DENSO

Parties outside the secret

１枚がベスト

Structure system diagram	Issuing section: Electric manufacturing department 2 production engineering room 4 / date of creation: 2/8/2016	Approval: 吉田 6/02/08	examination: 小坂 6/02/08	create: 實松 6/02/08	Distribution cloth Ahead

Line name	Assembly part number, part name	name / For quantity confirmation
690A MG Stereoline	212100-0080 Stater S / A, Mo Tar	Priority management designation: S 13, C 1, ◎ 2, ○ 17.17
System No. Systematic name <1/1> 05 05 Pre-twist molding process	Model Product Name 212100-0080 Stater S / A, Mo Tar	Delivery destination, reserved vehicle type Toyota 690A

05-001
Expansion molding

05-002
Output line molding

05-003
2 slot twist molding

ASSYDRAWING, statuser
212101-0080

No.	Revision Date	Revision item	Reason for revision	Revised person
△ 3	1/26/2017	Root bending load measuring instrument	Clerical error correction	Kosaka

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Confidentiality

1枚がベスト

Process control statement

Issuing section	Approval	examination	create
Electric manufacturing department 2 production engineering room 4	吉田 6/02/08	小坂 6/02/08	實松 6/02/08
date of creation: 2/8/2016			

Distribution cloth Ahead

System No. -System diagram number Line name

690A MG Stereoline

Assembly part number, part name

212100-0080

Stater S / A, Mo Tar

name: For initial flow

Priority management designation S: ◇13 C1 Ⓒ2 C17

Process No. / Process name / Station name <1/1>

05 05

Pre-twist molding (1st) (No. 1)

Model Product Name

212100-0080

Stater S / A, Mo Tar

Delivery destination, reserved vehicle type

Toyota

690A

<Process specifications>

Expand the batch-inserted connectors in the outer diameter direction,

Secure the gap (insulation distance) between the weld electrodes.

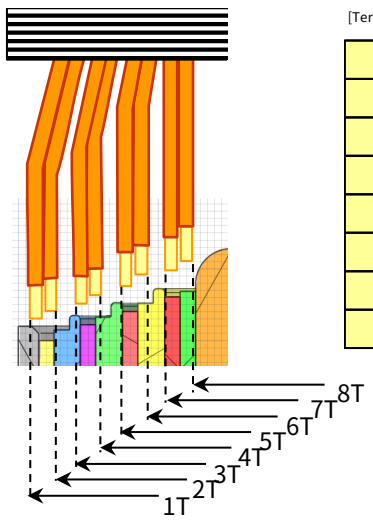
<Equipment>

NO.1 equipment

Equipment machine number	SMC-0810
Equipment name	Pre-twist molding machine
Model	—
capacity	7.9kW, 2t
Manufacturer name	Machinery Department

<Processing conditions>

Cycle time	90s	
Inner diameter clamp forward leading end	R73.86 ± 0.05	
1st expansion arrow insertion position	R77.35 ± 0.05	
2nd expansion arrow insertion position	R83.54 ± 0.05	
3rd expansion arrow insertion position	R90.33 ± 0.05	
Root clamp forward end	R91.49 ± 0.05	*Reference value
Outer diameter clamp forward leading end	R96.09 ± 0.05	*Reference value
Molding side holding load	500N	(Aim value)
Root clamp load	600N ± 50	
Tip clamp load	600N ± 50	



[Terminal position allowable dimensions]

1T	100.05
2T	90.96
3T	90.94
4T	85.06
5T	84.99
6T	79.06
7T	78.94
8T	68.56

<Quality>

<Working method>

1. 1. To supply to machining st after starting automatic operation

Remove the work from the pallet with a loader. 2. 2. After supplying to the processing st, the molding side is held down by the top plate.

3. 3. The inner diameter crush and the root crush are advanced and are in the slot.

Position 8 coils.

