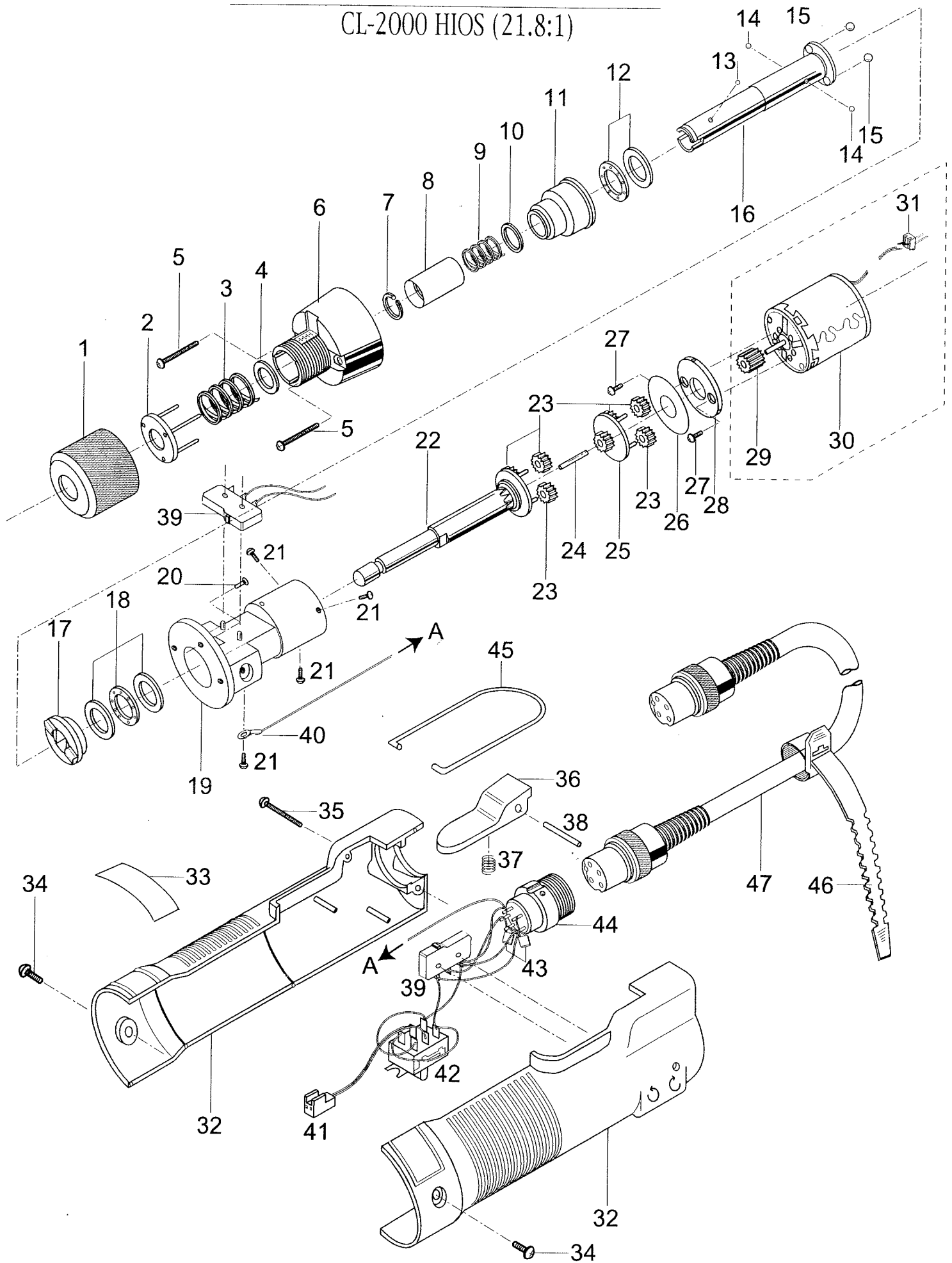


EXPLODED VIEW DRAWING

CL-2000 HIOS (21.8:1)



(CL-004)

PARTS LIST OF CL-2000(21.8:1)

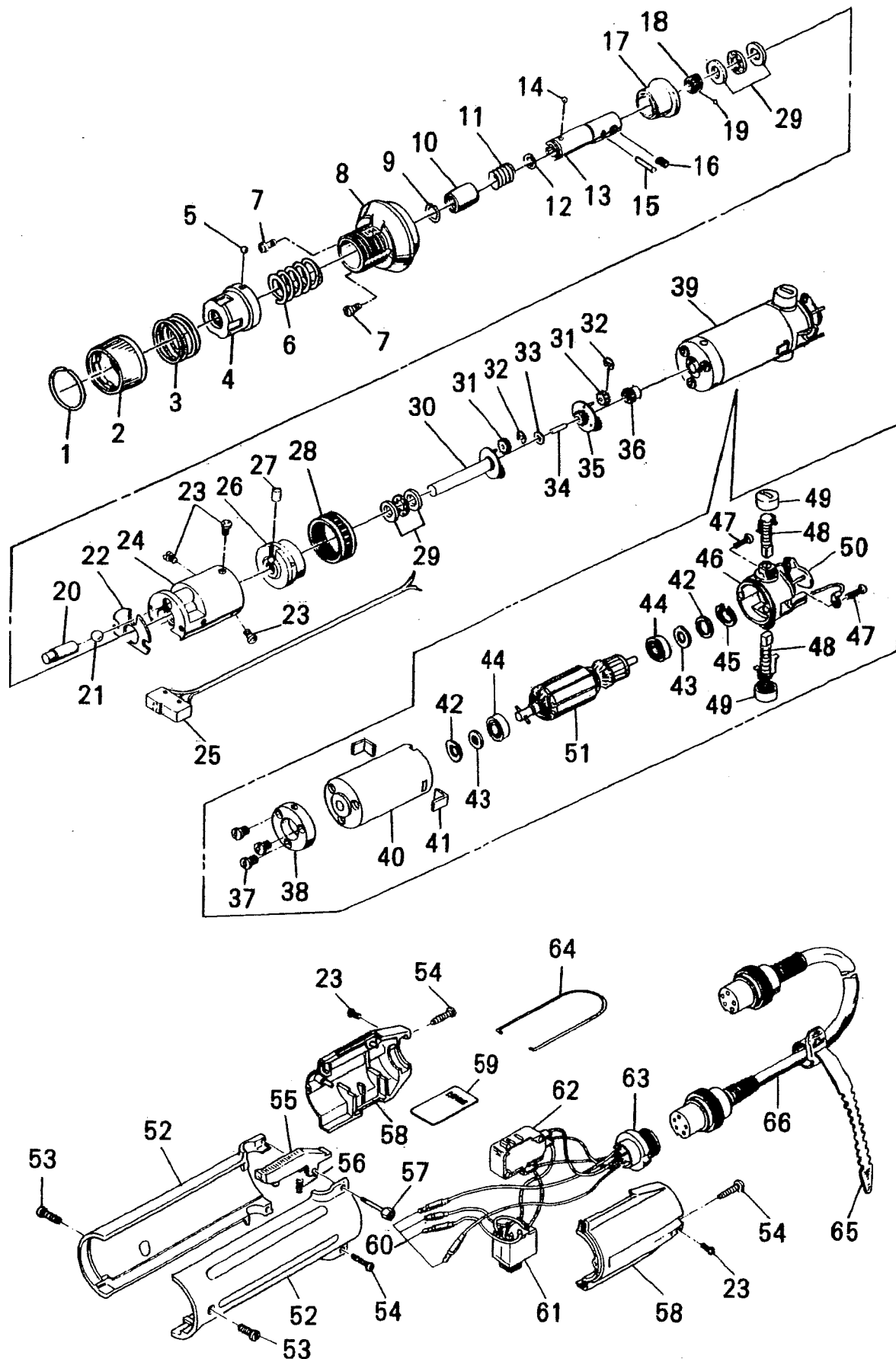
(HIOS SHANK)

ISSUED: November, 1998

REVISED: February, 1999

PARTS NAME	PARTS NO.	PARTS NAME	PARTS NO.
Transmission Assembly 1 - 26 (W/O 21)	CL2-TM	Motor Assembly 29 - 31	CL2-MT
1 Torque Adjusting Nut	CL2-0041	29 Pinion Gear (Include Motor Assy)	_____
2 Torque Adjusting Spring Holder A	CL2-0010	30 Motor (Include Motor Assy)	_____
3 Torque Adjusting Spring (Black)	CL2-0050-2	31 Connector 5045-02A (Include Motor Assy)	_____
Torque Adjusting Spring (Yellow)	CL2-0050-1		
4 Spring Holder B	CL2-0060	32 Body Case A & B	CL2-0380
5 Set Screw 2.6x15	STP26X150	33 Name Plate	CL2-0470
6 Torque Adjusting Bolt	CL2-0070	34 Set Screw 2.6x6	STP26X060
7 Collar Stopper	CL2-0100	35 Set Screw 2.6x12	STPB26X120
8 Joint Shaft Collar	CL2-0110	36 Switch Lever	CL2-0410
9 Joint Shaft Collar Spring	CL2-0120	37 Switch Lever Spring	CL2-0430
10 Washer 6.6X8.5X0.5	CL2-0130	38 Steel Shaft 2 ϕ X17.8	ACL20-0550
11 Clutch Panel	CL2-0170		
12 Thrust Bearing T-1370T1	CL2-0190	Circuit Assembly 39 - 44	CL2-CC
13 Steel Ball 1.5 ϕ	BALL-015		
14 Steel Ball 2.0 ϕ	BALL-02	39 Limit Switch SS-5-L(165)	CL4-0230
15 Steel Ball 3.17 ϕ	BALL-0317	40 Ground Connector(41-319) (Include Circuit Assy)	_____
16 Joint Shaft	CL2-0210	41 Housing Assy(5051-02) (Include Circuit Assy)	_____
17 Cam	CL2-0230	42 For/Rev Switch	CL2-0450
18 Thrust Bearing T-1160	A45-0170	43 Film Condenser	CL3NL-0440
19 Gear Case Assy	CL2-0270	44 5-Pin Connector	CL2-0440
20 Limit Pin	CL2-0250		
		45 Hanger	CL4-0590
21 Set Screw 2x4	STP20X040		
		46 Free-Up Belt	CL4-0600
22 Lower Planet Cage	CL2-0280	47 5-Core Cord W/Connectors In Both Ends	CL4-0611
23 Planet Gear	CL2-0290		
24 Steel Shaft 2 ϕ x9.8	CL65PS-0150		
25 Upper Planet Cage	CL2-0320		
26 Oil Seal	CL2-0330		
27 Set Screw 2x5	STP20X050		
28 Motor Front Panel	CL2-0340		

EXPLODED VIEW DRAWING
CL-3000HIOS
(SHORT TYPE)



