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| **PART NAME:** VALVE BTM | | | **PART NO:** 05 | | | **DRAWING NO:** 05 | |
| **REVISION NO:** 1 | | | **DATE:** 19/10/2019 | | | **PLANNER:** DAN NGUYEN (Z5206032) | |
| **MATL:** ALUMINIUM | | | **STOCK SIZE:** 10x50MM ROD | | | **QTY:** 2 | |
| **Op**  **#** | **Process Description** | **Machine** | **Tooling** | **Speed**  **(rpm)** | **Feed**  **(mm/rev)** | **Time (min)** | **Risk Assessment** |
| 501 | INSPECT the part | Vernier Calliper  150mm Metal Rule | - | - | - | 1 |  |
| 502 | FACE top surface for SURFACE FINISH of 1.6 | Centre Lathe | High Speed Steel  Single Point Right Hand Cutting Tool [3] | 4500 – 9000 [1] | - | 5 | Rotating chuck may cause lacerations and crush injuries. Cutting tool and workpiece may cause burn injuries. Swarf may be sharp and puncture skin.  Keep clear of rotating chuck. Only inspect workpiece when chuck has completely stopped. Wear safety glasses and steel capped boots. Do not wear loose clothing. Use coolant on cutting tool and workpiece. Clean swarf using a brush. |
| 503 | INSPECT surface dimensions | Vernier Calliper  150mm Metal Rule | - | - | - | 1 |  |
| 504 | CENTREDRILL centre of top surface | Centre Lathe | Centre Drill | 9000 [1] | - | 5 | Rotating chuck may cause lacerations and crush injuries. Cutting tool and workpiece may cause burn injuries. Swarf may be sharp and puncture skin.  Keep clear of rotating chuck. Only inspect workpiece when chuck has completely stopped. Wear safety glasses and steel capped boots. Do not wear loose clothing. Use coolant on cutting tool and workpiece. Clean swarf using a brush. |
| 505 | DRILL 4mm through hole in centre of top surface | Centre Lathe | 4mm Drill | 9000 [1] | 0.1 | 10 | Rotating chuck may cause lacerations and crush injuries. Cutting tool and workpiece may cause burn injuries. Swarf may be sharp and puncture skin.  Keep clear of rotating chuck. Only inspect workpiece when chuck has completely stopped. Wear safety glasses and steel capped boots. Do not wear loose clothing. Use coolant on cutting tool and workpiece. Clean swarf using a brush. |
| 506 | INSPECT hole position and depth | Vernier Calliper  150mm Metal Rule | - | - | - | 1 |  |
| 507 | BORE 7mm hole with 25mm depth in centre of top surface | Centre Lathe | High Speed Steel  Single Point Right Hand Cutting Tool [3] | 6000 [1] | 0.1 | 20 | Rotating chuck may cause lacerations and crush injuries. Cutting tool and workpiece may cause burn injuries. Swarf may be sharp and puncture skin.  Keep clear of rotating chuck. Only inspect workpiece when chuck has completely stopped. Wear safety glasses and steel capped boots. Do not wear loose clothing. Use coolant on cutting tool and workpiece. Clean swarf using a brush. |
| 508 | INSPECT hole position and depth | Vernier Calliper  150mm Metal Rule | - | - | - | 1 |  |
| 509 | SAW rod at 31mm from top surface | Hacksaw | - | - | - | 5 | Hacksaw is sharp and may cause cut injuries. Hacksaw and workpiece may get hot and cause burn injuries.  Wear safety glasses and steel capped boots. Do not wear loose clothing. |
| 510 | FACE bottom surface to 30mm from top surface for SURFACE FINISH of 1.6 | Centre Lathe | High Speed Steel  Single Point Right Hand Cutting Tool [3] | 4500 – 9000 [1] | 0.1 | 10 | Rotating chuck may cause lacerations and crush injuries. Cutting tool and workpiece may cause burn injuries. Swarf may be sharp and puncture skin.  Keep clear of rotating chuck. Only inspect workpiece when chuck has completely stopped. Wear safety glasses and steel capped boots. Do not wear loose clothing. Use coolant on cutting tool and workpiece. Clean swarf using a brush. |
| 511 | INSPECT surface dimensions | Vernier Calliper  150mm Metal Rule | - | - | - | 1 |  |
| 512 | THREAD M10x1.0 on external surface for depth of 10mm from bottom surface | Die Holder | M10 x 1.0 Die  [2] | - | - | 10 | Die and die holder may pinch skin. |
| 513 | THREAD M8x1.0 in 7mm hole from top surface for depth of 10mm | Tap Handle | M8 x 1.0 Tap  [2] | - | - | 10 | Tap and tap handle may pinch skin. |
| 514 | DEBURR edges | Files | - | - | - | 5 | Burr may have sharp edges and cause splinters. |
| 515 | INSPECT the part | Vernier Calliper  150mm Metal Rule | - | - | - | 1 |  |
|  | | | | | Total | 86 |  |

