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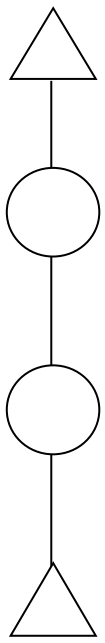
Parties outside the secret

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 6/02/08 田	examination: 小 6/02/08 坂	examination: 山 6/02/08 地	examination	create	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> 08 08 Terminal welding (general part)	Model Product Name 212100-0080 Stater S / A, Mo Tar	Delivery destination, reserved vehicle type Toyota 690A



08-001
Odd layer welding (Unit 1)

Welding electrode A: 9 → 11 →⋯ → 19 slot welding
Welding electrode B: 45 → 47 →⋯ → 7 slot welding
Welding electrode C: 33 → 35 →⋯ → 43 slot welding
Welding electrode D: 21 → 23 →⋯ → 31 slot welding

08-002
Even layer welding (Unit 2)

Welding electrode A: 10 → 12 →⋯ → 20 slot welding
Welding electrode B: 46 → 48 →⋯ → 8 slot welding
Welding electrode C: 34 → 36 →⋯ → 44 slot welding
Welding electrode D: 22 → 24 →⋯ → 32 slot welding

ASSY DRAWING, Stager
212101-0080

No.	Revision Date	Revision item	Reason for revision	Revised person
△ 2	1/20/2017	Tool specifications	Reflects the examination results during the initial flow	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	山地 6/02/08	
date of creation 2/8/2016				

System No. -System diagram number　Line name

690A MG Ste　Taline

Assembly part number, part name

212100-0080

Stationer S / A, motor

name　For initial flow

Priority management designation　SCC 13　C 1　◎ 2　○ 17.17

Process No.　Process name　Station name　<1/2>

08 08

Terminal welding (general part)　(No. 1 & No. 2)

Model Product Name

212100-0080

Stationer S / A, motor

Delivery destination, reserved vehicle type

Toyota

690A

<Process specifications>

After twisting and correcting the terminal, Tig weld (single-shot welding) 189 points on the terminal to connect the U, V, and W layers.

<Equipment>

NO.1 equipment

Equipment machine number	SMC-0813, 0814
Equipment name	Terminal Welder (General Department): No. 1 & No. 2
Model	―――――
capacity	13.3kW, 3.0t
Maker name	Machinery Department

<Tools>

NO.1 tool

Tool No.	Y1501-2413
Tool name	Electrode L (general wire part)
Tool grade	CuCrB, lifespan 60,000 shots

<Tools>

NO.2 Tool

Tool No.	Y1501-2414
Tool name	Electrode R (general wire part)
Tool grade	CuCrB, lifespan 60,000 shots

<Tools>

NO.3 Tool

Tool No.	Y1501-24150
Tool name	External electrode (general wire part)
Tool grade	CuCrB, lifespan 120,000 shots

<Tools> 2

NO.4 Tools

Tool No.	Y1501-20090
Tool name	Welding tochi
Tool grade	Tungsten with 2% cerium, lifespan 500 shots

<Tools> 2

NO.5 Tool

Tool No.	Y1501-25360
Tool name	Inner rod-shaped electrode (general part)
Tool grade	CuCrB, lifespan 120,000 shots

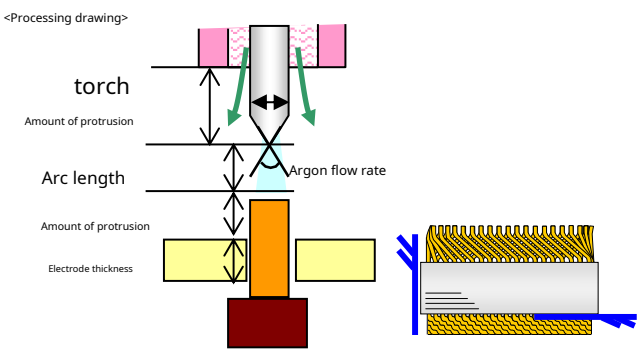
<Processing conditions>

Welding power supply	DT-300HV (Daihen)
Welding current	175A ± 15A
Welding time	0.25s ± 0.05s
To Cheer diameter	φ3.2
To Chee protrusion amount	3 ± 2mm
To Chee angle	45 °
To Che tip diameter	φ0.5
To Chee position slip	± 0.5 mm or less for both diameter and circumference
Circumferential clamp	Electrode gap 0.05 ± 0.02 mm
Clamp pressure in the circumferential direction	0.13 ± 0.02Mpa
Radial offset load	90N ± 40N
External electrode load	90N ± 40N
Amount of protrusion	3.5 ± 1mm
Electrode thickness	2.5mm
AL gas flow rate	10 ± 3 L / min(1 / Nao: Confirmation at the time of work)
After flow (innermost layer)	0.3s
Aku length	2mm
(Electrode check allowable range)	± 1.0 × ± 0.8mm No
difference from the welding master waveform	
Cycle time	90s

