



RT, RTX & HYDRAULIC PUMPS

USER GUIDE & SPARE PARTS MANUAL

SECTION I

IMPORTANT SAFETY INSTRUCTIONS

 **WARNING:** SAFETY NOTICE FOR OPERATION OF HYDRAULIC TORQUE TOOLS: CLEAR AND UNOBSTRUCTED COMMUNICATION BETWEEN THE TWO. DO NOT PLACE

GENERAL SAFETY

- READ ALL INSTRUCTIONS before using the equipment.
- KEEP WORK AREA CLEAN
- STORE IDLE TOOLS When not in use, tools and accessories should be properly stored to avoid deterioration.
- PROPER SAFETY ATTIRE When handling / operating hydraulic equipment, use work gloves, safety glasses, hard hats, safety shoes, hearing protection and other applicable clothing.
- STAY ALERT. Watch what you are doing. Use common sense. Do not use power equipment under the influence of any mood altering substances.

GENERAL USE PRECAUTIONS

- ALWAYS USE QUALITY ACCESSORIES. Always use top quality impact sockets in good condition which are the correct size and fully engage the nut. Hidden flaws, however, remain a possibility which could cause breakage, so stay clear of sockets during operation.
- DO NOT USE FORCE. Do not hammer on socket or tool to enhance performance. If the nut will not turn with the wrench you are using, use a larger size Rapid-Torc tool.
- MOVING EQUIPMENT Do not use Hydraulic Hoses, Swivels, Pump power or remote cords as means of moving the equipment.
- USE THE RIGHT TOOL Don't force small tools or attachments to do the job of a larger tool. Don't use a tool for purposes not intended.

PUMP SAFETY PRECAUTIONS

- CONSIDER WORK AREA ENVIRONMENT Electrical Pumps should NEVER be used in a potentially volatile environment. If there is any doubt, use an air pump. Also Note: metal contact can cause sparks, therefore precautions should be taken.
- AVOID PREMATURE TOOL STARTING The Pump Remote Control is for the TOOL OPERATOR only. If possible, avoid separate pump and tool operators.
- GUARD AGAINST ELECTRIC SHOCK. Ensure the pump is properly grounded and the proper voltage is being used.
- DO NOT USE KINKED HOSES. Inspect and replace if damaged.

TOOL OPERATION PRECAUTIONS

- MAINTAIN TOOLS WITH CARE For top performance, inspect tool, power pack, hoses, connectors, electric lines and accessories for visual damage, frequently. Always follow instructions for proper tool and pump maintenance. Refer to the Operations Maintenance Section for further clarification.

SECTION I

IMPORTANT SAFETY INSTRUCTIONS

ONE PERSON SHOULD OPERATE BOTH THE PUMP AND THE TOOL, UNLESS THERE IS HAND NEAR ACTION OR REACTION POINTS.

- **SHROUDS AND COVERPLATES.** All tools are equipped with shrouds and/or cover plates to cover up moving internal parts. Do not use without shrouds. Contact your local Rapid-Torc technician to fix.
- Ensure that all hydraulic connections are securely connected. Verify that the hydraulic hoses are not kinked. Ensure the square drive retainer is fully and securely engaged on the square drive. Secure the Impact Socket to the square drive. Use only High Quality Impact Sockets.
- Be sure the reaction arm lever is fully engaged. Be sure the hydraulic hoses are free of the reaction points. Pressurize the system for a test; if the tool tends to “ride up” or to “creep”, stop and re-adjust the reaction arm to a more solid and secure position.

REACTION POINT PRECAUTIONS

- **REACTION ARM.** Proper reaction is required. Adjust reaction arm in the same direction than the square drive if possible. Avoid excessive play. In case of questions, consult with your local Rapid-Torc office.
- **STAY CLEAR DURING OPERATION** In most cases, the tool will allow “hand-free” operation. If the tool must be held or steadied during operation, use alternative means of securing the tool to the application.
- **NOTE:** Remain clear of the reaction arm during operation and never put body parts between reaction arm and reaction surface.

THANK YOU FOR BUYING RAPID-TORC !

You are now in possession of one of the best quality hydraulic torque wrench of the worldwide market.

The RAPID-TORC tool is the result of decades of refinement in the bolting technology to make it the best of the worldwide market. This manual is designed to provide you with the basic knowledge required to operate and maintain your RAPID-TORC tool. Please read this manual carefully and follow the instructions provided. If you have any questions regarding your RAPID-TORC tool, please call us directly at (281)448-5900 or send a fax at (281)260-0779.

Your purchase of this RAPID-TORC tool entitles you to the following FREE services:

- **Free on-site training in the application and operation of your RAPID-TORC equipment.**
- **Free engineering assistance.**
- **Free loaner tools in case of failure during the warranty.**

Your local RAPID-TORC distributor is informed of the delivery of your equipment. Should you require immediate training, please feel free to call us directly to arrange an appointment with you at your convenience.

Again, thank you and welcome to RAPID-TORC!

WORLD-WIDE WARRANTY

RAPID-TORC equipment is engineered to the latest technological standards and is accompanied by a 12 month warranty.

If RAPID-TORC equipment cannot be repaired on site, FREE loaner equipment will be made available to you upon request (within the limits of the available stock).

RAPID-TORC CORPORATION OR ITS DEALERS SHALL NOT BE LIABLE FOR LOSS OF PRODUCTS OR OTHER INCIDENTAL OR CONSEQUENTIAL COSTS INCURRED BY THE BUYER OR THE USER.

SECTION II

INSTRUCTIONS BEFORE USE

READ CAREFULLY: Most malfunctions in new equipment are the result of improper operation and/or set-up.

PREPARATION: Remove Your Rapid-Torc Machine from shipping container.

INSPECTION: Visually inspect all components for shipping damage. If any damage is found, notify carrier immediately.

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

Rapid-Torc 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.

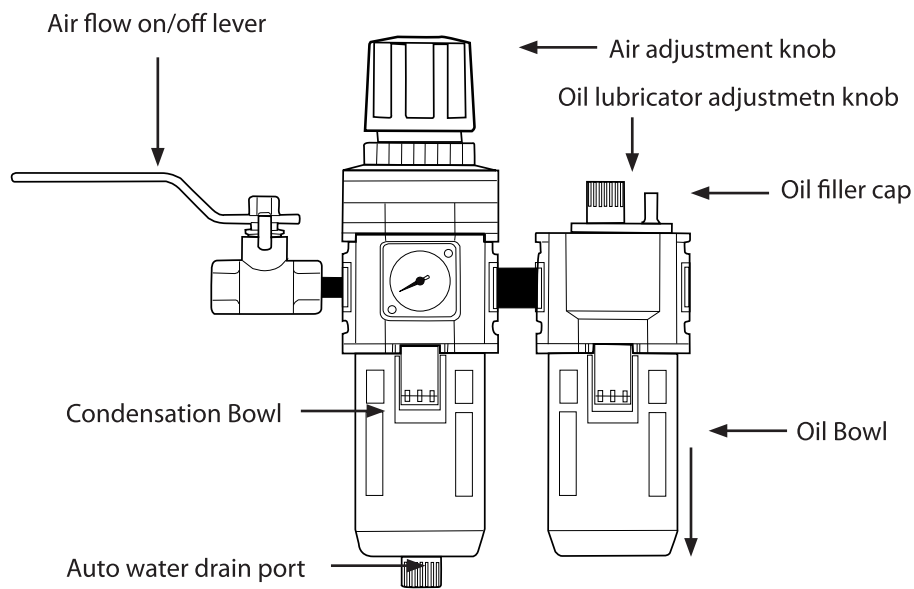
2.4 AIR CONNECTIONS

Ensure that you have sufficient air flow (58 up to 100 PSI / 4 up to 7 bar) to operate you 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. See page 6 for a diagram of the F.R.L.

SECTION II

INSTRUCTIONS BEFORE USE



3:1 GENERAL

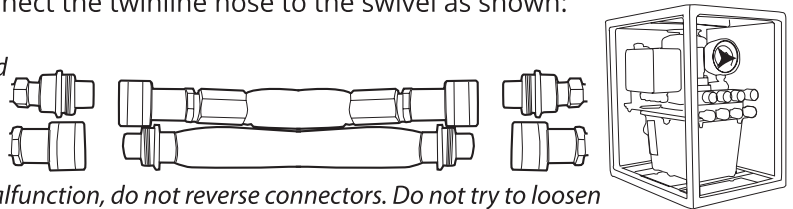
All Rapid-Torc Machines are supplied completely assembled, ready for use. A Rapid-Torc Hydraulic Power Pack, for use with your Rapid-Torc machine, is recommended to provide the speed, pressure and portability that make your Rapid-Torc System efficient and accurate.

The accuracy of your Rapid-Torc Machine is $\pm 3\%$ based upon our manufacturer's specifications. This accuracy is certified through calibration tests conducted by Rapid-Torc 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 Rapid-Torc® certified gauges (with a class 1 accuracy) to enhance the accuracy your torquing system.

3:2 CONNECTING THE SYSTEM

The Rapid-Torc Machine and the Power Pack are connected by a 10,000 PSI (700 bar) operating pressure twinline hose assembly. The safety ratio of the Rapid-Torc 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:

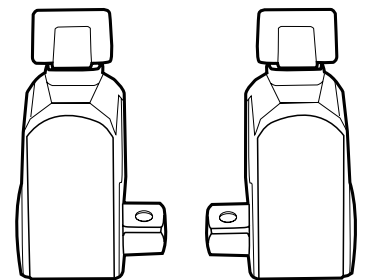
IMPORTANT: Ensure connectors are fully engaged and screwed snugly together. Never use two twin hydraulic hoses between Pump and Machine. If so, you have the high pressure on the retract side and your machine is no able to work properly. To avoid tool malfunction, do not reverse connectors. Do not try 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 RAPID-TORC® RT SERIES SQUARE DRIVE DRIVE DIRECTION CHANGE

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.



RIGHT = TIGHT

LEFT = LOOSE

REACTION ARM

All Rapid-Torc Machines 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 Rapid-Torc Reaction Arm is made of Special Aircraft Alloy and is 360° adjustable.

