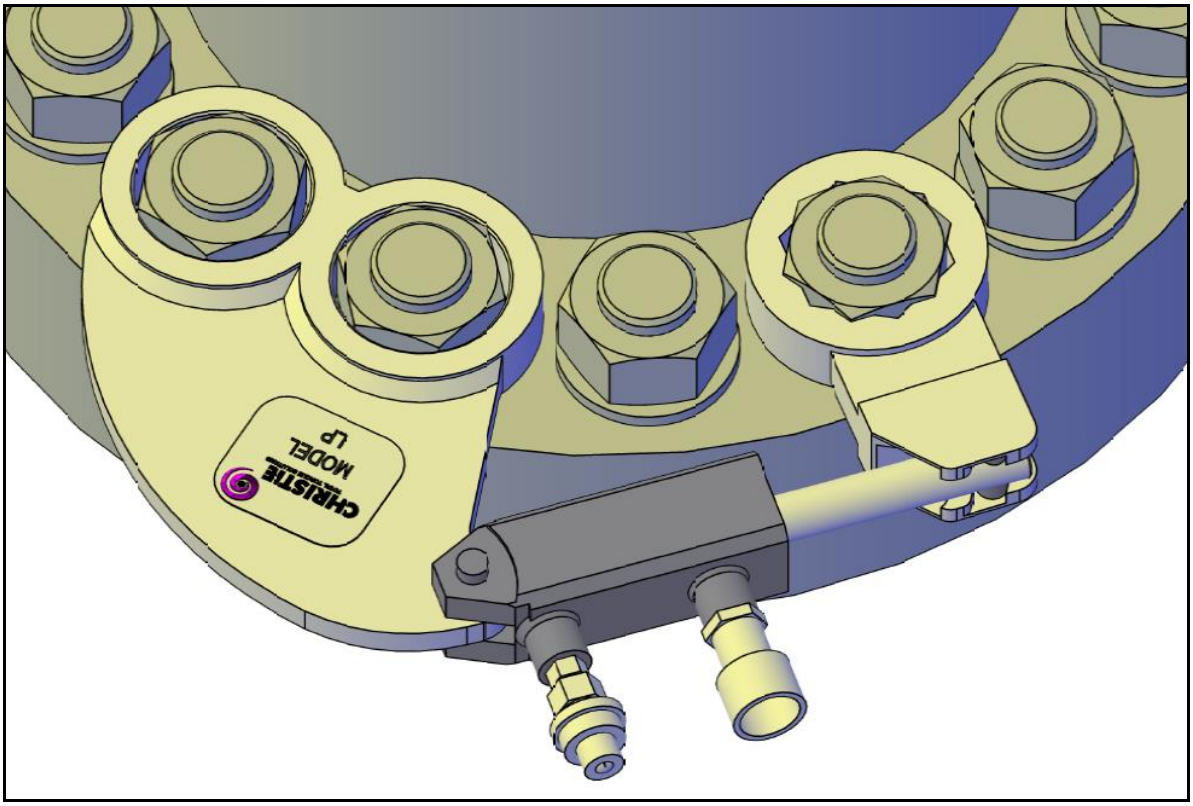
CHRISTIE
TOTAL TORQUE SOLUTIONS

LOW PROFILE TOOLING (LP)

USER GUIDE



CONTENTS

INTRODUCTION

The Low Profile (LP) Hydraulic wrench is a direct fitting hydraulic actuated power tool designed to accurately apply torque to tighten and remove threaded fasteners. The low profile system is ideal for flange work with limited height access.

IMPORTANT **Before operating this tooling ensure the operating and safety instructions are read and understood. Read in conjunction with the appropriate power pack operating instructions. If breakdown or malfunction occurs repair should only be attempted by trained personnel, if in doubt contact W. Christie (Industrial) Limited immediately.**

The static back anchor of the LP wrench sits firmly on two bolts and acts as a reaction.

This tool offers unique solutions with unchallenged access to those awkward bolts.

