<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
<th>round shaft/QTY.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>driver_shaft_01</td>
<td>Finished Blade Shaft</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>tube_01</td>
<td>Tube</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>handle_03</td>
<td>Hammer Handle</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Head_plastic_face</td>
<td>Hammer Head</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Head_plastic_face_02</td>
<td>Plastic Face</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>socket set screw cup point_ai</td>
<td>1/4-20x.75 Set Screw</td>
<td>1</td>
</tr>
</tbody>
</table>

**Assembly Procedure:**

1. Screw shaft to tube.
2. Press tube into head.
3. Press handle onto shaft.
4. Install set screw in head.
5. Screw plastic face onto head.

**Material:** Steel/Acrylic

**Finish:**

- Fractional: ±1/32
- Angular: Machined ±.005 Bend
- Two Place Decimal: ±.01
- Three Place Decimal: ±.005

**Comments:**


**Drawn by:** EJJ  
**Checked by:** DKR  
**Date:** 2/19/2015  
**Comment:** REMOVE ALL SHARP EDGES AND BURRS

**Hammer Assembly**
Operations List

1. Trak CNC Lathe  
   Turn radiuses, Cutoff  
   Program 810

2. Trak CNC Lathe  
   Face Cleanup, Drill  
   DRO

3. Sherline CNC Mill  
   Mill Flutes

Assembly Procedure:
- Screw shaft to tube. Press tube into head.
- Press handle onto shaft. Install set screw in head.
- Screw plastic face onto head.

Hammer Handle

MATERIAL: Acetel

DIRECTED TO:
- SMITH COLLEGE

DIMENSIONS ARE IN INCHES

TOLERANCES:
- FRACTIONAL ± 1/32
- ANGULAR: MACH ± 0.5 BEND ± .01
- TWO PLACE DECIMAL ± 0.005
- THREE PLACE DECIMAL ± 0.001

INTERPRET DRAWING PER: ASME Y14.5-1994

MATERIAL FINISH

UNITLESS UNLESS OTHERWISE SPECIFIED:

COMMENTS:
- REMOVE ALL SHARP EDGES AND BURRS

Assembly Procedure:
- Screw shaft to tube. Press tube into head. Press handle onto shaft. Install set screw in head. Screw plastic face onto head.

DRAWN: EJJ  
CHECKED: DKR

DATE: 2/19/2015

SHEET 2 OF 7

Hammer_plastic_face_02

WEIGHT: SCALE: 1:2
# Operations List

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Saw</td>
<td>Cut stock to 6-7/8 length</td>
</tr>
<tr>
<td>2</td>
<td>Trak CNC Lathe</td>
<td>Face/Turn/Center Drill one end</td>
</tr>
<tr>
<td>3</td>
<td>Trak CNC Lathe</td>
<td>Turn profile/Thread/Groove Prog 711</td>
</tr>
<tr>
<td>4</td>
<td>Wire brush wheel</td>
<td>Burnish threads</td>
</tr>
</tbody>
</table>

---

**Prog 711 notes**

- CHAMFER 60 DEG X.040
- 7/16-20 UNF THREAD
- .062 GROOVE .360 DIA
- .062 GROOVE .360 DIA (TO AID MILLING)

---

**CNC turned shaft**


---

**Dimensions are in inches**

**Material:** Low Carbon Steel

**Finish:**

**Comments:**


**Drawn:** EJJ  
**Checked:** DKR  
**Drawn Date:** 2/19/2015  
**Checked Date:** 2/19/2015

**Material:** Low Carbon Steel

**Scale:** 1:1

**Comments:**


---

**Assembly Procedure:**

1. Saw cut stock to 6-7/8 length
2. Trak CNC Lathe Face/Turn/Center Drill one end
3. Trak CNC Lathe Turn profile/Thread/Groove Prog 711
4. Wire brush wheel Burnish threads

---

**Center Drill**

**Stock:**

- .500
- .250
- .375
- .235
- .062
- .360 DIA

---

**Tolerances:**

- Fractional: ± 1/32"  
- Angular: Mach ± 1/8°  
- Two Place Decimal: ± .01  
- Three Place Decimal: ± .005

**Interpret Drawing Per:** ASME Y14.5-1994

---

**Assembly Procedure:**

- Screw shaft to tube. Press tube into head. Press handle onto shaft. Install set screw in head. Screw plastic face onto head.