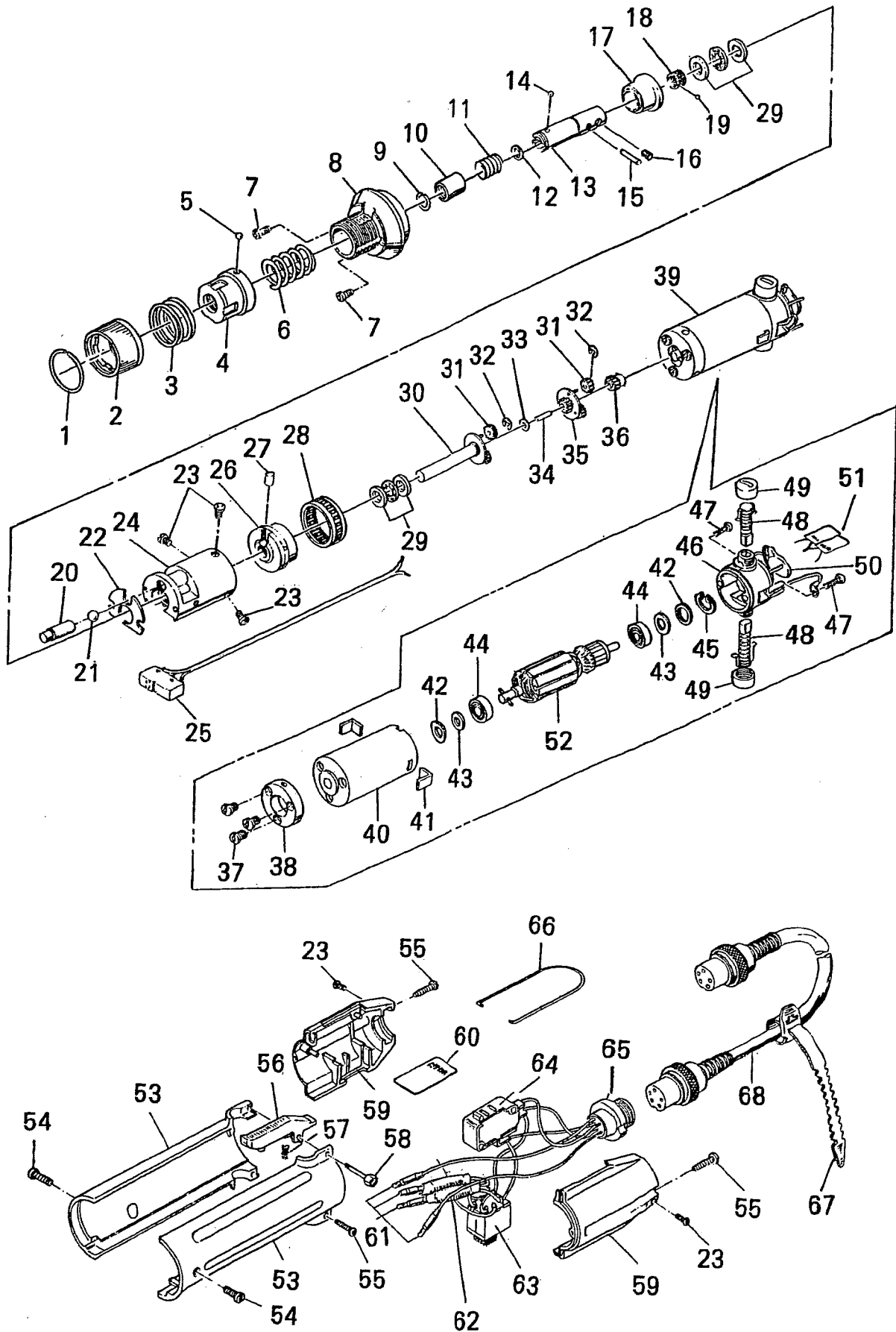
PARTS LIST OF CL-3000
(HIOS SHANK, SHORT TYPE)

ISSUED: November, 1991

REVISED: January, 1993

PARTS NAME	PARTS NO.	PARTS NAME	PARTS NO.
Transmission Assembly 1 - 36 (W/O 25)	CL3-TM	Upper Planet Cage Assembly 31,32,35	CL4-3310
Torque Adjusting Nut Assembly 1 - 5	CL4-NT	35 Upper Planet Cage	CL4-0310
1 Nut Cover Stopper	CL4-0010	36 Pinion Gear	CL4-0320
2 Nut Cover	CL4-0020	Motor	
3 Nut Cover Spring	CL4-0030	37 Set Screw 3x5	STP30X050
4 Torque Adjusting Nut	CL4-0040	38 Motor Front Panel	CL4-0350
5 Steel Ball 3.0 φ	BALL-03	39 Motor (Short Size)	CL3-0360
6 Torque Adjusting Spring 1.2 φ (Blue)	CL3-0060	40 Magnet Case	_____
Torque Adjusting Spring 1.0 φ (Gold)	CL3-0060-1	41 _____	_____
7 Set Screw 2.6x10	STP26X100	42 Wave Washer	CL4-0370
8 Torque Adjusting Bolt	CL3-0080	43 Rotor Adjusting Washer 0.1	CL4-0380-1
9 Collar Stopper	CL4-0090	Rotor Adjusting Washer 0.2	CL4-0380-2
10 Joint Shaft Collar	CL4-0100	Motor End Cover Assembly 44 - 50	CL3-3400
11 Collar Spring	CL4-0110	44 Motor Bearing	CL4-0450
12 Support Washer for Spring	CL3-0620	45 Stop Ring	CL4-0390
13 Joint Shaft	CL3-0130	46 Motor End Cover	CL3-0400
14 Steel Ball 2.0 φ	BALL-02	47 Set Screw 1.7X10	STP17X100
15 Joint Shaft Lock Pin 2x7	SR20X070	48 Carbon Brush	A45-0420
16 _____	_____	49 Carbon Brush Cap	A45-0430
17 Clutch Supporter	CL3-0160	50 Capacitor	CL4-0441
18 Slide Ball Bearing	CL3-0630	51 Rotor	CL3-0460
19 Ball	_____	52 Body Case A & B (Off White)	CL3-0471
Gear Assembly 20 - 36 (W/O 25)	CL3-GR	53 Set Screw 2.6x6	STP26X060
20 Clutch Ball Rod	CL4-0180	54 Set Screw 2.6x12	STPB26X120
21 Steel Ball 5.0 φ	BALL-05	55 Switch Lever	CL4-0500
22 Gear Case Plate	CL4-0200	56 Switch Lever Spring	CL4-0510
23 Set Screw 2.6x5	STP26X050	57 Switch Lever Plunger	CL4-0520
24 Gear Case	CL3-0210	Switch Assembly 23,58 - 64	CL3-SW1
25 Limit Switch	CL4-0230	58 Switch Cover A & B (Off White)	CL3-0531
26 Internal Gear	CL3-0240	59 Name Plate	CL3-0540
27 Cam Roller	CL4-0250	60 Terminal Holder	CL4-0550
28 Needle Ball Bearing	CL3-0640	61 For/Rev Switch	CL4-0560
29 Thrust Bearing 5x11	CL4-0170	62 Starting Switch	CL4-0570
Lower Planet Cage Assembly 30 - 32	CL4-3260	63 5-Pin Connector	CL4-0580
30 Lower Planet Cage	CL4-0260	64 Hanger	CL4-0590
31 Planet Gear	CL4-0270	65 Free-Up Belt	CL4-0600
32 E-Ring	CL4-0280	66 5-Core Cord W/Connectors In Both Ends	CL4-0611
33 Thrust Washer	CL4-0290		
34 Center Pin	CL4-0300		

EXPLODED VIEW DRAWING
CL-3000HIOS
(NOISELESS TYPE)



PARTS LIST OF CL-3000

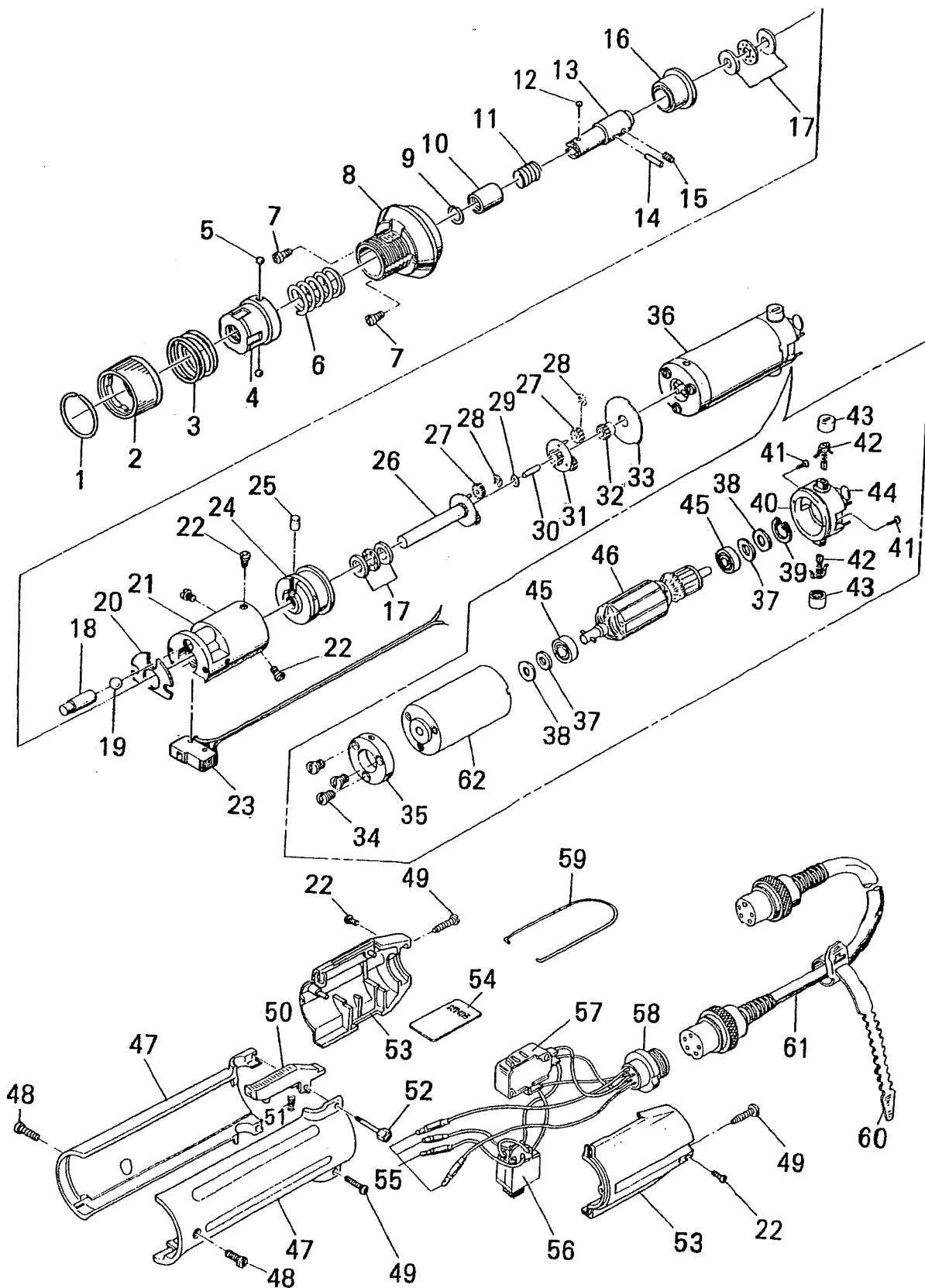
NOISELESS TYPE
(HIOS SHANK, SHORT TYPE)