4. Insert the first expansion arrow ⇒ second ⇒ third.

5. After the 3rd expansion arrow is inserted, 1T & 2T

The outer diameter clamp for molding advances.

6. After each jig is anchored, operation 3 is repeated.

Repeat this (24 slots x 2st).

7. After the pre-slot processing is completed, go to the pallet with the loader.

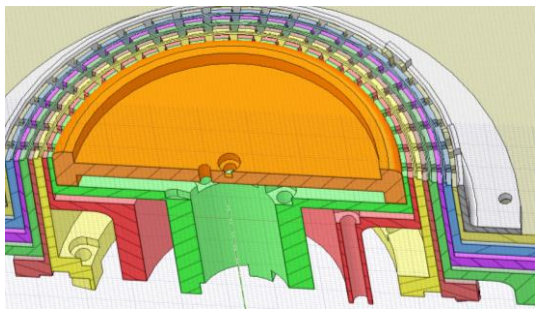
Set the work and transport it to the next process.

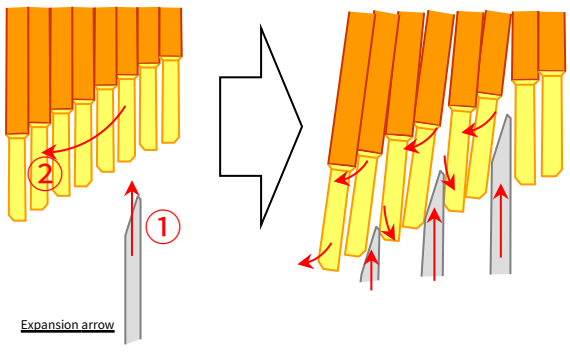
<Processing drawing>

[Twisting jig]

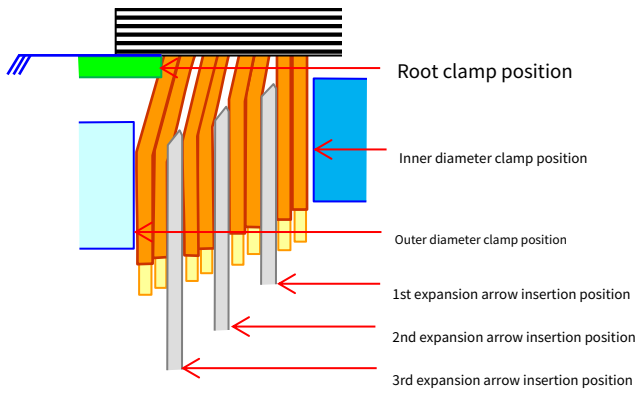
The terminal after expansion should enter the twisting jig.

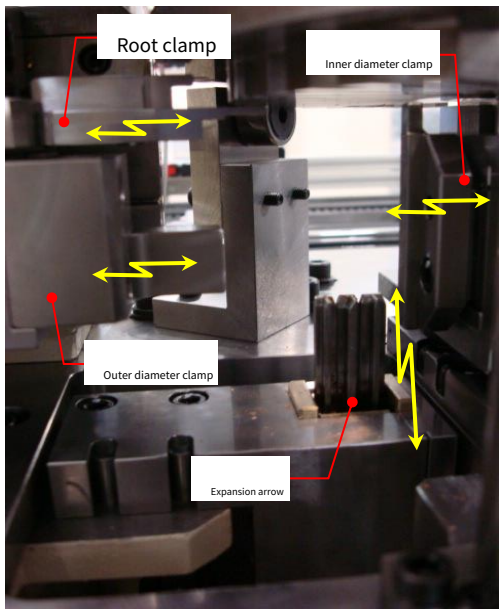
(Twisting jig cross-section image)





【process section】





<Disposal of defective products>

Dispose of all works that have become defective before twisting.

<Daily inspection>

・ Carry out based on the daily inspection check sheet. ・

Implement based on the refueling guidance table.

