

# PARTS & SERVICE NEWS

REF NO.	AT03116
DATE	Jul. 3, 2003
(C)	Page 1 of 25

**SUBJECT:** REPAIR PROCEDURE OF JUMP START PROTECTION FOR NIKKO STARTER

**PURPOSE:** To introduce jump start preventing cover for the starting motors and safety relays made by Nikko Elc.

**APPLICATION:** Refer to page 17 thru 25

**FAILURE CODE:** AB30Z9

**DESCRIPTION:**

1. Introduction

The cover has been developed to cover up the terminal of the starting motor and safety relay to prevent making jump start of the starting motor by short-circuiting the terminals of the starting motor/safety relay directly using a tool. The jump start preventing cover will be introduced in this Service News.

The jump start preventing cover being introduced in this Service News is applicable to the starting motors and safety relays made by Nikko Elc..

Regarding the starting motors made by Denso, refer to the separate Service News No. "AT02169".

2. Jump start preventing cover

1) Purpose

- To prevent making jump start of the starting motor by short-circuiting the terminals of the starting motor directly by use of some tool like a screw-driver, a resin made cover has been developed to cover up the terminals.  
(In case of the jump start preventing cover for the starting motors and safety relays made by Nikko Elc., resin made nut is necessary in addition.)
- This modification is being implemented for all the models of the construction machinery being produced in Komatsu factories. Regarding the separately sold engines, they will also be equipped with the above cover in case the part number of the starting motor is the same as the one being installed to Komatsu construction machineries. Those engines which are being exclusively sold separately will not be equipped with this cover. Also, the machines in the field are not equipped with this cover.

2) Background

This modification has been made since some users sometimes start the starting motor by making direct short circuiting by use of some tool like a screw driver for some reasons, while the starting motor should normally be started by use of the starting switch key. The above cover has been developed to prevent the jump start.

3) Details of the modification and applicable machine models refer to pages 4 thru 7 and 17 thru 25.

4) Interchangeability

- This cover (and resin made nut), is not usable, as independent parts, for the current starting motors.  
It is necessary to replace the cover related parts in kit when installing this jump start preventing cover as spare parts.
- They are interchangeable in the kit only.  
Refer to the interchangeability list being indicated on page 3 and 14 thru 16.

5) Prohibitions

- In case this cover (and resin made nut) is removed for some maintenance purpose, be sure to install the cover back to the original state. It is strictly prohibited to keep this cover left without installation.

3. Jump start prohibiting caution label

Since the jump start preventing cover is installed, the caution label shown below will be attached to the starting motor. Also, the caution label will also be attached to the machine when necessary.



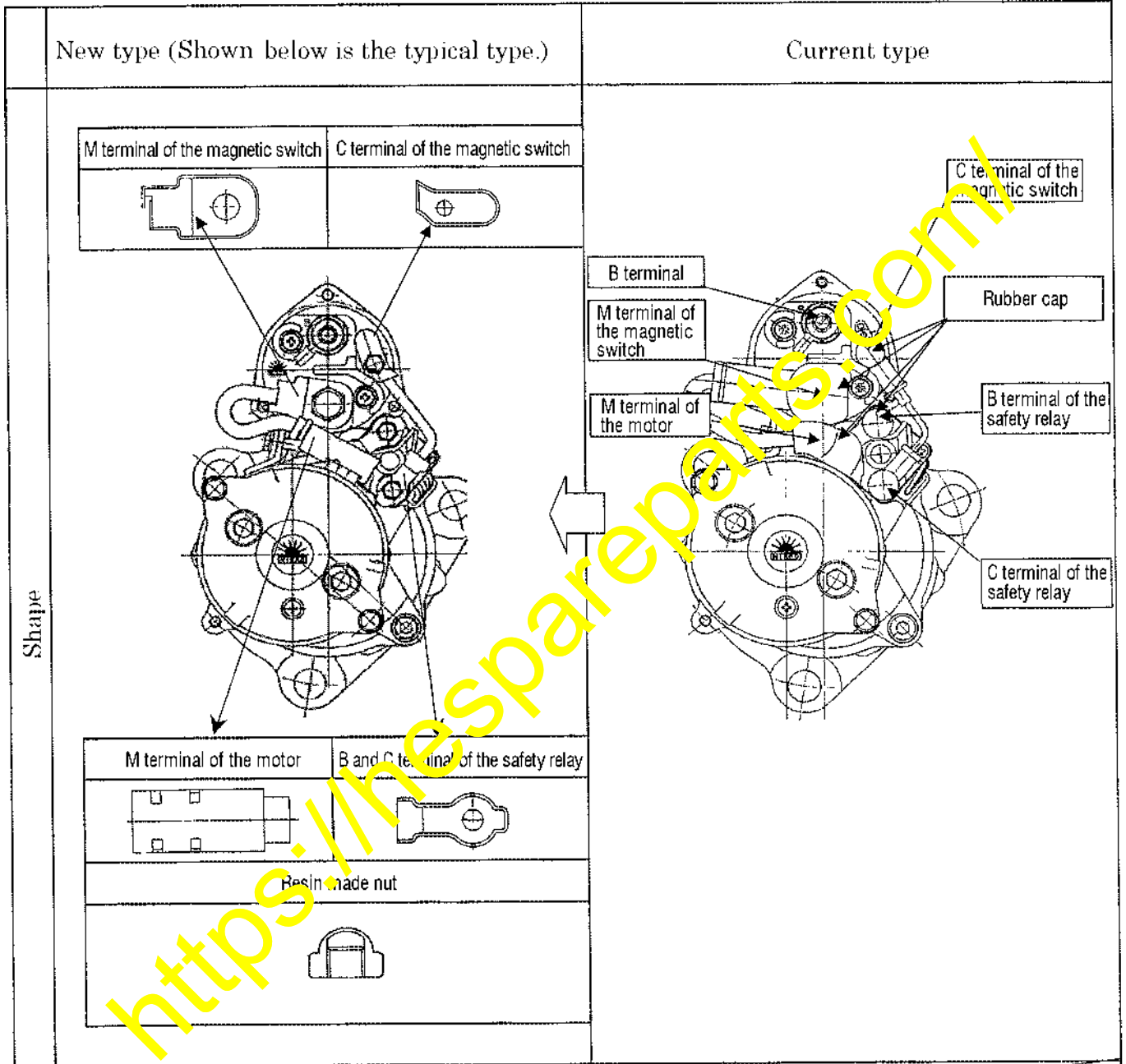
40mm × 40mm



5. Comparison of specifications between the new type (jump start preventing type) and the current type

1) Nikko Electric's reduction type

- Refer to the drawing shown below regarding the shape with and without the cover.
- The cover and the nut are to be installed to the following terminals.



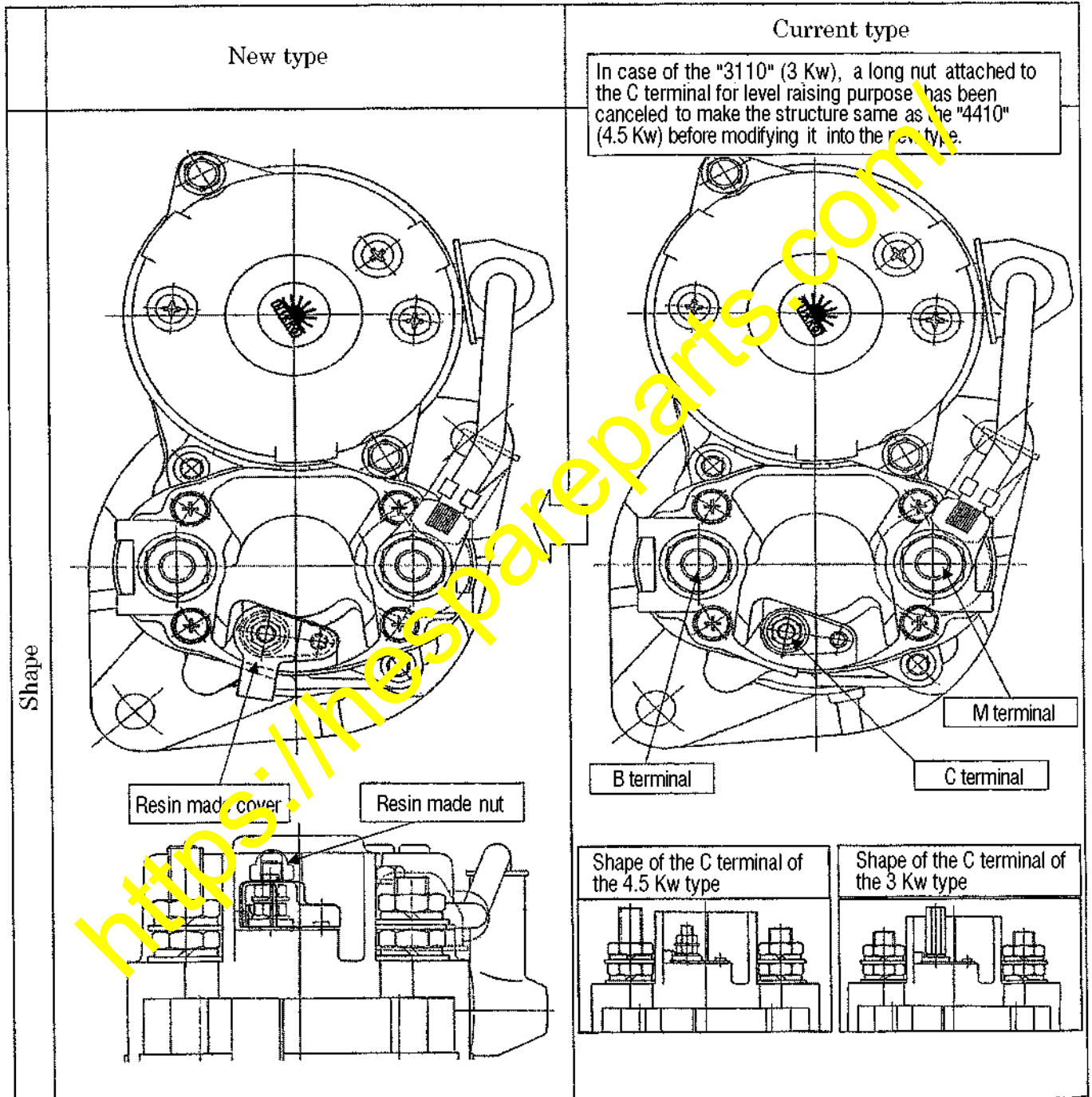
Changed point	New type	Current type	Remarks
a Terminal protection	Cover and resin made nut	Rubber cap	
b Material of the cover	Nylon 66	_____	
c Resin made nut	Attached.	_____	

