(FITTER)

୯୩୭ମ ମଧ୍ୟପାର୍ଶ୍ୱ
(୧ମ୍ୟ ସେମ୍ସ୍ଟର)

ଠାକୁର ହାଜରା
(TRADE PRACTICAL) (ODIA)

ବୃହତ ବିଷୟକୃତ
(SECTOR : Production & Manufacturing)

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Sector: Production & Manufacturing

Duration: 2 - Years

Trade: Fitter 1st Semester - Trade Practical

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Mentor Council (MC)

NCVT, I.A.S.

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The development of a self-organized instructional learning system for the training of welders in 2014-15 has been a significant milestone in NIMI’s efforts to enhance the educational delivery system. The objective was to develop an innovative and effective training module that would improve the efficiency and effectiveness of the training process.

The new system was designed to be interactive and engaging, with a focus on practical skills development. The training module was developed in collaboration with the Institute of Professional Studies (IMPS) and was based on the instructional design principles of instructional systems theory (IST). The training program was structured in a way that ensured a holistic learning experience for the trainees.

The training program included hands-on practice, theoretical instruction, and regular assessments to ensure that the trainees were able to apply their learning effectively. The training program was delivered in a blended learning format, with a mix of face-to-face sessions and online modules.

The trainees were provided with the necessary tools and equipment to practice their skills, and they were encouraged to apply their learning in real-world scenarios. The training program was designed to be flexible and adaptable, allowing for adjustments based on the needs of the trainees.

The results of the training program were positive, with a significant increase in the trainees’ confidence and skills. The trainees were able to apply their learning effectively in real-world scenarios, and the training program was well-received by both the trainees and the employers.

Overall, the development of the innovative training module has been a significant achievement for NIMI, and it has set a new standard for training programs in the welding industry. The new system has been well-received by the trainees and employers, and it has the potential to be replicated in other industries to improve the quality of training programs.

Y. K. Chakrabarti
Director, NIMI

June 2016 - 600 032


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- Visit to various section of the ITI

**Task 1:**

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2. Visit to various section of the ITI

**Task 2:**

1. Visit to various section of the ITI
2. Visit to various section of the ITI
3. Visit to various section of the ITI

**Remark:**

- Production & Manufacturing
- Fitter - Basic Fitting

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三是

• ଦେଶପର ହେକା ଵୃଦ୍ଧି କରାଇବ ଏବଂ ଭାରତ ରାଷ୍ଟ୍ରରଥରେ ପ୍ରକାଶ କରାଇବ。

| ନିମ୍ନଲିଖ୍ତ | ଦେଶପର ହେକା ଵୃଦ୍ଧି | ଭାରତ ରାଷ୍ଟ୍ରରଥରେ ପ୍ରକାଶ | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| Fig. 1 |  |  | 1 |  |  |  |  |  |  |
| Fig. 2 |  |  | 2 |  |  |  |  |  |  |
| Fig. 3 |  |  | 3 |  |  |  |  |  |  |
| Fig. 4 |  |  | 4 |  |  |  |  |  |  |
| Fig. 5 |  |  | 5 |  |  |  |  |  |  |
| Fig. 6 |  |  | 6 |  |  |  |  |  |  |
| Fig. 7 |  |  | 7 |  |  |  |  |  |  |
| Fig. 8 |  |  | 8 |  |  |  |  |  |  |

ନିମ୍ନଲିଖ୍ତ ଗୁଡ଼ିକ ଧ୍ୱାର କେନ୍ଦ୍ର

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## Practice on safety

- Practice on safety 1
- Practice on safety 2
- Practice on safety 3

### Identify the categories of the safety sign

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<th>PART NO.</th>
<th>EX. NO.</th>
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**ଏଟି 1:**

| ସମୟମାପ୍ତି | ସମୃଦ୍ଧି / ସମୃଦ୍ଧି ପରିପର୍ବର୍ତ୍ତନ | 
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| 4 | 5 | 6 |
| 7 | 8 | 9 |
| 10 | 11 | 12 |
| 13 | 14 | 15 |
| 16 | 17 | 18 |
| 19 | 20 | 

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଎ଟି 2:

**ଏଟି 2:**

| Fig 3 | 
| --- | --- |
| | 

**କର୍ତ୍ୟତା ଯୁକ୍ତ ରହିଛାରେ ତେବେବା ତେବେବା ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି ପରିପରି 

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dûru 3:

| ଜୁରା ସ୍ୟ୍ୟା | ପିରିକ (PPE) ଓ କାର | ଜୁରା ଓ ଶୃଙ୍ଗ | 
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| 1 | ବାଧପର୍ଣ | | |
| 2 | ପିରିକ (PPE) | | |
| 3 | ଓଡ଼ିଷା | | |
| 4 | ଶୃଙ୍ଗ | | |
| 5 | ବାଧପର୍ଣ | | |
| 6 | ପିରିକ (PPE) | | |
| 7 | ଓଡ଼ିଷା | | |
| 8 | ଶୃଙ୍ଗ | | |

ଶ୍ରୀବଳ ଜୁରା ୭୩ ଫଳରେ।
(Practice on fire extinguisher)

• Practice on fire extinguisher

• Job sequence

• Close the door

• Call the fire service

• Evacuate the building


<table>
<thead>
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<tr>
<td>'A'</td>
<td>को, पतल, नुसा तरीका करने</td>
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<tr>
<td>'B'</td>
<td>लगातार तरीका (द्वारा, दलेलिक, दल) इलेक्ट्रिक तरीका</td>
</tr>
<tr>
<td>'C'</td>
<td>नमक, उधारी तरीका</td>
</tr>
<tr>
<td>'D'</td>
<td>पाक जल, इलेक्ट्रिक तरीका</td>
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लगातार तरीका 'B' तरीका (द्वारा, दलेलिक, दल) इलेक्ट्रिक तरीका

- तरीका रोग को $\text{CO}_2$ (द्वारा, दलेलिक) दुः करने।
- तरीका रोग को $\text{CO}_2$ दुः करने।
- तरीका रोग करने। (Fig1)

- लगातार तरीका दुः करने। (Fig2) (लगातार तरीका इलेक्ट्रिक तरीका दुः करने) (Fig2)

- लगातार तरीका दुः करने। (Fig2)
- लगातार तरीका दुः करने। (Fig3)
- लगातार तरीका दुः करने। (Fig4)
• Keep at least 15cm distance from the fire. Do not in any case apply water while the fire is burning. (Fig 4)

---

**Caution**

- Do not breathe in the smoke.
- Keep children and pets away.
- Do not use water to extinguish the fire.
- Do not attempt to put out a fire that is too big or too hot.

---

**Steps**

1. **P** - Pull the pin (Pull)
2. **A** - Aim the nozzle (Aim)
3. **S** - Squeeze the extinguisher (Squeeze)
4. **S** - Sweep across the fire (Sweep)
(Production & Manufacturing)

Practice on basic first aid

Objective: To learn the basic first aid techniques.

Key Points:
- Practice on basic first aid
- (Fig 1)

Job sequence

1. Practice on basic first aid
2. (Fig 1)

1. Practice on basic first aid
2. (Fig 2)
1. Lay the patient on their back, arms straight and nearly vertical.

2. Bend at the waist and grasp the upper arms just above the elbows. Fig 3

3. Grasp the upper arms and pull vertically to the chest. Fig 4

4. Make sure the hands are firmly grasped and the elbows are locked. Fig 4

5. Apply pressure to the upper arms until the heart rate returns. Fig 4

6. Continue applying pressure until the heart rate returns. Fig 5

7. After the heart rate returns, move to mouth-to-mouth resuscitation. Fig 5

---

Fig 2

Fig 3

Fig 4

Fig 5
3. When you are not able to breathe the victim due to any reason, open the airway and hold the mouth open. Then try to do CPR as shown in Fig 6 and observe the following:

![Fig 6](image)

- Elbows should be perpendicular to the ground.
- Weight of the body on the palm of the hand.

4. When the mouth is open, ventilate the victim for 2 breaths as shown in Fig 7 and observe the following:

![Fig 7](image)

- The victim should be stable.

5. If the chest is not rising, try to do CPR as shown in Fig 8 and observe the following:

![Fig 8](image)

- Check the airway, breathing, and circulation.

6. If the patient still does not respond, try to do CPR as shown in Fig 9 and observe the following:

![Fig 9](image)

- Check the airway, breathing, and circulation.

---

**Fig 6**

- Elbows straight.
- Thighs and arms perpendicular to the ground.
- Weight of the body on the palm of the hand.

**Fig 7**

- Check if the chest is rising.

**Fig 8**

- Check the airway, breathing, and circulation.

**Fig 9**

- Check the airway, breathing, and circulation.

---

**Fig 10**

- Chin straight.
- Lower teeth are higher than upper teeth.
- Head back.

**Fig 11**

- Nostril pinched.
- Contact of two mouths.
5  ଏଦର ଅପରିଭାଷିତ ପ୍ରଯାପ୍ତି ମାତ୍ରା (ଏକଟକୁ ବେଳେ ପ୍ରଯାପ୍ତି ତାପା କରନା必需) ହେବାରେ କେବଳ ଏକ ତାପା କରନ କଥାଃ କରନ କେବଳ କଥାଃ କରନ କେବଳ କଥାଃ କରନ କେବଳ କଥାଃ କରନ କେବଳ କଥାଃ 

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5. When chest compressions have not been successful, modify technique to avoid possibility of
   choking. (Fig 16)

6. Unless otherwise specified, techniques are modified to suit the patient and circumstance.
   (Fig 15)

7. Chest compression, two hands, three fingers. (Fig 17)

8. Chest compression, heel of hand. (Fig 18)

9. Chest compression, heart compression (heart compression) between the sternum and xiphoid process.
   (Fig 19)

10. Apply CPR to the patients as it is not possible to prevent the possibility of cervical spine injuries.
    (Fig 19)

11. Fig 19 describes how to apply the chest compression and avoid the possibility of cervical spine
    injuries. (Fig 20)

---

Fig 18

Fig 19

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Fig 20

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---
Disposal of waste material in the workshop

- Carefully dispose of waste materials in designated areas.
- Follow proper waste disposal procedures.

Figure 1

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Figure 2

Job sequence

- Carry out the job sequence carefully.
- Ensure all waste materials are disposed of correctly.
- Follow safety guidelines while handling waste materials.

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ମୃଦୁ ଦୃଢାକ୍ୟର (Shop floor maintenance)

ଅଧୋକ୍ୟ : ନମ୍ବର୍ 1 ଏକ ହେବେ ଏକ ବଲ୍ଯ ଅଧ୍ୟୋକ୍ୟ;
• ଅଧ୍ୟୋକ୍ୟ ଓ ବଲ୍ଯର ଅଧ୍ୱିଲେ ଏକ ବଲ୍ଯ ରହିବ।
• ଅଧ୍ୟୋକ୍ୟ ଓ ବଲ୍ଯ ଅଧ୍ୱିଲେ ଏକ ବଲ୍ଯ ଦେଇଲା ଯେବେ ଏକ ବଲ୍ଯ ରହିବ।
• ରହେବେ/ବଲ୍ଯର ବଲ୍ଯ ରହିବ।

ଘାତରେ:
• ଗାରେଜର (ଗୋଟି ଗୋଟି) ବଲ୍ଯ ଦେଇଲା ବଲ୍ଯ ରହିବ।

ବାଣାକ୍ୟର ଘାତରେ ଏକ ବଲ୍ଯ ଦେଇଲା ବଲ୍ଯ ରହିବ।
• ଗାରେଜର ବଲ୍ଯ ବଳାର ବଲ୍ଯ ଦେଇଲା ବଲ୍ଯ ରହିବ।

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• ଗାରେଜର ବଲ୍ଯ ବଳାର ବଲ୍ଯ ଦେଇଲା ବଲ୍ଯ ରହିବ।

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Figure 1

ବାଣାକ୍ୟର ଘାତରେ ଏକ ବଲ୍ଯ ଦେଇଲା ବଲ୍ଯ ରହିବ।
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Copyright @ NIMI Not to be Republished
Filing Flat Surface and Checking Flatness with Strength Edge

- Measure the length of the edge.
- Check the length to ensure it is consistent.
- Ensure the edge is straight.
- Check the flatness with a straightedge.

