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In [8]:
# 연습문제 2 p242, node (7)
from math import sqrt
from scipy.stats import norm

a = [928, 72] # 품목 A
b = [772, 28] # 품목 B

n1 = sum(a)
n2 = sum(b)

p1 = a[1] / n1
p2 = b[1] / n2

p_hat = p1 - p2
z = norm.ppf(0.975)

se = sqrt((p1 * (1 - p1) / n1) + (p2 * (1 - p2) / n2))
lower = -(p_hat - z * se)
upper = p_hat + z * se

print(f'신뢰 상한과 하한 : ({lower:.4f}, {upper:.4f})\n식 : ({lower:.4f} < p1 - p2 < {upper:.4f})')
신뢰 상한과 하한 : (-0.0165, 0.0575)
식 : (-0.0165 < p1 - p2 < 0.0575)

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In [9]:
# 연습문제 2 p242, node (7) + 시각화
import matplotlib.pyplot as plt

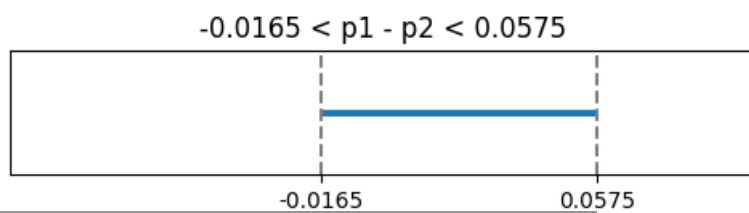
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lower = -0.0165
upper = 0.0575

plt.figure(figsize=(6, 1))
plt.hlines(0, lower, upper, linewidth=3)
plt.axvline(lower, linestyle='--', color='gray')
plt.axvline(upper, linestyle='--', color='gray')
plt.xlim(-0.1, 0.1)
plt.yticks([])
plt.xticks([lower, upper], [f'{lower:.4f}', f'{upper:.4f}'])
plt.title('-0.0165 < p1 - p2 < 0.0575')
plt.show()

```



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