SECTION III

OPERATION

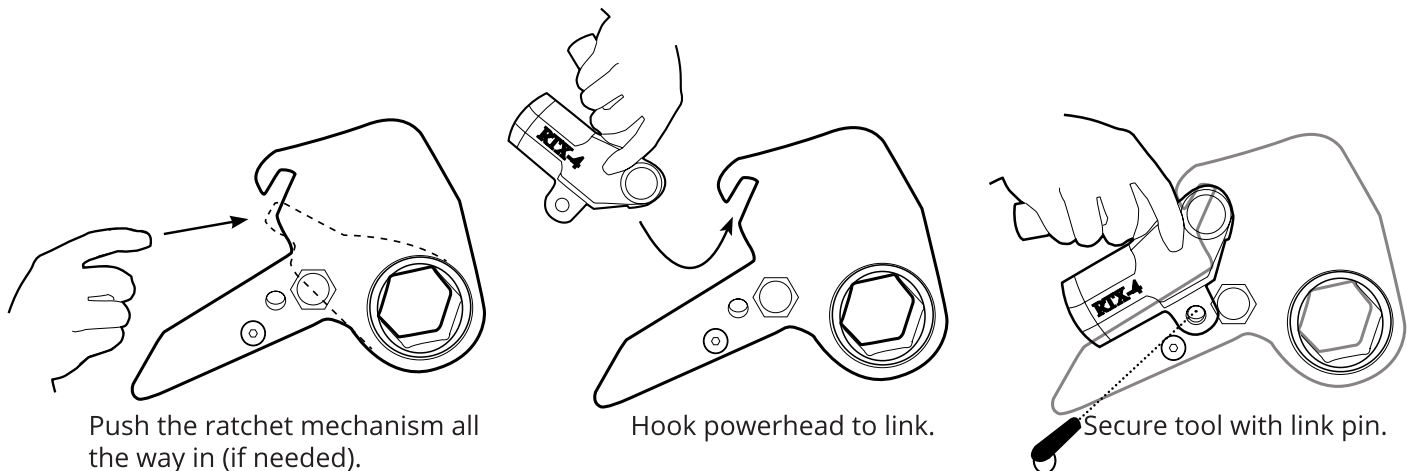
NOTE: The standard Rapid-Torc reaction arm cannot be welded on and should not be modified.

The reaction arm for all Rapid-Torc 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.

NOTE: The standard Rapid-Torc reaction arm cannot be welded on and should not be modified. The reaction arm for all Rapid-Torc 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). Double check the full engagement.

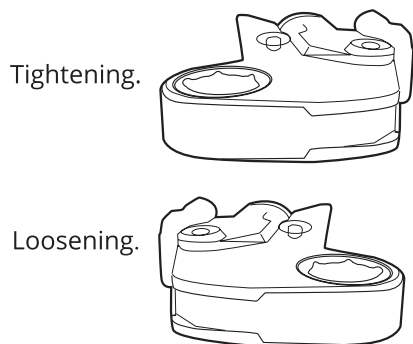
3:4 OPERATING THE RTX LOW CLEARANCE TOOL INSERTING THE RATCHET LINK

The “hook” described by the link’s Side Plates is inserted around the fixed pin of the power head, and the link is swung down to rest along the base of the power head cylinder. At this point, the link pin hole of the power head and link will align. Insert the link pin to secure.



Select the appropriate size low clearance ratchet link and insert it into the tool. Tool operation, bolt tightening and loosening, is the same as the square drive tool except for the use of the reaction arm.

The RTX low clearance ratchet links are supplied complete with a long reaction block. This reaction block is designed to react against an adjacent nut on most normal flange type applications. Prior to operating the tool, place the tool with the low clearance link on the nut to be tightened/loosened.



If the reaction block abuts against an adjacent nut or to some other secure stationary object, then use of the reaction block is appropriate. If, however, bolt spacing is such that the reaction block does not reach the adjacent bolt, use of the short reaction arm is indicated. This will allow reaction to be taken against the side of the flange. To attach the short reaction arm, remove the standard link retaining pin, align with the holes of the short reaction arm with those of the reaction block and insert the long retaining pin to secure. Ensure that the arm extends in the appropriate direction: right for tightening; left for loosening.

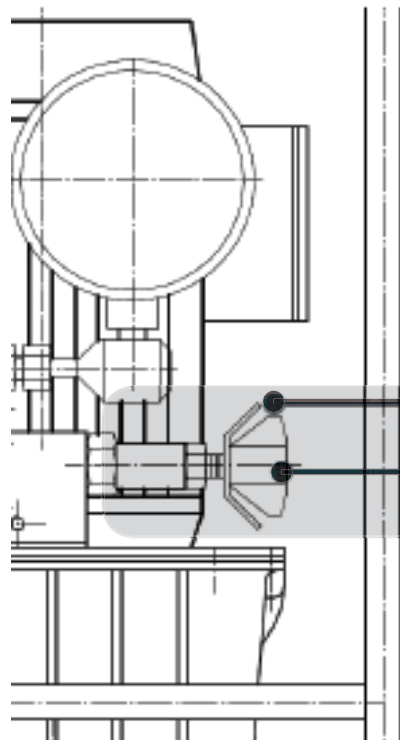
3:5 SETTING TORQUE

- 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. A complete copy of the chart appears in Section VII.

An example of finding the desired torque required is as follows:

1. Assume you are going to use a Rapid-Torc tool to torque a 1-1/4" bolt to 1,265 ft lbs.
2. Start by going to the chart above and read left-to-right across the top line (Starts out PSI and go to the right tool model etc) Ex: RT-3
3. Read straight down to the number closest to 1,265 ft lbs, which in this case is 1,280-about 1.5% over the targeted torque value.
4. Now using 1,280 ft lbs, read back to the left on that same line and read the pump pressure, under the PSI column, 4,000PSI.
5. To be technically correct, you should diminish that 4,000PSI by 1.5% (to 3,940), but 1,280 is well within the tool's +/-3% accuracy range, so proceed to set 4,000PSI on your pump's regulator valve.

3:6 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.

SECTION III

OPERATION

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.

3:7 APPLYING THE TORQUE MACHINE-TIGHTENING

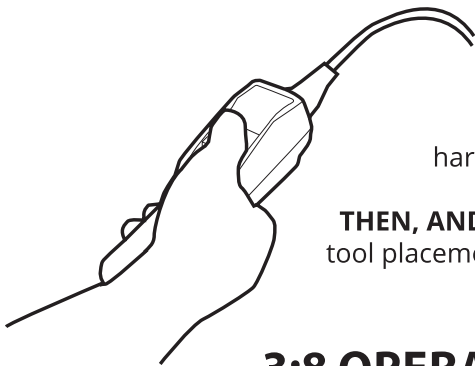
Having set your target pressure, cycle the tool three or four times to full pressure. Cycling the tool ensures that the system is operating properly and removes trapped air, if any.

FOR RT

1. For RT Square Drive, place the proper size impact socket on the square drive and secure properly with a locking ring and pin.
2. Place the tool and the socket on the nut, making sure that the socket has fully engaged the nut. Further ensure that the drive retainer is engaged.

FOR RTX

1. For RTX low profile tool, choose the appropriate hex size (Rapid-Torc has inserts available to quickly reduce the hex size).
2. Place RTX hex making sure that the hex has fully engaged the nut.



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.

3:8 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 buildup 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.

3:9 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 Rapid-Torc 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 Rapid-Torc 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.

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 as 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.

SECTION IV

RAPID-TORC® POWERPACKS

- 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 Rapid-Torc 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 RAPID-TORC OPERATION and SETTING TORQUE prior to installing the torque wrench onto the application

Your Rapid-Torc 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.

PANTHER Pump with an Automatic system: To run the automatic, simply keep pushing the blue button until you reach the final pressure.

NOTE: Do not use the automatic button to set the pressure.

5.1 TORQUE MACHINES

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 Rapid-Torc tools may be made by reasonably experienced individuals according to the aforementioned instructions. Otherwise, please contact Rapid-Torc 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.

5.2 POWERPACKS

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

- **Hydraulic Oil:** 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 air line 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 Rapid-Torc or by a qualified hydraulic service center.

SECTION V

TROUBLE SHOOTING

TEST #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.

TEST #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.

TEST #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.

TEST #4

Connect tool, pump and hoses together normally and turn pump "on". As oil leaks from the small port under the wivel, use a proper size Allen wrench and slowly tighten (clockwise) the set screw positioned between the couplings on the swivel. Continue to tighten until the flow stops plus a quarter turn.

TEST #5

THIS TEST SHOULD BE RUN PRIOR TO EVERY USE OF A RAPID-TORC 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". On square drive tools, you will also notice that the accuracy assurance 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 possible be connected up incorrectly.

TOOL	Advanced Side-Male	HOSE	Advance side- Female to Fe- male	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 you hose isn't long enough, connect 3 hoses together, move your pump or call RAPID-TORC for a longer hose assembly.

SECTION V

TROUBLESHOOTING

SYMPTOM	PROBABLE CAUSE	REQUIRED ACTION
Gauge shows pressure build-up but the tool will not cycle	<ol style="list-style-type: none"> 1. Couplings are loose or not working 2. Solenoid is not working 	<ol style="list-style-type: none"> 1. Tighten and/or replace couplings. Use Test #1 to isolate problem 2. Use test #2 . if not working replace solenoid
Cylinder will not retract	<ol style="list-style-type: none"> 1. See above. 2. Voltage to electric pump is too low to line drop or inadequate amperage is available. 3. Linkage between piston rod and drive pawl are broken. 	<ol style="list-style-type: none"> 1. See above. 2. 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. 3. Replace parts as necessary.
Cylinder pressure will not build	<ol style="list-style-type: none"> 1. Oil blow by in tool (Piston seal leak, blown O-ring, cracked piston) 2. Pump Problem. 	<ol style="list-style-type: none"> 1. Replace defective parts. SHOP JOB 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. 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. 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. 2C AIR PUMP-Fault FLR due to excessive moisture and/or dirt in air supply. Disassemble and change. SHOP JOB. 2D. Air pumps- Faulty remote control vv valve cartridge. Replace.
Cylinder/tool leaks	<ol style="list-style-type: none"> 1. Safety relief valve on swivel has lifted. 2. Blown O-ring in cylinder. 3. Defective gland seal. 	<ol style="list-style-type: none"> 1A Tighten all hose and couplers. If leak continues, adjust safety setting-Test#4. 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). 2. Replace O-Ring with proper high pressure O-Ring. SHOP JOB. 3. Replace gland seal. SHOP JOB.
Tool operates backwards	<ol style="list-style-type: none"> 1. Couplings reversed. 2. Multiple hoses in even numbers. 	<ol style="list-style-type: none"> 1. Run test #5. Replumb system as necessary. 2. As plumbed, Rapid-Torc 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.
Ratchet returns with retract stroke	<ol style="list-style-type: none"> 1. Broken or otherwise inoperable reaction pawl. 	
Ratchet will not take successive strokes.	<ol style="list-style-type: none"> 1. Broken or otherwise inoperative drive pawl or spring. 2. Cylinder not retracting completely. Ratchet will not take successive strokes. 3. Linkage between piston rod and drive plates is broken. 	<ol style="list-style-type: none"> . Replace drive pawl and/or spring. SHOP JOB. 2. Remove tool from nut and cycle freely for several strokes. If problem persists, check pawls. 2A Operator not allowing adequate time for cylinder to retract fully 3. Replace parts as necessary -SHOP JOB.

