

# USER MANUAL

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## RT square drive Hydraulic torque wrench system.





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- **Please read the Safety Information booklet that came with your hydraulic torque wrench**
- Please read this manual carefully. Most malfunctions in new equipment are the result of improper operation and/or set up.
- PREPARATION: Remove your hydraulic torque wrench from shipping container.
- INSPECTION: Visually inspect all components for shipping damage. If any damage is found, notify carrier immediately.
- Use the torque chart that corresponds with your model of hydraulic torque wrench

## 2.1 WORKING PRESSURE

The tool's maximum Working Pressure is 10,000 PSI (700 bar). Make sure that all hydraulic equipment (pumps, hoses, couplers) used with this tool are rated for 10,000 psi (700 bar) working Pressure. Review the documentation for the hydraulic pump in use to ensure pressure does not exceed 10,000 psi.

## 2.2 HYDRAULIC CONNECTIONS

Our hydraulic pumps are equipped with a zero-pressure relief valve. However, it could be possible that the retract side remain pressurized after the pump has been switched "off". This trapped pressure prevents the user from loosening the retract-side fittings by hand. To release the pressure, simply push the black button on top of the solenoid. All fittings are free to be manually tightened.

Never disconnect or connect any hydraulic hoses or fittings without first unloading the wrench and the pump. If the system includes a gauge, double check the gauge to assure pressure has been released. When making connections with quick disconnect couplings, make sure the couplings are fully engaged. Threaded connections such as fittings, gauges etc. must be clean and securely tightened and leak free.

**CAUTION:** Loose or improper threaded fittings can be potentially dangerous if pressurized. Severe over tightening can cause premature thread failure. Fittings need to be only tightened secure & leak free. Never grab, touch or in any way, come in contact with a hydraulic pressure leak. Escaping oil can penetrate the skin and cause injury.

## 2.3 ELECTRICAL CONNECTIONS

Ensure proper power availability to prevent motor failure or dangerous electrical overloading. Use the recommended amperage listed on the motor nameplate. Do not use electric pump if ground is not connected on plug.

Minimize the length of extension cords and be sure they are of adequate wire size, with ground connections.

Extension cord should be #10 AWG gauge.

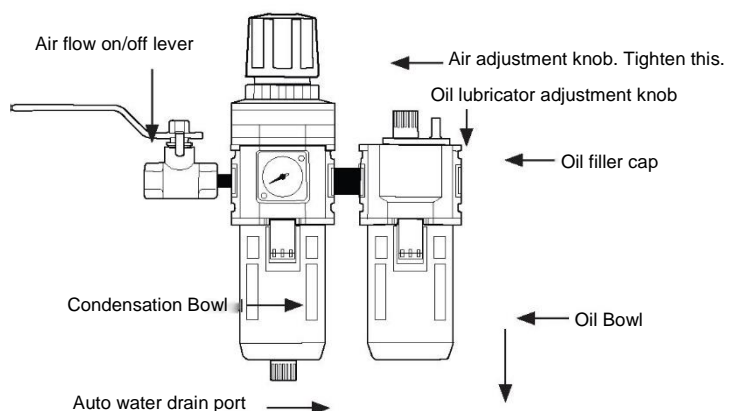
**WARNING:** Electric motors may spark. Do not operate in an explosive atmosphere or in the presence of conductive liquids. Air driven pumps are better suited for these applications.

## 2.4 AIR CONNECTIONS

Ensure that you have sufficient air flow (58 up to 100 PSI / 4 up to 7 bar) to operate your pneumatic pump. If in doubt, compare the pump manufacturer's recommended air flow rating prior to pressurizing pump. Improper air flow may damage the pump motor.

For best results use air hoses equal or larger than 3/4" internal diameter.

Use of a F.R.L. (Filter Regulator Lubricator) is highly recommended. Fill with oil and adjust the air admission with the adjustment knob.



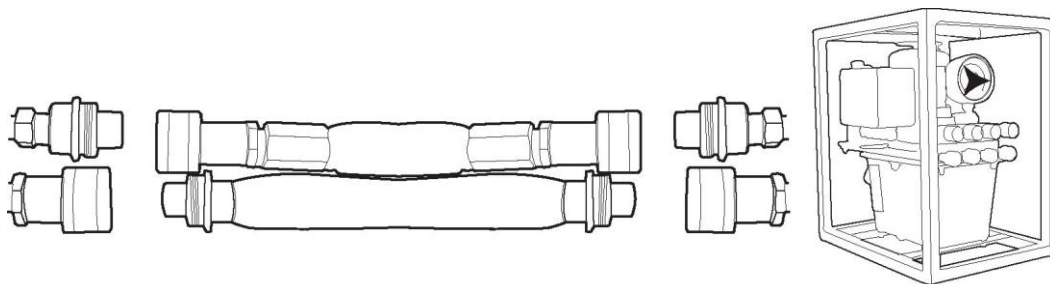
### 3:1 GENERAL SETUP

All our hydraulic torque wrenches are supplied completely assembled, ready for use. An Atlas Copco hydraulic power pack, for use with your Atlas Copco hydraulic torque wrench, is recommended to provide the speed, pressure and portability that make your Atlas Copco System efficient and accurate.

