DOGA®
Productive solutions

Electric Screwdrivers
DO Series

INSTRUCTIONS MANUAL

im Vertrieb von:

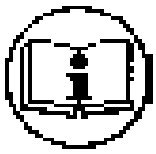
DOGATEC
Mit Sicherheit montiert

Tel.: +49/7361/8049950
D-73430 Aalen
www.dogatec.de

IMPORTANT

The tool delivered with this manual may been modified for specific needs.
In that case, please give us the tool code number written on our shipping note or the appoximate tool delivery date when you will place an order for a new similar tool or for spare parts.
In that way, you will be sure to get the required and/or spare part.

WARNING



This information has to be kept in a location known by all users.

Each operator has to read carrefully this manual before installing, using, and mending the product.

Be sure that the operator has understood using recommendations and the meaning of signs put on the product.

Most accidents could be avoided respecting this Manual Instructions. As a matter of fact, they were created according to European laws and norms regarding products.

In each case, please respect and follow safety national norms. Do not take off nor damage the stickers or advise put on the product and above all the details imposed by the law.

INDEX

1. Models & Specification

1.1 Matching driver with controller

SCREW DRIVER	DO250, DO350, DO450 DO250P, DO350P, DO450P	DOA250, DOA350, DOA450
CONTROLLER	XS-38D	XS-38D FA

1.2 Mechanical specification

Specification	**DO-38D (controller)**
Rated Input voltage	110 / 230 VAC (Selectable)
Rated Output voltage	30/38 VDC (Low/High)
Rated Output current- power	2.5A 95W
Maximum Output current	6 A
Intermittent operation	10s On / 30s Off

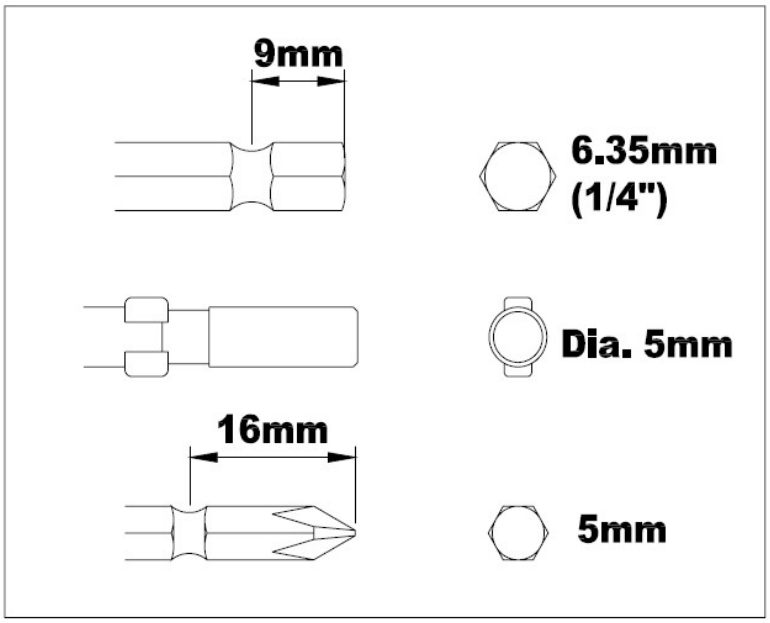
V (Voltage), DC (Direct Current), W (Watt), s (Seconds).

1.3 Mechanical specification

Model	**Screw**	**Torque Kgf.cm**	**Speed (RPM)**		**Weight (Kg)**	**Bit socket**
			LOW	HIGH		
DO250, DO250P	M2.6~M4	3.0~25	630	1,050	0.72	A: Hex1/4" B: Hex 5mm Ø 5mm
DO350, DO350P	M2.6~M5	4.0~35	460	750		
DO450, DO450P	M2.6~M6	5.0~45	330	550		
DO250	M2.6~M4	3.0~25	630	1,050	0.72	A: Hex1/4" B: Hex 5mm Ø 5mm
DO350	M2.6~M5	4.0~35	460	750		
DO450	M2.6~M6	5.0~45	330	550		

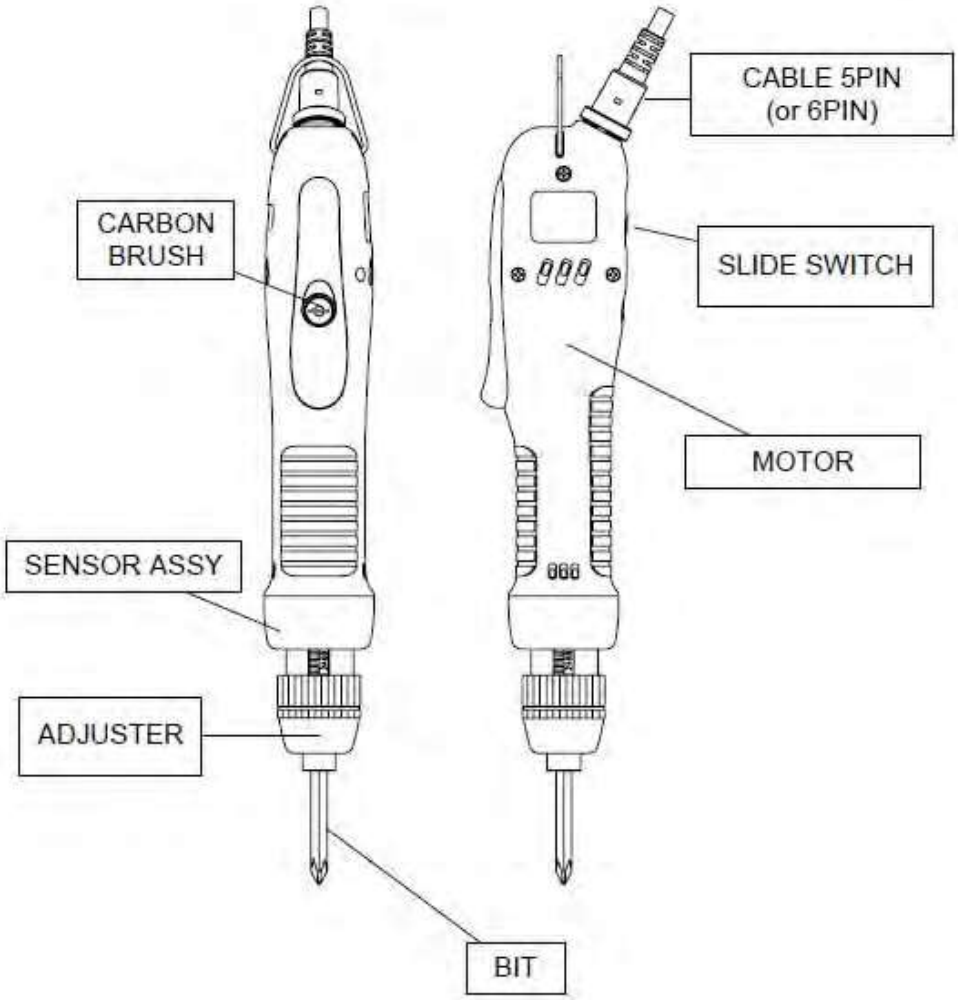
■**The above data can be changed without notice for the quality improvement.**