SECTION V

TROUBLE SHOOTING

SYMPTOM	PROBABLE CAUSE	REQUIRED ACTION
Tool locks onto nut.	<ol style="list-style-type: none"> 1. Reaction pawl is loaded when the tool is max'd out in torque. 2. Tool is operating backwards. 3. Tool is wedged under a fixed object. 	<ol style="list-style-type: none"> 1. Press advance button on remote and build pressure- continue to press down on remote while pulling back on one of the accuracy assurance levers- release remote while continuing to hold back on levers. 2. Push advance button down-tool should immediately fall free- Run test #5. 3. Remove shroud from around ratchet. Using any tool available, try the drive pawl out of the ratchet and at the same time pull back on the accuracy assurance levers. Tool should swing free or burn away the socket or obstruction.
Gauge records no pressure	<ol style="list-style-type: none"> 1. Gauge connection is loose. 2. Bad gauge. 3. Pump will not build pressure. 4. Tools seals are blown. 	<ol style="list-style-type: none"> 1. Tighten coupling. 2. Replace gauge. 3. See cylinder will not build pressure above. 4. Replace defective seals. SHOP JOB.
Pump will not build pressure.	<ol style="list-style-type: none"> 1. Air Electric supply is low. 2. Defective relief or regulator valve. 3. Low oil or clogged filter. 4. Internal leak in oil line from external relief valve to pump body. 5. Defect Solenoid or regulating valve. 	<ol style="list-style-type: none"> 1. Check air pressure or voltage. 2. Replace valve. SHOP JOB. 3. Fill reservoir and clean filter. 4. Open reservoir, inspect oil line while trying to build pressure- if leaking tighten fittings or replace. 5. See "Cylinder will not build pressure-#2 above"
Motor sluggish and inefficient "sounds sick" slow to build pressure.	<ol style="list-style-type: none"> 1. Air or electric supply is low. 2. Clogged filter. 	<ol style="list-style-type: none"> 1. See #1 in preceding block 2. Clean or replace filter
Pump heats up.	<ol style="list-style-type: none"> 1. Improper use. 2. Remote control is left in "on" position when pump is not actively in use. 	<ol style="list-style-type: none"> 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 accuracy assurance levers spring forward. 2. Turn pump off whenever not actually being used. DO NOT leave pump running when tool is not in use.
Pump cannot reach 10,000 psi, only 9,000psi	<ol style="list-style-type: none"> 1. Change regulating valve Part# 10006 	<ol style="list-style-type: none"> 1A. Remove 3 screws of 4 port block manifold 1B. Remove regulating valve #10006 1C. Replace new regulating valve #10006 1D. Don't forget metal ring 1E. Check o'rings on block manifold 1F. Replace block manifold 1G. Place 1 drop of loctite on each screw 1H. Tighten screws firmly - double check screws are fully tightened.
Pressure can't reach 4,000 psi	<ol style="list-style-type: none"> 1. Change cut off valve(s) Part# 10011 	<ol style="list-style-type: none"> 1A. Remove the pump from tank 1B. Change cut-off valves 3,250 psi /70 bar <p>90% Chance pump is working</p> <ol style="list-style-type: none"> 1C. If pump can't get 10,000 psi change cut-off valve 1,250 psi/350 bar
Pressure not stable (big variation)	<ol style="list-style-type: none"> 1. Change solenoid Part# 10065 (115v) Part# 10066 (220v) 	<ol style="list-style-type: none"> 1A. Remove top solenoid 1B. Replace new top solenoid 1C. Check o'rings

SECTION V

TROUBLESHOOTING

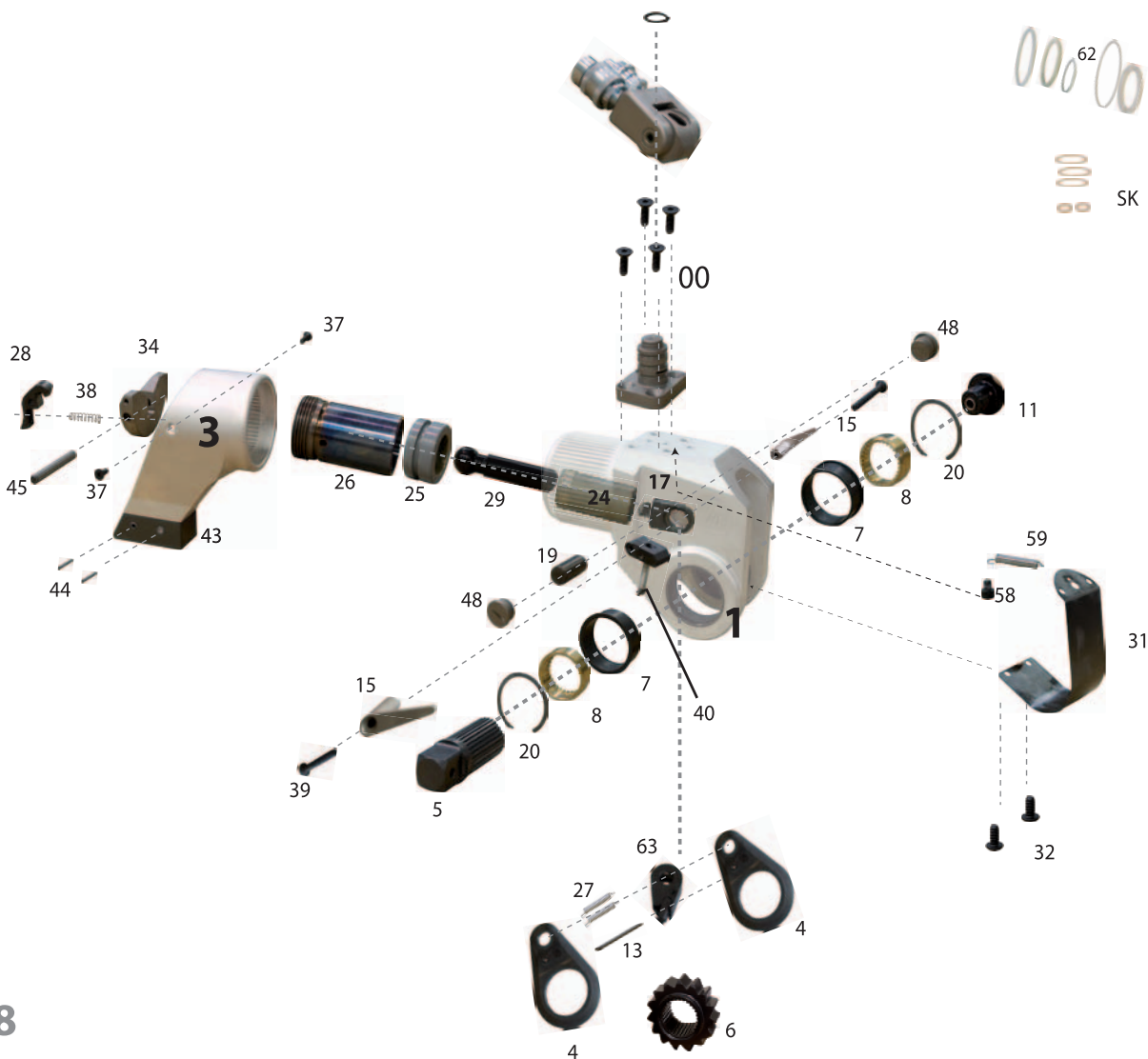
SYMPTOM	PROBABLE CAUSE	REQUIRED ACTION
Pressure not stable (small variation)	1. Change check valves Part# 20374 Need special tooling Part#	1A. Remove the pump from tank 1B. Replace check valve 1C. Do not tight too much
No pressure	1. Check piping	1A. Remove the pump from tank or Check piping couplers 1B. Check t-coupler inside the pump
Uncontrolled pressure	1. Check coupling Part#10190 2. Check pumps Part# 10168-10169-10170	1A. Remove the pump from the tank 1B. Remove piping 1C. Remove block pump (screws# 20444) 1D. Check attentively coupling 1E. Do not forget to replace keys(part #10184) 2A. Remove the pump from the tank 2B. Untight pump's screws 2C. Check seals 2D. Replace 2E. Tight firmly
Motor doesn't run	1. Check fuse 16 a Part# 10064 2. Check electrical box 3. Check 115v cord 4. Check plug 5. Check remote control	1. Change fuse 16 a (white - on top) 2. Check for disconnection 3. Check for wire cut or disconnect 4. Check for wire disconnect 5. Check for wire disconnect
Motor start difficult	1. Bearing Part#10198 & 10178 2. Remote control handswitch small white plastic support	1A. Remove the pump from the tank 1B. Remove block pump 1C. Disassemble block pump 1D. Change bearing 2A. Open the handswitch 2B. Replace small plastic parts
Blown fuses when starting	1. Check if fuse 16 a is blown Part# 10064	1A. To avoid the problem don't run motor If hydraulic hose are not connected
Hose or tool fitting is damaged or leaks.	1. Broken or melted plastic outer covering. 2. Frayed plastic strands. 3. Oil leaks through fibres. 4. Broken fittings.	1. If underlying plastic is still intact continue operation. Inspect frequently. 2. Cut hose in half and discard. Replace hose. 3. Cut hose in half and discard. Replace hose. 4. Remove old fitting and replace with STEEL high pressure fittings only. After changing fittings, always run test #5 to insure proper plumbing.
Electric pump will not run	1. Loose electric connections in control box. 2. Motor burned up. 3. Fuse	1. Open control box and visually inspect for loose threaded or push-on connectors. 2. Replace motor components whichever is necessary. SHOP JOB. 3. Change defect fuse

SECTION VI

DISASSEMBLY

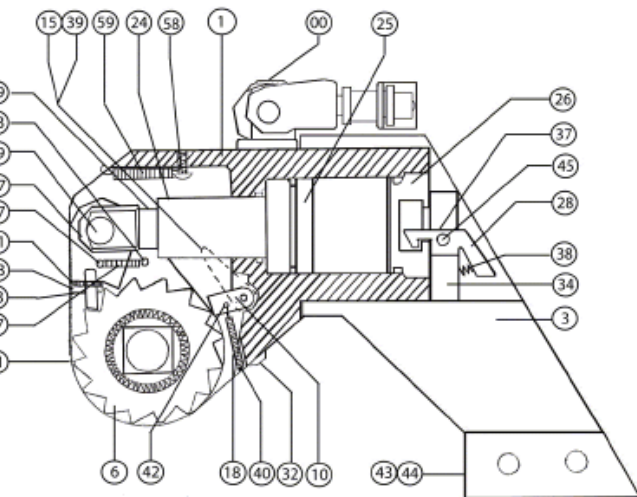
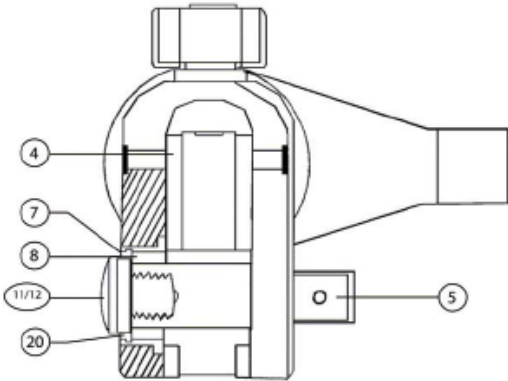
RT SQUARE DRIVE TOOL

1. Make sure the tool is fully retracted.
2. Remove the reaction arm.
3. Remove shroud by removing the two button head cap screws at the base of the housing. Unhook the spring.
4. Remove square drive (#5) by pressing the drive retainer while unscrew it or pressing center button of drive retainer (#11) while pulling square drive out of tool.
5. Remove the 2 square drive sleeves (#8). Remove retaining rings on outside of edge of drive sleeve and slide drive sleeves out.
6. Carefully remove Access Plugs (#48) to uncover housing access holes.
7. Line up rod pin (#19) with access holes in housing and punch rod pin through housing.
8. Remove ratchet(#6), 2 drive plates(#4), and drive pawl assembly (#63)
9. Remove screw from each lever (#15), and pull levers out of housing.
10. Remove the reaction pawl (#10) along with the reaction pawl spring (#18).
11. Using our special spanner tool, unscrew the cylinder end cap.(#26)
12. Remove the piston rod assembly which consists of parts (17, 24, 25, 29) by tapping connector rod (#17) with a punch and a hammer through the cylinder.