The accuracy of your Atlas Copco hydraulic torque wrench is +/-3% based upon our manufacturer's specifications. This accuracy is certified through calibration tests conducted by Atlas Copco or any other qualified calibration facility whose program is traceable to the National Institute of Standards and Technology (N.I.S.T). We strongly suggest using Atlas Copco certified gauges (with a class 1 accuracy) to enhance the accuracy your torquing system.

### 3:2 CONNECTING THE SYSTEM

The Atlas Copco hydraulic torque wrench and the power pack are connected by a 10,000 PSI (700 bar) operating pressure twinline hose assembly. The safety ratio of the Atlas Copco Hydraulic Hose is 4/1. On each twin hydraulic hose, one line must be MALE-MALE and the other line must be FEMALE-FEMALE in order to assure a correct interaction between Pump and Machine. Connect the twinline hose to the swivel as shown:



**IMPORTANT:** Ensure connectors are fully engaged and screwed snugly together.

Never use two twin hydraulic hoses between Pump and Machine. If so, you have the high pressure on the retract side and your machine is no able to work properly. To avoid tool malfunction, do not reverse connectors. Do not try to loosen the swivel assembly at any moment.

**WARNING:** Electric motors may spark. Do not operate in an explosive atmosphere or in the presence of conductive liquids. Air driven pumps are better suited for these applications.

### 3:3 OPERATING THE ATLAS COPCO RT SERIES SQUARE DRIVE

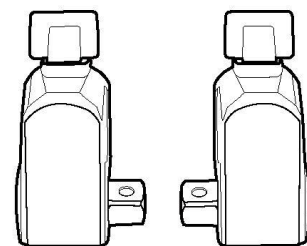
#### CHANGING DRIVE DIRECTION

To remove the square drive, push the round button on the drive retainer and gently pull on the square end of the square drive (for RT20, 25 & 50, push on the drive retainer while turning it counter-clockwise). To insert the drive in the tool, place the drive in the desired direction, engage drive and bushing splines, then twist drive and bushing until ratchet Spline can be engaged.

Push drive through ratchet. Depress drive retainer button, engage retainer with drive and release button to lock the square drive in position.

#### REACTION ARM

All Atlas Copco hydraulic torque wrenches are equipped with a universal reaction arm. These reactions arms are employed to absorb and counteract forces created as the unit operates. The reaction arm should extend in the same direction of the square drive; however, slight adjustments may be made to suit your particular application. The RT Reaction Arm is made of Special Aircraft Alloy and is 360° adjustable.



RIGHT = TIGHT

LEFT = LOOSE

**NOTE:** The standard RT reaction arm cannot be welded on and should not be modified.

The reaction arm for all RT Monobloc Housing is splined to slide over the rear (cylinder) portion of the tool. In operation, the reaction arm must be fully engaged and secured by inserting the spring loaded reaction arm lever at the base of the housing ( End Cap ). Ensure the reaction is fully engaged prior to operation.

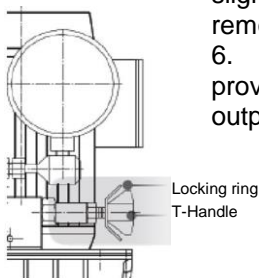
### 3:4 SETTING TORQUE

- Once the system is fully connected and proper power supply available, the operator may now adjust the pump pressure to the level needed for the application.
- When tightening, use the manufacturer's specifications to determine the torque value which you will ultimately require.
- Torque sequence may vary from plant to plant and even within individual plants, depending upon the gasket material, etc. Always abide by local procedures.
- Next, find the pressure-torque conversion table applicable to the tool which you intend to use.