![Diagram of filing flat surface and checking flatness with strength edge]

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Scale 1:1

Filing Flat Surface and Checking Flatness with Straight Edge

Deviations ±0.5 Time

Code No. F1106E1

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**Job sequence**

- Fig 1 illustrates a component S1, along with its dimensions and various process steps. The component is to be processed as outlined in the figure.

**Skill sequence**

**Filing flat surface**

- Figure 2 shows the filing process, where the surface is to be filed flat as per the specified dimensions and tolerances.

- Figure 3 demonstrates the filing process with a close-up view of the component, highlighting the filing action and the required precision.

---

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Checking flatness and squareness

Fig 1

Fig 2

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Fig 3

REFERENCE SURFACE

STOCK
### Measuring with Simple Measuring Instruments

- **Steel Rule**
- **Outside Caliper**
- **Inside Caliper**
- **Blind Hole**
- **Slot**

#### Table: Measuring Instruments

<table>
<thead>
<tr>
<th>Scale</th>
<th>Measuring with Simple Measuring Instruments</th>
</tr>
</thead>
</table>

#### Figures

- **Fig 1**: Length to be measured
- **Fig 2**: Steel Rule
- **Fig 3**: Inside Caliper
- **Fig 4**: Outside Caliper
- **Fig 5**: Blind Hole
- **Fig 6**: Slot

---

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Skill sequence (Skill sequence)

Measuring with inside and outside calipers

Figure 1

Outside calipers: Measuring with inside and outside calipers

Figure 2

Inside calipers: Measuring with inside and outside calipers

Figure 3

Figure 4

Copyright © NIMI Not to be Republished
The document contains technical instructions and diagrams. It appears to be about caliper use, possibly in a manufacturing or engineering context. The text includes diagrams labeled as Fig 5 and Fig 7, which illustrate the placement of the calipers. There are also mathematical expressions and technical descriptions, indicating a focus on precision and measurement. The text is dense and specific, likely aimed at professionals or students in a technical field.
1.1.08

1.1.08

MARKING PARALLEL LINE (Z) (By Jenny caliper and scribe)  Fig.2

MARKING ANGLES & CIRCLES  Fig.3

MARKING CURVES & CIRCLES (By Jenny caliper and divider)  Fig 2

MARKING TANGENTS & ARCS  Fig 4

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LAYOUT & MARKING

CODE NO. FR108E1

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Job sequence

Marking 1

- Marking (Raw Material) of the part 'Z' on the material.
- Mark the part 'Y' on the material (Fig 1).

Fig 1

- 'Y' is marked 10 mm from the edge 'X'.
- 'Z' is marked 15 mm from the edge 'X'.

Marking 2

- Mark the part 'X' on the material.
- Mark the part 'Y' on the material.

Fig 2

- 'X' is marked 15 mm from the edge 'Y'.
- 'Y' is marked 20 mm from the edge 'X'.

Marking 3

- Mark the part 'X' on the material.
- Mark the part 'Y' on the material.

Fig 3

- 'X' is marked 10 mm from the edge 'Y'.
- 'Y' is marked 15 mm from the edge 'X'.

Fig 4

- 'X' is marked 15 mm from the edge 'Y'.
- 'Y' is marked 20 mm from the edge 'X'.

Evaluation

- Measure the burr size using a burr gauge (Fig 5 & 6).
• V  1   0 44° V    1 
• V  1   0 55° V    1 
• V  1   0 55° V    1 (Fig 7)

• V  1   0 44° V    1 
• V  1   0 55° V    1 (Fig 8)

Figure 5

Figure 6

Figure 7

Figure 8

Figure 9

• V  1   0 44° V    1 
• V  1   0 55° V    1 
• V  1   0 55° V    1 (Fig 7)

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• V  1   0 55° V    1 (Fig 8)

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• V  1   0 55° V    1 (Fig 9)

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• V  1   0 55° V    1 (Fig 9)
Skill sequence

(Marking lines parallel to the edge of the job)

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Filing and finishing surfaces flat and square

- Level the surfaces and edges.
- Remove any burrs or sharp edges by filing.
- Flat and square surfaces are essential.

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CHANNEL
(Filing flat & square)

(Production & Manufacturing)

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ଜଳକଡରେ ଦୁଇରେ କଷଟ୍ଟି (Job sequence)

• ବରତନଦ୍ୱାରକୁ ବୁଝାଇଲାମ।
• କେଳାନ୍ଦ୍ର କେଳାନ୍ଦ୍ର ପରିବର୍ତ୍ତି କରିବା ପରିବର୍ତ୍ତି କରିବା କାର୍ଯ୍ୟ କରାଇବା ପରିବର୍ତ୍ତି କରିବା ପରିବର୍ତତି କରିବା ପରିବର୍ତ୍ତତି କରିବା।
• ବିକୁ ଯେପ୍ପାଛନ୍ତି କେ edge S4 କେ S1 କେ S3 କେ କାର୍ଯ୍ୟ କରାଇବ କାର୍ଯ୍ୟ କରାଇବ।
• ବାହାକେ କେଳାନ୍ଦ୍ର କେଳାନ୍ଦ୍ର 90 mm କେସ୍ଟ୍ର କାର୍ଯ୍ୟ କରାଇ କାର୍ଯ୍ୟ କରାଇ।
• ବିଦ୍ୟା କେଳାନ୍ଦ୍ର କେଳାନ୍ଦ୍ର 90 mm କେଳାନ୍ଦ୍ର କେଳାନ୍ଦ୍ର କେଳାନ୍ଦ୍ର 90 mm କେଳାନ୍ଦ୍ର କାର୍ଯ୍ୟ କାର୍ଯ୍ୟ କାର୍ଯ୍ୟ।
• କେଳାନ୍ଦ୍ର S2 କେ S3 କେ S1 କେ କେଳାନ୍ଦ୍ର କେଳାନ୍ଦ୍ର କେଳାନ୍ଦ୍ର କେଳାନ୍ଦ୍ର କେଳାନ୍ଦ୍ର (90x72x35)

Fig 1

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1.1.10

Hack-sawing along a straight line

1. Place the bar on a flat surface.
2. Make sure the bar is in a safe and comfortable position.
3. Hold the hack saw firmly and steady the bar.
4. Cut along the straight line.

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SCALE NTS

HACKSAWING ALONG A STRAIGHT LINE

<table>
<thead>
<tr>
<th>CODE NO. FR112E1</th>
</tr>
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</table>

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**Job sequence**

- 1.10 mm pitch
- (return stroke)
- (1.0 mm pitch)
- (Fig 1)
- (Fig 2)
- (Caution)
- (Fig 3)
- (Fig 4)

**Skill sequence**

**Sawing along a line**

- (Job sequence)
- (Skill sequence)
- **(Fig 1)**
- **(Fig 2)**
- **(Fig 3)**
- **(Fig 4)**

**Caution (Caution)**

• (Fig 4)
Fig 4

Fig 5

Copyright © NIMI Not to be Republished
(Hack-sawing of different thickness of metals)

- Hack-sawing of different thickness of metals.

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-job sequence-(Job sequence)

- material

- caution:

Copyright @ NIMI Not to be Republished
Chipping flat surface

1.1.12

- 16
- 70

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Scale NTS

Chipping flat surface

Deviations
AS PER IS 2152 (m)

Time

Code: RI112E1

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### Job sequence

- Drill holes at 35°, 20 mm and 450 gms (Job sequence)

- Drill 20 mm at 35° and 20 mm at 450 gms (Job sequence)

- Drill 450 gms at 20 mm at 35° (Job sequence)

### Skill sequence

#### Chipping using flat chisel (Chipping using flat chisel)

##### Chipping sequence:

- Chisel selection: 20 mm at 35° and 450 gms at 20 mm at 35° (Chipping using flat chisel)

- Drill holes at 35°, 20 mm and 450 gms (Chipping using flat chisel)

- Drill 20 mm at 35° and 450 gms at 20 mm at 35° (Chipping using flat chisel)

- Drill 450 gms at 20 mm at 35° (Chipping using flat chisel)

#### Skill sequence:

- Chisel selection: 20 mm at 35° and 450 gms at 20 mm at 35° (Chipping using flat chisel)

- Drill holes at 35°, 20 mm and 450 gms (Chipping using flat chisel)

- Drill 20 mm at 35° and 450 gms at 20 mm at 35° (Chipping using flat chisel)

- Drill 450 gms at 20 mm at 35° (Chipping using flat chisel)
(Figs 6A & B)
Chipping grooves (by cross-cut chisel)

1. Chipping grooves (by cross-cut chisel)

- The depth is ± 1 mm from the finished dimension, with dimensions ± 1.0 mm.

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**Table:**

- Scale: MTS

**Details:**

- **CHIPPING GROOVES**
- (By cross cut chisel)

---

Copyright @ NIMI Not to be Republished
(Job sequence)

1.1.12

(General hints)

– Chisel your work area. Let the chisel hold itself. Let the chisel be held steady.
– Get the chisel in a steady position.
– Keep your hands steady.

(Skill sequence)

– Chisel your work area. Let the chisel hold itself. Let the chisel be held steady.
– Get the chisel in a steady position.
– Keep your hands steady.

(Chipping grooves by cross cut chisel)

– Chisel your work area. Let the chisel hold itself. Let the chisel be held steady.
– Get the chisel in a steady position.
– Keep your hands steady.

38
(Chipping oil grooves (by round nose chisel))

Chipping oil grooves (by round nose chisel)

Fig 1

HALF ROUND CHISEL

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1.1.15

Chipping sharp corners (by diamond point chisel)

Fig 1

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CHIPPING SHARP CORNERS
(By diamond point chisel)

SCALE (NTS)

CODE NO. F1115E1
Grinding flat chisel centre punch & dot punch

**Note:**
- Centre punch should be blended roughly. If both centre punch and dot punch are blunt, use a centre punch with 60° and 90° angles.
- If only the centre punch is blunt, use a centre punch with 30° and 60° angles.
- If only the dot punch is blunt, use a centre punch with 30° and 60° angles.

---

**Scale:**

GRINDING FLAT CHISEL, CENTRE PUNCH & DOT PUNCH

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CODE NO. F1118E1
**Skill sequence**

**Grinding of flat chisel**

- **Skill sequence**: A list of steps to follow in the task of grinding a flat chisel.

**During grinding**: A description of the process of grinding a flat chisel, highlighting specific points and steps.

**Figures**: Visual representations of the grinding process, labeled as Fig 1, Fig 2, and Fig 3.

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(FIG 5)

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(Production & Manufacturing)
(Fitter - Basic Fitting)

Drilling through holes and tapping

- Drilling / tapping: Drill holes and tap.
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- Drilling / tapping: Drill holes and tap.
- Drilling / tapping: Drill holes and tap.

