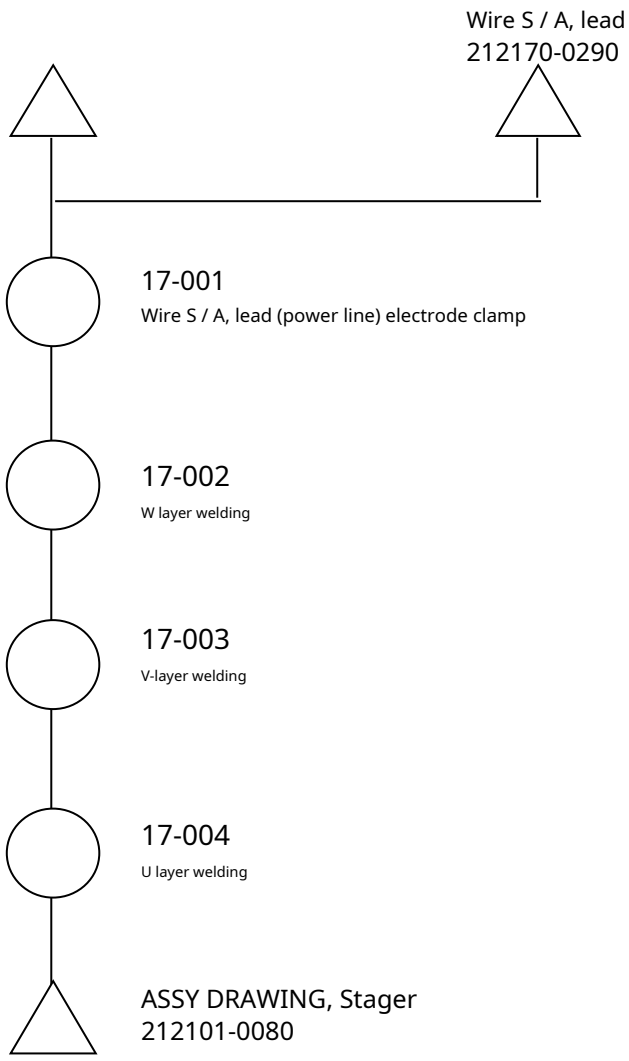
DENSO

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 6/02/08 田	examination: 小 6/02/08 坂	examination: 山 6/02/08 地			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> 17 17 Terminal welding (power line)	Model Product Name 212100-0080 Stater S / A, Mo Tar	Delivery destination, reserved vehicle type Toyota 690A



No.	Revision Date	Revision item	Reason for revision	Revised person

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Process control statement

Issuing section: Electric manufacturing department 2 production engineering room 4

date of creation: 2/8/2016

Approval	examination	examination
吉 6/02/08 田	小 6/02/08 坂	山 6/02/08 地

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: SCCC 13 1 2 17 17

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

17 17

Terminal welding (power line)

Model Product Name

212100-0080

Stater S / A, Mo Tar

Delivery destination, reserved vehicle type

Toyota

690A

<Process specifications>

Power line parts are supplied to the work, terminal Tig welding is performed, and coil wires are connected.

<Equipment>

NO.1 equipment

Equipment machine number	EZ-4558
Equipment name	Terminal welder (power line)
Model	————
capacity	13.3kW, 3.0t
Manufacturer name	Machinery Department

<Tools>

NO.1 tool

Tool No.	Y1501-24160
Tool name	Electrode L (neutral wire part / power wire part)
Tool grade	CuCrB, lifespan 60,000 shots

<Tools>

NO.2 Tool

Tool No.	Y1501-24170
Tool name	Electrode R (neutral wire part / power wire part)
Tool grade	CuCrB, lifespan 60,000 shots

<Tools>

NO.3 Tool

Tool No.	Y1501-24180
Tool name	External electrode (neutral wire part / power line part)
Tool grade	CuCrB, lifespan 60,000 shots

<Tools>

NO.4 Tools

Tool No.	Y1501-24270
Tool name	Welding torch
Tool grade	Tungsten with 2% cerium, lifespan 500 shots

<Assembled parts>

1. Wire S / A, lead: 212170-0290

<Processing conditions>

Welding power supply	DT-300HV (Daihen)
Welding current	190 ± 20A
Welding time	0.3 ± 0.05s
Toe side diameter	φ3.2
Toe side protrusion amount	3 ± 2mm
Toe side angle	45 °
Toe side tip diameter	φ0.5
Toe side position slip	± 0.5 mm or less for both diameter and circumference
Circumferential clamp	3.2 ± 0.5 mm (fixed size)
Radial offset load	90N ± 40N
External electrode load	90N ± 40N
Amount of protrusion	3.5 ± 1mm
Electrode thickness	2mm
AL gas flow rate	15 ± 5 L / min
Preflow, afterflow	0.5s
Arc length	2mm