1.4 Available type of bit

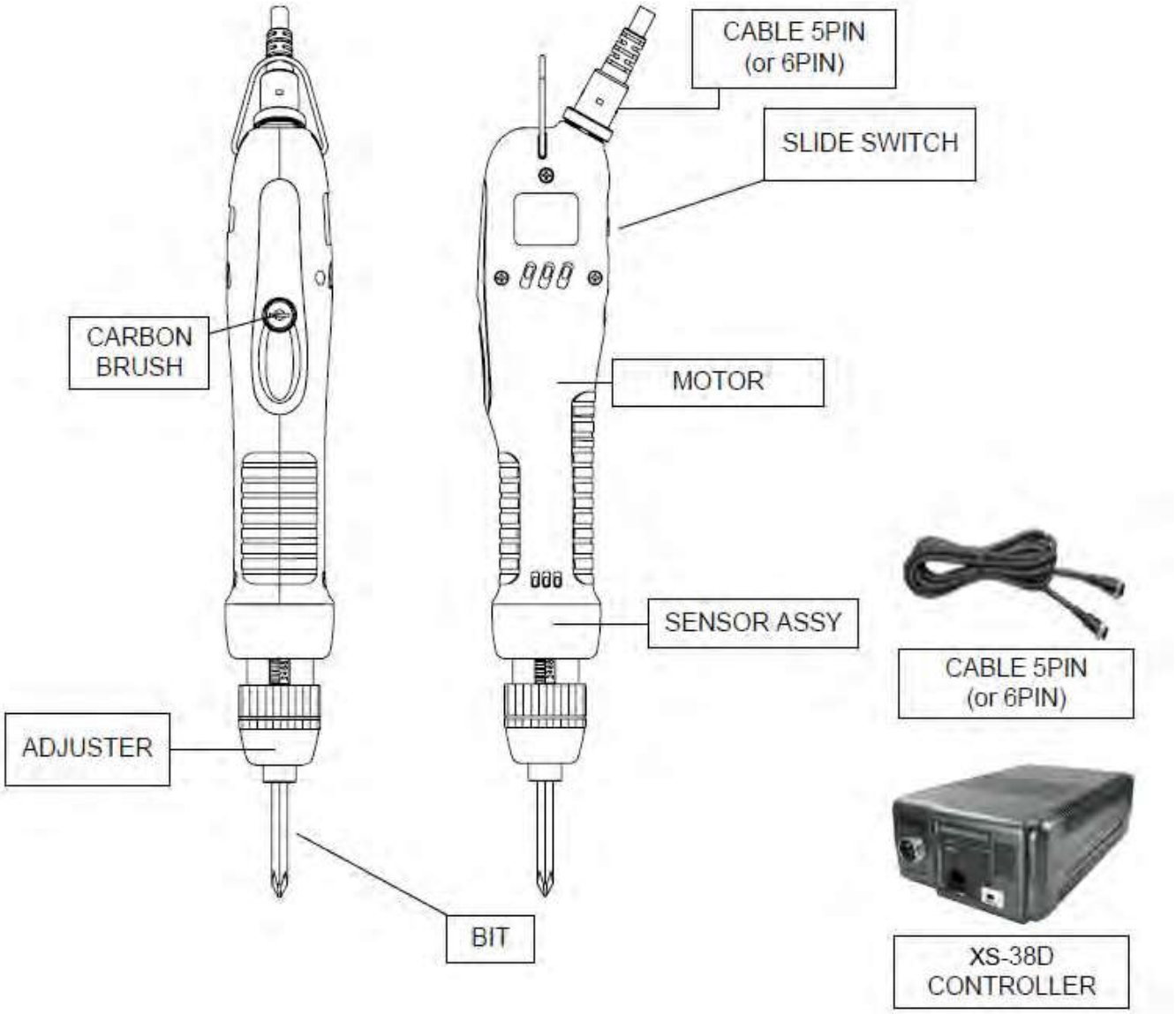


2. Layout

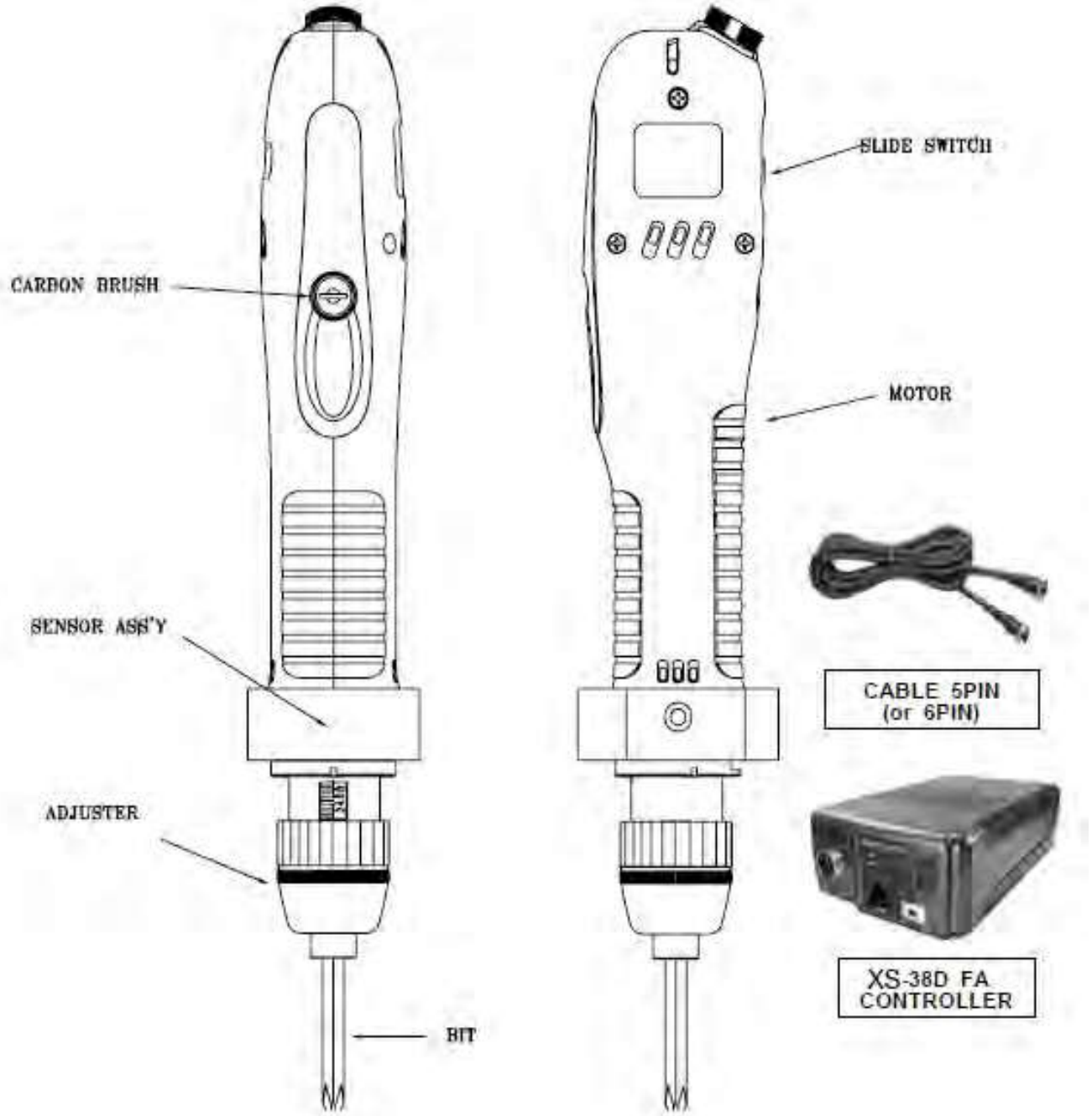
2.1 DO250, DO350, DO450



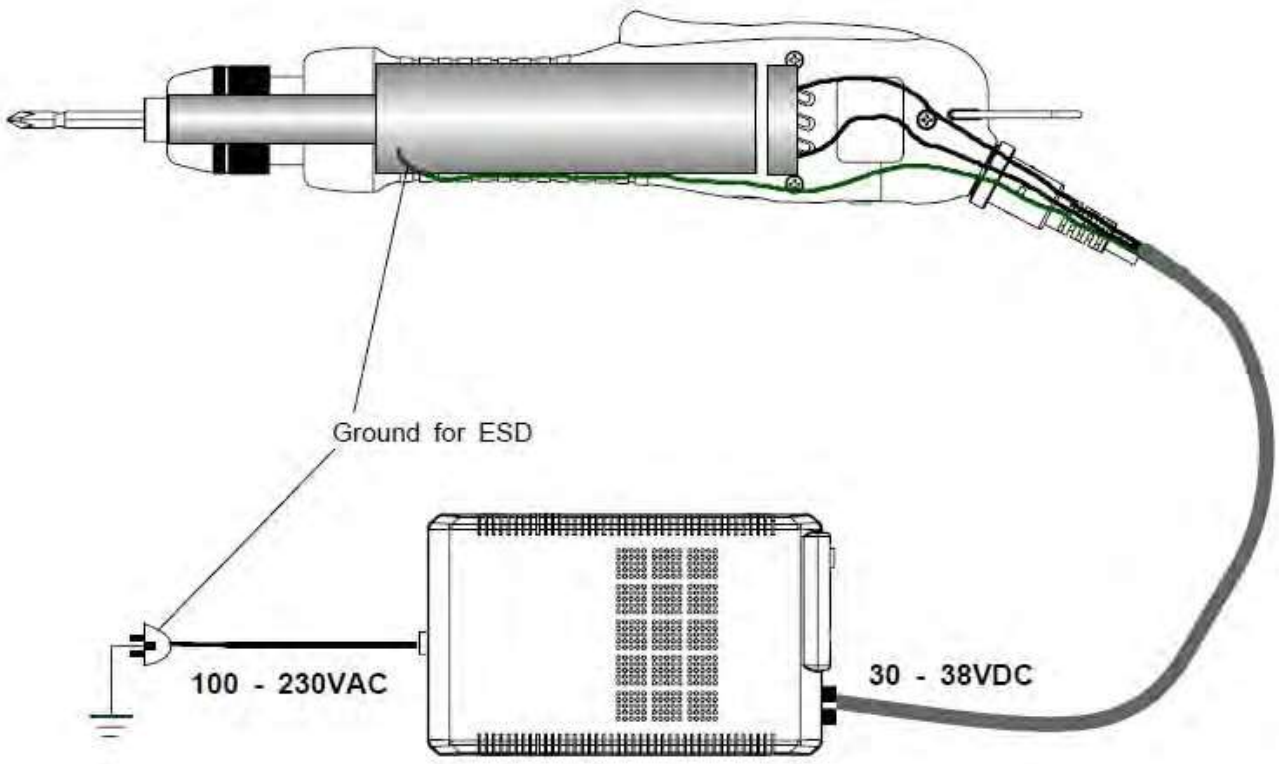
2.2 DO250P, DO350P, DO450P



2.3 DOA250, DOA350, DOA450



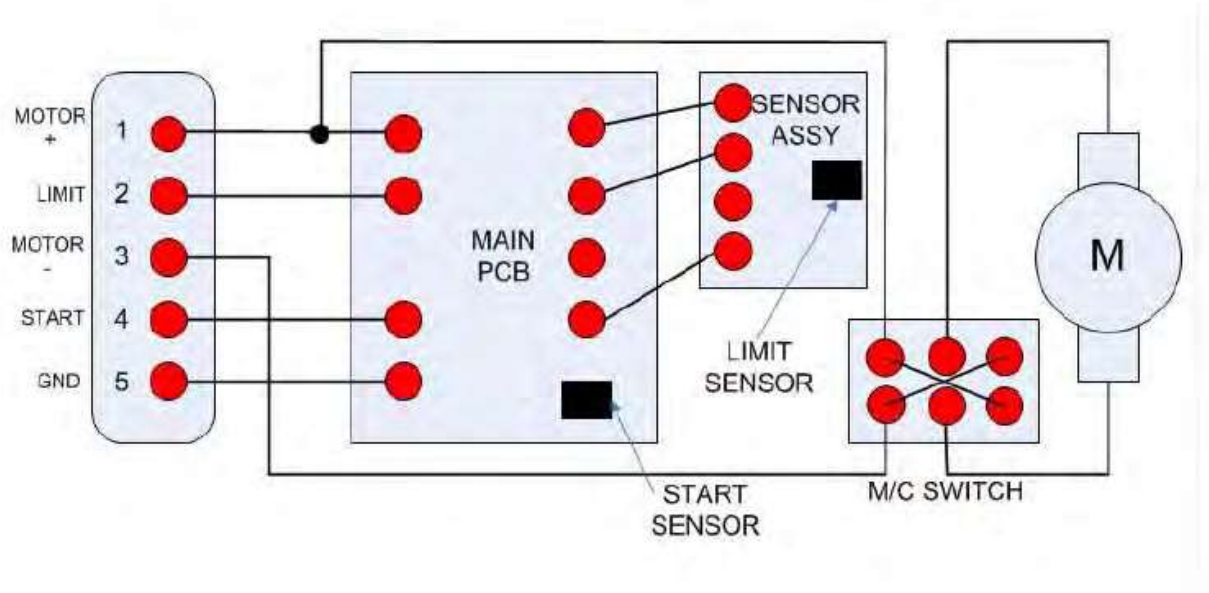
3. Electric safety system (CLASS III)



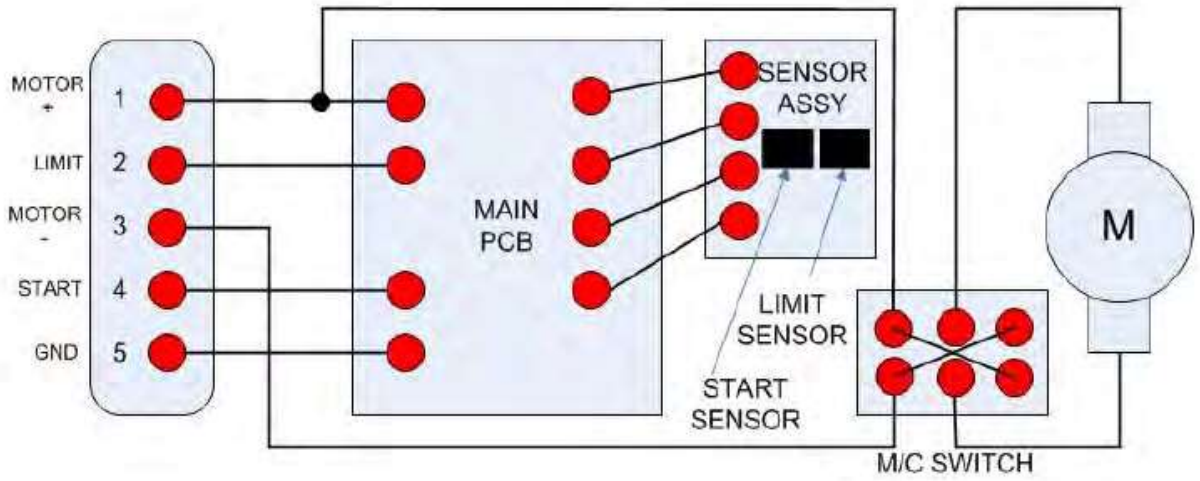
SAFETY EXTRA LOW VOLTAGE TRANSFORMER
(NRTL ,CE)

4. Electrical connection

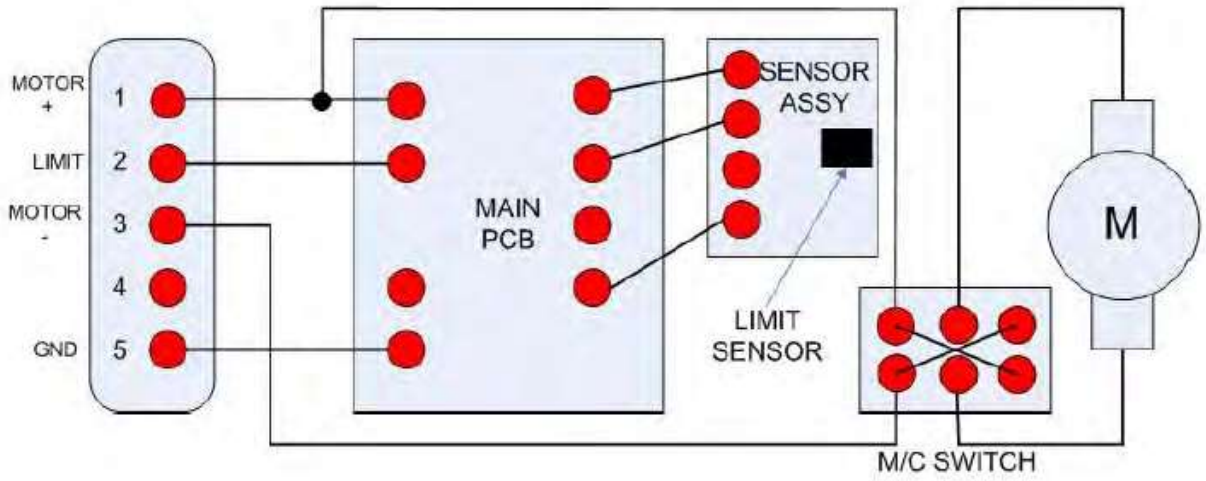
4.1 Electrical connection of DO250, DO350, DO450, DO250P, DO350P, DO450P



