

Parts Manual
PL12EN-48EA-F
10/05/2011

Cleco®

48EA Series
Electronically Controlled Flush Socket Nutrunner



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

Language Version:

This Parts Manual is the **“Original Instructions”** intended for all persons who will use or repair these tools.

Product Identification:

Refer to the “Model Nomenclature” page in this document.

Noise and Vibration:

Refer to documents CE-1002DC and CE-1002TD.

General Description:

Brushless DC electric transducer controlled right angle portable nutrunners.

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 as a hammer, lever or other improper usage that can cause tool damage and operator injury.

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“A”	48	E	A	X	XXX	XX	XX	X	X																																								
<p><u>Tool Series</u> 48</p>																																																	
<p><u>Motor Style</u> E = Brushless Electric Motor</p>																																																	
<p><u>Tool Type</u> A = Right Angle</p>																																																	
<p><u>Feature</u> - = Matrix Tool Connector (Standard) E = Air LB Connector</p>																																																	
<p><u>Maximum Torque Nm (rounded to nearest Nm)</u></p> <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;">F2</td> <td style="text-align: center;">F3</td> <td style="text-align: center;">F4</td> <td colspan="7"></td> </tr> <tr> <td style="text-align: center;">37 = 37 Nm</td> <td style="text-align: center;">53 = 53 Nm</td> <td style="text-align: center;">135 = 134 Nm</td> <td colspan="7"></td> </tr> <tr> <td style="text-align: center;">52 = 52 Nm</td> <td style="text-align: center;">75 = 75 Nm</td> <td style="text-align: center;">230 = 230 Nm</td> <td colspan="7"></td> </tr> <tr> <td></td> <td style="text-align: center;">110 = 110 Nm</td> <td colspan="8"></td> </tr> </table>										F2	F3	F4								37 = 37 Nm	53 = 53 Nm	135 = 134 Nm								52 = 52 Nm	75 = 75 Nm	230 = 230 Nm									110 = 110 Nm								
F2	F3	F4																																															
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52 = 52 Nm	75 = 75 Nm	230 = 230 Nm																																															
	110 = 110 Nm																																																
<p><u>Tool Termination</u> F2 = Flush Socket F3 = Flush Socket F4 = Flush Socket</p>																																																	
<p><u>Drive Socket</u></p> <p>Maximum Hex Size F2 = MJ F3 = EJ & MO F4 = MR</p> <p>Socket Number</p> <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;">EC = 3/8"</td> <td style="text-align: center;">MD = 10mm</td> <td style="text-align: center;">MI = 15mm</td> <td style="text-align: center;">MO = 21mm</td> </tr> <tr> <td style="text-align: center;">EE = 1/2"</td> <td style="text-align: center;">ME = 11mm (7/16")</td> <td style="text-align: center;">MJ = 16mm (5/8")</td> <td style="text-align: center;">MP = 22mm</td> </tr> <tr> <td style="text-align: center;">EF = 9/16"</td> <td style="text-align: center;">MF = 12mm</td> <td style="text-align: center;">MK = 17mm</td> <td style="text-align: center;">MQ = 23mm</td> </tr> <tr> <td style="text-align: center;">EH = 11/16"</td> <td style="text-align: center;">MG = 13mm</td> <td style="text-align: center;">ML = 18mm</td> <td style="text-align: center;">MR = 24mm (15/16")</td> </tr> <tr> <td style="text-align: center;">EJ = 13/16"</td> <td style="text-align: center;">MG = 13mm</td> <td style="text-align: center;">MM = 19mm (3/4")</td> <td style="text-align: center;">XX = No drive socket</td> </tr> <tr> <td style="text-align: center;">EK = 7/8"</td> <td style="text-align: center;">MH = 24mm</td> <td style="text-align: center;">MN = 20mm</td> <td></td> </tr> </table>										EC = 3/8"	MD = 10mm	MI = 15mm	MO = 21mm	EE = 1/2"	ME = 11mm (7/16")	MJ = 16mm (5/8")	MP = 22mm	EF = 9/16"	MF = 12mm	MK = 17mm	MQ = 23mm	EH = 11/16"	MG = 13mm	ML = 18mm	MR = 24mm (15/16")	EJ = 13/16"	MG = 13mm	MM = 19mm (3/4")	XX = No drive socket	EK = 7/8"	MH = 24mm	MN = 20mm																	
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EK = 7/8"	MH = 24mm	MN = 20mm																																															
<p><u>Extension</u> 0 = Flush 2 = 1/4" (6mm) 4 = 1/2" (13mm) 6 = 3/4" (19mm) 8 = 1" (25mm)</p>																																																	
<p><u>Output Type</u> 0 = Standard 1 = Fast Lead 2 = Magnetic</p>																																																	

“B”

m-Pro-400 Series
Controller



TME-200 Series
Controller

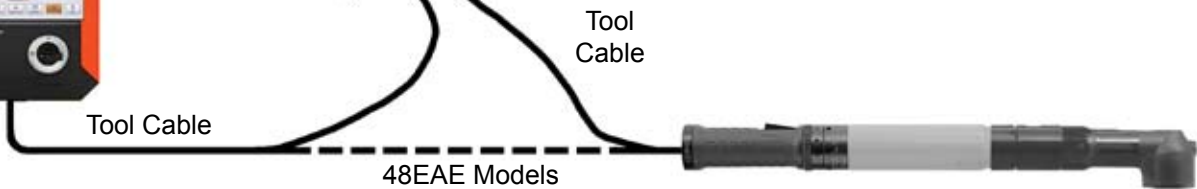


Complete Tool
Order Number
48EA(E)37F2xxxx
48EA(E)52F2xxxx
48EA(E)53F3xxxx
48EA(E)75F3xxxx
48EA(E)110F3xxxx
48EA(E)135F4xxxx
48EA(E)230F4xxxx

m-Pro-400GC
Global Controller



m-Pro-400-IT
Isolation Transformer
(48EA Models)



TME and m-Pro-400 Series Controllers

48EA	48EAE	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

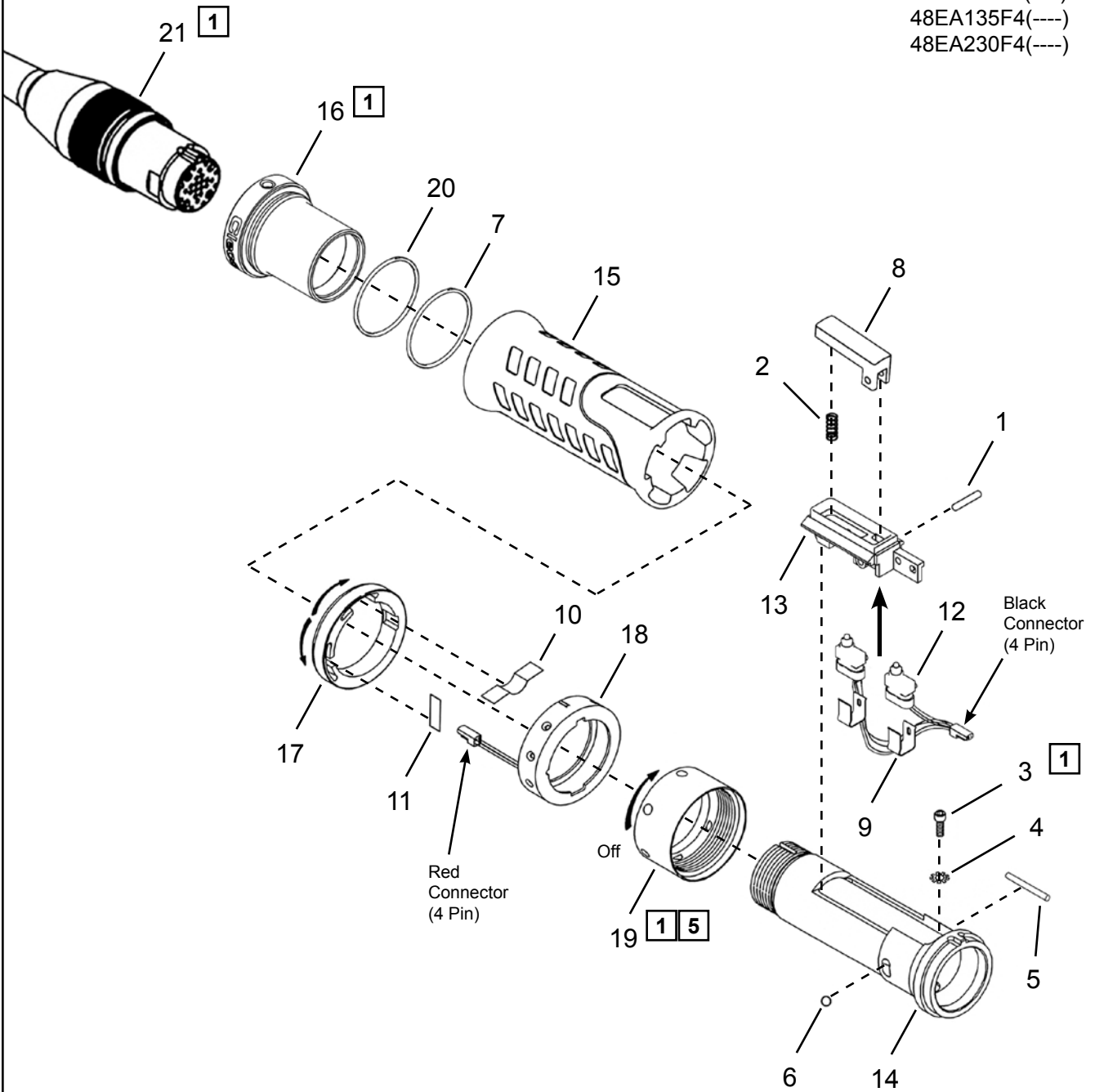
Supply Voltage	EN	
	Order Number	
115 VAC	TME-211-15-U	
115 VAC	TME-221-15-U	
230 VAC	TME-211-30-U	
230 VAC	TME-221-30-U	