<Working method>

1. Put the work into the equipment.(Odd layer: Unit 1, even layer: Unit 2)
2. Advance the weld electrode unit.
3. Clamp the terminal on the read side with the weld electrode.
4. Offset the left and right electrodes
   Make sure to use the electrodes and terminals.
5. Advance the outermost layer electrode unit, and clamp the bulging part toward the outer peripheral side by torsion molding.
6. Insert the backup electrode.
7. Perform Tig welding. (Inner layer side ⇒ outer layer side)
8. Clamp the welded electrode and index the electrode for two layers. ・ Welding visual NG products are re-loaded in front of the welding machine.　Re-introduced from N
9. Weld the odd and even layers to complete the welding.

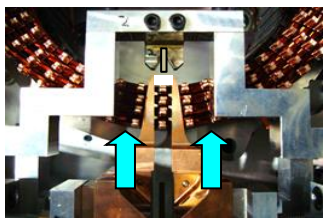
<Processing drawing>



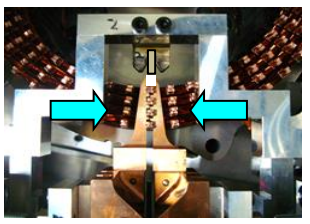
<Processing drawing>

[Clamp method]

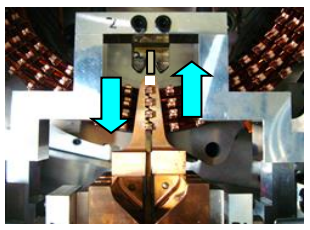
① Electrode movement



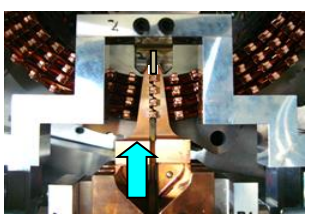
② Clamp



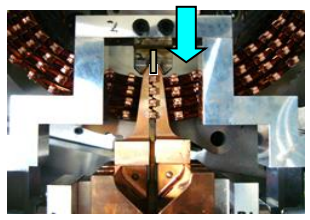
③ Offset



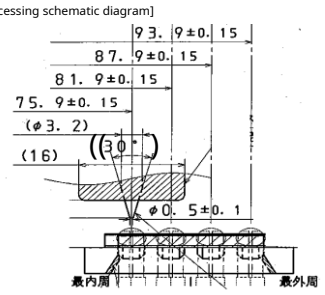
④ External electrode clamp



⑤ Backup electrode



[Processing schematic diagram]



<Defective product treatment>

・ Distance between in-phase conductors NG, large welding burr, and short circuit are considered to be defective.

<Regular cleaning>

Below, for items, use Fent, etc.

1 / Perform regular cleaning directly.

・ Wook processing part
・ Welding electrode part
・ Electrode unit drive unit

<Daily inspection>

・ Carry out based on the daily inspection check sheet. ・ Implement based on the refueling guidance table.

No.	Revision Date	Revision item	Reason for revision	Revised person
△ 2	1/20/2017	Tool specifications	Reflects the examination results during the initial flow	Kosaka
△ 1	20161002	Welding afterfloor part and time change	Clerical corrections	Mountains

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Confidentiality

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Process control statement

Issuing section	Approval	examination	create	Distribution cloth Ahead
Electric manufacturing department 2 production engineering room 4	吉 6/02/08 田	小 6/02/08 坂	山 6/02/08 地	
date of creation 2/8/2016				

System No. -System diagram number Line name	Assembly part number, part name	name
690A MG Ste Taline	212100-0080 Stationer S / A, motor	For initial flow
		Priority management designation SCC 13 C 1 2 17
Process No. Process name Station name <2/2>	Model Product Name	Delivery destination, reserved vehicle type
08 08 Terminal welding (general part) (No. 1 & No. 2)	212100-0080 Stationer S / A, motor	Toyota 690A