SECTION VI

DISASSEMBLY



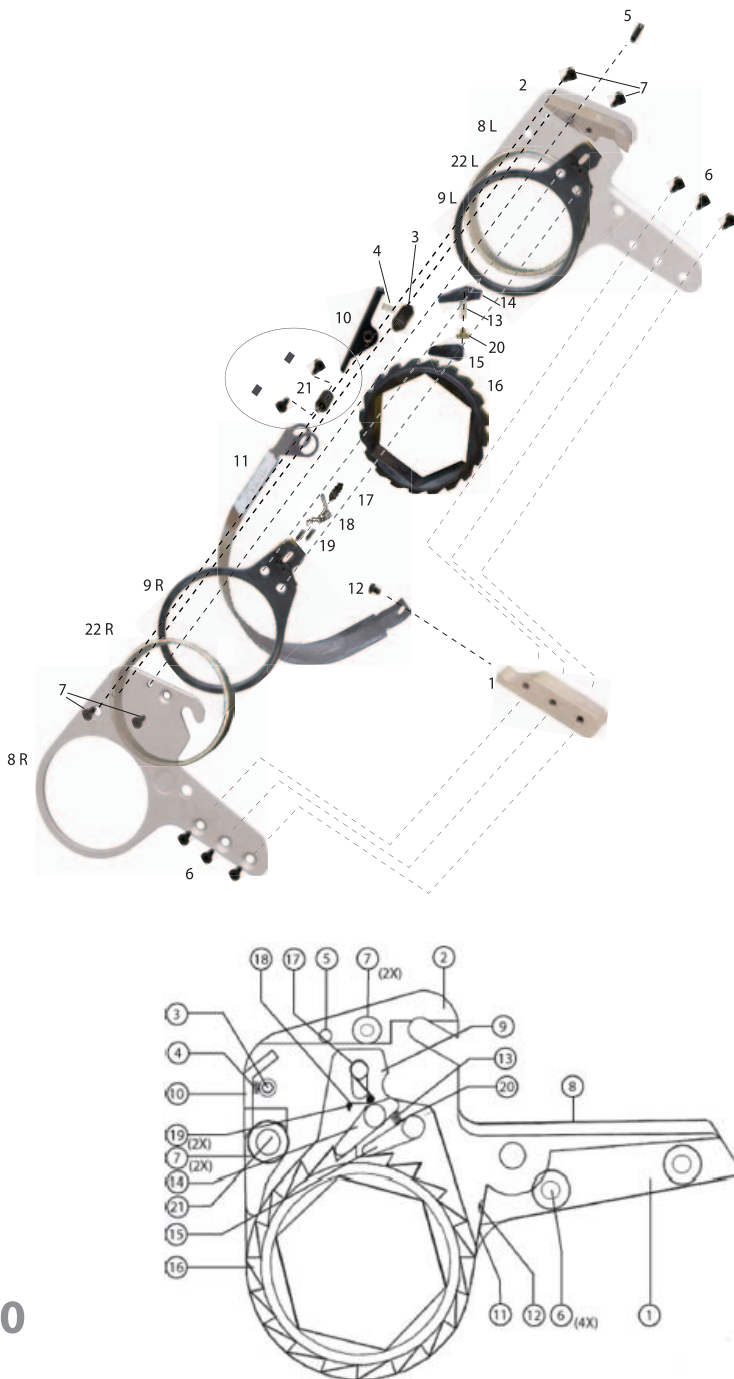
ITEM	DESCRIPTION	PART NUMBER
1	Housing	RT-#-1
3	Reaction Arm Assembly	RT-#-3
4	Drive Plate	RT-#-4
5	Square Drive	RT-#-5
6	Ratchet Spine	RT-#-6
7	Drive Bushing (2)	RT-#-7
8	Drive Sleeve Spline (2)	RT-#-8
10	Reaction Pawl	RT-#-10
11	Drive Retainer	RT-#-11
13	Drive Plate Roll Pin	RT-#-13
15	Disengagement Lever w/ screws	RT-#-15
17	Piston Rod End	RT-#-17
18	Reaction Pawl Spring + Roll Pin	RT-#-18
19	Rod End Pin	RT-#-19
20	Drive Sleeve Retaining Ring	RT-#-20
24	Piston Sleeve with Seal	RT-#-24
25	Piston with Seal	RT-#-25
26	Cylinder End Cap	RT-#-26
27	Drive Pawl Spring (2)	RT-#-27
28	Reaction Arm Lever	RT-#-28
29	Piston Rod	RT-#-29
31	Shroud	RT-#-31
32	Shroud Screws (2)	RT-#-32
33	Secondary Drive Pawl Spring	RT-#-33
34	Reaction Arm Plate	RT-#-34
37	Reaction Arm Plate Screws (2)	RT-#-37
38	Reaction Arm Lever Spring	RT-#-38
39	Disengagement Lever Screw	RT-#-39
40	Primary Drive Pawl Roll Pin	RT-#-40
41	Secondary Drive Pawl Pin	RT-#-41
42	Reaction Pawl Roll Pin	RT-#-42
43	Reaction Arm Boot with Pins	RT-#-43
44	Reaction Arm Boot Pin (2)	RT-#-44
45	Reaction Arm Lever Pin	RT-#-45
48	Access Plug (2)	RT-#-48
58	Shroud Spring Screw	RT-#-58
59	Shroud Spring	RT-#-59
61	Piston Rod Assembly	RT-#-61
62	Housing Seal Kit	RT-#-62
63	Drive Pawl Assembly	RT-#-63
00	Swivel Assembly	RT-#-00
SK	Swivel Seal Kit	RT-#-SK

SECTION VI

DISASSEMBLY

RTX LOW CLEARANCE TOOL

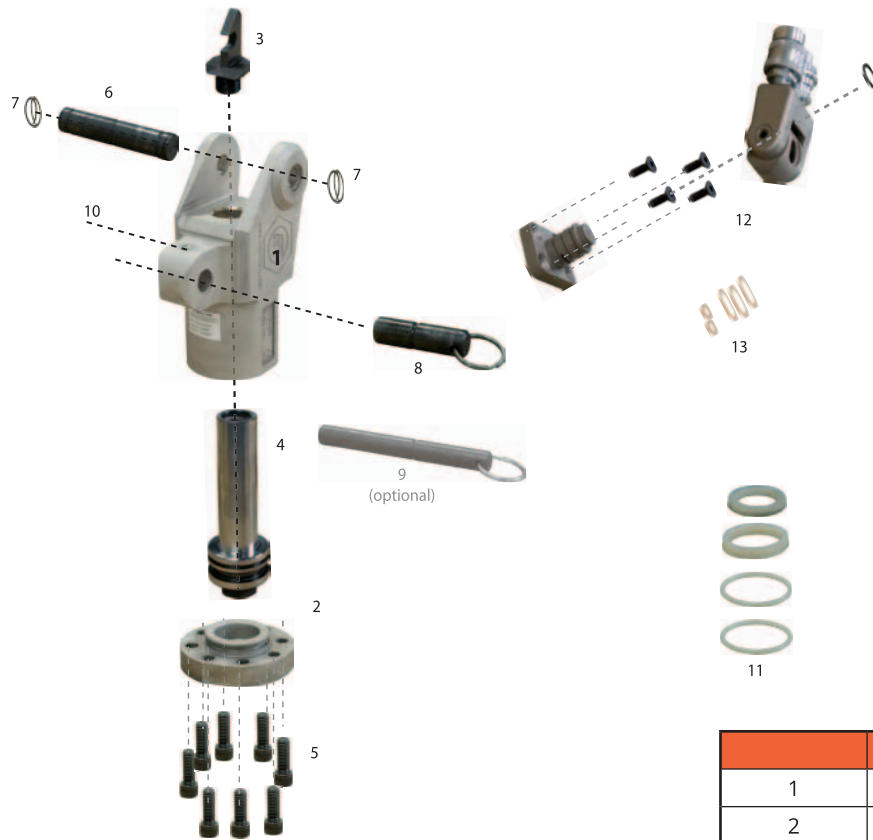
1. Make sure the tool is fully retracted.
 2. Remove the ratchet link.
 3. Remove shroud by removing the two button head cap screws at the base of the housing. Unhook the superior part of the shroud.
 4. Remove the 4 screws on each side of the ratchet link. Remove the two side plates.
 5. Remove the reaction pawl (#10, 3 & 4)
 6. Remove ratchet (#16), 2 drive plates (#9) and drive pawl assy. (#13, 14, 15, 17, 18, 19 & 24)
 7. Remove the 8 end cap bolts (#26) and remove the End cap (#2).
 8. Unscrew the rod end (#5).
 9. Remove the piston rod assembly which consists of parts (3 & 4) by tapping the piston rod (#4) with a punch and a hammer through the cylinder.
- Note: For assembly, follow the instructions in reverse. Be sure to properly lubricate all components prior to use.*



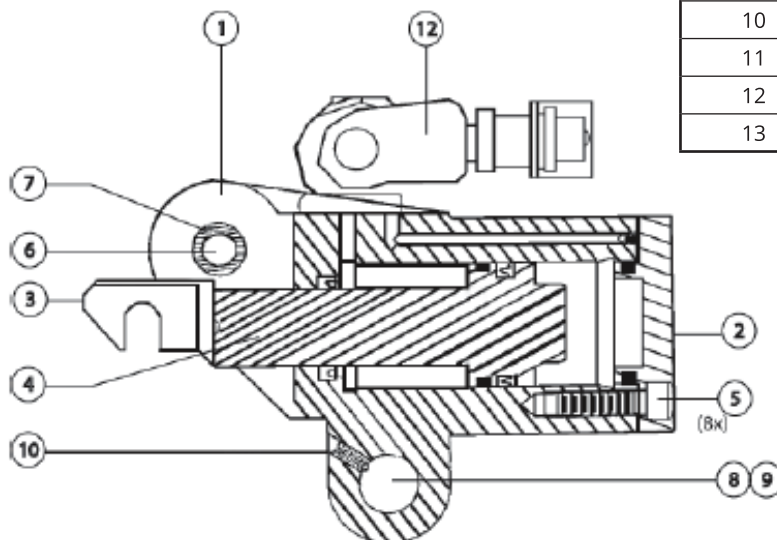
	Description	Part Number
1	Reaction Block Spacer	RTX-#-45
2	Top Spacer	RTX-#-46
3	Reaction Pawl Spring Spacer	RTX-#-47
4	Reaction Pawl Spring	RTX-#-37
5	Side Plate Roll Pin	RTX-#-48
6	Side Plate Screw Bottom (4)	RTX-#-50
7	Side Plate Screw Top (4)	RTX-#-51
8	Side Plate (left or right)	RTX-#-52
9	Drive Plate (left or right)	RTX-#-35
10	Reaction Pawl	RTX-#-36
11	Shroud	RTX-#-43
12	Shroud Screw	RTX-#-44
13	Drive Pawl Spring	RTX-#-27
14	Drive Pawl Primary	RTX-#-22
15	Drive Pawl Secondary	RTX-#-23
16	Ratchet	RTX-#-28
17	Drive Pin	RTX-#-33
18	Drive Pin Spring	RTX-#-34
19	Drive Spring Roll Pin	RTX-#-32
20	Spring Seat	RTX-#-49
21	Reaction Pawl Pin	RTX-#-99