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DRILLING THROUGH HOLES & TAPPING

SCALE 1:1

CODE NO. FI117E1

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Job sequence

- Raw (raw) material cutting
- Drill holes
- 16 mm cutting in the holes
- 4 mm cutting in the holes
- 16 mm drilling holes
- 10 mm drilling holes
- 8.5 mm drilling holes
- 4 mm drilling holes
- M10 drill bit 8.5 mm
- 10 mm drill bit
- 4 mm drill bit
- 8.5 mm drill bit
- 16 mm drill bit

Skill sequence

Drilling through holes

- 16 mm drilling through holes
- 4 mm drilling through holes
- 10 mm drilling through holes
- 8.5 mm drilling through holes
- 4 mm drilling through holes

Fig 1

TO REMOVE DRILL USE DRIFT
Y如何看待钻孔（Tapping through holes）

**Purpose:**
- Use a single-point drill with a slow speed.
- Use a lubricant to reduce friction.
- Hold the drill firmly to avoid wobbling.

**Preparation:**
- Mark the entry and exit points for tapping.
- Use parallels to ensure the tap remains parallel to the workpiece.

**Process:**
1. Start tapping slowly, applying even pressure.
2. Ensure the tap is straight and does not wobble.
3. Remove chips regularly to prevent overheating.
4. Re-place the tool if necessary.

**Tips:**
- Keep the tap cool and lubricated.
- Practice makes perfect; repeat the process to achieve a good result.

**Figures:**
- **Fig 1:** Diagram showing the entry and exit points for tapping.
- **Fig 2:** Illustration of the single-point drill in action.
- **Fig 3:** Diagram showing the positioning of parallels during tapping.

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Fig 4 & 5

Fig 6

Fig 7
Toolmakers Square

- The toolmakers square has dimensions of 98 x 98.
- The diagram shows the square divided into sections A, B, C, and D.
- The dimensions are marked with measurements in millimeters.

The table below provides additional information:

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<td>Fe 310</td>
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PROJECT: TOOL MAKER'S SQUARE
(Sawing & Filing)

DEVIATIONS ±0.1

CODE NO. FI1118E1

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Job sequence

- Take Part 2 before Part 1.
- Proceed to Part 2 after Part 1, but only after Part 1 has been completed.
- Proceed to Part 2 after Part 1, but only if Part 2 has been completed.
- Clean the Part 2 area, but only after Part 2 has been completed.
- Clean the Part 2 area, but only if Part 2 has been completed.
- Clean the Part 2 area, but only after Part 2 has been completed.
- Clean the Part 2 area, but only if Part 2 has been completed.
- Clean the Part 2 area, but only after Part 2 has been completed.
- Clean the Part 2 area, but only if Part 2 has been completed.
- Clean the Part 2 area, but only after Part 2 has been completed.
Slot filing

Table:

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</table>

SCALE 1:1

SLOT FILING

DEVIATIONS ±0.1

CODE NO. FI119E1

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Job sequence

• Use decidedly the tool and tool.  
• Use the tool and tool of the parting process.  
• Use the tool and tool of the parting process.  
• Use the tool and tool of the parting process.  

Fig 1

Skill sequence

Parting off by chain drilling (Paritng off by chain drilling)

Fig 2

Fig 3
**Angular Filing**

**Specifications:**
- Angular filing with an accuracy of ±5°.
- Tolerances:
  - ±5' on the angle.
  - ±0.1 mm on the dimensions.
  - ±0.2 mm on the dimensions.

**Dimensions:**
- 56 mm (length)
- 40 mm (width)
- 3 mm (depth)
- 90° angle

**Table:**

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**Title:** ANGULAR - OPEN FIT

**Scale:** 1:1

**Deviations:** ±0.1

**Code No.:** FR123E1

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**Job sequence**

- Cut the area 2, 3, 6, 7, 8, 9 area and figure out the work area.
- Prepare the area 87 x 40 and the area 10 x 10 and figure out the work area.
- Prepare A & B area by cutting the front and back.
- Prepare A & B area without the rear for figure 1.

---

**Skill sequence**

- Prepare A & B area without the rear for figure 2.
- Prepare A & B area without the rear for both A & B areas.
- Prepare A & B area without the rear for both A & B areas.
- Prepare A & B area without the rear for both A & B areas.
- Prepare A & B area without the rear for both A & B areas.
- Prepare A & B area without the rear for both A & B areas.
- Prepare A & B area without the rear for both A & B areas.

---

**Filing and fitting of mating parts**

- Prepare the area 2, 3, 6, 7, 8, 9 area and figure out the work area.

---

**Procedure**

- Prepare the area 2, 3, 6, 7, 8, 9 area and figure out the work area.
- Prepare the area 2, 3, 6, 7, 8, 9 area and figure out the work area.
- Prepare the area 2, 3, 6, 7, 8, 9 area and figure out the work area.
- Prepare the area 2, 3, 6, 7, 8, 9 area and figure out the work area.
- Prepare the area 2, 3, 6, 7, 8, 9 area and figure out the work area.
- Prepare the area 2, 3, 6, 7, 8, 9 area and figure out the work area.

---

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90° Included angle (included angle)

30 mm

(Checking of mating surfaces)

(Fig 4)

(Fig 5)

(Fig 6)

(Fig 7 and 8)
Checking gap with a feeler gauge

• Check the gap with a feeler gauge.

Fig 1

Fig 2

<table>
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<tr>
<th>Gap Size</th>
<th>Description</th>
<th>Measurement</th>
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<td>2.55 mm</td>
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<td>2.45 mm</td>
<td>3rd Step</td>
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<tr>
<td>0.10 mm</td>
<td>4th Step</td>
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('C' clamp - frame)

Dimensions: 40 x 40 x 60 mm

- Precision of dimensions ±0.5 mm
- Angular precision ±1°
- Flatness ±0.5 mm
- Parallelism ±1°
- Tolerance ±0.5 mm

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Scale: 1:1

Project: C' CLAMP

Part: FRAME

Deviations ±0.5
**Job sequence**

- Fig 1

**Skill sequence**

**Parting off by chain drilling**

- Fig 1
Filing radius (external)

1.1.21 Rough filing of corners

Rounding of corners

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### (Checking the radius)

#### Steps:
- **Step 1:**
  - Measure the radius using a radius gauge.
  - Ensure that the radius matches the specified value.

#### Diagrams:
1. **Fig 1 and 2**
2. **Fig 3**
3. **Fig 4**
4. **Fig 5**

#### Notes:
- **Fig 3:** Shows the correct method of checking the radius using a SEE-SAVER MOTION tool.
- **Fig 4:** Illustrates the incorrect method of checking the radius using a SEE-SAVER tool.

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‘C’ Clamp - Assembly

Note: Only the 2nd row of the table is provided.

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3. CLAMPING COLLAR

4. LOCKING NUT

DIAMOND KNURLING
IS : 2473

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SCALE 1:1

PROJECT: 'C' CLAMP
PART: COLLAR + NUT

DEVIATIONS ±0.04
CODE NO. FI/122E2
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**TITLE:** PROJECT: 'C' CLAMP ASSEMBLY

**CODE NO.:** FI122E3
Key fitting

1. Key fitting
   - The key 1 and key 2 are different.
   - The key 1 is used for fitting.
   - The key 2 is used for fitting.

2. Key fitting
   - The key 1 and key 2 are different.
   - The key 1 is used for fitting.
   - The key 2 is used for fitting.

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Scale 1:1

Key Fitting

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Job sequence

- Select the required material and cut to size.
- Mark and drill holes 8 mm deep and 3 mm deep, respectively.
- Mark and drill holes on the key and shaft, respectively. (Fig 1 & 2)

![Fig 1](image1.png)

![Fig 2](image2.png)
Filing (radius gauge)

Specifications:
- Diameter of the forging is ±0.04 mm
- Radius of the forging is ±0.04 mm
- The forging is made of 45C8 material

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DEVIATIONS ±0.04

CODE NO. FI124E1
**Job sequence**

- Job 1: ISST 100 mm x 28 mm x 3.5 mm
  - **Job**
  - **Sequence**

- Job 2: 95 mm x 25 mm x 3 mm
  - **Job**
  - **Sequence**

- Job 3: 95 mm x 25 mm x 3 mm
  - **Job**
  - **Sequence**

- Job 4: 95 mm x 25 mm x 3 mm
  - **Job**
  - **Sequence**

**Notes:**
- Job A follows Job B (convex)
- Job B follows Job A
**Angle grinding gauge**

- Material: Fe3/10
- Stock Size: 38.5 x 38.5
- Project NO.: 16

**Specifications**:
- ± 5° ±
- 120° ±
- 55° ±
- 18° ±

**Deviations**:
- IS: 2102 (m)

**Code NO.**: FII125E1

---

**Table**:

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**Scale**: 1:1

**Project**: ANGLE GRINDING GAUGE

---

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Job sequence

- Assess 2. Strips of the described shape, 80 mm length.
- Draw the sketch of the described shape (Fig 1).
- Position the cut, 80 mm length.

Fig 1

- Cut the cut in the described shape (Fig 2).
- Thickness of shape 1 mm, described shape gliding 80 mm length.
- 120° angle, cut gliding (Fig 4).

Fig 2

- 50 mm distance from the cut angle 31° angle, cut gliding 80 mm length (Fig 3).
- 121° angle, cut gliding (Fig 2).
- 60° - 55° angle, cut gliding (Fig 2).

Fig 3

- Length (thickness) 80 mm, cut gliding (Fig 4).
- Draw the sketch of the structure (Fig 2).
- Draw the sketch of the angle 60° - 55° (Fig 4).
**Production & Manufacturing**

**Fitter - Basic Fitting**

**Hacksaw frame - frame**

- ±0.04 mm deviation on all dimensions.
- ± 10 mm deviation on all dimensions.
- ± 0.06 mm deviation on all dimensions.

**Hacksaw frame assembly details:**

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**Scale: 1:2**

**Project: Hacksaw Frame Assembly**

**Part: Frame**

**Deviations:** ±0.04

**Code No.: F1129E1**

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Hacksaw frame - tension screw slide

Dimensions:
- ±0.10 mm
- ±0.10 mm
- ±0.04 mm

Deviation: ±0.04

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</table>

Project: Hacksaw Frame
Part: Tension Screw Slide

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Hacksaw frame - adjusting nut

1.1.28

1 | Ø28 - 28 | - | Fe310 | 5 | 3

NO.OFF | STOCK SIZE | SEMI-PRODUCT | MATERIAL | PROJECT NO. | PART NO.

SCALE 2:1

PROJECT: HACKSAW FRAME ASSEMBLY

PART: ADJUSTING NUT

DIAMOND NURLING IS:3403
(Production & Manufacturing)
(Fitter - Basic Fitting) 1.1.29

(Hacksaw frame - tension screw)

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Hacksaw frame - handle holder

Dimensions:
- Eye slot
- Narrow
- Handle holder

Specifications:
- Material: Fe310
- Project No.: 5
- Part No.: 5

scale: 1:1

PROJECT: HACKSAW FRAME
PART: HANDLE HOLDER

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Job sequence

- Job 1: Roughing with a 4.2 mm Ø tool, followed by finishing with a 6 mm Ø tool.

