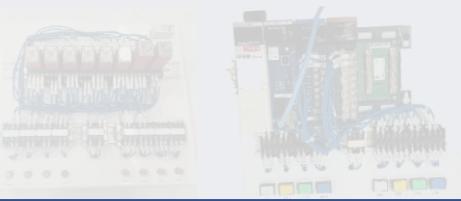


MTN Exercise 2

Competition details

	Evaluation item	Detail	Cut-Off	Score
Exercise1	Equipment Repair (Troubleshooting) 	Electrical circuit Troubleshooting / Ladder Circuit Design	TL & TM 30 Min. Troubleshooting std. time TL 10 Min. TM 13 Min.	50 Points
Exercise2	Plate Making 	Making the plate by hand finishing for mounting parts into the plate	TL & TM 30 Min.	50 Points

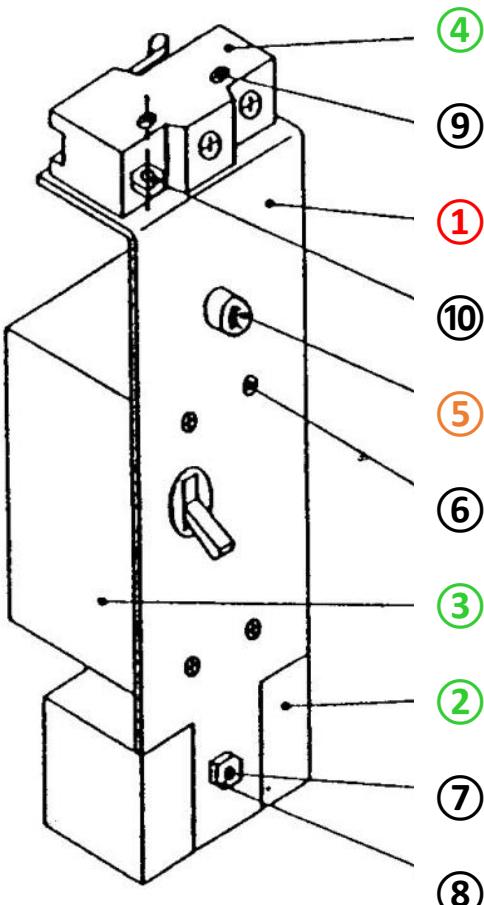
Ex.2 : Plate Making



MTN Common Exercise 2 : Plate Making (Hand work)

How to compete

Assembly drawing



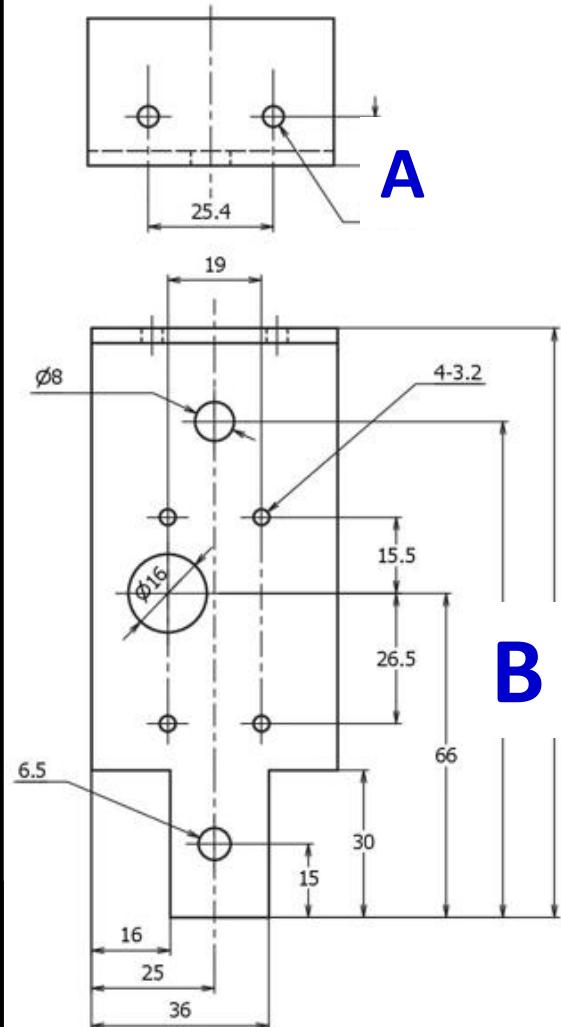
Make plate steel ① assembly with parts ②,③,④,⑤ (⑤ only for TL)

- No need to processing $\Phi 16$ and end face of part ①
- Do not do processing part ②
- Processing the mounting hole of part ②,③,④,⑤ by electric drill.
- Chamfering all processed holes without any burr.
- Cutting position of part ① should be chamfered without burr.
- Judge and fabricate based on the ranking criteria (attached file) for dimension processing accuracy of part ①
- **A** and **B** dimension will be announced on the competition day

Detail of parts

- ① Plate , ② Base , ③ Circuit Protector
④ Micro Switch , ⑤ Lamp (TL only)

Process drawing



MTN Common Exercise 2 : Plate Making

Supplied Parts (AP Prepared on competition day)

No.	1	2	3	4	5	6	7	8	9	10
Part name	Plate	Base	Circuit	Micro switch	LED (TL)	Screw	Bolt	Nut	Screw	Nut
Specification	150x50x2.3 (SS400)	30x30x50 (SS400)	CP32E /2.5WDC	Z-15GW2255-B	AP8M222-G	TC-H-3A×6	TA-BA-6×25	TN-Q1-6	TC-H-4A×25	TN-Q1-4
Q'ty	1	1	1	1	1	4	1	1	2	2
Picture										
Type	Work piece	Assembly parts								

MTN Common Exercise 2 : Plate Making

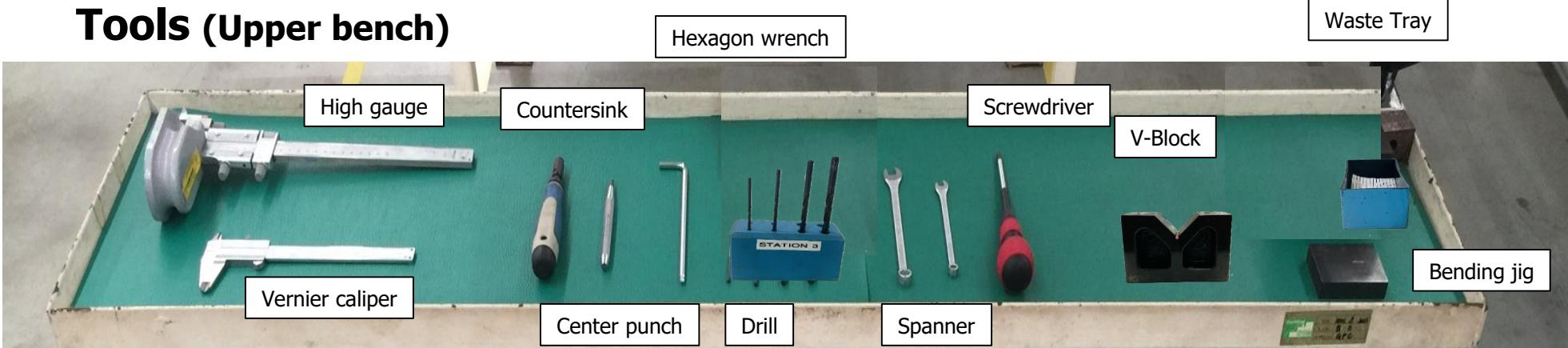
Tool Layout Di PT DENSO INDONESIA



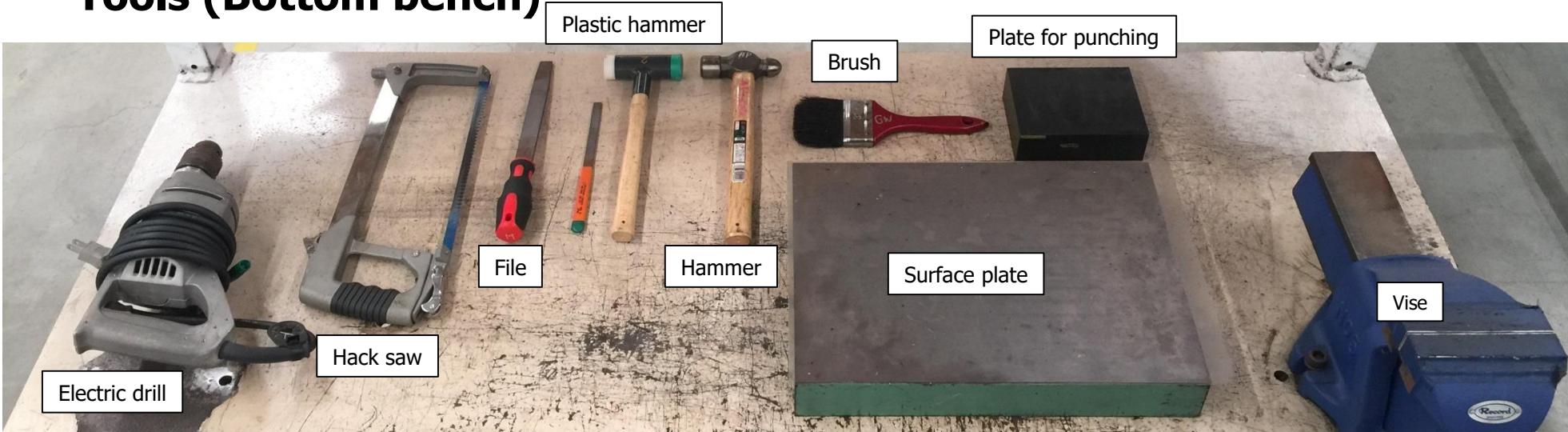
MTN Common Exercise 2 : Plate Making

Tool Layout

Tools (Upper bench)

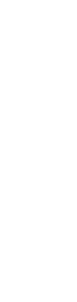


Tools (Bottom bench)



MTN Common Exercise 2 : Plate Making

Tools (Upper bench)

No.	1	2	3	4	5	6	7	8	9	10
Part name	Height gauge	Vernier caliper	Countersink	Center punch	Hexagon wrench	SS drill	Spanner	Screwdriver	V-block	Plate bending jig
Specification	150 or 200 mm.	-	Ø 12.0 mm or Less	-	M6 (5mm)	Ø3.2 ,4.2 ,6.5 & Ø8.0 for TL	M6 (10mm) M4 (7mm)	-	102x67x41 Type B100	50 × 70 × 15
Q'ty	1	1	1	1	1	4	2	1	1	1
Picture										
Preparing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	AP	<input type="radio"/>	<input type="radio"/>	AP	<input type="radio"/>
Remark	-	Digital is not allowed	Drill allowed with handle	-	-	Stepped drill NG	Wear glass when use	-	-	Circumference C 0.2