SECTION VI

DISASSEMBLY



	Description	Part Number
1	Housing	RTX-#-01
2	End Cap	RTX-#-02
3	Rod End	RTX-#-05
4	Piston Rod Assembly	RTX-#-06
5	Cylinder End Cap Screws	RTX-#-07
6	Fixed Upper Pin	RTX-#-08
7	Fixed Upper Pin Ring (2)	RTX-#-09
8	Link Pin Short	RTX-#-10
9	Link Pin Long (optional)	RTX-#-11
10	Link Pin Retainer	RTX-#-12
11	Housing Seal Kit	RTX-#-13
12	Swivel Assembly 180 X 360	RTX-#-62
13	Swivel Seal Kit	RTX-#-63



SECTION VII

TORQUE CONVERSION CHARTS

FT-LBS

PSI	BAR	RT1	RT3	RT5	RT8	RT10	RT20	RT25	RT50
1500	104	200	480	835	1200	1755	2960	3960	7875
1600	110	214	512	890	1280	1864	3160	4216	8400
1800	124	242	576	1000	1440	2082	3555	4728	9450
2000	138	270	640	1110	1600	2300	3950	5240	10500
2200	152	298	704	1222	1760	2526	4345	5752	11550
2400	165	326	768	1334	1920	2752	4740	6264	12600
2600	179	354	832	1446	2080	2978	5135	6776	13650
2800	193	382	896	1558	2240	3204	5530	7288	14700
3000	207	410	960	1670	2400	3430	5930	7800	15750
3200	220	438	1024	1782	2560	3656	6325	8318	16800
3400	234	466	1088	1894	2720	3882	6720	8836	17850
3600	248	494	1152	2006	2880	4108	7115	9354	18900
3800	262	522	1216	2118	3040	4334	7510	9872	19950
4000	276	550	1280	2230	3200	4560	7905	10390	21000
4200	290	578	1346	2342	3360	4792	8300	10898	22050
4400	303	606	1412	2454	3520	5024	8695	11406	23100
4600	317	634	1478	2565	3680	5256	9090	11914	24150
4800	331	662	1544	2678	3840	5488	9485	12422	25200
5000	345	690	1610	2790	4000	5720	9880	12930	26250
5200	358	718	1674	2902	4160	5948	10275	13450	27300
5400	372	746	1738	3014	4320	6176	10670	13970	28350
5600	386	774	1802	3126	4480	6404	11065	14490	29400
5800	400	802	1866	3238	4640	6632	11460	15010	30450
6000	414	830	1930	3350	4800	6860	11860	15530	31500
6200	427	858	1994	3462	4960	7094	12250	16040	32550
6400	441	886	2058	3574	5120	7328	12645	16550	33600
6600	455	914	2122	3686	5280	7562	13040	17060	34650
6800	468	942	2186	3798	5440	7796	13435	17570	35700
7000	482	970	2250	3910	5600	8030	13830	18080	36750
7200	496	998	2316	4022	5760	8264	14225	18602	37800
7400	510	1026	2382	4134	5920	8498	14620	19124	38850
7600	524	1054	2448	4246	6080	8732	15020	19646	39900
7800	538	1082	2514	4358	6240	8966	15415	20168	40950
8000	552	1110	2580	4470	6400	9200	15810	20680	42000
8200	565	1138	2646	4582	6560	9432	16200	21214	43050
8400	579	1166	2712	4694	6720	9664	16600	21738	44100
8600	593	1194	2778	4806	6880	9896	16995	22262	45150
8800	607	1222	2844	4918	7040	10128	17390	22786	46200
9000	620	1250	2910	5030	7200	10360	17785	23310	47250
9200	634	1278	2974	5142	7360	10592	18180	23826	48300
9400	648	1306	3038	5254	7520	10824	18575	24342	49350
9600	662	1334	3102	5366	7680	11056	18970	24858	50400
9800	676	1362	3166	5478	7840	11288	19365	25374	51450
10000	690	1390	3230	5590	8000	11520	19760	25890	52500

NEWTON METERS

SECTION VII TORQUE CONVERSION CHARTS

PSI	BAR	RT1	RT3	RT5	RT8	RT10	RT20	RT25	RT50
1500	104	271	651	1132	1627	2379	4013	5368	10675
1600	110	290	694	1206	1735	2527	4281	5715	11387
1800	124	328	781	1356	1952	2822	4818	6409	12810
2000	138	366	868	1505	2169	3118	5355	7103	14234
2200	152	403	954	1657	2386	3424	5891	7797	15657
2400	165	439	1041	1808	2603	3731	6428	8491	17081
2600	179	476	1128	1960	2820	4037	6965	9186	18504
2800	193	512	1215	2112	3037	4343	7502	9880	19927
3000	207	549	1301	2264	3253	4650	8039	10574	21351
3200	220	584	1388	2416	3470	4956	8574	11276	22774
3400	234	620	1475	2568	3687	5262	9110	11978	24197
3600	248	655	1562	2719	3904	5569	9645	12680	25621
3800	262	690	1648	2871	4121	5875	10181	13382	27044
4000	276	725	1735	3023	4338	6182	10716	14085	28468
4200	290	762	1825	3175	4555	6496	11251	14773	29891
4400	303	798	1914	3327	4772	6811	11787	15462	31314
4600	317	835	2004	3478	4989	7125	12322	16151	32738
4800	331	872	2093	3630	5206	7440	12858	16839	34161
5000	345	908	2183	3782	5422	7754	13393	17528	35585
5200	358	945	2269	3934	5639	8063	13930	18233	37008
5400	372	981	2356	4086	5856	8372	14467	18938	38431
5600	386	1018	2443	4238	6073	8681	15004	19643	39855
5800	400	1055	2530	4389	6290	8990	15541	20348	41278
6000	414	1091	2616	4541	6507	9299	16077	21052	42701
6200	427	1128	2703	4693	6724	9617	16612	21744	44125
6400	441	1164	2790	4845	6941	9934	17146	22435	45548
6600	455	1201	2877	4997	7158	10251	17680	23127	46972
6800	468	1238	2963	5149	7374	10568	18214	23818	48395
7000	482	1274	3050	5300	7591	10885	18748	24509	49818
7200	496	1311	3140	5452	7808	11203	19285	25217	51242
7400	510	1347	3229	5604	8025	11520	19822	25924	52665
7600	524	1384	3319	5756	8242	11837	20358	26632	54088
7800	538	1421	3408	5908	8459	12154	20895	27340	55512
8000	552	1457	3497	6060	8676	12472	21432	28047	56935
8200	565	1493	3587	6211	8893	12786	21967	28758	58359
8400	579	1528	3676	6363	9110	13101	22503	29468	59782
8600	593	1563	3766	6515	9327	13415	23038	30178	61205
8800	607	1598	3855	6667	9543	13730	23574	30889	62629
9000	620	1633	3945	6819	9760	14044	24109	31599	64052
9200	634	1670	4032	6970	9977	14359	24645	32299	65475
9400	648	1707	4118	7122	10194	14673	25180	32998	66899
9600	662	1743	4205	7274	10411	14988	25716	33698	68322
9800	676	1780	4292	7426	10628	15302	26251	34397	69746
10000	690	1817	4379	7578	10845	15617	26787	35096	71169

SECTION VII

TORQUE CONVERSION CHARTS

FT-LBS

PSI	BAR	RTX-2	RTX-4	RTX-8	RTX-14	RTX-18	RTX-30
1500	104	255	580	1143	2010	2676	4770
1600	110	272	618	1234	2144	2854	5088
1800	124	306	694	1417	2412	3209	5724
2000	138	340	770	1600	2680	3565	6360
2200	152	376	847	1754	2948	3922	6996
2400	165	412	924	1907	3216	4279	7632
2600	179	448	1001	2061	3484	4636	8268
2800	193	484	1078	2214	3752	4993	8904
3000	207	520	1155	2368	4020	5350	9540
3200	220	552	1232	2533	4288	5708	10176
3400	234	584	1309	2698	4556	6066	10812
3600	248	616	1386	2864	4824	6424	11448
3800	262	648	1463	3029	5092	6782	12084
4000	276	680	1540	3194	5360	7140	12720
4200	290	714	1618	3358	5628	7496	13356
4400	303	748	1696	3522	5896	7852	13992
4600	317	782	1774	3685	6164	8208	14628
4800	331	816	1852	3849	6432	8564	15264
5000	345	850	1930	4013	6700	8920	15900
5200	358	884	2007	4176	6968	9277	16536
5400	372	918	2084	4340	7236	9634	17172
5600	386	952	2161	4503	7504	9991	17808
5800	400	986	2238	4667	7772	10348	18444
6000	414	1020	2315	4830	8040	10705	19080
6200	427	1054	2392	4996	8308	11062	19716
6400	441	1088	2469	5161	8576	11419	20352
6600	455	1122	2546	5327	8844	11776	20988
6800	468	1156	2623	5492	9112	12133	21624
7000	482	1190	2700	5658	9380	12490	22260
7200	496	1224	2777	5825	9648	12848	22896
7400	510	1258	2854	5992	9916	13206	23532
7600	524	1292	2931	6158	10184	13564	24168
7800	538	1326	3008	6325	10452	13922	24804
8000	552	1360	3085	6492	10720	14280	25440
8200	565	1394	3163	6658	10988	14637	26076
8400	579	1428	3241	6823	11256	14994	26712
8600	593	1462	3319	6989	11524	15351	27348
8800	607	1496	3397	7154	11792	15708	27984
9000	620	1530	3475	7320	12060	16065	28620
9200	634	1566	3551	7486	12328	16421	29256
9400	648	1602	3627	7652	12596	16777	29892
9600	662	1638	3703	7819	12864	17133	30528
9800	676	1674	3779	7985	13132	17489	31164
10000	690	1710	3855	8151	13400	17845	31800