2) Nikko Electric's Nose-less type

- Refer to the drawing shown below regarding the shape with and without the cover.
- The resin made cover and nut are to be installed to the C terminal.

When installing the above cover and nut, since the above resin made cover is to be installed over the existing metal nut, it becomes necessary to tighten the resin made nut to fasten the cover.

Part number of the applicable current parts
600-863-3110 (3Kw)
600-813-4410 (4.5Kw)
600-813-4610 (4.5Kw)



In case of the "3110" (3 Kw), a long nut attached to the C terminal for level raising purpose has been canceled to make the structure same as the "4410" (4.5 Kw) before modifying it into the new type.

Shape

Resin made cover      Resin made nut

Shape of the C terminal of the 4.5 Kw type

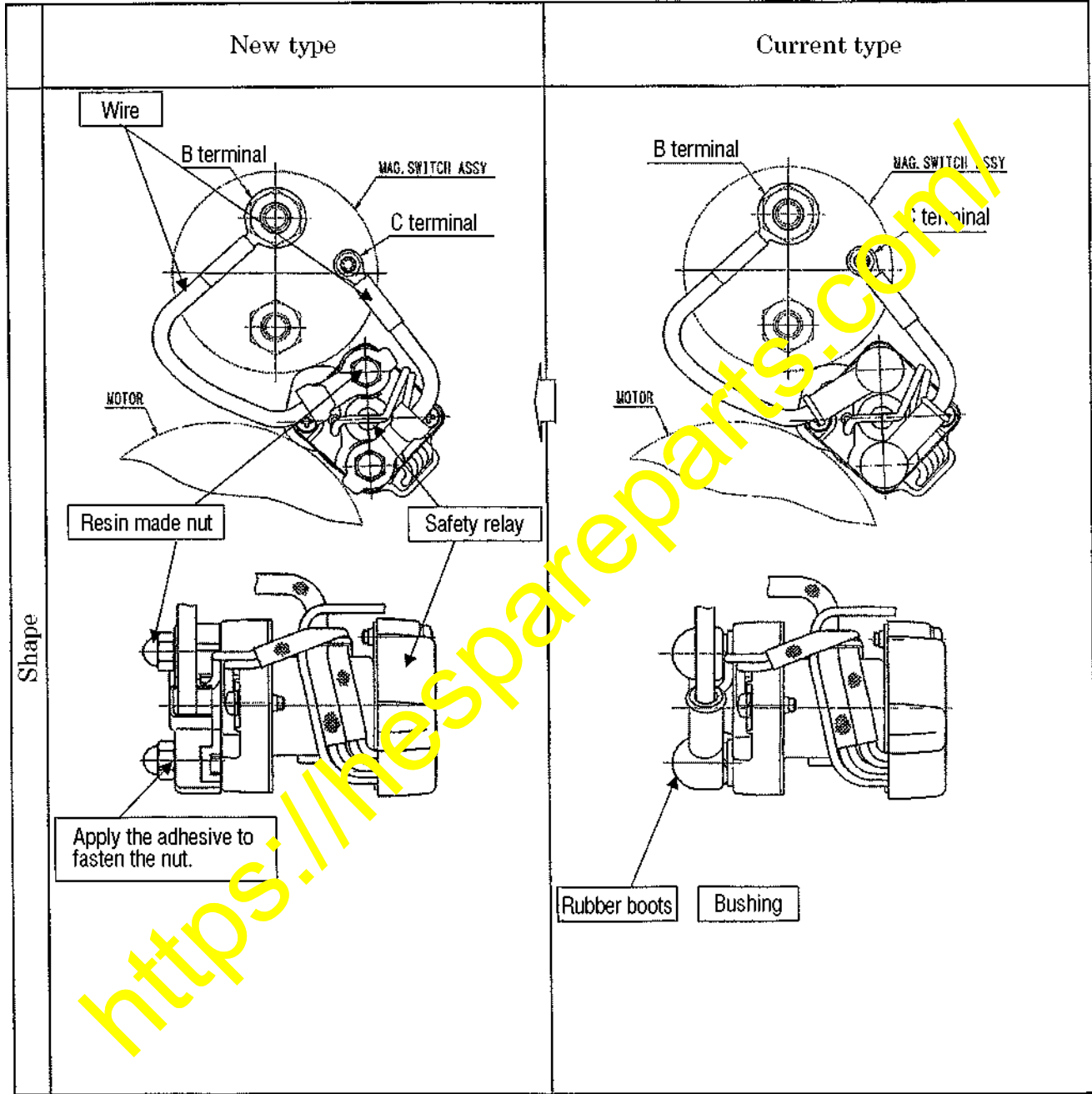
Shape of the C terminal of the 3 Kw type

Changed point		New type	Current type	Remarks
a	Terminal protection	Cover and resin made nut	Rubber cap	
b	Material of the cover	Nylon 66	(Rubber cap: Nitril)	
c	Resin made nut	Attached.	—————	
d	Wire (3 Kw type only)	With intermediate cable connector	Without intermediate cable connector	

3) Starting motor mounting type safety relay

In case you are replacing the safety relay separately, although the resin made cover is installed to the B terminal and C terminal of the safety relay it is not installed to the terminals connecting to the B terminal and C terminal of the magnetic switch.

Do not remove the resin made cover from the B terminal and C terminal of the safety relay if there is not a definite reason to do so.



Changed point		New type	Current type	Reason for making the change	Remarks
①	Cover (A, B)	Nylon 66	Rubber cap	To prevent starting the engine by short circuiting between the safety relay terminals.	
②	Resin made nut	Attached.	Not attached.		
③	Bolt	5 mm longer (Total length also has been increased.)	—		
④	Wire	No change has been made.	—		
⑤	(Adhesive)	Apply it to fasten the resin made nut.	—		

4) Separate installation type safety relay

The cover is not in common with the starting motor mounting type safety relay cover.

		New type	Current type	
Shape				
	<b>Changed point</b>	<b>New type</b>	<b>Current type</b>	<b>Remarks</b>
	Resin made cover (A)	Nylon 66	Not attached.	
	Resin made cover (B)	Nylon 66	Not attached.	
	Resin made nut	Attached.	Not attached.	
	Total length	86.5 mm	77.5 mm	
	Bolt length	5 mm longer	—————	

6. Wire connection

1) Nikko's reduction type

- Refer to the following instructions regarding the wire connection procedure after disassembling the starting motors other than Nikko's nose-less type starting motors. (The connection work is not necessary when installing already assembled ass'y to the machine.)

A) C terminal of the magnetic switch

		Part name		Wire connecting procedure	Remarks
	①	Resin made nut	a	Remove the parts ① thru ③.	
	②	Resin made cover	b	Install the part ④.	
	③	Nut	c	Tighten the part ③ at the torque per Table 2 below.	
	④	Terminal	d	After installing the part ②, apply adhesive to the part ①.	
	⑤	Base nut	e	Tighten the part ① at the torque per Table 1 below.	
			Note	Never loosen the base nut. After applying the adhesive, finish tightening within 30 min.	

B) M terminal of the magnetic switch

		Part name		Wire connecting procedure	Remarks
	①	Resin made nut	a	Remove the parts ① thru ③.	
	②	Resin made cover	b	Install the part ④.	
	③	Nut	c	Tighten the part ③ at the torque per Table 2 below.	
	④	Terminal	d	After installing the part ②, apply adhesive to the part ①.	
	⑤	Base nut	e	Tighten the part ① at the torque per Table 1 below.	
			Note	Never loosen the base nut. After applying the adhesive, finish tightening within 30 min.	