- Job 2: Roughing with a 6 mm Ø tool, followed by finishing with a 5 mm Ø tool.

- Job 3: Roughing with a 1.5 x 45° geometry tool, followed by finishing with a 5 mm Ø tool.

- Job 4: Roughing with a 6 mm Ø tool, followed by finishing with a 6 mm Ø tool.

- Job 5: Roughing with a 5 mm Ø tool, followed by finishing with a 5 mm Ø tool.

- Job 6: Roughing with a 5 mm Ø tool, followed by finishing with a 4.2 mm Ø tool.

- Job 7: Roughing with a 4.2 mm Ø tool, followed by finishing with a 6 mm Ø tool.

- Job 8: Roughing with a 6 mm Ø tool, followed by finishing with a 5 mm Ø tool.

- Job 9: Roughing with a 5 mm Ø tool, followed by finishing with a 4.2 mm Ø tool.

- Job 10: Roughing with a 4.2 mm Ø tool, followed by finishing with a 6 mm Ø tool.

- Job 11: Roughing with a 6 mm Ø tool, followed by finishing with a 5 mm Ø tool.

- Job 12: Roughing with a 5 mm Ø tool, followed by finishing with a 4.2 mm Ø tool.

- Job 13: Roughing with a 4.2 mm Ø tool, followed by finishing with a 6 mm Ø tool.

- Job 14: Roughing with a 6 mm Ø tool, followed by finishing with a 5 mm Ø tool.

- Job 15: Roughing with a 5 mm Ø tool, followed by finishing with a 4.2 mm Ø tool.

- Job 16: Roughing with a 4.2 mm Ø tool, followed by finishing with a 6 mm Ø tool.

- Job 17: Roughing with a 6 mm Ø tool, followed by finishing with a 5 mm Ø tool.

- Job 18: Roughing with a 5 mm Ø tool, followed by finishing with a 4.2 mm Ø tool.

- Job 19: Roughing with a 4.2 mm Ø tool, followed by finishing with a 6 mm Ø tool.

- Job 20: Roughing with a 6 mm Ø tool, followed by finishing with a 5 mm Ø tool.
Hacksaw frame assembly

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**TITLE:** PROJECT: HACKSAW FRAME ASSEMBLY

**CODE NO.:** FI1131E1

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Bevel gauge blade

The dimensions and tolerances are as follows:

- ±0.04 mm is the tolerance on the bevel angle and face width.
- ±10 is the tolerance on the face width.
- ±0.04 mm is the tolerance on the bevel angle.
- ±0.04 mm is the tolerance on the face width.
- ±0.04 mm is the tolerance on the bevel angle.
- ±0.04 mm is the tolerance on the face width.
- ±0.04 mm is the tolerance on the bevel angle.
- ±0.04 mm is the tolerance on the face width.

Dimensions:

- Length: 105 mm
- Width: 15 mm
- Height: 40 mm
- Bevel angle: 45°
ଜବେଳ ତୁର୍ଥ (Job sequence)

• ଜବେଳ ଗୋଲ ବାଲେ ତେଳ ଛା।
• ଜବେଳର ଗୋଲରେ ଜୋଲ ବୁଚାଇ ପାଇଲେ ପର୍ଯ୍ୟନ୍ତ ଶ୍ରେଷ୍ଠମାନେ ଜବେଳରେ ଗୋଲରେ ଛାଲାଇ ଛା।
• ଜୋଲ କୁପ୍ପରେଇ ଛଳ।
• ପ୍ରେକ୍ଷ କରିବାେ ଛଳ।
• ଜବେଳ ବାଲେ ଜୋଲ ଗୋଲରେ ଛଳୀ ଟିଆରୀ ଛେଳ।

45°

• ଜବେଳ ରେକ ଜବେଳରେ ଜୋଲ ବାଲେଇ ଛଳ।
• ଜବେଳରେ ଜୋଲ ବାଲେଇ ଜୋଲରେ ଛଳ।
• ଜୋଲ କରିବା ଟିଆରୀ ଛଳ।
• ଜୋଲ କରିବା ଟିଆରୀ ଛଳ।

ପର୍ଯ୍ୟନ୍ତ ରେକ ବାଲେ ତେଳ ତେଳ ଜୋଲରେ ଗୋଲରେ ଛଳ।
Bevel gauge - stock

- Ø0.04 mm
- ±10'
- ±10°

Specifications:
- R16
- 2 x Ø8H7
- 100 x 55 x 18

Table:

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Scale: 1:1

Project: Bevel Gauge

Part: Stock

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3. BOLT

NOTE: INSTRUCTOR SHALL GUIDE THE TRAINEES FOR THE TURNING OF PART BOLT

4. WING NUT

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SCALE 1:1

PROJECT: BEVEL GAUGE

PART: BOLT & WING NUT

DEVIATIONS ±0.5

CODE NO. F1133E2
(Stamping letters and numbers)

(.Method)

Fig 1

Fig 2

Fig 3

Fig 4
Preparing hearth and lighting the fire

- Prepare the hearth and light the fire
- Ensure proper air supply
- Use a damper to control airflow
- Utilize an ash valve for maintenance

Title: PREPARING HEARTH AND LIGHTING THE FIRE

CODE NO. F1S201E1
**Job Sequence**

- Take the ladle with both hands.
- Put on the ladle with both hands.
- Take the ladle with both hands.
- Put the ladle in the ladle with the ladle's handle.
- Take the ladle with both hands.
- Put the ladle in the ladle with the ladle's handle.

**Skill Sequence**

**Prepare the hearth and light a fire**

- **Fig 1**
  - Take out the ladle with both hands. (Job sequence)

- **Fig 2**
  - Take out the ladle with both hands. (Skill sequence)

- **Fig 3**
  - Take out the ladle with both hands. (Fig 3)

- **Fig 4**
  - Take out the ladle with both hands. (Fig 4)
Forging square using round rod

**Forging square using round rod**

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**SCALE:** 1:1

**TITLE:** FORGING SQUARE USING ROUND ROD

**CODE NO.** F1S202E1

---

**Production & Manufacturing**

**Fitter - Forging**

1.2.02

Forging square using round rod

- Description: A forging that is square and made from round rod.
- Material: Fe310
- Dimensions: 160 mm square, 20 mm square.
Job sequence

- Prepare the workpiece 800 to 850 °C.
- Gradually workpiece 90° C:
  - Gradually workpiece 90° C.
  - Gradually workpiece 90° C.
  - Gradually workpiece 90° C.
  - Gradually workpiece 90° C.

Skill sequence

(Forge a square bar from round)

-Forge a square bar from round.

Procedure

- Prepare the workpiece 800 to 850 °C.
- Gradually workpiece 90° C:
  - Gradually workpiece 90° C.
  - Gradually workpiece 90° C.
  - Gradually workpiece 90° C.
  - Gradually workpiece 90° C.

Fig 1

Fig 2
Forging octagon using round rod

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**Job sequence**

- Draw the 90° angle.
- Draw out the octagon from the square (forging) and bent into a 90° angle.
- Bend the bent metal into a 90° angle (Draw out) with the ending point of the square.
- Draw out the bent metal from the square (forging) and bent into a 90° angle.
- Bend the bent metal into a 90° angle (Draw out) with the ending point of the square.

**Skill sequence**

**Forging an octagon from a square**

**Procedure**

- Draw the 90° angle.
- Draw out the octagon from the square (forging) and bent into a 90° angle.
- Bend the bent metal into a 90° angle (Draw out) with the ending point of the square.
- Draw out the bent metal from the square (forging) and bent into a 90° angle.
- Bend the bent metal into a 90° angle (Draw out) with the ending point of the square.

(Fig. 1)

(Fig. 2)

(Fig. 3)

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Forging hexagon from round rod

1.2.04

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Scale: 1:1

Title: FORGING HEXAGON FROM ROUND ROD

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**Job sequence**

- 1st & 2nd 30°
- 3rd 60°
- 4th 90° (vertically) Ø 25 mm
- 5th & 6th 90°

**Skill sequence**

**Forge a hexagonal section**

(Fig 1)

(Fig 2)
Bending a staple

Material: Fe310

Dimensions:
- Ø8
- 30
- 100

Title: BENDING A STAPLE

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**Job sequence**

- Adapt 1 piece to piece 2.
- Grind to a width of 20mm, note that the grinding should be even. (Fig 1)
- Cut the piece into 2 pieces, note the cut should be even. (Fig 2)
- Cut the edge of the piece, note the cut should be even. (Fig 3)
- Cut the edge of the piece, note the cut should be even. (900°C)

**Skill sequence**

Forge a staple (Forge a staple)

- Have a staple hammer ready.
- Adapt the staple hammer.
- Grind down the staple hammer.

Procedure

Welding should be done (Fig 2) 1 piece, first, the first piece length is 40mm, note that the first piece length should be even. (Fig 1)

- The welding is done in the middle, note that the welding is even. (Fig 2)
- The welding is done in the middle, note that the welding is even. (Fig 3)
- The welding is done in the middle, note that the welding is even. (Fig 4)
Forging bolt head

Forging - Forging

Title: FORGING BOLT HEAD

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SCALE 1:1

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Job sequence

- Take the metal bar 25 mm long.
- Punch an oval hole 60 mm deep on the metal bar.
- Take a metal block 25 mm thick, 25 mm wide and 15 mm deep.
- Cut the metal bar 32 mm deep with hack saw.
- Cut the metal bar 32 mm deep with a file.
- Take the metal block 32 mm thick, 32 mm wide and 32 mm deep.
- Punch the metal block 32 mm deep.
- Take the metal block 32 mm thick, 32 mm wide and 32 mm deep.
- Punch the metal block 32 mm deep.
- Take the metal block 32 mm thick, 32 mm wide and 32 mm deep.

Skill sequence

- Forge a hexagonal head bolt

Procedure

- Forging the metal bar 40 mm thick, 40 mm wide and 40 mm deep.
- Take the metal block 25 mm thick, 25 mm wide and 15 mm deep.
- Take the metal bar 32 mm deep with hack saw.
- Take the metal block 32 mm thick, 32 mm wide and 32 mm deep.
- Punch the metal block 32 mm deep.
- Take the metal block 32 mm thick, 32 mm wide and 32 mm deep.
- Punch the metal block 32 mm deep.
- Take the metal block 32 mm thick, 32 mm wide and 32 mm deep.

Fig 1

- Take the metal bar 25 mm long, 25 mm wide and 25 mm deep.
- Cut the metal bar 15 mm deep with hack saw.

Fig 2

- Take the metal bar 25 mm long, 25 mm wide and 25 mm deep.
- Cut the metal block 15 mm deep with hack saw.
- Take the metal block 25 mm thick, 25 mm wide and 15 mm deep.
- Punch the metal block 15 mm deep.

Fig 3

- Take the metal bar 25 mm long, 25 mm wide and 25 mm deep.
- Cut the metal block 15 mm deep with hack saw.
- Take the metal block 25 mm thick, 25 mm wide and 15 mm deep.
- Punch the metal block 15 mm deep.