INTRODUCTION – CONTINUED…

The LP wrench must always be operated with the following:-

- Double Acting Hydraulic Power Pack capable of 10,000 psi (690 bar)
- Hydraulic Mineral Oil (None Synthetic, Grade 32 or equivalent)
- Hydraulic Hoses (Working Pressure 10,000 psi, 6mm Bore)
- Bolts / nuts hand tight on flange (to act as reaction for static back anchor)

If the intended use is other than for nuts, bolts and threaded fasteners please contact W. Christie (Industrial) Limited for guidance.

It is the responsibility of the user to consider associated site risks before introducing the equipment into the work-place.

TRAINING REQUIREMENTS

Training on the correct use of the LP hydraulic tooling is available. Please contact W. Christie (Industrial) Limited for more information.

GENERAL SAFETY

The improper use of hydraulic equipment is unsafe and may result in personal injury. It is important that operators have read, understood and comply with all instructions in this user guide.

If more than one individual is involved in the operation of the equipment then all must read the user guide. Good communication must be established to prevent accidents or misunderstandings.

Operators must be equipped with the following personal protective equipment (PPE):-

- Eye Protection (Safety Glasses / Goggles)
- Safety Footwear (Steel Toe Cap Boots)
- Heavy Gloves

Care must be taken not to exceed the maximum working pressure of the equipment. See the torque chart provided. Failure or breakup of components may result in personal injury.

Take care not to stand on, run over or trip over hydraulic hoses. Injury may result. To minimise danger ensure that these lines are not run across walkways, ladders, roadways and doorways, etc and that people likely to pass through the working area are aware of the danger.

To prevent entanglement with moving parts operators must not wear loose clothing, ties, jewellery etc… Long hair must be tied back.

Always keep hands, fingers and body parts clear of the reaction foot at all times. Trapping in this area can result in serious personal injury.

Before use, check the hydraulic hoses are not cut, split, kinked or damaged in any way. If in doubt **Do not use**.

All hydraulic equipment and ancillary products should be inspected for damage and irregularities prior to use. If in doubt **Do not use.**

Never lift or drag hoses or cables. This weakens the swagings and puts unnecessary stress on threads and couplings. Subsequent failure may result in causing injury.

