubricate angle head, gearing and motor bearings → Check and recalibrate transducer (48EA models)

Cleco®
Handle - Matrix Tool Connector

“D1”

Models
18EA08(---)
18EA15(---)
18EA22(---)
18EA28(---)



1 7 See Service Notes

Handle - Matrix Tool Connector

Illustration "D1"

Ref	Number	#	X	EN	
				Description	
1	541480	1	3	Switch Pin	
2	266255	1	3	Switch Spring	
3	B159V	1	3	Cap Screw - #6-32	
4	W115	1	3	Lock Washer	
5	1009089	1	3	Housing Pin	
6	1091PT	1	3	Steel Ball - 3/16"	
7	22598	1	3	O-Ring	
8	F900185	1		Switch Actuator	
9	207317	2	2	Switch Spring Clip	
10	541033	1	2	Reverse Spring	
11	541624	1	2	Forward/Reverse Spring	
12	F900571	1	2	Start/Reverse Switch	
13	207316	1		Switch Holder	
14	541015	1		Handle	
15	207323	1		Handle Sleeve	
16	207325	1		Connector Sleeve	
17	542938	1		Reverse Ring	
18	542819	1		Light Ring Assembly	
19	541017	1		Handle Retainer Nut	
20	524818	1	3	O-Ring	
Tool Cable (Optional Length)					
21	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	
	542778-50M			50 meter cable	
Inline Swivel Cable (Optional Length)					
21	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	
	544056-15M			15 meter cable	
Angle Swivel Cable (Optional Length)					
21	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	
	544055-15M			15 meter cable	
Tool Cable Extension (Optional Length)					
21	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

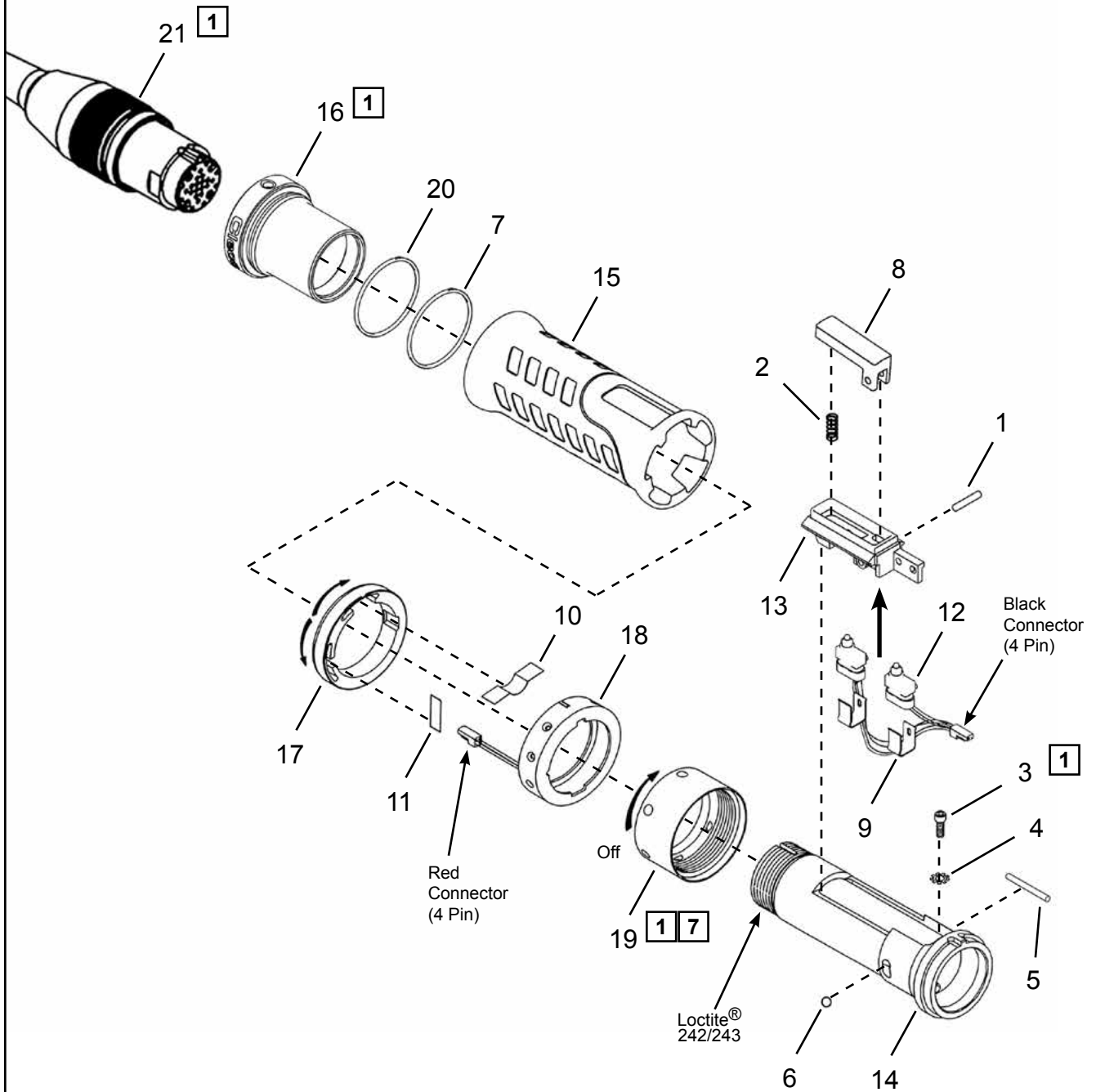
(X) Recommended Spare Parts (quantity shown based on 1-5 tools in operation)