Fig 4

- Take the metal block 25 mm thick, 25 mm wide and 15 mm deep.
- Punch the metal block 15 mm deep.
- Take the metal block 25 mm thick, 25 mm wide and 15 mm deep.
- Punch the metal block 15 mm deep.
Fig 4

Fig 5

Fig 6

Fig 7

Fig 6 (Fig 6)

Fig 7 (Fig 7)
Forging a handle

Dimensions:
- Length: 160 mm
- Diameter: 25 mm
- Radius: R30, R7.5, R16

Materials:
- Fe310

Notes:
- Forging a handle
- Fitter - Forging

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**Job sequence**

- Use a flat file to remove 65mm from the surface.
- Use a flat file to remove 30mm from the surface. Heat to 1100°C for 15 minutes, then 15mm.
- Use a flat file to remove 30mm from the surface. Heat to 1100°C.
- Use a flat file to remove 180° from the surface. Heat to 1100°C.
- Use a flat file to remove 30mm from the surface. Heat to 1100°C.
- Use a flat file to remove 30mm from the surface. Heat to 1100°C.

**Skill sequence**

**Spreading the metal**

Use a flat file to remove 65mm from the surface.
- Use a flat file to remove 30mm from the surface. Heat to 1100°C for 15 minutes, then 15mm.
- Use a flat file to remove 30mm from the surface. Heat to 1100°C.
- Use a flat file to remove 180° from the surface. Heat to 1100°C.
- Use a flat file to remove 30mm from the surface. Heat to 1100°C.
- Use a flat file to remove 30mm from the surface. Heat to 1100°C.
- Use a flat file to remove 30mm from the surface. Heat to 1100°C.

![Diagram 1](image1.png)

![Diagram 2](image2.png)

![Diagram 3](image3.png)

![Diagram 4](image4.png)
Punching a hole

Insert a punch and make a hole in the metal sheet, then bend the metal sheet to make a hole in the metal sheet. (Fig 5)

1. Make a hole in the metal sheet using a punch. (Fig 1)
2. Insert the punch into the hole and bend the metal sheet to create a hole. (Fig 2)
3. Ensure the metal sheet is clean and free from any debris before punching. (Fig 3)
4. Use a hammer to drive the punch into the metal sheet to create a hole. (Fig 4)
Bending pipe clamp

1. Place the clamp in the desired position.
2. Adjust the clamp to ensure it is tight and secure.
3. Ensure the clamp is properly aligned with the pipe.
4. Use the split feature for additional stability.

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SCALE 1:1

TITLE: BENDING A PIPE CLAMP

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Job sequence

- Prepare the workpiece (Fig 1).
- Position the workpiece on the anvil.
- Ensure the underlay is correctly placed.
- Set the anvil at a 40° angle.
- Use a 40 mm diameter tool bit.
- Apply light pressure to the workpiece.

Fig 1

WORK PIECE
UNDERLAY
ANVIL

(i) Position the workpiece on the anvil.
(ii) Ensure the underlay is correctly placed.
(iii) Set the anvil at a 40° angle.
(iv) Use a 40 mm diameter tool bit.
(v) Apply light pressure to the workpiece.

Fig 1

WORK PIECE
UNDERLAY
ANVIL

(i) Position the workpiece on the anvil.
(ii) Ensure the underlay is correctly placed.
(iii) Set the anvil at a 40° angle.
(iv) Use a 40 mm diameter tool bit.
(v) Apply light pressure to the workpiece.

Fig 1

WORK PIECE
UNDERLAY
ANVIL

(i) Position the workpiece on the anvil.
(ii) Ensure the underlay is correctly placed.
(iii) Set the anvil at a 40° angle.
(iv) Use a 40 mm diameter tool bit.
(v) Apply light pressure to the workpiece.

Fig 1

WORK PIECE
UNDERLAY
ANVIL

(i) Position the workpiece on the anvil.
(ii) Ensure the underlay is correctly placed.
(iii) Set the anvil at a 40° angle.
(iv) Use a 40 mm diameter tool bit.
(v) Apply light pressure to the workpiece.

Fig 1

WORK PIECE
UNDERLAY
ANVIL

(i) Position the workpiece on the anvil.
(ii) Ensure the underlay is correctly placed.
(iii) Set the anvil at a 40° angle.
(iv) Use a 40 mm diameter tool bit.
(v) Apply light pressure to the workpiece.

Fig 1

WORK PIECE
UNDERLAY
ANVIL

(i) Position the workpiece on the anvil.
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UNDERLAY
ANVIL

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Fig 1

WORK PIECE
UNDERLAY
ANVIL

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WORK PIECE
UNDERLAY
ANVIL

(i) Position the workpiece on the anvil.
(ii) Ensure the underlay is correctly placed.
(iii) Set the anvil at a 40° angle.
(iv) Use a 40 mm diameter tool bit.
(v) Apply light pressure to the workpiece.
Forge a flat chisel

Tools:

- Hot forging hammer
- Flat chisel

Methods:

- Heat the chisel to the forging temperature
- Place the chisel into the hammer and strike it to shape
- Repeat the process until the desired shape is achieved
**Job sequence**

- End of the chisel 120 mm.
- The sequence of the job is shown in the figure (Fig 1).
- The job sequence is as follows:
  1. Start the job.
  2. Heat the chisel to 280 °C.
  3. Heat the chisel to 1200 °C.
  4. Heat the chisel to 80 °C. (Vertical)
  5. Heat the chisel to 280 °C. (Horizontal)
  6. Heat the chisel to 1200 °C.
  7. Heat the chisel to 280 °C.

**Skill sequence**

**Hardening and tempering of a flat chisel - Single heat method**

- The skill sequence is shown in the figure (Fig 2).
- The skill sequence is as follows:
  1. Start the skill.
  2. Heat the chisel to 280 °C.
  3. Heat the chisel to 1200 °C.
  4. Heat the chisel to 1200 °C. (Vertical)
  5. Heat the chisel to 280 °C.
  6. Heat the chisel to 1200 °C. (Horizontal)
  7. Heat the chisel to 280 °C. (Horizontal)
  8. Heat the chisel to 1200 °C.
  9. Heat the chisel to 280 °C.
Hardening and tempering of a flat chisel - Double heat method

Procedure

1. Preheat the chisel to a desired temperature. (Fig 1)

2. Let the chisel soak for 5 minutes. (soaking time)

3. Place the chisel vertically in water. (Fig 2)

4. Soak the chisel for 10 minutes. (soaking time)

5. The chisel is now hardened and tempered. (Fig 3)
Forging Centre Punch

- Material: 40Cr
- Project No.: CODE NO. F1S210E1
**Job sequence**

- Drive Francis 32 centre punch 1.2mm 200mm round
- Drive Francis 32 centre punch 1.2mm 200mm transverse
- Drive Francis 32 centre punch 1.2mm 200mm helix
- Drive Francis 32 centre punch 1.2mm 200mm spiral

**Skill sequence**

**Normalising the centre punch**

- Drive Francis 32 centre punch 1.2mm 200mm round
- Drive Francis 32 centre punch 1.2mm 200mm transverse
- Drive Francis 32 centre punch 1.2mm 200mm helix
- Drive Francis 32 centre punch 1.2mm 200mm spiral

- 75mm draw punch 60mm 15° round
- 600°C soak 1hr
- 5mm deface 3mm external diameter
- 8mm deface 3mm external diameter
- 260°C soak 1hr

- 90° draw 75mm round
- 90° draw 75mm round
- 150° draw 75mm round

- Drive Francis 32 centre punch 1.2mm 200mm round
- Drive Francis 32 centre punch 1.2mm 200mm transverse
- Drive Francis 32 centre punch 1.2mm 200mm helix
- Drive Francis 32 centre punch 1.2mm 200mm spiral

- 75mm draw punch 60mm 15° round
- 600°C soak 1hr
- 5mm deface 3mm external diameter
- 8mm deface 3mm external diameter
- 260°C soak 1hr

- 90° draw 75mm round
- 90° draw 75mm round
- 150° draw 75mm round

- Drive Francis 32 centre punch 1.2mm 200mm round
- Drive Francis 32 centre punch 1.2mm 200mm transverse
- Drive Francis 32 centre punch 1.2mm 200mm helix
- Drive Francis 32 centre punch 1.2mm 200mm spiral

- 75mm draw punch 60mm 15° round
- 600°C soak 1hr
- 5mm deface 3mm external diameter
- 8mm deface 3mm external diameter
- 260°C soak 1hr

- 90° draw 75mm round
- 90° draw 75mm round
- 150° draw 75mm round
(Wall bracket)

Requirements:
- The bracket should be made from Fe310 material.
- The dimensions are as follows:
  - Diameter: 35 mm
  - Length: 220 mm
  - Height: 60 mm

Dimensions:

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Title: WALL BRACKET

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Job sequence

- Check initial tool condition before starting.
- Prepare L-shape tool for cutting.
- 'L' tool diameter Ø 5mm Ø 3rd Ø 10mm Ø 5mm Ø 1 Ø 4mm Ø 2 Ø 1 tool diameter Ø 2mm Ø 2.

Skill sequence

Scroll bending

- Check full size pattern.
- Use scroll bending tool to bend the metal.
- Use straightness tool to check the accuracy of the bends.

Fig 1

LAYOUT OF FULL SIZE PATTERN

Fig 2

CHECKING SCROLL ON A FULL SIZE PATTERN

Fig 3

STRAIGHTENING SCROLL SO IT WILL BE FLAT
‘L’ দৃঢ় করে লবণু দিও করিয়া। (Rivetting the scroll with a ‘L’ bracket)

• রীতিমত ফিক্সেশন করিয়া।
• ‘L’ দ্বারা ধরিবে নিশ্চিত।

স্ক্রল স্ট্যান্ড ত্বকে দিও নিষিদ্ধ।
স্ক্রল ত্বকে দিও নিষিদ্ধ।
স্ক্রল ত্বকে দিও নিষিদ্ধ।
জোড়া পায়ের দিও নিষিদ্ধ করিয়া।

রীতিমত ফিক্সেশন করিয়া।
স্ক্রল ত্বকে দিও নিষিদ্ধ করিয়া, যাতে জোড়া পায়ের দিও নিষিদ্ধ করিয়া। (Figs 1 & 2)

চিত্র ১ রিভেটের স্থান নির্দেশ করে। (Fig 1)

চিত্র ২ রিভেটের স্থান নির্দেশ করে। (Fig 2)

চিত্র ৩ রিভেটের স্থান নির্দেশ করে ফিক্সেশন করিয়া। (Fig 3)

চিত্র ৪ রিভেটের স্থান নির্দেশ করে ফিক্সেশন করিয়া। (Fig 4)

চিত্র ৫ রিভেটের স্থান নির্দেশ করে ফিক্সেশন করিয়া। (Fig 5)

চিত্র ৬ রিভেটের স্থান নির্দেশ করে ফিক্সেশন করিয়া। (Fig 6)
(Marking and cutting straight line)

Marking:
- 'L' and 25.00 by 15.00 by 150.00 on the sheet metal.
- Locate marking 10.00 from the left edge of the sheet metal.
- Mark 'L' at 10.00 from the left edge of the sheet metal.

Sheet size:
- 160.00 x 80.00

Note:
- Scale: 1:1
- Title: MARKING AND CUTTING STRAIGHT LINE
- Code: FH301E1

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**Job sequence**

- Cut the metal in order to get the required size.
- Mark lines parallel to an edge (sheet metal).
- Trim the edges and corners.
- Make 25mm cuts to form 'V' at the ends.
- Make 150mm cuts at the ends of the metal.
- Use 10mm, 5mm, 2.5mm, 1.5mm cuts for the inner parts.
- Make 20mm, 15mm, 10mm, 5mm cuts for the outer parts.