TOOLING MODELS COVERED BY MANUAL

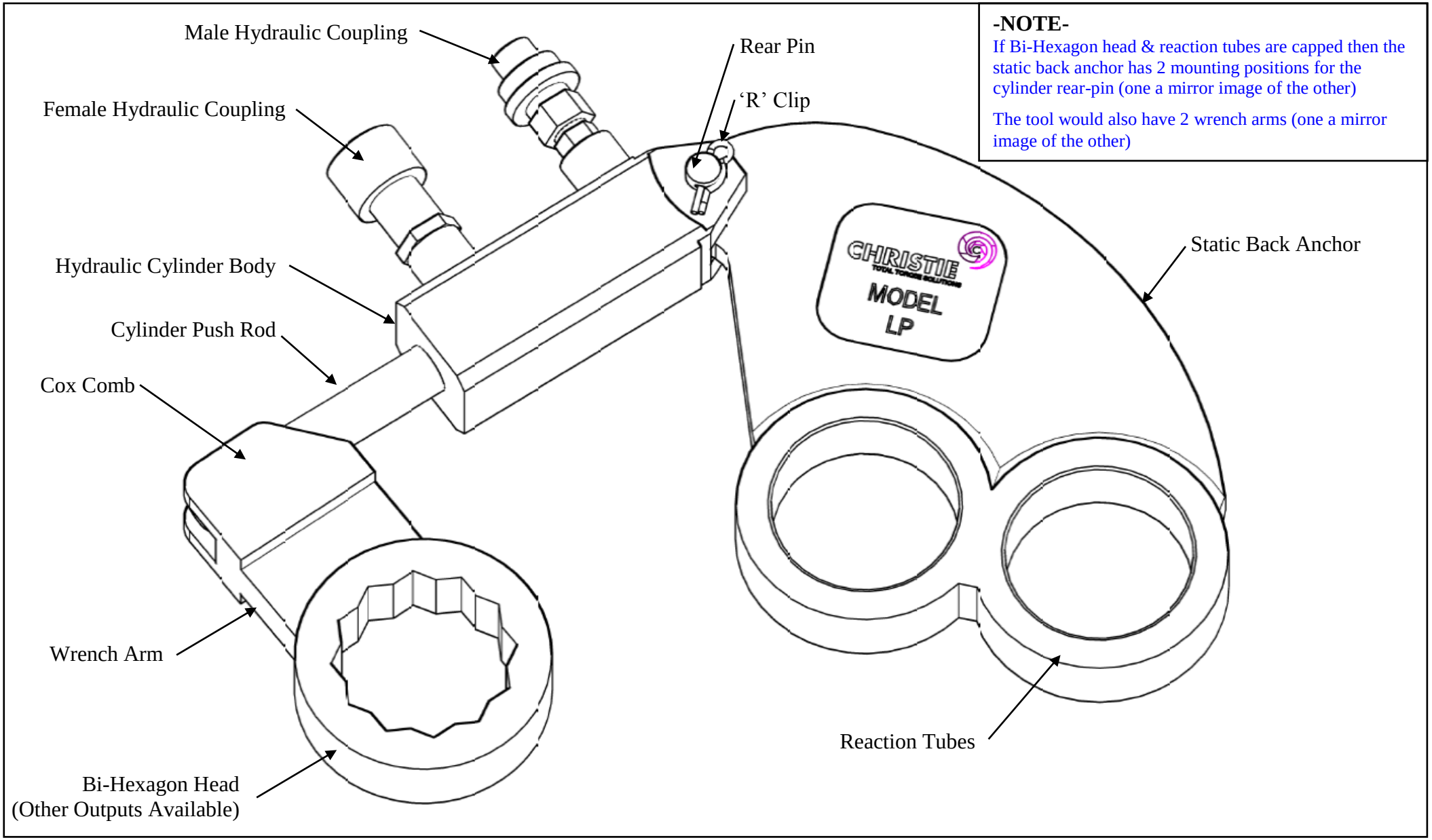
Model	Push Torque Capacity	
	Lbf.ft	Nm
LP3	2950	4,000
LP5	7,950	10,775
LP7	18,600	25,215
LP9	44,000	59,655

ACCESSORIES AVAILABLE TO BUY OR HIRE

The following accessories are available upon request and can be custom made to suit requirements. Please contact W. Christie (Industrial) Ltd for more information:-

- Alternative Static Back Anchors & Wrench Arms (To Suit different Flange and fastener sizes)
- Custom Lifting points.
- Hydraulic Power Pack Units (Typical units listed below):-
  - ADR70XD-LPR (Air Driven, Xtra, Desert Operation, Low Pressure Return)
  - ADR70MD-LPR (Air Driven, Micro, Desert Operation, Low Pressure Return)
  - EDR70X-LPR (Electric Driven, Xtra, Low Pressure Return)
  - EDR70M-LPR (Electric Driven, Micro, Low Pressure Return)