Cleco®
Handle - Matrix Tool Connector

“C1”

Models

- 48EA37F2(-----)
- 48EA52F2(-----)
- 48EA53F3(-----)
- 48EA75F3(-----)
- 48EA110F3(-----)
- 48EA135F4(-----)
- 48EA230F4(-----)



[1] [5] See Service Notes

Handle - Matrix Tool Connector

Illustration "C1"

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

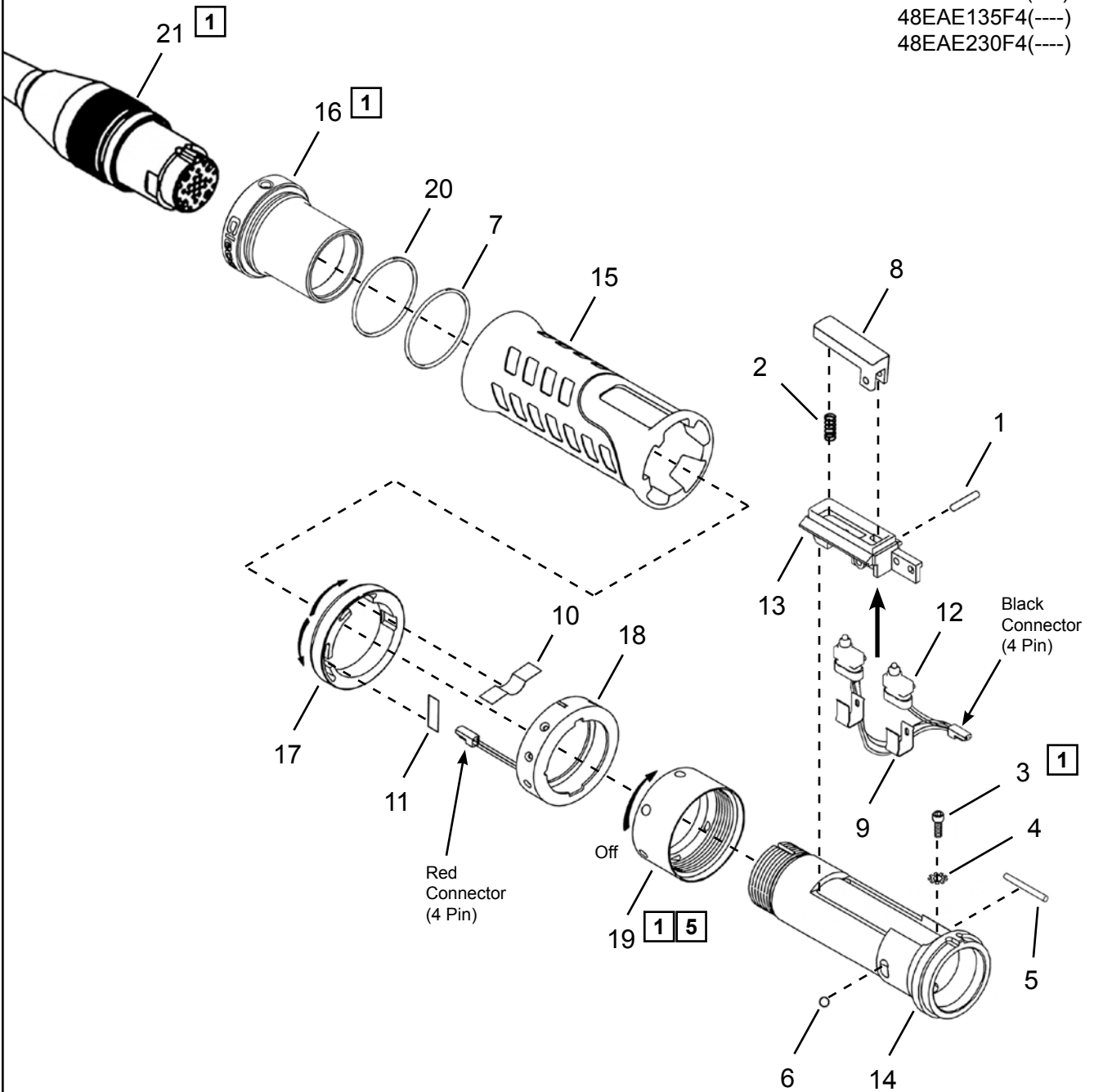
(X) Recommended Spare Parts

Cleco®
Handle - Air LB Tool Connector

“C2”

Models

- 48EAE37F2(----)
- 48EAE52F2(----)
- 48EAE53F3(----)
- 48EAE75F3(----)
- 48EAE110F3(----)
- 48EAE135F4(----)
- 48EAE230F4(----)



1 5 See Service Notes

Handle - Air LB Tool Connector

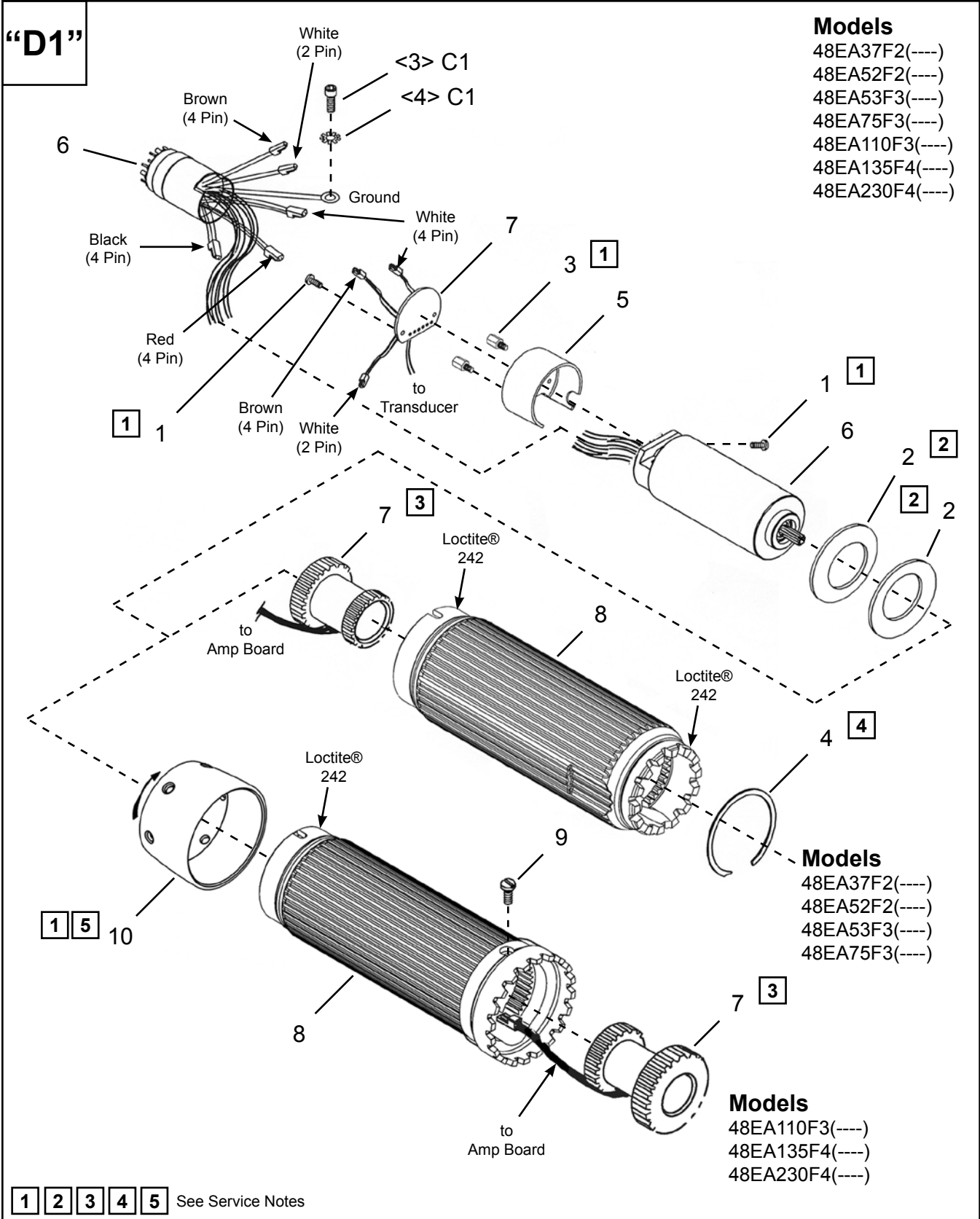
Illustration "C2"

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

Cleco®
Motor - Matrix Tool Connector



Motor - Matrix Tool Connector

Illustration "D1"

Ref	Number	#	X	EN
				Description
1	17-111	3	6	Pan Head Screw - #4-40 x .19
2	541009	2	2	Wave Washer
3	542244	2	2	Stand Off - 5/16"
4	Table "D1"	1	2	Retaining Ring
5	542588	1		Motor Spacer
6	301761	1		Motor Assembly
7	Table "D1"	1		Transducer Assembly
8	Table "D1"	1		Housing
9	B159X	1	3	Pan Head Screw - #4-40 x 1/4
10	207353	1		Lock Nut