At the time of measurement	Heavy	No.	Characteristic / Measuring instrument	Management method: Management interval	Management method: Management method	Management method: Administrator	Process capability σ, X, Cp, Cpk	remarks	Quality ID Relationship criteria
		1	Main air pressure 0.4 ± 0.05MPa / Pressure gauge (0.001)	1 / Direct (at the time of work)	Condition management / Check sheet	worker			
		2	Root clamp 1 ° molding load 600 ± 50N / Road cell (1.0)	1 / Direct (at the time of work)	Condition management / Check sheet	worker			
		3	Root clamp 2p molding load 600 ± 50N / Road cell (1.0)	1 / Direct (at the time of work)	Condition management / Check sheet	worker			
		Four	Tip clamp 1 ° molding load 600 ± 50N / Road cell (1.0)	1 / Direct (at the time of work)	Condition management / Check sheet	worker			
		Five	Tip clamp 2p molding load 600 ± 50N / Road cell (1.0)	1 / Direct (at the time of work)	Condition management / Check sheet	worker			
		6	process section(Molding blade, tip & root clamp) No scratches or scratches / Visually	1 / Direct (at the time of work)	Condition management / Check sheet	worker			
		7	No harmful scratches on the coil wire / Visually	2 / Direct, when adjusting the extended arrow	Check	worker		* See limit sample	
		8	Molding side height 22.1 +0.5 / -0.3mm / Dedicated measuring machine (0.01 mm)	When adjusting the extended arrow	Recording paper	worker			
		9	Terminal circumferential position 0 ± 1.5 mm / 3-dimensional measuring devices	When adjusting the extended arrow	Recording paper	Team leader		16 slot measurement (No. 1, 4, 7 ... every 3 slots)	
		Ten	Radial position 1T <100.05mm, 2T> 90.96m m / 3-dimensional measuring devices	When adjusting the extended arrow	Recording paper	Team leader		16 slot measurement (No. 1, 4, 7 ... every 3 slots)	
		11 11	Radial position 3T <90.94mm, 4T> 85.06mm / 3-dimensional measuring devices	When adjusting the extended arrow	Recording paper	Team leader		16 slot measurement (No. 1, 4, 7 ... every 3 slots)	
		12	Radial position 5T <84.99mm, 6T> 79.06mm / 3-dimensional measuring devices	When adjusting the extended arrow	Recording paper	Team leader		16 slot measurement (No. 1, 4, 7 ... every 3 slots)	
		13	Radial position 7T <78.94mm, 8T> 68.56mm / 3-dimensional measuring devices	When adjusting the extended arrow	Recording paper	Team leader		16 slot measurement (No. 1, 4, 7 ... every 3 slots)	
		14	Terminal height Aim ± 0.8 / Dedicated measuring machine (0.01 mm)	When adjusting the extended arrow	Recording paper	worker			

No.	Revision Date	Revision item	Reason for revision	Revised person
△3	1/26/2017	Root bending load measuring instrument	Clerical error correction	Kosaka

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Process control statement

Issuing section	Approval	examination	create
Electric manufacturing department 2 production engineering room 4	吉田 6/02/08	小坂 6/02/08	實松 6/02/08
date of creation: 2/8/2016			

Distribution cloth Ahead

System No. -System diagram number Line name

690A MG Stereoline

Assembly part number, part name

212100-0080

Stater S / A, Mo Tar

name: For initial flow

Priority management designation S

Process No. Process name Station name <1/1>

05 05

Pre-twist molding (2st) (No. 1)

Model Product Name

212100-0080

Stater S / A, Mo Tar

Delivery destination, reserved vehicle type

Toyota

690A

<Process specifications>

The wire to which the output wire Assy is welded is formed in the subsequent process.