ISSUED: April, 1993

REVISED: _____

PARTS NAME	PARTS NO.	PARTS NAME	PARTS NO.
Transmission Assembly 1 - 36 (W/O 25)	CL3-TM	Upper Planet Cage Assembly 31,32,35	CL4-3310
Torque Adjusting Nut Assembly 1 - 5	CL4-NT	35 Upper Planet Cage	CL4-0310
1 Nut Cover Stopper	CL4-0010	36 Pinion Gear	CL4-0320
2 Nut Cover	CL4-0020	Motor	
3 Nut Cover Spring	CL4-0030	37 Set Screw 3x5	STP30X050
4 Torque Adjusting Nut	CL4-0040	38 Motor Front Panel	CL4-0350
5 Steel Ball 3.0 φ	BALL-03	39 Motor (Short Size)	CL3-0360
6 Torque Adjusting Spring 1.2 φ (Blue)	CL3-0060	40 Magnet Case	_____
7 Set Screw 2.6x10	STP26X100	41 _____	_____
8 Torque Adjusting Bolt	CL3-0080	42 Wave Washer	CL4-0370
9 Collar Stopper	CL4-0090	43 Rotor Adjusting Washer 0.1	CL4-0380-1
10 Joint Shaft Collar	CL4-0100	Rotor Adjusting Washer 0.2	CL4-0380-2
11 Collar Spring	CL4-0110	Motor End Cover Assembly 44 - 51	CL3NL-3400
12 Support Washer for Spring	CL3-0620	44 Motor Bearing	CL4-0450
13 Joint Shaft	CL3-0130	45 Stop Ring	CL4-0390
14 Steel Ball 2.0 φ	BALL-02	46 Motor End Cover	CL3-0400
15 Joint Shaft Lock Pin 2x7	SR20X070	47 Set Screw 1.7X10	STP17X100
16 Set Screw 3x2.5	SH30X025	48 Carbon Brush	A45-0420
17 Clutch Supporter	CL3-0160	49 Carbon Brush Cap	A45-0430
18 Slide Ball Bearing	CL3-0630	50 Capacitor	CL4-0441
19 Ball	_____	51 Condenser 682KG	CL3NL-0440
Gear Assembly 20 - 36 (W/O 25)	CL3-GR	52 Rotor	CL3-0460
20 Clutch Ball Rod	CL4-0180	53 Body Case A & B (Off White)	CL3-0471
21 Steel Ball 5.0 φ	BALL-05	54 Set Screw 2.6x6	STP26X060
22 Gear Case Plate	CL4-0200	55 Set Screw 2.6x12	STPB26X120
23 Set Screw 2.6x5	STP26X050	56 Switch Lever	CL4-0500
24 Gear Case	CL3-0210	57 Switch Lever Spring	CL4-0510
25 Limit Switch	CL4-0230	58 Switch Lever Plunger	CL4-0520
26 Internal Gear	CL3-0240	Switch Assembly 23,59 - 66	CL3NL-SW1
27 Cam Roller	CL4-0250	59 Switch Cover A & B (Off White)	CL3-0531
28 Needle Ball Bearing	CL3-0640	60 Name Plate	CL3-0540
29 Thrust Bearing 5x11	CL4-0170	61 Terminal Holder	CL4-0550
Lower Planet Cage Assembly 30 - 32	CL4-3260	62 Noise Filter B	A45-0630
30 Lower Planet Cage	CL4-0260	63 For/Rev Switch	CL4-0560
31 Planet Gear	CL4-0270	64 Starting Switch	CL4-0570
32 E-Ring	CL4-0280	65 5-Pin Connector	CL4-0580
33 Thrust Washer	CL4-0290	66 Hanger	CL4-0590
34 Center Pin	CL4-0300	67 Free-Up Belt	CL4-0600
		68 5-Core Cord W/Connectors In Both Ends	CL4NL-0610

EXPLODED VIEW DRAWING
CL-4000 HIOS



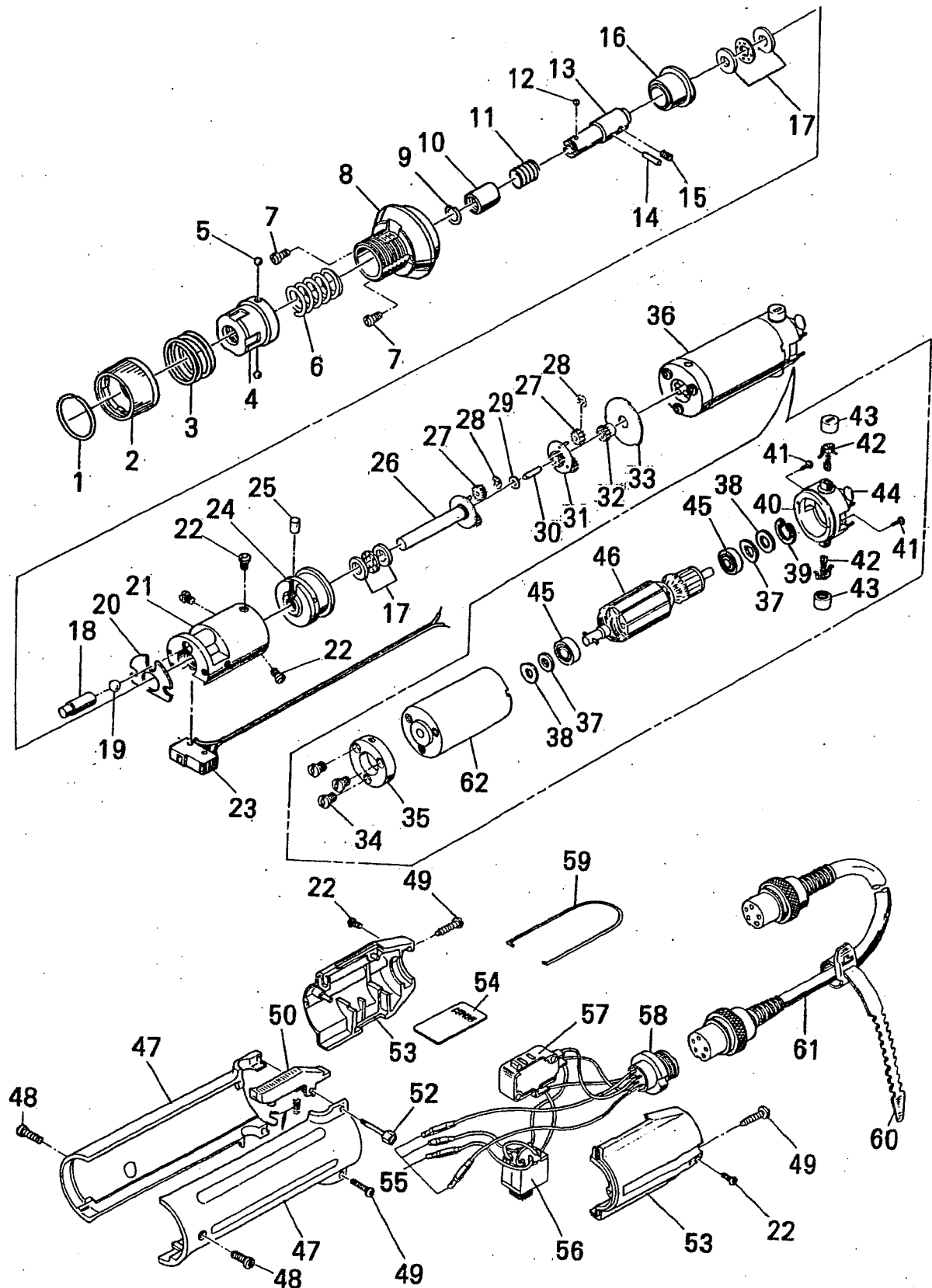
PARTS LIST OF CL-4000
(HIOS SHANK)

ISSUED: November, 1991

REVISED: January, 1993

PARTS NAME	PARTS NO.	PARTS NAME	PARTS NO.
Transmission Assembly 1 - 33 (W/O 23)	CL4-TM	Upper Planet Cage Assembly 27, 28, 31	CL4-3310
Torque Adjusting Nut Assembly 1 - 5	CL4-NT	31 Upper Planet Cage	CL4-0310
1 Nut Cover Stopper	CL4-0010	32 Pinion Gear	CL4-0320
2 Nut Cover	CL4-0020	33 Grease Seal	CL4-0330
3 Nut Cover Spring	CL4-0030	Motor	
4 Torque Adjusting Nut	CL4-0040	34 Set Screw 3x5	STP30X050
5 Steel Ball 3.0 ϕ	BALL-03	35 Motor Front Panel	CL4-0350
6 Torque Adjusting Spring 1.2 ϕ (Blue)	CL3-0060	36 Motor	CL4-0360
Torque Adjusting Spring 1.5 ϕ (Red)	CL4-0060	62 Magnet Case	
7 Set Screw 2.6x10	STP26X100	37 Wave Washer	CL4-0370
8 Torque Adjusting Bolt	CL4-0080	38 Rotor Adjusting Washer 0.1	CL4-0380-1
		Rotor Adjusting Washer 0.2	CL4-0380-2
Joint Shaft Assembly 9 - 13	CL4-JS	Motor End Cover Assembly 39 - 45	CL4-3400
9 Collar Stopper	CL4-0090	39 Stop Ring	CL4-0390
10 Joint Shaft Collar	CL4-0100	40 Motor End Cover	CL4-0400
11 Collar Spring	CL4-0110	41 Set Screw 1.7X10	STP17X100
12 Steel Ball 2.0 ϕ	BALL-02	42 Carbon Brush	CL4-0420
13 Joint Shaft	CL4-0130	43 Carbon Brush Cap	CL4-0430
14 Joint Shaft Lock Pin 2x9	SR20X090	44 Capacitor	CL4-0441
15 Set Screw 3x3	SH30X030	45 Motor Bearing	CL4-0450
16 Clutch Supporter	CL4-0160	46 Rotor	CL4-0460
Gear Assembly 17 - 33 (W/O 23)	CL4-GR	47 Body Case A & B	CL4-0470
17 Thrust Bearing 5x11	CL4-0170	48 Set Screw 2.6x6	STP26X060
18 Clutch Ball Rod	CL4-0180	49 Set Screw 2.6x12	STPB26X120
19 Steel Ball 5.0 ϕ	BALL-05	50 Switch Lever	CL4-0500
20 Gear Case Plate	CL4-0200	51 Switch Lever Spring	CL4-0510
21 Gear Case	CL4-0210	52 Switch Lever Plunger	CL4-0520
22 Set Screw 2.6x5	STP26X050	Switch Assembly 22, 53 - 59	CL4-SW
23 Limit Switch	CL4-0230	53 Switch Cover A & B	CL4-0530
24 Internal Gear	CL4-0240	54 Name Plate	CL4-0540
25 Cam Roller	CL4-0250	55 Terminal Holder	CL4-0550
Lower Planet Cage Assembly 26 - 28	CL4-3260	56 For/Rev Switch	CL4-0560
26 Lower Planet Cage	CL4-0260	57 Starting Switch	CL4-0570
27 Planet Gear	CL4-0270	58 5-Pin Connector	CL4-0580
28 E-Ring	CL4-0280	59 Hanger	CL4-0590
29 Thrust Washer	CL4-0290	60 Free-Up Belt	CL4-0600
30 Center Pin	CL4-0300	61 5-Core Cord W/Connectors In Both Ends	CL4-0611