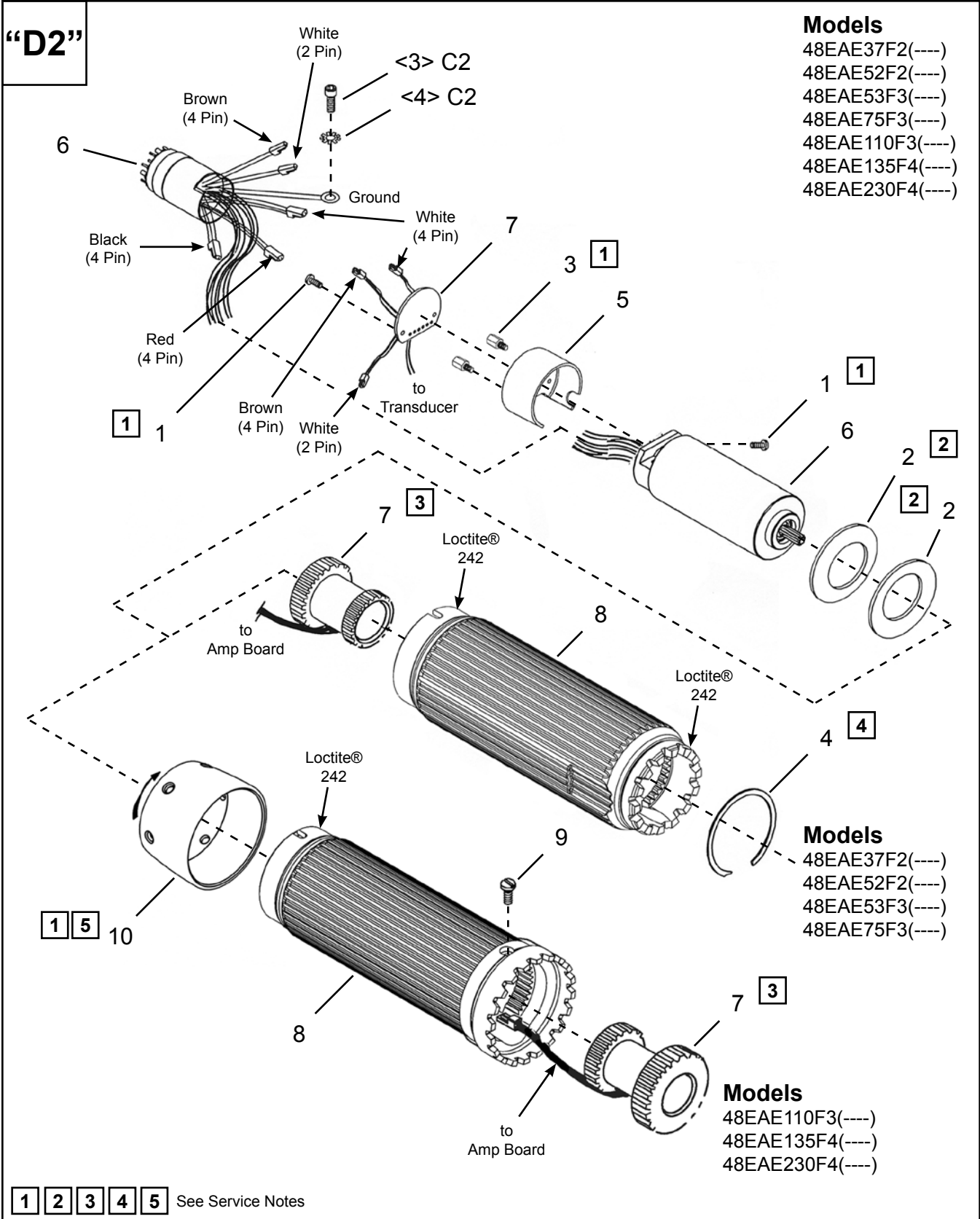
(#) Quantity

(X) Recommended Spare Parts

Table "D1"

Ref.	Description	#	48EA37 48EA53	#	48EA52 48EA75	#	48EA110 48EA135	#	48EA230
4	Retaining Ring	1	505306	1	505306		-----		-----
7	Transducer (unprogrammed)	1	542846-36	1	542846-48	1	542846-100	1	542846-40
	Transducer (programmed)	1	542846-36P	1	542846-48P	1	542846-100P	1	542846-40P
	Transducer Capacity		36 Nm		48 Nm		100 Nm		40 Nm
8	Housing	1	207340	1	207340	1	207341	1	207341

Cleco®
Motor - Air LB Tool Connector



Motor - Air LB Tool Connector

Illustration "D2"

Ref	Number	#	X	EN
				Description
1	17-111	3	6	Pan Head Screw - #4-40 x .19
2	541009	2	2	Wave Washer
3	542244	2	2	Stand Off - 5/16"
4	Table "D2"	1	2	Retaining Ring
5	542588	1		Motor Spacer
6	301761E	1		Motor Assembly
7	Table "D2"	1		Transducer Assembly
8	Table "D2"	1		Housing
9	B159X	1	3	Pan Head Screw - #4-40 x 1/4
10	207353	1		Lock Nut

(#) Quantity

(X) Recommended Spare Parts

Table "D2"

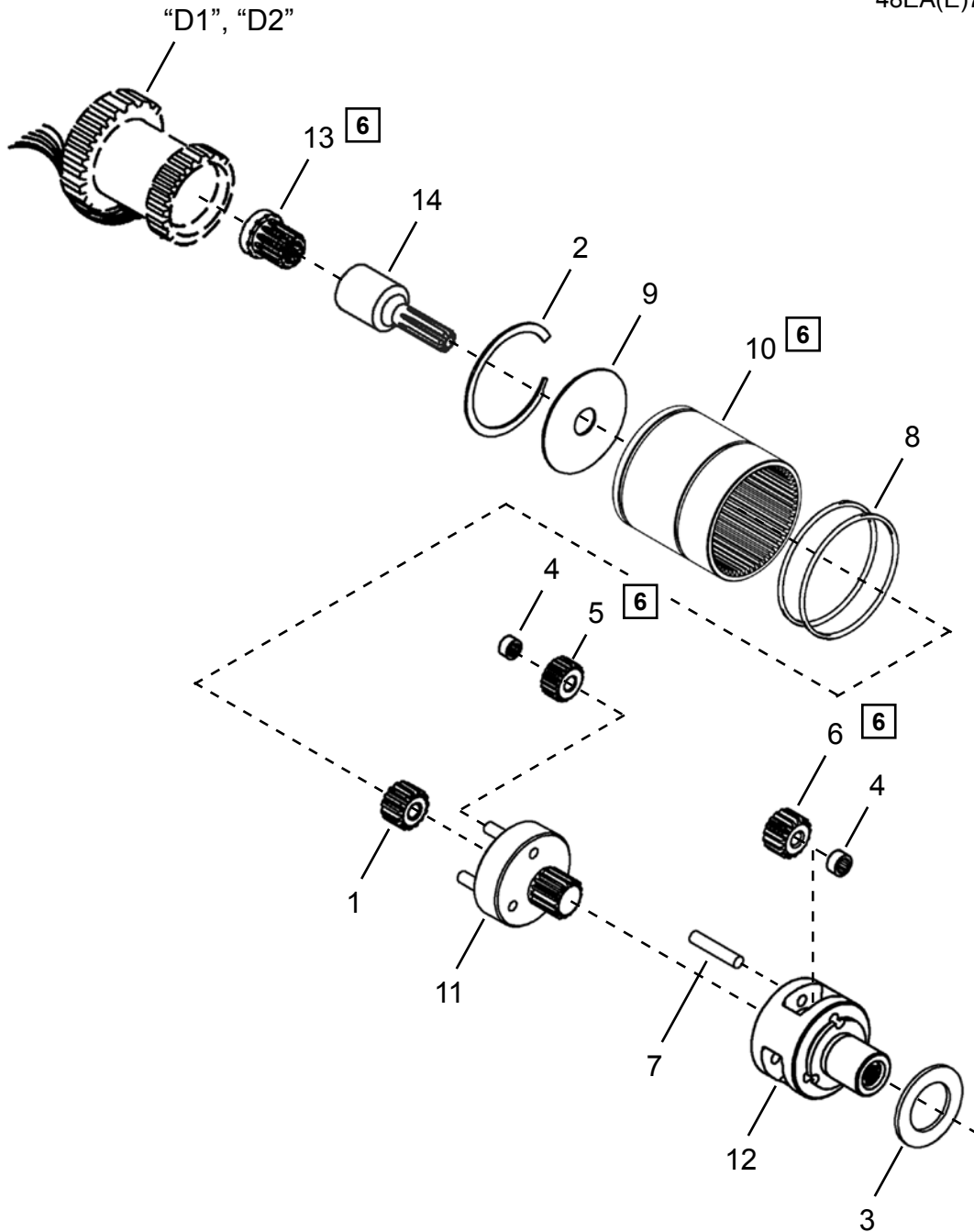
Ref.	Description	#	48EAE37 48EAE53	#	48EAE52 48EAE75	#	48EAE110 48EAE135	#	48EAE230
4	Retaining Ring	1	505306	1	505306		-----		-----
7	Transducer (unprogrammed)	1	542846-36	1	542846-48	1	542846-100	1	542846-40
	Transducer (programmed)	1	542846-36P	1	542846-48P	1	542846-100P	1	542846-40P
	Transducer Capacity		36 Nm		48 Nm		100 Nm		40 Nm
8	Housing	1	207340	1	207340	1	207341	1	207341

Cleco® Double Stage Gearing

“E”

Models

- 48EA(E)37F2(----)
- 48EA(E)52F2(----)
- 48EA(E)53F3(----)
- 48EA(E)75F3(----)



6 See Service Notes

Cleco®
Double Stage Gearing

PL12EN-48EA-F
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Illustration "E"

Ref	Number	#	X	EN
				Description
1	541899	1	3	Slip-On Gear (17T)
2	800116	1	2	Retaining Ring
3	207303	1	2	Thrust Washer
4	203749	6	12	Needle Bearing
5	541894	3	6	Planet Gear (17T)
6	Table "E"	3	6	Planet Gear
7	541888	3	6	Planet Pin
8	542724	2	6	O-Ring
9	541887	1	2	Washer
10	542722	1		Ring Gear
11	Table "E"	1		Planet Carrier
12	Table "E"	1		Planet Cage
13	541044	1	2	Pinion Adapter
14	541898	1	2	Extension Pinion

(#) Quantity
(X) Recommended Spare Parts
(T) Teeth

Table "E"