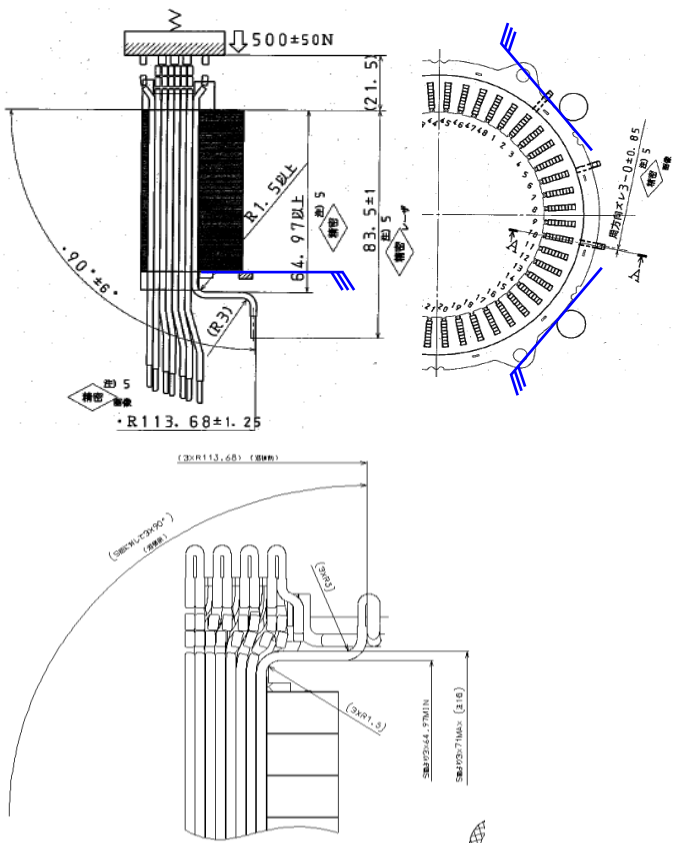
<Equipment>

NO.1 equipment

Equipment machine number	SMC-0810
Equipment name	Pre-twist molding machine
Model	—
capacity	7.9kW, 2t
Manufacturer name	Machinery Department

<Processing conditions> * Combine output wire molding and 2 slot twisting

Cycle time	90s
Molding side holding load	500N ± 50
Root bending die position	R91.6 ± 0.05
Fundamental bending load	700 ± 30N
Roller load	398N ± 80N



<Working method>

1. 1. To supply to machining st after starting automatic operation

Remove the work from the pallet with a loader. 2. 2. After supplying to the processing st, the molding side is held down by the top plate.

3. 3. Line drawer

4. Fundamental bending

5. Raise the line

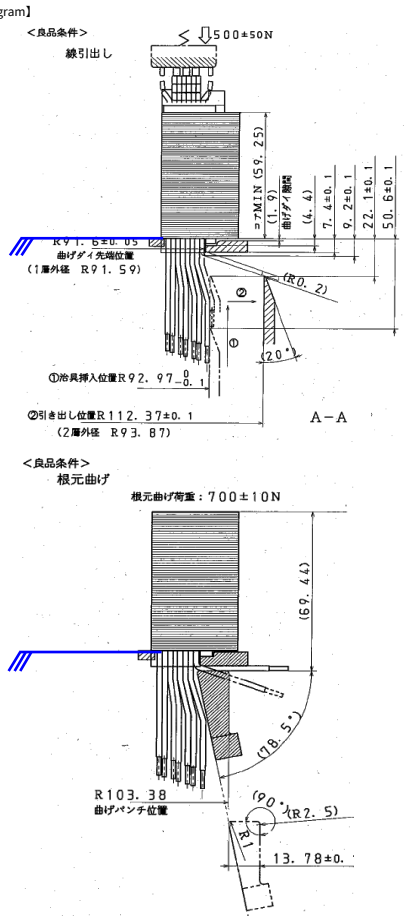
6. Repeat operation 3⇒4⇒5.