4.2 Electrical connection of DO250P, DO350P, DO450P

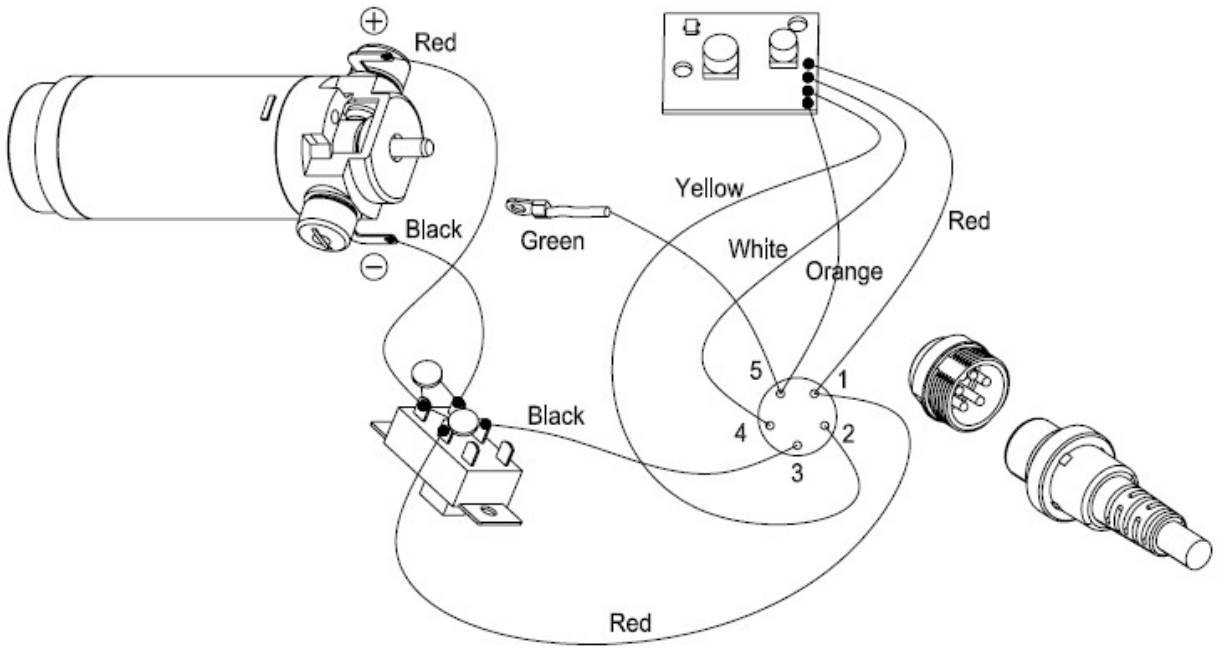


4.3 Electrical connection of DOA250, DOA350, DOA450

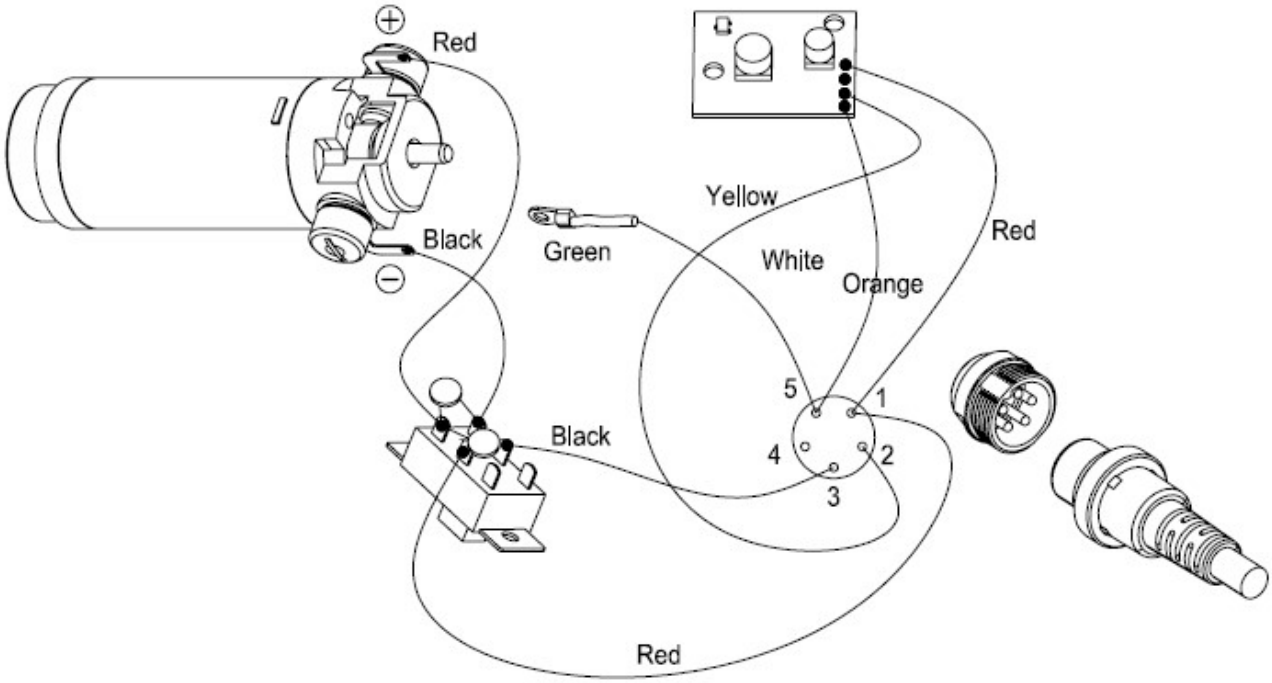


5. Wiring

5.1 Wiring for DO250, DO350, DO450, DO250P, DO350P, DO450P



5.2 Wiring for DOA250, DOA350, DOA450



6. Maintenance intervals

Maintenance intervals may be determined by the several approaches : number of cycles in use, number of hours in use, type of joint, torque and calendar time. All these factors should be considered for the most preventative maintenance.

7. Commonly replaced parts

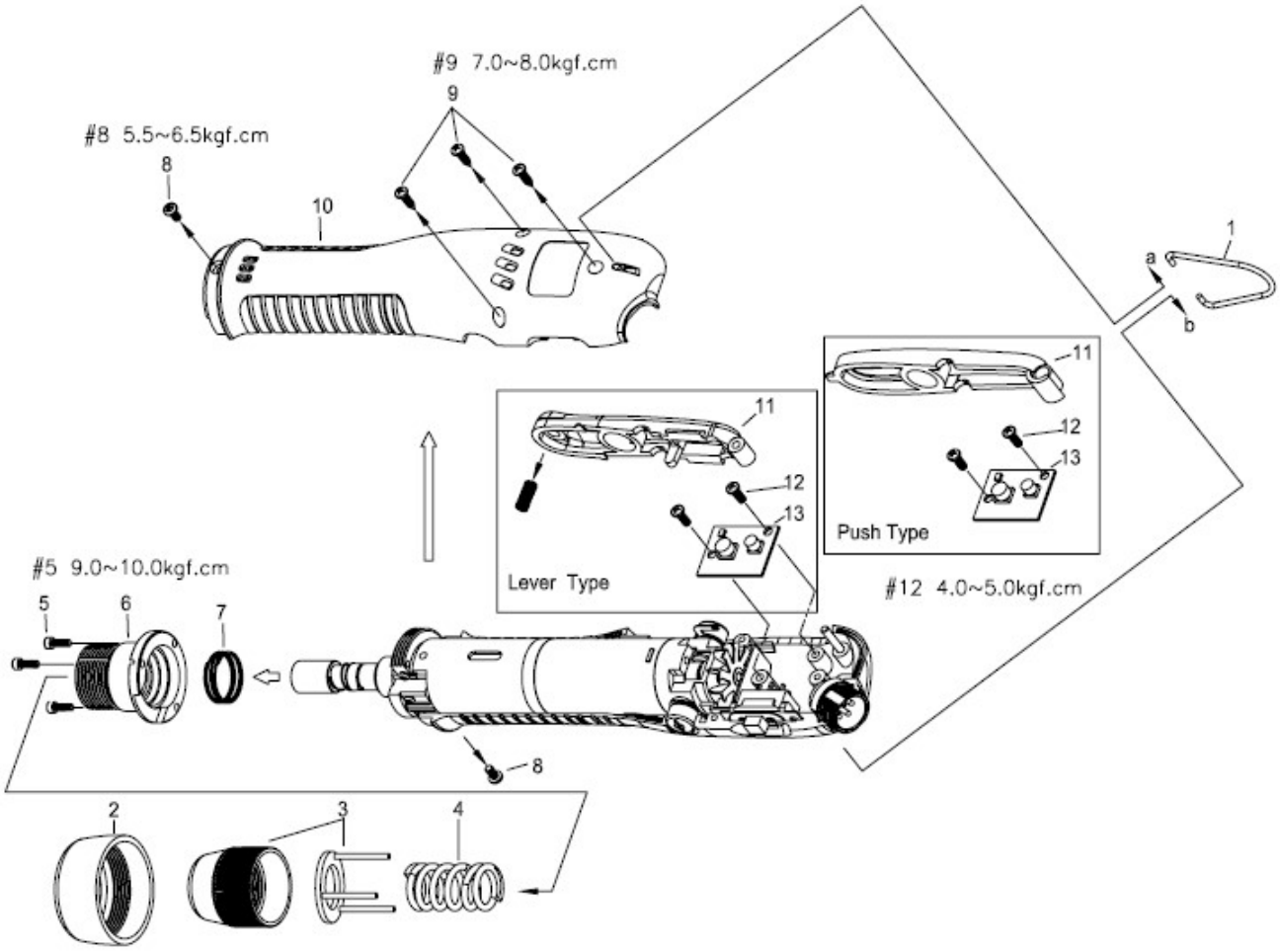
No	Parts Description	Quantity
1	Carbon brush assy	2
2	Cable 6pin	1

8. Required tools for service

No	CODE	TOOL	RELATIVE PARTS
1		Hand Wrench (HEX.2mm,1.5mm)	Adjuster, Fan, Top Cover
2		Snapring Plier(R22) (S12)	Snap Ring
3		Twizer	Idle Gear, Wiring
4		Long Nose Plier(modified)	Bit Socket Ring
5		Urethane Hammer	Bit Collar
6		Magnetic Pin	Dia.2mm Steel Ball For Bit Socket
7		Wire Stripper	Lead Wire
8		Soldering Iron	Soldering
9		Analog Multi Tester	Voltage, Current, Resistance
10		Heating Gun	Shrink Tube
11		Hand Driver (NO.2)	Screw (M3x12) For Housing
12		Hand Driver (NO.1)	Screw (M2.0x16, M2.3x20) For Micro Switch
13		Handy Load Tester (A)	Function Test
14		Handy Load Tester (B,C)	Function Test
15		Handy Load Tester (PUSH B,C)	Function Test
16		Handy Load Tester (E)	Function Test
17		Hand Driver (Slotted)	Carbon Brush
18		Clamping Tool	Earth Wire Clamping
19		Vise Plier	Collar
20		Grease	Gear
21		Solder Wire, Solder Paste	
22		Shrink Tube	
23		Nipper	
24		Shirnk Tube D2.5	
25		Shirnk Tube D3.0	
26		Shirnk Tube D1.5	
27		Test cable 5PIN (or 6PIN)	Controller

9. Service

9.1 Disassembly of housing for DO250, DO350, DO450, DO250P, DO350P, DO450P



Process

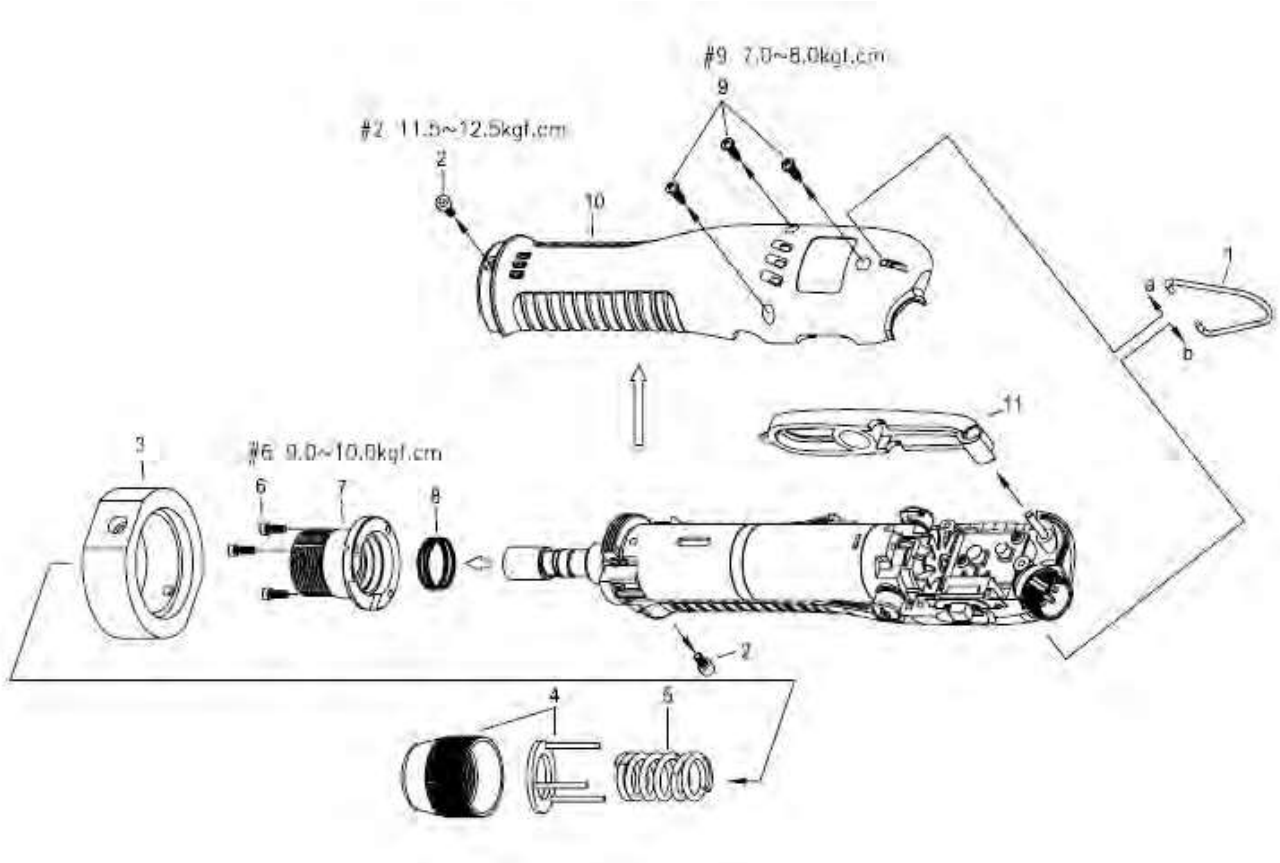
1. Pull the one end of HOOK out, and the other end of HOOK(1) out to "a" direction.
2. Follow the process number on the drawing.
3. Apply the torque of 9~10 Kgf.cm for fastening screw "5".