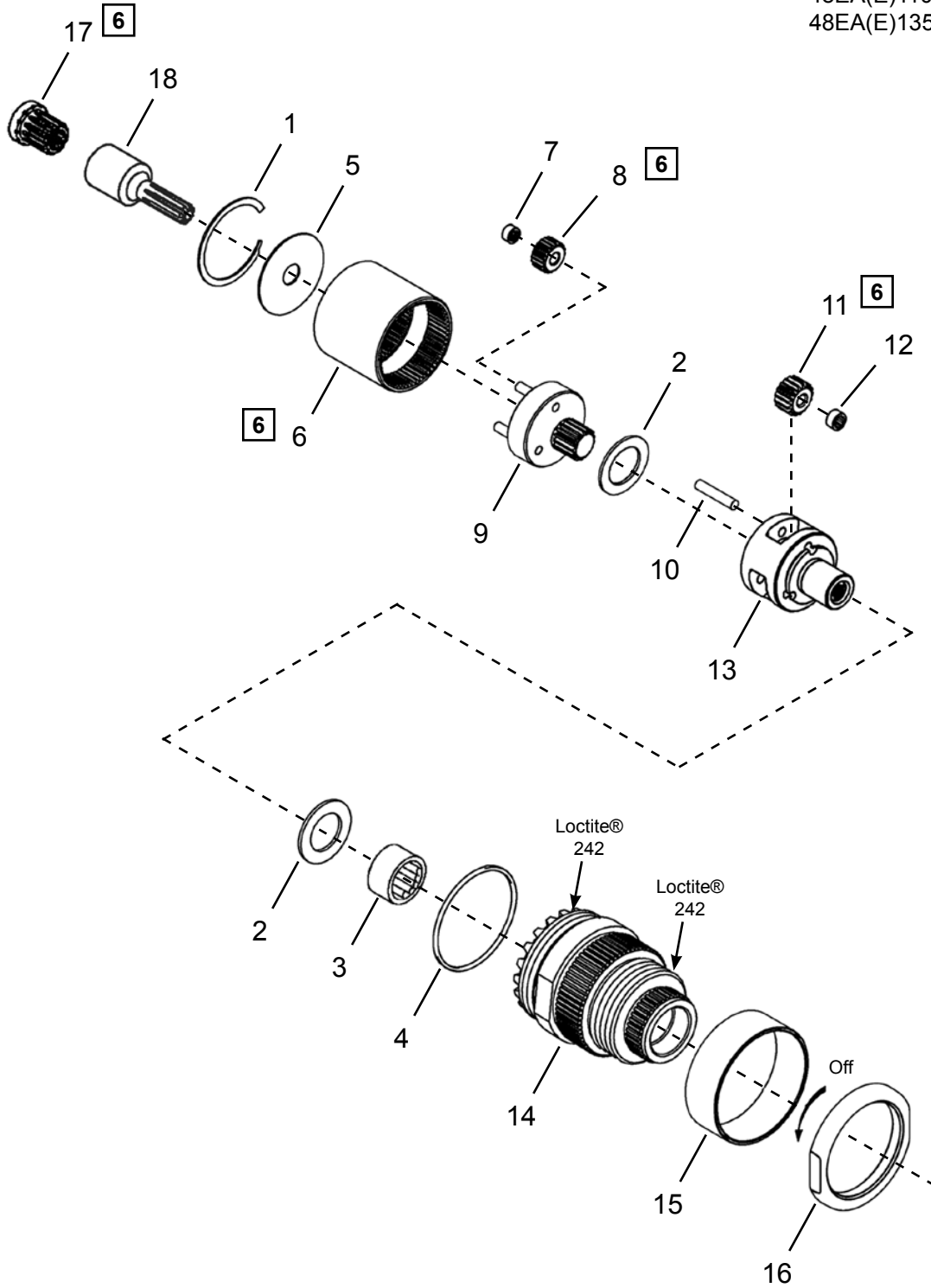
Ref.	Description	#	48EA(E)37	#	48EA(E)52
			48EA(E)53		48EA(E)75
6	Planet Gear	3	541894 (17T)	3	541897 (20T)
11	Planet Carrier	1	542230	1	542233
12	Planet Cage	1	542079	1	542099

(T) Teeth

Cleco® Double Stage Gearing

“F”

Models
48EA(E)110F3(----)
48EA(E)135F4(----)



6 See Service Notes

Cleco®
Double Stage Gearing

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10/05/2011

Illustration "F"

Ref	Number	#	X	EN	
				Description	
1	541210	1	2	Retaining Ring	
2	510675	2	4	Thrust Washer	
3	800177	1	3	Needle Bearing	
4	1010843	1	3	O-Ring	
5	541185	1		Washer	
6	541167	1		Ring Gear	
7	541488	3	6	Needle Bearing	
8	541478	3	6	Planet Gear (27T)	
9	Table "F"	1		Planet Carrier	
10	541492	3	6	Planet Pin	
11	Table "F"	3	6	Planet Gear	
12	541489	3	6	Needle Bearing	
13	Table "F"	1		Planet Cage	
14	541045	1		Gear Case (includes Ref. 3)	
15	541169	1		Cover	
16	207352	1		Retaining Nut	
17	541044	1	2	Pinion Adapter	
18	541898	1	2	Extension Pinion	

(#) Quantity
(X) Recommended Spare Parts
(T) Teeth

Table "F"

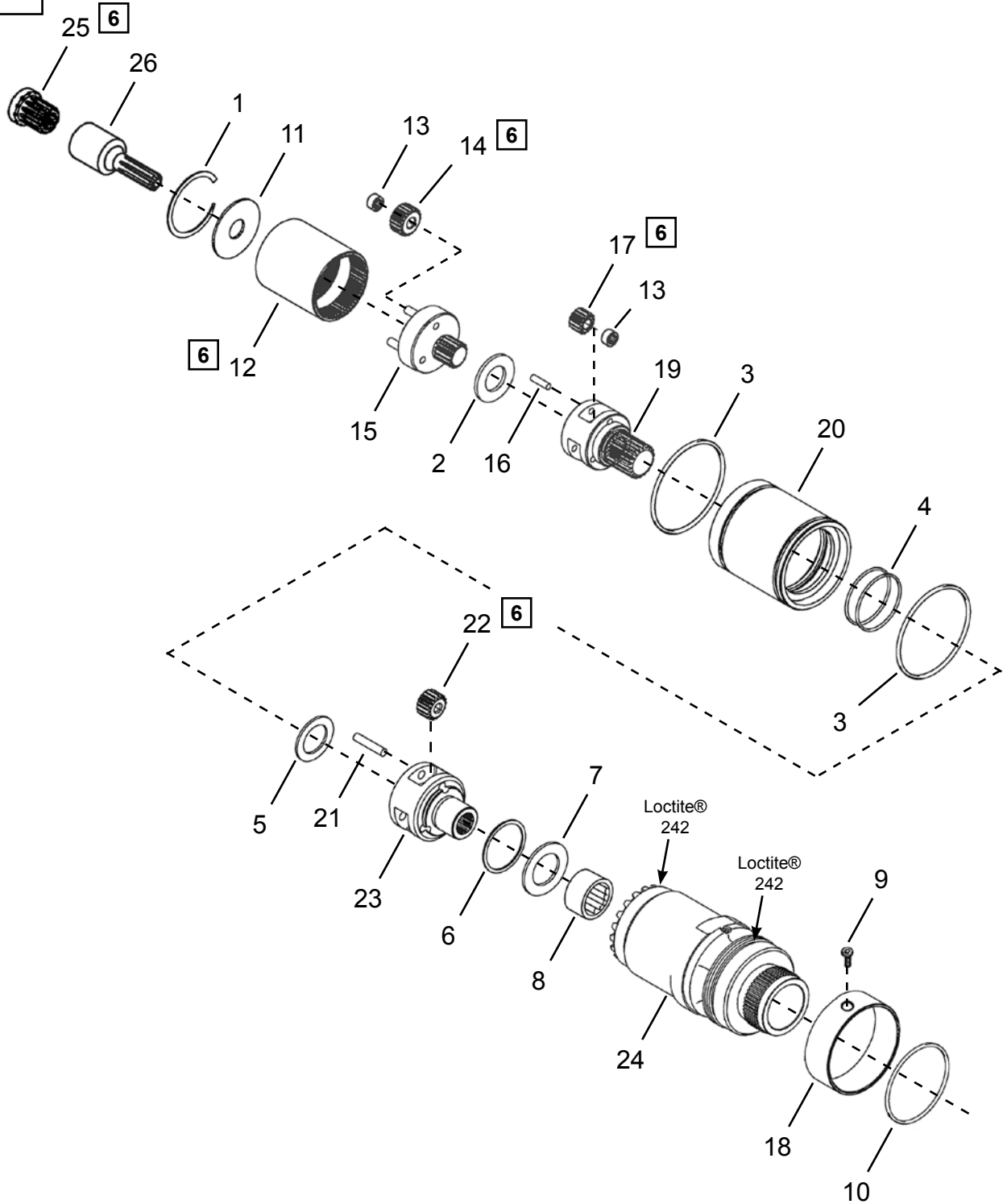
Ref.	Description	#	48EA(E)110	#	48EA(E)135
9	Planet Carrier	1	542333	1	542332
11	Planet Gear	3	541474 (17T)	3	541475 (21T)
13	Planet Cage	1	541279	1	541278

(T) Teeth

Cleco® Triple Stage Gearing

Models
48EA(E)230F4(----)

“G”



6 See Service Notes

Cleco®
Triple Stage Gearing

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Illustration "G"