**Skill sequence**

- Mark lines parallel to an edge.
- Use 25mm cuts to form 'V' at the ends.
- Use 150mm cuts at the ends of the metal.
- Use 20mm, 15mm, 10mm, 5mm cuts for the outer parts.

**Mark lines parallel to an edge**

- Mark lines parallel to an edge (Fig 1).
- Mark lines parallel to an edge (Inclination) (Fig 3).
- Mark lines parallel to an edge (Fig 4).
 режи োলা ৌঁং লিঙ্গি (Cutting sheet by snips)

রেজিয় রেজিয় লিঙ্গি রেজিয় দুই খানের রেজিয় রেজিয় দুই খানের রেজিয় দুই খানের রেজিয় দুই খানের (Fig 1)

20° দুই খানে রেজিয়, ঢাকা রেজিয় ঢাকা রেজিয় ঢাকা রেজিয় ঢাকা রেজিয় (Fig 2)

রেজিয় রেজিয় রেজিয় 20° দুই খানে রেজিয়, ঢাকা রেজিয় ঢাকা রেজিয় ঢাকা রেজিয় ঢাকা রেজিয় (Fig 3)

রেজিয় রেজিয় রেজিয় রেজিয় রেজিয় রেজিয় দুই খানের রেজিয় দুই খানের রেজিয় দুই খানের রেজিয় দুই খানের (Fig 4)

রেজিয় রেজিয় রেজিয় রেজিয় রেজিয় রেজিয় রেজিয় রেজিয় রেজিয় রেজিয় রেজিয় রেজিয় রেজিয় রেজিয় রেজিয় (Fig 5)

রেজিয় রেজিয় রেজিয় রেজিয় রেজিয় রেজিয় রেজিয় রেজিয় রেজিয় রেজিয় রেজিয় রেজিয় রেজিয় রেজিয় রেজিয় (Fig 6)

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Marking curves, circle and cutting

**Job sequence**

- Marking curves, circle and cutting
- 6mm diameter hole 100 from edge of cut
- Job: Fitter - Sheet Metal

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SCALE 1:1

TITLE: MARKING CURVES AND CUTTING

112
**Job sequence**

- Cut the circle with a radius of 75 mm.
- Cut the circle with a radius of 150 mm.
- Cut the circle with a radius of 75 mm.
- Cut the circle with a radius of 150 mm.
- Cut the circle with a radius of 9 mm.

**Diagram Details**

- Title: MARKING CIRCLES AND CUTTING
- Scale: 1:1
- Code No.: FH30283
- Copyright © NIMI Not to be Republished
**Skill sequence**

**Wing**  ডিন  রাকি  ডিন (Marking with wing compass)

- ডিন
- ডিন
- ডিন

**Wing compass**

- ডিন
- ডিন
- ডিন

(Fig 1)

(Fig 2)

(Fig 3)

(Fig 4)

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ରୁବଳ ରେଳୋଗା ଏକରେ ରାଖିବେ ଦୃଢାର୍ଥୀ କରାଇ ଦୂର ଲିଖିବେ ତାରେ ଦୂର ଲିଖାରେ ଏକରେ ରାଖିବେ ଦୃଢାର୍ଥୀ କରାଇ ଦୃଢାର୍ଥୀ କରାଇ ଦୃଢାର୍ଥୀ କରାଇ ଦୃଢାର୍ଥୀ କରାଇ।


dଃୟଣ ଏକରେ ରାଖିବେ କରାଇ ଦୃଢାର୍ଥୀ କରାଇ ଦୃଢାର୍ଥୀ କରାଇ ଦୃଢାର୍ଥୀ କରାଇ।

(Fig 5)

(Fig 6)
(Inscribing an equilateral triangle in a circle)

Example: Let the circle be 75 mm in diameter.

- Inscribe a circle
- Draw the center
- Draw a radius
- Draw an equilateral triangle

The side length of the triangle is 37.5 mm.

---

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**TITLE:** INScribing an equilateral triangle in a circle

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### Job sequence

- Circle one quadrant of the circle are divided into equal parts.
- Draw the circle.
- Draw the square in the circle.
- The parts of 90 degrees are drawn.
- The circle is divided into equal parts.

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**Title:** INSCRIBING A SQUARE IN A CIRCLE

**Scale:** 1:1

**Deviations:** ±0.5

**Code No.:** F1303E2

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**Skill sequence**

**Marking triangle in a given circle**

- Draw a circle and label its center as O.
- Draw a diameter BD through O.
- Draw another diameter AC through O, intersecting BD at D.

**Marking square in a given circle**

- Draw a circle and label its center as O.
- Draw a diameter AC through O.
- Draw another diameter BD through O, intersecting AC at D.
AC लबल लबल A & C लबल रदा लबल 1 & 2 लबल तर लबल 26।
लबल लदल B & D लदल रिल।
B & D लल रदा लदल 26।
BD ल AC लदलबल।
AB, BC, CD & DA ल स्थल लदा लदल 26।
ABCD लदल स्थलबल लदल लदल स्थलबल। (Fig 3)
Inscribing a hexagon and an octagon in a circle

**Job sequence**

- Draw the radius of the circle.
- Draw the diameter of the circle.
- Draw the diameter perpendicular to the radius.
- Join the ends of the diameter to form a square.
- Draw the diagonal of the square.
- Draw the other diagonal of the square.
- Erase the square.
- Draw the hexagon.
- Draw the octagon.

**Note:** Always check the dimensions and tolerances before cutting.
### Job sequence

- Square 720
- Round 100
- Square 120

**Note:**

- The order of jobs is crucial for the correct execution of the sequence.
### Skill sequence

**Marking a regular hexagon**

1. **Skill sequence:**
   - Circle a circle anywhere on the paper.
   - Mark the circle with O.
   - Draw the horizontal diameter OX and OY.
   - Draw a horizontal line through X (Fig 1).

2. **Result:**
   - Draw the horizontal line through X parallel to OX.
   - Draw the horizontal line through Y parallel to OY.
   - Draw the horizontal line through X parallel to OX.
   - Draw the horizontal line through Y parallel to OY.

3. **Result:**
   - Draw the horizontal line through X parallel to OX.
   - Draw the horizontal line through Y parallel to OY.
   - Draw the horizontal line through X parallel to OX.
   - Draw the horizontal line through Y parallel to OY.

**Output:**
- A regular hexagon is formed.

**Figures:**
- Fig 1: Circle with marked O.
- Fig 3: Hexagon with labeled vertices A, B, C, D, E, F.

### Marking a regular octagon

1. **Skill sequence:**
   - Circle a circle anywhere on the paper.
   - Mark the circle with O.
   - Draw the horizontal diameter OX and OY.
   - Draw a horizontal line through X (Fig 1).

2. **Result:**
   - Draw the horizontal line through X parallel to OX.
   - Draw the horizontal line through Y parallel to OY.
   - Draw the horizontal line through X parallel to OX.
   - Draw the horizontal line through Y parallel to OY.

3. **Result:**
   - Draw the horizontal line through X parallel to OX.
   - Draw the horizontal line through Y parallel to OY.
   - Draw the horizontal line through X parallel to OX.
   - Draw the horizontal line through Y parallel to OY.

**Output:**
- A regular octagon is formed.

**Figures:**
- Fig 1: Circle with marked O.
- Fig 3: Octagon with labeled vertices A, B, C, D, E, F, G, H.

---

**Figures:**
- Fig 1: Circle with marked O.
- Fig 3: Octagon with labeled vertices A, B, C, D, E, F, G, H.
A, B, C, D ଓଠା ହୀକା ମାଧ୍ୟ୍ୟରେ ରହିଛି ଏବଂ ମାନ୍ୱକ ମାଧ୍ୟ୍ୟ ରହିଛି। 

E, F, G, H ରମାଧ୍ୟ୍ୟରେ ରହିଛି ଏବେ ଏହି ରମାଧ୍ୟରେ ରହିଛି। (Fig 4)

E, F, G, H ରମାଧ୍ୟ୍ୟରେ ରହିଛି ଏବଂ E, F, G, H ରମାଧ୍ୟରେ ରହିଛି। (Fig 5)

AH, HD, DG, GB, BF, FC, CE ରମାଧ୍ୟରେ EA ରମାଧ୍ୟରେ ରହିଛି। (Fig 6)
Marking with template and profile cutting

Job sequence:

- Edge (edge) 5mm
- Chamfer (curvature) 0.5
- Burr (edge) 0.5

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Profile marking and cutting

1. Profile marking and cutting
2. R points at cut edge
3. Dimensions are in centimeters

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Job sequence

- Set up machine arbitrarily. Lock it. 
- Level the machine using levelers. 
- Check the machine to ensure it is level. 
- Check the machine to ensure it is level. 
- Lock the machine.

Skill sequence

Parallel line development

- Set up the machine. 
- Lock the machine.

Fig 1

Fig 2

Fig 3

Fig 4

Fig 5

Fig 6

Fig 7
(Fig 8)

(12th point) design should not be disturbed during the design. This is also
(Fig 9)

(12th point) design should not be disturbed during the design. This is also
(Fig 10)

(12th point) design should not be disturbed during the design. This is also
(Fig 11)
Punching holes using a solid punch

Job sequence:
- Punch holes Ø6 mm in the area (Fig 1)
- Mark the locating points on the job
- Drill the holes Ø6 mm
- Smooth the edges of the holes

Fig 1

Scale: 1:1

Material: CLAMP

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(Skill sequence)

Positioning the punch and finishing the punch holes

1. Set-up the punch at the desired location. Remove any burrs or sharp edges.
   - Use a sharp tool to remove any burrs or sharp edges.
   - Apply a thin film of coolant to the punch and workpiece. (Fig 1)

2. Position the punch and finish the punch holes.
   - Align the punch with the workpiece.
   - Use a needle file or a fine-grit stone to remove any burrs or sharp edges.
   - Apply a thin film of coolant to the punch and workpiece. (Fig 2)

3. Resharpening of a solid punch

   - Set-up the punch at the desired location. Remove any burrs or sharp edges.
     - Use a sharp tool to remove any burrs or sharp edges.
     - Apply a thin film of coolant to the punch and workpiece. (Fig 1)

   - Refine the punch using a grinding wheel. Adjust the grinding wheel to the desired angle.
   - Apply a thin film of coolant to the punch and grinding wheel. (Fig 3)

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Fig 2

Grinding wheel

Direction of rotation

Solid punch

Left hand

Right hand

Fig 2 shows the grinding wheel and the direction of rotation. The solid punch is being used by the left hand, while the right hand is holding the workpiece.

The diagram illustrates how the grinding wheel is used to cut a workpiece, with the solid punch applying pressure to the workpiece. This process is a common method used in metalworking and manufacturing.

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**Rectangular tray**

**Dimensions:**
- Length: 85
- Width: 35
- Height: 20
- Side angles: 45°

**Notes:**
- The tray is designed to be cut from a 135 x 90 x 0.5 mm sheet metal.
- The edges are hemmed and the flaps are soldered.
- The tray has 90° angles at the corners for a neat fit.
- Flow and penetration marks are indicated for assembly.

**Title:** PROJECT: MARKING RECTANGULAR TRAY WITH FLAPS SOLDERING

**Code:** F1308E1

**Credit:** Copyright © NIMI Not to be Republished
 documentos (Job sequence)

- Carry out the following steps:
  - Prepare the surface of the parts to be joined.
  - Clean the surface of the parts to be joined.
  - Apply flux to the parts to be joined.
  - Heat the parts to be joined.
  - Join the parts together.

documentos - skill (Skill sequence)

Method of soft soldering

- Use a soft soldering iron.
- Heat the parts to be joined.
- Join the parts together.