   Apply the torque of 5.5~6.5 Kgf.cm for fastening screw "8".

   Apply the torque of 7~8 Kgf.cm for fastening screw "9".

   Apply the torque of 4~5 Kgf.cm for fastening screw "12".

9.2 Disassembly of housing for DOA250, DOA350, DOA450



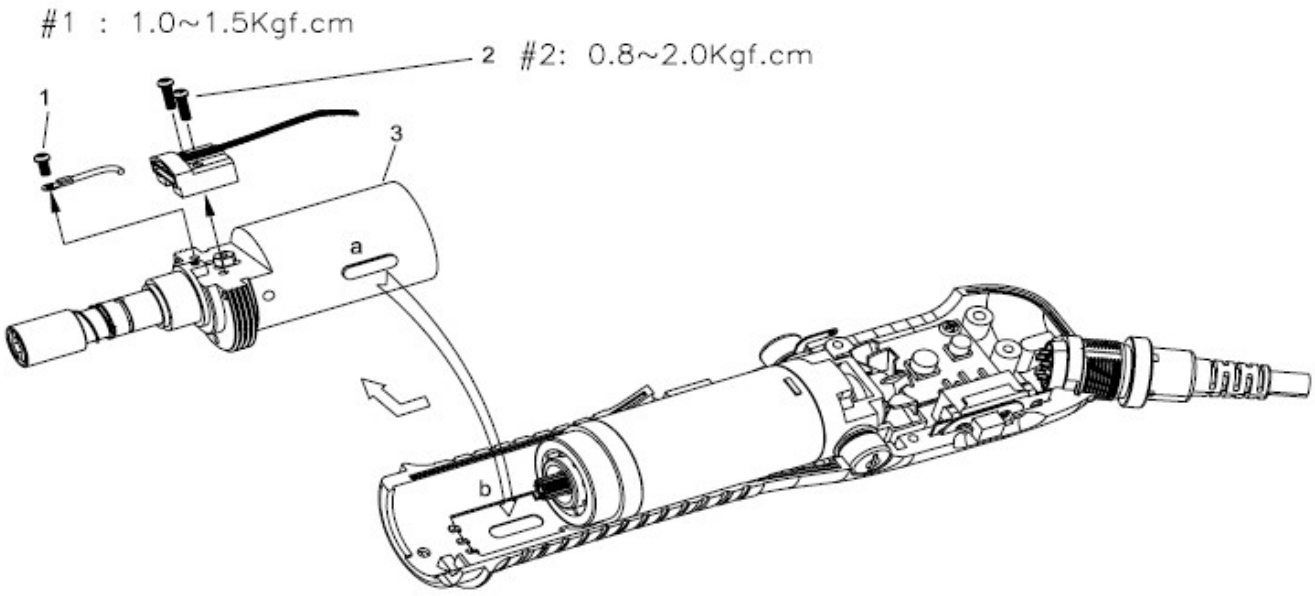
Process

1. Pull the one end of HOOK out, and the other end of HOOK out to "a" direction.
2. Follow the process number on the drawing.
3. Apply the torque of 9~10 Kgf.cm for fastening screw "6".

   Apply the torque of 11.5~12.5 Kgf.cm for fastening screw "2".

   Apply the torque of 7~8 Kgf.cm for fastening screw "9".

9.3 Gear set removal from housing



Process

1. Follow the process number on the drawing.

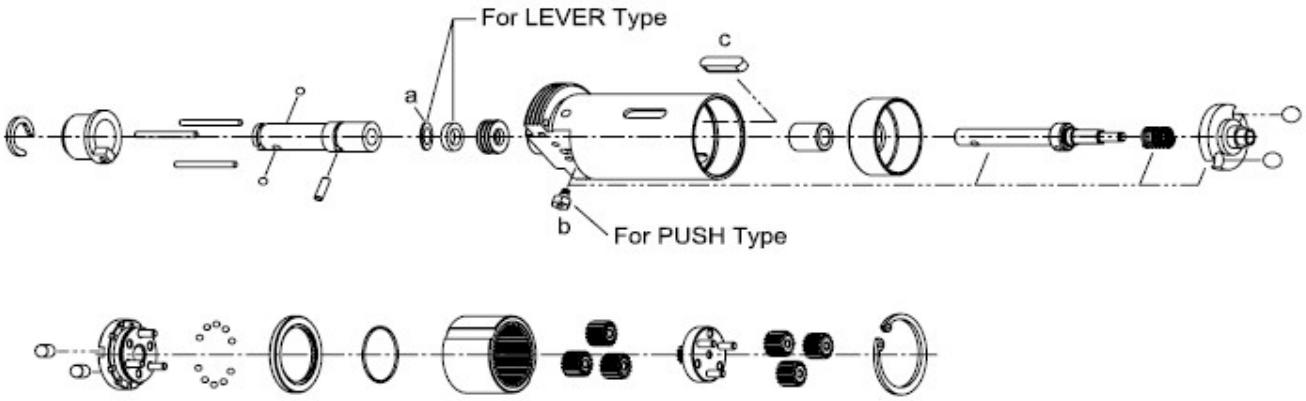
2. the key "a" should fit completely into the groove "b" for assembly again.

3. Apply the torque of 0.8~1.0 Kgf.cm for fastening screw "2".

   (Strongly recommend to fasten the screw by No1 Phillips(+) hand screwdriver).

   Apply the torque of 1.0~1.5 Kgf.cm for fastening screw "1".

9.4 Disassembly of gear set for DO250, DO250P, DO350, DO350P, DO450, DO450P, DOA250, DOA350, DOA450



Process

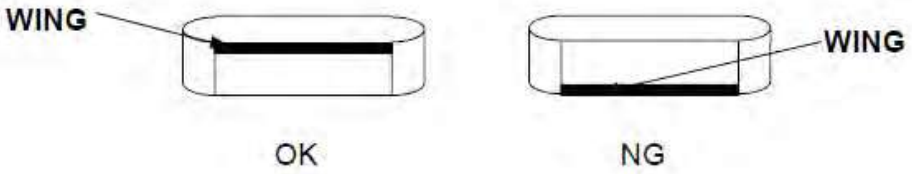
1. Disassemble the housing part according to the exploded drawing.

