Poplock Impact Bit Socket Quality Testing Report – Gauge Testing

1. Introduction

To reach the highest precision and consistency in manufacturing, Poplock has developed a custom-designed Torx Bit Tip Gauge. This precision tool is used to verify that every mass-produced bit tip follow the exact Camcar standard for Torx dimensions. By implementing strict gauge testing process, we can guarantee that each bit meets the necessary dimensional accuracy, ensuring optimal fit, performance, and longevity in high-torque applications.

2. Purpose of Gauge Testing

Gauge testing serves several critical purposes in the quality control of Impact Bit Sockets:

- **Dimensional Accuracy –**
  Ensures the bit tip is within tolerance limits for proper fit with Torx screws.
- **Consistency in Mass Production –**
  Verifies that every bit maintains the same high standard, preventing deviations.
- **Optimized Performance –**
  Ensures the bit provides maximum torque transfer without slippage or wear.
- **Dimensional Accuracy –**
  Ensures the bit tip is within tolerance limits for proper fit with Torx screws.
- **Consistency in Mass Production –**
  Verifies that every bit maintains the same high standard, preventing deviations.

3. Gauge Testing Process & Step Control

To maintain strict quality control, the Torx Bit Tip Gauge is used at multiple stages of production:

Step 1: Pre-Production Calibration

The gauge block is first verified against a master standard to ensure its precision.
Calibration records are maintained to track the gauge's accuracy over time.
The gauge is stored in a controlled environment to prevent temperature-related expansion/contraction affecting measurements.

Step 2: First Trial Production Sample Inspection

Before mass production begins, sample bits from the first production batch are tested.
The bit tip is inserted into the "GO" and "NO-GO" slots on the gauge.
If the tip fits within the "GO" slot but does not fit the "NO-GO" slot, it is approved.
If it fails either test, adjustments are made to the tooling before production continues.

Step 3: Inline Production Inspection

A random sampling method is used during mass production, where selected bits are tested using the gauge.
The same GO/NO-GO method is applied to verify consistency.
Any detected variation triggers an immediate production halt for recalibration and correction.

Step 4: Post-Production Quality Check

At the final stage, 100% of critical batches are inspected using the gauge.
All measurement results are recorded and cross-checked to ensure compliance.
Bits that pass are packaged for shipment, while any failing components are rejected and investigated.

4. Ensuring High-Quality Standards

By integrating precision gauge testing, Poplock ensures:

- Zero Defective Bits – No incorrectly sized tips reach the market.
- Higher Torque Efficiency – Precision-matched bit tips optimize torque transfer.
- Extended Tool Life – Perfect fitment reduces wear on both bits and screws.
- Industry Leadership – Surpassing standard requirements sets Poplock apart from competitors.

5. Conclusion

The Star Bit Tip Gauge for Torx is a critical quality assurance tool that ensures every Poplock Impact Bit Socket maintains industry-leading precision and durability. Through pre-production calibration, inline inspections, and post-production verification, Poplock guarantees superior quality, outperforming competitors in reliability and consistency.