EXPLODED VIEW DRAWING
CL-4000 HEX



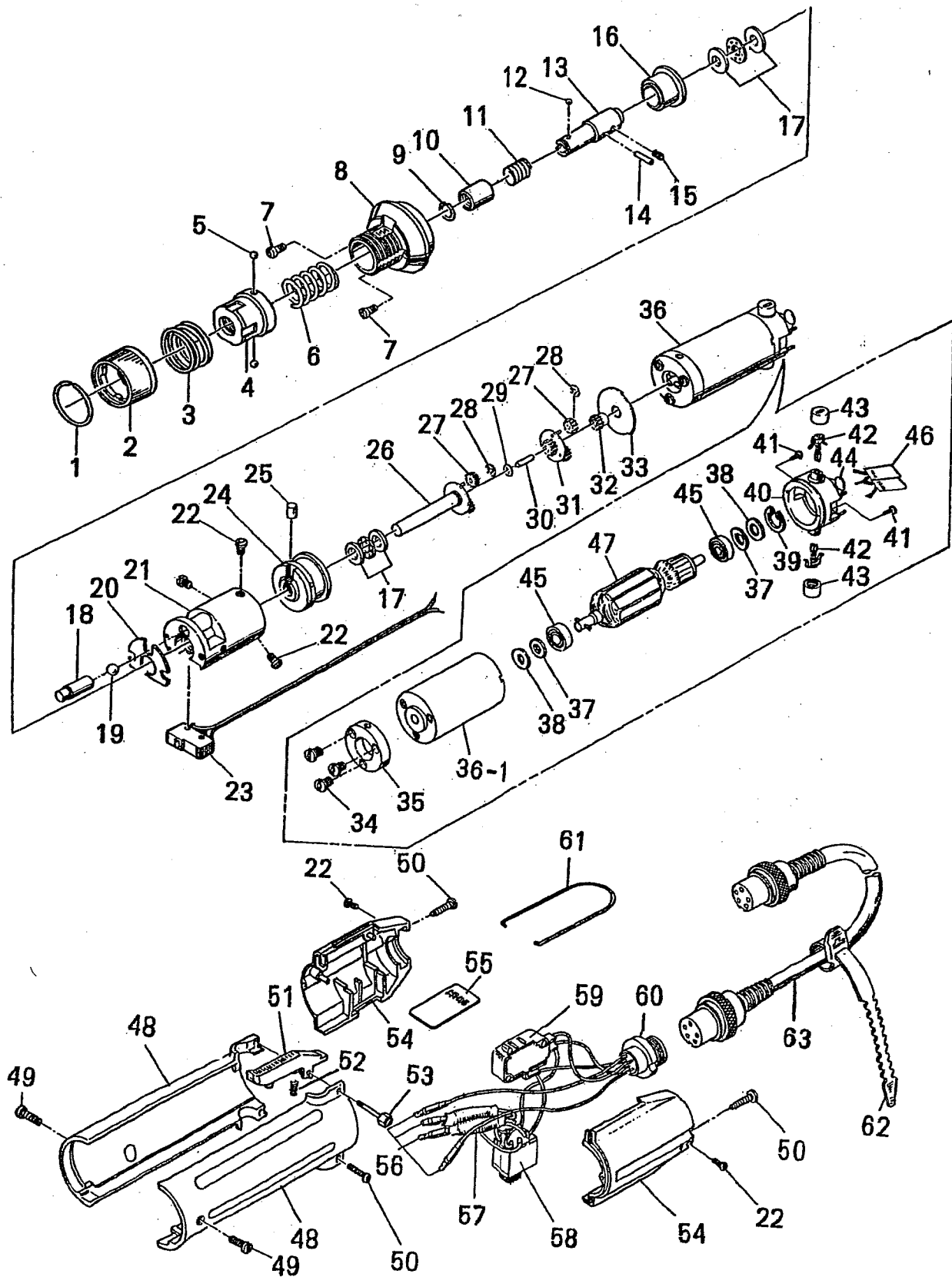
PARTS LIST OF CL-4000
(HEX SHANK)

ISSUED: November, 1991

REVISED: January, 1993

PARTS NAME	PARTS NO.	PARTS NAME	PARTS NO.
Transmission Assembly 1 - 33 (W/O 23)	CL4X-TM	Upper Planet Cage Assembly 27,28,31	CL4-3310
Torque Adjusting Nut Assembly 1 - 5	CL4-NT	31 Upper Planet Cage	CL4-0310
1 Nut Cover Stopper	CL4-0010	32 Pinion Gear	CL4-0320
2 Nut Cover	CL4-0020	33 Grease Seal	CL4-0330
3 Nut Cover Spring	CL4-0030	Motor	
4 Torque Adjusting Nut	CL4-0040	34 Set Screw 3x5	STP30X050
5 Steel Ball 3.0 ϕ	BALL-03	35 Motor Front Panel	CL4-0350
6 Torque Adjusting Spring 1.2 ϕ (Blue)	CL3-0060	36 Motor	CL4-0360
Torque Adjusting Spring 1.5 ϕ (Red)	CL4-0060	62 Magnet Case	
7 Set Screw 2.6x10	STP26X100	37 Wave Washer	CL4-0370
8 Torque Adjusting Bolt	CL4-0080	38 Rotor Adjusting Washer 0.1	CL4-0380-1
		Rotor Adjusting Washer 0.2	CL4-0380-2
Joint Shaft Assembly 9 - 13	CL4X-JS	Motor End Cover Assembly 39 - 45	CL4-3400
9 Collar Stopper	CL4X-0090	39 Stop Ring	CL4-0390
10 Joint Shaft Collar	CL4X-0100	40 Motor End Cover	CL4-0400
11 Collar Spring	CL4X-0110	41 Set Screw 1.7X10	STP17X100
12 Steel Ball 1.5 ϕ	BALL-015	42 Carbon Brush	CL4-0420
13 Joint Shaft	CL4X-0130	43 Carbon Brush Cap	CL4-0430
14 Joint Shaft Lock Pin 2x9	SR20X090	44 Capacitor	CL4-0441
15 Set Screw 3x3	SH30X030	45 Motor Bearing	CL4-0450
16 Clutch Supporter	CL4-0160	46 Rotor	CL4-0460
Gear Assembly 17 - 33 (W/O 23)	CL4-GR	47 Body Case A & B	CL4-0470
17 Thrust Bearing 5x11	CL4-0170	48 Set Screw 2.6x6	STP26X060
18 Clutch Ball Rod	CL4-0180	49 Set Screw 2.6x12	STPB26X120
19 Steel Ball 5.0 ϕ	BALL-05	50 Switch Lever	CL4-0500
20 Gear Case Plate	CL4-0200	51 Switch Lever Spring	CL4-0510
21 Gear Case	CL4-0210	52 Switch Lever Plunger	CL4-0520
22 Set Screw 2.6x5	STP26X050	Switch Assembly 22,53 - 59	CL4-SW
23 Limit Switch	CL4-0230	53 Switch Cover A & B	CL4-0530
24 Internal Gear	CL4-0240	54 Name Plate	CL4-0540
25 Cam Roller	CL4-0250	55 Terminal Holder	CL4-0550
Lower Planet Cage Assembly 26 - 28	CL4-3260	56 For/Rev Switch	CL4-0560
26 Lower Planet Cage	CL4-0260	57 Starting Switch	CL4-0570
27 Planet Gear	CL4-0270	58 5-Pin Connector	CL4-0580
28 E-Ring	CL4-0280	59 Hanger	CL4-0590
29 Thrust Washer	CL4-0290	60 Free-Up Belt	CL4-0600
30 Center Pin	CL4-0300	61 5-Core Cord W/Connectors In Both Ends	CL4-0611

EXPLODED VIEW DRAWING
CL-4000 HIOS HEX
(NOISELESS TYPE)



PARTS LIST OF CL-4000

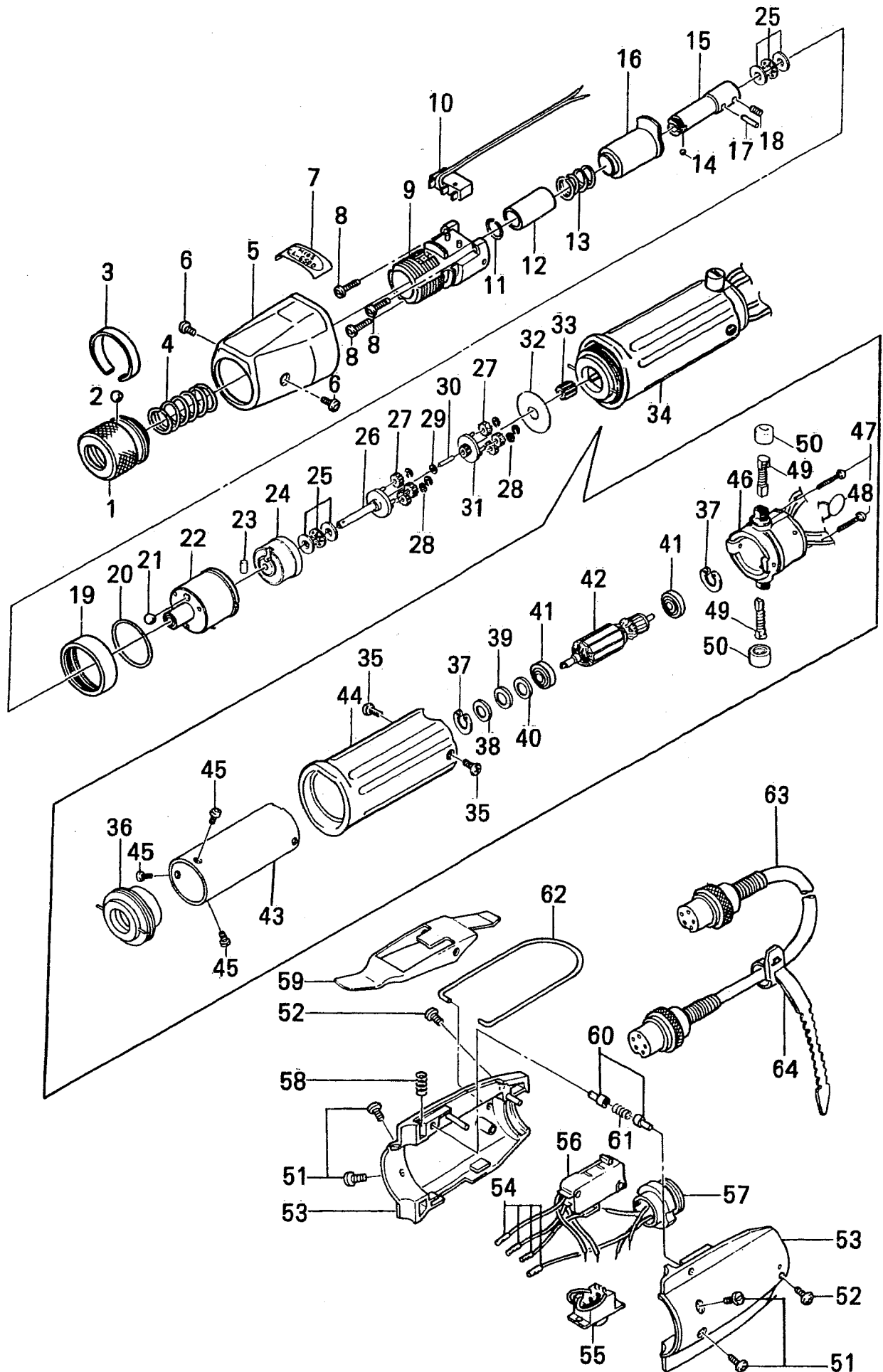
**NOISELESS TYPE
(HIOS SHANK, HEX SHANK)**