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| **PART NAME:** VALVE TOP | | | **PART NO:** 06 | | | **DRAWING NO:** 06 | |
| **REVISION NO:** 1 | | | **DATE:** 19/10/2019 | | | **PLANNER:** DAN NGUYEN (Z5206032) | |
| **MATL:** ALUMINIUM | | | **STOCK SIZE:** 10x25MM ROD | | | **QTY:** 2 | |
| **Op**  **#** | **Process Description** | **Machine** | **Tooling** | **Speed**  **(rpm)** | **Feed**  **(mm/rev)** | **Time (min)** | **Risk Assessment** |
| 601 | INSPECT the part | Vernier Calliper  150mm Metal Rule | - | - | - | 1 |  |
| 602 | FACE top surface for SURFACE FINISH of 1.6 | Centre Lathe | High Speed Steel  Single Point Right Hand Cutting Tool [3] | 4500 – 9000 [1] | - | 5 | Rotating chuck may cause lacerations and crush injuries. Cutting tool and workpiece may cause burn injuries. Swarf may be sharp and puncture skin.  Keep clear of rotating chuck. Only inspect workpiece when chuck has completely stopped. Wear safety glasses and steel capped boots. Do not wear loose clothing. Use coolant on cutting tool and workpiece. Clean swarf using a brush. |
| 603 | TURN curved surface of rod for 8mm external diameter for depth of 15mm from top surface for SURFACE FINISH of 1.6 | Centre Lathe | High Speed Steel  Single Point Right Hand Cutting Tool [3] | 4500 – 5625 [1] | 0.1 | 20 | Rotating chuck may cause lacerations and crush injuries. Cutting tool and workpiece may cause burn injuries. Swarf may be sharp and puncture skin.  Keep clear of rotating chuck. Only inspect workpiece when chuck has completely stopped. Wear safety glasses and steel capped boots. Do not wear loose clothing. Use coolant on cutting tool and workpiece. Clean swarf using a brush. |
| 604 | INSPECT surface dimensions | Vernier Calliper  150mm Metal Rule | - | - | - | 1 |  |
| 605 | CENTREDRILL centre of top surface | Centre Lathe | Centre Drill | 9000 [1] | - | 5 | Rotating chuck may cause lacerations and crush injuries. Cutting tool and workpiece may cause burn injuries. Swarf may be sharp and puncture skin.  Keep clear of rotating chuck. Only inspect workpiece when chuck has completely stopped. Wear safety glasses and steel capped boots. Do not wear loose clothing. Use coolant on cutting tool and workpiece. Clean swarf using a brush. |
| 606 | DRILL 4mm through hole in centre of top surface | Centre Lathe | 4mm Drill | 8000 [1] | 0.1 | 10 | Rotating chuck may cause lacerations and crush injuries. Cutting tool and workpiece may cause burn injuries. Swarf may be sharp and puncture skin.  Keep clear of rotating chuck. Only inspect workpiece when chuck has completely stopped. Wear safety glasses and steel capped boots. Do not wear loose clothing. Use coolant on cutting tool and workpiece. Clean swarf using a brush. |
| 607 | INSPECT hole position and depth | Vernier Calliper  150mm Metal Rule | - | - | - | 1 |  |
| 608 | SAW rod at 16mm from top surface | Hacksaw | - | - | - | 5 | Hacksaw is sharp and may cause cut injuries. Hacksaw and workpiece may get hot and cause burn injuries.  Wear safety glasses and steel capped boots. Do not wear loose clothing. |
| 609 | FACE bottom surface to 15mm from top surface for SURFACE FINISH of 1.6 | Centre Lathe | High Speed Steel  Single Point Right Hand Cutting Tool [3] | 5625 – 9000 [1] | ­0.1 | 10 | Rotating chuck may cause lacerations and crush injuries. Cutting tool and workpiece may cause burn injuries. Swarf may be sharp and puncture skin.  Keep clear of rotating chuck. Only inspect workpiece when chuck has completely stopped. Wear safety glasses and steel capped boots. Do not wear loose clothing. Use coolant on cutting tool and workpiece. Clean swarf using a brush. |
| 610 | INSPECT surface dimensions | Vernier Calliper  150mm Metal Rule | - | - | - | 1 |  |
| 611 | THREAD M8x1.0 on external surface for depth of 10mm from bottom surface | Die Holder | M8 x 1.0 Die [2] | - | - | 10 | Die and die holder may pinch skin. |
| 612 | DEBURR edges | File | - | - | - | 5 | Burr may have sharp edges and cause splinters. |
| 613 | INSPECT the part | Vernier Calliper  150mm Metal Rule | - | - | - | 1 |  |
|  | | | | | Total | 75 |  |

**References:**

[1] TAFE NSW Engineering Skills Centre. Student Background Notes for Basic Machining Operations. Available at: Ultimo TAFE NSW. [Accessed 19/10/2019]

[2] TAFE NSW Engineering Skills Centre (2010). Student Background Notes for the Use of Hand and Power Tools. Available at: Ultimo TAFE NSW. [Accessed 19/10/2019]

[3] Soni, V. (2017). Introduction and Nomenclature of Single Point Cutting Tool and Tool Signature. Available at: <http://www.mechanicalclasses.com/2017/01/single-point-cutting-tool.html> [Accessed 19/10/2019]