Contestant must bring by themselves

MTN Common Exercise 2 : Plate Making

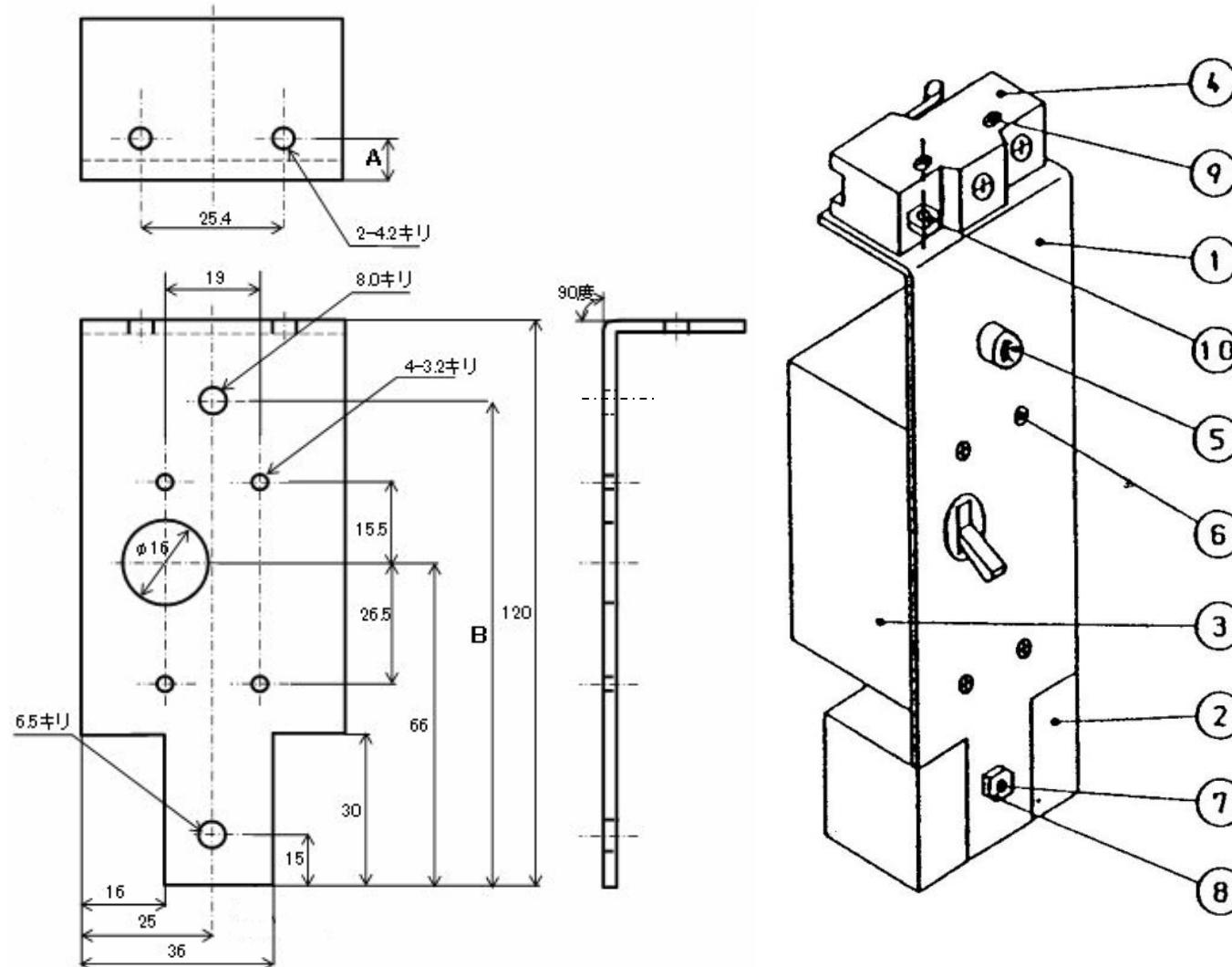
Tools (Bottom bench)

No.	1	2	3	4	5	6	7	8	9	10	11	12
Part name	Electric drill	Broom	Wire brush	Hack saw	File	Hand second File	Plastic hammer	Iron hammer	Waste cloth	Punch base	Note paper	Plate
Specification	6401 or 6301 or equivalent	-	-	300 mm	250mm medium or rough grit	Flat Half round Trapezoid	1/2 pounds	Not over 1 pounds	-	-	Size A5	-
Q'ty	1	1	1	1	1	1	1	1	1	1	1	1
Picture												
Preparing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	AP	AP	AP				
Remark	-	-	-	24T	-	-	For bending steel plate	For punching	Punching and Vise	-	-	-

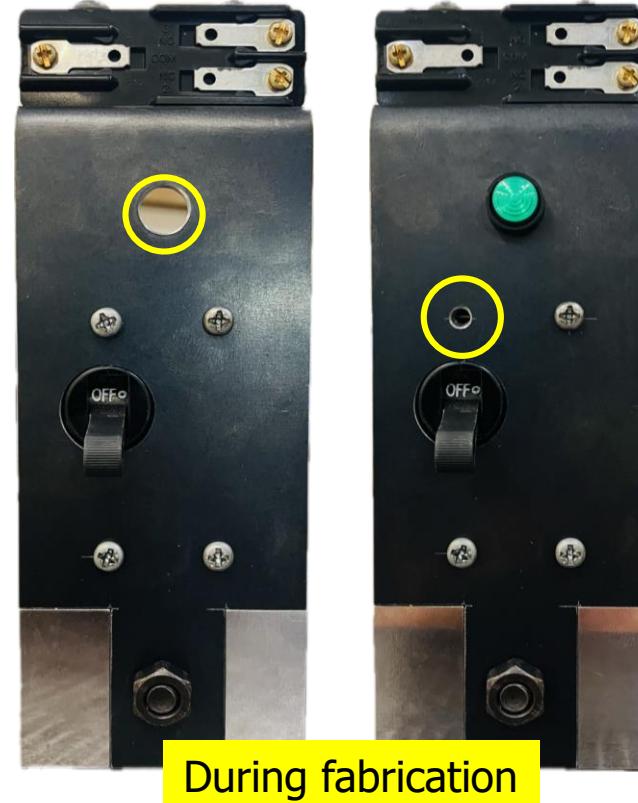
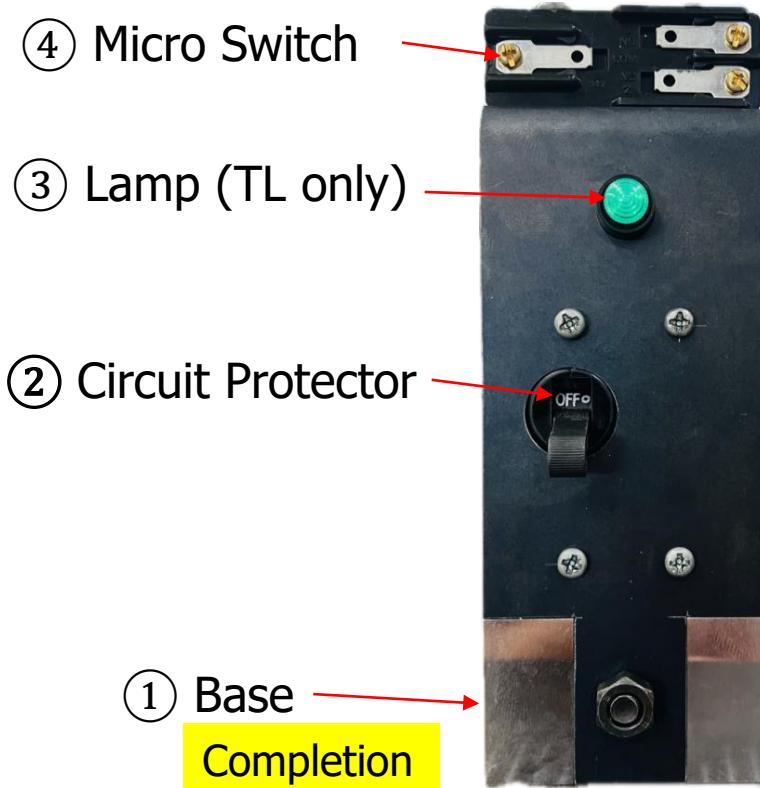
Contestant must bring by themselves

MTN Common Exercise 2 : Plate Making

Plate Making Scoring



Scoring Manual - Work Piece

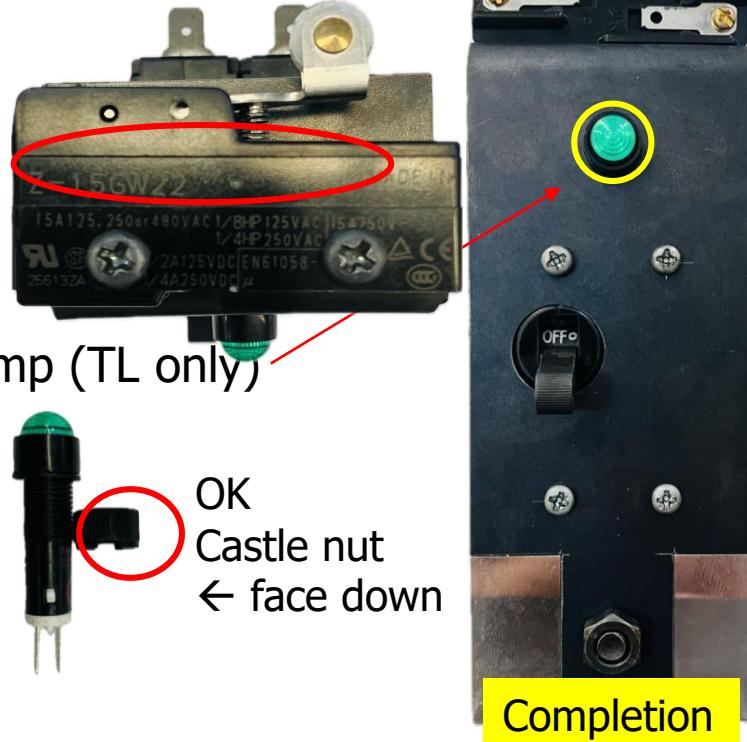


Item	How	Ranking criteria		
		A rank	B rank	C rank
(17).Completion	Visual Check	0 point deducted	4 point deducted	5 point deducted
		Finish	Non assembly Miss-assembly	During fabrication