Cleco®
Handle - Air LB Tool Connector

“D2”

Models

- 18EAE08(---)
- 18EAE15(---)
- 18EAE22(---)
- 18EAE28(---)



1 7 See Service Notes

Handle - Air LB Tool Connector

Illustration "D2"

Ref	Number	#	X	EN	
				Description	
1	541480	1	3	Switch Pin	
2	266255	1	3	Switch Spring	
3	B159V	1	3	Cap Screw - #6-32	
4	W115	1	3	Lock Washer	
5	1009089	1	3	Housing Pin	
6	1091PT	1	3	Steel Ball - 3/16"	
7	22598	1	3	O-Ring	
8	F900185	1		Switch Actuator	
9	207317	2	2	Switch Spring Clip	
10	541033	1	2	Reverse Spring	
11	541624	1	2	Forward/Reverse Spring	
12	F900571	1	2	Start/Reverse Switch	
13	207316	1		Switch Holder	
14	207322	1		Handle	
15	207323	1		Handle Sleeve	
16	207325E	1		Connector Sleeve	
17	542938	1		Reverse Ring	
18	542819	1		Light Ring Assembly	
19	541017	1		Handle Retainer Nut	
20	524818	1	3	O-Ring	
Tool Cable (Optional Length)					
21	301866-2M	1		2 meter cable	
	301866-3M			3 meter cable	
	301866-4M			4 meter cable	
	301866-6M			6 meter cable	
	301866-8M			8 meter cable	
	301866-10M			10 meter cable	
	301866-15M			15 meter cable	
Inline Swivel Cable (Optional Length)					
21	301904-2M	1		2 meter cable	
	301904-3M			3 meter cable	
	301904-8M			8 meter cable	
	301904-15M			15 meter cable	
Angle Swivel Cable (Optional Length)					
21	301903-2M	1		2 meter cable	
	301903-3M			3 meter cable	
	301903-8M			8 meter cable	
	301903-15M			15 meter cable	
Tool Cable Extension (Optional Length)					
21	301877-4M	1		4 meter cable	
	301877-8M			8 meter cable	
	301877-10M			10 meter cable	
	301877-20M			20 meter cable	
	301877-30M			30 meter cable	
	301877-40M			40 meter cable	
	301877-50M			50 meter cable	