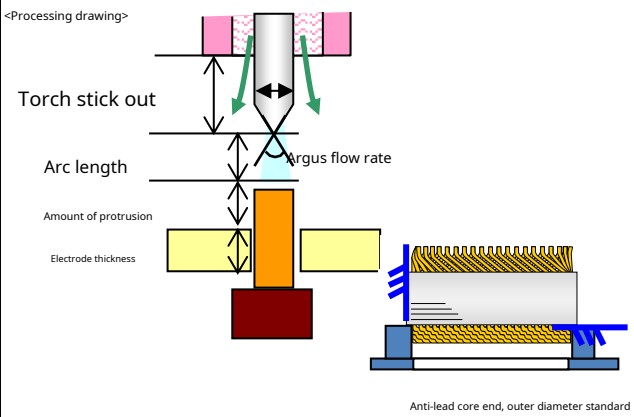
No difference from the welding master waveform

Cycle time 50s

<Working method>

1. Put the work into the equipment.
2. Advance the weld electrode unit.
3. Clamp the terminal on the lead side with the weld electrode.
4. Offset the left and right electrodes
   Make sure to ground the electrodes and terminals.
5. Advance the outermost layer electrode unit,
   Make sure to ground the electrode and neutral wire.
6. Tig weld the power line (W phase ⇒ V phase ⇒ U phase).
7. Unclamp the weld electrode.
8. Pay out the work.

<Processing drawing>

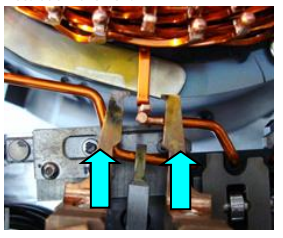


Anti-lead core end, outer diameter standard

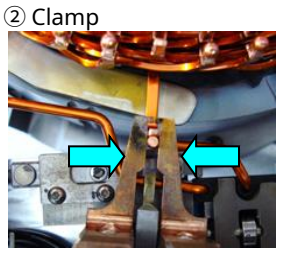
<Processing drawing>

[Electrode shape]

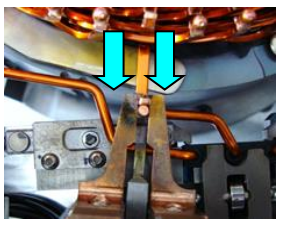
① Electrode movement



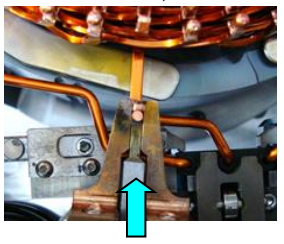
② Clamp



③ Offset

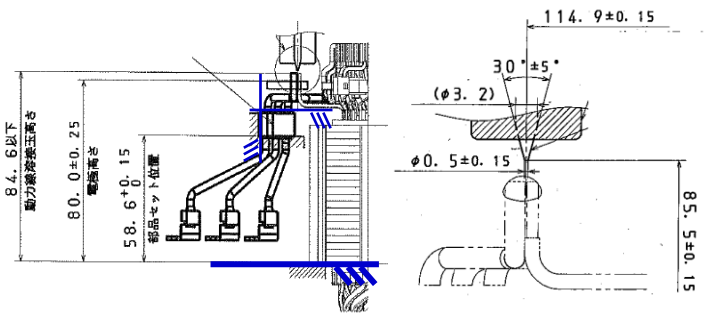


④ External electrode clamp



<Processing drawing>

[Processing schematic diagram]



<Defective product treatment>

・ Welding visual NG products are re-loaded from the re-loading lane in front of the power line welding machine.

<Regular cleaning>

Below, for items, use Fent, etc.

1 / Perform regular cleaning directly.

・ Working part

・ Welding electrode part

・ Magazine input section

<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
△				

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Process control statement

Issuing section	Approval	examination	examination	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 Stereoline	212100-0080 Stater S / A, Mo Tar	For initial flow
		Priority management designation SCCC 13 1 2 17 17
Process No. / Process name / Station name <2/2>	Model Product Name	Delivery destination, reserved vehicle type
17 17 Terminal welding (power line)	212100-0080 Stater S / A, Mo Tar	Toyota 690A