Scoring Manual & Standard Details - Work Piece

④ Micro Switch

OK
can see the letter
→ correct side

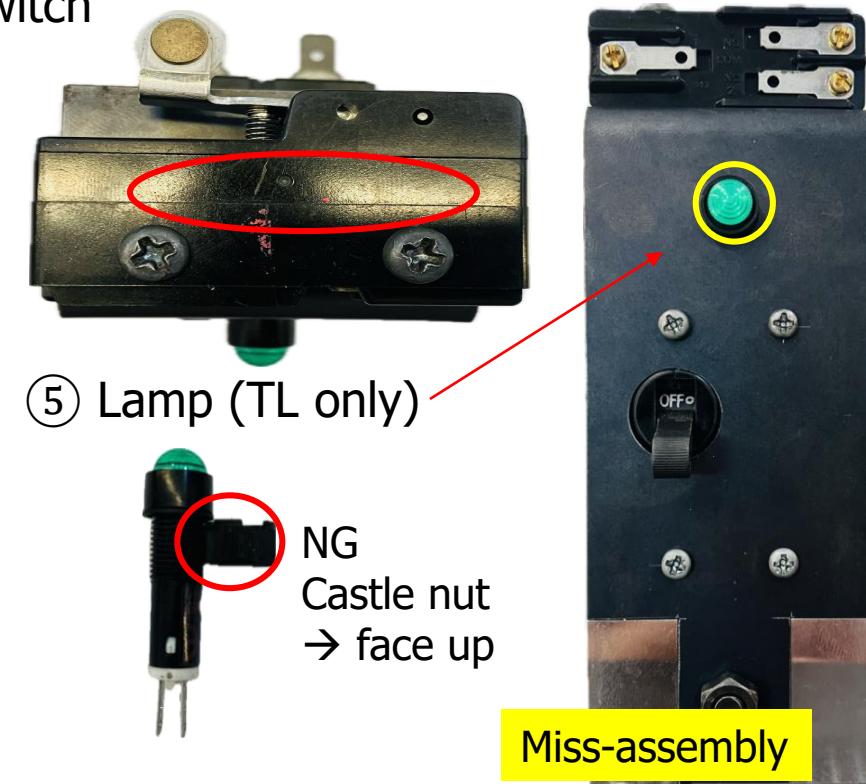


⑤ Lamp (TL only)



④ Micro Switch

NG
can not see the letter →
Incorrect side



⑤ Lamp (TL only)



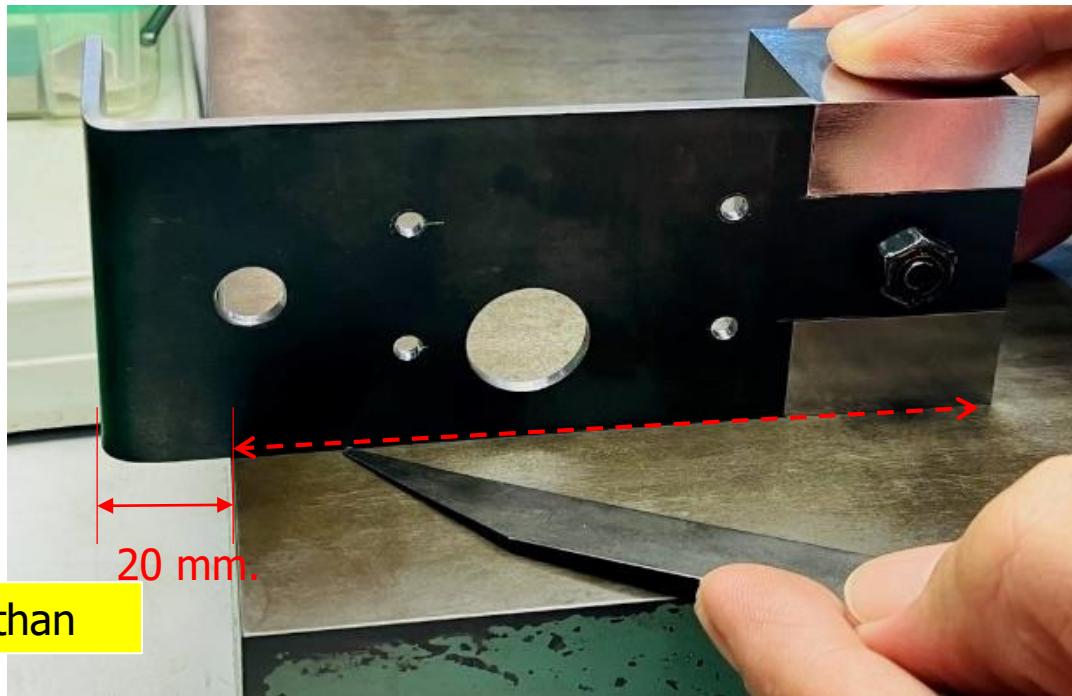
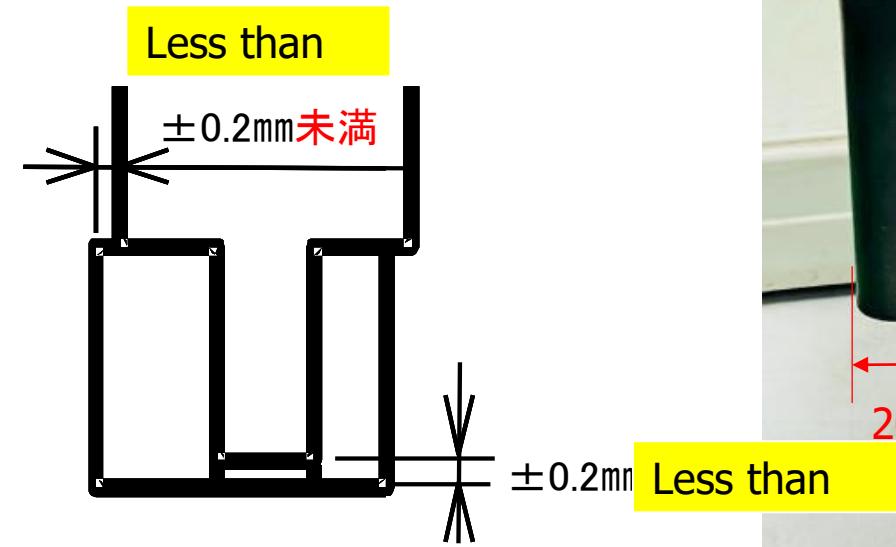
Item	How	Ranking criteria		
		A rank	B rank	C rank
		0 point deducted	4 point deducted	5 point deducted
(17).Completion	Visual Check	Finish	Non assembly Miss-assembly	During fabrication

Scoring Manual & Standard Details - Work Piece



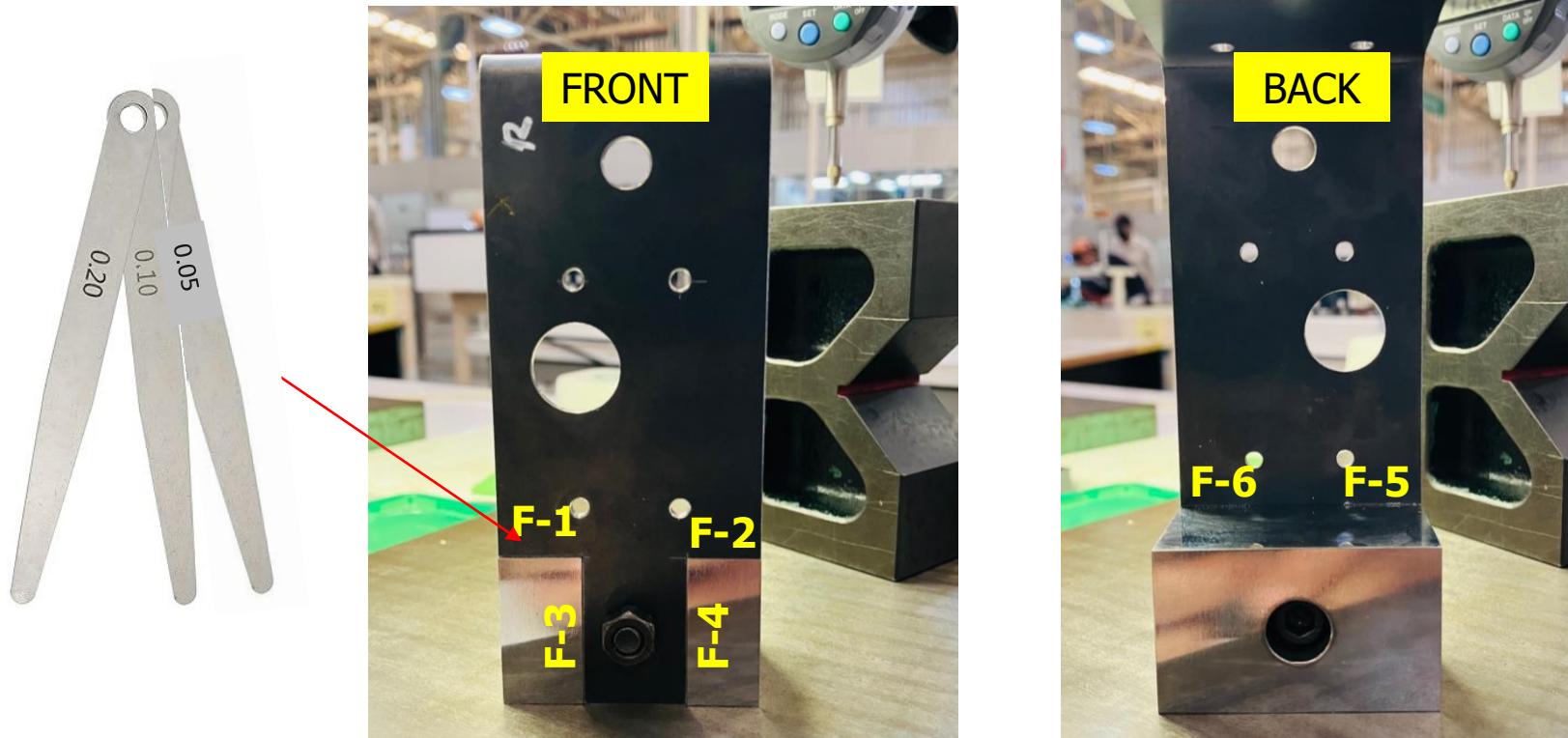
Item	How	Ranking criteria		
		A rank	B rank	C rank
		0 point deducted	1 point deducted	2 point deducted
⑯ Untightening, loosen screw	Use Your hands to hold the part and move it.	None	Have	