7.3 After the slot processing is completed, at the opposite st

2 Slot twist molding is performed.

<Processing drawing>

【Pattern diagram】



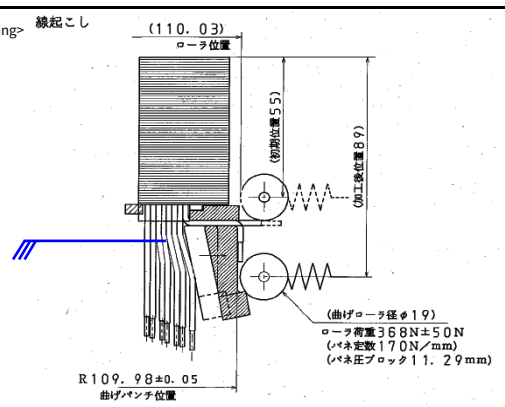
<Regular cleaning>

The following items are for regular cleaning with fences, etc. (1 / straight) ・

Fundamental bending die

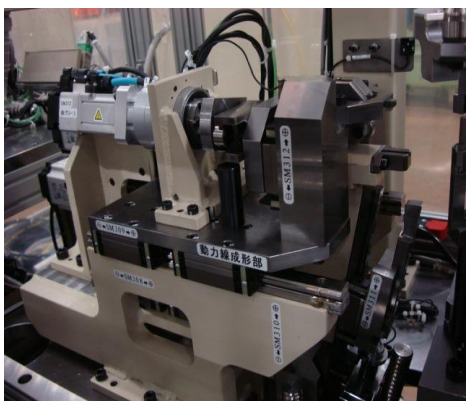
・ Lho La

<Processing drawing>



[Exterior photo]

【process section】



<Disposal of defective products>

Dispose of all works that have become defective before twisting.

<Daily inspection>

・ Carry out based on the daily inspection check sheet. ・

Implement based on the refueling guidance table.

Dispose of all works that have become defective before twisting.

<Quality>

At the time of measurement	Heavy	No.	Characteristic / Measuring instrument	Management method: Management interval	Management method	Administrator	Process capability σ, X, Cp, Cpk	remarks	Quality ID / Relationship criteria
◇		1	Low load 398 ± 80N Low load cell (1.0)	1 / Direct (at the time of work)	Condition management Check sheet	worker			
◇		2	Root bending load 700 ± 30N △3 Load cell (1.0)	1 / Direct (at the time of work)	Condition management Check sheet	worker			
◇		3	process section (Bending roller, punch, root clamp) No scratches or scratches Visually	1 / Direct (at the time of work)	Condition management Check sheet	worker			
◆		Four	No harmful scratches on the coil wire Visually	2 / Direct, at the time of punch & roller adjustment	Check	worker		* See limit sample	
◆		6	Barrage tolerance (circumferential direction) within 0.85 x 4.85 [0 ± 0.85] Check gauge 3-dimensional measuring devices	1 / direct When changing conditions	Check sheet Recording paper	worker Team leader		Gage management starts from March 2016	
◆		7	Barack tolerance (diameter) 1.25 x 4.2 or less [R113.68 ± 1.25] Check gauge 3-dimensional measuring devices	1 / direct When changing conditions	Check sheet Recording paper	worker Team leader		Gage management starts from March 2016	
◆		8	Terminal height 83.5 ± 1 Height gauge (0.01mm)	1 / direct	Recording paper	worker			
◆		9	Leader top surface height 71 or less Height gauge (0.01mm)	1 / direct	Recording paper	worker			
◆		Ten	Leader height 64.97 or higher Height gauge (0.01mm)	1 / direct	Recording paper	worker			
◆		11 11	Bending angle 89 ± 6 ° Check gauge 3-dimensional measuring devices	1 / direct When changing conditions	Check sheet Recording paper	worker Team leader		This gage can be replaced with a gage of 6,7	

No.	Revision Date	Revision item	Reason for revision	Revised person
△3	1/26/2017	Root bending load measuring instrument	Clerical error correction	Kosaka