Method of soft soldering

- Use a soft soldering iron.
- Heat the parts to be joined.
- Join the parts together.

Fig 1

Fig 2

Fig 3

Fig 4

Fig 5
ঔদ্ধত্য দন্তে গলামূল্য কর্ক দলদান করিনি ও।
লক্ষ্য দলদান করল ও করিনি বিশিষ্ট দলদান করি।
ছোট দলদান সম্পন্ন হইল বলিয়া দললিখন করি।
কাঠামো দলদান বিশিষ্ট হইল স্বীকার করি করিলাম লিখিত করি।
লক্ষ্য দল গলা এক (rag) দললিখন বিশিষ্ট পুথি পুথি দললিখন করিলাম।

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Soldered lap joint

Job sequence

75 x 50 soldered lap joint

- 75 x 50 half-rolled copper sheet
- 1 Solder 60:40

<table>
<thead>
<tr>
<th>NO.OFF</th>
<th>STOCK SIZE</th>
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<th>MATERIAL</th>
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<tbody>
<tr>
<td>1</td>
<td>ISSH 105 x 30 x 0.5</td>
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<td>G.I SHEET</td>
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</tr>
</tbody>
</table>

Scale 1:1

SOLDERED LAP JOINT

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Skill sequence

Preparing the soft solders

1. Prepare the soft solders

- Prepare the soft solders by melting lead in a crucible and adding tin slowly. Lead should be melted first. Soft soldering sticks can be made by wrapping a thin stick of solder with paper and pushing it to the bottom. (Fig 1)

2. Preparing the soft solders

- Preparing the soft solders involves melting lead and adding tin in small amounts. The lead should be melted first, followed by adding tin slowly. Safety tongs should be used to handle the molten lead. (Fig 1)

3. Removing dross

- Dross is removed using a perforated ladle. The ladle should be held above the surface, and dross should be removed carefully. (Fig 2)

4. Thin sticks of solder

- Thin sticks of solder are made by wrapping a thin stick of solder with paper and pushing it to the bottom. (Fig 3)

5. WARNING

- When working with soft solders, always wear protective clothing and use safety equipment. Always ensure that the area is well-ventilated. (Fig 1)
Preparing the Working Point of Soldering Bit

1. Prepare the working point of the soldering bit.
2. Rub the bit in sal-ammoniac.
3. Spread the solder on the faces of the bit.

Tacking and Soldering the Joint

1. Tack and solder the joint.
2. Clean the surfaces to be joined.

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Fig 7

DIRECT SOLDERING

Fig 8

WET RAG

CLEANING OF FLUX RESIDUE

The solder joint is visible. Wipe the joint area with a wet rag.

Fig 8

WET RAG

CLEANING OF FLUX RESIDUE

The solder joint is visible. Wipe the joint area with a wet rag.

Fig 8

WET RAG

CLEANING OF FLUX RESIDUE

The solder joint is visible. Wipe the joint area with a wet rag.

The solder joint is visible. Wipe the joint area with a wet rag.

The solder joint is visible. Wipe the joint area with a wet rag.

The solder joint is visible. Wipe the joint area with a wet rag.
Single plated soldered butt joint

1.3.10

Job sequence

- 1. This sequence is optional, but it can be useful.
- 2. This sequence involves welding the two plates together in the desired orientation.
- 3. This sequence involves grinding the welded joint to ensure a uniform surface.
- 4. This sequence involves checking the weld for any imperfections and making necessary corrections.
Skill sequence

Making a single plated soldered butt joint

1. Preheat the soldering iron.
2. Loosen and fray the insulation.
(Fig 1)

3. Place the stand and support stand.
(Fig 2)

4. Hold the soldered butt joint, turn ON the soldering iron.
(Fig 3)

5. Remove the soldered butt joint when the soldering iron is off.

Alignment

Ensure the soldering iron is at an angle before making contact with the solder.

(Alignment)

1. Preheat the soldering iron.
2. Loosen and fray the insulation.
(Fig 1)

3. Place the stand and support stand.
(Fig 2)

4. Hold the soldered butt joint, turn ON the soldering iron.
(Fig 3)

5. Remove the soldered butt joint when the soldering iron is off.

(ON)

1. Preheat the soldering iron.
2. Loosen and fray the insulation.
(Fig 1)

3. Place the stand and support stand.
(Fig 2)

4. Hold the soldered butt joint, turn ON the soldering iron.
(Fig 3)

5. Remove the soldered butt joint when the soldering iron is off.

Soldering iron:

1. Preheat the soldering iron.
2. Loosen and fray the insulation.
(Fig 1)

3. Place the stand and support stand.
(Fig 2)

4. Hold the soldered butt joint, turn ON the soldering iron.
(Fig 3)

5. Remove the soldered butt joint when the soldering iron is off.

(ON)
(Sweat soldered lap joint)

Job sequence:

- 75 x 50
- 75 x 50
- 75 x 50
- 75 x 50
- 75 x 50

Fig 1
(Skill sequence)

(Sweating or sweat soldering)

• The first step is to apply flux to the joint area.

• The second step is to apply heat to the joint.

• The third step is to remove the excess flux.

• The fourth step is to inspect the joint for solder.

(Fig 1)

(Fig 2)

(Fig 3)

(Fig 4)
Taper tray

Measurements:
- Taper tray dimensions are as follows:
  - Length: 150mm
  - Width: 235mm

Details:
- The taper tray is made from steel sheet.
- The tray has a base with a 120° angle.
- The height of the tray is 55mm.
- The dimensions are exaggerated for clarity.

<table>
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<tr>
<th>NO.</th>
<th>ITEM</th>
<th>Quant.</th>
<th>SIZE</th>
<th>Stock Type</th>
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<td>ISH 60 x 25 x 0.5</td>
<td></td>
<td></td>
<td>Steel Sheet</td>
<td></td>
<td></td>
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<tr>
<td>1</td>
<td>ISH 290 x 290 x 0.5</td>
<td></td>
<td></td>
<td>Steel Sheet</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Scale: 1:1

Title: TAPER TRAY

Deviations: ±0.5

Code No. F1312E1
**Job sequence**

- Cut out the square of 1100 mm × 1100 mm.
- Place the square inside the tray.
- Fold the square into the tray at 120°.
- Fold the square into the tray at 90°.
- Fold the square into the tray at 60°.
- Fold the square into the tray at 30°.

**Skill sequence**

**Development for given square taper tray**

- Cut out a square of 150 x 150 mm.
- Place the square inside the tray.
- Fold the square into the tray at 15°.
- Fold the square into the tray at 10°.
- Fold the square into the tray at 5°.

![Diagram 1](image1)

![Diagram 2](image2)

![Diagram 3](image3)

![Diagram 4](image4)

![Diagram 5](image5)

![Diagram 6](image6)
ବୂବିଜୁ (Lock seaming)

ଦ୍ରାକ୍ଷର : ତାଙ୍କ ପୂରନ କରାଇବା ପ୍ରଭାବିତ 
* ତାଗାଳା ଛଟା ସୁଳା ବୂବିଜୁ ପ୍ରଭାବିତ

ତାଗାଳା ଛଟା ସୁଳା ବୂବିଜୁ ପାଇଁ (Fig 1)

Fig 1

ତାଗାଳା ବୂବିଜୁ ଦାଁବାରେ ଦୁଇମିତି ବର୍ଣ୍ଣ ବୂବିଜୁ ପ୍ରଭାବିତ ବଳାନ୍ତି (Fig 2)

Fig 2

ତାଗାଳା ବୂବିଜୁ ଲିଫଟିଗୁଡି ପୂରନ ବାଦାମି ଜାଣାନ୍ତି (Fig 3)

Fig 3

ବୂବିଜୁ ଜାଣାନ୍ତି ଲିଫଟିଗୁଡି ପୂରନ ବାଦାମି ଜାଣାନ୍ତି (Fig 4)

Fig 4
Fig 3

Fig 4

Fig 5

Fig 6

Fig 7

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Dust pan

- Made of steel, 0.8 mm thick.
- Handle diameter 220 x 150 mm.
- Handle made of aluminum tube.
- Pan made of steel sheet 260 x 1 x 75 mm.

<table>
<thead>
<tr>
<th>Part</th>
<th>Material</th>
<th>Quantity</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>ø4 x 10</td>
<td>IS 2165</td>
<td>SNAP HEAD R/W ET /3</td>
</tr>
<tr>
<td>1</td>
<td>Ø20 x 0.8 - 150</td>
<td>ALUMINIUM TUBE</td>
<td>HANDLE /2</td>
</tr>
<tr>
<td>1</td>
<td>BSH 260 x 260 x 1.75</td>
<td>AL. SHEET</td>
<td>PAN /1</td>
</tr>
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</table>

**Title: Dust Pan**

**Scale:**
- 1:1

**Deviations:** ±0.5 mm

**Code No.:** F1313E1
PROJECT: DUST PAN
PART: PAN

SCALE NTS

DEVATIONS ±0.5

CODE NO. FH1313E3
**Job sequence**

- First, prepare the work area by setting up the necessary tools and materials.
- Ensure that the area is clean and free from clutter.
- Check the equipment for any defects or malfunctions.
- Prepare the materials for the job.
- Begin the work by following the sequence of steps outlined.

**Skill sequence**

**Development for a circular cone**

- Prepare the material by cutting out the circular base and the side panel.
- Use a shovel to create a slope on the side panel.
- Use a shovel to create a slope on the side panel.
- Use a shovel to create a slope on the side panel.
- Use a shovel to create a slope on the side panel.

**Figures**

- Figure 1: Shows the cone with the plane view.
- Figure 2: Shows the base of the cone.
- Figure 3: Shows the side view of the cone.
- Figure 4: Shows the side view of the cone with the slope.
- Figure 5: Shows the side view of the cone with the slope.
(Fig 6) 

(Fig 7) 

(Fig 8)
(Single strap single row riveted butt joint)

- 1.3.14

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<thead>
<tr>
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<th>SEMI-PRODUCT</th>
<th>MATERIAL</th>
<th>PROJECT NO.</th>
<th>PART NO.</th>
<th>EX. NO.</th>
<th>DEVIATIONS</th>
<th>TIME</th>
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<td>10</td>
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<td>--</td>
<td>M.S. FLAT HEAD RIVET</td>
<td>--</td>
<td>--</td>
<td>28</td>
<td>--</td>
<td>--</td>
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<tr>
<td>1</td>
<td>BSH 140 x 55 - 1.6</td>
<td>--</td>
<td>MILD STEEL SHEET</td>
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<td>28</td>
<td>--</td>
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</tbody>
</table>

SCALE 1:1

SINGLE STRAP SINGLE ROW RIVETED BUTT JOINT

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Job sequence

- BIS 153
- BIS 50 x 48 mm

- Smooth
- Flat

- Fig 1

- 24 x 48 mm
- 50 x 48 mm

- 2.5 T
- 3T

- 3 x Ø 3.2 mm

- 8 x Ø 3 mm

- 8 x D

- 2 x Ø 3.2 mm

Skill sequence

- Layout the spacing for rivet holes to make single strap single riveted butt joint

- 50 x 48 mm

- 24 x 48 mm

- 8 x Ø 3 mm
3.1.4

The 3 x 3 mm cross section is indicated in Figure 1. The total thickness of the cross section is the sum of the thickness of the individual sections. (Fig 1)

The dimension of the strap is indicated in Figure 2. (Fig 2)
Double strap single row riveted butt joint

1.3.15

- Dimensions: 12 rows, 50 mm length
- Material: Mild Steel Sheet
- Rivets: 12 flat head rivets Ø3x10-10NOS.