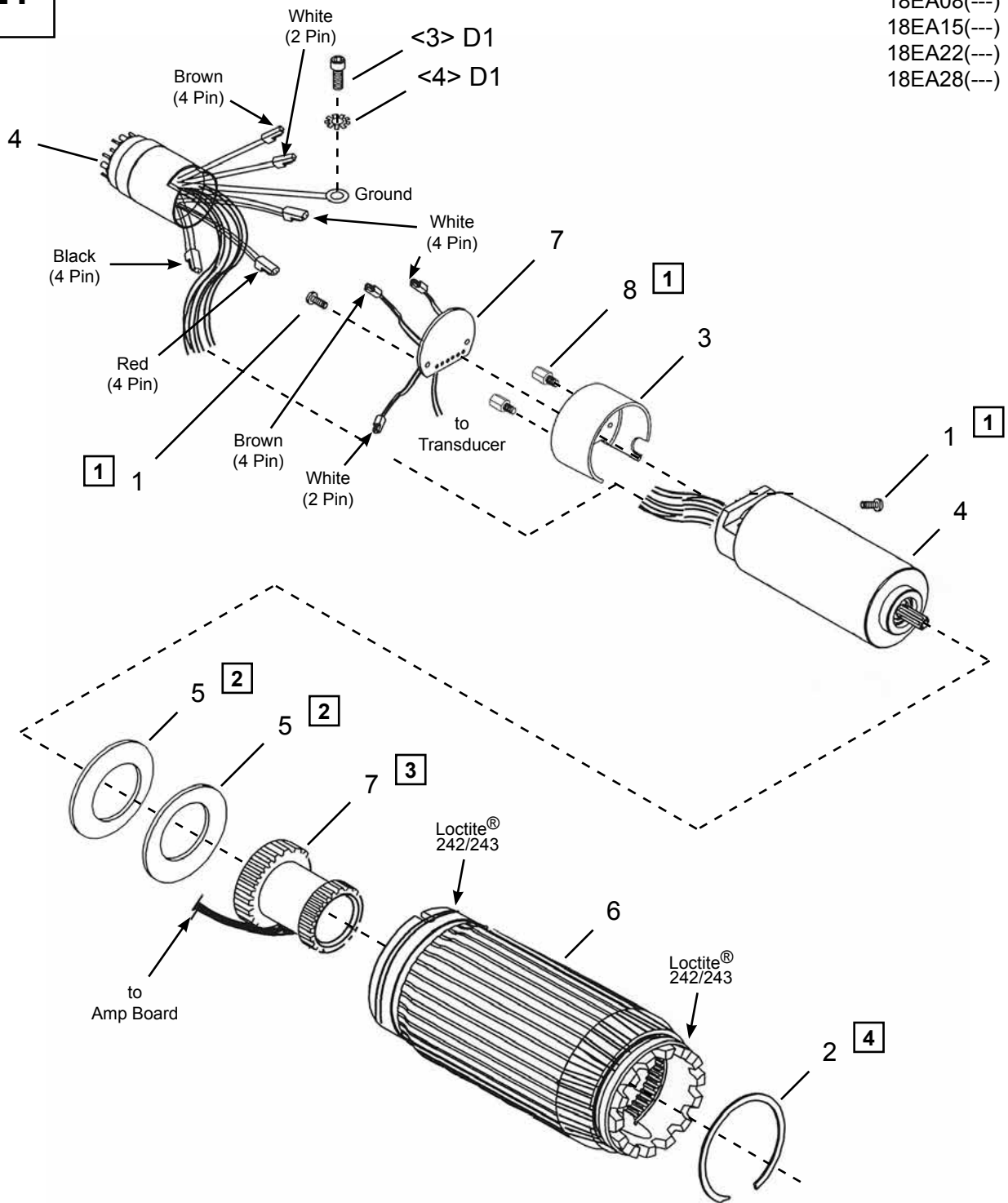
(#) Quantity

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

Cleco®
Motor - Matrix Tool Connector

“E1”

Models
18EA08(---)
18EA15(---)
18EA22(---)
18EA28(---)



1 2 3 4 See Service Notes

Motor - Matrix Tool Connector

Illustration "E1"

Ref	Number	#	X	EN
				Description
1	17-111	3	6	Pan Head Screw - #4-40 x .19
2	505306	1	2	Retaining Ring
3	542588	1		Motor Spacer
4	301760	1		Motor Assembly
5	541009	2	2	Wave Washer
6	207339	1		Housing
7	Table "E1"	1		Transducer Assembly
8	542244	2	2	Stand Off - 5/16"

(#) Quantity

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

Table "E1"

Ref.	Description	#	18EA08AL2	#	18EA15AM3	#	18EA22AM3	#	18EA28AM3
7	Transducer (unprogrammed)	1	542846-6	1	542846-12	1	542846-17	1	542846-31
	Transducer (programmed)	1	542846-6P	1	542846-12P	1	542846-17P	1	542846-31P
	Transducer Capacity		6 Nm		12 Nm		17 Nm		31 Nm

Cleco®
Motor - Air LB Tool Connector

PL12EN-18EA
11/20/2015

Illustration "E2"

Ref	Number	#	X	EN
				Description
1	17-111	3	6	Pan Head Screw - #4-40 x .19
2	505306	1	2	Retaining Ring
3	542588	1		Motor Spacer
4	301760E	1		Motor Assembly
5	541009	2	2	Wave Washer
6	207339	1		Housing
7	Table "E2"	1		Transducer Assembly
8	542244	2	2	Stand Off - 5/16"