<Quality>

At the time of measurement	Heavy	No.	Characteristic / Measuring instrument	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 15 ± 5 L / min Flowmeter (0.1)	1 / Direct (at the time of work)	Condition management Check sheet	worker			
	Ⓒ	3	Weld strength 142.2N or more Push pull gage (0.01N)	1 / direct	x-Rs control chart	Team leader		U, V, W phase (2, 6, 10 slots) 3 stratified management	
	Ⓒ	Four	Welded cross-sectional area 4.7㎟ or more X-ray (0.01㎟)	1 / W	Proposal x-Rs control chart	Partial inspection Team leader		U, V, W phase (2, 6, 10 slots) 3 stratified management	
		Five	Power line position φ5.4 (free) Dedicated measuring instrument (0.01)	4 / Nao	Recording paper	worker			
		6	Power line position φ4.4 (fixed) or less Dedicated measuring instrument (0.01)	4 / Nao	Recording paper	worker			
		7	Power line height 10.8 (+ 4.2 / -0.8) (free) Dedicated measuring instrument (0.01)	4 / Nao	Recording paper	worker			
		8	Power line height 9.8 (+ 4.2 / -0.8) (fixed) Dedicated measuring instrument (0.01)	4 / Nao	Recording paper	worker			
	Ⓒ	9	No film burning Visual check	4 / Nao	Check sheet	Team leader		* See limit sample	
		Ten	Welded mating surface is melted Visual check	4 / Nao	Check	worker		* See limit sample	
		11 11	No blow hole (≦7% provisional) X-ray	1W, when adjusting welding conditions	Proposal	Partial inspection		U, V, W phase (2, 6, 10 slots) 3 stratified management	
		12	Welded ball quality (no ball separation, etc.) Visual check (see limit sample)	2 / Straight, welding condition adjustment Time	Check	worker		* See limit sample	
	◎	13	Welding conditions Current value 190A ± 20A Welding monitor	4 / Nao 100%	xR control chart Equipment automatic check	Team leader worker			
	◎	14	Welding conditions Welding time 0.3s ± 0.05s Welding monitor	4 / Nao 100%	xR control chart Equipment automatic check	Team leader worker			

No.	Revision Date	Revision item	Reason for revision	Revised person
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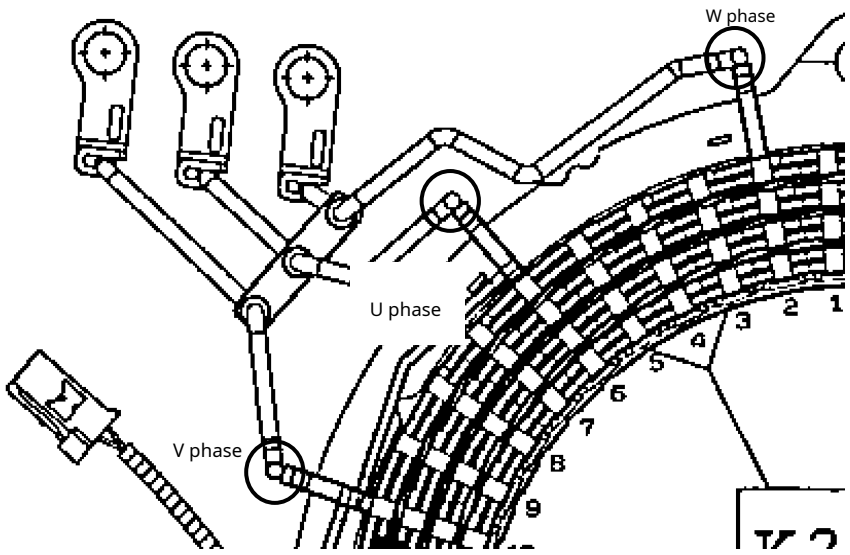
Line name	Assembly part number, part name	name
690A MG Stereoline	212100-0080 Stater S / A, Mo Tar	For initial flow
		Priority management designation: S 13 C 1 C 2 ○ 17 17
System No. Systematic name <1/1>	Model Product Name	Delivery destination, reserved vehicle type
17 17 Terminal welding (power line)	212100-0080 Stater S / A, Mo Tar	Toyota 690A

● Measurement site and frequency

Measurement site	interval
U phase	1 / W
W phase	
Phase V	



● Evaluation items

Joining area 4.7㎟ or more

blow hole 7% or less

・図7−8に示す溶接部をD−Dでカットする。
・図7−9に示すD−D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7−9に示すD−D断面図のE−Eでカットし、E−E 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。

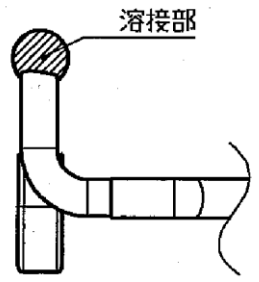
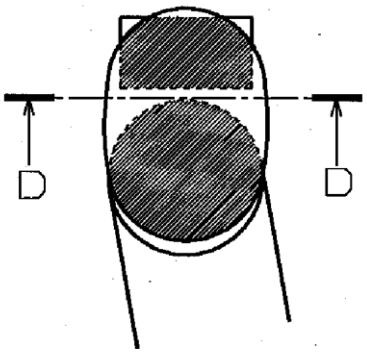
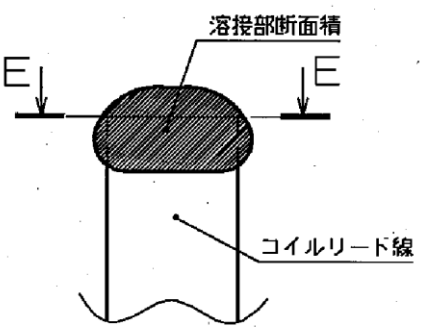
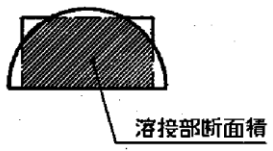


図7−8 溶接断面基準





D−D断面図
（コイル間中心）



E−E断面図
（母材との境界面）

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