### 3:5 SETTING WORKING PRESSURE ON THE PUMP

To set the pressure on the pump, follow this procedure:

1. Loosen the knurled locking ring below the "T" handle on the pump's external pressure regulator. Then turn the "T" handle counter clockwise (CCW) until it turns freely and easily.
2. Turn the pump "on". Using the pump's remote control pendant, push down the advance switch (or button on air pumps) and hold it.
3. While holding the pump in the advance mode, slowly turn the "T" handle clockwise and observe the pump pressure gauge rise. *NOTE: Always adjust the regulator in order to increase the pressure up - Never down. Never adjust the regulation with the tool on the application.*
4. When your gauge reaches 4,000 PSI stop turning the "T" handle and let the gauge settle out.
5. If the pressure continues to rise (above 4,000), release the advance button and back off your pressure slightly-by turning CCW on the "T" handle. Then re-depress the advance switch on you remote and slowly bring pressure up to 4,000 again.
6. When the pressure is correct, turn the pump "off" and tighten the knurled lock nut provided under the "T" handle. This sets pump pressure, which determines torque tool output.
7. Once your target pressure is set and locked, cycle the pump once more to ensure that your pressure setting did not change as you turned down the knurled knob.



### 3:6 APPLYING THE TORQUE MACHINE-TIGHTENING

Having set your target pressure, cycle the tool three or four times to full pressure. Cycling the tool ensures that the system is operating properly and removes trapped air, if any.

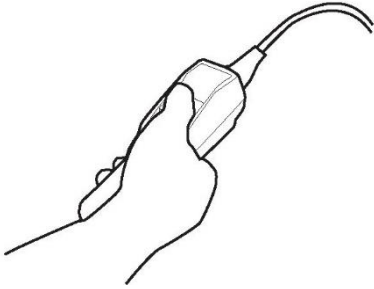
Verify that any impact sockets used are rated to accept the full torque output of the tool they are to be used with. Ensure the correct size impact socket for the nut A/F has been selected, placed on the square drive and secure with a locking pin and ring.

Place the tool and the socket on the nut, making sure that the socket has fully engaged the nut, check that the drive retainer is engaged.

Make sure the reaction arm is firmly abutted against a stationary object (i.e. an adjacent nut, flange, equipment housing etc.). When positioning the wrench, make sure that the hose connections are well clear of any obstructions and that all body parts are safely out of harm's way. **THEN, AND ONLY THEN**, apply momentary pressure to the system to ensure proper tool placement. If it doesn't look or act right, stop and re-adjust the reaction arm.

*NOTE: Please read Safety Instructions supplied with the torque wrench for further guidance on tool usage*

### 3:7 OPERATING THE TORQUE MACHINE



1. By pushing down on the remote control button in the advance position, the rear of the tool will be pushed back until its reaction arm will contact its reaction point.
2. Continue to hold down the button as the socket or ratchet link turns until you hear an audible "click" which will signify the hydraulic cylinder inside the tool is fully extended and will not turn the advance further.
3. Continuing to hold down the remote control button will result in a rapid build up of pressure to the point of where the gauge reads what was preset prior to applying the wrench.

*IMPORTANT: The reading of full preset pressure after the cylinder is extended DOES NOT INDICATE that this pressure (torque) is applied to the bolt. It only indicates that the cylinder is fully extended and cannot turn the socket or the ratchet link further until the tool automatically resets itself.*

Releasing the remote control button will retract the cylinder. The tool will automatically reset itself and the operator will hear an audible "click" indicating he can again push the remote control button and the socket will turn. Each time the cylinder is extended and retracted, it is called a cycle. Successive cycles are made until the tool "stalls" at the pre-set Torque/PSI with an accuracy of +/-3%. Repeatability is +/- 1%.

*IMPORTANT: ALWAYS ATTEMPT ONE FINAL CYCLE TO ENSURE THE "STALL" POINT HAS BEEN REACHED.*

Should the tool "lock-on" after the final cycle, push down on the remote control button once more (to build pressure) and, while maintaining this pressure, pull back on the external disengagement lever (RT) or reaction Pawl (RTX). Releasing the remote control while continuing to hold back on the pawl lever/reaction pawl will allow the tool to be removed easily.

***Use of the automatic system is only recommended after Point 3.6, 3.7 and 3.8 have been respected. With an Automatic Pump, cycle the tool one more time without automatic to check the final torque.***

### 3:8 LOOSENING PROCEDURES

First, set the pump to 9,000 PSI (Do not try directly at 10,000 PSI). Change the drive and the reaction arm to the loosening mode (Left = Loose), assuring the reaction arm abuts squarely off a solid reaction point. Press and hold the remote control button down. Pressure will decrease as the socket begins to turn. As the cylinder extends fully, you will hear an audible "click". Release the remote control button, and the cylinder automatically retracts, at this time you will again hear the audible "click". Repeat this process until the fastener can be removed by hand.