C) M terminal of the starting motor

		Part name		Wire connecting procedure	Remarks
	①	Resin made cover	a	It is not necessary to disconnect this section after its production by the manufacturer.	
	②	Tie wrap	b	If disconnected by some error, make the installation as per the following procedure.	
	③	Claw			
	④	Terminal	c	Insert the claw of the part ① into the part ④ and fasten to the cable at the position indicated in the drawing by use of the tie wrap ②.	

d) Tightening torque (Unit: N·m)

M5	1.45 – 1.74
M6	2.45 – 2.9
M8	7.4 – 8.8
M10	9.8 – 11.8

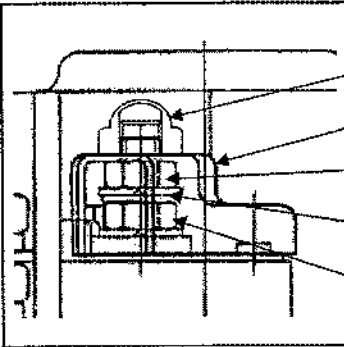
M4	1.3 – 1.6
M5	2.5 – 3.0
M6	4.4 – 5.4
M8	13.7 – 15.7
M10	19.6 – 25.5
M10	15.7 – 19.6

Brass



2) Nikko's nose-less type starting motor

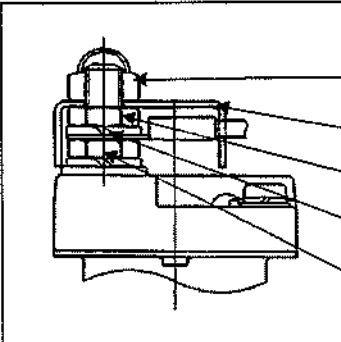
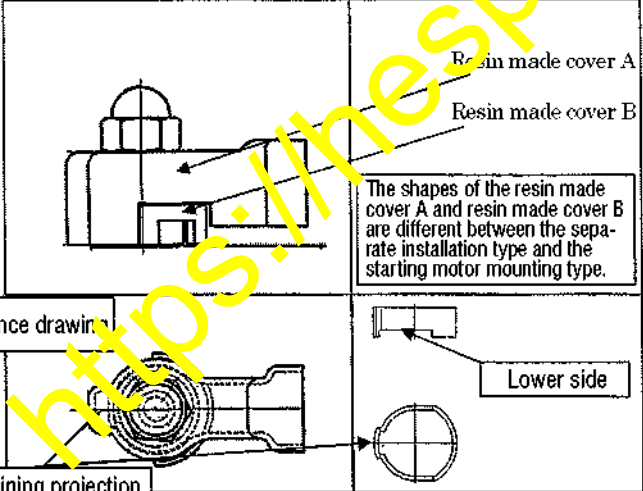
(Part No. 600-863-3210, 600-863-4510, 600-863-4611)

	Part name		Wire connecting procedure		Remarks
	①	Resin made nut	a	Remove the parts ① thru ③.	
②	Resin made cover	b	Install the part ④.		
③	Nut	c	Tighten the part ③ at the torque per Table 2 on page 8.		
④	Terminal	d	After installing the part ②, apply adhesive to the part ①.		
⑤	Base nut	e	Tighten the part ① at the torque per Table 1 on page 8.		
		Note	Never loosen the base nut. After applying the adhesive, finish tightening within 30 min.		

3) Nikko's safety relay

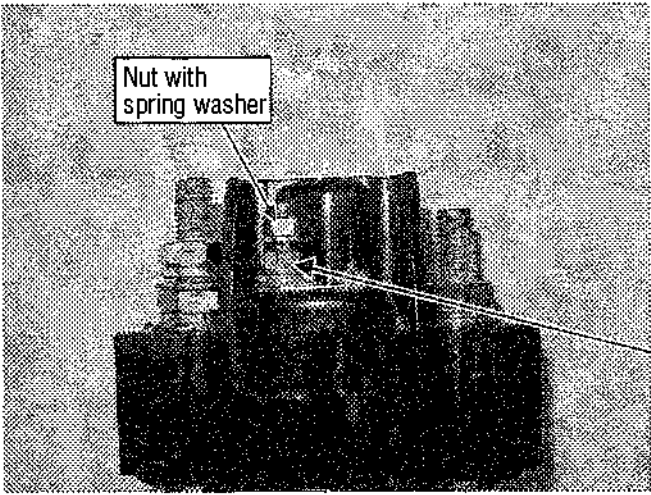
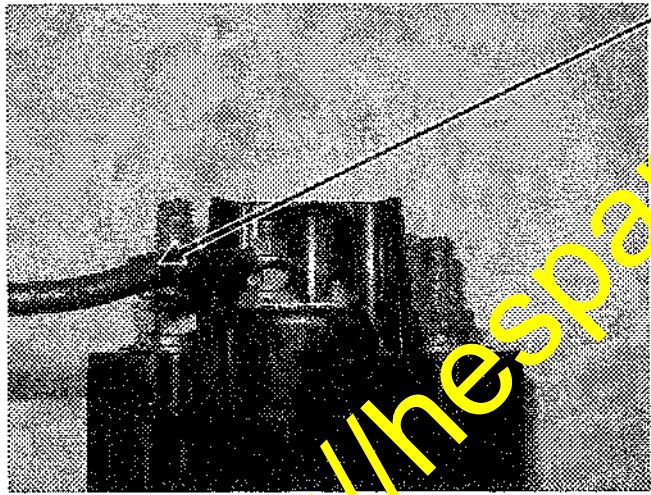
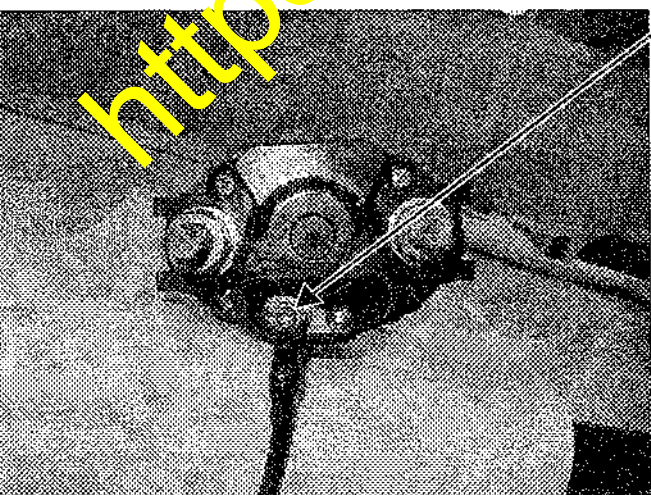
The wire connection is in common between the starting motor mounting type safety relay and the separate installation type safety relay.

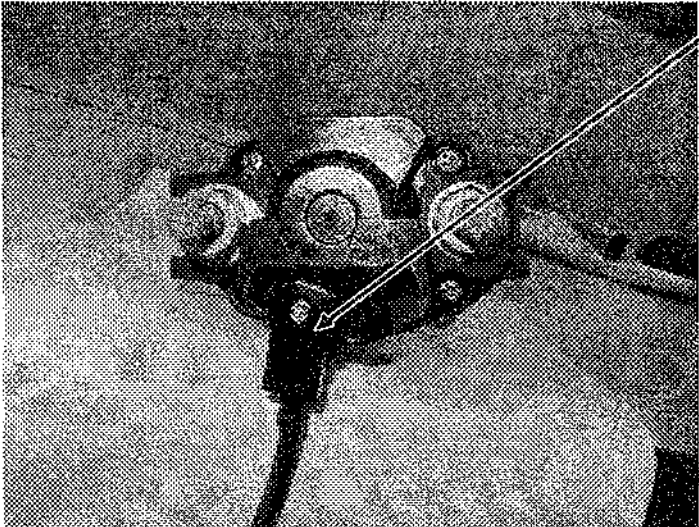


(Part No. 600-815-8960, 8941, 8951)

	Part name		Wire connecting procedure		Remarks
	①	Resin made nut	a	Remove the parts ① thru ③.	
②	Resin made cover, 2 pcs.	b	Install the B type cover of the parts ②.		
③	Nut	c	When installing the cover, direct the notched side downward and, also, direct the water draining projection toward the opposite side of the wire.		
④	Terminal	d	Install the part ④.		※ Refer to drawing
⑤	Base nut	e	Tighten the part ③ at the torque per Table 2 on page 8.		
Resin made cover A		f	Install the A type cover ② matching the direction.		
Resin made cover B		g	After finishing installation of the cover ②, apply adhesive to the part ①.		
 <p>The shapes of the resin made cover A and resin made cover B are different between the separate installation type and the starting motor mounting type.</p>		Note	Never loosen the base nut. After applying the adhesive, finish tightening within 30 min.		