2. The washer "a" (t=0.2 or 0.3) is supplementary insertion for minimizing gap between the shaft and bit socket.

3. The sensor magnet "b" is for push type only.

4. The key "c" have wings on bottom side. The wings should located inside of the gear case. PIC 9-1

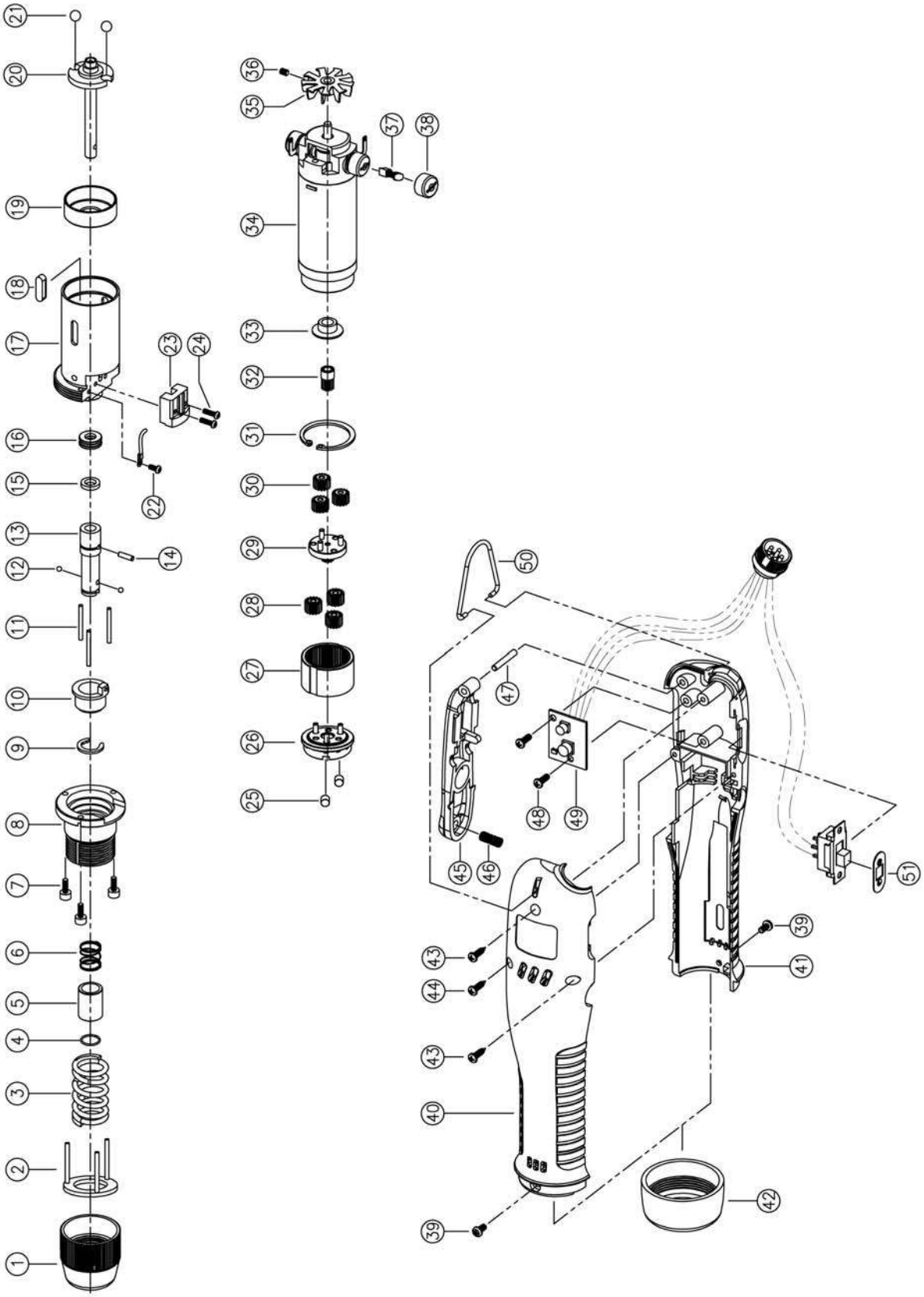
PIC 9-1



5. Apply the grease " sapphire premier NLGI2 " of ROCOL or equivalent products on the gears.

10. Drawings and parts list

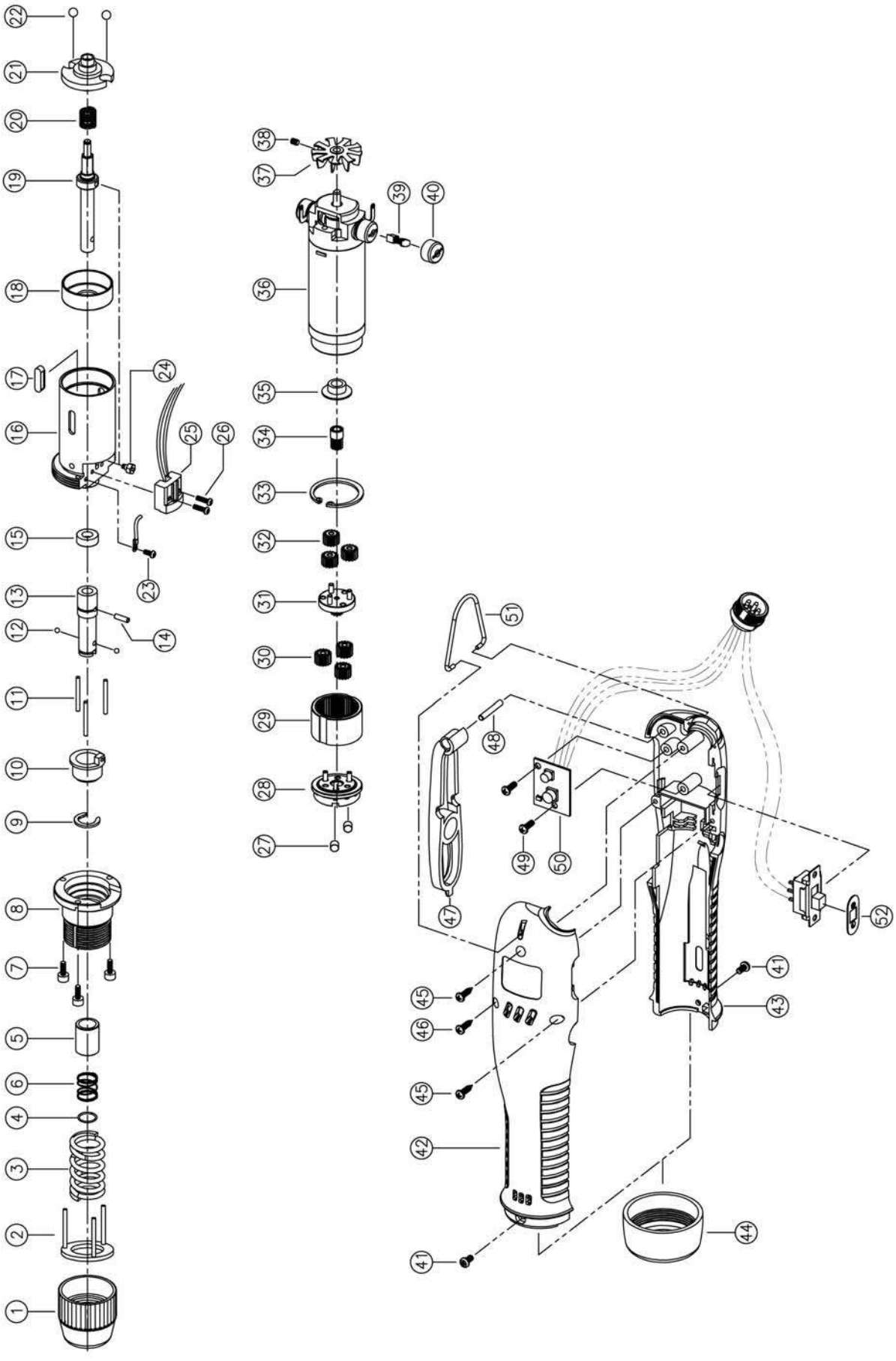
10.1 Drawing for DO Lever



10.2 Drawing for DO Lever

NO.	CODE	DESCRIPTION	DO250A	DO250B	DO350A	DO350B	DO450A	DO450B
1	PKK1801	ADJUSTER	1	1	1	1	1	1
2	PSK1132	TORQUE SPRING HOLDER ASS'Y	1	1	1	1	1	1
3	PSK1817	TORQUE SPRING [BRONZE]	1	1				
3	PSK1815	TORQUE SPRING [SILVER]	1	1	1	1	1	1
3	PKK1814	TORQUE SPRING [GOLD]			1	1	1	1
3	PSK1816	TORQUE SPRING [BLACK]					1	1
4	PAL1973	BIT SOCKET RING	1	1	1	1	1	1
5	PSK1410	BIT COLLAR	1	1	1	1	1	1
6	PSK1964	COLLAR SPRING	1	1	1	1	1	1
7	PSW2204	WRENCH BOLT	3	3	3	3	3	3
8	PKK1131	TOP COVER ASSY	1	1	1	1	1	1
9	PSK1954	C-RING	1	1	1	1	1	1
10	3000031	SLEEVE ASSY DO v3	1	1	1	1	1	1
11	PSK1327	NEEDLE PIN	3	3	3	3	3	3
12	PAL1928	STEEL BALL	2		2		2	
12	PAL1929	STEEL BALL		2		2		2
13	PSK1401	BIT SOCKET A	1		1		1	
13	PSK1402	BIT SOCKET B		1		1		1
14	PAL1231	GEAR HOLDER PIN	1	1	1	1	1	1
15	PSK1347	SPACER	1	1	1	1	1	1
16	PSK1921	THRUST BEARING	1	1	1	1	1	1
17	PKK1107	GEAR CASE ASSY [LEVER]	1	1	1	1	1	1
18	PKK1911	KEY	1	1	1	1	1	1
19	PKK1319	SLIDE RING	1	1	1	1	1	1
20	PKK1302	SHAFT [LEVER]	1	1	1	1	1	1
21	PAL1935	STEEL BALL	2	2	2	2	2	2
22	PSW2205	SCREW	1	1	1	1	1	1
23	3000038	SENSOR ASSY 3K(L)	1	1	1	1	1	1
24	PSW2211	SCREW	2	2	2	2	2	2
25	PKK1910	ROLLER	2	2	2	2	2	2
26	PKK1105	CLUTCH ASSY	1	1				
26	PKK1106	CLUTCH ASSY B			1	1	1	1
27	PKK1232	RING GEAR	1	1	1	1	1	1
28	PKK1207	IDLE GEAR (13T)	3	3				
28	PKK1208	IDLE GEAR B (16T)			3	3	3	3
29	PKK1103	1ST GEAR HOLDER ASSY B	1	1				
29	PKK1102	1ST GEAR HOLDER ASSY			1	1		
29	PKK1112	1ST GEAR HOLDER ASSY C					1	1
30	PKK1207	IDLE GEAR (13T)	3	3	3	3		
30	PKK1208	IDLE GEAR B (16T)					3	3
31	PKK1902	SNAP RING	1	1	1	1	1	1
32	PKK1235	PINION GEAR	1	1	1	1		
32	PKK1236	PINION GEAR B					1	1
33	PKK1820	WASHER	1	1	1	1	1	1
34	PKK4005	MOTOR ASSY	1	1	1	1	2	2
35	PKK1808	FAN	1	1	1	1	1	1
36	PSW2303	SET SCREW	1	1	1	1	1	1
37	PKK4100	CARBON BRUSH ASSY	2	2	2	2	2	2
38	PEF4057	BRUSH CAP	2	2	2	2	2	2
39	PSW2302	SCREW	2	2	2	2	2	2
40	PKK1827	UPPER HOUSING	1	1	1	1	1	1
40	5000016	UPPER HOUSING [ESD]	1	1	1	1	1	1
41	PKK1828	LOWER HOUSING	1	1	1	1	1	1
41	5000017	LOWER HOUSING [ESD]	1	1	1	1	1	1
42	PKK1802	HOUSING NUT	1	1	1	1	1	1
43	PSW2701	SCREW	2	2	2	2	2	2
44	PSW2703	SCREW	1	1	1	1	1	1
45	3000104	LEVER ASSY [ESD]	1	1	1	1	1	1
45	3000341	LEVER ASSY	1	1	1	1	1	1
46	PKK1841	LEVER SPRING	1	1	1	1	1	1
47	PEK1840	LEVER PIN	1	1	1	1	1	1
48	PSW2702	SCREW	2	2	2	2	2	2
49	3000112	CONTROL SET [DO LEVER]	1	1	1	1	1	1
50	PEK1803	HOOK	1	1	1	1	1	1
51	QKK0420	SWITCH COVER LABEL	1	1	1	1	1	1

10.3 Drawing for DO Push



10.4 Drawing for DO Push

NO.	CODE	DESCRIPTION	DO250PA	DO250PB	DO350PA	DO350PB	DO450PA	DO450PB
1	PKK1801	ADJUSTER	1	1	1	1	1	1
2	PSK1132	TORQUE SPRING HOLDER ASSY	1	1	1	1	1	1
3	PSK1817	TORQUE SPRING [BRONZE]	1	1	1	1		
3	5000137	TORQUE SPRING [SILVER]	1	1				
3	PSK1815	TORQUE SPRING [SILVER]			1	1	1	1
3	PKK1814	TORQUE SPRING [GOLD]					1	1
4	5000471	BIT SOCKET RING	1		1		1	
4	PAL1973	BIT SOCKET RING		1		1		1
6	5000455	BIT COLLAR	1		1		1	
6	5000059	COLLAR B		1		1		1
7	5000472	COLLAR SPRING A	1		1		1	
7	5000063	COLLAR SPRING		1		1		1
7	PSW2204	WRENCH BOLT	3	3	3	3	3	3
8	PKK1131	TOP COVER ASSY	1	1	1	1	1	1
9	PSK1954	C-RING	1	1	1	1	1	1
10	3000031	SLEEVE ASSY	1	1	1	1	1	1
11	PSK1327	NEEDLE PIN	3	3	3	3	3	3
12	PAL1929	STEEL BALL	2	2	2	2	2	2
13	5000318	BIT SOCKET A	1		1		1	
13	5000319	BIT SOCKET B		1		1		1
14	PAL1231	GEAR HOLDER PIN	1	1	1	1	1	1
15	5000555	SPACER	1	1	1	1	1	1
16	PKK1108	GEAR CASE ASSY[PUSH]	1	1	1	1	1	1
17	PKK1911	KEY	1	1	1	1	1	1
18	PKK1319	SLIDE RING	1	1	1	1	1	1
19	3000547	PUSH SHAFT ASSY	1	1	1	1	1	1
20	PSK1963	SPRING [PUSH START]	1	1	1	1	1	1
21	PKK1305	SHAFT [BALL HOLDING TYPE]	1	1	1	1	1	1
22	PAL1935	STEEL BALL	2	2	2	2	2	2
23	PSW2205	SCREW [M PHILIPS M2.3x5L]	1	1	1	1	1	1
24	PSK1113	MAGNET HOLDER ASSY	1	1	1	1	1	1
25	3000039	SENSOR ASSY 3K(P)	1	1	1	1	1	1
26	PSW2211	SCREW	2	2	2	2	2	2
27	PKK1910	ROLLER	2	2	2	2	2	2
28	PKK1105	CLUTCH ASSY	1	1				
28	PKK1106	CLUTCH ASSY B			1	1	1	1
29	PKK1232	RING GEAR	1	1	1	1	1	1
30	PKK1207	IDLE GEAR (13T)	3	3				
30	PKK1208	IDLE GEAR B (16T)			3	3	3	3
31	PKK1103	1ST GEAR HOLDER ASSY B	1	1				
31	PKK1102	1ST GEAR HOLDER ASSY			1	1		
31	PKK1112	1ST GEAR HOLDER ASSY C					1	1
32	PKK1207	IDLE GEAR (13T)	3	3	3	3		
32	PKK1208	IDLE GEAR B (16T)					3	3
33	PKK1902	SNAP RING	1	1	1	1	1	1
34	PKK1235	PINION GEAR	1	1	1	1		
34	PKK1236	PINION GEAR B					1	1
35	PKK1820	WASHER	1	1	1	1	1	1
36	PKK4005	MOTOR ASSY	1	1	1	1	1	1
37	PKK1808	FAN	1	1	1	1	1	1
38	PSW2303	SET SCREW	1	1	1	1	1	1
39	PKK4100	CARBON BRUSH ASSY	2	2	2	2	2	2
40	PEF4057	BRUSH CAP	2	2	2	2	2	2
41	PSW2302	SCREW	2	2	2	2	1	1
42	PKK1827	UPPER HOUSING	1	1	1	1	1	1
42	5000016	UPPER HOUSING [ESD]	1	1	1	1	1	1
43	PKK1828	LOWER HOUSING	1	1	1	1	1	1
43	5000017	LOWER HOUSING [ESD]	1	1	1	1	1	1
44	PKK1802	HOUSING NUT	1	1	1	1	1	1
45	PSW2701	SCREW	2	2	2	2	2	2
46	PSW2703	SCREW	1	1	1	1	1	1
47	PKK1819	ATTACHMENT	1	1	1	1	1	1
47	5000019	ATTACHMENT [ESD]	1	1	1	1	1	1
48	PEK1840	LEVER PIN	1	1	1	1	1	1
49	PSW2702	SCREW	2	2	2	2	2	2
50	3000113	CONTROL SET [DO PUSH]	1	1	1	1	1	1
51	PEK1803	HOOK	1	1	1	1	1	1
52	QKK0420	SWITCH COVER LABEL	1	1	1	1	1	1

11. Partial check and repair

11.1 Controller check (XS series)

STEP 1. Select the range of analog multi tester on 'DC50V'.
*** We Strongly recommend Analog tester during service.

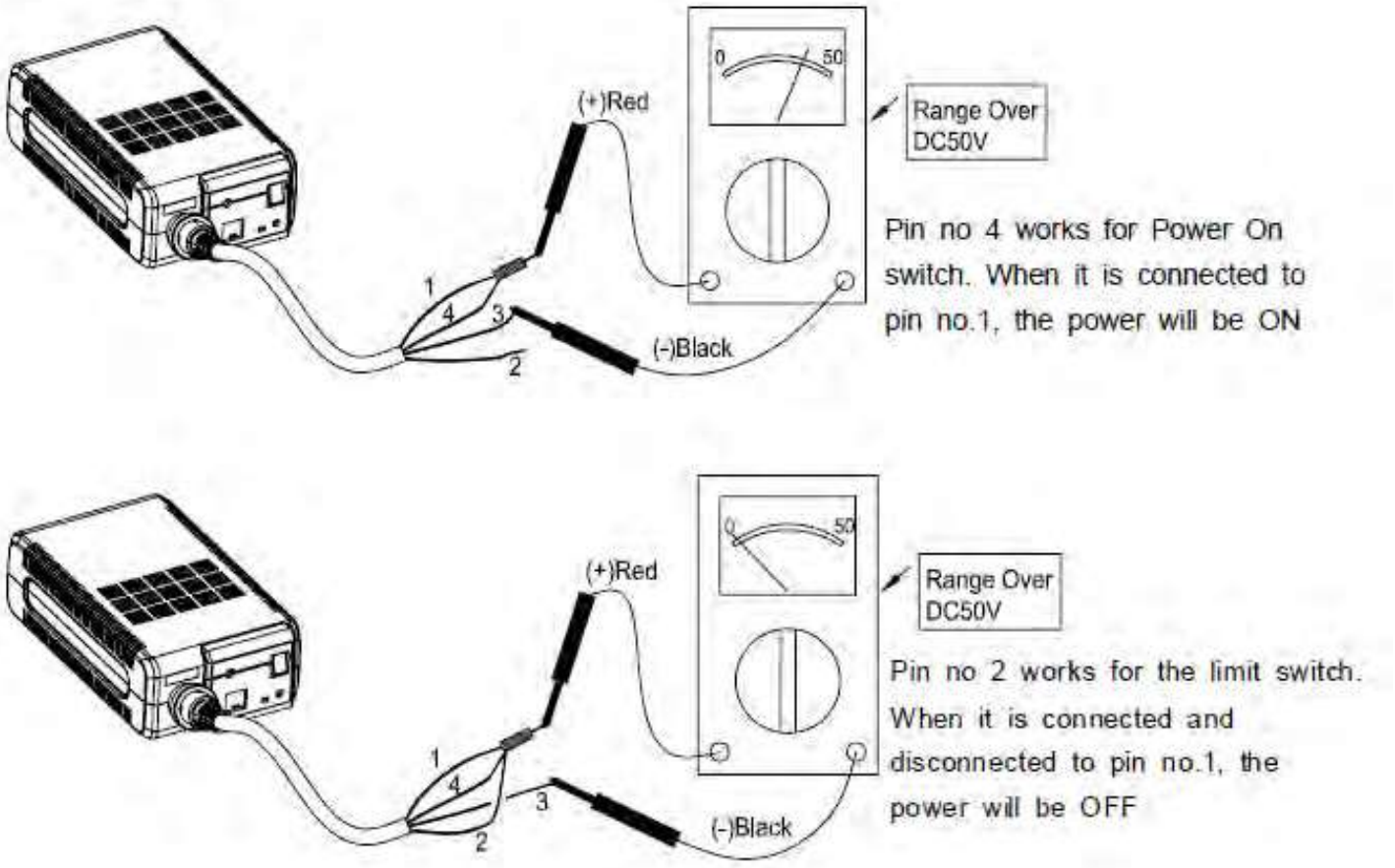
STEP 2. Select the controller mode on 'HIGH'
.
STEP 3. Check the output voltage between pin #1 and #3 at 30V or 40V MODE.
Pin #4 should be connected to pin #1 for this test.