<Quality>

At the time of measure Heavy	No.	Characteristic / Measuring instrument	Management method: Management interval	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	Ar gas flow rate 10 ± 3 L / min Flowmeter (0.1)	1 / Direct (at the time of work)	Condition management Check sheet	worker			
©	3	Welding strength 64.2N or more Push pull cage (1N)	1 / direct	x-Rs control chart	Team leader		see Attachment	
©	Four	Weld cross-sectional area 2.9㎟ or more X-ray (0.01㎟)	1 / W	Proposal x-Rs control chart	Partial inspection Team leader		see Attachment	
* 1	Five	Twist side height after welding 96.15 mm or less Dedicated measuring instrument (0.01)	4 / direct (Existing / Noh increase)	xR control chart	Team leader		Max value of all slots (189 points in general section)	
©	6	Distance between in-phase conductors 1.05 mm or more Visual Unit 2 (0.01)	4 / direct (Existing / Noh increase)	xR control chart	worker			
©	7	Distance between phases and conductors 4 mm or more Caliper (0.01) * 7-8T only	4 / direct (Existing / Noh & Pattern N ① / ② are rotated)	xR control chart	worker		Day shift Between 7-8, 8-9, 9-10 slots = 3 places Night shift Between 31-32, 32-33, 33-34 slots = 3 places	
©	8	No film burning Visual check	4 / direct (Existing / Noh increase)	Check sheet	Team leader		* See limit sample	
	9	Welded mating surface is melted Visual check	4 / direct	Check	worker		* See limit sample	
	Ten	No blue hole (≦ 7% provisional) X-ray	1 / W, when adjusting welding conditions	Proposal	Partial inspection		see Attachment	
	11 11	Welded ball quality (no ball separation, etc.) Visual check (see limit sample)	1 / straight, welding condition adjustment And when replacing electrodes	Tool Check	worker			
©	12	Welding conditions Current value 175A ± 15A Welding monitor	4 / direct (Existing / Noh increase) 100%	xR control chart Equipment automatic check	Team leader worker			
©	13	Welding conditions Welding time 0.25s ± 0.05s Welding monitor	4 / direct (Existing / Noh increase) 100%	xR control chart Equipment automatic check	Team leader worker			

No.	Revision Date	Revision item	Reason for revision	Revised person
△ 2	1/20/2017	Tool specifications	Reflects the examination results during the initial flow	Kosaka

品質と安全のデンソー

DENSO

Parties outside the secret

１枚がペスト

Structure system diagram	Issuing section: Electrical Engineering Development Department, Electrical Engineering Department / date of creation: 10/12/2016	Approval: 吉 16/10/24 田	examination	create: 山 16/10/23 地	Distribution cloth Ahead

Line name	Assembly part number, part name	name
690A MG Stereoline	212100-0080 Stater S / A, Mo Tar	For initial flow
		Priority management designation: S 13 / C 1 / ◎ 2 / ○ 17.17
System No. Systematic name <1/1>	Model Product Name	Delivery destination, reserved vehicle type
08 08 Terminal welding (general part)	212100-0080 Stater S / A, Mo Tar	Toyota 690A

● Joint area & blow hole inspection site and frequency

Target electrode	Target slot	interval	Rotation number
Unit 1 A electrode	9 slots 1-8T	1 / W	①
Unit 2 A electrode	10 slots 3-8T, 12 slots 1-2T		
Unit 1 D electrode	21 slots 1-8T	1 / W	⑤
Unit 2 D electrode	22 slots 1-8T		
Unit 1 C electrode	33 Slots 1-8T	1 / W	③
Unit 2 C electrode	34 slots 1-8T		
Unit 1 B electrode	45 slots 1-8T	1 / W	⑦
Unit 2 B electrode	46 slots 1-8T		
Unit 3 A electrode	9 slots 1-8T	1 / W	⑥
Unit 4 A electrode	10 slots 3-8T, 12 slots 1-2T		
Unit 3 D electrode	21 slots 1-8T	1 / W	②
Unit 4 D electrode	22 slots 1-8T		
Unit 3 C electrode	33 Slots 1-8T	1 / W	⑧
Unit 4 C electrode	34 slots 1-8T		
Unit 3 B electrode	45 slots 1-8T	1 / W	④
Unit 4 B electrode	46 slots 1-8T		

* Since the neutral wire is used, slot No. 12 is used for 1-2T.