(#) Quantity

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

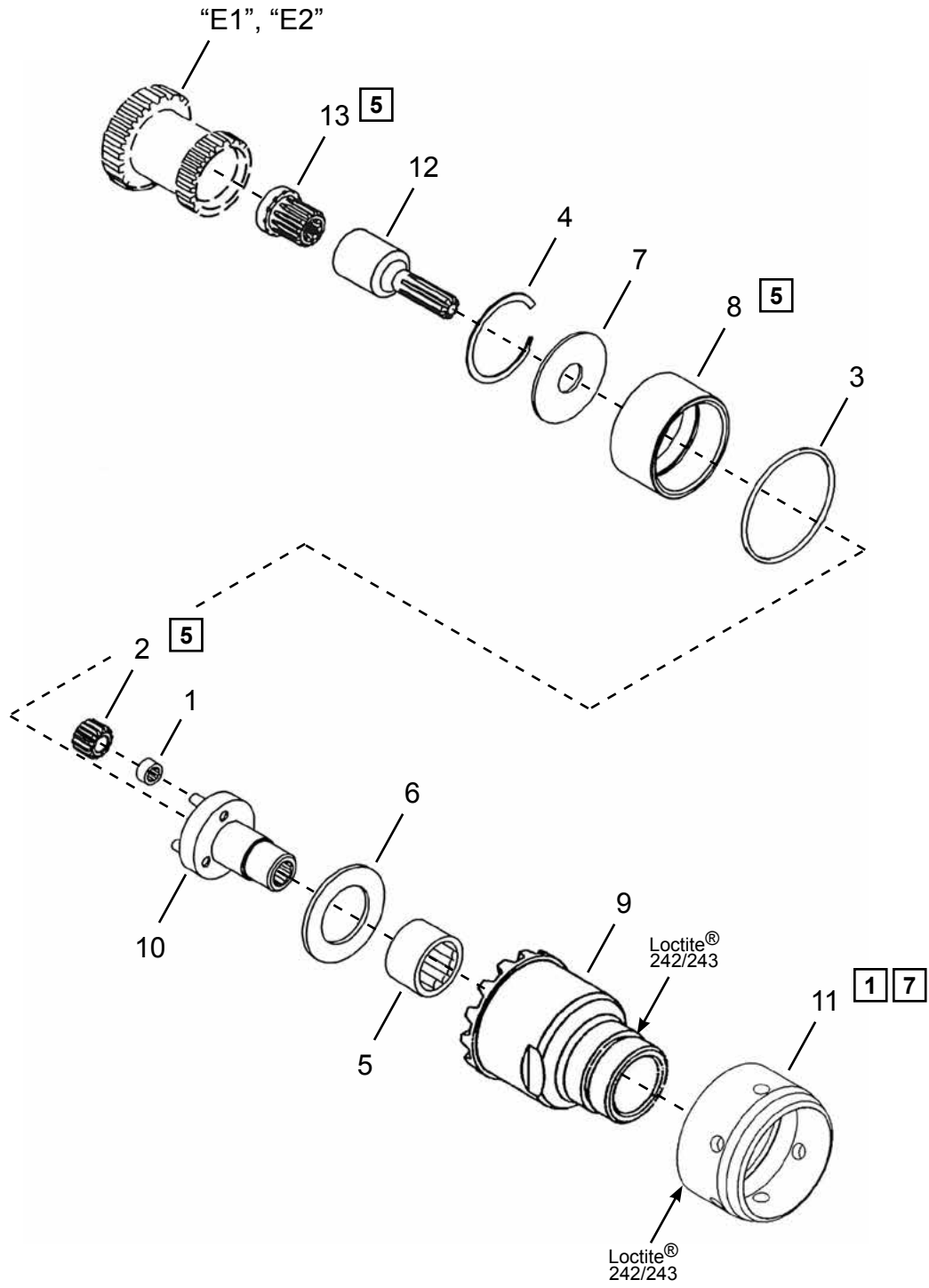
Table "E2"

Ref.	Description	#	18EAE08AL2	#	18EAE15AM3	#	18EAE22AM3	#	18EAE28AM3
7	Transducer (unprogrammed)	1	542846-6	1	542846-12	1	542846-17	1	542846-31
	Transducer (programmed)	1	542846-6P	1	542846-12P	1	542846-17P	1	542846-31P
	Transducer Capacity		6 Nm		12 Nm		17 Nm		31 Nm

Cleco® Single Stage Gearing

Models
18EA(E)08(---)

“F”



1 5 7 See Service Notes

Cleco®
Single Stage Gearing

PL12EN-18EA
11/20/2015

Illustration "F"

Ref	Number	#	X	EN
				Description
1	541487	3	6	Needle Bearing
2	541893	3	6	Planet Gear (21T)
3	1011732	1	3	O-Ring
4	800116	1	2	Retaining Ring
5	500511	1	2	Needle Bearing
6	303162	1		Thrust Washer
7	541887	1		Washer
8	542090	1		Ring Gear
9	542751	1		Adapter (includes Ref. 5)
10	542095	1		Planet Carrier Assembly
11	541904	1		Gear Case Nut
12	541898	1	2	Extension Pinion
13	541044	1	2	Pinion Adapter