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Process control statement

Issuing section	Approval	examination	create	Distribution cloth Ahead
Electric manufacturing department 2 production engineering room 4	吉田 6/02/08	小坂 6/02/08	實松 6/02/08	
date of creation 2/8/2016				

System No. -System diagram number Line name

690A MG Stereoline

Assembly part number, part name

212100-0080

Stater S / A, Mo Tar

name For initial flow

Priority management designation S 13 C 1 C 2 C 17.17

Process No. Process name Station name <1/1>

05 05

Pre-twist molding (2st) (No. 1)

Model Product Name

212100-0080

Stater S / A, Mo Tar

Delivery destination, reserved vehicle type

Toyota

69

<Process specifications>

In the post-process, the wire to which the neutral wire Assy is welded is formed.

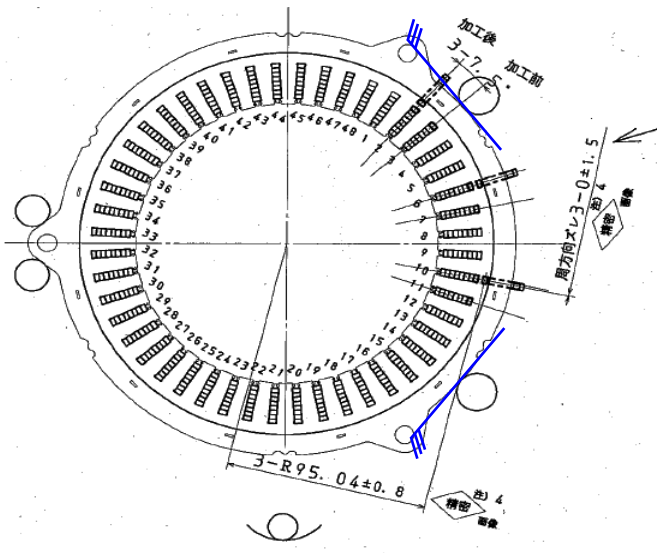
<Equipment>

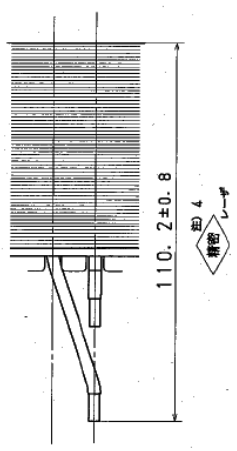
NO.1 equipment

Equipment machine number	SMC-0810
Equipment name	Pre-twist molding machine
Model	—
capacity	7.9kW, 2t
Manufacturer name	Machinery Department

<Processing conditions> * Combine output wire molding and 2 slot twisting

Cycle time	90s
Molding side holding load	500N ± 50
Bending starting point position	R91.86 ± 0.05
Twist angle	8 ° ⇒ 7.5 °





<Working method>

1. 1. Nemoto clamp

2. 2. Insert twisting jig

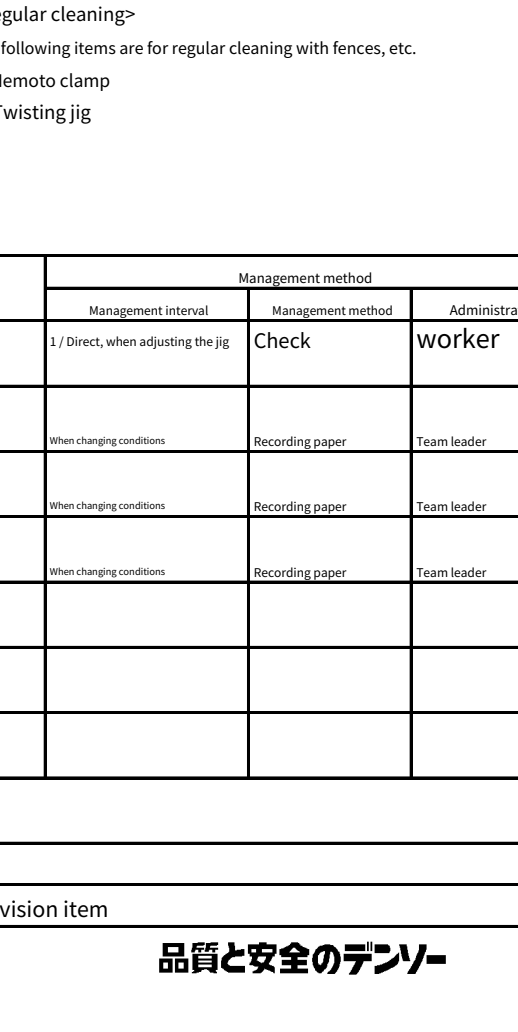
After twisting 3.8 °, twist it back to 7.5 °.