ISSUED: April, 1993

REVISED: _____

PARTS NAME	PARTS NO.	PARTS NAME	PARTS NO.
Transmission Assembly 1 - 33 (W/O 23)	CL4-TM	29 Thrust Washer	CL4-0290
Transmission Assembly 1 - 33 (W/O 23)	CL4X-TM	30 Center Pin	CL4-0300
Torque Adjusting Nut Assembly 1 - 5	CL4-NT	Upper Planet Cage Assembly 27, 28, 31	CL4-3310
1 Nut Cover Stopper	CL4-0010	31 Upper Planet Cage	CL4-0310
2 Nut Cover	CL4-0020	32 Pinion Gear	CL4-0320
3 Nut Cover Spring	CL4-0030	33 Grease Seal	CL4-0330
4 Torque Adjusting Nut	CL4-0040	Motor	
5 Steel Ball 3.0 φ	BALL-03	34 Set Screw 3x5	STP30X050
6 Torque Adjusting Spring 1.2 φ (Blue)	CL3-0060	35 Motor Front Panel	CL4-0350
Torque Adjusting Spring 1.5 φ (Red)	CL4-0060	36 Motor	CL4-0360
7 Set Screw 2.6x10	STP26X100	36-1 Magnet Case	
8 Torque Adjusting Bolt	CL4-0080	37 Wave Washer	CL4-0370
Joint Shaft Assembly 9 - 13	CL4-JS	38 Rotor Adjusting Washer 0.1	CL4-0380-1
Joint Shaft Assembly 9 - 13	CL4X-JS	Rotor Adjusting Washer 0.2	CL4-0380-2
9 Collar Stopper	CL4-0090	Motor End Cover Assembly 39 - 46	CL4NL-3400
Collar Stopper	CL4X-0090	39 Stop Ring	CL4-0390
10 Joint Shaft Collar	CL4-0100	40 Motor End Cover	CL4-0400
Joint Shaft Collar	CL4X-0100	41 Set Screw 1.7X10	STP17X100
11 Collar Spring	CL4-0110	42 Carbon Brush	CL4-0420
Collar Spring	CL4X-0110	43 Carbon Brush Cap	CL4-0430
12 Steel Ball 2.0 φ	BALL-02	44 Capacitor	CL4-0441
Steel Ball 1.5 φ	BALL-015	45 Motor Bearing	CL4-0450
13 Joint Shaft	CL4-0130	46 Condenser 682KG	CL3NL-0440
Joint Shaft	CL4X-0130	47 Rotor	CL4-0460
14 Joint Shaft Lock Pin 2x9	SR20X090	48 Body Case A & B	CL4-0470
15 Set Screw 3x3	SH30X030	49 Set Screw 2.6x6	STP26X060
16 Clutch Supporter	CL4-0160	50 Set Screw 2.6x12	STPB26X120
Gear Assembly 17 - 33 (W/O 23)	CL4-GR	51 Switch Lever	CL4-0500
17 Thrust Bearing 5x11	CL4-0170	52 Switch Lever Spring	CL4-0510
18 Clutch Ball Rod	CL4-0180	53 Switch Lever Plunger	CL4-0520
19 Steel Ball 5.0 φ	BALL-05	Switch Assembly 22, 54 - 61	CL4NL-SW
20 Gear Case Plate	CL4-0200	54 Switch Cover A & B	CL4-0530
21 Gear Case	CL4-0210	55 Name Plate	CL4-0540
22 Set Screw 2.6x5	STP26X050	56 Terminal Holder	CL4-0550
23 Limit Switch	CL4-0230	57 Noise Filter B	A45-0630
24 Internal Gear	CL4-0240	58 For/Rev Switch	CL4-0560
25 Cam Roller	CL4-0250	59 Starting Switch	CL4-0570
Lower Planet Cage Assembly 26 - 28	CL4-3260	60 5-Pin Connector	CL4-0580
26 Lower Planet Cage	CL4-0260	61 Hanger	CL4-0590
27 Planet Gear	CL4-0270	62 Free-Up Belt	CL4-0600
28 E-Ring	CL4-0280	63 5-Core Cord W/Connectors In Both Ends	CL4NL-0610

EXPLODED VIEW DRAWING
CL-6000,6500HIOS



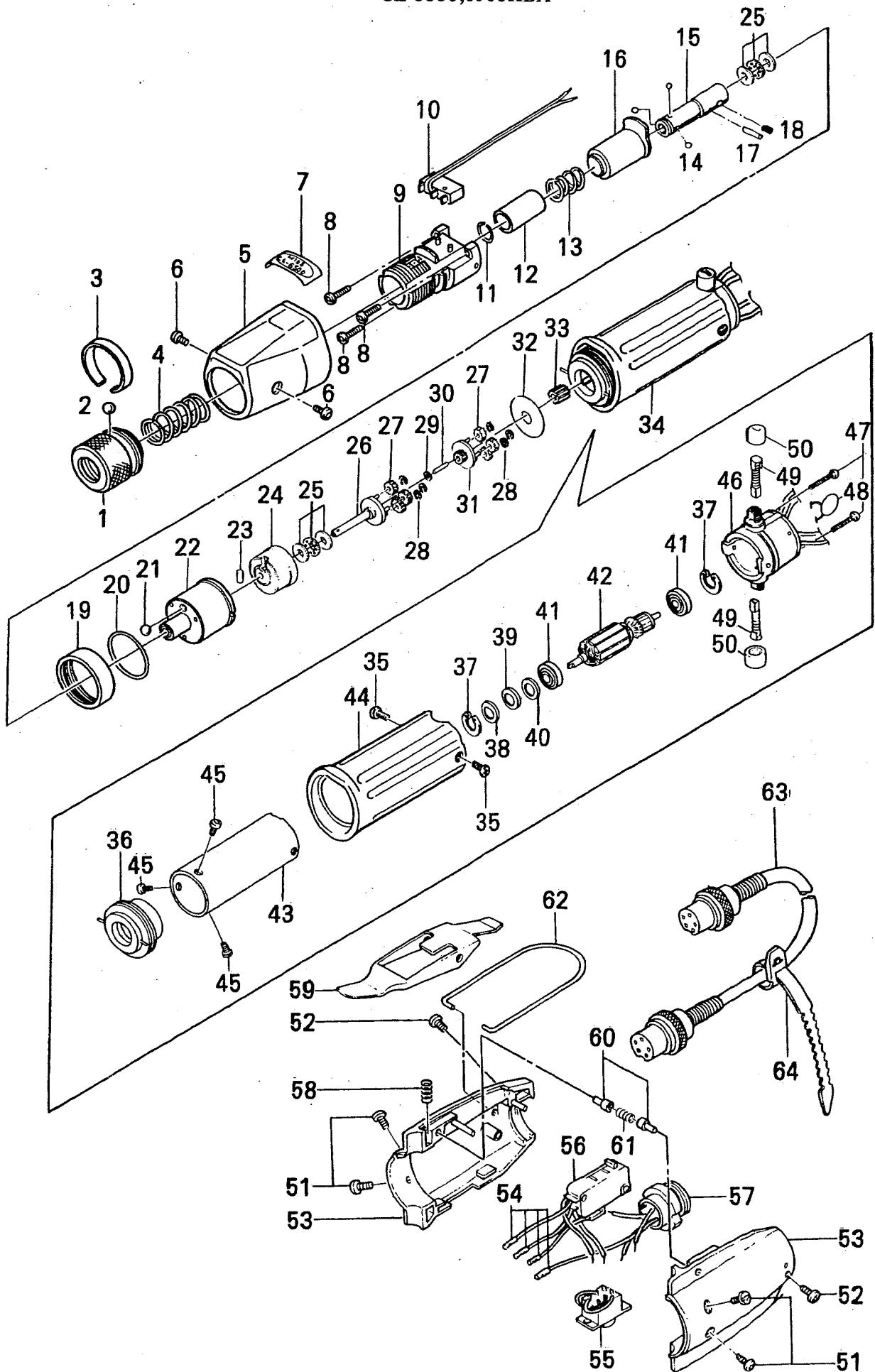
PARTS LIST OF CL-6000.6500
(HIOS SHANK)

ISSUED: November, 1991

REVISED: January, 1993

PARTS NAME	PARTS NO.	PARTS NAME	PARTS NO.
Transmission Assembly 1 - 33 (W/O 10)	CL6-TM	Upper Planet Cage Assembly 31,27,28	CL65-3310
Transmission Assembly 1 - 33 (W/O 10)	CL65-TM		
Torque Adjusting Nut Assembly 1 - 3	CL65-NT	31 Upper Planet Cage	CL65-0310
1 Torque Adjusting Nut	CL65-0010	32 Grease Seal	CL65-0320
2 Steel Ball 3.0 φ	BALL-03	33 Pinion Gear	CL65-0330
3 Knotting Ball Band	CL65-0030		
4 Torque Adjusting Spring (Brown)	CL6-0040	34 Motor	CL6-0340
Torque Adjusting Spring (Yellow)	CL65-0040	Motor	CL65-0340
5 Clutch Cover	CL65-0050	35 Set Screw 3x5.5	STB30X055
6 Set Screw 3x5.5	STB30X055	36 Motor Front Cover	CL65-0360
7 Mark Label	CL6-0070	37 Ring Stopper S	CL65-0370
Mark Label	CL65-0070	38 Wave Washer	CL65-0380
8 Set Screw 2.6x8	STP26X080	39 Rotor Adjusting Washer 0.1	CL65-0390
9 Torque Adjusting Bolt	CL65-0090	40 Rotor Adjusting Washer 0.2	CL65-0400
		41 Motor Bearing	CL65-0410
10 Limit Switch	CL4-0230	42 Rotor	CL6-0420
		Rotor	CL65-0420
Joint Shaft Assembly 11 - 15	CL65-JS	43 Magnet Case For CL-6000	
		For CL-6500	
11 Collar Stopper	CL65-0110	44 Motor Case	CL6-0440
12 Joint Shaft Collar	CL65-0120	Motor Case	CL65-0440
13 Collar Spring	CL65-0130	45 Set Screw 3x4	STP30X040
14 Steel Ball 2.5 φ	BALL-025		
15 Joint Shaft	CL65-0150	Motor End Cover Assembly 37,41,46 - 50	CL65-3470
16 Clutch Supporter	CL65-0160		
17 Joint Shaft Lock Pin 2x11.8	DL10-0180	46 Motor End Cover	CL65-0470
18 Set Screw 3x3	SH30X030	47 Set Screw 2.6x20	STP26X200
19 Gear Case Set Ring	CL65-0190	48 Capacitor	CL4-0441
20 O-Ring	CL65-0200	49 Carbon Brush	CL65-0490
		50 Carbon Brush Cap	CL65-0500
Gear Assembly 21 - 33	CL65-GR		
		51 Set Screw 3x8	STB30X080
21 Clutch Ball 5.5 φ	BALL-055		
22 Gear Case	CL65-0220	Switch Assembly 52 - 62 (W/O 58,59)	CL65-SW
23 Cam Roller 5x7	CL65-0230		
24 Internal Gear	CL65-0240	52 Set Screw 2.6x5	STP26X050
25 Thrust Bearing 6x12	CL65-0250	53 Switch Cover A & B	CL65-0530
		54 Terminal Holder	CL4-0550
Lower Planet Cage Assembly 26 - 28	CL65-3260	55 For/Rev Switch	CL65-0590
		56 Starting Switch	CL4-0570
26 Lower Planet Cage	CL65-0260	57 5-Pin Connector	CL4-0580
27 Planet Gear	CL65-0270	58 Switch Lever Spring	CL65-0610
28 E-Ring	CL65-0280	59 Switch Lever	CL65-0640
		60 Switch Lever Plunger	CL65-0620
29 Thrust Washer	CL4-0290	61 Plunger Spring	CL65-0630
30 Center Pin	CL65-0300	62 Hanger	CL65-0650
		63 5-Core Cord W/Connectors In Both Ends	CL65-0660
		64 Free-Up Belt	CL65-0670