Scoring Manual & Standard Details - Work Piece



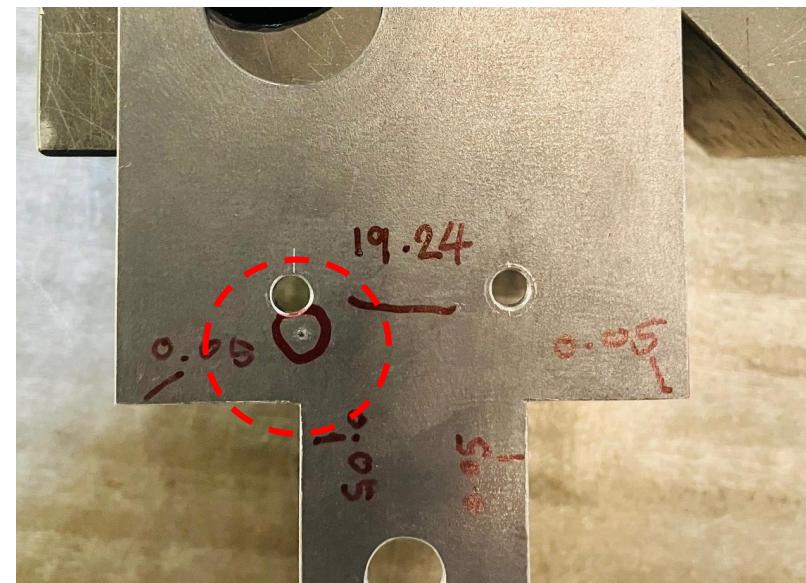
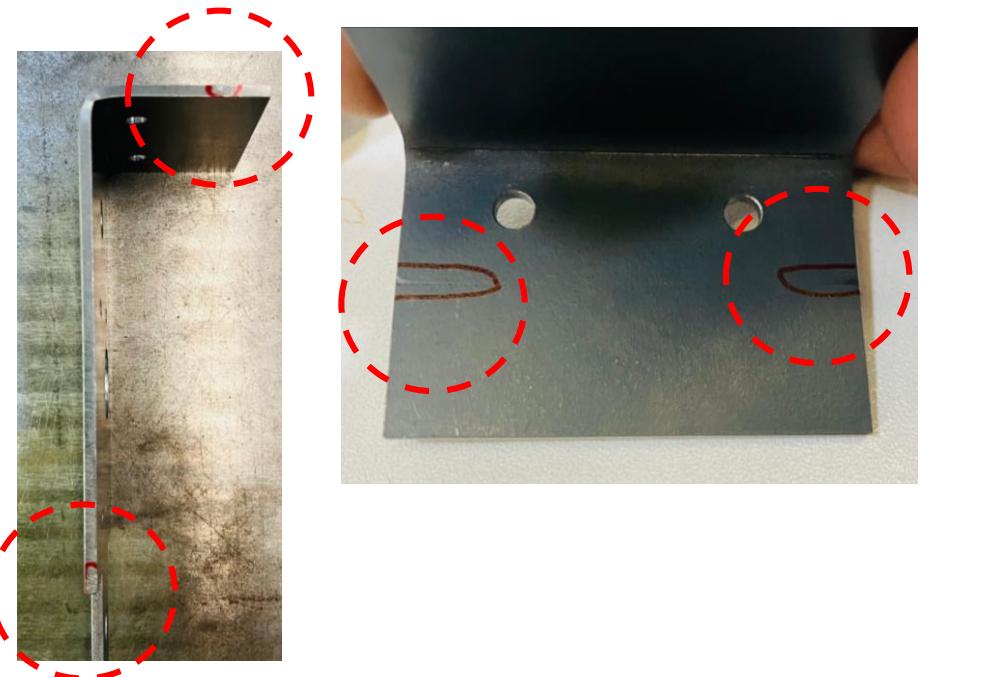
Item	How	Ranking criteria		
		A rank	B rank	C rank
(9) Mounting unlevelness	Press the jig with your fingers, then check with a filler gauge 0.2 insert check.	0 point deducted	1 point deducted	2 point deducted

Scoring Manual & Standard Details - Work Piece



Item	How	Ranking criteria			
		A rank	B rank	C rank	D rank
		0 point deducted	1 point deducted	2 point deducted	3 point deducted
⑥ Clearance	Filler gauge Over all 6 Position	Less than 0.05 mm	Less than 0.1 mm	Less than 0.2 mm	Other

Scoring Manual & Standard Details - Work Piece

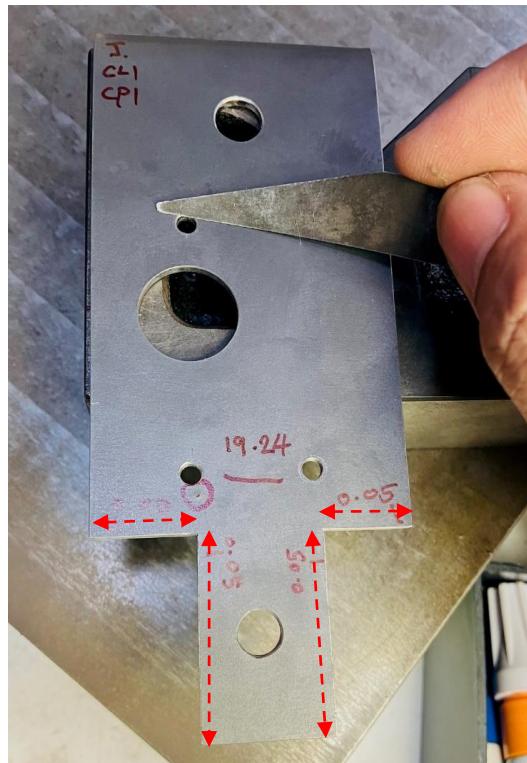
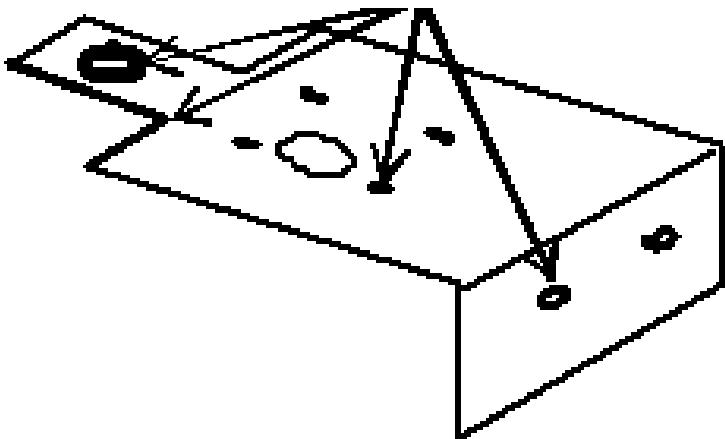


Item	How	Ranking criteria		
		A rank	B rank	C rank
⑫ Scratch during working	scratch from the lead must have no impressed mark from chips, etc.	None	≤ 2 positions	≥ 3 positions or more

Not use

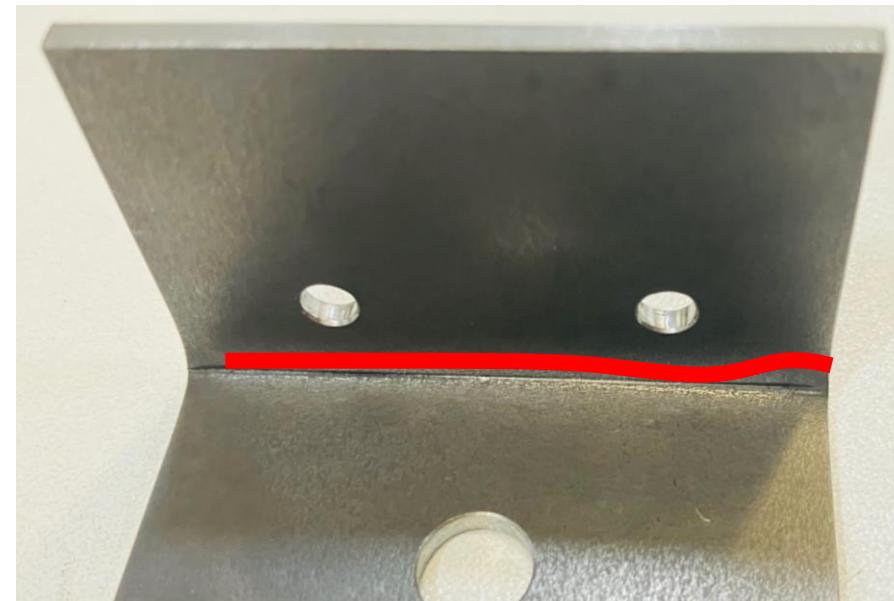
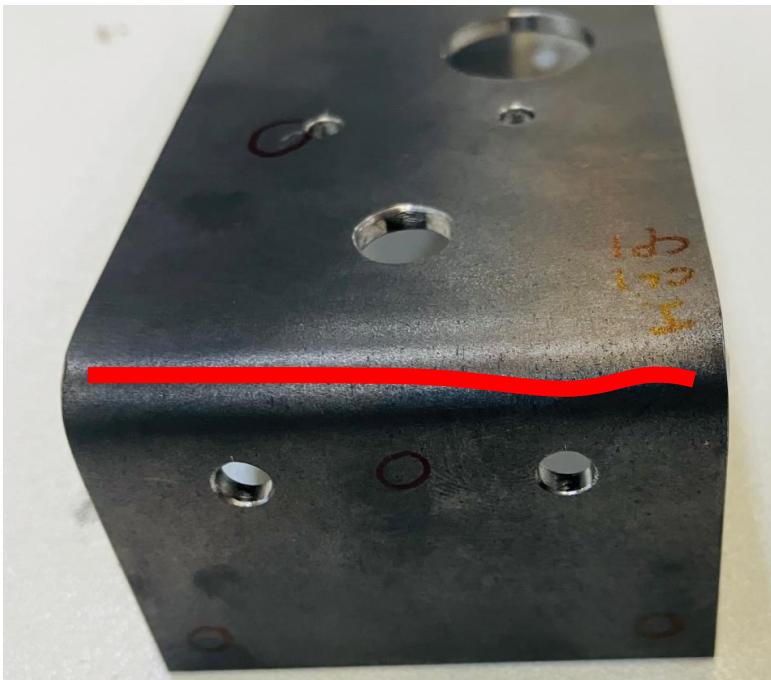
Scoring Manual & Standard Details - Work Piece

Must have no burr



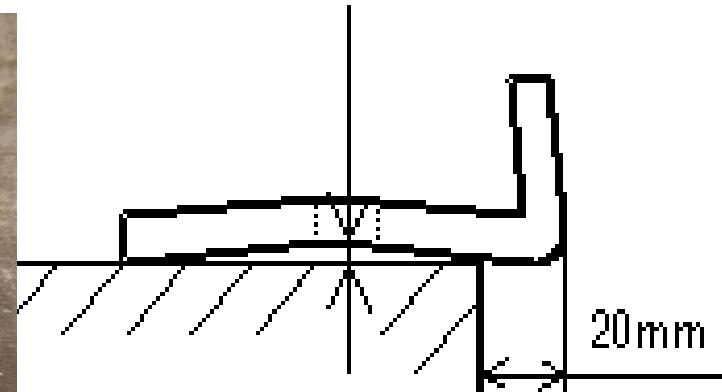
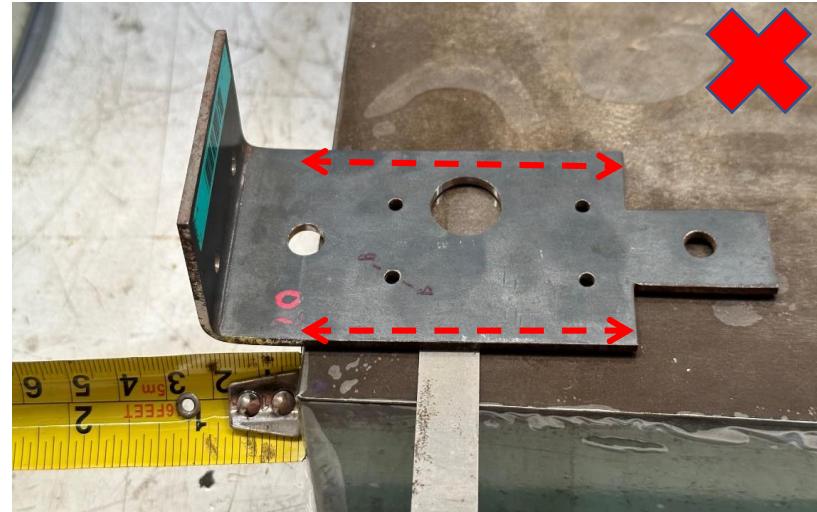
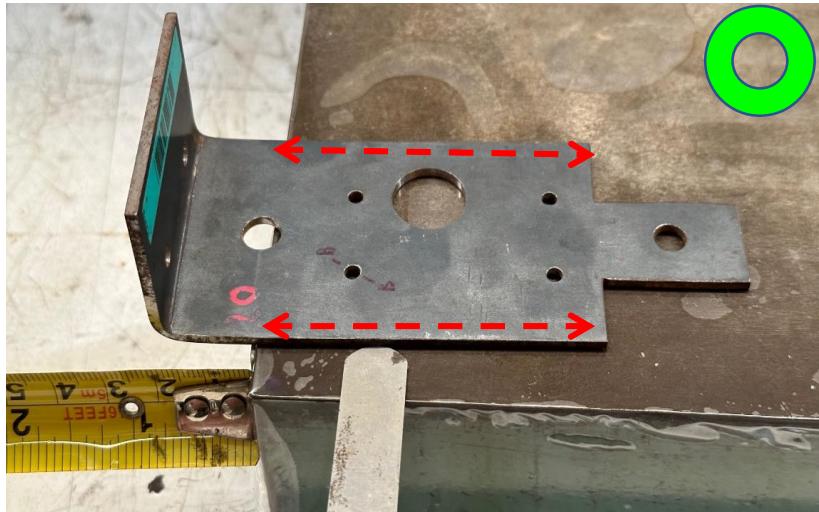
Item	How	Ranking criteria		
		A rank	B rank	C rank
⑬ Burr during fabricating	Must have no burr (check by Filler gauge 0.1 mm)	0 point deducted	1 point deducted	2 point deducted
None	≤ 2 positions	≥ 3 positions		