NEWTON METERS

SECTION VII TORQUE CONVERSION CHARTS

PSI	BAR	RTX-2	RTX-4	RTX-8	RTX-14	RTX-18	RTX-30
1500	104	346	786	1549	2725	3628	6466
1600	110	369	838	1673	2906	3869	6897
1800	124	415	941	1921	3270	4351	7759
2000	138	461	1044	2169	3633	4833	8622
2200	152	510	1148	2377	3996	5317	9484
2400	165	559	1253	2585	4360	5801	10346
2600	179	607	1357	2794	4723	6285	11208
2800	193	656	1461	3002	5086	6769	12070
3000	207	705	1566	3210	5450	7252	12932
3200	220	748	1670	3434	5813	7738	13795
3400	234	792	1774	3658	6176	8223	14657
3600	248	835	1879	3882	6539	8708	15519
3800	262	878	1983	4106	6903	9194	16381
4000	276	922	2088	4330	7266	9679	17243
4200	290	968	2193	4552	7629	10162	18105
4400	303	1014	2299	4774	7993	10644	18968
4600	317	1060	2405	4996	8356	11127	19830
4800	331	1106	2511	5218	8719	11609	20692
5000	345	1152	2616	5440	9083	12092	21554
5200	358	1198	2721	5662	9446	12576	22416
5400	372	1244	2825	5883	9809	13060	23278
5600	386	1291	2929	6105	10172	13544	24141
5800	400	1337	3034	6326	10536	14028	25003
6000	414	1383	3138	6548	10899	14512	25865
6200	427	1429	3243	6772	11262	14996	26727
6400	441	1475	3347	6997	11626	15480	27589
6600	455	1521	3451	7221	11989	15964	28451
6800	468	1567	3556	7445	12352	16447	29313
7000	482	1613	3660	7670	12716	16931	30176
7200	496	1659	3765	7896	13079	17417	31038
7400	510	1705	3869	8122	13442	17902	31900
7600	524	1751	3973	8348	13805	18387	32762
7800	538	1798	4078	8574	14169	18873	33624
8000	552	1844	4182	8801	14532	19358	34486
8200	565	1890	4288	9025	14895	19842	35349
8400	579	1936	4393	9250	15259	20326	36211
8600	593	1982	4499	9474	15622	20810	37073
8800	607	2028	4605	9699	15985	21294	37935
9000	620	2074	4711	9923	16349	21778	38797
9200	634	2123	4814	10148	16712	22260	39659
9400	648	2172	4917	10374	17075	22743	40522
9600	662	2220	5020	10599	17438	23225	41384
9800	676	2269	5123	10824	17802	23708	42246
10000	690	2318	5226	11049	18165	24191	43108

SECTION VII

TORQUE CONVERSION CHARTS

SQUARE / ALLEN DRIVE WORKING TORQUE

DRIVE SIZE: The square or hex drive of each RAPID-TORC is limited in its maximum output by its material and its engagement area. Since your RAPID-TORC 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.



DRIVE SIZE		DRIVE TYPE	MAX WORKING TORQUE		PROBABLE FAILURE	
mm	in		ft lbs	Nm	ft lbs	Nm
12mm	5/8"	Allen	350	470	380	510
	1/2"	Square	385	520	425	570
17mm	5/8"	Allen	685	920	750	1000
19mm	3/4"	Allen	1185	1600	1300	1750
	3/4"	Square	1390	1870	1485	2000
22mm	7/8"	Allen	1880	2500	2065	2780
24mm	1"	Allen	2810	3790	3100	4180
	1"	Square	3230	4350	3400	4590
27mm	1-1/8"	Allen	4000	5400	4400	5940
	1-1/4"	Allen	5500	7400	6100	8230
32mm	1-3/8"	Allen	7300	9800	8000	10800
36mm	1-1/2"	Allen	9500	12800	10400	14000
	1-1/2"	Square	11520	15500	12475	16800
41mm	1-5/8"	Allen	12000	16200	13200	1780
	1-3/4"	Allen	15000	20200	16500	22200
46mm	1-7/8"	Allen	18500	24900	20300	27400
50mm	2"	Allen	22500	30300	24700	33300
	2-1/4"	Allen	32000	43200	35100	47300
	2-1/2"	Allen	44000	59400	48200	65000
	2-1/2"	Square	52500	70800	63625	85800

SECTION VIII

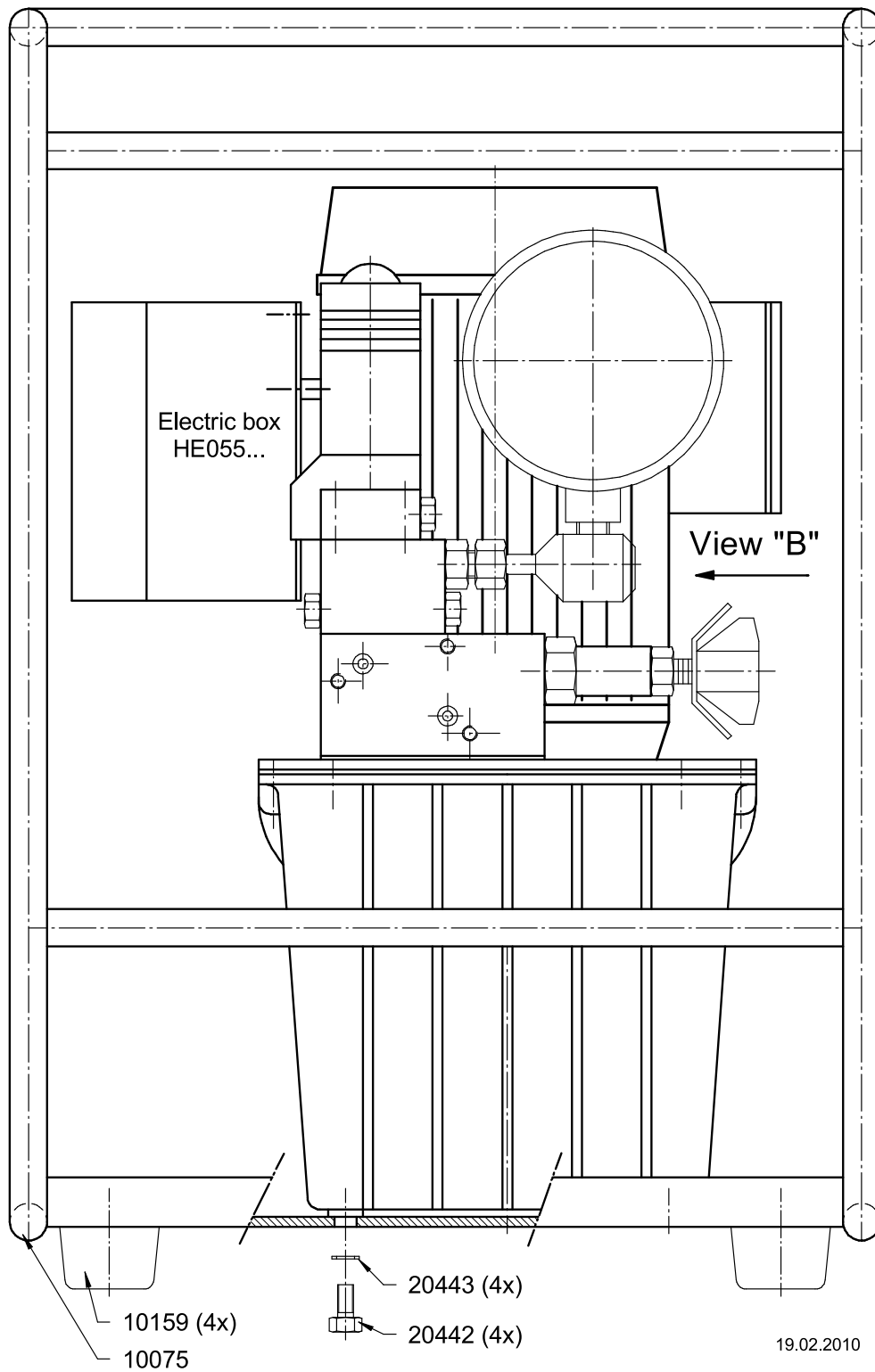
POWERPACK COMPONENTS

PANTHER PUMP (ELECTRIC MODELS)



