

HYTORC of Georgia

Key HYTORC Tools for:

- 1) **Patriot P1 Hydraulic Drill Rig Maintenance**
- 2) **Crane Repair & Maintenance**

Patriot P1 Hydraulic Drill Rig Maintenance

1. HYTORC jGun™ Dual Speed (Air or Electric)

Best for:

- Fastener removal and installation at moderate torque ranges
- Daily service tasks where speed and portability matter
- Repetitive bolting (e.g., carriage plates, access panels)

Applications on P1:

- **Accessory panel and shield bolts**
- **Hydraulic pump mount bolts**
- **Small to medium structural joints around the mast**
- **Swivel and hose arm bracket bolts**

Why it's useful:

- High cycle speed for quicker service
 - Dual speed control (fast run-down / controlled torque)
 - Ideal for shop and field environments where access and speed matter
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2. Lithium Gun™ (Battery-Powered Torque Tool)

Best for:

- Wireless, hose-free torque delivery
- Field service where hydraulics or air are unavailable
- Compact reach areas

Applications on P1:

- **Track or undercarriage (if the drill rig is crawler-mounted)**
- **Retention bolts in the cab or control modules**
- **Boom/lift arm accessory fasteners**

Why it's useful:

- Portable, battery-driven convenience

- Excellent for maintenance crews on remote or constrained sites
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3. MXT+ (Hydraulic Square-Drive Torque Wrench)

Best for:

- High-torque nuts and bolts (final drive housings, pivot pins)
- Severe torque requirements where pneumatic/electric isn't enough

Applications on P1:

- **Main frame structural bolts**
- **Boom pivot and kinematic link bolts**
- **Heavy gearbox or hydraulic motor mount bolts**
- **Large pivot/axle support bolts**

Why it's useful:

- High torque capacity with precise control
 - Minimal operator fatigue versus breaker bars or impact guns
 - Can be paired with HYTORC custom reactions for tight clearance work
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4. Avanti™ Series (High-Capacity Hydraulic)

Best for:

- Larger torque ranges and extended reach
- Repetitive heavy removal/install cycles
- Situations where MXT range is borderline or heavier fasteners exist

Applications on P1:

- **Large structural anchor bolts (if applicable)**
- **Heavy pivot assemblies requiring high clamp load**
- **Any drilled or seized bolts where maximum torque and controlled load application are essential**

Why it's useful:

- Superb torque capacity with large wrench frames
 - Strong performance on high-load fasteners
 - Smooth, powerful operation with consistency
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5. HYTORC Stealth™ (Low-Clearance Torque Wrench)

Best for:

- Ultra-tight or obstructed bolt locations
- Bolt access where traditional square wrenches cannot get clearance

Applications on P1:

- **Confined brackets and gusset plate bolts**
- **Under-structure fasteners near hydraulic lines**
- **Bolting inside frame rails or close to other assemblies**

Why it's useful:

- Ultra-thin head profile
 - Great for tight machine cavities
 - Works where other tools physically can't fit
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6. Hydraulic Tensioners

Best for:

- Direct bolt tensioning where torque alone is insufficient
- Critical load-bearing joints

Applications on P1:

- **Cylinder head or housing joints on large rock drills**
- **High-load anchor bolts that require controlled tension (vs just torque)**

Why it's useful:

- Bypasses torque ambiguity by stretching the stud and capturing that stretch
 - Ensures precise joint clamping — key in high-vibration equipment
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Tool Accessories That Matter

HYTORC Washers

- Eliminate reaction tool kickback
- Provide hands-free torquing
- Highly useful near structural gussets, close to panels

Reaction Arms & Fixtures

- Customized to fit around the P1's frame, hoses, guards
- Prevent tool reaction from damaging machine surfaces

Deep Reach Sockets & Extensions

- For bolts recessed deep in housings, elevator columns, or covered by guards

Calibrated Pump & Gauge

- Paired with hydraulic tools (MXT+, Avanti) for **consistent documented torque**

Typical Bolt Types & Tool Pairing (Quick Reference)