***NOTE: IF THE BOLT DOES NOT LOOSEN WITH THE ABOVE PROCEDURE, IT IS AN INDICATION THAT YOU NEED A LARGER TOOL TO LOOSEN THE BOLT.***

#### 4.1 SETTING TORQUE

All Atlas Copco power packs operate at a pressure range from 500 to 10,000 PSI and are fully adjustable. They have been engineered and designed for portability and high flow for increased speed. Before using your Atlas Copco power pack, check the following points.

- Is the reservoir filled with oil?
- Where is the closest electrical outlet at the job site?
- Is there enough air pressure (60 to 100 PSI) and Air flow at the job site? (Air units only)
- Is the gauge mounted and rated for 10,000 PSI/700 bar?

#### 4.2 WORKING PRESSURE

The pump's maximum working pressure is 10,000 PSI / 700bar. Make sure all hydraulic equipment and accessories are rated for 10,000 PSI / 700bar operating pressure. Hydraulic pumps are available with higher pressure outputs, if not using an Atlas Copco power pack verify maximum operating pressure of the unit being used and ensure the system maximum operating pressure (10,000 PSI / 700 bar) is not exceeded.

#### 4.3 HYDRAULIC CONNECTIONS

Never disconnect or connect hydraulic hoses or fittings without first unloading the wrench. Unplug the electrical cord of the pump, and open all hydraulic controls several times to assure that the system has been depressurized. If the system includes a gauge, double check the gauge to assure pressure has been released. When making a connection with quick disconnect couplings, make sure the couplings are fully engaged threaded connections such a fittings, gauges etc. must be clean and securely tightened and leak free.

***CAUTION: Loose or improperly threaded couplers can be potentially dangerous if pressurized, however, severe over tightening can cause premature thread failure. Fittings need to be only tightened secure and leak free. Never grab, touch or in any way come in contact with a hydraulic pressure leak. Escaping oil can penetrate the skin and cause injury. Do not subject the hose and potential hazard such as sharp surfaces, extreme heat or heavy impact. Do not allow the hose to kink and twist. Inspect the hose for wear before it is used.***

#### 4.4 ELECTRICAL POWER

1. CHECK FOR PROPER ELECTRICAL SUPPLY BEFORE CONNECTING.
2. THIS MOTOR MAY SPARK. DO NOT OPERATE IN AN EXPLOSIVE ATMOSPHERE OR IN PRESENCE OF CONDUCTIVE LIQUIDS.
  - a. Do not use a power or extension cord that is damaged or has exposed wiring.
  - b. All single phase motors come equipped with a three prong grounding type plug to fit the proper grounded type electrical outlet. Do not use a two prong ungrounded extension cord as the pump's motor must be grounded.
3. Compare motor nameplate against power availability to prevent motor burnout or dangerous electrical overloading.

#### 4.5 PRIOR TO USE

Check hydraulic oil (Use Grade 46) level to prevent possible pump burnout. Open the filler plug located on the reservoir plate. Look at oil fill level on the oil sight gauge. The oil level should be approximately 2" from the top of the reservoir plate- with motor off. Add oil as necessary. Do not mix different grades of oil. Make sure all desired gauge, valve, hose and quick coupler connections are tight and secure before operating. The use of a pressure gauge is required for normal pump operation. Mounted on the manifold, the gauge permits the operator to monitor the load on the wrench. Class1 certified calibrated gauges are available for most applications.

## 4.6 OPERATION

Before starting your electric Panther Pump, connect your hydraulic hoses to both the pump and torque wrench. To start the pump, press briefly the white button on the remote control. This will start your pump and place it in the retract position push the white switch to advance and release.

*NOTE: Read the section labelled OPERATION and SETTING TORQUE prior to installing the torque wrench onto the application*

Your Panther hydraulic pump has been designed with an auto shut off system. The pump will shut off after approximately 1 minute of non-cycling. This will prevent overheating and unnecessary wear, thereby prolonging the life of your pump.



## 5.1 TROUBLE SHOOTING HYDRAULIC TORQUE WRENCH

Tool failure, although rare, does occur. Such failure is most often in the hydraulic couplers or hoses. These items are repairable or replaceable immediately, since they are available universally. Failures of structural members of the tool are quite rare, however, replacement parts are available from stock. All repairs to Atlas Copco tools may be made by reasonably experienced individuals according to the aforementioned instructions. Otherwise, please contact Atlas Copco to schedule a quick repair of the tool.