<table>
<thead>
<tr>
<th>Scale: 1:1</th>
<th>DOUBLE STRAP SINGLE ROW RIVETED BUTT JOINT</th>
<th>DEVIATIONS ±0.5</th>
</tr>
</thead>
<tbody>
<tr>
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<td>M.S. FLAT HEAD RIVET</td>
<td>Code No. FI1316E1</td>
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<tr>
<td>ISSH 170 x 65 - 1.6</td>
<td>MILD STEEL SHEET</td>
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</tr>
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</table>
### Paint Pail Assembly (Paint pail assembly)

**Materials:**
- 4.5 x 5
- ISSH 55 x 16 x 0.6
- φ4 x 260
- φ2.5 x 415
- ISSH 150 x 150 x 0.4
- ISSH 410 x 165 x 0.4

**Notes:**
- G1 SHEET
- Fe310
- G1 SHEET

**Dimensions:**
- Ø125
- 150

**Additional Notes:**
- Soldering
- Grooved Lock Seam

**Parts List:**
- 4
- 1
- 1
- 1
- 1
- 1

**Title:** Paint Pail Assembly

---

**Scale:**

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<tr>
<th>Scale NTS</th>
<th>Title: Paint Pail Assembly</th>
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**Deviations:**
- ±0.5

**Code No.:** F131GB1
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<th>PART NO.</th>
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<tr>
<td>1</td>
<td>ISSH 410 x 165 x 0.4</td>
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<td>G.I.SHEET</td>
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</table>

**SCALE 1:2**

**PROJECT:** PAINT PAIL

**PART:** BODY DEVELOPMENT

**CODE NO.** F1318E2

**DEVIATIONS ±0.5**

BENDING LINE
PROJECT: PAINT PAIL
PART: BOTTOM PIECE
<table>
<thead>
<tr>
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<th>PROJECT NO.</th>
<th>PART NO.</th>
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<tbody>
<tr>
<td>1</td>
<td>ISSH 55 x 16 x 0.6</td>
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<td>G.I.SHEET</td>
<td>5</td>
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</tbody>
</table>

**SCALE** 2:1

**PROJECT:** PAINT PAIL

**PART:** BRACKET

DEVIATIONS ±0.5

CODE NO. F11316E4
**Job sequence**

- Cut the tube to the size needed.
- Mark the joints.
- Place the tube in the bending rolls.
- Clamp the tube in the rolls.
- Bend the tube using the rolling machine.
- Cut off the excess material.
- Place the bent tube in the cabinet.

**Skill sequence**

**Forming cylinders by using bending rolls**

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Bending rolls</td>
<td>Used to form the cylindrical shape.</td>
</tr>
<tr>
<td>Clamp</td>
<td>Used to hold the tube in place during bending.</td>
</tr>
<tr>
<td>Rolling machine</td>
<td>Used to bend the tube.</td>
</tr>
</tbody>
</table>

**Figure 1**

- 200 mm (outside dia.)
- 120 mm (inside dia.)
- 1.5 mm (plate thickness)
- 300 mm (length)

**Figures 2a & 2b**

- 1/3rd 200 x 270 mm
- 1 mm (outside dia.)
- 0.75 mm (inside dia.)
- 300 mm (length)
Fig 2
(a) BEND GAUGE
R 60
SHEET METAL
(b)

Fig 3
AXIAL LINE OF ROLLS
INSERT THE SHEET INTO THE ROLLS

Fig 4
SHEET
A
C
FRONT ROLLS
LIFT
B
REAR ROLL

Fig 5

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(Production & Manufacturing)
(Fitter - Sheet Metal)  

Store box (Store box)

1.3.17

Store box

1. Store box 1 & 3, Store box 2: Make 1.
2. Store box 2: Make 1.

Instructions

1. Store box 1 & 3, Store box 2: Make 1.
2. Store box 2: Make 1.

<table>
<thead>
<tr>
<th>Part</th>
<th>Stock Size</th>
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<th>Part No.</th>
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<td>G.J. SHEET</td>
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</tr>
<tr>
<td>1</td>
<td>ISSH 300 x 155 x 0.8</td>
<td>G.J. SHEET</td>
<td>6</td>
<td>BODY /2</td>
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<tr>
<td>1</td>
<td>ISSH 125 x 110 x 0.8</td>
<td>G.J. SHEET</td>
<td>6</td>
<td>BACK PIECE /1</td>
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</tr>
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</table>

SCALE: 1:2

TITLE: STORE BOX

Copyright @ NIMI Not to be Republished
2. BODY

3. FRONT PIECE

SCALE 1:2

<table>
<thead>
<tr>
<th>NO</th>
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<th>PART NO.</th>
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<td>ISH 300 x 155 x 0.8</td>
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<td>G.1.SHEET</td>
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SCALE 1:1

TITLE: STORE BOX

DEVATIONS ±0.5

CODE NO. FI317E2

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Make wired straight edge (by hand process)

Job sequence:
- Take 80 x 200 mm sized 3 mm diameter G.I. wire.
- Take 200 mm diameter G.I. wire.
- Take 88 x 210 mm sized 3 mm diameter G.I. wire.
- Take 180 x 210 mm sized 3 mm diameter G.I. wire.
- Take 200 mm diameter G.I. wire.
- Take 200 mm diameter G.I. wire.
- Take 200 mm diameter G.I. wire.
- Take 200 mm diameter G.I. wire.

<table>
<thead>
<tr>
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<td>G.I. WIRE</td>
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<td>-</td>
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</tr>
</tbody>
</table>

Scale: 1:2

MAKE WIRED STRAIGHT EDGE
(BY HAND PROCESS)

Copyright @ NIMI Not to be Republished
(Skill sequence)

(Making wired straight edge for stiffening by hand process)

- Make rigid straight edge by hand process.
- Make a rigid straight edge by hand process.

Fig 1

Fig 2

Fig 3

Fig 4

Fig 5

Fig 6
(Fig 7)

ପୂର୍ବକୁ କରିବାରୁ ଲୋକରେ ରାଜ୍ଜା ଏବଂ ରାଜ୍ଜୀତିକ ଦର୍ପଣୀ ଏବଂ ବିଚାର କରାଇବ ।
Fitter - Sheet Metal

Make false wiring at straight edge.

- Use the given dimensions.
- Use GI wire.
- Use GI sheet.

<table>
<thead>
<tr>
<th>NO.OFF</th>
<th>STOCK SIZE</th>
<th>SEMI-PRODUCT</th>
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<tr>
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<td>G.I. SHEET</td>
<td>-</td>
<td>-</td>
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</tbody>
</table>

Make false wiring at straight edge (by hand process)

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**Job sequence**

- Select the Job Ex.No.1.3.18 and cut the excess wire. Determine the path for the wires and mark the cut-off point. Before marking, make sure to mark the straight edge, cut the excess wire, and also cut the excess wire. Then use the scissors to cut the excess wire.
(Production & Manufacturing)
(Fitter - Sheet Metal)

1.3.20

Seaming the body and the tail

NOTE: PART NO. 3 TOP RING IS BEING COMPLETED AS EXERCISE NO. 38

<table>
<thead>
<tr>
<th>NO.OFF</th>
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SEAMING THE BODY AND THE TAIL

PROJECT: FUNNEL
PART: 1. BODY 2. TAIL

CODE NO. F1320E1

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Job sequence

Part I

- 10 gauge 6-inch galvanized steel sheet 1/2 lb (Flatten) (Fig 1)
- 10 gauge 6-inch steel sheet 1/2 lb (Fig 2)
- 10 gauge 6-inch steel sheet 1 1/2 lb (Fig 3)
- 10 gauge 6-inch steel sheet 1 1/2 lb (Fig 4)

Part II

- 10 gauge 6-inch galvanized steel sheet 1/2 lb (Flatten) (Fig 5)
- 10 gauge 6-inch galvanized steel sheet 1/2 lb (Fig 6)

Skill sequence

Forming a frustum of a cone with locked grooved joint

- 1 1/2 lb (Fig 7)
- 1 1/2 lb (Fig 8)
(Fig 1)

(Fig 2)

(Fig 3)

(Fig 4)

(Fig 5)

(Fig 6)

(Fig 7a)

(Fig 7b & 7c)
Fig 17

Fig 18

Fig 19

Fig 20

Fig 21
(Funnel)

- Material: SS 304 x Ø 360
- G.I. Wire: 7
- G.I. Sheet: 3

<table>
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<tr>
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SCALE 1:1

PROJECT: FUNNEL
PART: FERRULE

DEVIATIONS ±1

CODE NO. FI321E1
### Job sequence

- Job dimensions 326 x 26, rounded edges 2 cm, as per the drawing.
- Job material: 4 mm, 220 x 220, 3 mm, 2 x 2.
- Job tolerance: 4 mm.
- Wire diameter: 2 mm.
- Wire length: 2 mm.
- Job finish: 2 mm, 3 mm.
- Job thickness: 2 mm.

### Skill sequence

*Making wired edge along a curved surface by hand process*

- **Skill** GI: 1.3.21

- **Fig 1**: Wire 180° rounded edges, 2 mm, 3 mm, 4 mm.

- **Fig 2**: Setting hammer, hatchet stake.

- **Fig 3**: Curved flange, finished stage of wiring.

- **Fig 4**: GI wire inserted.

- **Fig 5**: Creasing hammer, anvil stake.

### Notes

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(Production & Manufacturing)

(Fitter - Sheet Metal)

Assembly of parts of funnel (by soldering)

- Dimensions: 38 & 35 are to be realised.
- Dimensions 40 & 33 are to be a minimum of 38 & 35 respectively.
- Steps included to 31 & 38 are to be done in a separate sheet.

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| 1   | Ø2 - 360   | G.I. WIRE  | 07                 | 3   | Fitting & soldering joint.
| 1   | ISSH 160 x 25 x 0.5 | G.I. SHEET | 07 | 4 |
| 1   | BS - 2 - 38 | BS - 2 - 38 | 07 | 3 |
| 1   | BS - 2 - 34 | BS - 2 - 34 | 07 | 2 |

ASSEMBLY OF PARTS OF FUNNEL (BY SOLDERING)

PROJECT: FUNNEL

PART: 1, 2, 3 & 4

SCALE: NTS

DEVIATIONS ±1

CODE NO. FH1322E1

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3mm HEMMING BOTH SIDES

FORMING THE HANDLE

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<th>1</th>
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<th>G.I SHEET</th>
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SCALE 1:1

PROJECT: FUNNEL
PART: HANDLE

CODE NO. FI1322E2

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Job sequence

Assembly of funnel

- Place the 2mm circular disk (Fig. 1) and the 4mm circular disk (Fig. 2) and then solder them together.
- Place the 3mm circular disk (Fig. 3) and the 1mm circular disk (Fig. 4) and then solder them together.
- Lay the 1mm circular disk (Fig. 4) down on the 3mm circular disk.
- Solder the 1mm circular disk to the 3mm circular disk.
- Solder the 4mm circular disk to the 2mm circular disk.
- Solder the 1mm circular disk to the 3mm circular disk.