STEP 4. When the pin #2 is connected and disconnected to the pin #1, the shown output voltage should disappear (0 V).

EVALUATION

CONTROLLER	OUTPUT VOLTAGE		EVALUATION	ACTION
	30V MODE	40V MODE		
XS-38D	0~27V	0~35V	NG	REPLACE
	28~32V	36~40V	OK	go to next process

PIC 1-1



11.2 Cable 5 or 6pin check [1]

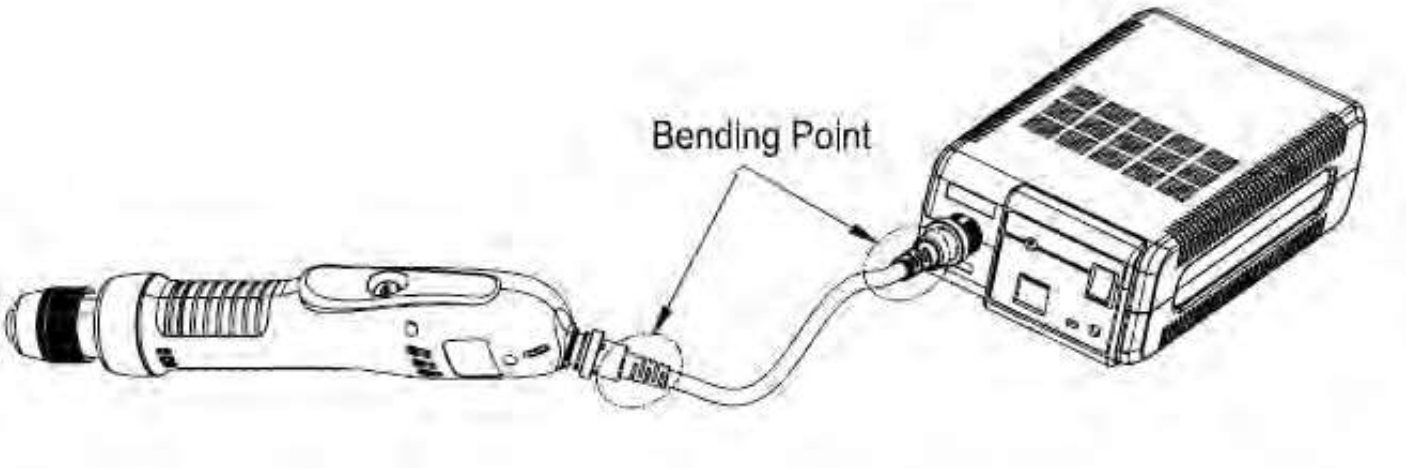
STEP 1. If the driver does not run, go to chap. 11-3.

STEP 2. Keep the driver running, and bend the cord to the variable direction (PIC. 2-1).

EVALUATION

If you find any bad connection on Cable 5pin or 6pin, replace it.

PIC. 2-1



11.3 Cable 5 or 6pin check [2]

STEP 1. Be sure that the cable is disconnected.

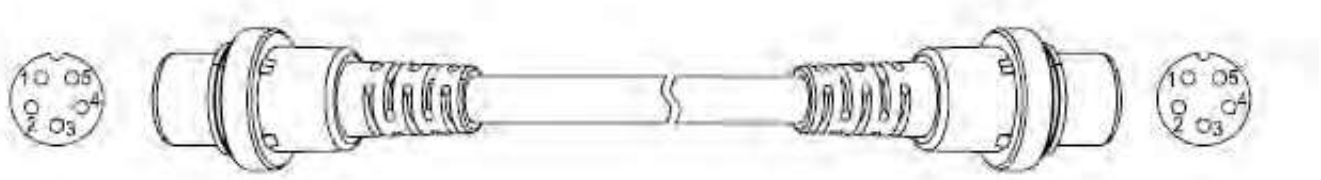
STEP 2. Select the range of analog multi tester on 'R x 1'.

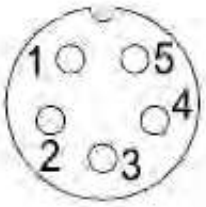
STEP 3. Test each resistance between terminals of cable 5 or 6pin. (PIC.3-1)

EVALUATION

RESULT	EVALUATION	ACTION
Resistance "Ω" (open)	NG	replace
Resistance "0" (closed)	OK	go to the next process

PIC 3-1





11.4 Motor set check

STEP 1. Check carbon brush assy (go to 11-6).

STEP 2. Be sure that the cable 5 or 6pin is disconnected.

STEP 3. Be sure that the slide switch assy should be on neutral position.

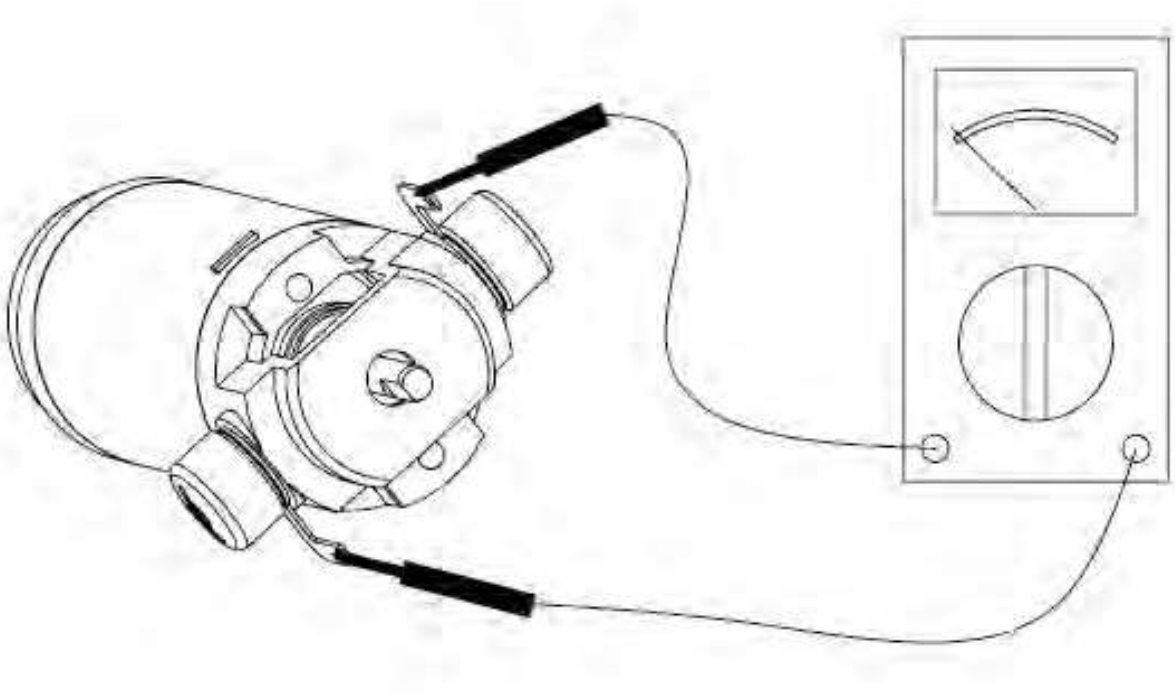
STEP 4. Select the range of analog multi tester on 'R x 1'.

STEP 5. Check the resistance between terminals(PIC 4-1).

EVALUATION

	RESULT	EVALUATION	ACTION
DO MOTOR	40~46	OK	go to the next process
DO MOTOR	0~39	NG	Replace

PIC 4-1



11.5 Slide switch check

STEP 1. Be sure that no power on.

STEP 2. Remove lead wires(red,black) between slide switch and motor set.

STEP 3. Select the range of analog multi tester on 'R x 1' or short circuit check mode.

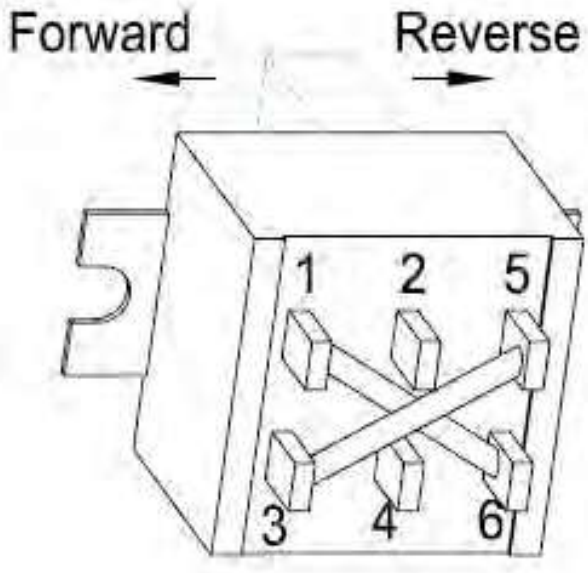
STEP 4. Check the short circuit between the leads shown on the table and (PIC. 5-1).

SWITCH MODE	RESISTANCE CHECKING POINTS	EVALUATION	ACTION (IF NG)
FOR	1 AND 2	RESISTANCE "0" OR SHORTCIRCUIT (CLOSED) IS "OK" RESISTANCE "∞ "(OPEN) IS "NG"	REPLACE SLIDE SWITCH
	3 AND 4		
REV	2 AND 5		
	4 AND 6		

EVALUATION

If you find any failure of short circuit, repair(if possible) or replace it.

PIC 5-1



11.6 Carbon brush assy check

STEP 1. Disconnect the cable 5 or 6pin.

STEP 2. Open both brush caps, and pull out the carbon brush assys.

STEP 3. Inspect whether carbon brush assys are right position, and they should be authorized ones by Doga.

STEP 4. Check each Length of carbon brush is enough long.

STEP 5. Check the electric wire connection.

EVALUATION

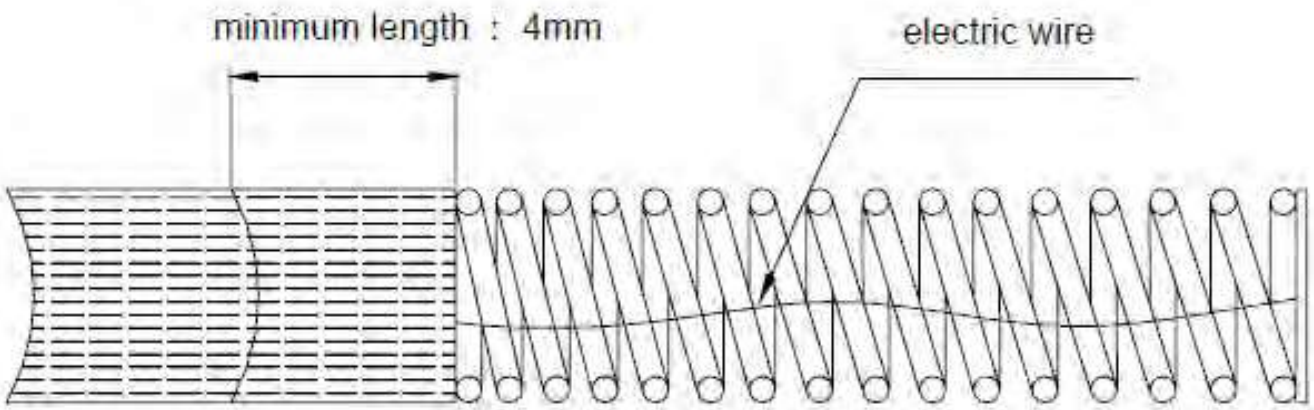
Replace carbon brush assys, if :

- The length is shorter than 4mm

- Electric wire is cut or has bad connection

(When you need to replace carbon brush assy, you should replace both carbonbrush assys at once. even if one is in a good condition.)