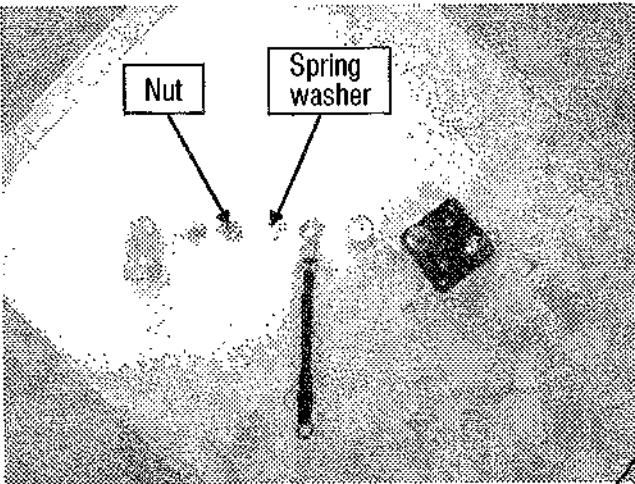
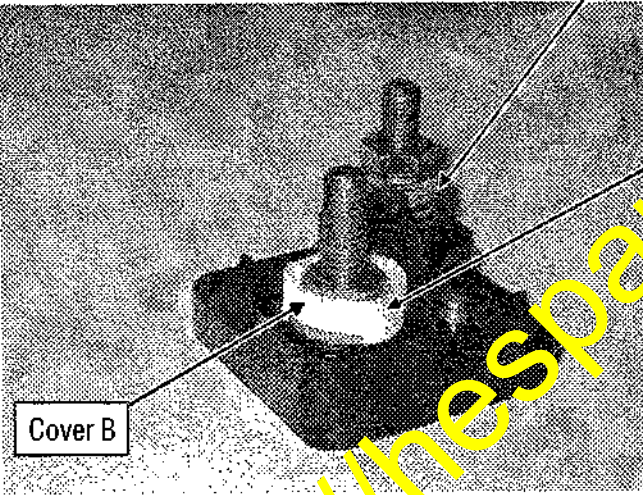
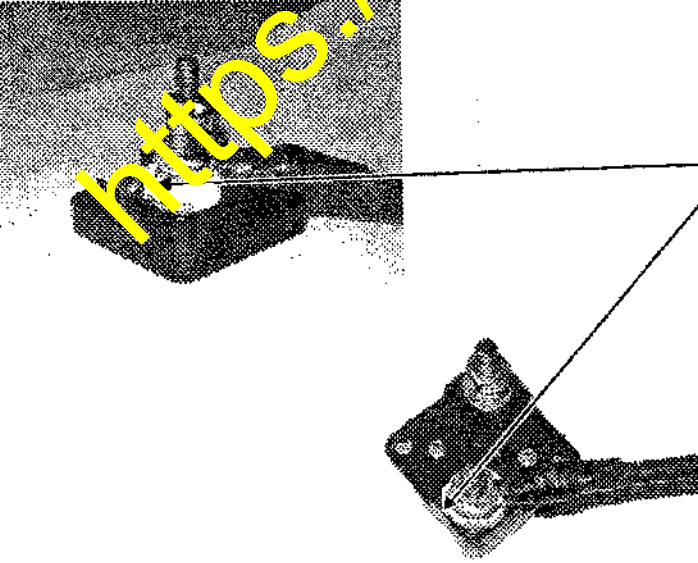
- The procedure explaining the procedure as per the above Sections 2) and 3) using photographs are indicated on page 10 thru 13.

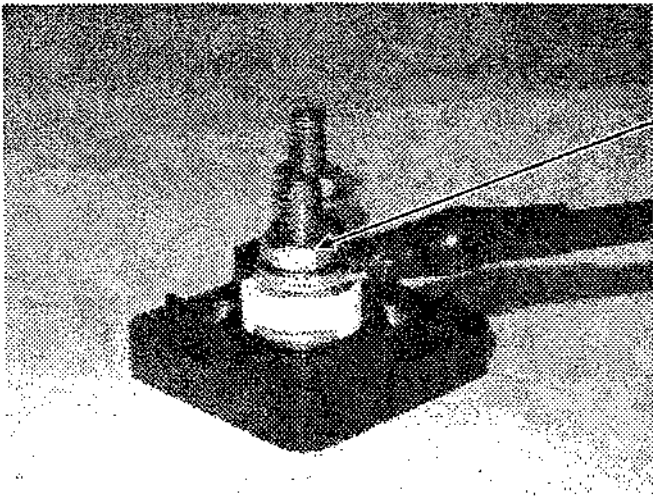
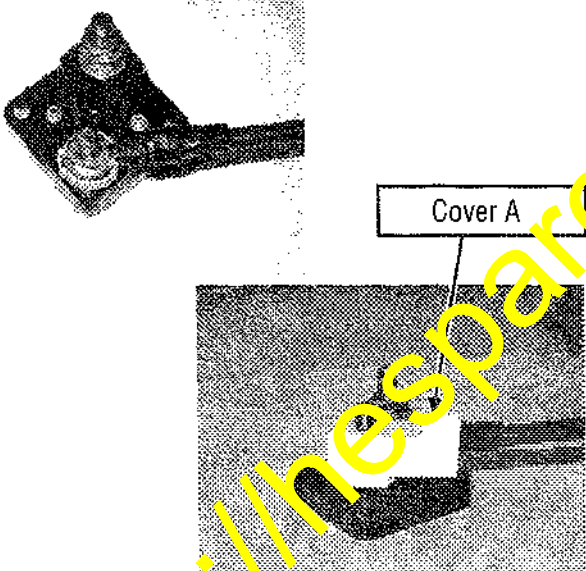

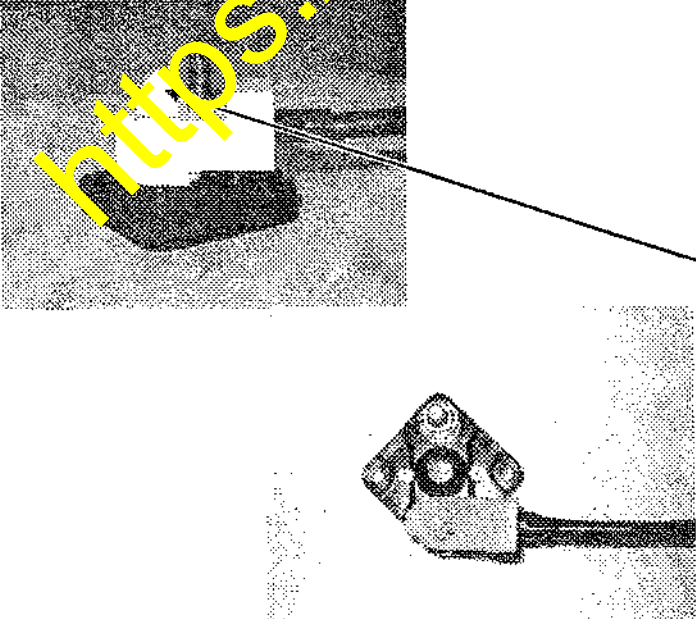
- Installation procedure for the cover for the Nikko's nose-less starting motor  
With the photographs being used for explanations, the rear section of the magnetic switch only is being removed.

Structure	Procedure
<p>①</p> 	<p>① Remove the cover and the resin made nut. (Being delivered in temporarily installed state.) Remove the nut with spring washer.</p> <p>Note: Do not loosen the lower side nut.</p>
<p>②</p> 	<p>② Install the machine harness. Regarding the direction of the harness, follow the shape of the cover when installing it. Lead it as shown in the photograph shown below. (The photograph indicated on the LH side shows the lead toward left to see it clearly.)</p>
<p>③</p> 	<p>③ Install the nut with spring washer which has been removed as per the above Item ①. Nut tightening torque: <u><math>2.75 \pm 0.25 \text{ N} \cdot \text{m}</math></u> (Screw size: M5 × 0.8)</p>

Structure	Procedure
<p>④</p> 	<p>④ Install the cover.</p>
<p>⑤</p> 	<p>⑤ Apply the adhesive to the resin made nut.</p> <ul style="list-style-type: none"> <li>● Recommended adhesive brand is <b>Three-Bond 1401.</b></li> <li>● Apply the adhesive to the nut for one round of the thread.</li> </ul>
<p>⑥</p> 	<p>⑥ Tighten the resin made nut.</p> <p><b>Note: After applying the adhesive onto the nut, finish installation within 30 min.</b></p> <ul style="list-style-type: none"> <li>● Nut tightening torque (Set wrench indication): 1.45 – 1.74 N·m</li> <li>● <b>Note: Tighten the nut using a set wrench.</b></li> </ul> <p><b>Note: Do not move the wire and cover after tightening</b></p>