- Lubrication: All moving parts should periodically be coated with a good quality lubricant as Molykote with Graphite P37 or Dow Corning 1000. Under harsh environmental conditions, cleaning and lubricating should be performed more frequently. Warning: Sea Water is very corrosive, and, therefore, tools exposed to sea water should be maintained more frequently.
- Hydraulic hoses: Hoses should be checked for cracks and leaks after each job. Hydraulic fittings can become plugged with dirt and should be flushed periodically. Hydraulic hoses have to wear a valid control certification.
- Quick-Connects: Fittings should be kept clean and not allowed to be dragged along the ground or floor, as even small particles of dirt can cause the internal valves to malfunction.
- Springs: Springs are used for the drive pawl assembly and for the accuracy assurance pawl. These springs can be replaced if necessary.
- Cylinder Seals: If the cylinder requires disassembly, it is recommended that the cylinder seals be replaced at the same time. Seal kits are readily available.
- Structural Member: All structural parts on the tool should be inspected once a year to determine if there are any cracks, chips or deformities. If so, immediate replacement is required.

**Recommended Service intervals are:**

1. Heavy Duty use or use in corrosive/harsh environments – every 3 Months  
Internal Drive components may require frequent inspection and re-lubrication under heavy duty cycles, e.g. weekly
2. Normal use – every 6 months
3. Light or infrequent use – every 12 months

## 5.2 TROUBLESHOOTING POWERPACKS

Atlas Copco Hydraulic Power Packs are precision-built units and, as such, do require a certain amount of care and maintenance

- Hydraulic Oil should be completely changed after every 40 hours of operation, or at least twice a year. Always make sure the reservoir is filled with fluid. If additional oil is required, use only high- grade hydraulic oil such as grade 46.
- Quick-Disconnect Fittings should be checked periodically for leaks. Dirt or foreign materials should be kept away from fittings. Clean before use.
- Hydraulic Gauge: Some gauges are liquid filled. Should this liquid level drop, it indicates external leakage, and replacement is necessary. Should the gauge fill with hydraulic oil, it indicates internal failure and it should be discarded.
- Filter on Pump: The filter should be replaced twice a year in normal use and more often if the pump is used daily or in a dirty, harsh environment.
- Remote Control: (Air Unit) The airline to the remote control unit should be checked for obstructions or kinks in the line periodically. If there is a bend or break in the line, it must be replaced. The spring- loaded buttons on the remote handle should be checked in the event of operating difficulties. (Electric Unit) The switch buttons should be checked periodically if any indications of problems exist.
- Air Valve: This valve should be checked twice a year.
- Armature: (Electric Unit) Check yearly.
- Pumping unit: The pump should be overhauled every 2 years. This can be done by Atlas Copco or by a qualified hydraulic service centre.



## 6.1 TROUBLESHOOTING ROUTINES

### ROUTINE #1

Attach hoses to pump and tool in the normal manner. Press the advance button and hold it down. If the pump pressure builds and the hoses "flex" but the tool still refuses to cycle, the problem is most likely a loose or defective coupling connection. To find out where the bad coupling is, remove the tool from the hoses and marry the loose ends together and cycle the pump. If the gauge pressure reads no more than 500 PSI, then the bad fitting is on the tool. A significantly greater pressure indicates that the problem is in either the pump or a hose fitting.

### ROUTINE #2

Remove screws from pump motor to reservoir, slide pump motor to the back while keeping pistons into oil. Turn pump on. If you have no oil coming out from the solenoid tube, change the solenoid. Tight the regulating valve to maximum, Push on the advance button and while holding down, look if any oil is coming out from the regulating tube. If oil is coming out, change the regulating valve.

### ROUTINE #3

Remove tool from hoses. Cycle pump. If pump fails to build pressure, the problem is with the pump. If it does build pressure, the problem is with hydraulic blow-by in the tool.

### ROUTINE #4

THIS TEST SHOULD BE RUN PRIOR TO EVERY USE OF AN ATLAS COPCO TOOL.

Connect the tool, pump and hoses together as normal. Cycle the pump several times. Cycle the system once more and observe the sequence of operation. As you depress the advance button, the tool drive shroud turn about 24 degrees and you should hear an audible "click". You will also notice that the disengagement levers will move to the rear of the tool and spring forward. At this point, release the advance button. You should see no further movement and after a moment you will hear another audible "click". This is how the tools are designed to operate. If you observe any other sequence of operation, the system is out of order and cannot deliver more than 10% of its designed capacity. Take immediate corrective action. For reference, tools and pumps are designed from the factory plumbed as follows. This ensures that the tool, pump and ONE hose cannot possibly be connected up incorrectly.