TOOL FEATURES – FIGURE 1

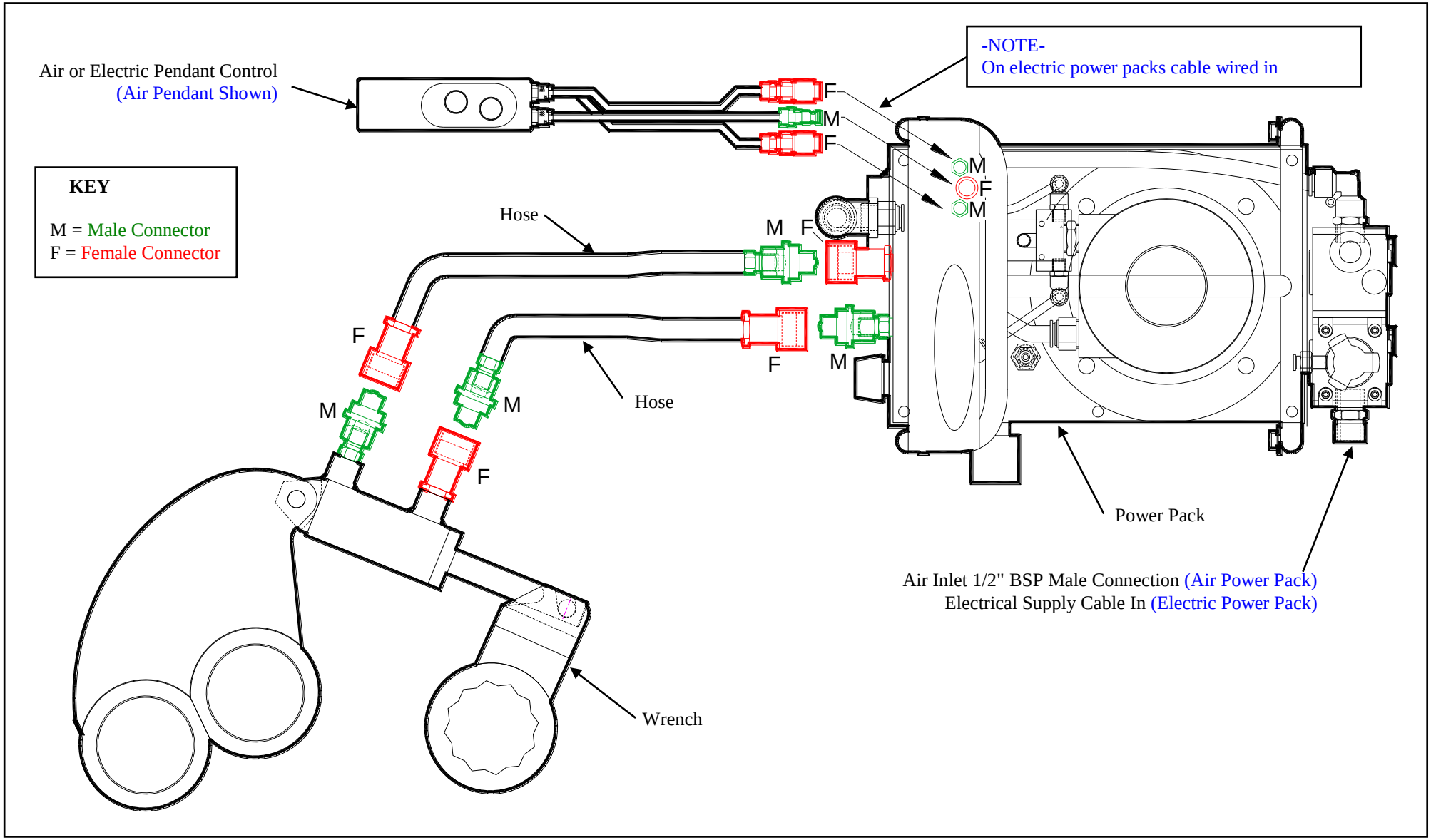


-NOTE-

If Bi-Hexagon head & reaction tubes are capped then the static back anchor has 2 mounting positions for the cylinder rear-pin (one a mirror image of the other)

The tool would also have 2 wrench arms (one a mirror image of the other)

CONNECTION LAYOUT – FIGURE 2



ASSEMBLY

Please refer to figure 2 for Connection Layout

- **Ensure** that the Bi-Hexagon head fits comfortably on the application and there are no restrictions to the fastening operation.
- **Ensure** the couplings on the hydraulic cylinder and power packs hoses are compatible and in clean and good condition
- **Connect** the power pack unit's hoses to the hydraulic couplings on the LP tools hydraulic cylinder ensuring the screw collar on each female coupling screws fully up the shoulder on the male coupling