Scoring Manual & Standard Details - Work Piece



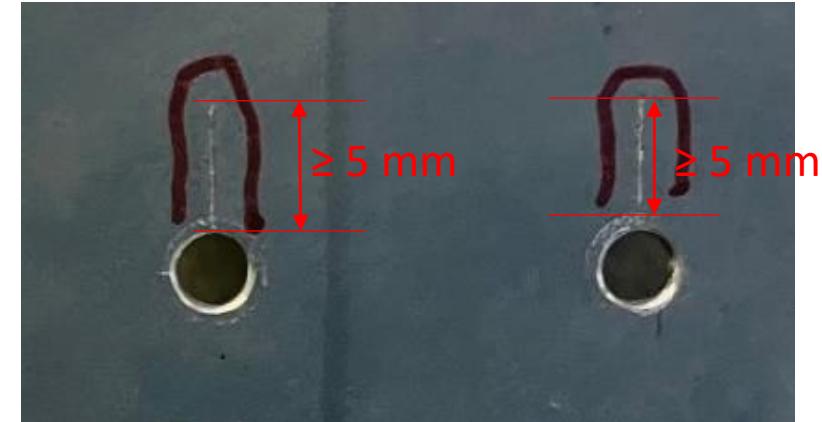
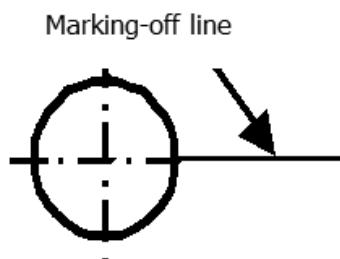
Item	How	Ranking criteria		
		A rank	B rank	C rank
		0 point deducted	1 point deducted	2 point deducted
⑯ Crack or sharpen at bending position	Visually inspect, there are no cracks in the folded area.	None	Have	

Scoring Manual & Standard Details - Work Piece



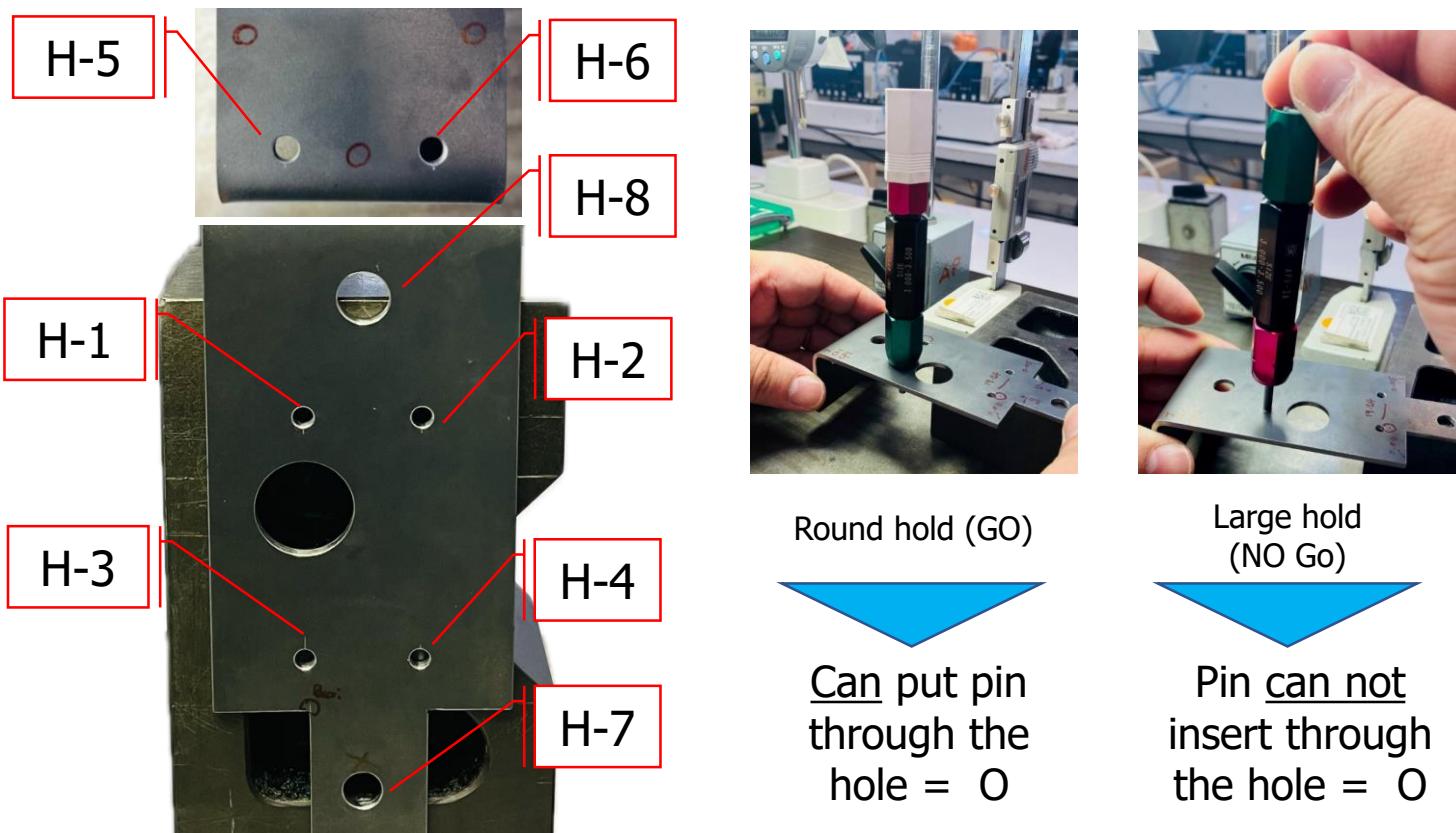
Item	How	Ranking criteria		
		A rank	B rank	C rank
		0 point deducted	1 point deducted	2 point deducted
⑩ Plate warping	Filler gauge 0.2 mm check plate there are No Gap	Gap less than 0.2 mm	Gap 0.2 mm or more	

Scoring Manual & Standard Details - Work Piece



Item	How	Ranking criteria		
		A rank	B rank	C rank
		0 point deducted	1 point deducted	2 point deducted
⑪ Marking-off line	Vernier Caliper Check Marking-off line less than 5mm	None	Have	

Scoring Manual & Standard Details - Work Piece



Example

OK = O, NG = x	Round hold(GO)	Large hole (NO GO)
Position H-1	3.2 mm	O
Position H-2	3.2 mm	X
Position H-3	3.2 mm	O
Position H-4	3.2 mm	O
Position H-5	4.2 mm	O
Position H-6	4.2 mm	O
Position H-7	6.5 mm	O
Position H-8	8.0 mm	O
No. of NG Hold		2

Item	How	Ranking criteria		
		A rank	B rank	C rank
⑯ Fabricating hole diameter	Pin gauge check diameter	0 point deducted	1 point deducted	2 point deducted
Deduct 1 point/hole (maximum 3 points deducted)				

Scoring Manual & Standard Details - Work Piece

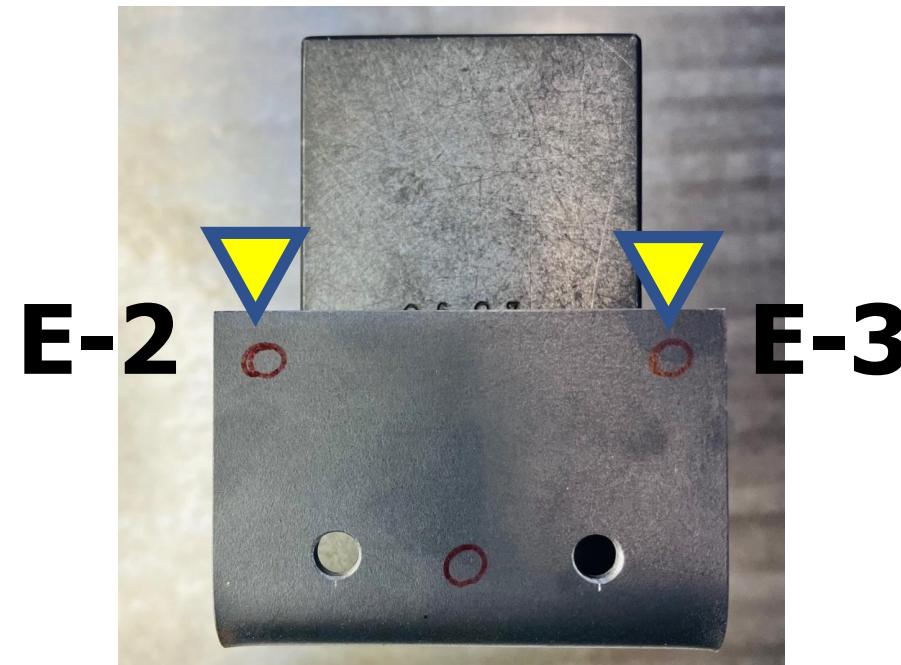
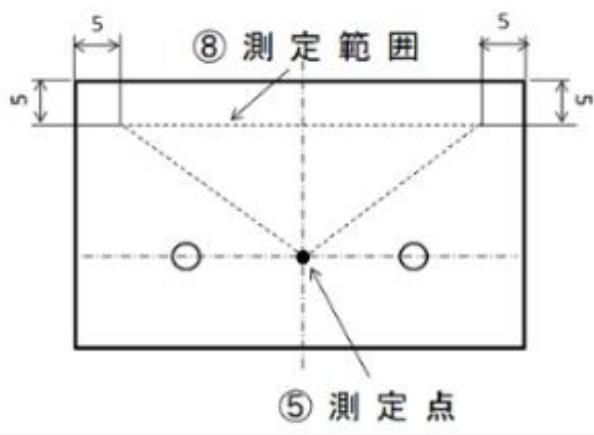