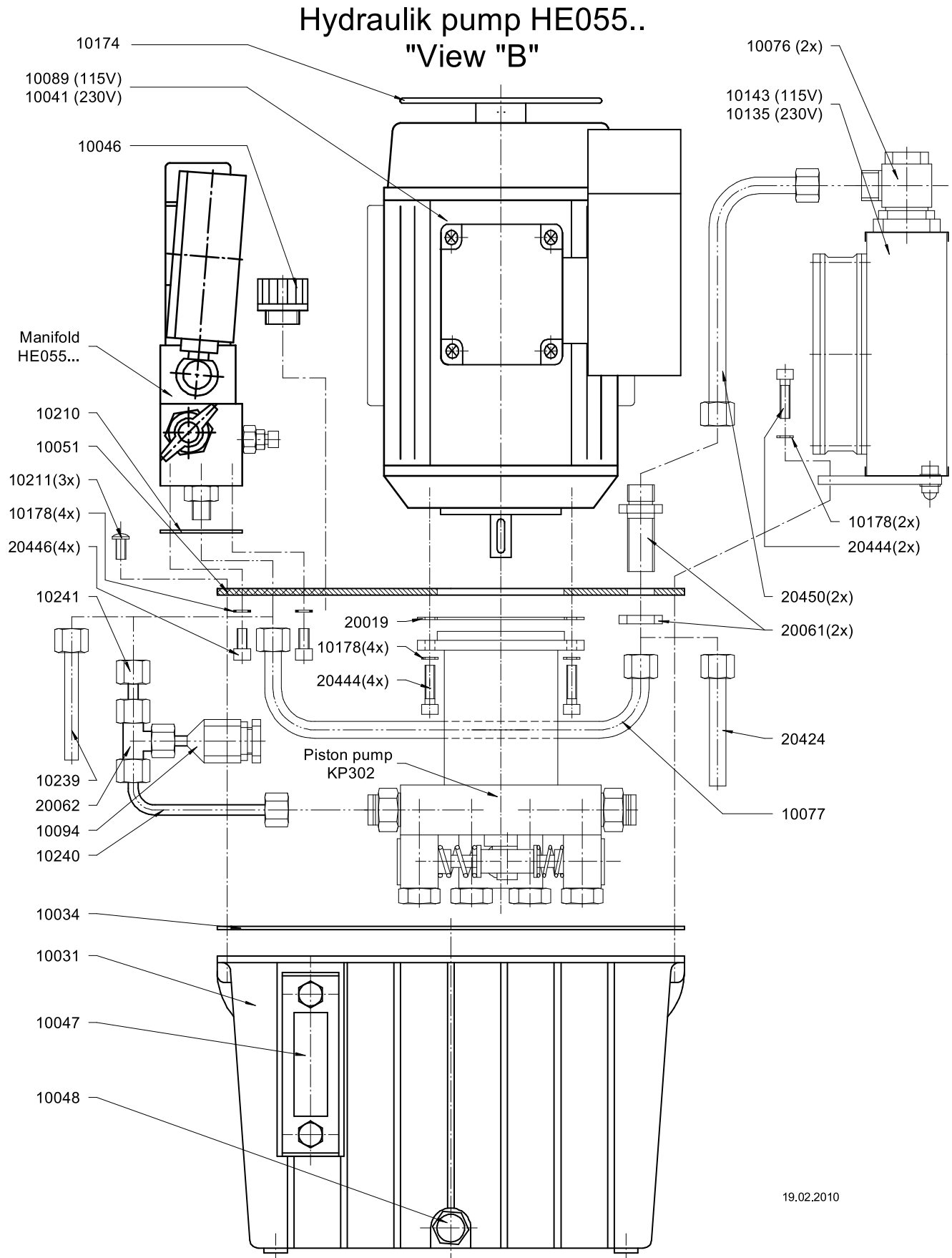
SECTION VIII

POWERPACK COMPONENTS



SECTION VIII

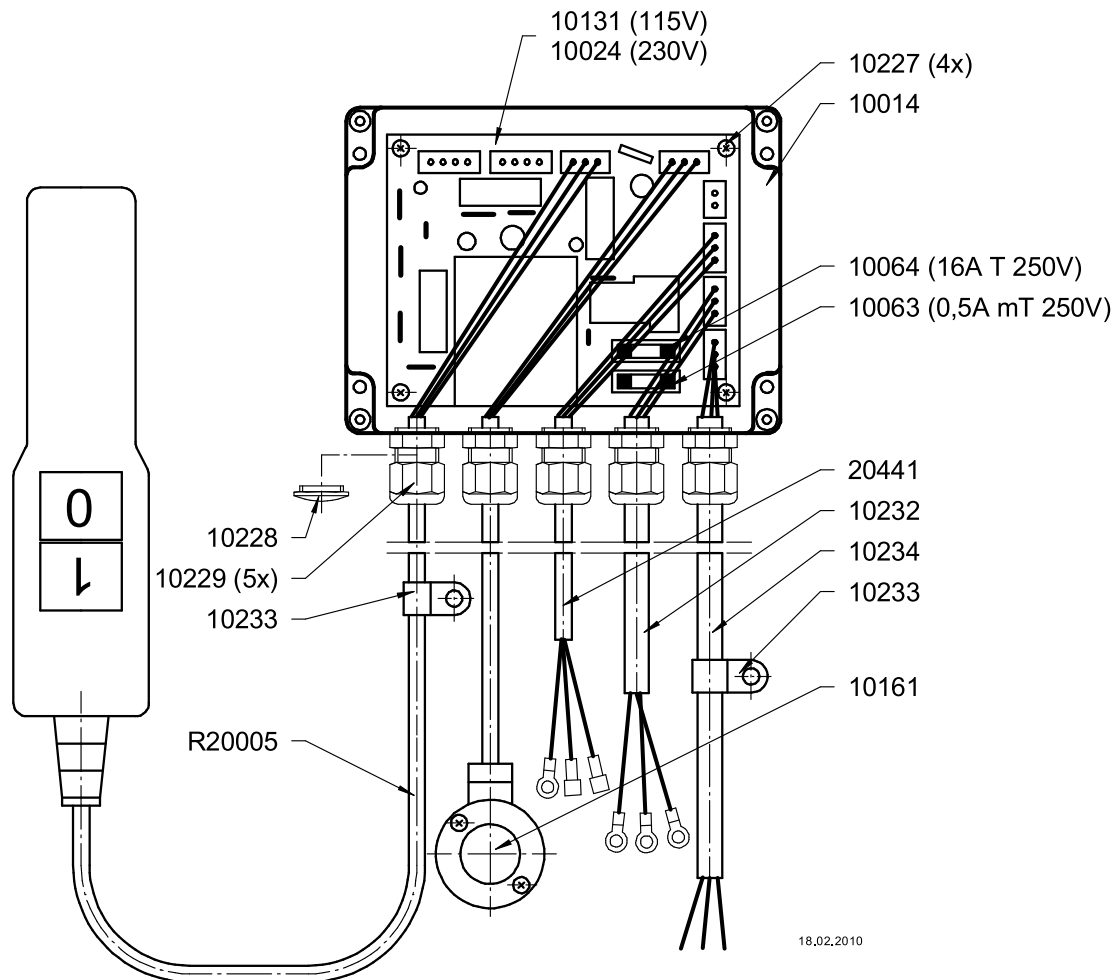
POWERPACK COMPONENTS



19.02.2010

SECTION VIII

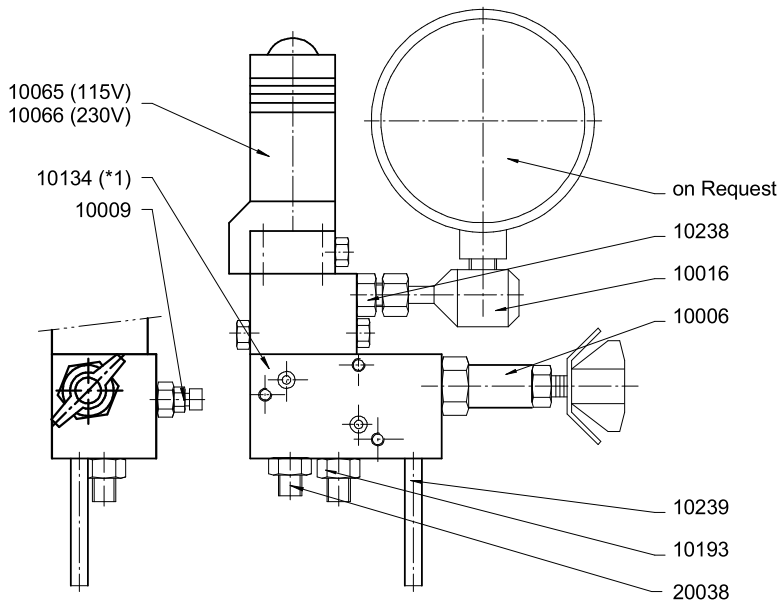
POWERPACK COMPONENTS



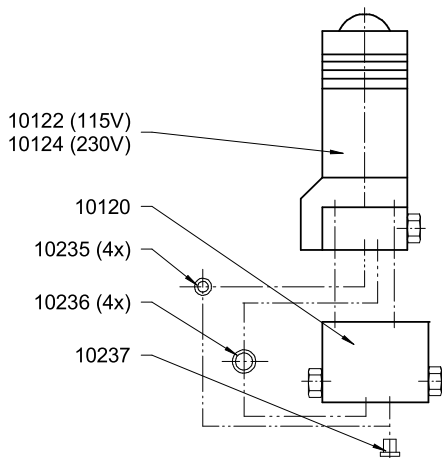
SECTION VIII

POWERPACK COMPONENTS

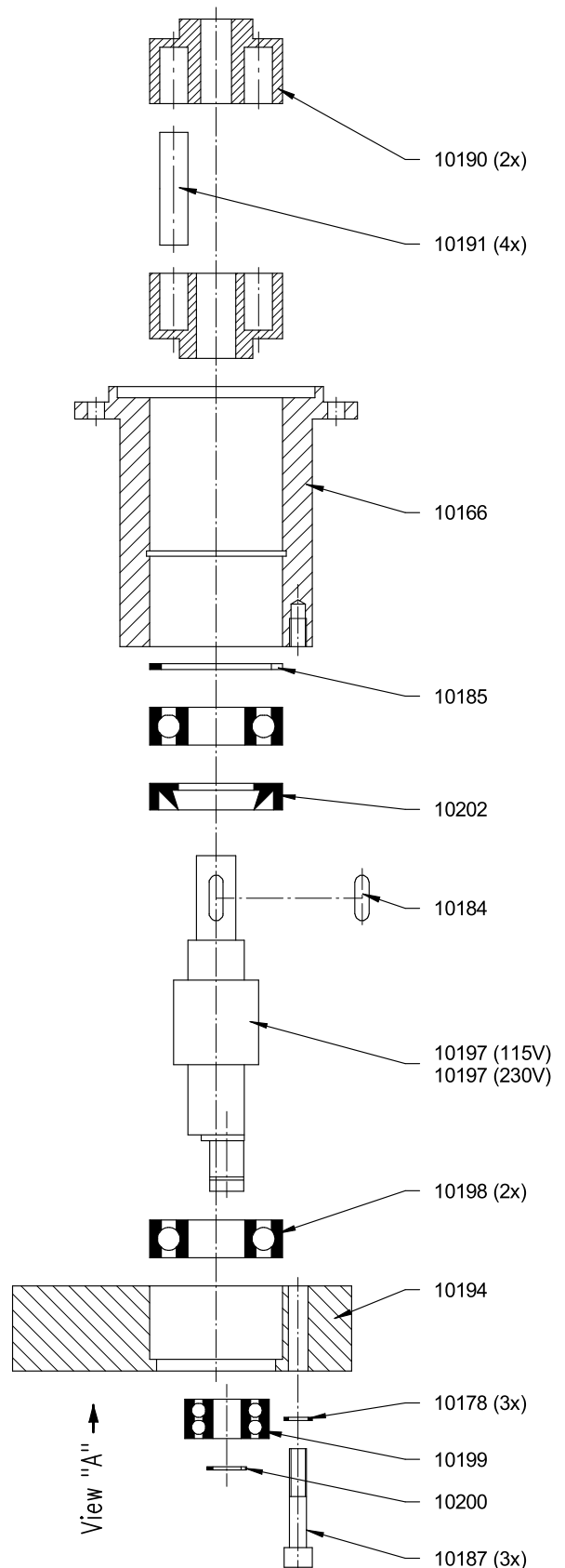
Piston pump KP302...