TORQUE REACTION

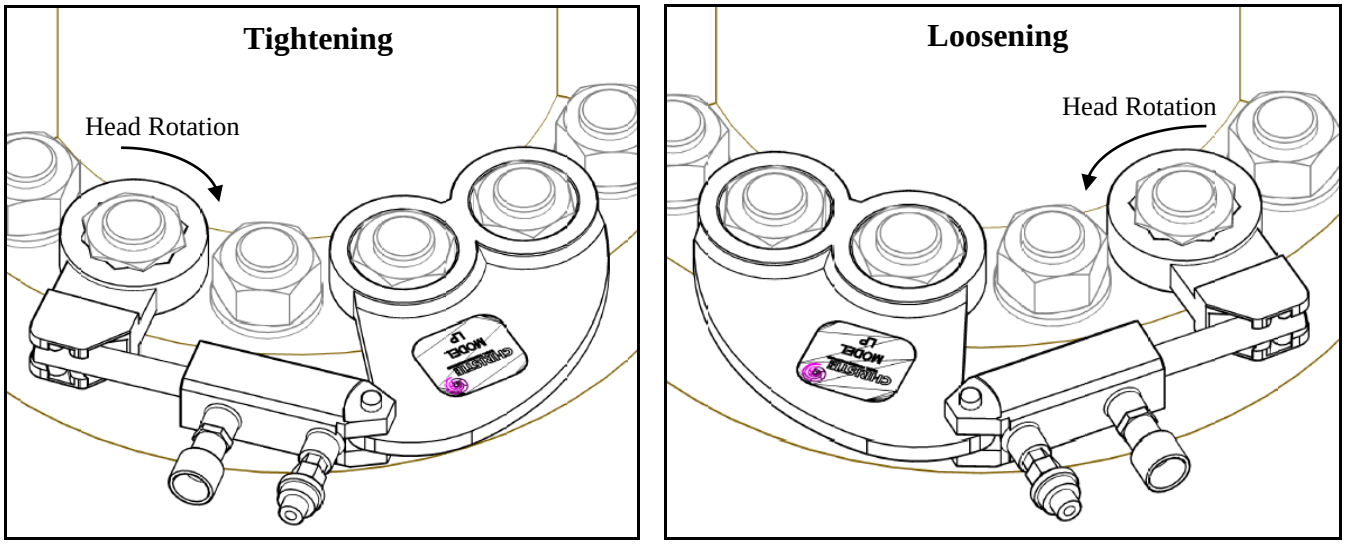
React only as shown. For correct reaction see figure 3.

The reaction tries to rotate in the opposite direction to nut rotation.

Both static back anchor reaction tubes must be placed over the nuts (see figure 3)

Keep hands / clothing etc clear of the reaction area (Trapping Hazard).

CORRECT REACTION – FIGURE 3



OPERATING – BOLT TIGHTENING

1. Determine the required hydraulic pressure for the desired torque (using the calibration graph for the tool)
2. With the LP tooling free of its application extend the piston rod fully.
3. When full stroke is achieved, maintain the forward pressure and adjust to required setting by the relief valve on the power pack, pressure increase or decrease will be indicated on the power pack gauge. The correct torque is now set.
4. Ensure the cylinder push rod is fully retracted.
5. Position the static back anchor reaction tubes over the nuts (see figure 3 - tightening)
6. Position the wrench arm bi-hexagon head firmly and squarely on the nut to be tightened (see figure 3 – tightening).
7. Position / line up the cylinder push rod end pin into the slot furthest away on the cox comb
8. Extend the cylinder. This will rotate the wrench arm in a clockwise direction.
9. Retract the cylinder. This will move the cylinder push rod end pin out of the cox comb slot
10. Position / line up the cylinder push rod end pin into the next closest slot.
11. Extend the cylinder. This will rotate the wrench arm in a clockwise direction.
12. Retract the cylinder. This will move the cylinder push rod end pin out of the cox comb slot.
13. Repeat steps 10 to 12 until cylinder stops in mid forward stroke. This indicates the required torque has been achieved.

NOTE If correct torque has not been achieved and all cox comb slots have been used then remove, re-position the wrench arm and repeat steps 7 to 13.