Ref	Number	#	X	EN
				Description
1	503405	1	2	Retaining Ring
2	542536	1	2	Thrust Washer
3	1012614	2	4	O-Ring
4	22598	2	4	O-Ring
5	510675	1	2	Thrust Washer
6	800201	1	2	Retaining Ring
7	502981	1	2	Thrust Washer
8	800168	1	3	Needle Bearing
9	B124Z	1	2	Socket Head Cap Screw - #6-32 x 1/4
10	30923	1	3	O-Ring
11	542337	1	2	Washer
12	541008	1		Ring Gear
13	203749	6	12	Needle Bearing
14	541477	3	6	Planet Gear (20T)
15	542327	1		Planet Carrier
16	541480	3	6	Planet Pin
17	541472	3	6	Planet Gear (14T)
18	542473	1		Cover
19	542531	1		Planet Cage
20	541438	1		Ring Gear Adapter
21	510754	3	6	Planet Pin
22	542474	3	6	Planet Gear (16T)
23	541436	1		Planet Cage
24	542471	1		Gear Case (includes Ref. 8 - 9)
25	541044	1	2	Pinion Adapter
26	541898	1	2	Extension Pinion

(#) Quantity
(X) Recommended Spare Parts
(T) Teeth

Cleco® Hold and Drive Adapters

“H”

301788 Adapter
48EA(E)37F2(----)
48EA(E)52F2(----)
48EA(E)53F3(----)
48EA(E)75F3(----)

1 See Service Notes

“I”

301909 Adapter
48EA(E)110F3(----)
48EA(E)135F4(----)

1 See Service Notes

“J”

301915 Adapter
48EA(E)230F4(----)

1 See Service Notes

Cleco®
Hold and Drive Adapters

PL12EN-48EA-F
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Illustration "H"

Ref	Number	#	X	EN
				Description
1	301789	1		Angle Head Adapter Assembly (includes Ref. 2-5)
2	500528	1	3	Needle Bearing
3	207347	1		Angle Head Adapter
4	543462-02	1		Gear Case Nut
5	207346	1		Angle Head Adapter
6	800146	1	2	Retaining Ring
7	543063	1	1	Drive Adapter

(#) Quantity
(X) Recommended Spare Parts

Illustration "I"

Ref	Number	#	X	EN
				Description
1	543065	1		Lock Nut
2	543062	1	2	Retaining Ring
3	543064	1		Attachment Adapter
4	800146	1	2	Retaining Ring
5	543063	1	1	Pinion Adapter

(#) Quantity
(X) Recommended Spare Parts

Illustration "J"

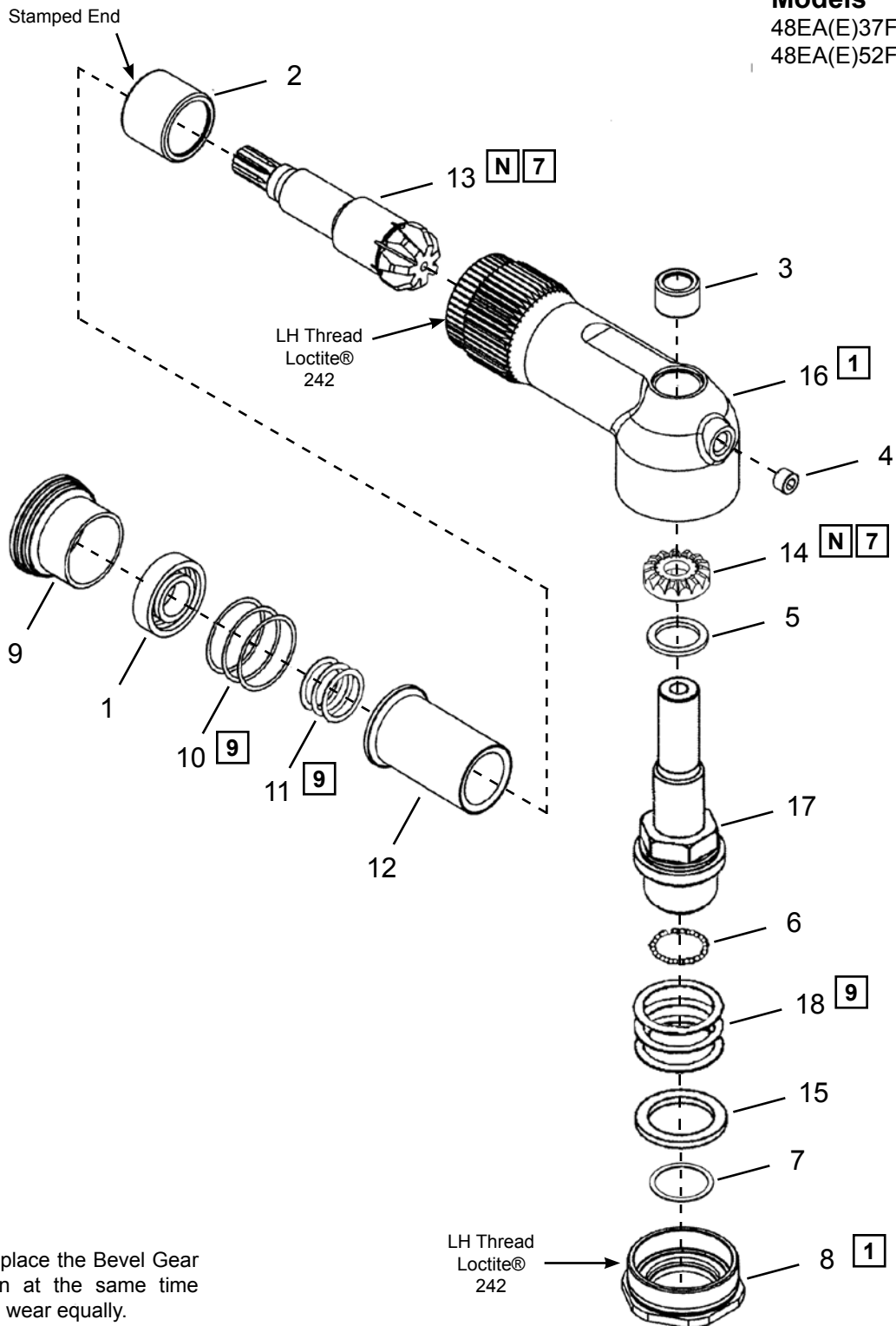
Ref	Number	#	X	EN
				Description
1	543066	1		Attachment Adapter
2	543068	1		Lock Nut
3	543067	1	1	Pinion Adapter

(#) Quantity
(X) Recommended Spare Parts

Cleco®
Flush Socket Attachment (F2)

“K”

Models
48EA(E)37F2(----)
48EA(E)52F2(----)



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

1 7 9 See Service Notes

Flush Socket Attachment (F2)

Illustration "K"

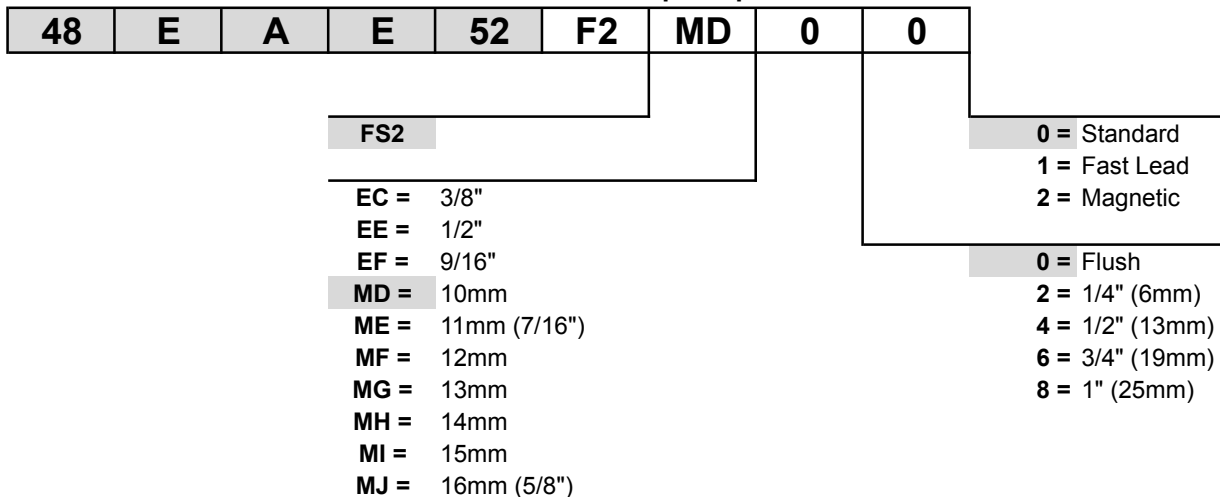
Ref	Number	#	X	EN	
				Description	
1	92100007	1	2	Ball Bearing	
2	92000035	1	2	Needle Bearing	
3	92030011	1	2	Needle Bearing	
4	12601432	1	1	Plug	
5	12601407	1	2	Spacer	
6	94010004	30	60	Steel Ball	
7	819783	1	3	O-Ring	
8	12601012D	1		End Nut	
9	43288128	1		Spacer	
10	126011372	AR	AR	Shim (.002")	
	126011373	AR	AR	Shim (.003")	
	126011275	AR	AR	Shim (.005")	
11	94200016	AR	AR	Shim (.002")	
	94200017	AR	AR	Shim (.003")	
	94200018	AR	AR	Shim (.005")	
12	12601098	1		Bearing Spacer	
13	43287129	1	1	Bevel Pinion	
14	12601260B	1	1	Bevel Gear	
15	12601472	1	2	Spacer	
16	43288130	1		Angle Housing (includes Ref. 4)	
17	Table "K"	1		Flush Socket Spindle	
18	12601137A2	AR	AR	Shim (.002")	
	12601137A3	AR	AR	Shim (.003")	
	12601137A5	AR	AR	Shim (.005")	

(#) Quantity

(X) Recommended Spare Parts

Table "K"