TOOL	Advanced Side-Male	HOSE	Advance side- Female to Female	PUMP	Advance side-Male
	Retract side-Female		Retract Side-Male to Male		Retract Side-Female

*Note that connecting two (or any even numbers) of hoses together creates "one" hose which is plumbed backwards! Male to Female and Female to Male. This will cause the system to operate backwards per Test #5 above. If your hose isn't long enough, connect 3 hoses together, move your pump or call Atlas Copco for a longer hose assembly.*

SYMPTOM	PROBABLE CAUSE	REQUIRED ACTION
Gauge shows pressure build-up but the tool will not cycle	Couplings are loose or not working Solenoid is not working	Tighten and/or replace couplings. Use Test #1 to isolate problem Use test #2. if not working replace solenoid
Cylinder will not retract	<ol style="list-style-type: none"> <li>See above.</li> <li>Voltage to electric pump is too low to line drop or inadequate amperage is available.</li> <li>Linkage between piston rod and drive pawl are broken.</li> </ol>	<ol style="list-style-type: none"> <li>See above.</li> <li>Get shorter extension cord or upgrade to 12AWG, 25 amp rating or better. If shop power is adequate, draw power from welding machine or cal rod transformer.</li> <li>Replace parts as necessary.</li> </ol>
Cylinder pressure will not build	<ol style="list-style-type: none"> <li>Oil blow by in tool (Piston seal leak, blown O-ring, cracked piston)</li> <li>Pump Problem.</li> </ol>	<ol style="list-style-type: none"> <li>Replace defective parts. SHOP JOB</li> <li>Remove screws from pump motor to reservoir, slide pump motor to the back while keeping pistons into oil. Turn pump on. If you have no oil coming out from the solenoid tube, change the solenoid.</li> <li>2A. Tight the regulating valve to maximum, Push on the advance button and while holding down, look if any oil is coming out from the regulating tube. If oil is coming out, change the regulating valve.</li> <li>2B If pump sounds like a lot of pebbles in a tin can, the problem may be a worn motor coupling-remove motor from base plate-using a pair of needle nose pliers removes the motor coupling-if worn replace. SHOP JOB.</li> <li>2C AIR PUMP-Fault FLR due to excessive moisture and/or dirt in air supply. Disassemble and change. SHOP JOB.</li> <li>2D. Air pumps- Faulty remote control vv valve cartridge. Replace.</li> </ol>
Cylinder/tool leaks	<ol style="list-style-type: none"> <li>Safety relief valve on swivel has lifted.</li> <li>Blown O-ring in cylinder.</li> <li>Defective gland seal.</li> </ol>	<ol style="list-style-type: none"> <li>1A Tighten all hose and couplers. If leak continues, adjust safety setting – Test #4.</li> <li>1B Check to see if the system is properly plumbed by running test #5 (high pressure on retract side will lift the safety relief valve).</li> <li>2. Replace O-Ring with proper high pressure O-Ring. SHOP JOB.</li> <li>3. Replace gland seal. SHOP JOB.</li> </ol>
Tool operates backwards	<ol style="list-style-type: none"> <li>Couplings reversed.</li> <li>Multiple hoses in even numbers.</li> </ol>	<ol style="list-style-type: none"> <li>Run test #5. Replumb system as necessary.</li> <li>As plumbed, Atlas Copco hoses may only be joined together in odd numbers ONLY if it is necessary to use 2, 4, 6 hoses-make an adapter from spare high pressure couplings and nipples.</li> </ol>
Ratchet returns with retract stroke	<ol style="list-style-type: none"> <li>Broken or otherwise inoperable reaction pawl.</li> </ol>	
Ratchet will not take successive strokes.	<ol style="list-style-type: none"> <li>Broken or otherwise inoperative drive pawl or spring.</li> <li>Cylinder not retracting completely. Ratchet will not take successive strokes.</li> <li>Linkage between piston rod and drive plates is broken.</li> </ol>	<ol style="list-style-type: none"> <li>Replace drive pawl and/or spring. SHOP JOB.</li> <li>Remove tool from nut and cycle freely for several strokes. If problem persists, check pawls.</li> <li>2A Operator not allowing adequate time for cylinder to retract fully</li> <li>3. Replace parts as necessary -SHOP JOB.</li> </ol>
Tool locks onto nut.	<ol style="list-style-type: none"> <li>Reaction pawl is loaded when the tool is maxed out in torque.</li> <li>Tool is operating backwards.</li> <li>Tool is wedged under a fixed object.</li> </ol>	<ol style="list-style-type: none"> <li>Press advance button on remote and build pressure-continue to press down on remote while pulling back on one of the disengagement levers- release remote while continuing to hold back on levers.</li> <li>Push advance button down-tool should immediately fall free- Run test #5.</li> <li>Remove shroud from around ratchet. Using any tool available, pry the drive pawl out of the ratchet and at the same time pull back on the disengagement levers. Tool should swing free or turn away the socket or obstruction.</li> </ol>
Gauge records no pressure	<ol style="list-style-type: none"> <li>Gauge connection is loose.</li> <li>Bad gauge.</li> <li>Pump will not build pressure.</li> </ol>	<ol style="list-style-type: none"> <li>Tighten coupling.</li> <li>Replace gauge.</li> <li>See cylinder will not build pressure above.</li> <li>Replace defective seals. SHOP JOB.</li> </ol>