---

**Material:** Low Carbon Steel

**Finish:**

- CHAMFER 60 DEG X.040
- 7/16-20 UNF THREAD
- .062 GROOVE .360 DIA
- .062 GROOVE .360 DIA (TO AID MILLING)

---

**Scale:** 2:1

**Comments:**


---

**Material:** Low Carbon Steel

**Finish:**

- CHAMFER 60 DEG X.040
- 7/16-20 UNF THREAD
- .062 GROOVE .360 DIA
- .062 GROOVE .360 DIA (TO AID MILLING)

---

**Assembly Procedure:**

- Screw shaft to tube. Press tube into head. Press handle onto shaft. Install set screw in head. Screw plastic face onto head.

---

**Material:** Low Carbon Steel

**Finish:**

- CHAMFER 60 DEG X.040
- 7/16-20 UNF THREAD
- .062 GROOVE .360 DIA
- .062 GROOVE .360 DIA (TO AID MILLING)

---

**Assembly Procedure:**

- Screw shaft to tube. Press tube into head. Press handle onto shaft. Install set screw in head. Screw plastic face onto head.

---

**Material:** Low Carbon Steel

**Finish:**

- CHAMFER 60 DEG X.040
- 7/16-20 UNF THREAD
- .062 GROOVE .360 DIA
- .062 GROOVE .360 DIA (TO AID MILLING)

---

**Assembly Procedure:**

- Screw shaft to tube. Press tube into head. Press handle onto shaft. Install set screw in head. Screw plastic face onto head.

---

**Material:** Low Carbon Steel

**Finish:**

- CHAMFER 60 DEG X.040
- 7/16-20 UNF THREAD
- .062 GROOVE .360 DIA
- .062 GROOVE .360 DIA (TO AID MILLING)

---

**Assembly Procedure:**

- Screw shaft to tube. Press tube into head. Press handle onto shaft. Install set screw in head. Screw plastic face onto head.

---

**Material:** Low Carbon Steel

**Finish:**

- CHAMFER 60 DEG X.040
- 7/16-20 UNF THREAD
- .062 GROOVE .360 DIA
- .062 GROOVE .360 DIA (TO AID MILLING)

---

**Assembly Procedure:**

- Screw shaft to tube. Press tube into head. Press handle onto shaft. Install set screw in head. Screw plastic face onto head.

---

**Material:** Low Carbon Steel

**Finish:**

- CHAMFER 60 DEG X.040
- 7/16-20 UNF THREAD
- .062 GROOVE .360 DIA
- .062 GROOVE .360 DIA (TO AID MILLING)

---

**Assembly Procedure:**

- Screw shaft to tube. Press tube into head. Press handle onto shaft. Install set screw in head. Screw plastic face onto head.
### OPERATIONS LIST

<table>
<thead>
<tr>
<th>No.</th>
<th>Operation</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Emery cloth Polish shaft</td>
<td>Low Carbon Steel</td>
</tr>
<tr>
<td>2</td>
<td>Trak Mill Machine blade shape/trim end/Engrave</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Torch/casenite Heat treat and temper blade</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Emery cloth Polish blade faces</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Lathe Knurl 1/2” of shaft for friction fit</td>
<td></td>
</tr>
</tbody>
</table>

#### DIMENSIONS ARE IN INCHES

<table>
<thead>
<tr>
<th>Material</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Carbon Steel</td>
<td></td>
</tr>
</tbody>
</table>

#### TOLERANCES:

- FRACTIONAL: 1/32’
- ANGULAR: MACH .5 BEND ± .01
- TWO PLACE DECIMAL ± .005
- THREE PLACE DECIMAL ± .000

#### COMMENTS:

- REMOVE ALL SHARP EDGES AND BURRS

#### MATERIAL FINISH:

- Low Carbon Steel

#### DRAWN CHECKED DATE

- EJJ DKR 2/19/2015

#### UNLESS OTHERWISE SPECIFIED:

- DIMENSIONS ARE IN INCHES
- TOLERANCES:
  - FRACTIONAL: 1/32’
  - ANGULAR: MACH .5 BEND ± .01
  - TWO PLACE DECIMAL ± .005
  - THREE PLACE DECIMAL ± .000