(#) Quantity

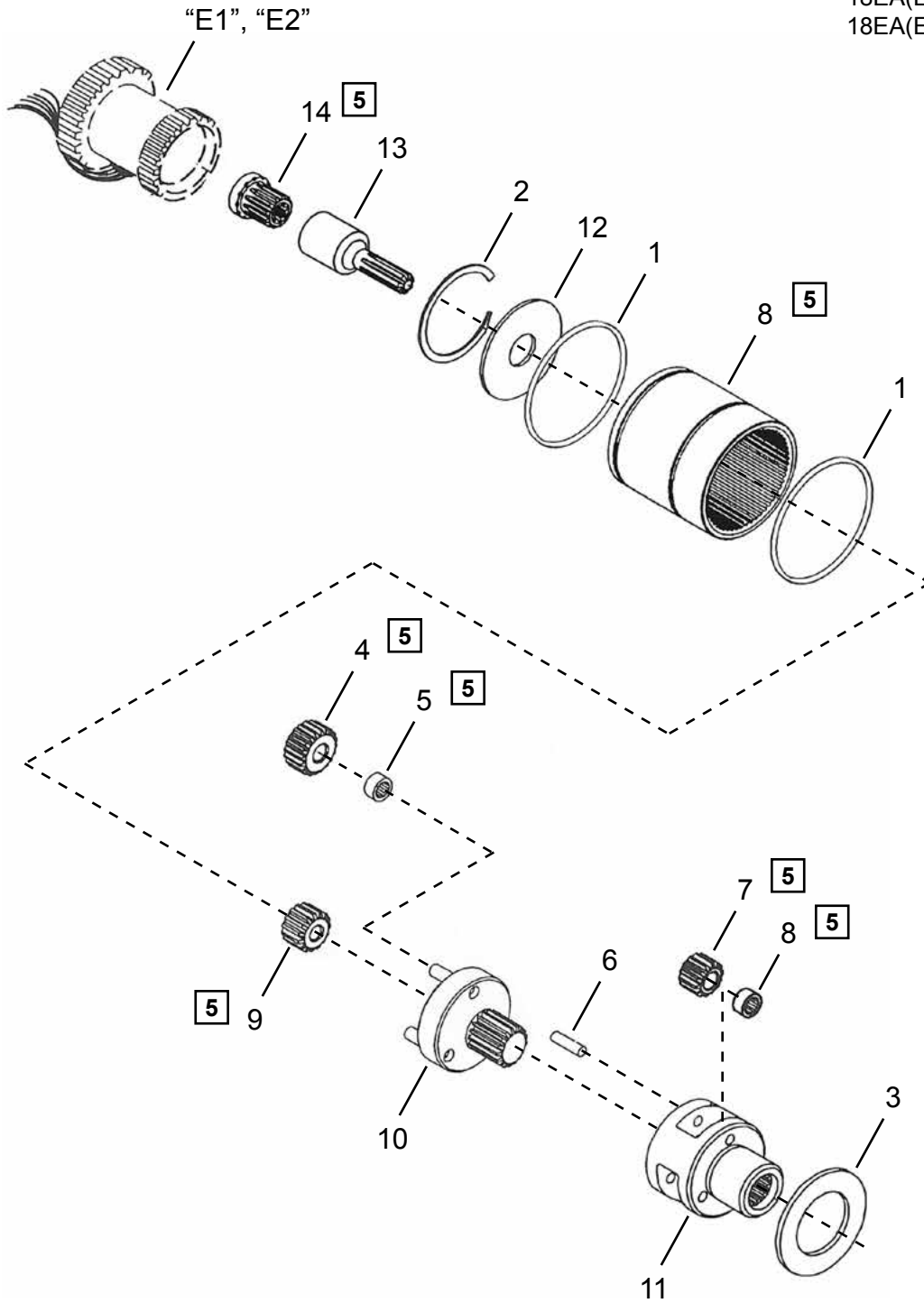
(X) Recommended Spare Parts (quantity shown based on 1-5 tools in operation)

(T) Teeth

Cleco® Double Stage Gearing

“G”

Models
18EA(E)15(---)
18EA(E)22(---)
18EA(E)28(---)



5 See Service Notes

Cleco®
Double Stage Gearing

PL12EN-18EA
11/20/2015

Illustration "G"

Ref	Number	#	X	EN	
				Description	
1	542724	2	6	O-Ring	
2	800116	1	2	Retaining Ring	
3	Table "G"	1	2	Thrust Washer	
4	Table "G"	3	6	Planet Gear	
5	541487	6	12	Needle Bearing	
6	541888	3	6	Planet Pin	
7	Table "G"	3	6	Planet Gear	
8	542722	1		Ring Gear	
9	Table "G"	1	3	Slip On Gear	
10	Table "G"	1		Planet Carrier Assembly	
11	Table "G"	1		Planet Carrier	
12	541887	1	2	Washer	
13	541898	1	2	Extension Pinion	
14	541044	1	2	Pinion Adapter	

(#) Quantity

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

Table "G"

Ref.	Description	#	18EA(E)015	#	18EA(E)22	#	18EA(E)28
3	Thrust Washer	1	502983	1	207303	1	502983
4	Planet Gear	3	541894 (17T)	3	541894 (17T)	3	541893 (21T)
7	Planet Gear	3	541894 (17T)	3	541897 (20T)	3	541894 (17T)
9	Slip On Gear	1	541899	1	541899		-----
10	Planet Carrier Assembly	1	542230	1	542233	1	542231
11	Planet Carrier	1	542079	1	542099	1	542079