Machine Joint	Bolt Size	Service Challenge	Best HYTORC Tool
Boom pivot bolts	1–1¼"	Heavy torque & vibration	MXT+ / Avanti
Hydraulic pump mounts	¾"–1"	Frequent removal	jGun / Lithium
Access panel bolts	½"–¾"	High volume & speed	jGun / Lithium
Gearbox housing bolts	1"–1½"	High torque + precision	Avanti / MXT+
Tight underframe fasteners	Various	Limited clearance	Stealth
Cylinder head / high preload	Large studs	Precision clamp load	Hydraulic tensioner

Operational Advantages on P1

- ◆ **Speed:** Pneumatic/electric tools like jGun & Lithium dramatically reduce hours compared with impact wrenches or breaker bars.
 - ◆ **Consistency:** Hydraulic tools (MXT+/Avanti) deliver **documentable torque** for repeatability.
 - ◆ **Safety:** HYTORC Washers and reaction fixtures eliminate pinch points and reduce kickback risks.
 - ◆ **Field Versatility:** Battery and pneumatic tools ensure crews aren't tied to hydraulic pumps.
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✂ Example Scenarios on P1 Drill Rig

Scenario 1 — Track-mounted rig undercarriage service

- Breakout track shoe bolts
- Tighten to precise preload
- Tools: jGun (rapid), Stealth (tight spots), MXT+ (high torque)

Scenario 2 — Boom pivot bearing replacement

- Pivot link bolts require exact torque to prevent premature wear
- Tools: Avanti (high torque), MXT+ (calibrated precision)

Scenario 3 — Hydraulic pump rebuild

- Fasteners seized from contamination
- Tools: jGun Dual Speed (fast run-down), Lithium (mobile)

Scenario 4 — Gearbox mount and housing maintenance

- Heavy bolts, sealed housing
- Tools: Hydraulic tensioners (uniform preload), MXT+ (repeatability)

HYTORC Tools That Matter for: Crane Repair & Maintenance

1. jGun™ Dual Speed (Pneumatic or Electric)

Best For: Moderate-torque service tasks where speed matters and access is fair.

Key Features:

- Fast run-down and controlled torque finish
- Excellent for high-volume maintenance
- Great for field and shop settings
- Air or battery/electric options

Ideal Applications:

- Panel / access cover bolts
 - Hydraulic pump & valve block bolts
 - Secondary structure brackets
 - Winch mount bolts
 - Travel motor/cylinder mount bolts
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2. Lithium Gun™ (Battery Powered)

Best For: Portable, hose-free torque; excellent in tight spaces or remote jobsites.

Key Features:

- Lightweight, cordless convenience
- Solid torque for midsize hardware
- Great on carrier decks and boom base access points

Ideal Applications:

- Cab mounting fasteners
- Electrical box panels
- Hydraulic control valve mounts
- Lighting/guardian system bolts

3. MXT+ (Hydraulic Square Drive Torque Wrench)

Best For: Heavy structural bolting & large-diameter fasteners.

Key Features:

- Precise, repeatable torque via calibrated hydraulics
- Broad torque range
- Can pair with HYTORC Washer or custom reactions

Ideal Applications on Cranes:

- **Boom base and swing pedestal bolts**
- **Superstructure frame bolts**
- **Crawler track frame & carrier structural joints**
- **Counterweight mounting bolts**
- **Final drives and travel drive housings (cranes with track drives)**

4. Avanti™ High-Capacity Hydraulic Torque Tools

Best For: High torque, heavy lifting bolt clusters that exceed MXT capacity.

Key Features:

- Handles very large bolts reliably
- High torque output with smooth operation
- Ideal on toughest crane service jobs

Ideal Applications:

- **Carrier main frame connections**
 - **Large pivot/tilt pins**
 - **Load bearing structural joints**
 - **Pivot/boom hoist assemblies with large fasteners**
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5. Stealth™ (Low-Clearance Hydraulic Torque Wrench)

Best For: Constrained locations where space prevents normal tool access.

