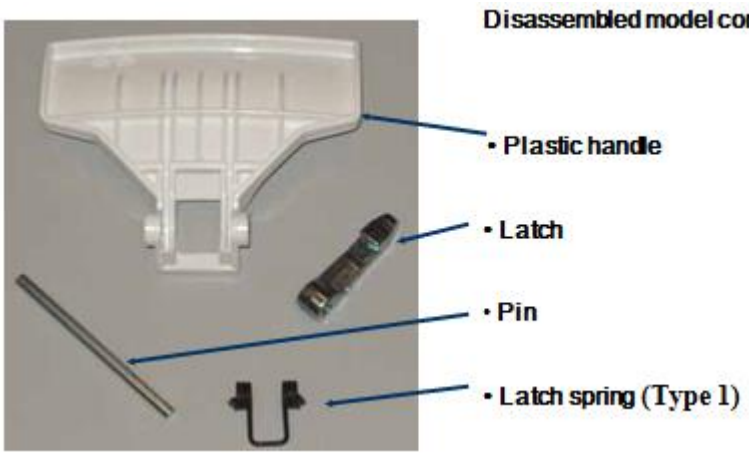
# Exercise 3: Evaluation of feeding and insertion costs for the Electrolux® handle.

## Product and components:




# Feeding and Orienting Costs

## Geometrical Classification of Pin and Latch:

<table>
<tr><th>Part</th><th>Kind</th><th>Dimension</th><th colspan="2">First digit classification</th><th>Second digit</th><th>Third digit</th></tr>
<tr><td rowspan="3">Latch:<br>  </td><td rowspan="3">Non rotational</td><td rowspan="3">A ≈38 mm<br>B ≈ 8.8 mm<br>C ≈9.5 mm</td><td>A/B</td><td>A/C</td><td rowspan="3">1.No symm<br>2. One feature<br>Therefore the second digit is 4</td><td rowspan="3">Groove in Y direction therefore the third digit is 4</td></tr>
<tr><td>≈ 4.3</td><td>= 4</td></tr>
<tr><td colspan="2">Therefore the first digit is 7</td></tr>
<tr><td rowspan="3">Pin:<br>  </td><td rowspan="3">Rotational</td><td rowspan="3">L= 40<br>D=4</td><td colspan="2">L/D</td><td rowspan="3">Part is ALPHA symm therefore The second digit is 0</td><td rowspan="3">Part is BETA symm therefore The third digit is 0</td></tr>
<tr><td colspan="2">10</td></tr>
<tr><td colspan="2">Therefore the first digit is 2</td></tr>
</table>

**Latch code is 744 therefore**:

$C_r$ = 1.5 E = 0.1

Given that the longest part dimension is 38mm and the E=0.1 the maximum rate obtainable by a feeder is:

$F_m$ = 1500*(0.1/38)= 3.9 parts/min

Hypotizing a necessary rate $F_r$ = 12 > $F_m$ (so we use formula 5.4)and given the $C_r$ =1.5 we have

$C_{r(f???)}$= 0.03*(60/3.9)*1.5 = **69 cents**

Should be $C_f$ but it is a convention.

**Pin code is 200 therefore:**

$C_r$ = 1 E = 0.9

Given that the longest part dimension is 40mm and the E=0.9 the maximum rate obtainable by a feeder is:

$F_m$ = 1500*(0.9/40)= 33.75 parts/min

Hypotizing a necessary rate $F_r$ = 12 < $F_m$ (so we use formula 5.3) and given the $C_r$ =1 we have

$C_f$= 0.03*(60/12)*1 = **15 cents**

# Inserting Costs

| Part | First Digit | Second Digit | $W_c$ |
|---|---|---|---|
| Latch:  | The part is not immediately secured and trajectory is not really straight therefore **2** | The part needs to be hold in place and there are no feature for the alignment and there is resistance to insertion therefore **9** | **6.1** |
| Pin:  | The part is not inserted from above therefore **1** | The part doesn't need to be hold down and it is not easy to align and insert therefore **3** | **2.5** |

Latch $C_i$= 0.06*(60/12)*6.1= 1.83 $!!!!!!!

Pin $C_i$= 0.06*(60/12)*2.5= 75 cents

## Total cost:

Latch: Cf+Ci = 1.83 + 0.69 = 2.52 $

Pin: Cf+Ci = 0.75 + 0.15 = 0.9 $