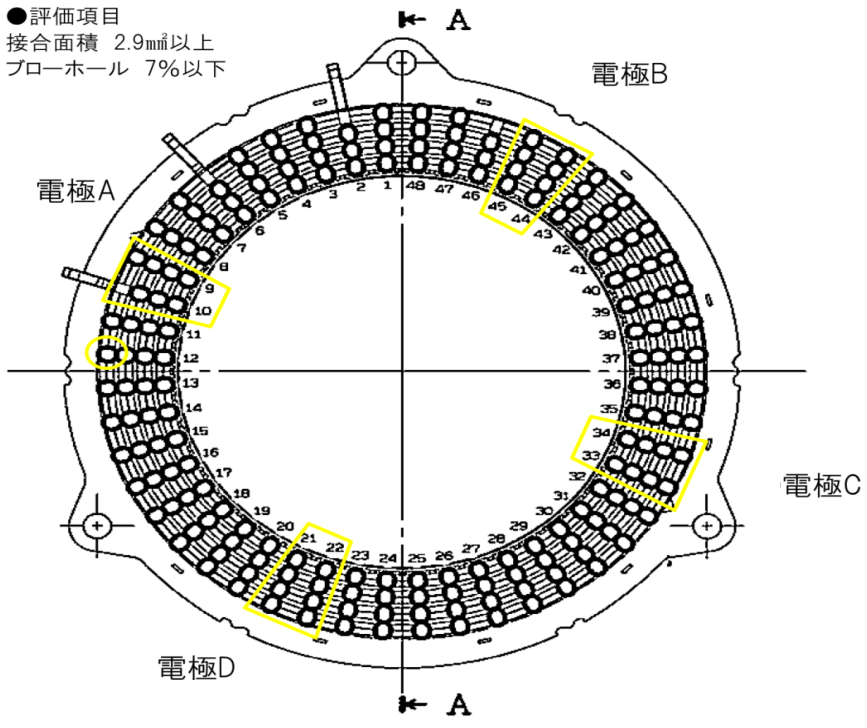
● Tensile strength measurement site and frequency

Target electrode	Target slot	interval	Rotation number
Unit 1 A electrode	9 slots 1-8T	1 / direct	△2 ①
Unit 2 A electrode	10 slots 3-8T, 12 slots 1-2T		
Unit 1 D electrode	21 slots 1-8T		
Unit 2 D electrode	22 slots 1-8T		
Unit 1 C electrode	33 Slots 1-8T	1 / direct	△2 ④
Unit 2 C electrode	34 slots 1-8T		
Unit 1 B electrode	45 slots 1-8T		
Unit 2 B electrode	46 slots 1-8T		
Unit 3 A electrode	9 slots 1-8T	1 / direct	△2 ③
Unit 4 A electrode	10 slots 3-8T, 12 slots 1-2T		
Unit 3 D electrode	21 slots 1-8T		
Unit 4 D electrode	22 slots 1-8T		
Unit 3 C electrode	33 Slots 1-8T	1 / direct	△2 ②
Unit 4 C electrode	34 slots 1-8T		
Unit 3 B electrode	45 slots 1-8T		
Unit 4 B electrode	46 slots 1-8T		

* Since the neutral wire is used, slot No. 12 is used for 1-2T.

* Since the neutral wire is used, slot No. 12 is used for 1-2T.

●評価項目
接合面積　2.9㎟以上
ブローホール　7%以下



溶接断面積の測定手順

- 図5　4に示す溶接部をA−Aでカットする。
- 図5−5に示すA−A断面図のハッチング部の面積を測定する。
- 母材との境界面の溶接断面積を測定する場合は、図5−5に示すA−A断面図のB−Bでカットし、B−B 断面図のハッチング部の面積を測定する。
なお、母材上面の溶け残りがない場合は、溶接断面積が確保されているため、カット不要とする。

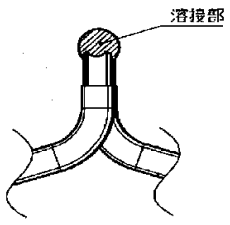
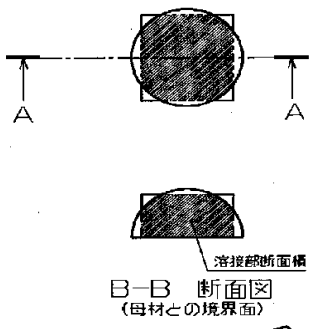
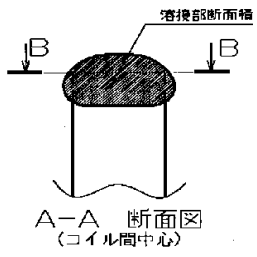


図5−4　溶接断面基準



B−B　断面図
（母材との境界面）



A−A　断面図
（コイル間中心）

No.	Revision Date	Revision item	Reason for revision	Revised person
△ 2	1/20/2017	Tool specifications	Reflects the examination results during the initial flow	Kosaka

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