Poplock Indexing Pry Bar Quality Testing Report

1. Introduction

The purpose of this report is to summarize the quality testing of the Poplock Indexing Pry Bar series, conducted in accordance with ANSI and ASME standards. The testing focuses on evaluating durability, life cycle performance, and breaking torque under controlled conditions. The series includes sizes ranging from 8", 12”, 16”, 24”, 33" and extension 33”~53”, with unique double gear designs for enhanced functionality and durability.

2. Testing Setup and Procedure

• 2-1 Testing Standards

The tests adhere to the ANSI/ASME B107.60-2004 standards for Rolling Head Pry Bars. Key requirements include:
- Gear torque exceeding 1200 inch-lbs for 12” rolling head pry bars.
- Compliance with salt spray corrosion tests (ISO 9227-2012) for over 48 hours.
- Incremental head angles of 18 degrees, providing up to 11 different angle selections for specific applications.

• 2-2 Testing Setup

The testing was carried out using Hong Ann Tool Industries’ custom-designed multi-task testing equipment, certified by SGS. Key elements of the setup include:
- **Fixture Design** : A fixture designed to apply increasing force until failure.
- **Sled System** : A movable sled to securely hold the pry bar at critical points:
  - **Contact Point 1 :** Concave arch.
  - **Contact Point 2 :** Convex arch.
- **Pressure Application** : Force applied via a Pressure Test Facility at a point 1 inch from the pry bar’s handle end.
- **Durability Testing** : Pressure cycling set between 2600 and 5000 inch-lbs to simulate repeated real-world use.

2-3 Procedure Summary

1. The pry bar is loaded into the sled and secured at contact points.
2. Force is incrementally applied until the bar reaches failure.
3. Failure is defined as any structural compromise, such as broken components or inability to function.
4. Results, including peak load and failure modes, are recorded for analysis.

3. Testing Types

3-1 Life Cycle Test

This test measures the number of cycles the pry bar can endure under preset forces without breaking. Hong Ann Poplock Tool set high standard requirement is 5000 cycles at 3000 inch-lbs for durability verification.

3-2 Breaking Torque Test

This test evaluates the maximum torque the pry bar can sustain before structural failure. For example, 12” pry bars exceed ANSI requirement torque 1200 inch-lbs, with result testing demonstrating over minimum 3 times the ANSI requirements.

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4. Failure Analysis

4-1 Failure Points by Sample

- Sample A (Poplock Tool 1): Gear shear-off inside handle shaft; reliable performance with highbreaking torque.
- Sample B (Poplock Tool 2): Gear fracture; moderate torque resistance with life cycle limited by plastic knob.
- Sample C (Poplock Tool 3): Gear deformation and handle shaft crack; moderate performance with structural weakness.
- Sample D (Poplock Tool 4): Complete gear failure; poor performance in both torque and life cycle tests.

5. Conclusions and Recommendations

5-1 Summary

- Sample A demonstrates superior durability and torque resistance, suitable for demanding applications.
- Samples B and C are moderately robust but present specific design vulnerabilities.
- Sample D underperforms, indicating quality and structural limitations.

5-2 Recommendations

- Material Enhancements: Strengthen gear materials to prevent shear and deformation.
- Design Improvements: Reinforce components.
- Standard Alignment: Ensure all samples meet or exceed ANSI Type V standards for rolling head pry bars.