PIC 6-1



11.7 Gear set check

STEP 1. Inspect idle gears inside of gear case by visual (PIC 8-1).

STEP 2. Turn the bit in a direction, then the idle gears should run freely (PIC.7-2).

STEP 3. Check the sleeve assy and magnet holder assy (8-1).

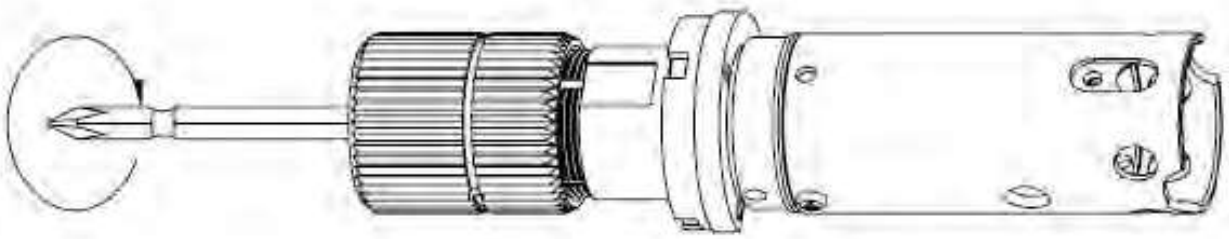
STEP 4. Check the position of magnet holder assy (8-2).

EVALUATION

- Replace damaged part, if it is wear, tear, or broken (**see chapter 9**)
- Clean up, if it doesn't turn freely or you can see a mote, dust, other particle inside gear case
- Replace sleeve assy, if it is wear, tear, or broken
- Correct the position and adjust its alignment

PIC 7-1

PIC 7-2



11.8 Sleeve assy, magnet holder assy check

STEP 1. Magnet check

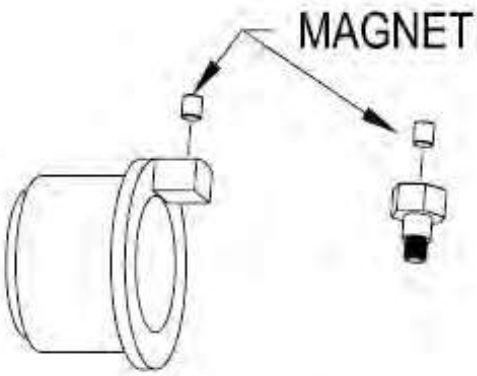
Any worn, broken and wrong positioned magnet should be replaced.

PIC 8-1 is shown the right position of magnet on sleeve assy and magnet holder assy.

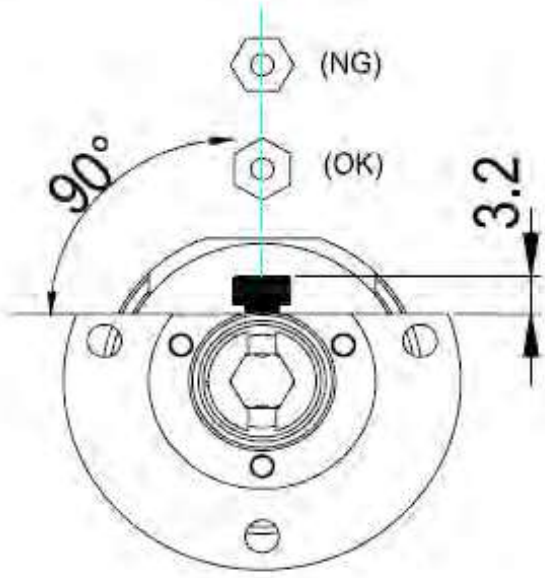
Be sure the right alignment on PIC 8-2 between gear case and magnet holder assy.

*** The position of magnet of magnet holder assy is very important on assembling of Push start driver.

PIC 8-1



PIC 8-2 Magnet holder assy alignment.



11.9 Sensor assy function check

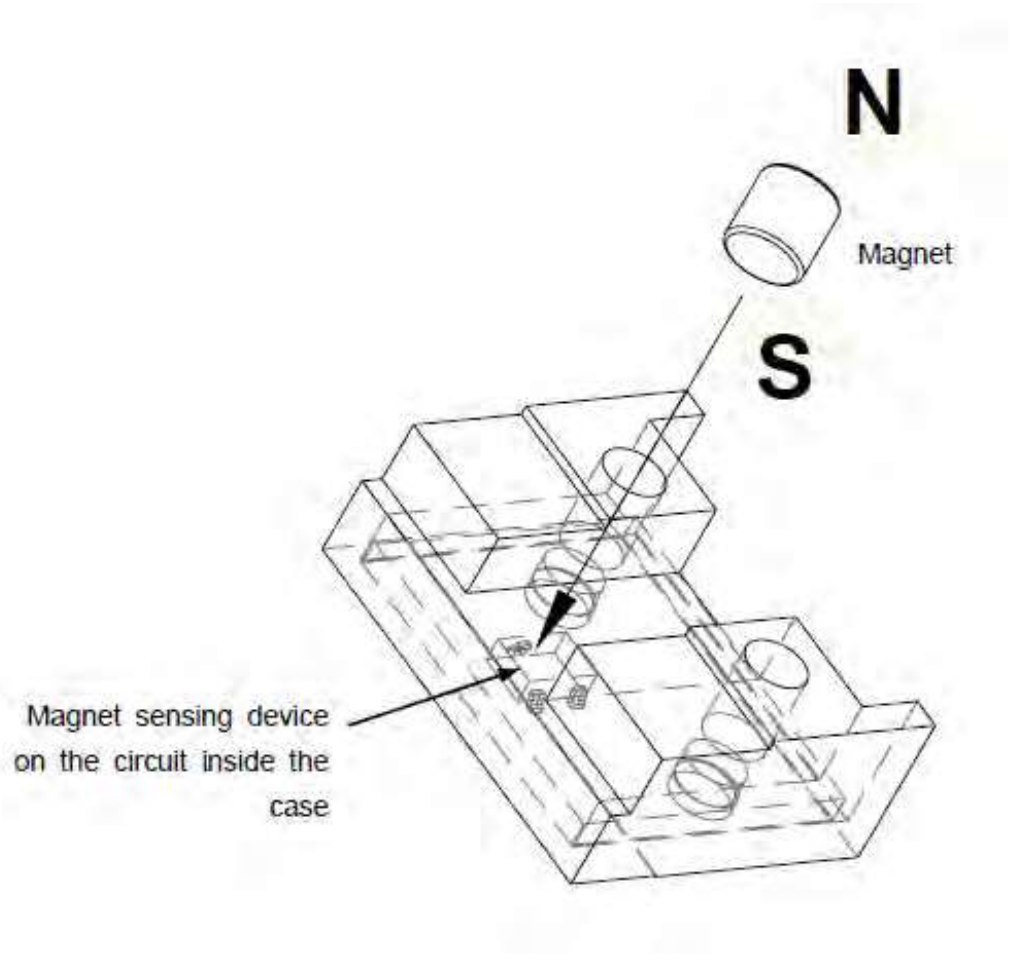
STEP 1. Open the housings and disassemble the sensor assy from gear set.

STEP 2. Keep the motor running by pressing the lever and scan around the sensor case by moving the magnet of sleeve assy. The sensor device works with the North pole magnet.

STEP 3. The motor should stop when the north pole magnet appears and disappears around the sensing device.

STEP 4. For push start driver, use one more magnet for the motor running.
The sensor assy for push start driver has two sensing devices on the circuit board inside the case.

PIC 9-1 sensor assy cheaking point



11.10 Wiring check

STEP 1. Open the upper housing.

STEP 2. Inspect all wiring connection is correct according to **chapter 5.**

STEP 3. Find out any wire cut, evidence of arc and poor condition of connection.

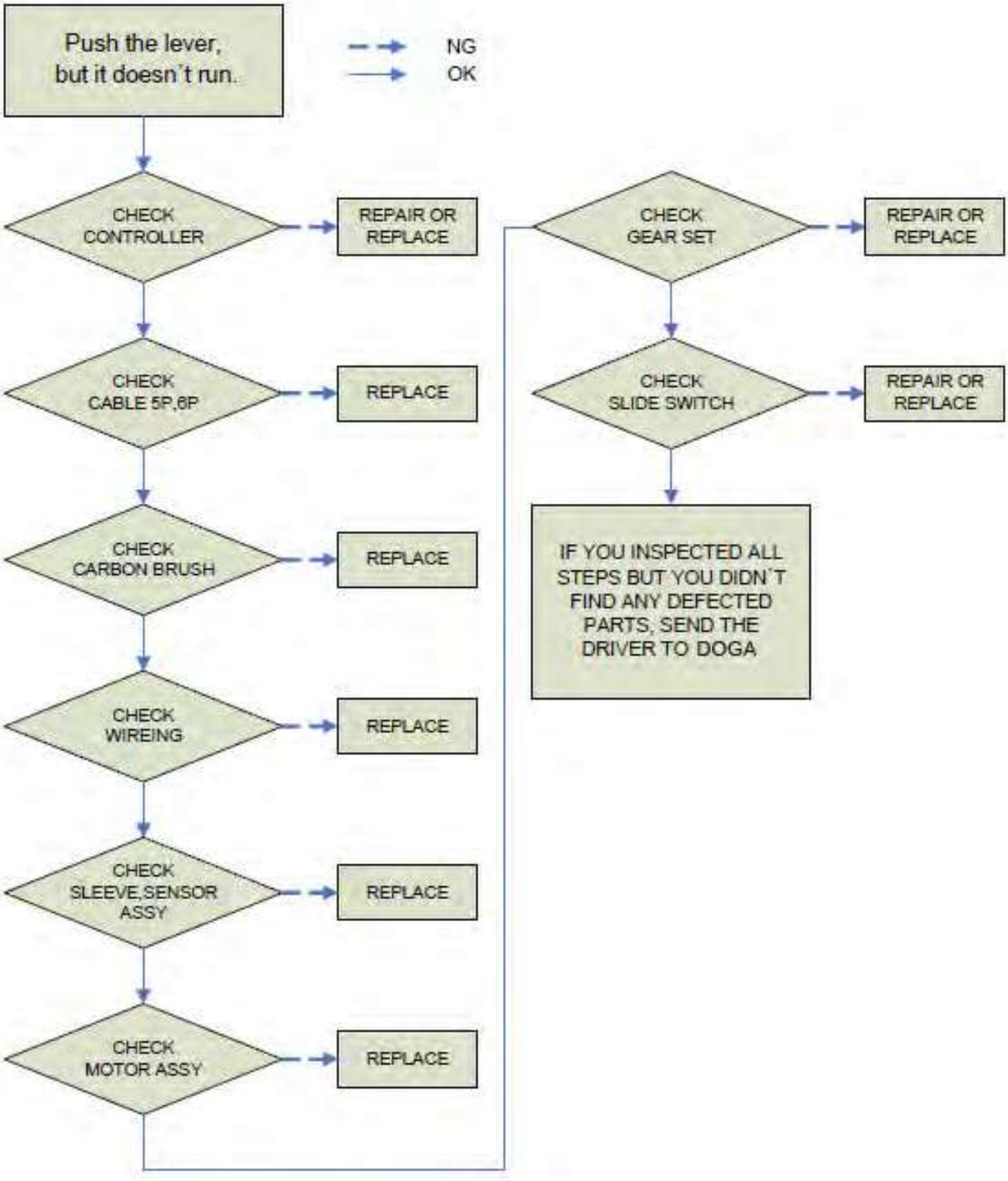
EVALUATION

-Replace if you find any damage, cut, or melted wire.