- Installation procedure for the cover for the Nikko's safety relay

Structure	Procedure
<p>①</p>  <p>Nut</p> <p>Spring washer</p>	<p>① Remove the nut and the spring washer.</p> <p>Note: Do not loosen the lower side nut.</p>
<p>②</p>  <p>Cover B</p>	<p>② Install the cover B in the direction shown in the photograph.</p> <p>• Direct the flat surface toward the terminal side.</p>
<p>③</p> 	<p>③ Install the machine harness in the direction shown in the photograph.</p> <p>• Direct the water draining projection toward the top end.</p>

Structure	Procedure
<p>④</p> 	<p>④ Install the spring washer and the nut which have been removed as per the above Item ①.</p> <ul style="list-style-type: none"> <li>● Nut tightening torque: <math>4.9 \pm 0.5 \text{ N} \cdot \text{m}</math> (Thread size: M6 × 1)</li> </ul>
<p>⑤</p> 	<p>⑤ Install the cover A in the direction shown in the photograph.</p> <ul style="list-style-type: none"> <li>● Apply the adhesive to the resin made nut. <b>Recommended adhesive brand is Three-Bond 1401.</b> Apply the adhesive to the nut for one round of the thread.</li> </ul> 
<p>⑥</p> 	<p>⑥ Tighten the resin made nut.</p> <p><b>Note: After applying the adhesive onto the nut, finish installation within 30 min.</b></p> <ul style="list-style-type: none"> <li>● Nut tightening torque (Set wrench indication): <math>2.45 - 2.9 \text{ N} \cdot \text{m}</math></li> <li>● <b>Note: Tighten the nut using a set wrench.</b></li> <li>● <b>Note: Do not move the wire and cover after tightening the nut.</b></li> </ul>

## 7. 1) List of part numbers of the separate installation type safety relays

No	Current Part No.		New Part No.	
	Komatsu's Part No.	Supplier's Part No. of the Safety Relay	Komatsu's Part No.	Supplier's Part No. of the Safety Relay
1	600-815-8930	0-25000-7412	600-815-8960	0-25000-8650
2	600-815-8940	0-25000-7962	600-815-8941	0-25000-7963
3	600-815-8950	0-25000-8620	600-815-8951	0-25000-8621

## 2) List of part numbers of the starting motors 2.8 Kw/3 Kw/4 Kw/5.5 Kw

These are supplier's part numbers.

No	Current Part No.			New Part No.			Nominal output	Motor dia.	COVER ASSY		YOKE ASSY	MAG. SW	Remarks
	Komatsu's Part No.	Supplier's Part No.	Supplier's Part No. of the Safety Relay	Komatsu's Part No.	Supplier's Part No.	Supplier's Part No. of the Safety Relay			starting motor itself	Safety relay			
1	600-813-3130	0-23000-0470	0-25000-8500	600-813-3131	0-23000-0471	0-25000-8501	2.8kW/24V	φ 78R	7-47761-0060	7-47761-0030		7-47100-0340	
2	600-813-3171	0-23000-0451	0-25000-6972	600-813-3172	0-23000-0452	0-25000-6973	2.8kW/24V	φ 78R	7-47761-0060	7-47761-0030		7-47100-0330	
3	600-813-4241	0-23000-0293	0-25000-6971	600-813-4242	0-23000-0500	0-25000-6973	2.8kW/24V	φ 78R	7-47761-0060	7-47761-0030		7-47100-0350	
4	600-813-4411	0-23000-0333	0-25000-7771	600-813-4412	0-23000-0520	0-25000-7772	2.8kW/24V	φ 78R	7-47761-0060	7-47761-0030		7-47100-0330	
5	600-813-4440	0-23000-0373	0-25000-8500	600-813-4441	0-23000-0530	0-25000-8501	2.8kW/24V	φ 78R	7-47761-0060	7-47761-0030		7-47100-0330	
6	600-813-3231	0-23000-1172	0-25000-8111	600-813-3232	0-23000-1173	0-25000-8112	5.5kW/24V	φ 90R	7-47761-0050	7-47761-0030		7-47100-0310	
7	600-813-3281	0-23000-1163	0-25000-8111	600-813-3282	0-23000-2670	0-25000-8112	5.5kW/24V	φ 90R	7-47761-0050	7-47761-0030		7-47100-0310	
8	600-813-3321	0-23000-1292	0-25000-6953	600-813-3322	0-23000-1293	0-25000-8112	5.5kW/24V	φ 90R	7-47761-0050	7-47761-0030		7-47100-0310	
9	600-813-3351	0-23000-1412	0-25000-8390	600-813-3352	0-23000-1413	0-25000-8391	5.5kW/24V	φ 90R	7-47761-0050	7-47761-0030		7-47100-0310	
10	600-813-3361	0-23000-1432	0-25000-8111	600-813-3362	0-23000-1433	0-25000-8112	5.5kW/24V	φ 90R	7-47761-0050	7-47761-0030		7-47100-0310	
11	600-813-3391	0-23000-1273	0-25000-6902	600-813-3392	0-23000-2150	0-25000-6903	5.5kW/24V	φ 90R	7-47761-0050	7-47761-0030		7-47100-0310	
12	600-813-3461	0-23000-1532	0-25000-6902	600-813-3462	0-23000-1533	0-25000-6903	5.5kW/24V	φ 90R	7-47761-0050	7-47761-0030		7-47100-0310	
13	600-813-4121	0-23000-2570	0-25000-6953	600-813-4122	0-23000-2571	0-25000-8860	5.5kW/24V	φ 90R	7-47761-0050	7-47761-0030		7-47100-0310	
14	600-813-4351	0-23000-1552	0-25000-8400	600-813-4352	0-23000-1553	0-25000-8401	5.5kW/24V	φ 90R	7-47761-0050	7-47761-0030		7-47100-0320	
15	600-813-4423	0-23000-2560	0-25000-7282	600-813-4424	0-23000-2561	0-25000-7283	5.5kW/24V	φ 90R	7-47761-0050	7-47761-0030		7-47100-0310	
16	600-813-6211	0-23000-2112	0-25000-7282	600-813-6212	0-23000-2113	0-25000-7283	5.5kW/24V	φ 90R	7-47761-0050	7-47761-0030		7-47100-0310	
17	600-863-3110	0-24000-0030	-	600-863-3110	0-24000-0030	-	3.0kW/24V	φ 83R					
				600-863-3210	0-24000-0040	-			7-47761-0020		7-24200-0010		
18	600-863-4410	0-24000-3060	-	600-863-4410	0-24000-3060	-	4.5kW/24V	φ 90R					
				600-863-4510	0-24000-3240	-			7-47761-0020		7-24200-0020		
19	600-863-4610	0-24000-3070	-	600-863-4611	0-24000-3071	-	4.5kW/24V	φ 90R	7-47761-0020		7-24200-0020		

3) List of part numbers of the starting motors  
7.5 Kw (100)/11 Kw

These are supplier's part numbers.

No	Current Part No.			New Part No.			Nominal output	Motor dia.	COVER ASSY		MAG.SW	Remarks
	Komatsu's Part No.	Supplier's Part No.	Supplier's Part No. of the Safety Relay	Komatsu's Part No.	Supplier's Part No.	Supplier's Part No. of the Safety Relay			Starting motor itself	Safety relay		
20	600-813-4532	0-23000-3152	0-25000-6522	600-813-4533	0-23000-3153	0-25000-6523	7.5kW/24V	φ 100R	7-47761-0010	7-47761-0030	7-47100-0230	
21	600-813-4561	0-23000-3162	0-25000-6522	600-813-4562	0-23000-3163	0-25000-6523	7.5kW/24V	φ 100R	7-47761-0010	7-47761-0030	7-47100-0230	
22	600-813-4651	0-23000-3172	0-25000-8370	600-813-4652	0-23000-3173	0-25000-8371	7.5kW/24V	φ 100R	7-47761-0010	7-47761-0030	7-47100-0230	
23	600-813-4681	0-23000-3185	0-25000-8370	600-813-4682	0-23000-3186	0-25000-8371	7.5kW/24V	φ 100R	7-47761-0010	7-47761-0030	7-47100-0230	
24	600-813-4791	0-23000-3275	0-25000-6872	600-813-4792	0-23000-3276	0-25000-6873	7.5kW/24V	φ 100R	7-47761-0010	7-47761-0030	7-47100-0230	
25	600-813-6411	0-23000-3291	0-25000-7872	600-813-6412	0-23000-3292	0-25000-7873	7.5kW/24V	φ 100R	7-47761-0010	7-47761-0030	7-47100-0240	
26	600-813-6421	0-23000-3301	0-25000-7882	600-813-6422	0-23000-3302	0-25000-7883	7.5kW/24V	φ 100R	7-47761-0010	7-47761-0030	7-47100-0240	
27	600-813-6611	0-23000-3285	0-25000-7322	600-813-6612	0-23000-3286	0-25000-7323	7.5kW/24V	φ 100R	7-47761-0010	7-47761-0030	7-47100-0230	
28	600-813-6621	0-23000-3321	0-25000-8031	600-813-6622	0-23000-3322	0-25000-8032	7.5kW/24V	φ 100R	7-47761-0010	7-47761-0030	7-47100-0230	
29	600-813-6631	0-23000-3331	0-25000-8331	600-813-6632	0-23000-3332	0-25000-8332	7.5kW/24V	φ 100R	7-47761-0010	7-47761-0030	7-47100-0230	
30	600-863-5710	0-23000-3340	0-25000-8331	600-863-5711	0-23000-3341	0-25000-8332	7.5kW/24V	φ 100R	7-47761-0010	7-47761-0030	7-47100-0240	
31	600-813-9311	0-23000-7671	0-25000-8281	600-813-9312	0-23000-7672	0-25000-8282	11.0kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0270	
32	600-813-9321	0-23000-7731	0-25000-8281	600-813-9322	0-23000-7732	0-25000-8282	11.0kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0270	
33	600-813-9330	0-23000-7675	0-25000-8284	600-813-9331	0-23000-7676	0-25000-8285	11.0kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0280	
34	600-813-9340	0-23000-8020	0-25000-8550	600-813-9341	0-23000-8021	0-25000-8551	11.0kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0290	
35	600-813-9360	0-23000-8350	0-25000-8660	600-813-9361	0-23000-8351	0-25000-8661	11.0kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0280	
36	600-813-9510	0-23000-8110	0-25000-8520	600-813-9511	0-23000-8111	0-25000-8521	11.0kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0270	
37	600-813-9720	0-23000-8130	0-25000-8550	600-813-9721	0-23000-8131	0-25000-8940	11.0kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0290	
38	600-863-8110	0-23000-8060	0-25000-8331	600-863-8111	0-23000-8061	0-25000-8332	11.0kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0270	