Example: Spindle Number

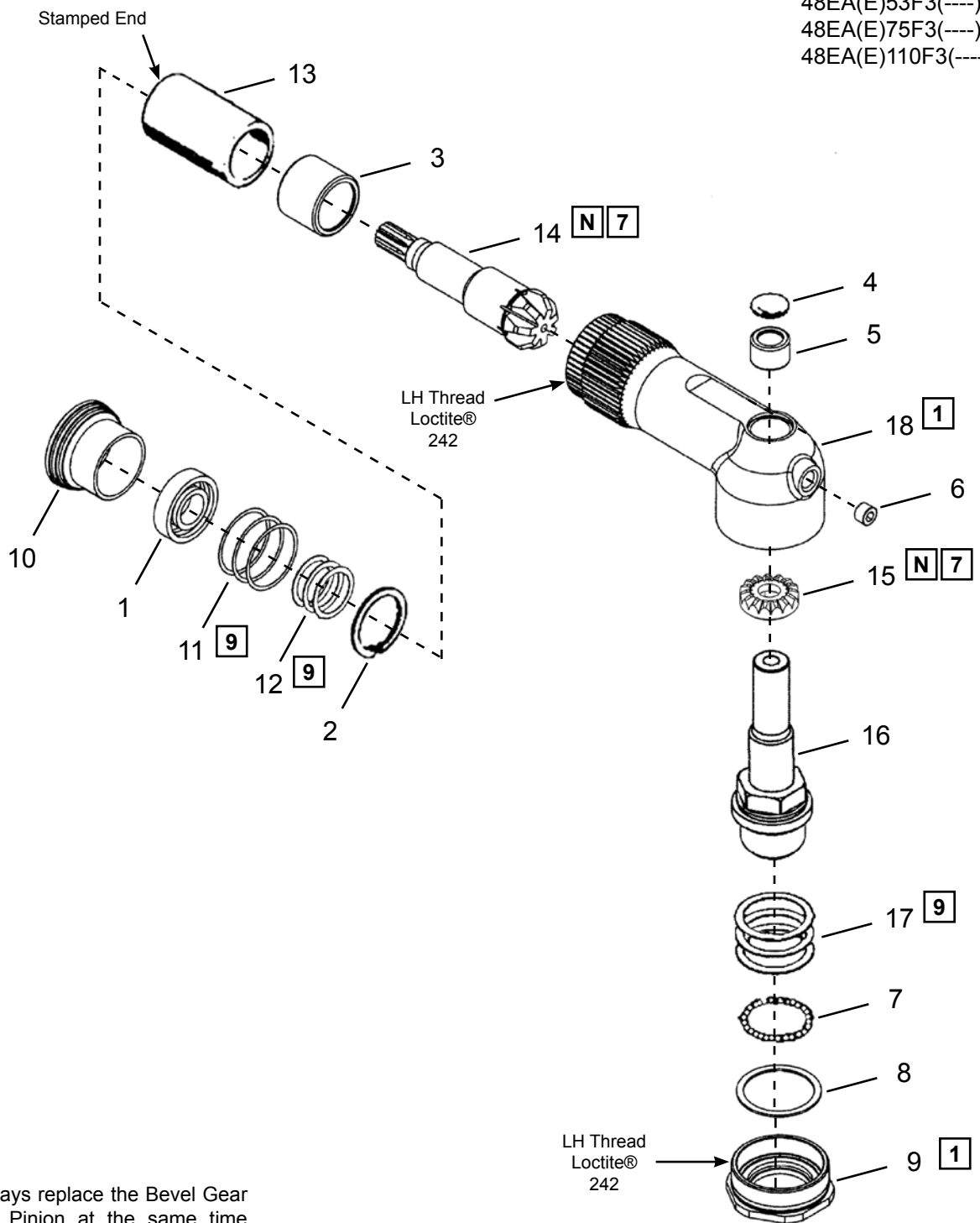


Cleco® Flush Socket Attachment (F3)

“L”

Models

- 48EA(E)53F3(----)
- 48EA(E)75F3(----)
- 48EA(E)110F3(----)



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

1 7 9 See Service Notes

Flush Socket Attachment (F3)

Illustration "L"

Ref	Number	#	X	EN	
				Description	
1	92100133	1	2		Ball Bearing
2	92600020	1	2		Retaining Ring
3	92020046	1	2		Needle Bearing
4	12601479	1	2		Plug
5	92000021	1	2		Needle Bearing
6	93440006	1	1		Plug
7	94010006	33	66		Steel Ball
8	93010025	1	3		O-Ring
9	19557103	1			End Nut
10	48018105	1			Spacer
11	12601137A2	AR	AR		Shim (.002")
	12601137A3	AR	AR		Shim (.003")
	12601137A5	AR	AR		Shim (.005")
12	94200020	AR	AR		Shim (.002")
	94200021	AR	AR		Shim (.003")
	94200022	AR	AR		Shim (.005")
13	48019135	1			Bearing Spacer
14	48018103	1	1		Bevel Pinion
15	12601260A	1	1		Bevel Gear
16	Table "L"	1			Flush Socket Spindle
17	12601137B2	AR	AR		Shim (.002")
	12601137B3	AR	AR		Shim (.003")
	12601137B5	AR	AR		Shim (.005")
18	49107102	1			Angle Housing (includes Ref. 6)

(#) Quantity

(X) Recommended Spare Parts

Table "L"

Example: Spindle Number

48	E	A	E	53	F3	MG	0	0
-----------	----------	----------	----------	-----------	-----------	-----------	----------	----------

FS3

- EE** = 1/2"
- EF** = 9/16"
- EH** = 11/16"
- EJ** = 13/16"
- MG** = 13mm
- MH** = 14mm
- MI** = 15mm
- MJ** = 16mm (5/8")
- MK** = 17mm
- ML** = 18mm
- MM** = 19mm (3/4")
- MN** = 20mm
- MO** = 21mm

- 0** = Standard
- 1** = Fast Lead
- 2** = Magnetic

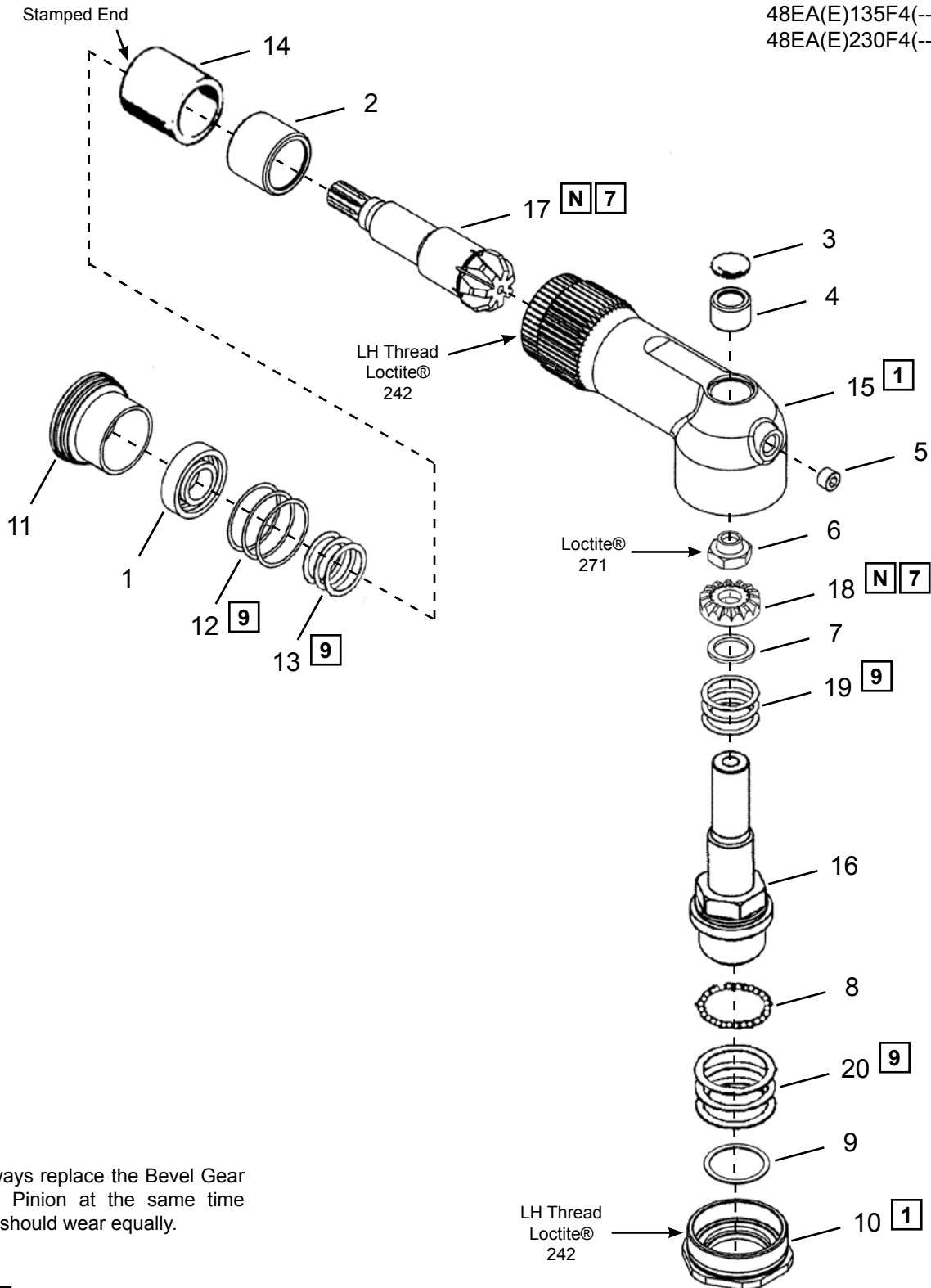
- 0** = Flush
- 2** = 1/4" (6mm)
- 4** = 1/2" (13mm)
- 6** = 3/4" (19mm)
- 8** = 1" (25mm)

Cleco® Flush Socket Attachment (F4)

“M”

Models

48EA(E)135F4(----)
48EA(E)230F4(----)



[N]

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

[1] [7] [9] See Service Notes

Flush Socket Attachment (F4)

Illustration "M"