Key Features:

- Ultra-thin profile
- Same calibrated torque accuracy in tight spaces

Ideal Applications:

- Under-structure gussets
 - Close-clearance engine mounts
 - Boom stick side plates
 - Compact carrier areas around winch housings
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6. HYTORC Washers

Best For: Eliminating tool reaction issues and operator pinch points.

Key Features:

- Hands-free tightening (no reaction arm needed)
- Great for repetitive bolting
- Improves safety on confined crane assemblies

Ideal Applications:

- Boom truck pivot bolts
 - Knuckle articulating joint fasteners
 - Hydraulic manifold block bolts
 - Bracket assemblies with limited reaction surfaces
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7. Hydraulic Tensioners

Best For: High-preload, vibration-prone, or critical load-bearing joints.

Key Features:

- Produces accurate preload via tension rather than torque alone
- Excellent where torque isn't a reliable indicator of clamp load

Ideal Applications:

- Large base anchor bolts
- Counterweight pedestal anchors
- Boom butt joint studs on large lattice or tubular boom cranes

Crane-Specific Target Bolted Joints & Tool Pairing

Crane System / Joint	Typical Bolt Type/Size	HYTORC Tool Solution
Boom pedestal / swing frame bolts	1"–1½"	MXT+ / Avanti + HYTORC Washer
Superstructure frame	1"–1¾"	Avanti / MXT+
Counterweight mount bolts	1"–1¼"	MXT+ / Hydraulic tensioners
Crawler track & undercarriage (crawler cranes)	¾"–1½"	jGun / Lithium / MXT+
Winch drive mounts	¾"–1"	jGun Dual Speed
Hoist gear covers	1"–1¼"	MXT+ / Avanti
Engine mount bolts	7/8"–1¼"	Lithium Gun / jGun
Hydraulic pump mounts	¾"–1"	jGun / Lithium
Boom stick pivot bolts (knuckle booms)	1"–1½"	Avanti / MXT+
Sheave assembly bolts	¾"–1"	jGun / Stealth
Cab structure bolts	¾"–1"	Lithium / jGun
Hydraulic manifold blocks	½"–7/8"	HYTORC Washers + jGun



Why HYTORC Tools Excel in Crane Maintenance

✓ Speed & Consistency

Compared to breaker bars or conventional impacts, HYTORC tools:

- Reduce bolt cycle time
- Reduce variation in torque/clamp load
- Improve repeatability — important on load-bearing crane joints

✓ Safety

- HYTORC Washers and reaction options eliminate dangerous reaction kickback
- Pneumatic and battery tools reduce strain vs cheater bars
- Tools reduce chance of thread galling and rework

✓ Access & Flexibility

- Stealth & low-profile tools reach into tight crane structures
- Cordless Lithium works where hydraulics/air aren't available

✓ Documentation & Traceability

Many HYTORC systems (hydraulic quantification) can provide calibrated torque data — useful for service records and compliance.



Practical Example Scenarios

Scenario A — Boom Pedestal Rebuild

- **Fixed Problem:** Uneven torque on pedestal bolts leads to misalignment
- **HYTORC Tools:** Avanti hydraulic with HYTORC Washers
- **Result:** Uniform clamp load + documented torque

Scenario B — Winch Motor Service

- **Fixed Problem:** Repetitive removal of pump/valve blocks
- **HYTORC Tools:** jGun Dual Speed + Lithium Gun for panel bolts

- **Result:** Faster turnaround and reduced downtime

Scenario C — Crawler Crane Track Service

- **Fixed Problem:** High bolt counts and severe exposure
 - **HYTORC Tools:** jGun for rapid removal, MXT+ on heavy structural bolts
 - **Result:** Equal torque, fewer call-backs
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Recommended Field Kits for Crane Shops

Service Truck Kit

- jGun Dual Speed (air + electric options)
- Lithium Gun
- Standard sockets (metric / imperial)
- HYTORC Washers
- Quick-connect air hoses

Heavy Service Bay Kit

- MXT+ hydraulic torque wrench
- Avanti heavy torque system
- Stealth low-clearance kit
- Hydraulic hoses, pump, calibrated gauge

Precision Tension Kit

- Hydraulic tensioners
- Calibration chart set
- Reaction fixtures