## 4) 7.5 Kw (114)

These are supplier's part numbers.

No	Current Part No.			New Part No.			Nominal output	Motor dia.	COVER ASSY		MAG.SW	Remarks
	Komatsu's Part No.	Supplier's Part No.	Supplier's Part No. of the Safety Relay	Komatsu's Part No.	Supplier's Part No.	Supplier's Part No. of the Safety Relay			Starting motor itself	Safety relay		
39	600-813-3531	0-23000-6253	0-25000-6563	600-813-3532	0-23000-8290	0-25000-8640	7.5kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0250	
40	600-813-3612	0-23000-7362	0-25000-6832	600-813-3613	0-23000-7363	0-25000-6833	7.5kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0250	
41	600-813-3622	0-23000-7840	0-25000-6872	600-813-3623	0-23000-7841	0-25000-6873	7.5kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0250	
42	600-813-3631	0-23000-6533	0-25000-8102	600-813-3632	0-23000-8300	0-25000-8103	7.5kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0250	
43	600-813-3661	0-23000-7910	0-25000-6872	600-813-3662	0-23000-7911	0-25000-6873	7.5kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0250	
44	600-813-3671	0-23000-6563	0-25000-8450	600-813-3672	0-23000-8310	0-25000-8451	7.5kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0260	
45	600-813-3681	0-23000-6603	0-25000-6912	600-813-3682	0-23000-8320	0-25000-6913	7.5kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0250	
46	600-813-3711	0-23000-7760	0-25000-6962	600-813-3712	0-23000-7761	0-25000-6963	7.5kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0250	
47	600-813-3721	0-23000-6693	0-25000-8380	600-813-3722	0-23000-8330	0-25000-8381	7.5kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0260	
48	600-813-3731	0-23000-7551	0-25000-6832	600-813-3732	0-23000-7552	0-25000-6833	7.5kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0250	
49	600-813-3741	0-23000-7572	0-25000-7122	600-813-3742	0-23000-7573	0-25000-7123	7.5kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0260	
50	600-813-4551	0-23000-7890	0-25000-6832	600-813-4552	0-23000-7891	0-25000-6833	7.5kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0250	
51	600-813-4671	0-23000-7022	0-25000-8340	600-813-4672	0-23000-7023	0-25000-8341	7.5kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0250	
52	600-813-4922	0-23000-6983	0-25000-8370	600-813-4923	0-23000-8340	0-25000-8371	7.5kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0250	
53	600-813-4932	0-23000-7860	0-25000-7322	600-813-4933	0-23000-7861	0-25000-7323	7.5kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0250	
54	600-813-7112	0-23000-7770	0-25000-7971	600-813-7113	0-23000-7771	0-25000-7972	7.5kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0250	
55	600-813-7121	0-23000-7780	0-25000-7971	600-813-7122	0-23000-7781	0-25000-7972	7.5kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0250	
56	600-813-7131	0-23000-7790	0-25000-8440	600-813-7132	0-23000-7791	0-25000-8441	7.5kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0250	
57	600-813-7141	0-23000-7800	0-25000-8460	600-813-7142	0-23000-7801	0-25000-8461	7.5kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0260	
58	600-813-7151	0-23000-7951	0-25000-8520	600-813-7152	0-23000-7952	0-25000-8521	7.5kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0250	
59	600-813-7221	0-23000-7492	0-25000-7902	600-813-7222	0-23000-7493	0-25000-7903	7.5kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0260	
60	600-813-7311	0-23000-7302	0-25000-7702	600-813-7312	0-23000-7303	0-25000-7703	7.5kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0300	
61	600-813-7521	0-23000-7870	0-25000-8410	600-813-7522	0-23000-7871	0-25000-8411	7.5kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0250	
62	600-813-7531	0-23000-7880	0-25000-8470	600-813-7532	0-23000-7881	0-25000-8471	7.5kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0260	
63	600-813-7541	0-23000-7751	0-25000-8331	600-813-7542	0-23000-7752	0-25000-8332	7.5kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0250	
64	600-813-7611	0-23000-7422	0-25000-8420	600-813-7612	0-23000-7423	0-25000-8421	7.5kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0260	
65	600-813-7640	0-23000-8030	0-25000-8560	600-813-7641	0-23000-8031	0-25000-8561	7.5kW/24V	φ 114R	7-47761-0010	7-47761-0030	7-47100-0260	









Part numbers of the 5.5 Kw starting motors and applicable machine models

Part No. (Upper line: Current Lower line: New)	Applicable machine model												
600-813-3231	@PW150 - 1												
(600-813-3232)													
600-813-3281	@D40A - 3	@D40AM - 5	@D40P - 5	@D40PF - 5	@D41 - 3	@D41 - 5	@D41E - 3	@D41E - 5	@GD505A - 2	@JV100A - 1	@W90 - 2		
(600-813-3282)	EG125 - 2	EG125B - 2	EG125BS - 2	EG150 - 5	EG150B - 5	EG150BS - 5	S6D105-G2 - 1	S6D105-G3 - 1	S6D105-GD - 1	S6D105-GJP - 1	S6D110 - 1		
	S6D110-G2 - 1	S6D110-G3 - 1	SA6D110-G1 - 1	SA6D110-G2 - 1	SA6D110-G3 - 1	SA6D110-GD - 1	SA6D110-GJP - 1	SA6D110-GT - 1	SA6D110-P - 1				
600-813-3321	@CL60 - 2	@GD305A - 1	@GD313A - 1	@GD355A - 1	@GD405A - 2	@GD461A - 1	@GD510R - 1	@GD511A - 1	@GD511A-DZ - 1	@PC100 - 3	@PC120 - 3		
(600-813-3322)	@PC120 - 3U	@PC150 - 3	@PC180 - 3	@PC180 - 3U	@PF3 - 1	@PF3W - 1	@PW100 - 3	@PW100 - 3A	6D95L - 1	6D95L-G1 - 1	6D95L-W1 - 1		
	S6D95L - 1	S6D95L - 1	S6D95L - 1	S6D95L-C1 - 1	S6D95L-C3 - 1	S6D95L-G1 - 1	S6D95L-GT - 1						
600-813-3351	@D31A - 18	@D31A - 20	@D37A - 2	@D37A - 5									
(600-813-3352)													
600-813-3361	@CD50 - 1	S4D95L - 1	S4D95L-C1 - 1	S6D95L - 1	S6D95L-C1 - 1								
(600-813-3362)													
600-813-3391	@GD505A - 3	@GD521A - 1	@GD611A - 1	@GD611A-DZ - 1	@GD661A - 1	@GD661A-DZ - 1	@WA200 - 1	@WA250 - 1	@WA300 - 1	@WA300 - 1J	@WA320 - *		
(600-813-3392)	@WA320 - 1	@WU10S - 1	BE-WA200 - 1										
600-813-3461	@WA100 - 1	@WA120 - 1	@WA150 - 1	@WA180 - 1	@WT150 - 1	ID-WA180 - 1							
(600-813-3462)													
600-813-4121	@BP500 - 3	@PC220 - 3*	@PC220 - 3D	@PF5 - 1	@PW100 - 1	@PW200 - 1	@PW210 - 1	BE-PC220 - 3					
(600-813-4122)													
600-813-4351	@D31A - 18	@D31A - 20	@D37A - 2	@D37A - 5									
(600-813-4352)													
600-813-4423	@JV80 - 1	@KE230 - 1	@PC100 - 5	@PC100 - 6	@PC100-DE - 5	@PC100-JP - 6	@PC100N - 6	@PC120 - 5	@PC120 - 6	@PC120-DE - 5	@PC128UU - 1		
(600-813-4424)	@PC130 - 5	@PC150 - 5	@PC200 - 5	@PC200 - 6	@PC200 - 6Z	@PC200-AC - 6	@PC200-DA - 5	@PC200-DB - 5	@PC200-JP - 6	@PC210 - 5	@PC220 - 5		
	@PC220 - 6	@PC220-DB - 5	@PC220LC-AC - 6	@PW130-KU - 6	@TP6D95L - 1	4A95L-W1 - 1	A6D95LE-PHS - 1	ID-PC100 - 5	ID-PC200 - 5	S4D95L-C1 - 1	S4D95L-C2 - 1		
	S4D95L-W2 - 1	S6D95L-C2 - 1											
600-813-6211	@WA100 - 3	@WA150 - 3	@WA200 - 3										
(600-813-6212)													