*1 : For direct Coupler connection use 10082



18.02.2010

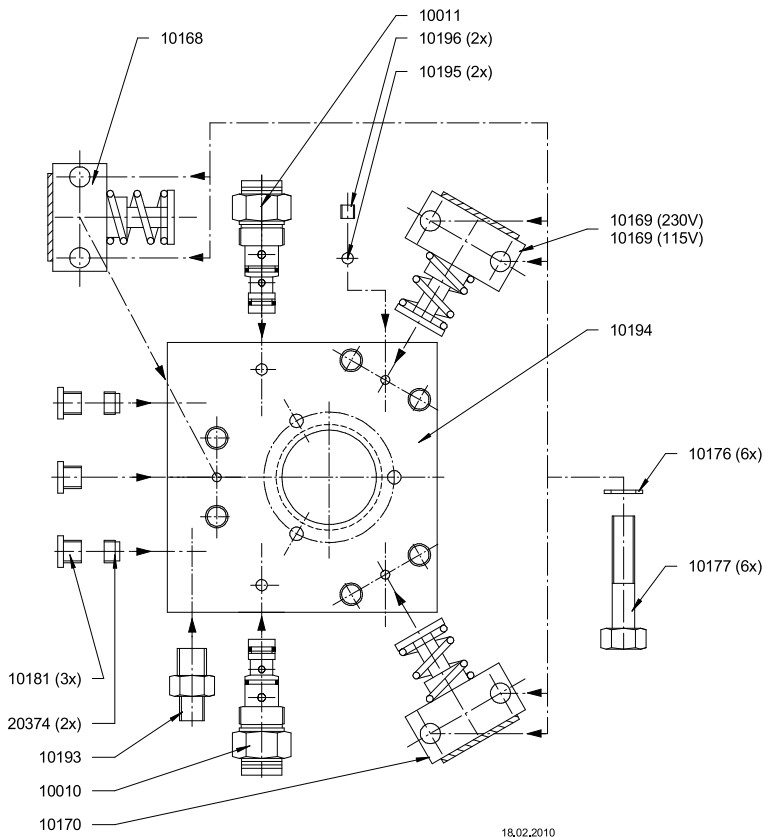


18.02.2010

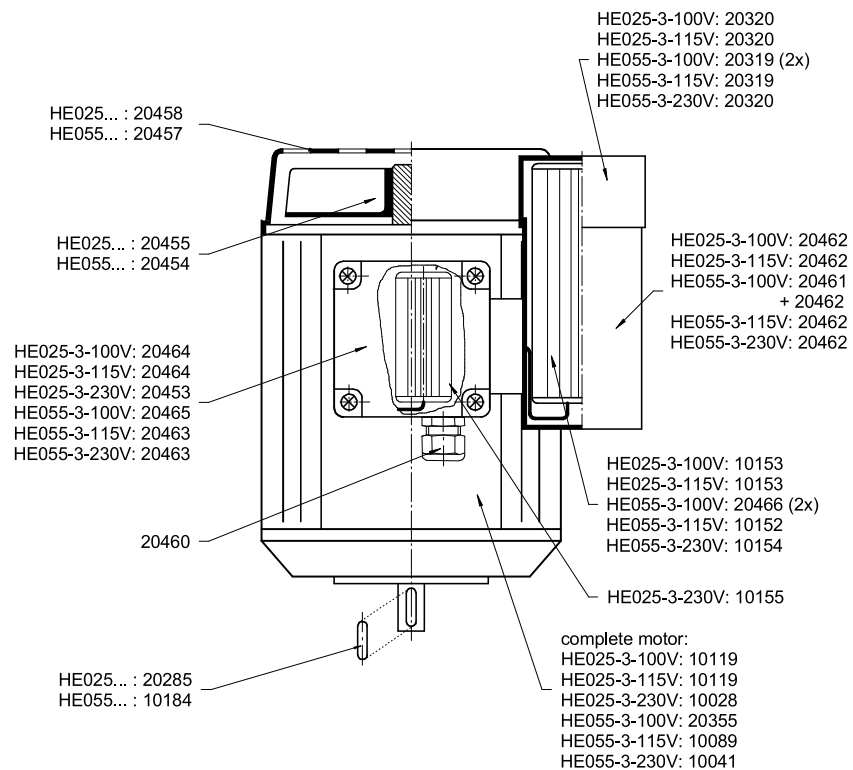
SECTION VIII

POWERPACK COMPONENTS

Piston pump KP302... View "A"



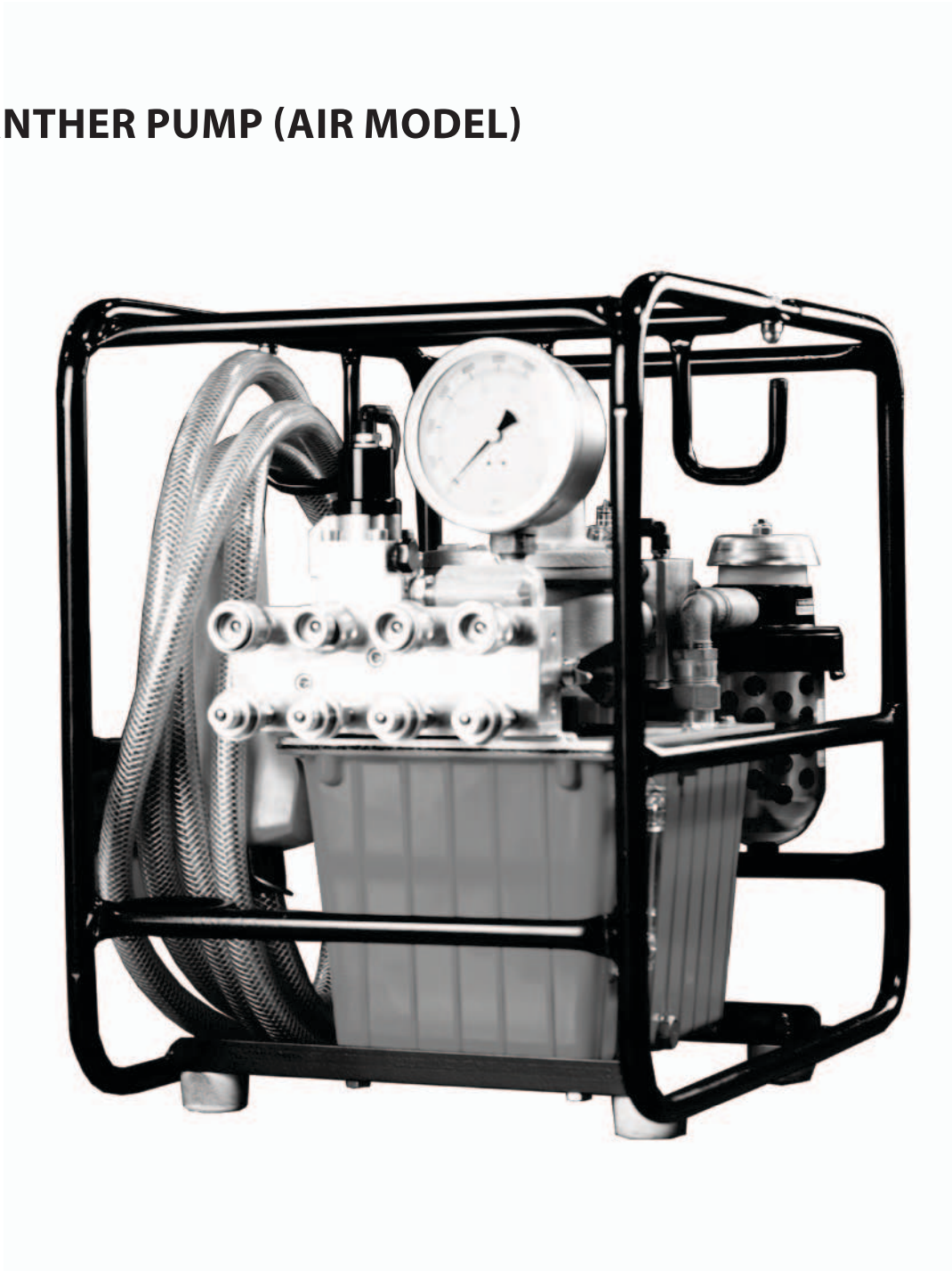
Electric Motors



SECTION VIII

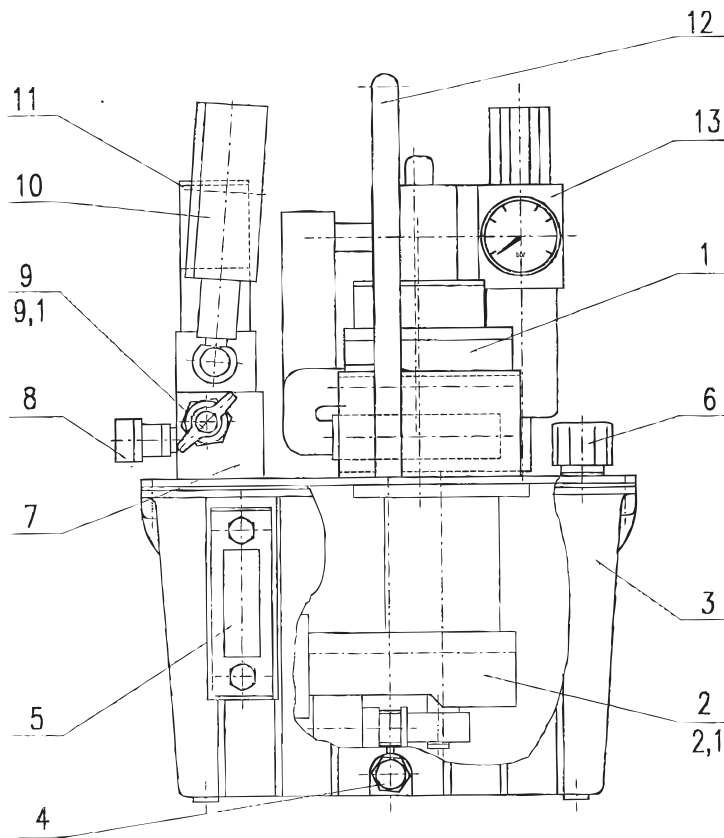
POWERPACK COMPONENTS

PANTHER PUMP (AIR MODEL)

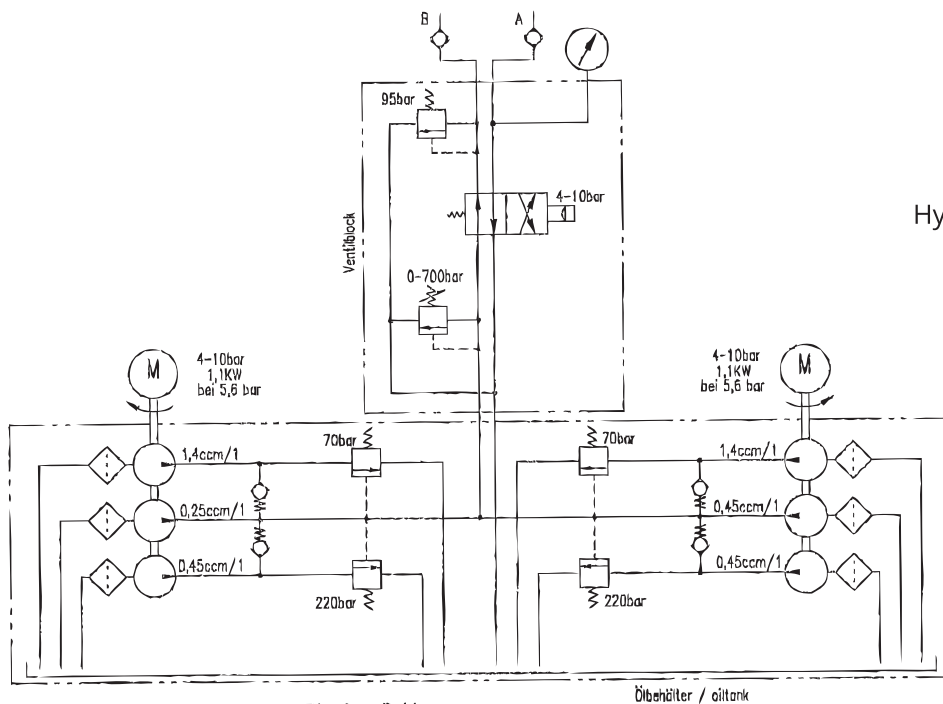


SECTION VIII

POWERPACK COMPONENTS



1. Motor
2. Internal Spare
3. Oil Tank
4. Hex Pipe Plug
5. Thermometer/Oil Level
6. Filler Plug
7. Back Pressure valve-Manifold Assembly
8. Hydraulic Couplers
9. Pressure Regulator Valve
10. Gauge
11. Solenoid Valve
12. Frame
13. Filter/Regulator/Lubricator
14. Remote Control



Hydraulic Flow



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