SYMPTOM	PROBABLE CAUSE	REQUIRED ACTION
	4. Tools seals are blown.	
Pump will not build pressure.	<ol style="list-style-type: none"> <li>1. Air Electric supply is low.</li> <li>2. Defective relief or regulator valve.</li> <li>3. Low oil or clogged filter.</li> <li>4. Internal leak in oil line from external relief valve to pump body.</li> <li>5. Defect Solenoid or regulating valve.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check air pressure or voltage.</li> <li>2. Replace valve. SHOP JOB.</li> <li>3. Fill reservoir and clean filter.</li> <li>4. Open reservoir, inspect oil line while trying to build pressure- if leaking tighten fittings or replace.</li> <li>5. See "Cylinder will not build pressure-#2 above"</li> </ol>
Motor sluggish and inefficient "sounds sick" slow to build pressure.	<ol style="list-style-type: none"> <li>1. Air or electric supply is low.</li> <li>2. Clogged filter.</li> </ol>	<ol style="list-style-type: none"> <li>1. See #1 in preceding block</li> <li>2. Clean or replace filter</li> </ol>
Pump heats up.	<ol style="list-style-type: none"> <li>1. Improper use.</li> <li>2. Remote control is left in "on" position when pump is not actively in use.</li> </ol>	<ol style="list-style-type: none"> <li>1. Operator is continuing to hold down on the advance stroke after the cylinder has reached end of stroke- this causes a lot of oil to go through a very small hole in relief-valve- causing heat build-up. Have operator release advance stroke after disengagement levers spring forward.</li> <li>2. Turn pump off whenever not actually being used. DO NOT leave pump running when tool is not in use.</li> </ol>
Pump cannot reach 10,000 psi, only 9,000psi	1. Change regulating valve Part# 10006	IA. Remove 3 screws of 4 port block manifold IB. Remove regulating valve #10006 IC. Replace new regulating valve #10006 ID. Don't forget metal ring IE. Check o'rings on block manifold IF. Replace block manifold IG. Place 1 drop of loctite on each screw IH. Tighten screws firmly - double check screws are fully tightened.
Pressure can't reach 4,000 psi	1. Change cut off valve(s) Part# 10011	IA. Remove the pump from tank IB. Change cut-off valves 3,250 psi /70 bar 90% Chance pump is working IC. If pump can't get 10,000 psi change cut-off valve 1,250 psi/350 bar
Pressure not stable (big variation)	1. Change solenoid Part# 10065 (115v) Part# 10066 (220v)	IA. Remove top solenoid IB. Replace new top solenoid IC. Check o'rings
Pressure not stable (small variation)	1. Change check valves Part# 20374 Need special tooling Part#	IA. Remove the pump from tank IB. Replace check valve IC. Do not tight too much
No pressure	1. Check piping	IA. Remove the pump from tank or Check piping couplers IB. Check t-coupler inside the pump
Uncontrolled pressure	1. Check coupling Part#10190	IA. Remove the pump from the tank IB. Remove piping IC. Remove block pump (screws# 20444) ID. Check attentively coupling IE. Do not forget to replace keys(part #10184)
	2. Check pumps Part# 10168-10169-10170	2A. Remove the pump from the tank 2B. Untighten pump's screws 2C. Check seals 2D. Replace 2E. Tighten firmly