EXPLODED VIEW DRAWING
CL-6000,6500HEX



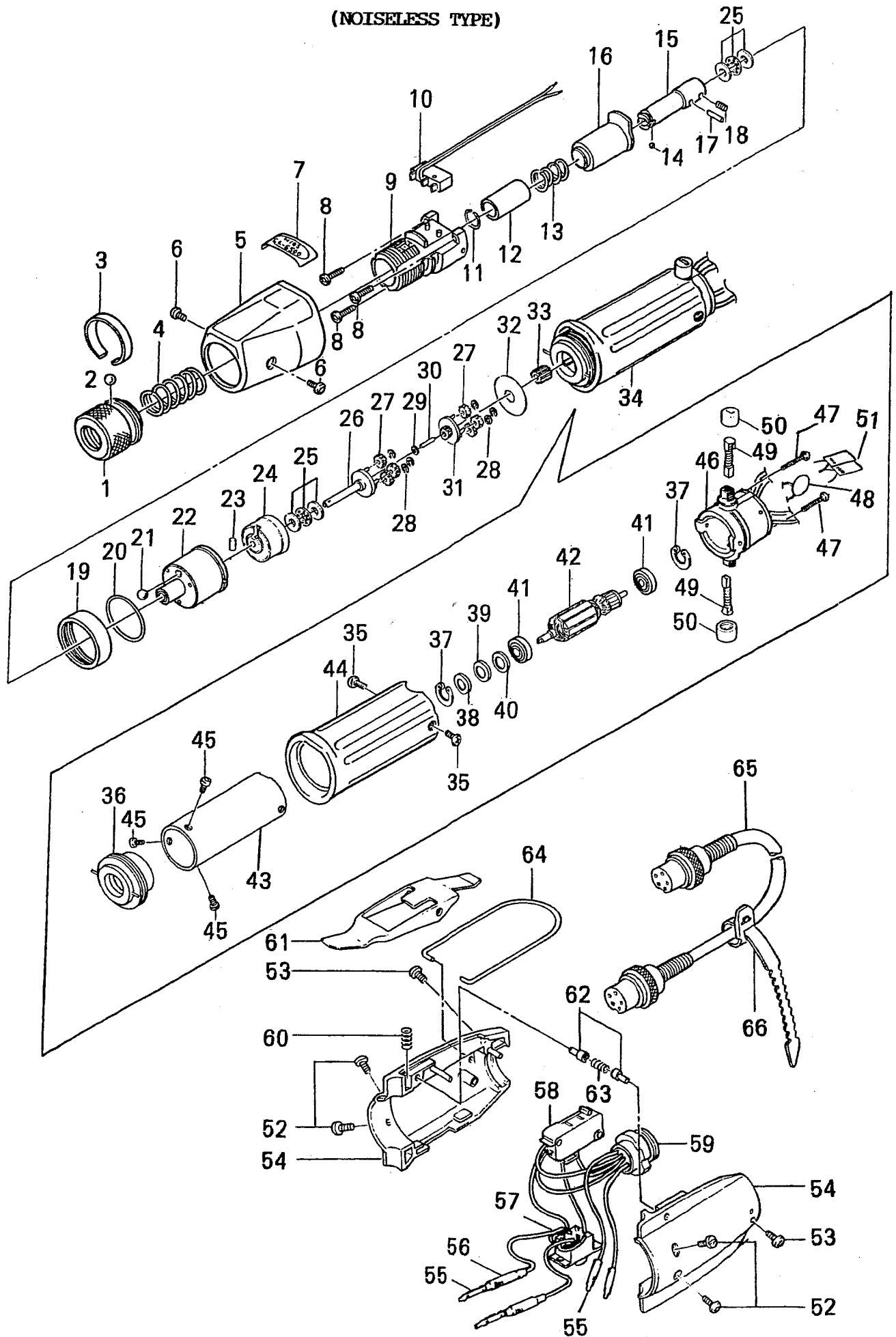
PARTS LIST OF CL-6000.6500
(HEX SHANK)

ISSUED: November, 1991

REVISED: January, 1993

PARTS NAME	PARTS NO.	PARTS NAME	PARTS NO.
Transmission Assembly 1 - 33 (W/O 10)	CL6X-TM	Upper Planet Cage Assembly 31,27,28	CL65-3310
Transmission Assembly 1 - 33 (W/O 10)	CL65X-TM		
Torque Adjusting Nut Assembly 1 - 3	CL65-NT	31 Upper Planet Cage	CL65-0310
1 Torque Adjusting Nut	CL65-0010	32 Grease Seal	CL65-0320
2 Steel Ball 3.0 ϕ	BALL-03	33 Pinion Gear	CL65-0330
3 Knotting Ball Band	CL65-0030		
4 Torque Adjusting Spring (Brown)	CL6-0040	34 Motor	CL6-0340
Torque Adjusting Spring (Yellow)	CL65-0040	Motor	CL65-0340
5 Clutch Cover	CL65-0050	35 Set Screw 3x5.5	STB30X055
6 Set Screw 3x5.5	STB30X055	36 Motor Front Cover	CL65-0360
7 Mark Label	CL6-0070	37 Ring Stopper S	CL65-0370
Mark Label	CL65-0070	38 Wave Washer	CL65-0380
8 Set Screw 2.6x8	STP26X080	39 Rotor Adjusting Washer 0.1	CL65-0390
9 Torque Adjusting Bolt	CL65-0090	40 Rotor Adjusting Washer 0.2	CL65-0400
		41 Motor Bearing	CL65-0410
10 Limit Switch	CL4-0230	42 Rotor	CL6-0420
		Rotor	CL65-0420
Joint Shaft Assembly 11 - 15	CL65X-JS	43 Magnet Case For CL-6000	
		For CL-6500	
11 Collar Stopper	CL65-0110	44 Motor Case	CL6-0440
12 Joint Shaft Collar	CL65X-0120	Motor Case	CL65-0440
13 Collar Spring	CL65-0130	45 Set Screw 3x4	STP30X040
14 Steel Ball 2.0 ϕ	BALL-02		
15 Joint Shaft	CL65X-0150	Motor End Cover Assembly 37,41,46 - 50	CL65-3470
16 Clutch Supporter	CL65-0160		
17 Joint Shaft Lock Pin 2x11.8	DL10-0180	46 Motor End Cover	CL65-0470
18 Set Screw 3x3	SH30X030	47 Set Screw 2.6x20	STP26X200
19 Gear Case Set Ring	CL65-0190	48 Capacitor	CL4-0441
20 O-Ring	CL65-0200	49 Carbon Brush	CL65-0490
		50 Carbon Brush Cap	CL65-0500
Gear Assembly 21 - 33	CL65-GR	51 Set Screw 3x8	STB30X080
		Switch Assembly 52 - 62 (W/O 58,59)	CL65-SW
21 Clutch Ball 5.5 ϕ	BALL-055		
22 Gear Case	CL65-0220	52 Set Screw 2.6x5	STP26X050
23 Cam Roller 5x7	CL65-0230	53 Switch Cover A & B	CL65-0530
24 Internal Gear	CL65-0240	54 Terminal Holder	CL4-0550
25 Thrust Bearing 6x12	CL65-0250	55 For/Rev Switch	CL65-0590
		56 Starting Switch	CL4-0570
		57 5-Pin Connector	CL4-0580
Lower Planet Cage Assembly 26 - 28	CL65-3260		
		58 Switch Lever Spring	CL65-0610
26 Lower Planet Cage	CL65-0260	59 Switch Lever	CL65-0640
27 Planet Gear	CL65-0270		
28 E-Ring	CL65-0280	60 Switch Lever Plunger	CL65-0620
		61 Plunger Spring	CL65-0630
29 Thrust Washer	CL4-0290	62 Hanger	CL65-0650
30 Center Pin	CL65-0300		
		63 5-Core Cord W/Connectors In Both Ends	CL65-0660
		64 Free-Up Belt	CL65-0670

EXPLODED VIEW DRAWING
CL-6000,6500HIOS HEX
(NOISELESS TYPE)



PARTS LIST OF CL-6000.6500

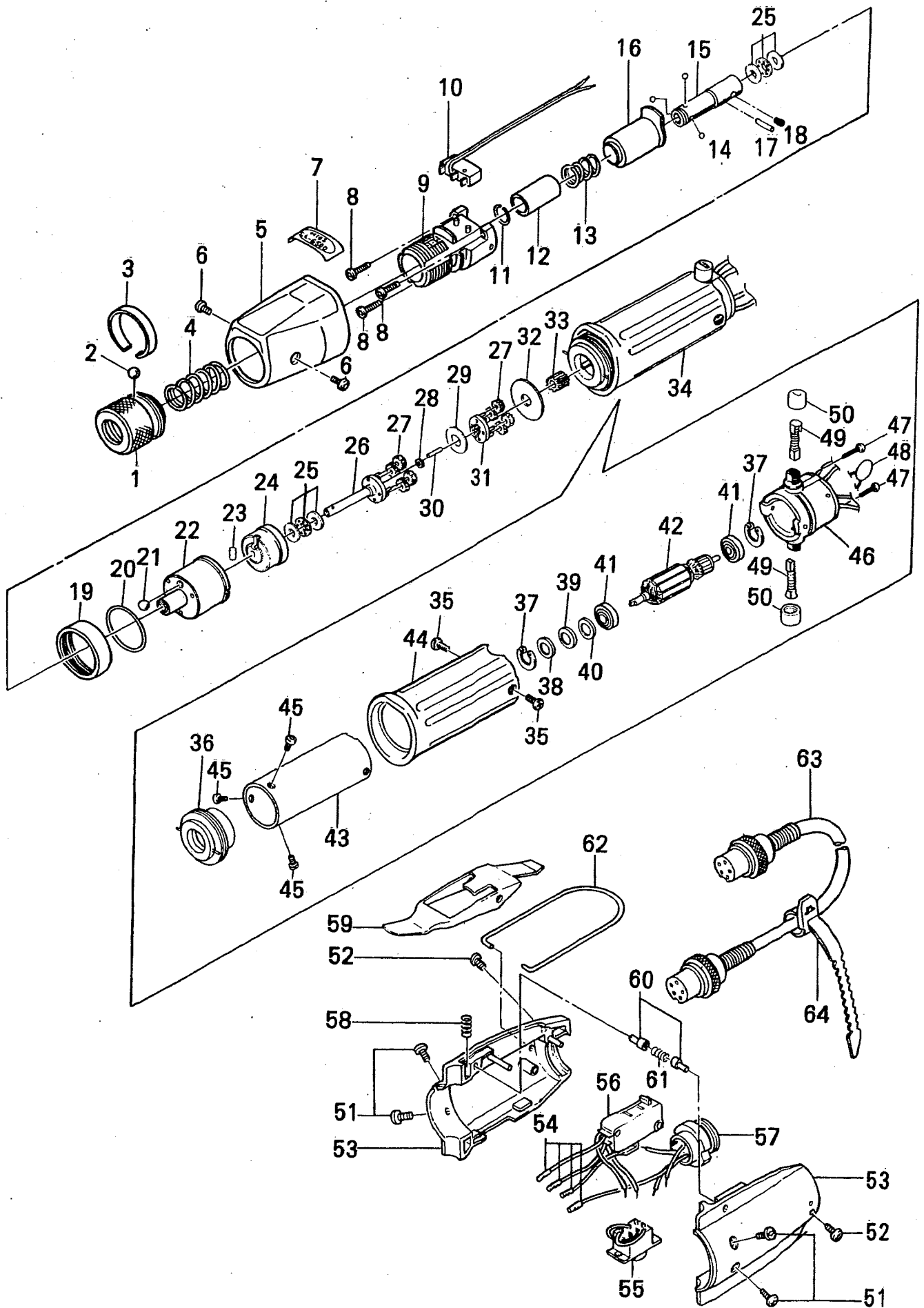
NOISELESS TYPE
(HIOS SHANK, HEX SHANK)