4. Mold all applicable lines.

5. Anroda

<Processing drawing>

【Pattern diagram】



<Regular cleaning>

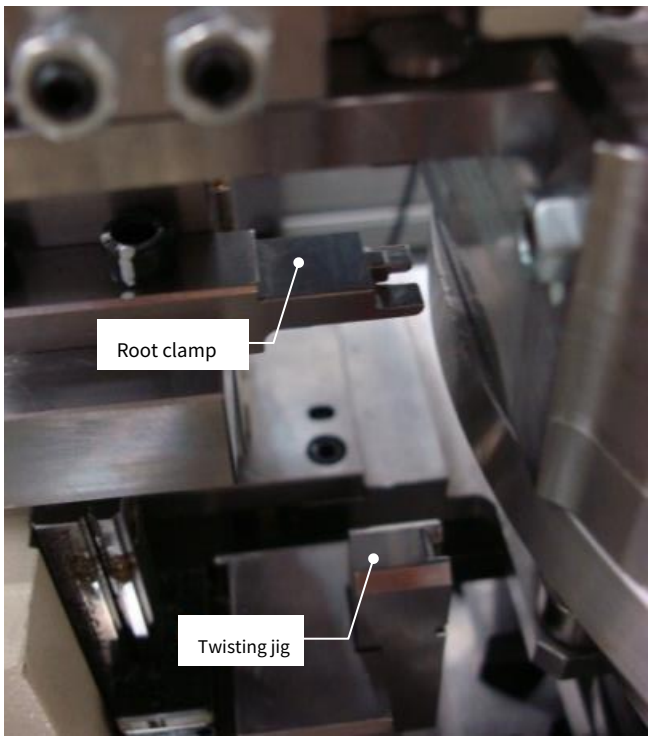
The following items are for regular cleaning with fences, etc.

・ Nemoto clamp

・ Twisting jig

<Addition

[Addition]



<Disposal of defective products>

Dispose of all works that have become defective before twisting.

<Daily inspection>

・ Carry out based on the daily inspection check sheet. ・

Implement based on the refueling guidance table.

<Quality>

At the time of measurement	Heavy	No.	Characteristic / Measuring instrument	Management method: Management interval	Management method: Management method	Management method: Administrator	Process capability σ, X, Cp, Cpk	remarks	Quality ID Relationship criteria
		1	No harmful scratches on the coil wire Visually	1 / Direct, when adjusting the jig	Check	worker		* See limit sample	
		2	Circumferential position 0 ± 1.5 mm 3-dimensional measuring devices	When changing conditions	Recording paper	Team leader			
		3	Radial position R95.04 ± 0.8 3-dimensional measuring devices	When changing conditions	Recording paper	Team leader			
		Four	Terminal height 110.2 ± 0.8 Height gauge (0.01mm)	When changing conditions	Recording paper	Team leader			
		Five							
		6							
		7							

No.	Revision Date	Revision item	Reason for revision	Revised person
△3	1/26/2017	Root bending load measuring instrument	Clerical error correction	Kosaka

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