Ref	Number	#	X	EN	
					Description
1	92100133	1	2		Ball Bearing
2	92000057	1	2		Needle Bearing
3	94190044	1	2		Plug
4	92000145	1	2		Needle Bearing
5	93440006	1	1		Plug
6	93200022	1	2		Lock Nut
7	48019173	1	2		Spacer
8	94010007	30	60		Steel Ball
9	93010027	1	3		O-Ring
10	48017172	1			End Nut
11	48018105	1			Spacer
12	12601137A2	AR	AR		Shim (.002")
	12601137A3	AR	AR		Shim (.003")
	12601137A5	AR	AR		Shim (.005")
13	94200020	AR	AR		Shim (.002")
	94200021	AR	AR		Shim (.003")
	94200022	AR	AR		Shim (.005")
14	48019142	1			Bearing Spacer
15	49096102	1			Angle Housing (includes Ref. 5)
16	Table "M"	1			Flush Socket Spindle
17	48017139	1	1		Bevel Pinion
18	48017140	1	1		Bevel Gear
19	48019145	AR	AR		Shim (.002")
	48019146	AR	AR		Shim (.003")
	48019147	AR	AR		Shim (.005")
20	48019148	AR	AR		Shim (.002")
	48019149	AR	AR		Shim (.003")
	48019150	AR	AR		Shim (.005")

(#) Quantity
 (X) Recommended Spare Parts

Table "M"

Example: Spindle Number

48	E	A	E	135	F4	MM	0	0
-----------	----------	----------	----------	------------	-----------	-----------	----------	----------

FS4

- EH** = 11/16"
- EJ** = 13/16"
- EK** = 7/8"
- MJ** = 16mm (5/8")
- MK** = 17mm
- ML** = 18mm
- MM** = 19mm (3/4")
- MN** = 20mm
- MO** = 21mm
- MP** = 22mm
- MQ** = 23mm
- MR** = 24mm (15/16")

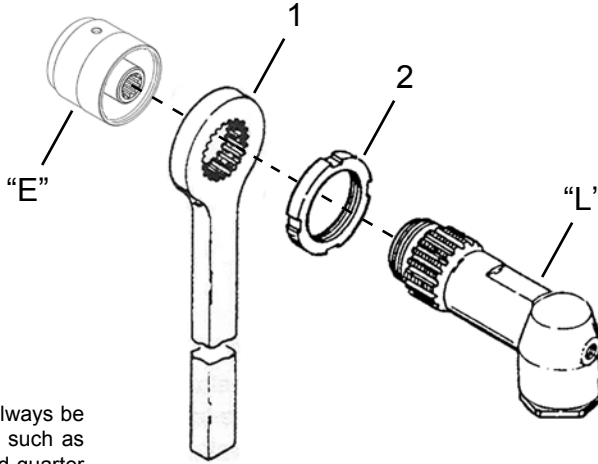
- 0** = Standard
- 1** = Fast Lead
- 2** = Magnetic

- 0** = Flush
- 2** = 1/4" (6mm)
- 4** = 1/2" (13mm)
- 6** = 3/4" (19mm)
- 8** = 1" (25mm)

Cleco® Reaction Bar Installation

“N”

Models:
48EA(E)75F3(----)

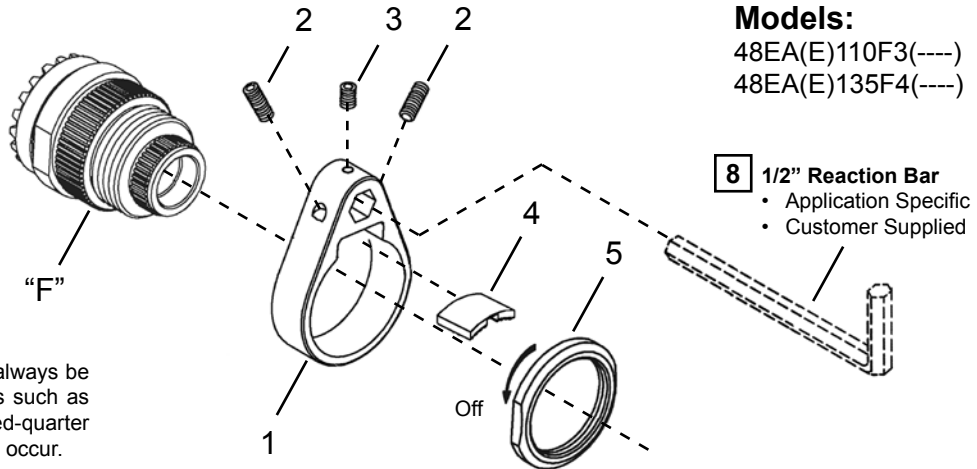


WARNING

Reaction bar and bracket should always be used in higher torque applications such as above 50 ft.-lbs. (68 Nm) or in closed-quarter areas where injury to fingers could occur.

“O”

Models:
48EA(E)110F3(----)
48EA(E)135F4(----)



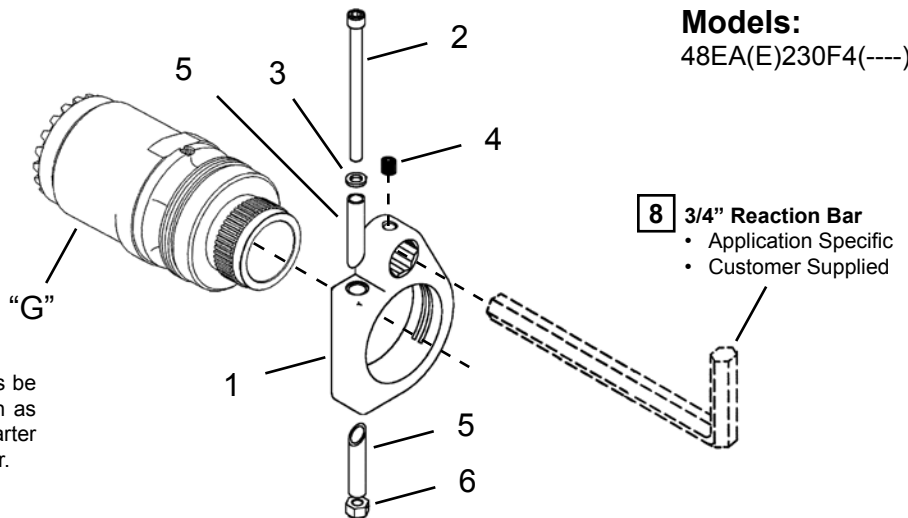
WARNING

Reaction bar and bracket should always be used in higher torque applications such as above 50 ft.-lbs. (68 Nm) or in closed-quarter areas where injury to fingers could occur.

8 See Service Notes

“P”

Models:
48EA(E)230F4(----)



WARNING

Reaction bar and bracket should always be used in higher torque applications such as above 50 ft.-lbs. (68 Nm) or in closed-quarter areas where injury to fingers could occur.

8 See Service Notes

Cleco®
Reaction Bar Installation

PL12EN-48EA-F
10/05/2011

Illustration "N"

Ref	Number	#	X	EN
				Description
1	48038160	1		Reaction Bar
2	49098103	1		Lock Nut

(#) Quantity
(X) Recommended Spare Parts

Illustration "O"

Ref	Number	#	X	EN
				Description
1	541206	1		Bracket (includes Ref. 2-3)
2	B132Z	2	4	Set Screw - #8-32 x 1/2
3	B129J	1	2	Set Screw - #8-32 x 5/16
4	541207	1		Splined Key
5	541490	1		Retaining Nut

(#) Quantity
(X) Recommended Spare Parts

Illustration "P"

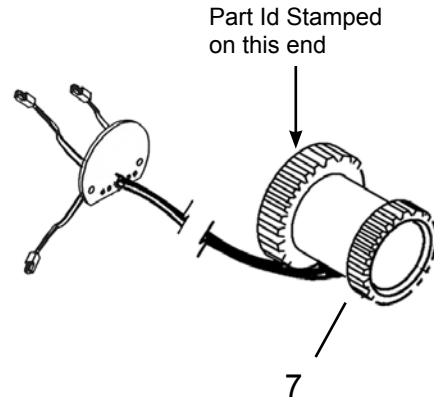
Ref	Number	#	X	EN
				Description
1	531297	1		Bucking Bar Collar (includes Ref. 2-6)
2	B156A	1	2	Socket Head Screw
3	25285	1	2	Washer
4	B110D	1	3	Set Screw
5	531281	2	2	Locking Sleeve
6	C108Y	1	3	Nut

(#) Quantity
(X) Recommended Spare Parts

1 Tightening Torque

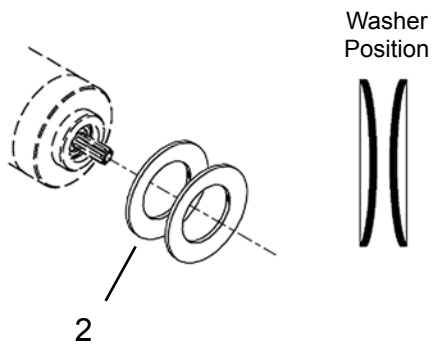
Illustration	Reference	Tightening torque	
		Ft-Lbs (in-lbs)	Nm
C1, C2	3	(10-14)	1,1-1,6
	16	25-30	34-41
	19	35-40	47-54
	21 (Swivel)	15-18	20-25
D1, D2	1	(4-6)	0,45-0,68
	3	(4-6)	0,45-0,68
	10	35-40	47-54
H	4	40-50	54-68
	5	40-50	54-68
I	1	40-50	54-68
J	2	40-50	54-68
K	8	30-40	61-74
	16	45-55	61-74
L	9	80-100	108-136
	18	50-60	68-81
M	10	80-100	108-136
	15	50-60	68-81

3 Transducer Identification

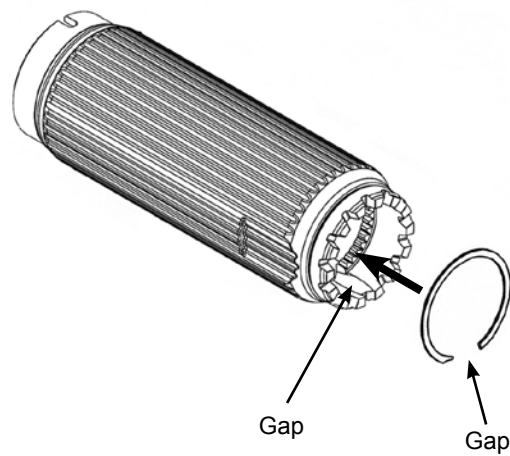


Transducers are not interchangeable, check part number.