ISSUED: April, 1993

REVISED: _____

PARTS NAME	PARTS NO.	PARTS NAME	PARTS NO.
Transmission Assembly 1 - 33 (W/O 10)	CL6-TM	29 Thrust Washer	CL4-0290
Transmission Assembly 1 - 33 (W/O 10)	CL65-TM	30 Center Pin	CL65-0300
Transmission Assembly 1 - 33 (W/O 10)	CL6X-TM	Upper Planet Cage Assembly 31,27,28	CL65-3310
Transmission Assembly 1 - 33 (W/O 10)	CL65X-TM		
Torque Adjusting Nut Assembly 1 - 3	CL65-NT	31 Upper Planet Cage	CL65-0310
1 Torque Adjusting Nut	CL65-0010	32 Grease Seal	CL65-0320
2 Steel Ball 3.0 φ	BALL-03	33 Pinion Gear	CL65-0330
3 Knotting Ball Band	CL65-0030		
4 Torque Adjusting Spring (Brown)	CL6-0040	34 Motor	CL6-0340
Torque Adjusting Spring (Yellow)	CL65-0040	Motor	CL65-0340
5 Clutch Cover	CL65-0050	35 Set Screw 3x5.5	STB30X055
6 Set Screw 3x5.5	STB30X055	36 Motor Front Cover	CL65-0360
7 Mark Label	CL6-0070	37 Ring Stopper S	CL65-0370
Mark Label	CL65-0070	38 Wave Washer	CL65-0380
8 Set Screw 2.6x8	STP26X080	39 Rotor Adjusting Washer 0.1	CL65-0390
9 Torque Adjusting Bolt	CL65-0090	40 Rotor Adjusting Washer 0.2	CL65-0400
		41 Motor Bearing	CL65-0410
10 Limit Switch	CL4-0230	42 Rotor	CL6-0420
		Rotor	CL65-0420
Joint Shaft Assembly 11 - 15	CL65-JS	43 Magnet Case For CL-6000	
Joint Shaft Assembly 11 - 15	CL65X-JS	For CL-6500	
		44 Motor Case	CL6-0440
		Motor Case	CL65-0440
		45 Set Screw 3x4	STP30X040
11 Collar Stopper	CL65-0110	Motor End Cover Assembly 37,41,46 - 51	CL65NL-3470
12 Joint Shaft Collar	CL65-0120		
Joint Shaft Collar	CL65X-0120	46 Motor End Cover	CL65-0470
13 Collar Spring	CL65-0130	47 Set Screw 2.6x20	STP26X200
14 Steel Ball 2.5 φ	BALL-025	48 Capacitor	CL4-0441
Steel Ball 2.0 φ	BALL-02	49 Carbon Brush	CL65-0490
15 Joint Shaft	CL65-0150	50 Carbon Brush Cap	CL65-0500
Joint Shaft	CL65X-0150	51 Condenser 682KG	CL3NL-0440
16 Clutch Supporter	CL65-0160		
17 Joint Shaft Lock Pin 2x11.8	DL10-0180	52 Set Screw 3x8	STB30X080
18 Set Screw 3x3	SH30X030	Switch Assembly 53 - 64 (W/O 60,61)	CL65NL-SW
19 Gear Case Set Ring	CL65-0190		
20 O-Ring	CL65-0200	53 Set Screw 2.6x5	STP26X050
Gear Assembly 21 - 33	CL65-GR	54 Switch Cover A & B	CL65-0530
21 Clutch Ball 5.5 φ	BALL-055	55 Terminal Holder	CL4-0550
22 Gear Case	CL65-0220	56 Noise Filter B	A45-0630
23 Cam Roller 5x7	CL65-0230	57 For/Rev Switch	CL65-0590
24 Internal Gear	CL65-0240	58 Starting Switch	CL4-0570
25 Thrust Bearing 6x12	CL65-0250	59 5-Pin Connector	CL4-0580
Lower Planet Cage Assembly 26 - 28	CL65-3260		
26 Lower Planet Cage	CL65-0260	60 Switch Lever Spring	CL65-0610
27 Planet Gear	CL65-0270	61 Switch Lever	CL65-0640
28 E-Ring	CL65-0280		
		62 Switch Lever Plunger	CL65-0620
		63 Plunger Spring	CL65-0630
		64 Hanger	CL65-0650
		65 5-Core Cord W/Connectors In Both Ends	CL65-0660
		66 Free-Up Belt	CL65-0670

EXPLODED VIEW DRAWING
CL-7000HEX

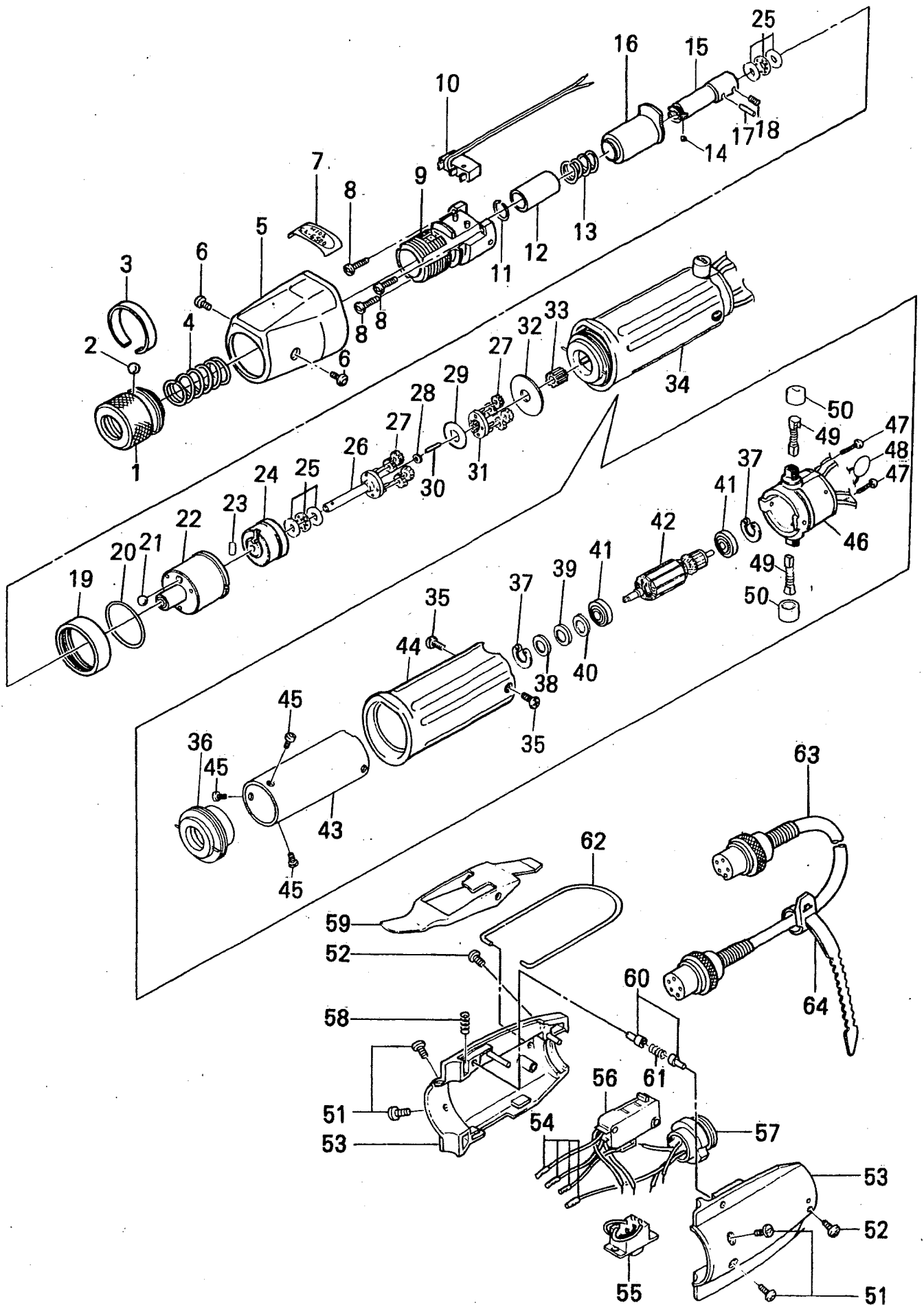


PARTS LIST OF CL-7000
(HEX SHANK)

ISSUED: November, 1991
REVISED: January, 1993

PARTS NAME	PARTS NO.	PARTS NAME	PARTS NO.
Transmission Assembly 1 - 33 (W/O 10)	CL7X-TM	Upper Planet Cage Assembly 31,27	CL7-3310
Torque Adjusting Nut Assembly 1 - 3	CL65-NT	31 Upper Planet Cage	CL7-0310
1 Torque Adjusting Nut	CL65-0010	32 Grease Seal	CL65-0320
2 Steel Ball 3.0 ϕ	BALL-03	33 Pinion Gear	CL7-0330
3 Knotting Ball Band	CL65-0030	34 Motor	CL7-0340
4 Torque Adjusting Spring (Purple)	CL7-0040	35 Set Screw 3x5.5	STB30X055
5 Clutch Cover	CL65-0050	36 Motor Front Cover	CL65-0360
6 Set Screw 3x5.5	STB30X055	37 Ring Stopper S	CL65-0370
7 Mark Label	CL7-0070	38 Wave Washer	CL65-0380
8 Set Screw 2.6x8	STP26X080	39 Rotor Adjusting Washer 0.1	CL65-0390
9 Torque Adjusting Bolt	CL65-0090	40 Rotor Adjusting Washer 0.2	CL65-0400
10 Limit Switch	CL4-0230	41 Motor Bearing	CL65-0410
Joint Shaft Assembly 11 - 15	CL65X-JS	42 Rotor	CL7-0420
11 Collar Stopper	CL65-0110	43 Magnet Case	CL7-0440
12 Joint Shaft Collar	CL65X-0120	44 Motor Case	STP30X040
13 Collar Spring	CL65-0130	45 Set Screw 3x4	CL65-3470
14 Steel Ball 2.0 ϕ	BALL-02	Motor End Cover Assembly 37,41,46 - 50	CL65-0470
15 Joint Shaft	CL65X-0150	46 Motor End Cover	STP26X200
16 Clutch Supporter	CL65-0160	47 Set Screw 2.6x20	CL4-0441
17 Joint Shaft Lock Pin 2x11.8	DL10-0180	48 Capacitor	CL65-0490
18 Set Screw 3x3	SH30X030	49 Carbon Brush	CL65-0500
19 Gear Case Set Ring	CL65-0190	50 Carbon Brush Cap	STB30X080
20 O-Ring	CL65-0200	51 Set Screw 3x8	CL65-SW
Gear Assembly 21 - 33	CL7-GR	Switch Assembly 52 - 62 (W/O 58,59)	STP26X050
21 Clutch Ball 5.5 ϕ	BALL-055	52 Set Screw 2.6x5	CL65-0530
22 Gear Case	CL65-0220	53 Switch Cover A & B	CL4-0550
23 Cam Roller 5x7	CL65-0230	54 Terminal Holder	CL65-0590
24 Internal Gear	CL7-0240	55 For/Rev Switch	CL4-0570
25 Thrust Bearing 6x12	CL65-0250	56 Starting Switch	CL4-0580
Lower Planet Cage Assembly 26 - 27	CL7-3260	57 5-Pin Connector	CL65-0610
26 Lower Planet Cage	CL7-0260	58 Switch Lever Spring	CL65-0640
27 Planet Gear	CL7-0270	59 Switch Lever	CL65-0620
28 Thrust Washer	CL4-0290	60 Switch Lever Plunger	CL65-0630
29 Gear Plate B	CL7-0680	61 Plunger Spring	CL65-0650
30 Center Pin	CL7-0300	62 Hanger	CL65-0660
		63 5-Core Cord W/Connectors In Both Ends	CL65-0670
		64 Free-Up Belt	

EXPLODED VIEW DRAWING
CL-7000HIOS



PARTS LIST OF CL-7000
(HIOS SHANK)