Part numbers of the 7.5 Kw (φ 100) starting motors and applicable machine models (1/2)

Part No. (Upper line: Current Lower line: New)	Applicable machine model												
600-813-4532	@D50 - 18	@D50A - 17	@D53 - 17	@D53A - 18	@D53P - 18	@D58E - 1	@D58P - 1	@D60A - 8	@D60A - 11	@D60A - 1D	@D60E - 8		
(600-813-4533)	@D60F - 8A	@D60F - 8B	@D60P - 8	@D60P - 11	@D60P - 1D	@D60PL - 8	@D60S - 8	@D63E - 1	@D63E - 1A	@D65A - 8	@D65A - 11		
	@D65A - 1D	@D65E - 8	@D65E - 8D	@D65E-JK - 8	@D65P - 8	@D65P - 11	@D65P - 1D	@D65P - 8C	@D70LE - 8	@D70LE-JK - 8	@D70LE-JP - 8		
	@D75A - 1	@D75S - 5	@D83E - 1	@GD605A - 3	@GD605A - 3	@GD705A - 4	@GD705A - 4A	@WT250 - 1	6D125-CJK - 1	BE-D65E - 8	BE-GD605R - 2		
	BE-SA140AG - 1	EG300 - 5	EG300B - 5	EG300BS - 5	EG300-L - 5	EG350A-L - 1	EG350B-L - 1	EG400 - 2	EG400B - 2	EG400B-L - 2	EG400BS - 2		
	ID-D60E - 8	ID-D65E - 8	ID-D65P - 8	ID-D75S - 5	ID-D85ESS - 1	S6D125-C1 - 1	S6D125-W1 - 1	S6D125-W2 - 1	S6D140 - 1	S6D140-G2 - 1	S6D140-G3 - 1		
	S6D140-GD - 1	S6D140-GH - 1	S6D140-GJP - 1	S6D140-GN - 1	S6D140-P - 1	SA6D140A - 1	SA6D140A-A1 - 1	SA6D140A-G2 - 1	SA6D140A-G3 - 1	SA6D140A-GA - 1	SA6D140A-GB - 1		
	SA6D140A-GD - 1	SA6D140A-GH - 1	SA6D140A-GN - 1	SA6D140A-M - 1	SA6D140B - 1	SA6D140B-A1 - 1	SA6D140B-G2 - 1	SA6D140B-G3 - 1	SA6D140B-GA - 1	SA6D140B-GN - 1	SA6D140B-M - 1		
	SAA6D140-G3 - 1												
600-813-4561	@D40AM - 5	@D40P - 5	@D40PF - 5	@D41 - 5	@D41E - 5	@D66S - 1	S6D110 - 1	S6D110-A2 - 1	S6D110-G3 - 1	SA6D110-A2 - 1	SA6D110-G2 - 1		
(600-813-4562)	SA6D110-GD - 1												
600-813-4651	@GD505A - 3	@GD521A - 1	@GD525A - 1B	@GD525A - 1C	@GD611A - 1	@WA200 - 1	@WA250 - 1	@WA300 - 1	@WA320 - *	@WA320 - 1	@WA350 - 1		
(600-813-4652)	@WA350 - 1*	@WA350 - 1*	@WA380 - 1	@WA400 - *	@WA400 - 1	@WA420 - 1N	@WA420 - 1	ID-WA420 - 1	SA6D110-WNB - 1				
600-813-4681	@WA450 - 1	@WA450 - 1*	@WA470 - 1	@WF450T - 1									
(600-813-4682)													
600-813-4791	@GT240 - 1	@LW250 - 3	@LW250M - 2										
(600-813-4792)													
600-813-6411	@BR300S - 1	@GD611A - 1	@PC300 - 5	@PC300 - 6	@PC300 - 5L	@PC300-DC - 5	@PC300-DZ - 6	@PC300-JK - 6	@PC300-JP - 6	@PC300-RT - 6	@PC340LC-KU - 6		
(600-813-6412)	@WA300 - 3	@WA320 - 3	@WA350 - 3	@WA350 - 3*	@WA380 - 3	@WA380-HH - 3	@WA400 - 3	@WA420 - 3	@WA420-RT - 3	@WF350 - 3	@WT250E - 1		
	@WU10S-E - 1	A6D108E-C2 - 2	EG150BS - 5	J6D108E-A2 - 2	J6D108E-GD - 2	J6D108E-GZ - 2	SA6D108-GD - 1	T6D108E-GD - 2	T6D108E-W2 - 2				
600-813-6421	@D57S - 1B	EG150BS - 5	EG185E-L - 1	J6D108E-C2 - 2	S6D108 - 1	S6D108-C2 - 1	S6D108-FG1 - 1	S6D108-G1 - 1	S6D108-G2 - 1	S6D108-G3 - 1	S6D108-GA - 1		
(600-813-6422)	S6D108-GD - 1	S6D108-GF - 1	S6D108-P - 1	S6D108-W2 - 1	SA6D108 - 1	SA6D108 - 1	SA6D108-C2 - 1	SA6D108-G1 - 1	SA6D108-G2 - 1	SA6D108-G3 - 1	SA6D108-GD - 1		
	SA6D108-P - 1	SA6D108-M - 1											
600-813-6611	@D53 - 17	@D53A - 18	@D53P - 18	@D58E - 1	@D58P - 1	@D60P - 12	@D60P - 12	@D65E - 12	@D65E - 12	@D65E-JP - 12	@D65EX - 12		
(600-813-6612)	@D65EX - 12	@D70LE - 12	@D70LE - 12	@D75S - 5	@D85ESS - 2	@D85ESS - 2	@D85ESS - 2A	@D85ESS - 2A	@D85ESS-JK - 2	@D85ESS-JP - 2	@D85ESS-JP - 2		
	@GD605A - 5	@GD705A - 4A	@HD205 - 5	@HD255 - 5	@HD285TN - 5	@HU400AS - 2	@WA450 - 3	@WA450-AD - 3	@WA450L - 1	@WA470 - 3	@WA470-DZ - 3		
	@WA470-HH - 3	@WA470-HH - 3E	@WA470-JK - 3	@WA470-JP - 3	@WF450T - 3	A6D125E-GD - 2	B66 - 00	D61E - 12	D61EX - 1	D61EX - 12	D61EX-BB - 12		
	D61P - 12	D61PX - 1	D61PX - 12	D61PX-BB - 12	D68ESS - 12	EG220BS - 2	EG300BS - 5	J6D125E-C1 - 2	J6D125E-FH1 - 2	J6D125E-G1 - 2	J6D125E-G3 - 2		
	J6D125E-GD - 2	J6D125E-GE - 2	J6D125E-KC - 2	J6D125E-P - 2	J6D125E-W1 - 2	J6D140E-GD - 2	J6D140E-GD - 3	J6D140E-GE - 2	J6D140E-KC - 2	J6D140E-KC - 3	S6D125-CJK - 1		
	S6D125-G2 - 2	S6D125-G3 - 2	S6D125-R - 2	SA6D125-G2 - 2	SA6D125-G3 - 2	SAA6D125-G3 - 2	T6D125E-CJK - 2	T6D125E-FH1 - 2	T6D125E-FH2 - 2	T6D125E-FH3 - 2	T6D125E-GD - 2		
	T6D125E-GE - 2	T6D125E-KC - 2	T6D125E-P - 2	TA6D140-G1 - 2									



Part numbers of the 7.5 Kw (φ 114) starting motors and applicable machine models (1/2)