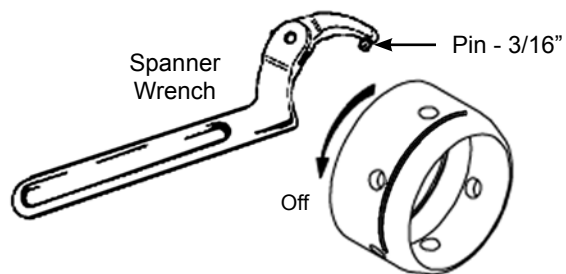
2 Washer Assembly



4 Retaining Ring Assembly

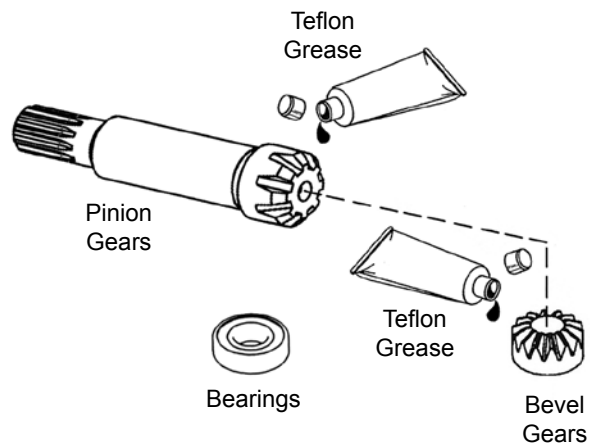


5 Spanner Wrench



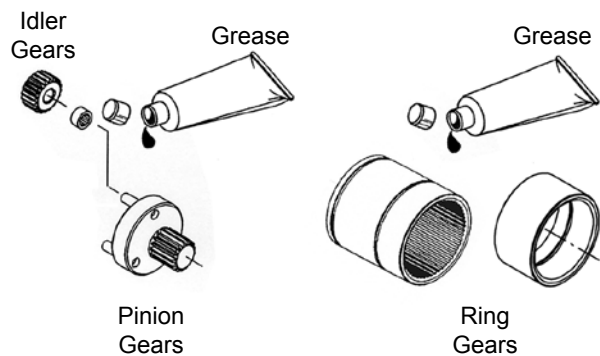
7 Angle Head Lubrication

540395 - 2 oz. (56 g)
513156 - 1 pound (0.45 kg)

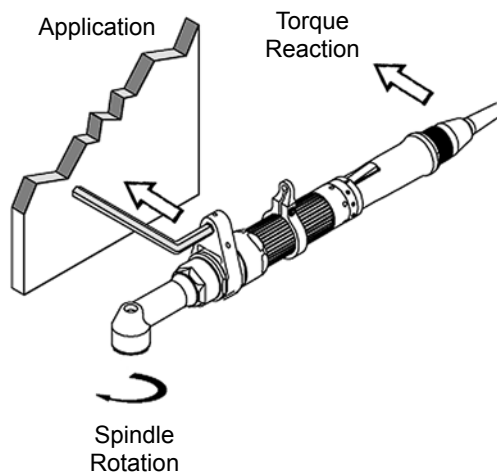


6 Gear Train Lubrication

541444 - 2 oz. (56 g)
541445 - 1 pound (0.45 kg)



8 Torque Reaction



1 Shim Assembly

Illustration "K"

F2 Series Shim Assembly:

- 1) Position Bevel Pinion Gear to dimension shown using Shims 10 or 11.
- 2) Assemble Bevel Gear and Drive Spindle using Shim 18 to obtain .002/.004 backlash after running gears under load.

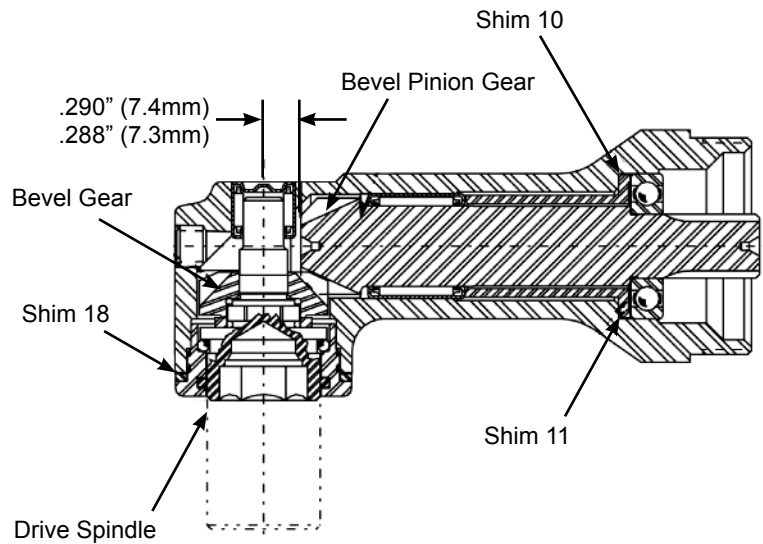


Illustration "L"

F3 Series Shim Assembly:

- 1) Position Bevel Pinion Gear to dimension shown using Shims 11 or 12.
- 2) Assemble Bevel Gear and Drive Spindle using Shim 17 to obtain .002/.004 backlash after running gears under load.

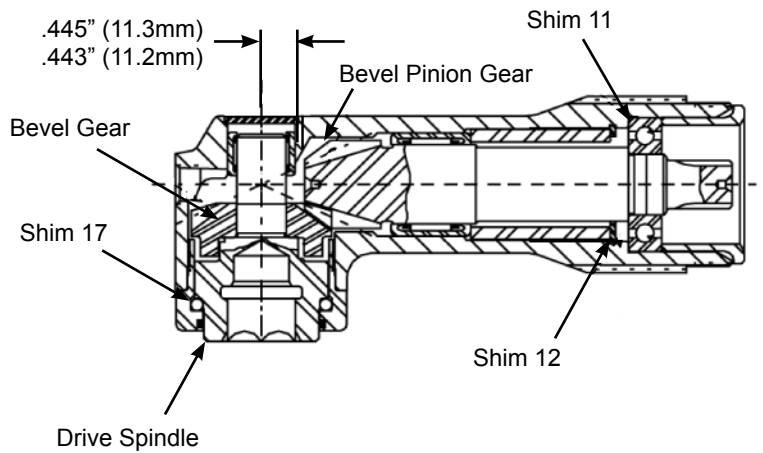
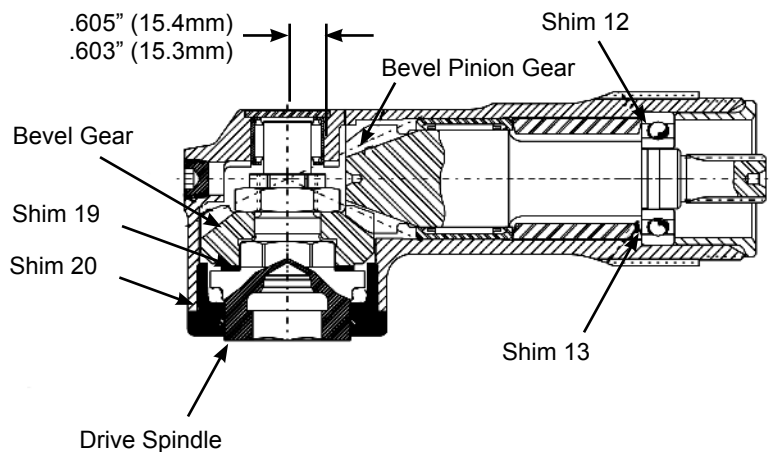


Illustration "M"

F4 Series Shim Assembly:

- 1) Position Bevel Pinion Gear to dimension shown using Shims 12 or 13.
- 2) Assemble Bevel Gear and Drive Spindle using Shims 19 and 20 to obtain .002/.004 backlash after running gears under load.



Tool Memory Parameters

48EA(E) Tool Memory Parameters

Model Number	Max Speed [RPM]	Max Torque [Nm]	Torque Cal [Nm]	Transducer Type	Angle Cal [PPD]	Static Current Factor [Nm/A]
48EA(E)37F2xxxx	1225	37	45.8648	542846-31	70.2893	1.5491
48EA(E)52F2xxxx	860	52	69.5554	542846-48	99.1829	2.1859
48EA(E)53F3xxxx	850	53	65.5212	542846-31	100.4132	2.2130
48EA(E)75F3xxxx	600	74	99.3649	542846-48	141.6898	3.1226
48EA(E)110F3xxxx	400	110	203.5980	542846-100	213.0167	4.6946
48EA(E)135F4xxxx	270	134	201.4084	542846-100	318.8948	7.0280
48EA(E)230F4xxxx	150	227	297.2863	542846-40	567.7714	11.8873

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.

Dallas, TX
**Apex Tool Group
Sales & Service Center**
1470 Post & Paddock
Grand Prairie, TX 75050
Tel: 972-641-9563
Fax: 972-641-9674

Detroit, MI
**Apex Tool Group
Sales & Service Center**
2630 Superior Court
Auburn Hills, MI 48326
Tel: 248-391-3700
Fax: 248-391-7824

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

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Norwalk, CA 90650
Tel: 562-623-4457
Fax: 562-802-1718

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**Apex Tool Group
Sales & Service Center**
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Redmond, WA 98052
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Fax: 425-497-0496

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

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