ISSUED: November, 1991

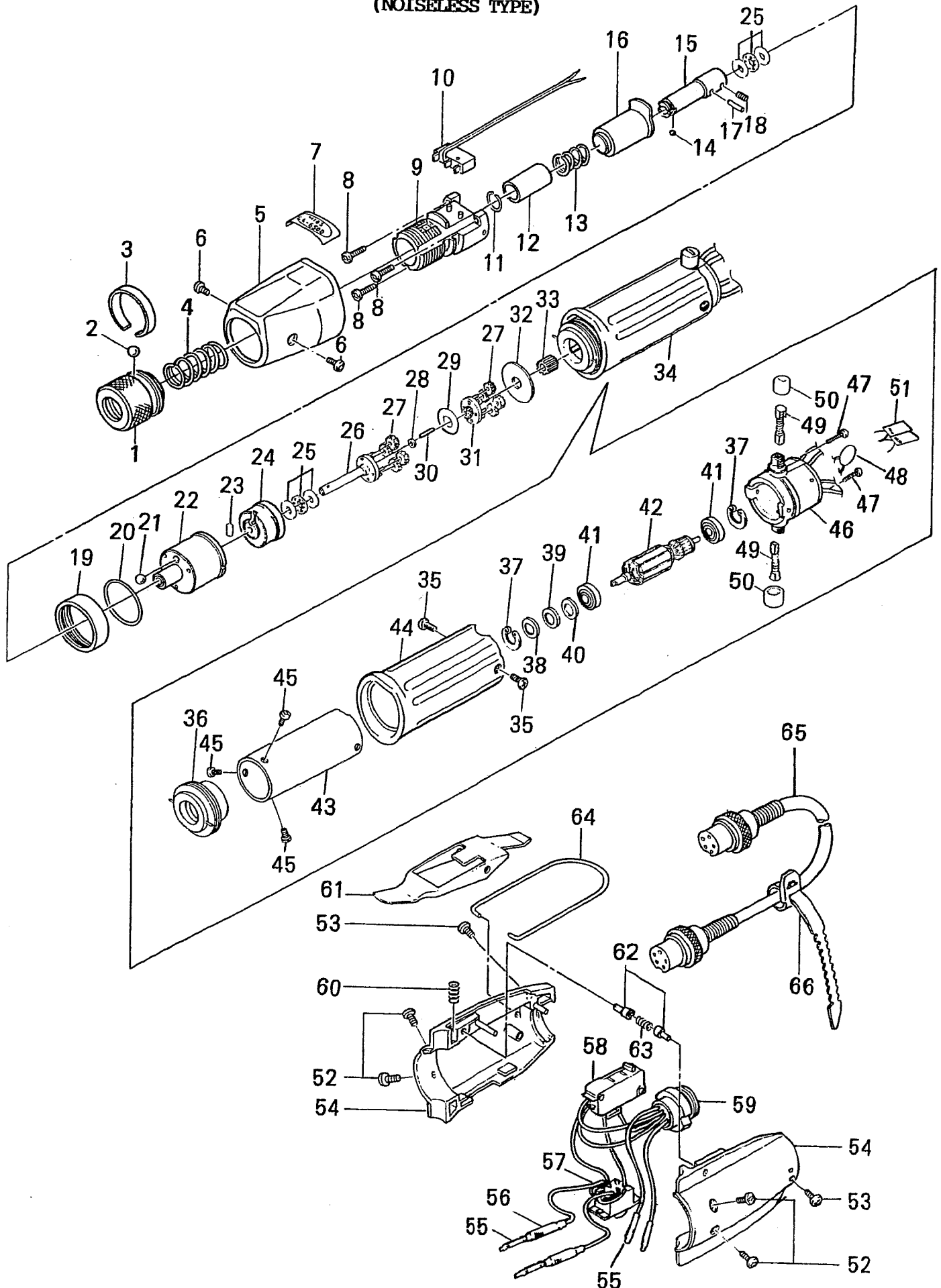
REVISED: January, 1993

PARTS NAME	PARTS NO.	PARTS NAME	PARTS NO.
Transmission Assembly 1 - 33 (W/O 10)	CL7-TM	Upper Planet Cage Assembly 31, 27	CL7-3310
Torque Adjusting Nut Assembly 1 - 3	CL65-NT	31 Upper Planet Cage	CL7-0310
1 Torque Adjusting Nut	CL65-0010	32 Grease Seal	CL65-0320
2 Steel Ball 3.0 ϕ	BALL-03	33 Pinion Gear	CL7-0330
3 Knotting Ball Band	CL65-0030	34 Motor	CL7-0340
4 Torque Adjusting Spring (Purple)	CL7-0040	35 Set Screw 3x5.5	STB30X055
5 Clutch Cover	CL65-0050	36 Motor Front Cover	CL65-0360
6 Set Screw 3x5.5	STB30X055	37 Ring Stopper S	CL65-0370
7 Mark Label	CL7-0070	38 Wave Washer	CL65-0380
8 Set Screw 2.6x8	STP26X080	39 Rotor Adjusting Washer 0.1	CL65-0390
9 Torque Adjusting Bolt	CL65-0090	40 Rotor Adjusting Washer 0.2	CL65-0400
10 Limit Switch	CL4-0230	41 Motor Bearing	CL65-0410
Joint Shaft Assembly 11 - 15	CL65-JS	42 Rotor	CL7-0420
11 Collar Stopper	CL65-0110	43 Magnet Case	CL7-0440
12 Joint Shaft Collar	CL65-0120	44 Motor Case	STP30X040
13 Collar Spring	CL65-0130	45 Set Screw 3x4	
14 Steel Ball 2.5 ϕ	BALL-025	Motor End Cover Assembly 37, 41, 46 - 50	CL65-3470
15 Joint Shaft	CL65-0150	46 Motor End Cover	CL65-0470
16 Clutch Supporter	CL65-0160	47 Set Screw 2.6x20	STP26X200
17 Joint Shaft Lock Pin 2x11.8	DL10-0180	48 Capacitor	CL4-0441
18 Set Screw 3x3	SH30X030	49 Carbon Brush	CL65-0490
19 Gear Case Set Ring	CL65-0190	50 Carbon Brush Cap	CL65-0500
20 O-Ring	CL65-0200	51 Set Screw 3x8	STB30X080
Gear Assembly 21 - 33	CL7-GR	Switch Assembly 52 - 62 (W/O 58, 59)	CL65-SW
21 Clutch Ball 5.5 ϕ	BALL-055	52 Set Screw 2.6x5	STP26X050
22 Gear Case	CL65-0220	53 Switch Cover A & B	CL65-0530
23 Cam Roller 5x7	CL65-0230	54 Terminal Holder	CL4-0550
24 Internal Gear	CL7-0240	55 For/Rev Switch	CL65-0590
25 Thrust Bearing 6x12	CL65-0250	56 Starting Switch	CL4-0570
Lower Planet Cage Assembly 26 - 27	CL7-3260	57 5-Pin Connector	CL4-0580
26 Lower Planet Cage	CL7-0260	58 Switch Lever Spring	CL65-0610
27 Planet Gear	CL7-0270	59 Switch Lever	CL65-0640
28 Thrust Washer	CL4-0290	60 Switch Lever Plunger	CL65-0620
29 Gear Plate B	CL7-0680	61 Plunger Spring	CL65-0630
30 Center Pin	CL7-0300	62 Hanger	CL65-0650
		63 5-Core Cord W/Connectors In Both Ends	CL65-0660
		64 Free-Up Belt	CL65-0670

EXPLODED VIEW DRAWING

CL-7000HIOS HEX

(NOISELESS TYPE)



(CL-461)

PARTS LIST OF CL-7000

NOISELESS TYPE
(HIOS SHANK, HEX SHANK)

ISSUED: April, 1993

REVISED: _____

PARTS NAME	PARTS NO.	PARTS NAME	PARTS NO.
Transmission Assembly 1 - 33 (W/O 10)	CL7-TM	Upper Planet Cage Assembly 31, 27	CL7-3310
Transmission Assembly 1 - 33 (W/O 10)	CL7X-TM		
Torque Adjusting Nut Assembly 1 - 3	CL65-NT	31 Upper Planet Cage	CL7-0310
1 Torque Adjusting Nut	CL65-0010	32 Grease Seal	CL65-0320
2 Steel Ball 3.0 φ	BALL-03	33 Pinion Gear	CL7-0330
3 Knotting Ball Band	CL65-0030		
4 Torque Adjusting Spring (Purple)	CL7-0040	34 Motor	CL7-0340
5 Clutch Cover	CL65-0050	35 Set Screw 3x5.5	STB30X055
6 Set Screw 3x5.5	STB30X055	36 Motor Front Cover	CL65-0360
7 Mark Label	CL7-0070	37 Ring Stopper S	CL65-0370
8 Set Screw 2.6x8	STP26X080	38 Wave Washer	CL65-0380
9 Torque Adjusting Bolt	CL65-0090	39 Rotor Adjusting Washer 0.1	CL65-0390
		40 Rotor Adjusting Washer 0.2	CL65-0400
10 Limit Switch	CL4-0230	41 Motor Bearing	CL65-0410
Joint Shaft Assembly 11 - 15	CL65-JS	42 Rotor	CL7-0420
Joint Shaft Assembly 11 - 15	CL65X-JS	43 Magnet Case	
		44 Motor Case	CL7-0440
11 Collar Stopper	CL65-0110	45 Set Screw 3x4	STP30X040
12 Joint Shaft Collar	CL65-0120	Motor End Cover Assembly 37, 41, 46 - 51	CL65NL-3470
Joint Shaft Collar	CL65X-0120		
13 Collar Spring	CL65-0130	46 Motor End Cover	CL65-0470
14 Steel Ball 2.5 φ	BALL-025	47 Set Screw 2.6x20	STP26X200
Steel Ball 2.0 φ	BALL-02	48 Capacitor	CL4-0441
15 Joint Shaft	CL65-0150	49 Carbon Brush	CL65-0490
Joint Shaft	CL65X-0150	50 Carbon Brush Cap	CL65-0500
16 Clutch Supporter	CL65-0160	51 Condenser 682KG	CL3NL-0440
17 Joint Shaft Lock Pin 2x11.8	DL10-0180		
18 Set Screw 3x3	SH30X030	52 Set Screw 3x8	STB30X080
19 Gear Case Set Ring	CL65-0190	Switch Assembly 53 - 64 (W/O 59, 60)	CL65NL-SW
20 O-Ring	CL65-0200		
Gear Assembly 21 - 33	CL7-GR	53 Set Screw 2.6x5	STP26X050
21 Clutch Ball 5.5 φ	BALL-055	54 Switch Cover A & B	CL65-0530
22 Gear Case	CL65-0220	55 Terminal Holder	CL4-0550
23 Cam Roller 5x7	CL65-0230	56 Noise Filter B	A45-0630
24 Internal Gear	CL7-0240	57 For/Rev Switch	CL65-0590
25 Thrust Bearing 6x12	CL65-0250	58 Starting Switch	CL4-0570
		59 5-Pin Connector	CL4-0580
Lower Planet Cage Assembly 26 - 27	CL7-3260		
26 Lower Planet Cage	CL7-0260	60 Switch Lever Spring	CL65-0610
27 Planet Gear	CL7-0270	61 Switch Lever	CL65-0640
		62 Switch Lever Plunger	CL65-0620
28 Thrust Washer	CL4-0290	63 Plunger Spring	CL65-0630
29 Gear Plate B	CL7-0680	64 Hanger	CL65-0650
30 Center Pin	CL7-0300	65 5-Core Cord W/Connectors In Both Ends	CL65-0660
		66 Free-Up Belt	CL65-0670