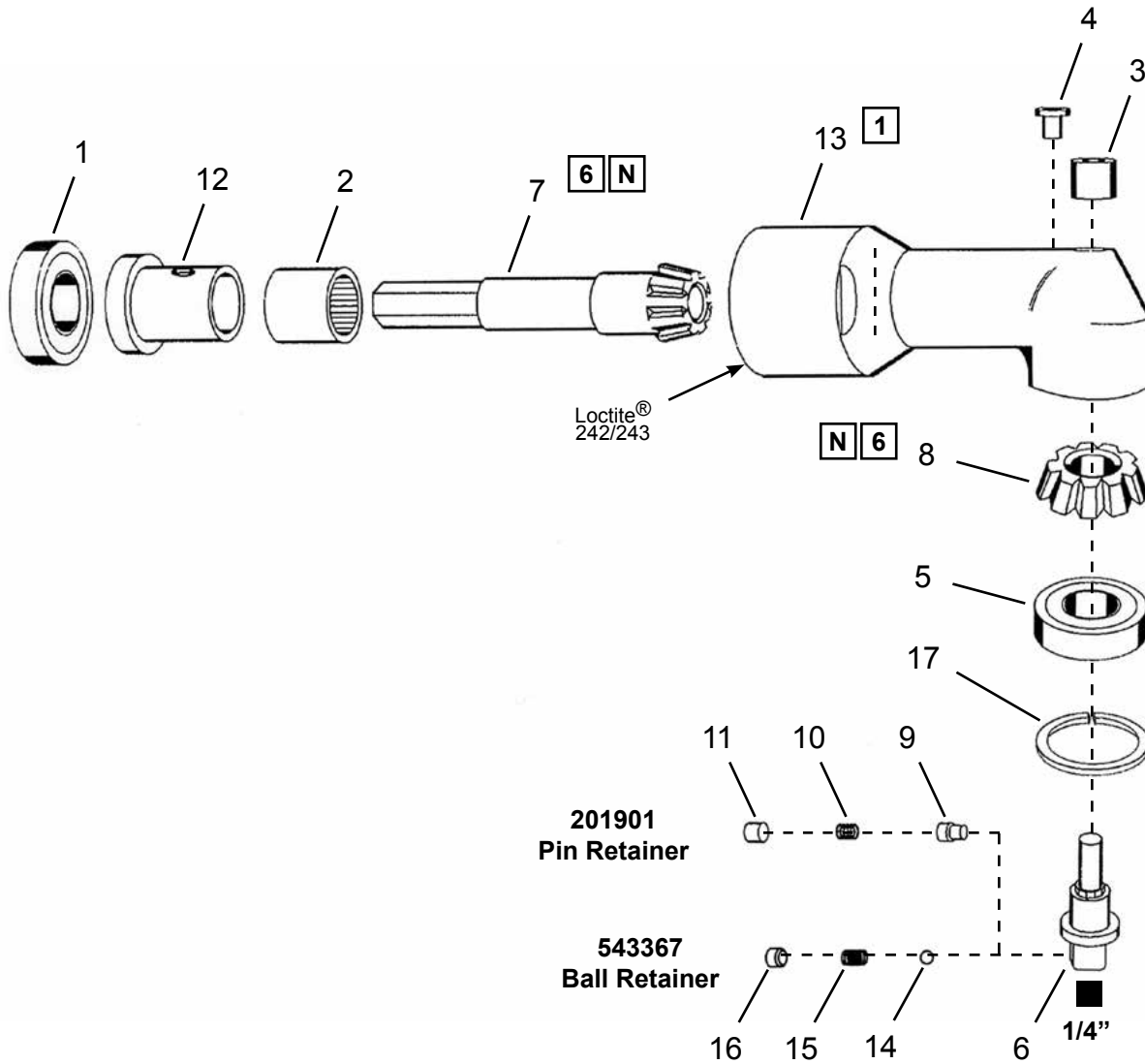
(T) Teeth

Cleco®
Angle Head Attachment (Code AL2)

“H”

1/4" Square Drive - 201901 (Pin Retainer)
1/4" Square Drive - 543367 (Ball Retainer)

Model
18EA(E)08AL2(B)



N

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

1

6

See Service Notes

Angle Head Attachment (Code AL2)

Illustration "H"

Ref	Number	#	X	EN
				Description
1	847846	1	2	Ball Bearing
2	845845	1	2	Needle Bearing
3	617600	1	2	Needle Bearing
4	864964	1		Grease Fitting
5	847595	1	2	Ball Bearing
6	869038	1		Output Spindle - 1/4" Pin Lock (includes Ref. 9-11)
	543362	1		Output Spindle - 1/4" Ball Lock (includes Ref. 14-16)
7	204993	1	1	Bevel Pinion
8	869028	1	1	Bevel Gear
9	202987	1	3	Pin
10	847853	1	3	Spring
11	202986	1	3	Plug
12	869029	1		Spacer
13	869676	1		Angle Housing (includes Ref. 4)
14	94010006	1	3	Steel Ball
15	WS-252	1	3	Spring
16	LB-252	1	3	Plug
17	869033	1	2	Retaining Ring