E-1



Item	How	Ranking criteria			
		A rank	B rank	C rank	D rank
		0 point deducted	1 point deducted	2 point deducted	3 point deducted
⑤ Overall bending length (A)	Use a Dial gauge to measure the height 120.00 at point E-1	Within ± 0.3 mm	Within ± 0.5 mm	Within ± 1.0 mm	Other

Scoring Manual & Standard Details - Work Piece

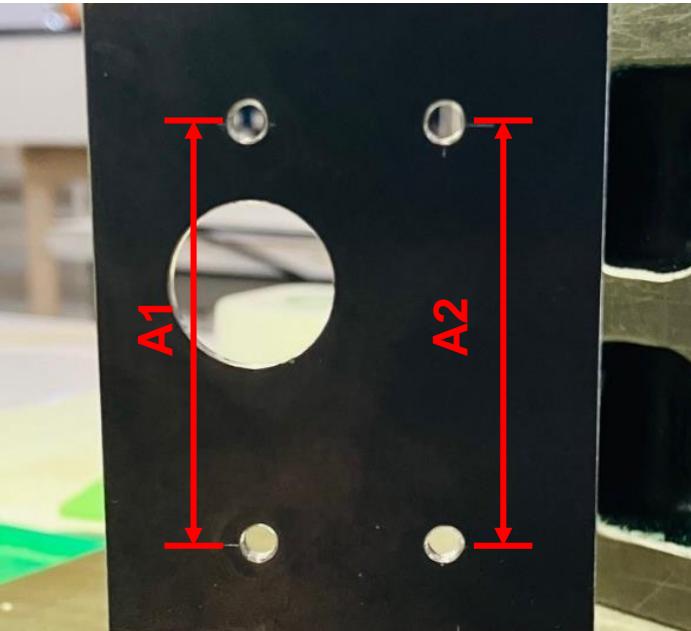


Item	How	Ranking criteria		
		A rank	B rank	C rank
⑧ Bending angle (Max – Min)	Difference Used dial gauge measure check	0 point deducted	1 point deducted	2 point deducted
		Less than 0.2 mm	Less than 0.5 mm	Other

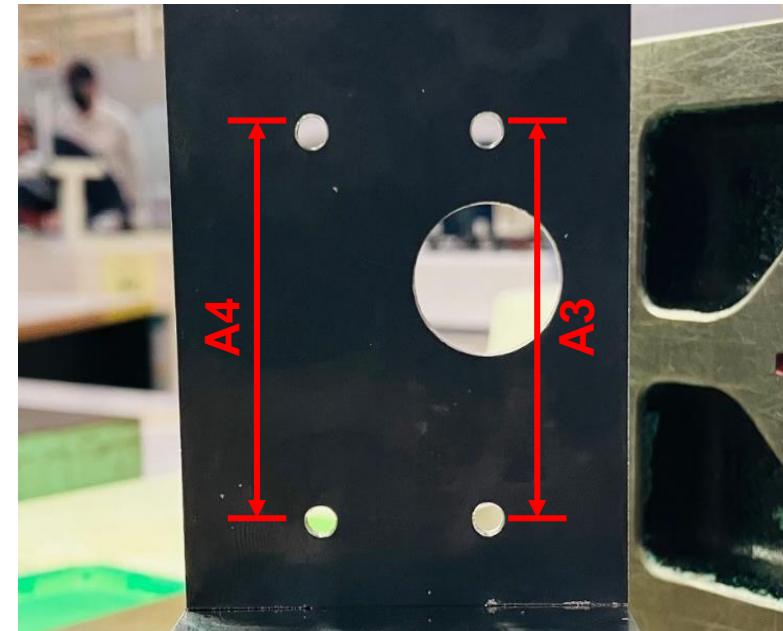
Scoring Manual & Standard Details - Work Piece



Example Picture



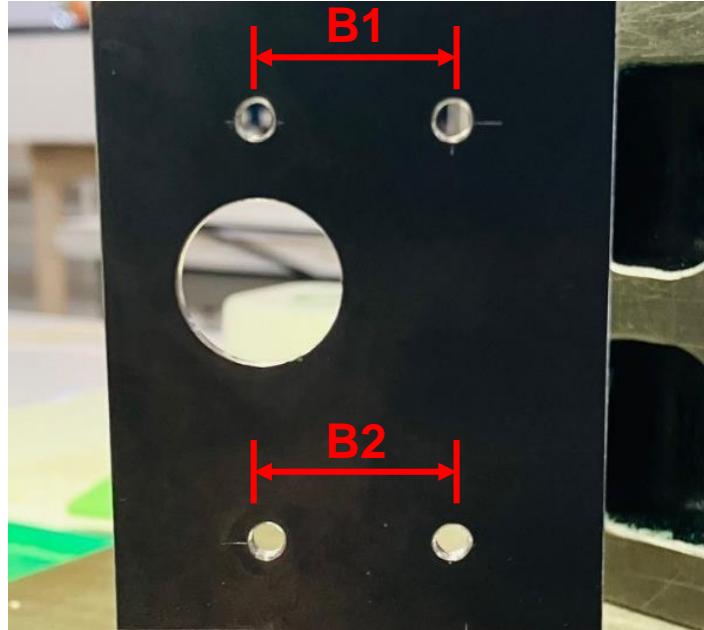
Front = A1, A2



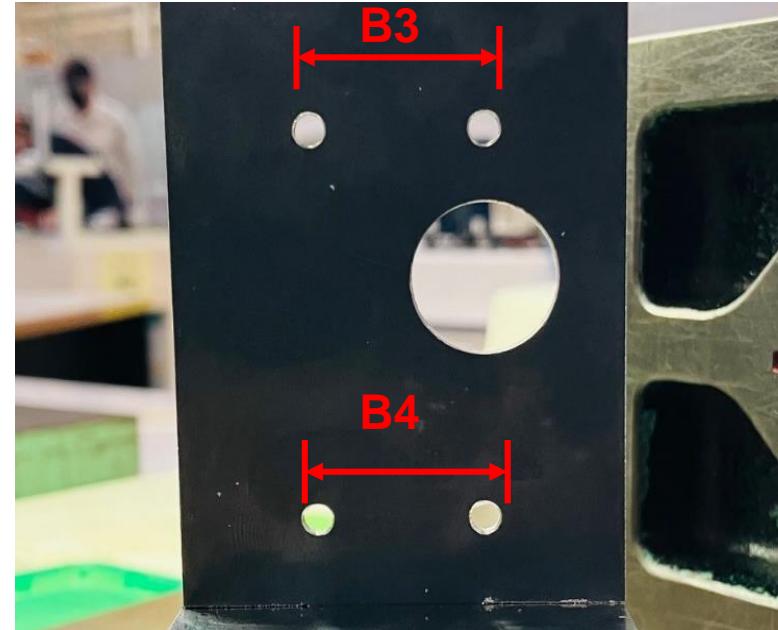
Back = A3, A4

Item	How	Ranking criteria			
		A rank	B rank	C rank	D rank
		0 point deducted	1 point deducted	2 point deducted	3 point deducted
① Pitch between mounting holes 42 mm	Used Vernier caliper check 4 Position Front and rear side mounting holes CP	Within ± 0.2 mm	Within ± 0.5 mm	Within ± 1.0 mm	Other

Scoring Manual & Standard Details - Work Piece



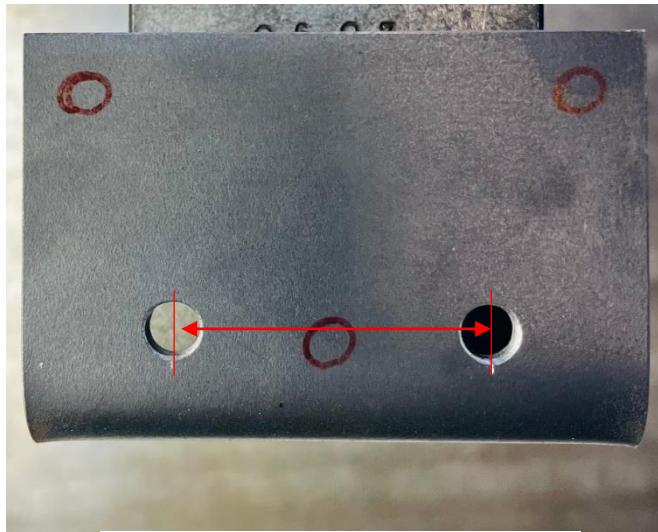
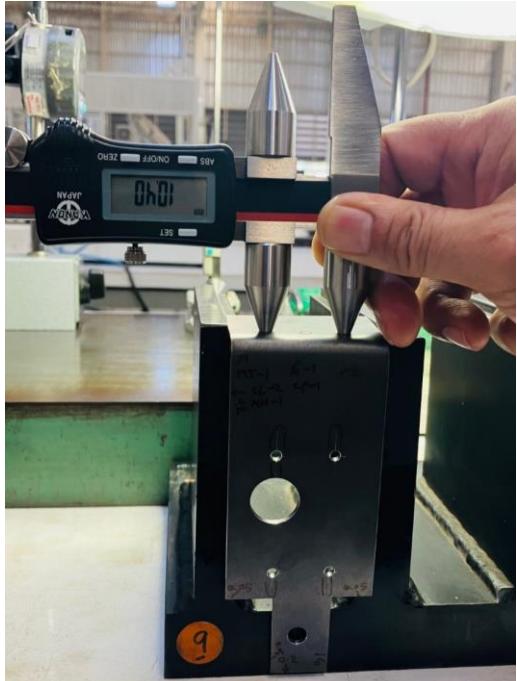
Front = B1, B2



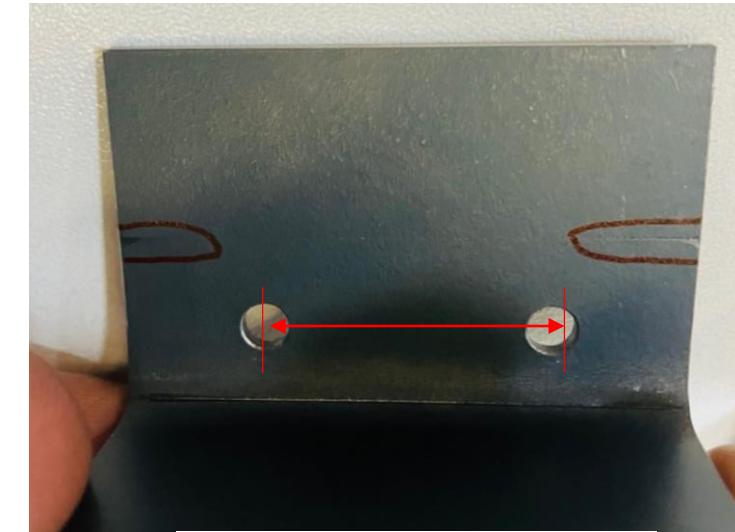
Back = B3, B4

Item	How	Ranking criteria			
		A rank	B rank	C rank	D rank
		0 point deducted	1 point deducted	2 point deducted	3 point deducted
② Pitch between mounting holes 19.00 mm	Used Vernier caliper check 4 Position Front and rear side mounting holes CP	Within ± 0.2 mm	Within ± 0.5 mm	Within ± 1.0 mm	Other