OPERATING – BOLT LOOSENING

1. Determine the hydraulic pressure for maximum torque (using the calibration graph for the tool)
2. With the LP tooling free of its application extend the piston rod fully.
3. When full stroke is achieved, maintain the forward pressure and adjust to required setting by the relief valve on the power pack, pressure increase or decrease will be indicated on the power pack gauge. The correct torque is now set.
4. Ensure the cylinder push rod is fully retracted.
5. Position the static back anchor reaction tubes over the nuts (see figure 3 - loosening)
6. Position the wrench arm bi-hexagon head firmly and squarely on the nut to be loosened (see figure 3 – loosening).
7. Position / line up the cylinder push rod end pin into the slot furthest away on the cox comb
8. Extend the cylinder. This will rotate the wrench arm in an anti-clockwise direction.
9. Retract the cylinder. This will move the cylinder push rod end pin out of the cox comb slot
10. Position / line up the cylinder push rod end pin into the next closest slot.
11. Extend the cylinder. This will rotate the wrench arm in an anti-clockwise direction.
12. Retract the cylinder. This will move the cylinder push rod end pin out of the cox comb slot.
13. Repeat steps 10 to 12 until the fastener is loose.

NOTE If the nut is not loose and all cox comb slots have been used then remove, re-position the wrench arm and repeat steps 7 to 13.

BOLT TIGHTENING TO BOLT LOOSENING (NONE CAPPED REACTION TUBES)

To alternate from tightening to loosening on LP tools without capped reaction tubes or head:-

- Turn the tool over and position the LP tool as per figure 3 (Correct Reaction)

BOLT TIGHTENING TO BOLT LOOSENING (CAPPED REACTION TUBES)

To alternate from tightening to loosening on LP tools with capped reaction tubes:-

1. Remove the 'R' Clip and slide rear pin from static back anchor / cylinder.
2. Remove the cylinder from the static back anchor.
3. Re-position the Hydraulic cylinder on the alternative static back anchor hole.
4. Slide the rear pin through the static back anchor / cylinder rear.
5. Re-fit the 'R' Clip.
6. Position the LP tool as per figure 3 (correct reaction).

NOTE **Tools with capped Bi-Hexagon heads are supplied with 2 wrench arms. One is a mirror image of the other.**

One wrench arm is for tightening. The other wrench arm is for loosening.

MAINTENANCE AND RECALIBRATION

To prevent premature failure and ensure confidence in torque supply, it is recommended that this equipment is serviced and calibrated at least on an annual basis, by W. Christie (Industrial) Ltd.

WARRANTY

The wrench comes with a one year (1) conditional warranty.

Christie Wrenches are guaranteed against manufacturer and material defects, but not against abuse, misuse or neglect by the user.

When returning tooling for examination, always ensure the reaction and Power Pack are returned.

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E.C. DECLARATION OF CONFORMITY

MODELS COVERED: LP3, LP5, LP7, LP9

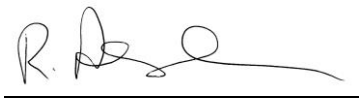
DESCRIPTION: Low Profile Tooling

We hereby declare that the following machinery complies with the essential health and safety requirements of the European Machinery Directive 2006/42/EC published on the 9th June 2006

W Christie (Industrial) Ltd, Meadowbank Road, Rotherham S61 2NF, United Kingdom.

This machinery has been designed and manufactured in accordance with the following transposed harmonised European Standard:-

BS EN ISO 12100-2:2003 Safety of Machinery – Technical Principles

SIGNED: 

NAME: R. G. Askham **POSITION:** Senior Applications Engineer

On behalf of W Christie (Industrial) Ltd

W. CHRISTIE (INDUSTRIAL) LTD
Christie House, Meadowbank Road,
Rotherham, South Yorkshire, S61 2NF

t: +44(0)1709 550088
e: info@wchristie.com
f: +44(0)1709 550030
w: www.wchristie.com

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