#### INTERPRET DRAWING PER: ASME Y14.5-1994
### OPERATIONS LIST

<table>
<thead>
<tr>
<th></th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Saw</td>
</tr>
<tr>
<td>2</td>
<td>Engine Lathe</td>
</tr>
<tr>
<td>3</td>
<td>Engine Lathe</td>
</tr>
<tr>
<td>4</td>
<td>Engine Lathe</td>
</tr>
</tbody>
</table>

**Assembly Procedure:**
- Screw shaft to tube. Press tube into head. Press handle onto shaft. Install set screw in head. Screw plastic face onto head.

**Notations:**
- **Material:** 1/2 steel tubing
- **Finish:**
  - Fractional: 1/32
  - Angular: Mach: .5 Bend: .1
  - Two place decimal: .01
  - Three place decimal: .005
- **Interpret Drawing Per:** ASME Y14.5-1994
- **UNLESS OTHERWISE SPECIFIED:**
- **Dimensions Are in Inches**
- **Tolerances:**
  - Fractional: 1/32
  - Angular: Mach: .5 Bend: .1
  - Two place decimal: .01
  - Three place decimal: .005
- **Comments:**
  - REMOVE ALL SHARP EDGES AND BURRS

**Dimensions:**
- 4.00
- 7/16-20 UNF
- .625
- .450 X 60°, NEAR SIDE
- .391 THRU ALL

**Material:**
- Tube
- 1/2 steel tubing

**Drawn:** EJJ
**Checked:** DKR
**Date:** 2/19/2015
### Operations List

<table>
<thead>
<tr>
<th>Operation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Saw</td>
<td>Cutoff long enough to make two heads (5 inches)</td>
</tr>
<tr>
<td>2. Engine Lathe</td>
<td>Face / Chamfer Hammer face</td>
</tr>
<tr>
<td>3. Engine Lathe</td>
<td>Turn Grooves - regrip for each groove</td>
</tr>
<tr>
<td>4. Engine Lathe</td>
<td>Knurl</td>
</tr>
<tr>
<td>5. Saw</td>
<td>Cutoff hammer head 2-1/8</td>
</tr>
<tr>
<td>6. Engine Lathe</td>
<td>Face / Turn to 2.05 length</td>
</tr>
<tr>
<td>7. Bridgeport</td>
<td>Drill / Ream (use fixture block to locate centers)</td>
</tr>
<tr>
<td>8. Engine Lathe</td>
<td>Centerdrill / Drill / Tap 1/4-20</td>
</tr>
</tbody>
</table>

---

**Assembly Procedure:**
- Screw shaft to tube.
- Press tube into head.
- Press handle onto shaft.
- Install set screw in head.
- Screw plastic face onto head.

---

**Material:**
Low Carbon Steel

**Finish:**

**Tolerances:**
- Fractional: 1/32" ± 0.001
- Angular: Mach: .5 Bend: ± 0.005
- Two Place Decimal: ± .01
- Three Place Decimal: ± .005

**Interpret Drawing Per:**
ASME Y14.5M-1994

---

**Hammer Head**

**Size:** A 100

**Material:**
Low Carbon Steel

**Finish:**

**Comments:**
- Remove all sharp edges and burrs.

**Drawn:** EJJ
**Checked:** DKR
**Date:** 2/19/2015

**Dimensions:**
- 0.03 x 45.00° Chamfer
- 31/64 Drill ∨ .75 Ream .500
- ø .201 Thru 1/4-20 UNC Thru
- ø 1.000

---

** Unless otherwise specified:**
- Dimensions are in inches
- Tolerances:
  - Fractional: 1/32" ± 0.001
  - Angular: Mach: .5 Bend: ± 0.005
  - Two Place Decimal: ± .01
  - Three Place Decimal: ± .005

---

**Drawn Checked:**
- DKR 2/19/2015

---

**Sheet 6 of 7**

**Scale:** 1:1
**Weight:**

---

**Hammer_plastic_face_02**

**Remove all sharp edges and burrs.**