Scoring Manual & Standard Details - Work Piece



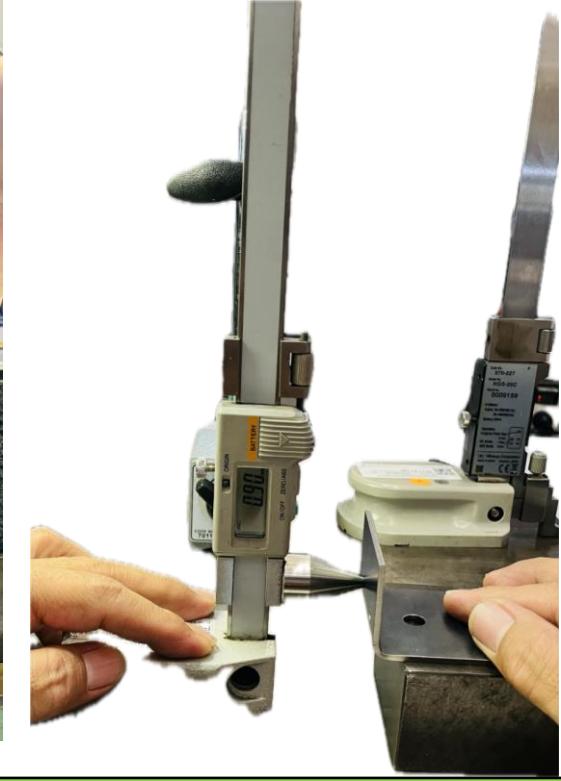
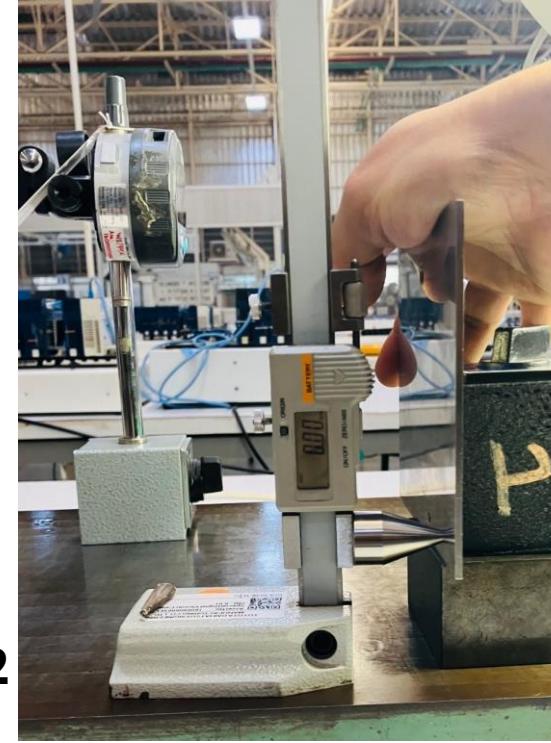
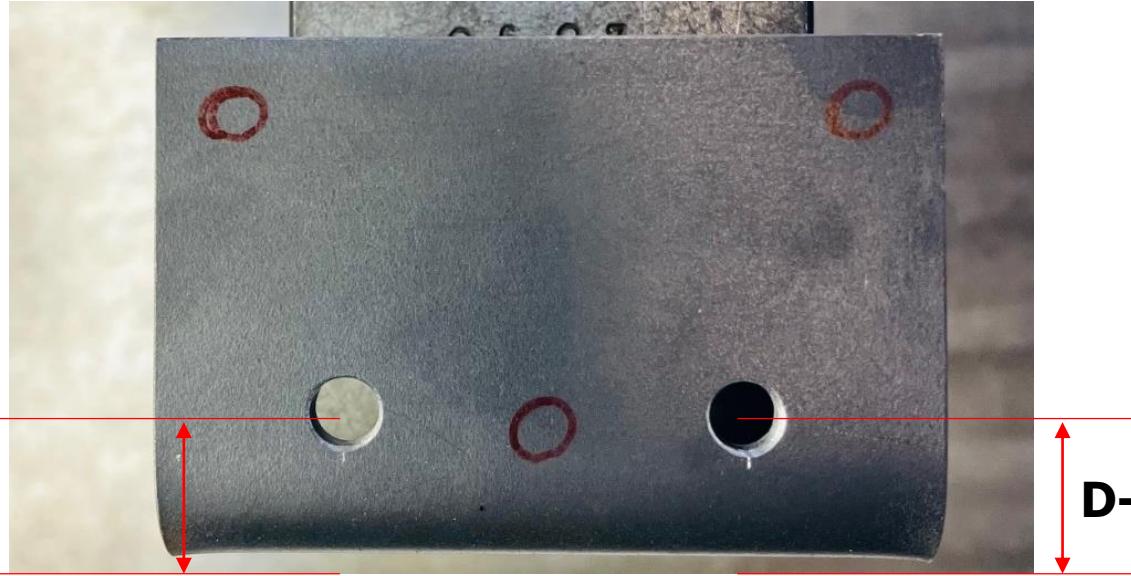
Front = C-1



Back = C-2

Item	How	Ranking criteria			
		A rank	B rank	C rank	D rank
		0 point deducted	1 point deducted	2 point deducted	3 point deducted
③ Pitch between mounting holes	Centerline Vernier caliper check	Within ± 0.2 mm	Within ± 0.5 mm	Within ± 1.0 mm	Other

Scoring Manual & Standard Details - Work Piece



Item	How	Ranking criteria			
		A rank	B rank	C rank	D rank
		0 point deducted	1 point deducted	2 point deducted	3 point deducted
⑦ L/S mounting hole height (A)	High gauge check 2 Position	Within ± 0.2 mm	Within ± 0.5 mm	Within ± 1.0 mm	Other

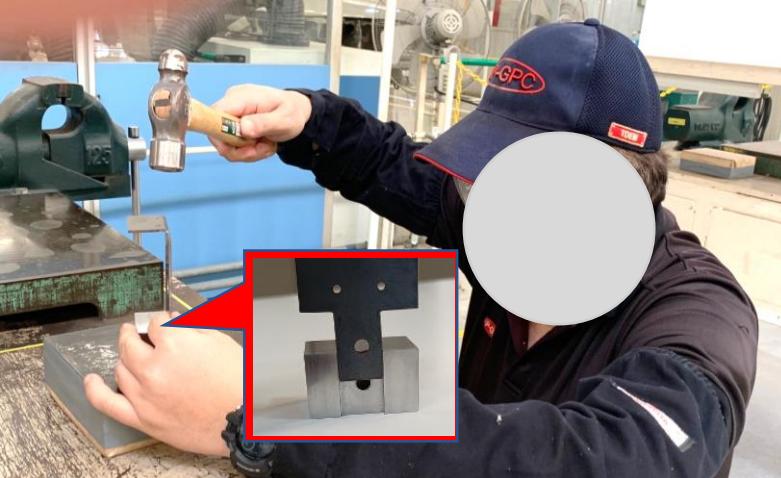
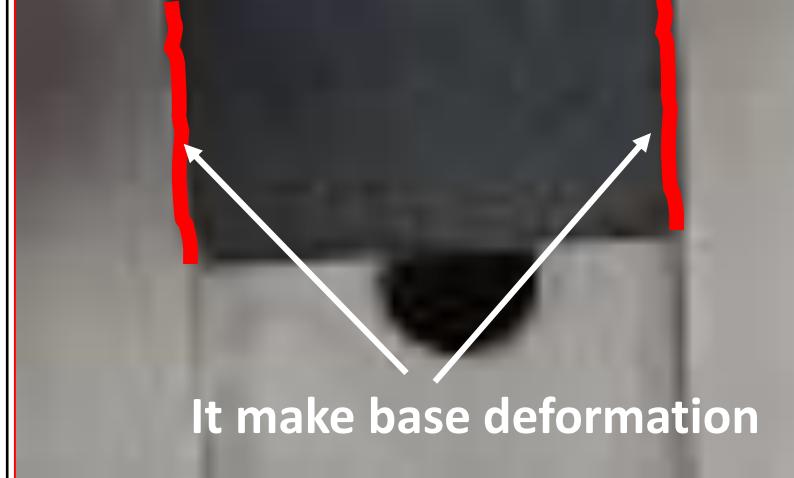
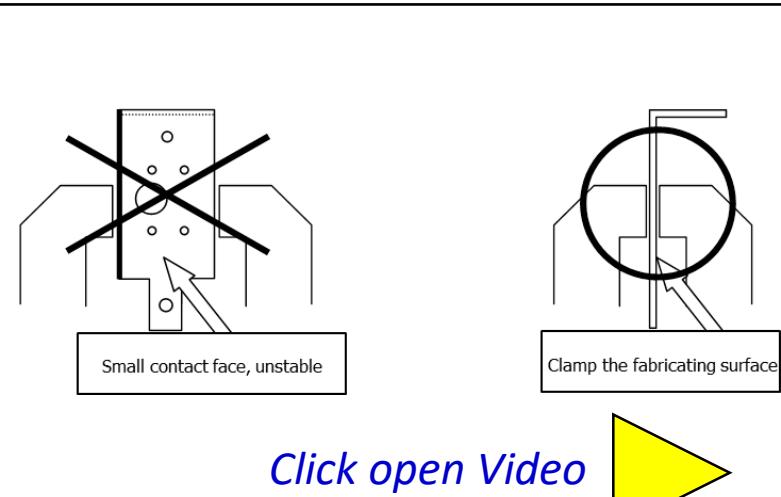
Scoring Manual & Standard Details - Work Piece

Item	How	Ranking criteria			
		A rank	B rank	C rank	D rank
		0 point deducted	1 point deducted	2 point deducted	3 point deducted
4. Hole height (B)	Use digital height gauge to measure	± 0.2 mm.	± 0.5 mm.	± 1.0 mm.	Other



Special Deduct Point

①. Prohibited operation : Deduct 3 points

Item(action)	Picture	Because(effect)
A. Hit by the hammer when fitting it in the gap of the joint		 It make base deformation
B. Clamp to the datum surface, when clamping the plate to the vise table	 Small contact face, unstable Clamp the fabricating surface Click open Video	Contact surface is narrow and unstable    

Special Deduct Point

①. Prohibited operation : Deduct 3 points

Item(action)	Picture	Because(effect)
C. It's not allowed to wear short-sleeve without arm cover in the operation area and It's not allowed to use gloves. Note : Arm cover must cover all skin without skin expose		Can make contestant injury. 