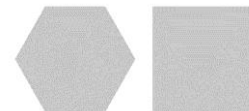
<b>SYMPTOM</b>	<b>PROBABLE CAUSE</b>	<b>REQUIRED ACTION</b>
Motor doesn't run	<ol style="list-style-type: none"> <li>1. Check fuse 16 a Part# 10064</li> <li>2. Check electrical box</li> <li>3. Check 115v cord</li> <li>4. Check plug</li> <li>5. Check remote control</li> </ol>	<ol style="list-style-type: none"> <li>1. Change fuse 16 a (white - on top)</li> <li>2. Check for disconnection</li> <li>3. Check for wire cut or disconnect</li> <li>4. Check for wire disconnect</li> <li>5. Check for wire disconnect</li> </ol>
Motor start difficult	<ol style="list-style-type: none"> <li>1. Bearing Part#10198 &amp; 10178</li> <li>2. Remote control handswitch small white plastic support</li> </ol>	<ol style="list-style-type: none"> <li>IA. Remove the pump from the tank</li> <li>IB. Remove block pump</li> <li>IC. Disassemble block pump</li> <li>ID. Change bearing</li> </ol> <ol style="list-style-type: none"> <li>2A. Open the handswitch 2B. Replace small plastic parts</li> </ol>
Blown fuses when starting	<ol style="list-style-type: none"> <li>1. Check if fuse 16 a is blown Part# 10064</li> </ol>	<ol style="list-style-type: none"> <li>1A. To avoid the problem don't run motor If hydraulic hose are not connected</li> </ol>
Hose or tool fitting is damaged or leaks.	<ol style="list-style-type: none"> <li>1. Broken or melted plastic outer covering.</li> <li>2. Frayed plastic strands.</li> <li>3. Oil leaks through fibres.</li> <li>4. Broken fittings.</li> </ol>	<ol style="list-style-type: none"> <li>1. If underlying plastic is still intact continue operation. Inspect frequently.</li> <li>2. Cut hose in half and discard. Replace hose.</li> <li>3. Cut hose in half and discard. Replace hose.</li> <li>4. Remove old fitting and replace with STEEL high pressure fittings only. After changing fittings, always run test #5 to insure proper plumbing.</li> </ol>
Electric pump will not run	<ol style="list-style-type: none"> <li>1. Loose electric connections in control box.</li> <li>2. Motor burned up.</li> <li>3. Fuse</li> </ol>	<ol style="list-style-type: none"> <li>1. Open control box and visually inspect for loose threaded or push-on connectors.</li> <li>2. Replace motor components whichever is necessary. SHOP JOB.</li> <li>3. Change defect fuse</li> </ol>

## 7.1 SQUARE / ALLEN DRIVE WORKING TORQUE

DRIVE SIZE: The square or hex drive of each drive is limited in its maximum output by its material and its engagement area. Since Atlas Copco uses a specially suited alloy-steel for its drive members, the following maximum torque output can be achieved without drive failure, provided the reaction member abuts close to the same plane as the nut to be turned.

If the reaction arm cannot abut on the same plane as the nut to be turned, less torque should be applied, as the additional side load has to be taken into consideration. When torque requirements are close in excess of the values listed above, use RT's/-9/ Sockets Hex-Drive with replaceable Hex Insert Bits.

RT series is available with square drive (standard) or option hexagonal/Allen drive. The table below reviews ideal working range for the respective drives.



in	DRIVE TYPE	MAX WORKING TORQUE		PROBABLE FAILURE	
		ft lbs	Nm	ft lbs	Nm
1/2"	Hex	353	478	392	531
1/2"	Square	367	497	408	553
5/8"	Hex	689	934	766	1038
3/4"	Hex	1191	1614	1324	1794
3/4"	Square	1239	1679	1377	1865
7/8"	Hex	1892	2565	2102	2848
1"	Hex	2824	3827	3138	4252
1"	Square	2937	3980	3263	4422
1-1/8"	Hex	4021	5448	4468	6054
1-1/4"	Hex	5516	7474	6129	8304
1-3/8"	Hex	7341	9948	8157	11053
1-1/2"	Hex	9531	12915	10590	14350
1-1/2"	Square	9912	13432	11014	14924
1-5/8"	Hex	12118	16420	13465	18245
1-3/4"	Hex	15135	20508	16817	22787
1-7/8"	Hex	18616	25224	20684	28027
2"	Hex	22593	30613	25103	34015
2-1/4"	Hex	32168	43588	35742	48431
2-1/2"	Hex	44126	59791	49029	66435
2-1/2"	Square	45891	62183	50990	69092

DRIVE SIZE	DRIVE TYPE	MAX WORKING		PROBABLE	
		TORQUE		FAILURE	
		ft lbs	Nm	ft lbs	Nm
mm					
12mm	Hex	298	404	331	449
17mm	Hex	847	1147	941	1275
19mm	Hex	1182	1602	1313	1780
22mm	Hex	1835	2486	2039	2763
24mm	Hex	2382	3228	2647	3587
27mm	Hex	3392	4596	3769	5107
32mm	Hex	5647	7652	6275	8502
36mm	Hex	8040	10895	8934	12105
41mm	Hex	11878	16094	13197	17882
46mm	Hex	16774	22730	18638	25255
50mm	Hex	21542	29190	23935	32433



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