(#) Quantity

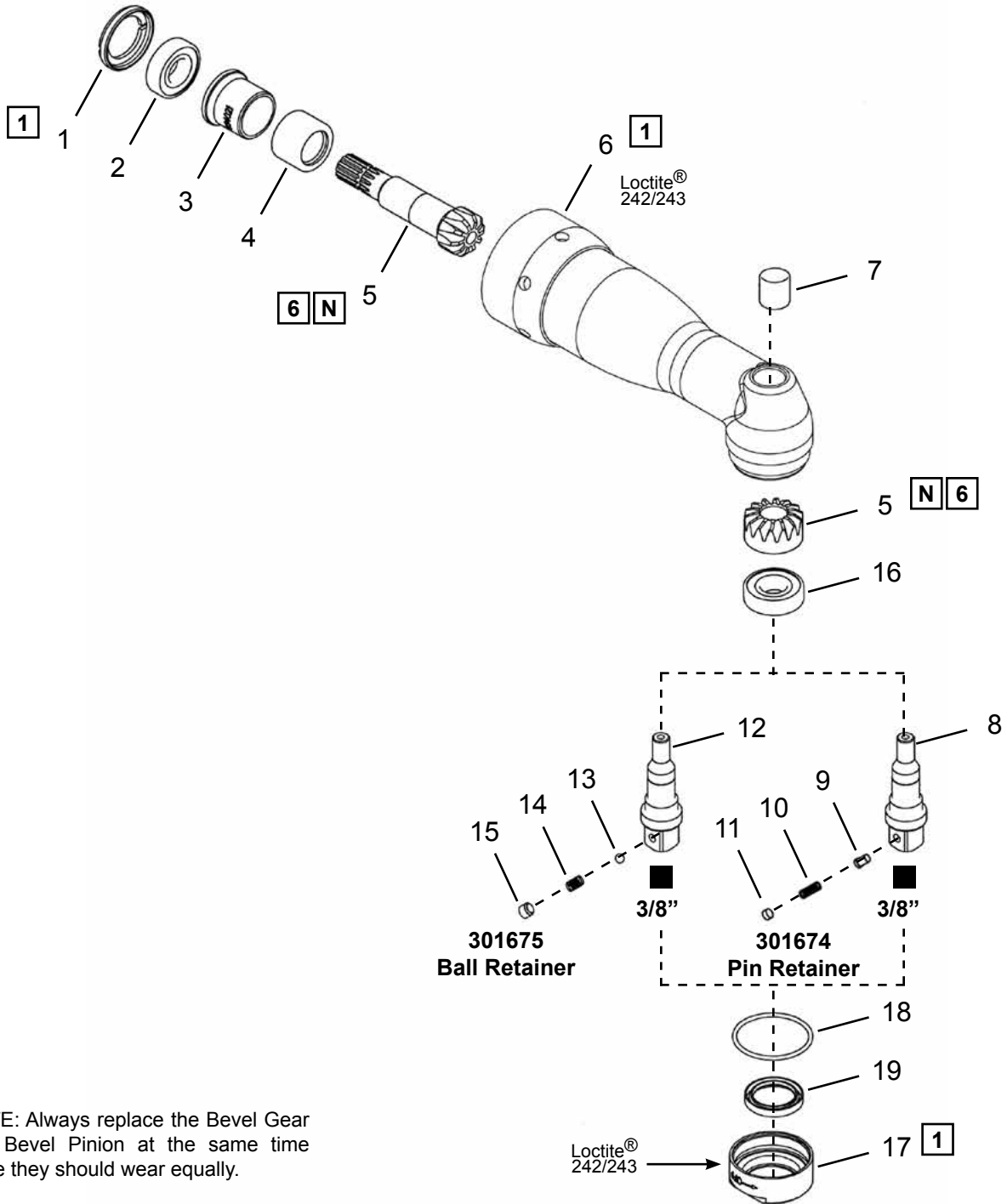
(X) Recommended Spare Parts (quantity shown based on 1-5 tools in operation)

Cleco®
Angle Head Attachment (Code AM3)

“1”

3/8” Square Drive - 301674 (Pin Retainer)
3/8” Square Drive - 301675 (Ball Retainer)

Model
18EA(E)15AM3(B)
18EA(E)22AM3(B)
18EA(E)28AM3(B)



N

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

1

6

See Service Notes

Angle Head Attachment (Code AM3)

Illustration "I"

Ref	Number	#	X	EN
				Description
1	934023	1		Lock Ring
2	934035	1	2	Ball Bearing
3	934021	1		Spacer
4	526942	1	2	Bearing
5	933792	1	1	Bevel Gear Set
6	207295	1		Angle Housing
7	500499	1	2	Needle Bearing
8	934025	1		Output Spindle - 3/8" (includes Ref. 9-11)
9	24499	1	3	Retainer
10	9D6481	1	3	Spring
11	26989PT	1	3	Plug
12	543363	1		Output Spindle - 3/8" (includes Ref. 13-15)
13	1091PT	1	3	Steel Ball
14	WS-371	1	3	Spring
15	LB-370	1	3	Bushing
16	207622PT	1	2	Ball Bearing
17	929177	1		Retainer Nut (includes Ref. 18-19)
18	905084	1	3	O-Ring
19	918163	1	3	Shaft Seal