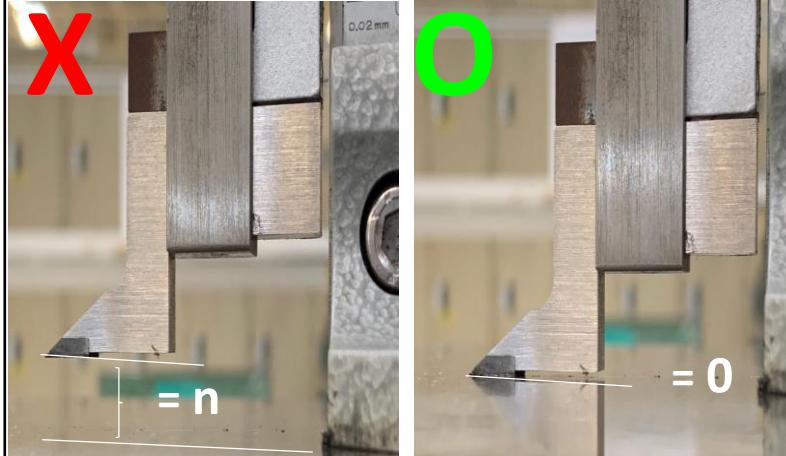
Special Deduct Point

② Tool damage : Deduct 1 point each time
Drill, saw blade, file breakage.



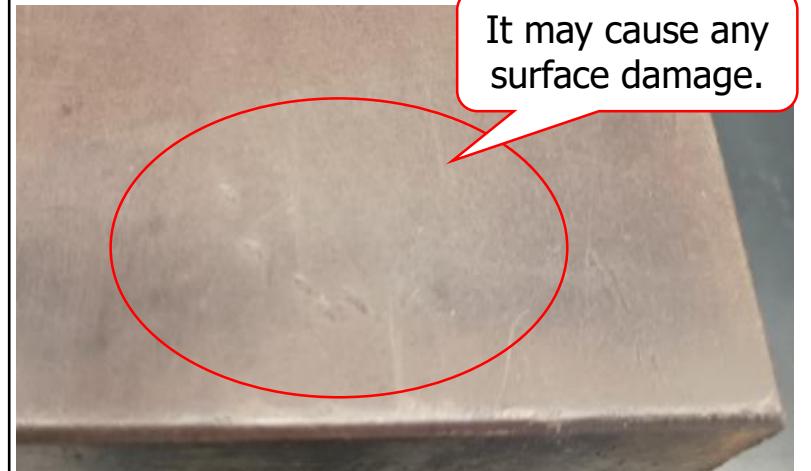
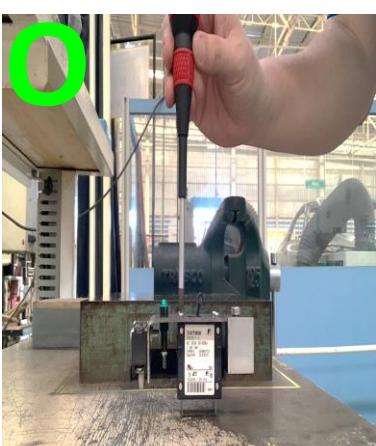
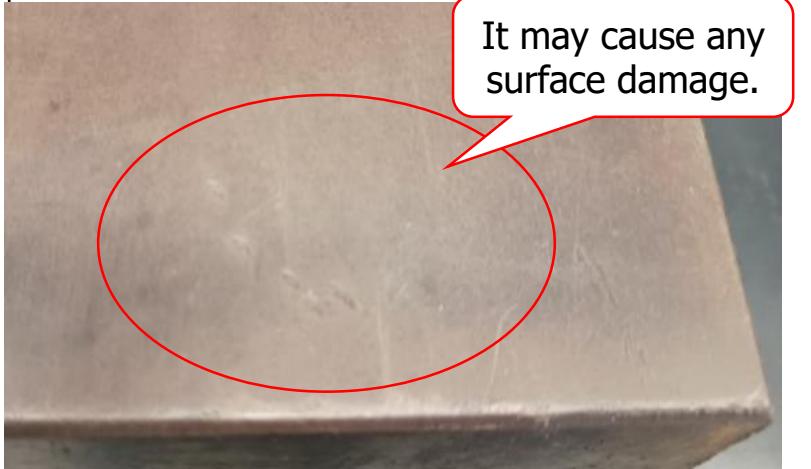
Special Deduct Point

③ Work attitude : Deduct 1 point each time

Item(action)	Picture	Because(effect)
A. Perform other element work without lower the scribe of the height gauge.		<p>Can make contestant injury.</p> 
B. Lay down the height gauge on the surface plate.		<p>It may cause any surface damage.</p> 

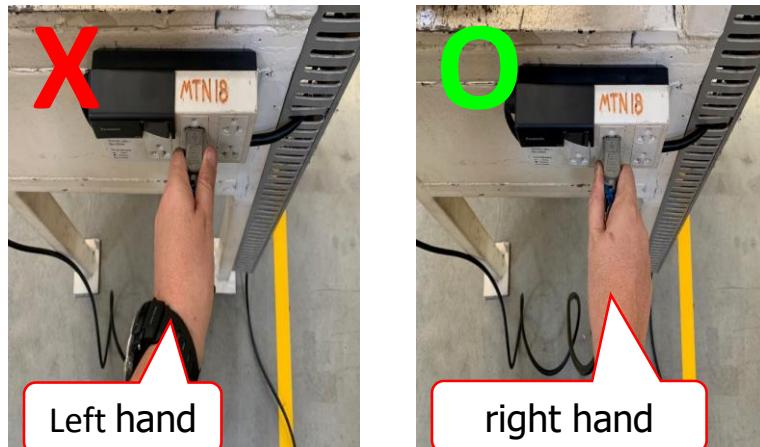
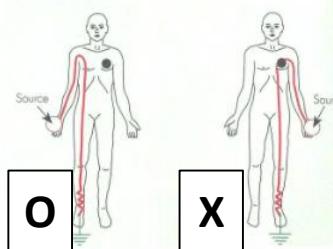
Special Deduct Point

③ Work attitude : Deduct 1 point each time

Item(action)	Picture	Because(effect)
C. Punching on the surface plate.	 	 It may cause any surface damage.
D. Perform assembly work on the surface plate.	 	 It may cause any surface damage.

Special Deduct Point

③ Work attitude : Deduct 1 point each time

Item(action)	Picture	Because(effect)
E. Use the left hand when pull out and insert the connector of the electric drill.		<p>if an electric current passes from the hand from the left hand to the left foot. The electric current will flow directly through the heart itself.</p> 
F. Perform other element work, when put in and pull out the drill, when the connector of the electric drill is connected.		<p>For prevent contestant injury. It cause of pinch accident.</p>

Special Deduct Point

③ Work attitude : Deduct 1 point each time

Item(action)	Picture	Because(effect)
G. Insert the Waste cloth in the vise table and drilling.		Poor 4S. and may have chips on the WEX then when contestant use WEX it cause of accident and scratch .
H. Leave the remained cutting material, paper for preventing scratch on the floor.		If pick it up before moving to next element work, point will not be deducted For prevent contestant slip. It cause of accident.

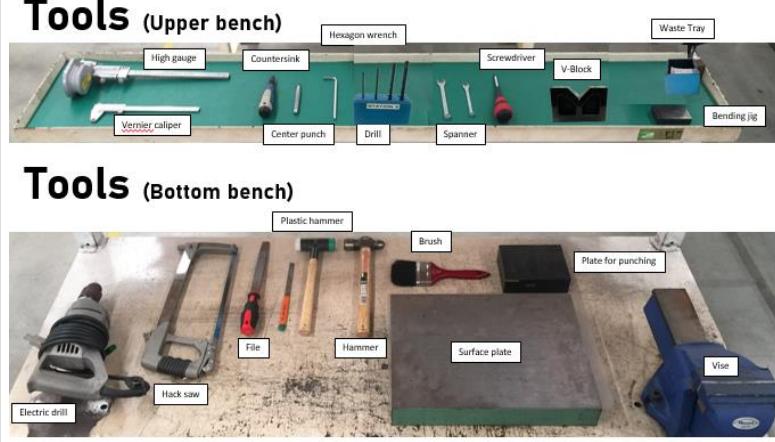
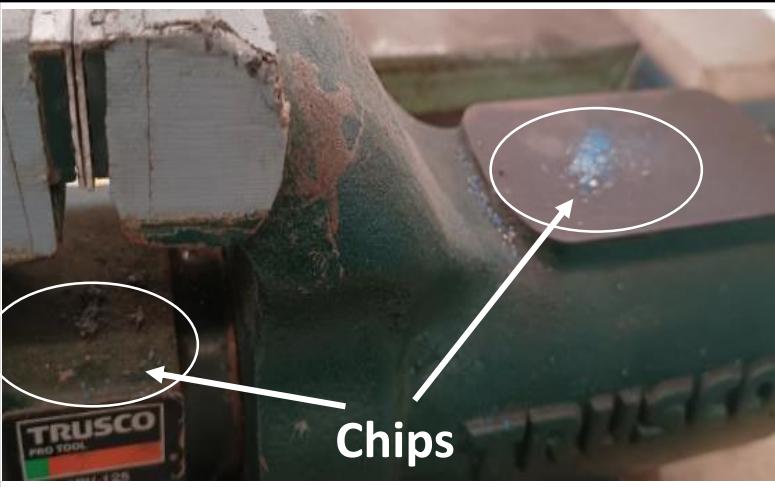
Special Deduct Point

④ Finished condition : Deduct 1 point

Item(action)	Picture	Because(effect)
A. Vice clamp return NG.	 	Poor 4S. and it cause of accident.
B. Electric drill cable not stored.	 	Poor 4S. and it cause of accident.

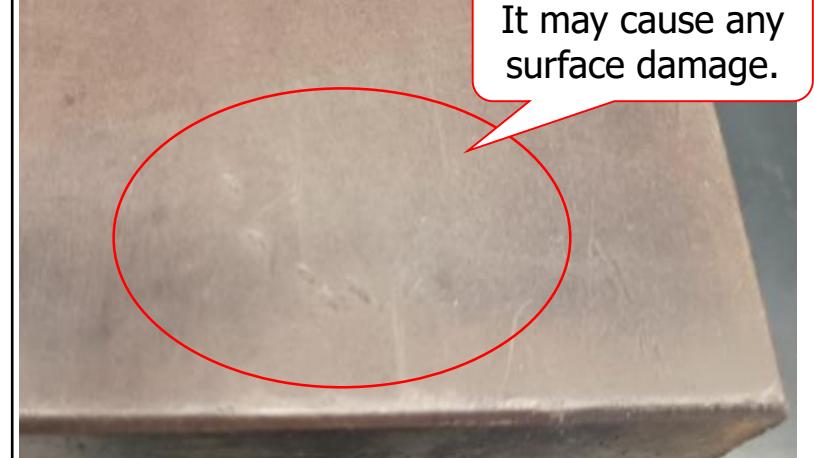
Special Deduct Point

④ Finished condition : Deduct 1 point

Item(action)	Picture	Because(effect)
C. Tools must be return to upper or lower position. Reference to the picture, order is necessary		Poor 4S. and it cause of accident. *Deduct 1 point per piece*
D. Chips on the work bench and vice.		Poor 4S. and it cause of accident.

Special Deduct Point

④ Finished condition : Deduct 1 point

Item(action)	Picture	Because(effect)
E. Place finished product on surface plate		

TERIMA KASIH