Part No. (Upper line: Current Lower line: New)	Applicable machine model											
600-813-3531	@GH320 - 1	@GH320 - 2	@HV380 - 2	@WT500 - 1	@WT500 - 1J	@WT500E - 1	6D125 - 1	6D125-GD - 1	6D125-GN - 1	6N125-G1 - 1	EG125CNBS - 1	
(600-813-3532)	EG300BS - 5	EH090 - 1	S6D125-A2 - 1	S6D125-FG1 - 1	S6D125-FG2 - 1	S6D125-FH1 - 1	S6D125-G1 - 1	S6D125-G2 - 1	S6D125-G3 - 1	S6D125-GH - 1	S6D125-GJP - 1	
	S6D125-GN - 1	S6D125-P - 1	S6D125-W1 - 1	S6D125-W2 - 1	SA6D125 - 1	SA6D125-G1 - 1	SA6D125-G2 - 1	SA6D125-G3 - 1	SA6D125-GD - 1	SA6D125-GH - 1	SA6D125-GJP - 1	
	SA6D125-GN - 1	SA6D125-P - 1	SA6D125-R - 1	SA6D125-W1 - 1								
600-813-3612	@D135A - 1	@D375A - 1	@D85 - 21	@D85A - 21	@D85A - 2B	@HD465 - 3	@HD465 - 3C					
(600-813-3613)												
600-813-3622	@HV700 - 2	@PC1000 - 1	A12V140-G2 - 1	A12V140-G3 - 1	BE-PC1000 - 1	EG750A-L - 1	EG750B-L - 1	EPSA12V140 - 1	J12V140E-GD - 1	J12V140-GCK - 1	SA12V140 - 1	
(600-813-3623)	SA12V140-A2 - 1	SA12V140-G2 - 1	SA12V140-G3 - 1	SA12V140-GD - 1	SA12V140-P - 1	SA6D170B-C2 - 1						
600-813-3631	@CS210 - 1	@GD605A - 5	@GD623A - 1	@GD623A - 1S	@GD623A-DZ - 1	@GD625A - 1B	@HD205 - 3	@HS150S - 8	@HS150S - 10	@HS300LS - 1	@HS400DG - 1	
(600-813-3632)	@HU300A - 1	@HU400AS - 1	@PC1600 - 1F	@PC1600 - 1R	@PC300 - 3A	@PC300 - 3V	@PC400 - 3A	@PC400 - 3V	@PC650 - 3	@WS16S - 3	@WS23 - 2F	
	@WS23 - 2R	BE-PC300 - 3	BE-PC650 - 3	S6D125-R - 1								
600-813-3661	@PC220 - 3*	@PC280 - 3*	@PF5 - 1	@PF550L - 1	@PW200 - 1	@PW100 - 1						
(600-813-3662)												
600-813-3671	@D53 - 17	@D53A - 18	@D60A - 11	@D65A - 8	@D65A - 11	@PC1600 - AF	@PC1600 - AR	@PC1600SP - 1F	@PC1600SP - 1R			
(600-813-3672)												
600-813-3681	@CS360 - 2	@GC380 - 1	@GD805A - 1	@GS360 - 2								
(600-813-3682)												
600-813-3711	@WA600 - 1	@WD600 - 1	@WA700 - 1									
(600-813-3712)												
600-813-3721	@WA200 - 1											
(600-813-3722)												
600-813-3731	@PC1000 - 1	BE-PC1000 - 1	SA6D170B-C2 - 1									
(600-813-3732)												
600-813-3741	@D85A - 21	@D85A - 2B	@PC1000 - 1	SA6D170A-M - 1								
(600-813-3742)												
600-813-4551	@HD200D - 3											
(600-813-4552)												
600-813-4671	@BR200T - 1	@BR500JG - 1	@BR700C - 1	@CS210 - 1	@D87E-AF - 2	@GH320 - 2	@GT275S - 1	@LZ600 - 1	@PC1800 - 6F	@PC1800 - 6R	@PC400 - 5	
(600-813-4672)	@PC400 - 6	@PC400 - 5L	@PC400-DC - 5	@PC400-DZ - 6	@PC400-JK - 6	@PC400-JP - 6	@PC400-KU - 6	@PC400ST - 6	@PC650 - 5	@PC750 - 6	@PC750-KU - 6	
	GT275S - 1	J6D125E-CJK - 2	S6D125-C2 - 1	SA6D125-C2 - 1	SA6D125-W1 - 1	SA6D140-A2 - 1						

## Part numbers of the 7.5 Kw (φ 114) starting motors and applicable machine models (2/2)

Part No. (Upper line: Current Lower line: New)	Applicable machine model
600-813-4922 (600-813-4923)	@WA800 - 1 @WA800 - 2 @WA900 - 1 J12V140-GCK - 1
600-813-4932 (600-813-4933)	@BR1600JG - 1 @D475A - 2 @D475A - 3 @HD465 - 5 @HD465-JK - 5 @HD785 - 3 @HD785 - 5 @HD785 - 2* @HD785-DZ - 5 @HD785-JK - 5 @HD985 - 3 @HD985 - 5 @PC1100 - 6 @WA800 - 3 @WA900 - 3 @WD900 - 3 A6D170E-W2 - 2 A6D170E-WJK - 2 BE-B60 - 1 D12V170-G1 - 1 J12V140E-GE - 1 J12V140-WJK - 1 SA12N170-G1 - 1 SA12V140-C2 - 1 SA12V140-GD - 1 SA12V140-W1 - 1 SA12V170-G3 - 1 SA6D170-W1 - 1
600-813-7112 (600-813-7113)	@D275A - 2 @D375A - 2 @D375A - 3 @D85 - 21 @D85A - 21 @D85A - 2B @D85C - 21 @HD465 - 5 @HD465-JK - 5 @WA600 - 3 @WA600-DZ - 3 @WA700 - 3 @WA700-AP - 1 @WA700-AP - 3 @WF650T - 3 A6D170E-WJK - 2 BE-B60 - 1 SA6D170-C2 - 1 SA6D170-W1 - 1
600-813-7121 (600-813-7122)	@BR1600JG - 1 @PC1100 - 6 @WA600 - 3E @WA600-AC - 3 @WD600 - 3 @WA700 - 3E A6D170E-KC - 3 A6D170E-W2 - 2 SAA6D170E - 3*
600-813-7131 (600-813-7132)	@PC1100 - 6 @PC1100-HA - 6
600-813-7141 (600-813-7142)	@PC1100 - 6
600-813-7151 (600-813-7152)	@D375A - 5 @HD465 - 7
600-813-7221 (600-813-7222)	@D85A - 2B
600-813-7311 (600-813-7312)	@PC1000 - 1 SA12V140-M - 1 12M140A - 1
600-813-7521 (600-813-7522)	@PC1100 - 6 @PC1100-HA - 6
600-813-7531 (600-813-7532)	@PC1100 - 6
600-813-7541 (600-813-7542)	@D475A - 3
600-813-7611 (600-813-7612)	@D53 - 17 @D53A - 18 @D65E - 12 @D65EX - 12 @PC400 - 6 @PC650 - 5 @PC750 - 6
600-813-7640 (600-813-7641)	@D65E - 12 @D65EX - 12



Part numbers of the 11 Kw starting motors and applicable machine models

Part No. (Upper line: Current Lower line: New)	Applicable machine model											
(600-813-9311)	@BR200T - 1E	@BR500JG - 2	@BR550JG - 1	@D155AX - 3	@D155AX - 5	@D53 - 17	@D53A - 18	@D53P - 18	@D58E - 1	@D58P - 1	@D60P - 12	
(600-813-9312)	@D65E - 12	@D65EX - 12	@D75S - 5	@D85ESS - 2A	@GC380F - 2	@GD605A - 5	@GD705A - 4A	@GH320 - 2	@HD325 - 6	@HV3000 - 1	@HV6000 - 1	
	@LW500 - 1	@PC400 - 5	@PC400 - 6	@PC400 - 6E	@PC400-AC - 6	@PC400-KU - 6	@PC400ST - 6	@PC650 - 5	@PC750 - 6	@WA450 - 3	@WA470 - 3	
	@WA500 - 3	@WA500-DZ - 3	@WF550 - 3	J6D140E-KC - 2	J6D140E-W2 - 2	S6D140-P - 1	SA6D140-A2 - 1	SA6D140-A-W1 - 1	SA6D140-C2 - 1	SA6D140-P - 1	SA6D140-W1 - 1	
600-813-9321	@BR1000JG - 1	@CS360 - 2E	@D155AX - 5A	@D275AX - 5	@D65E - 12	@D65EX - 12	@D85ESS - 2A	@GS500 - 1	@HD325 - 6E	@HM350 - 1	@HM400 - 1	
(600-813-9322)	@PC1800E - 6F	@PC1800E - 6R	@PC600 - 6	@PC600-KU - 6	@PC750 - 6E	@PC750-KU - 6E	@WA430 - 5	@WA450-AD - 5	@WA470-HH - 5	@WA480 - 5	@WA480-AD - 5	
	@WA480-HH - 5	@WA500 - 3E	@WA500-AC - 3	@WA500-HH - 3	@WT800E - 1	@WZ4000 - 1						
600-813-9330	@PC1800 - 6F	@PC1800 - 6R										
(600-815-9331)												
600-813-9340	@D65E - 12	@PC600 - 6										
(600-815-9341)												
600-813-9510	@PC1200 - 7	@PC1250 - 7	@WA700 - 3E	A6D170E-CC - 3								
(600-815-9511)												
600-863-8110	CUMMINS - 1	@GD655A - 3	@PC300 - 7									
CN:4063521												
(600-863-8111)												
CN:												