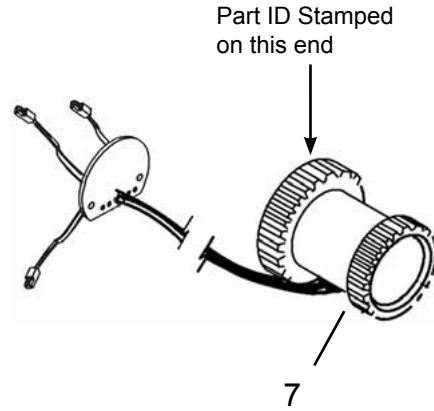
(#) Quantity

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

1 Tightening Torque

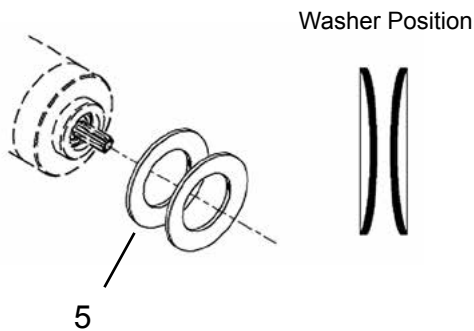
Illustration	Reference	Tightening torque	
		Ft-Lbs (in-lbs)	Nm
D1, D2	3	(10-14)	1.1-1.6
	16	25-30	34-41
	19	35-40	47-54
	21	15-18	20-25
E1, E2	8	(4-6)	0.45-0.68
F	11	35-40	47-54
H	13	35-40	47-54
I	1	7-11	10-15
	6	35-40	47-54
	17	13-16	18-22

3 Transducer Identification

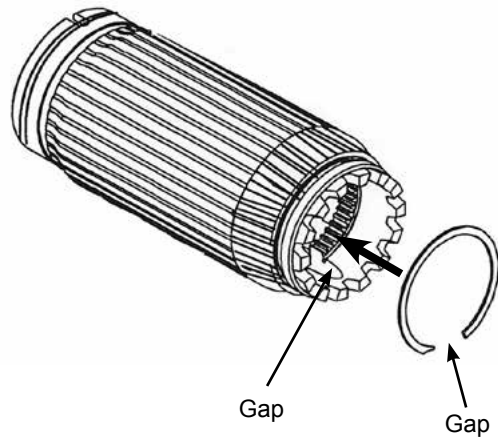


Transducers are not interchangeable, check part number.

2 Washer Assembly

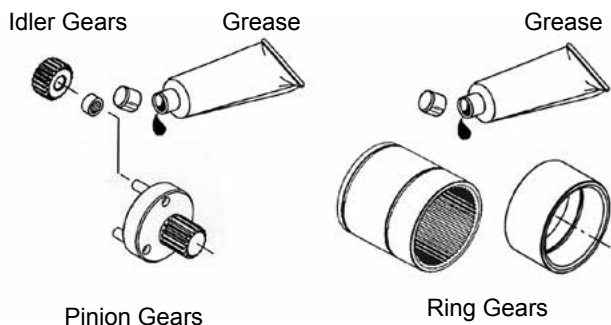


4 Retaining Ring Assembly

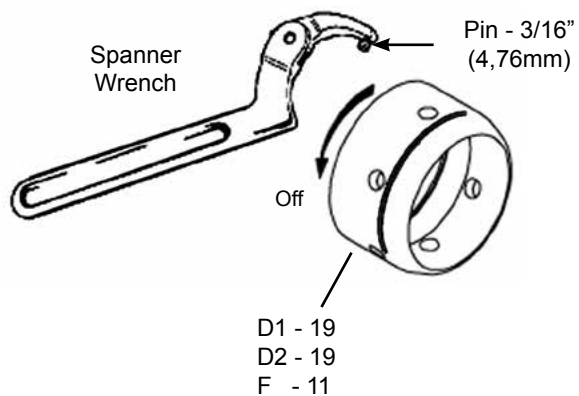


5 Gear Train Lubrication

541444 - 2 oz. (56 g)
541445 - 1 pound (0,45 kg)

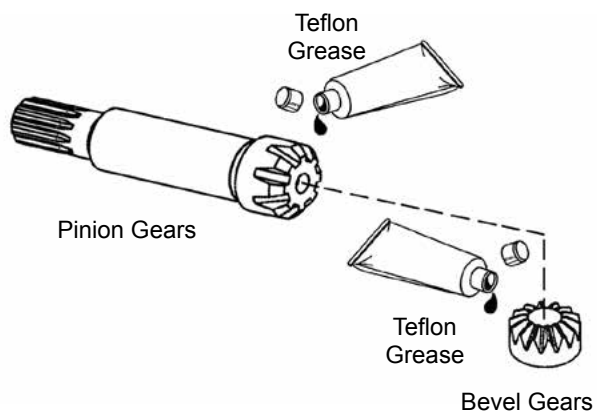


7 Spanner Wrench



6 Angle Head Lubrication

544076 - 2 oz. (56 g)
544077 - 1 pound (0,45 kg)



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Contact the nearest Apex Tool Group Sales & Service Center for the appropriate facility to handle your service requirements.

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