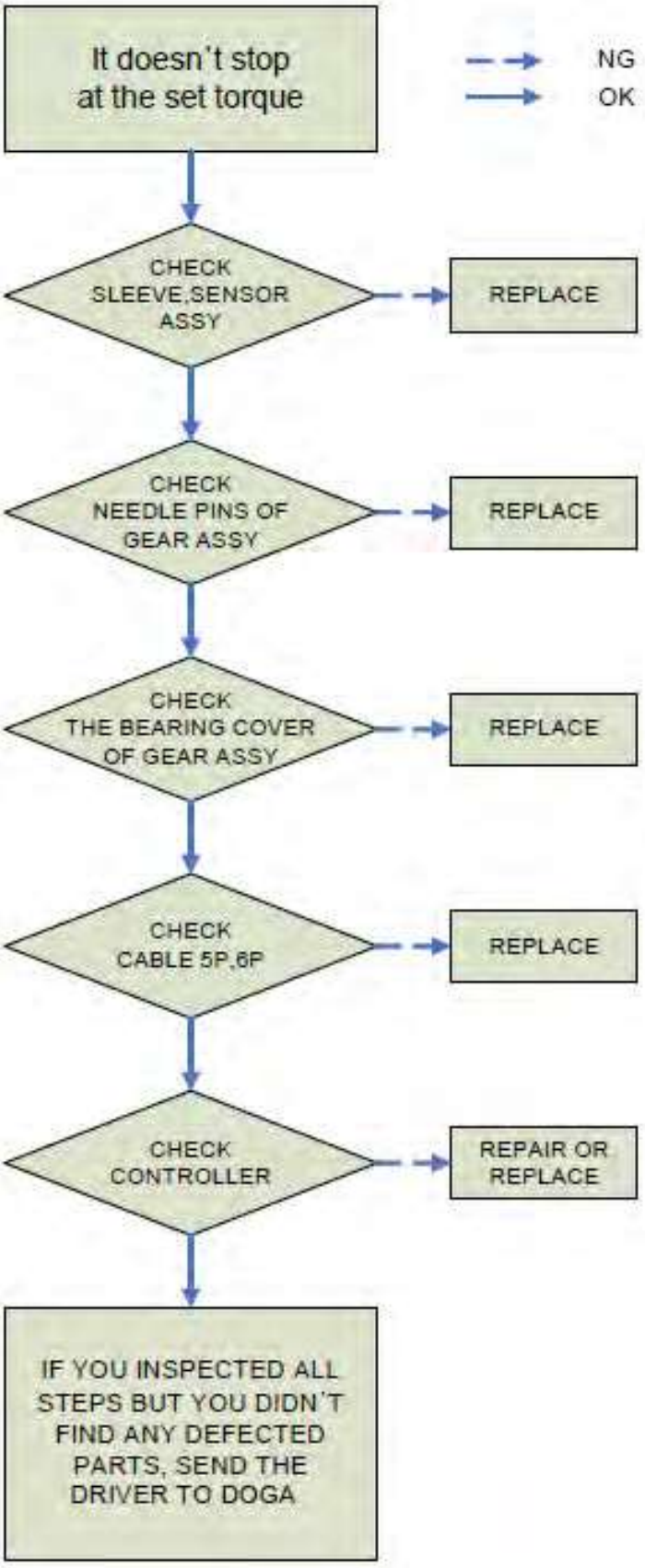
-Resolder if you find any poor condition of connections.

12. Trouble shooting

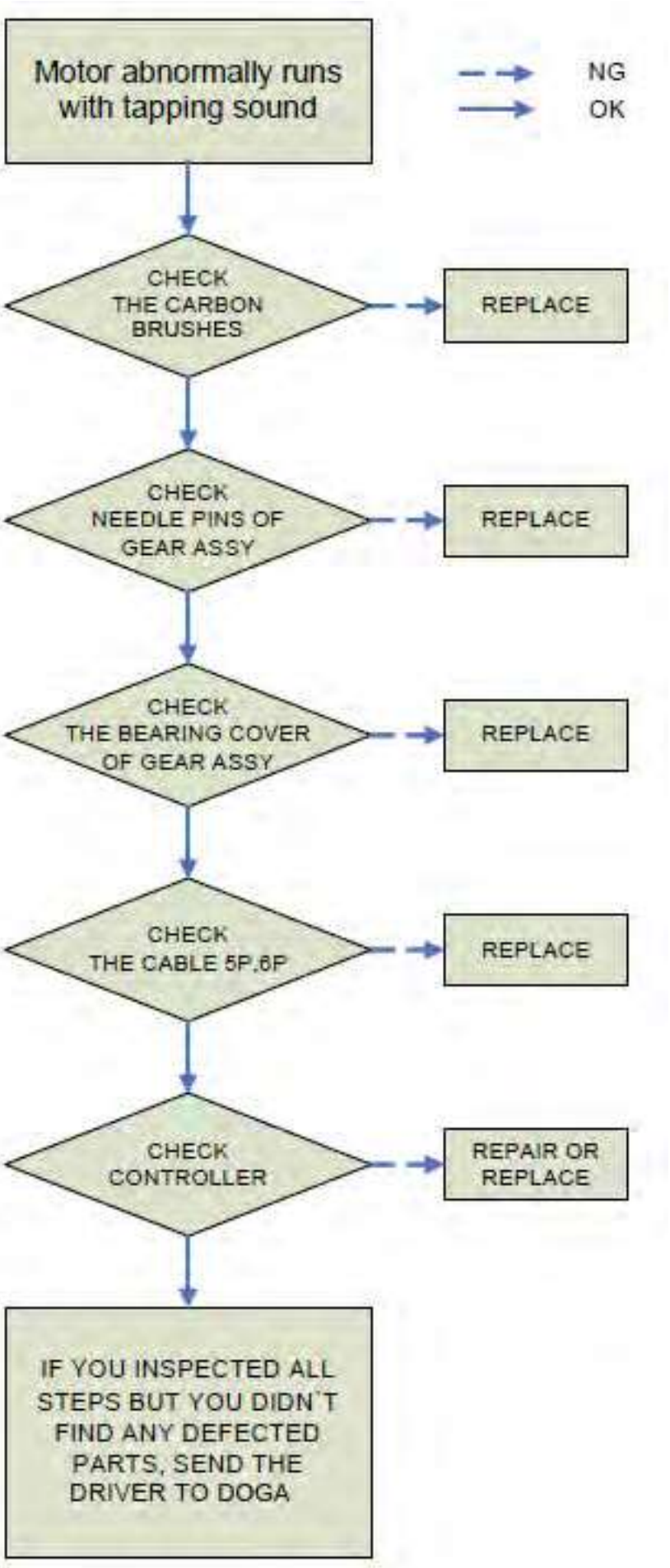
12.1 It doesn't work



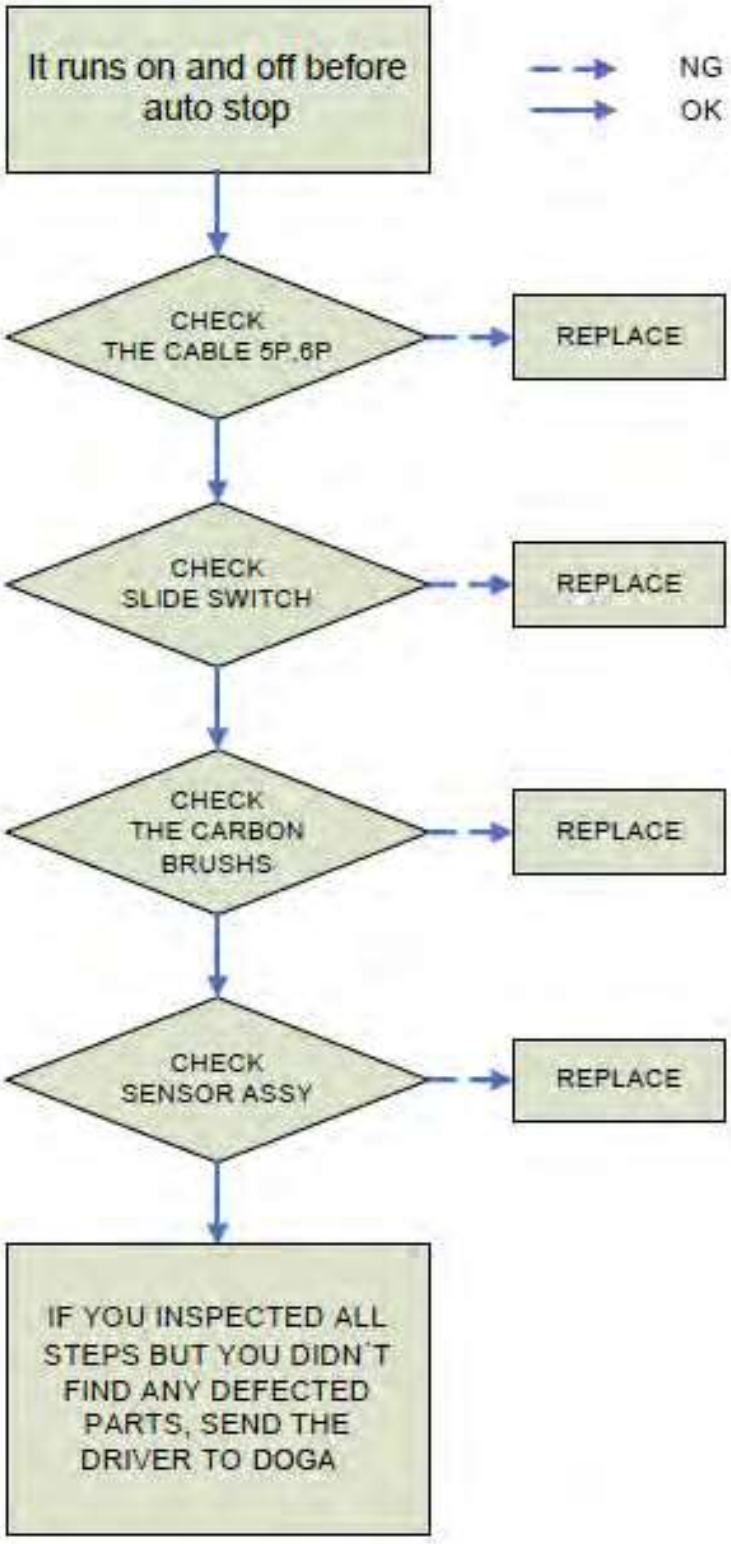
12.2 It doesn't stop at the set torque



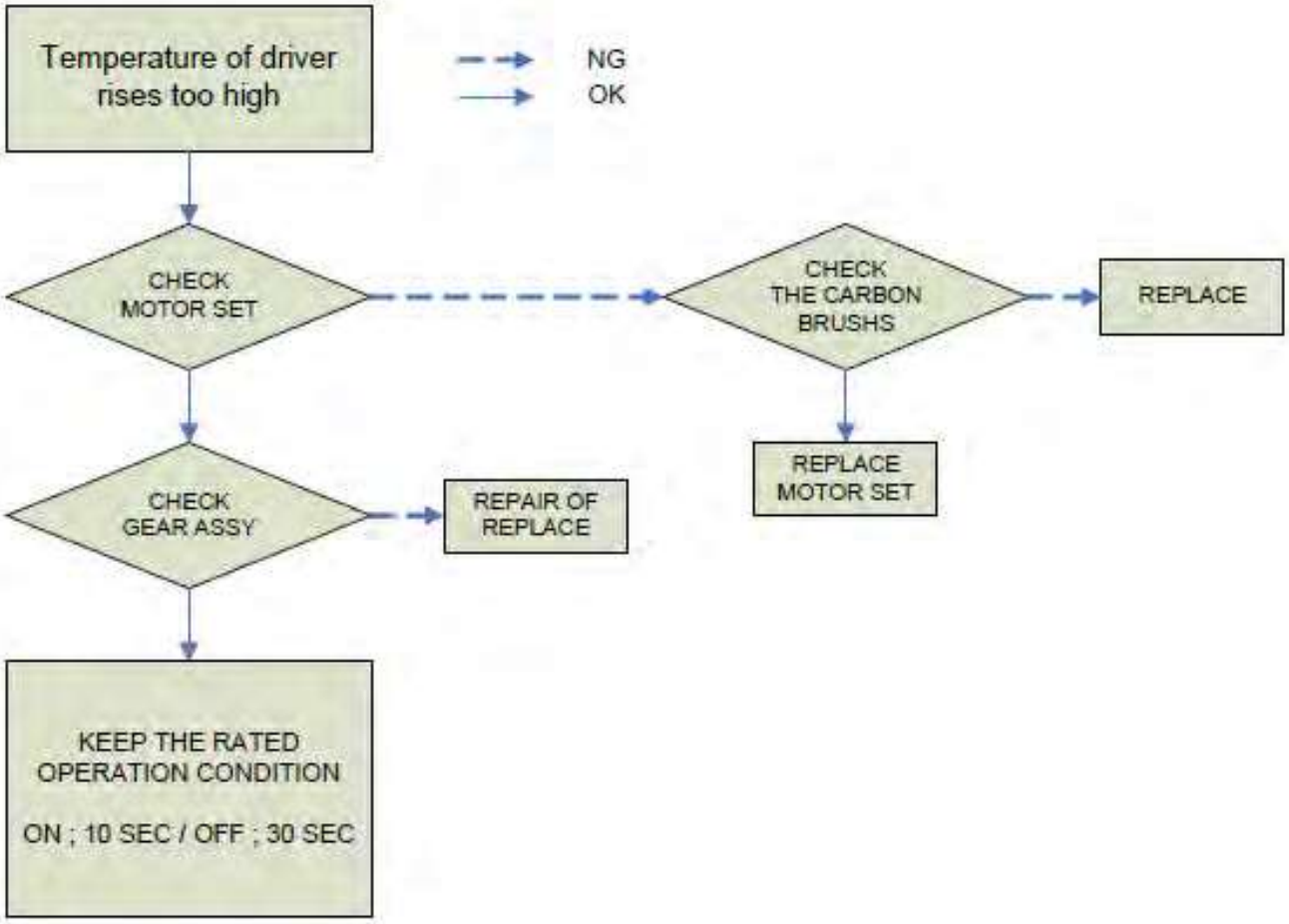
12.3 Motor abnormally runs with tapping sound



12.4 It runs on and off before auto stop



12.5 Temperature of driver rises too high



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