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AXT PowerPak – Version 4

Operation and Maintenance Manual





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Safety

General

Congratulations on your purchase of a B&D Manufacturing AXT PowerPak.

This Operation Manual provides the operator with an overview of the components incorporated in the design, the procedures and instructions on how to operate and perform routine maintenance and troubleshooting of your AXT PowerPak.

The objective of this manual is to provide simple, clear, and complete details, procedures and instructions. These objectives are backed by B&D Manufacturing's commitment to offer superior custom designed equipment and technical support.

Every effort has been undertaken to ensure the accuracy and completeness of information in this manual. Constant efforts are made to improve the quality and performance of B&D Manufacturing products, so some details included in this Operation Manual may differ slightly from your AXT PowerPak. If you have any questions about these differences, please contact B&D Manufacturing.

If you do not understand any of the information, instructions or procedure explanations in this manual, contact B&D Manufacturing.

The operator **must** understand all outlined potential hazards described in the **Safety** section located at the front of this manual prior to operating, performing maintenance on, or troubleshooting of the Align Boring Machine and the AXT PowerPak.

It shall be the responsibility of the employer or owner to ensure that all operators have received proper training prior to operating, performing maintenance on, or troubleshooting of the Align Boring Machine and the AXT PowerPak.

The operator **must** follow all specific site procedures and guidelines when operating, performing maintenance on, or troubleshooting of the Align Boring Machine and the AXT PowerPak. In **no circumstance** shall the instructions and procedures outlined in this manual take precedence over your established **specific site procedures and guidelines**.

Do not undertake the operation, maintenance, troubleshooting, repairs or servicing of your Align Boring Machine and the AXT PowerPak unless you are familiar with the operation and servicing of technical equipment and have received proper training.

If your level of training, skill or comprehension of the Manual's instructions or procedures could possibly result in injury to personnel or damage to your Align Boring Machine or AXT PowerPak, have the work done by a qualified B&D Manufacturing Representative. Your




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common sense and good judgment are crucial to the safe and successful operation and maintenance of your Align Boring Machine.

At any time, if the operator suspects that a safety issue may be present with the B&D Manufacturing Align Boring Machine perform an immediate shutdown on the Align Boring Machine, disconnect electrical power to the AXT PowerPak and immediately notify your supervisor.

NEVER permit anyone to operate, or perform maintenance on, or perform troubleshooting of your Align Boring Machine or AXT PowerPak without first receiving proper training. Failure to do so could result in serious injury to personnel.

- Read and understand this Manual before you operate or perform maintenance on or troubleshooting of your AXT PowerPak.


CAUTION	
	Refer to this Operation Manual before operating, maintaining or troubleshooting your AXT PowerPak.

- Read the Cautions, Warnings, and Dangers in this section before you operate or perform maintenance on, or perform troubleshooting on your AXT PowerPak.
- Read instructions and procedures thoroughly before you start to operate or perform maintenance on, or perform troubleshooting on your AXT PowerPak.
- Review all warnings, cautions and dangers that accompany any instruction or procedure.
- Review the **Safety** section and all relevant cautions, warnings and dangers each time you prepare to perform maintenance on or troubleshoot of your AXT PowerPak.



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- Read and understand the Align Boring Operation and Maintenance Manual before you operate or perform maintenance on or troubleshooting of your Align Boring Machine.

CAUTION	
	<p>Refer to the Align Boring Operation and Maintenance Manual before operating, maintaining or troubleshooting your Align Boring Machine.</p>

- Improper usage can cause injury to personnel or damage to equipment. Read and understand your site specific safety instructions **thoroughly** before using your Align Boring Machine or AXT PowerPak.
- Contact B&D Manufacturing for additional training opportunities.




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Safety Notices

There are three types of Safety notices used in this manual.


- Caution Notices

CAUTION	
	Caution notice indicates a potential hazardous situation that if not avoided, may result in personnel injury or damage to equipment.

- Warning Notices

WARNING	
	Warning notice indicates a potential hazardous situation that if not avoided, may result in serious injury or death to personnel.

- Danger Notices

DANGER	
	Danger notice indicates an imminently hazardous situation that if not avoided, will result in serious injury or death to personnel.



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Cautions, Warnings and Dangers

Please read cautions, warnings and dangers before you operate or perform maintenance on, or perform troubleshooting on your Align Boring Machine and AXT PowerPak.

It shall be the responsibility of the employer or owner to furnish all the tools and personnel protective equipment that are required to safely operate, perform maintenance on or troubleshooting of the Align Boring Machine or AXT PowerPak.

Always follow established specific site procedures and guidelines and ensure tools and personnel protective equipment (PPE) are in good condition prior to performing maintenance on your Align Boring Machine or AXT PowerPak.

Although not all of the personnel protective safety equipment is necessary to perform all instructions, procedures and tasks on the Align Boring Machine or AXT PowerPak, most sites and facilities require them as a standard and it is good practice to use them at all times.


It is critical that the appropriate protective safety equipment be worn at all times when you operate or perform maintenance on, or perform troubleshooting on your Align Boring Machine and AXT PowerPak.


The following list all of the perceived Cautions, Warnings and Dangers that potential exist when operating, performing maintenance on or troubleshooting the Align Boring Machine and AXT PowerPak. Every effort has been made to outline all of the potential Caution, Warning and Danger notices that may arise when operating, performing maintenance on or troubleshooting the Align Boring Machine and AXT PowerPak. Even though every effort has been made the operator **must** use common sense and good judgment when operating, performing maintenance on or troubleshooting the Align Boring Machine and AXT PowerPak, as unforeseen hazards may develop.




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Cautions

CAUTION	
	<p>Training Caution.</p> <p>Refer to this Operation Manual and to the Align Boring Machine Operation and Maintenance Manual before operating, maintaining or troubleshooting your AXT PowerPak.</p>

CAUTION	
	<p>Eye Protection Caution.</p> <p>Wear Eye Protection, safety glasses with side shields or goggles, at all times when operating, maintaining or troubleshooting your Align Boring Machine and AXT PowerPak.</p>

CAUTION	
	<p>Face Protection Caution.</p> <p>It is recommended to wear Face Shield Protection plus Eye Protection at all times when operating your Align Boring Machine and AXT PowerPak.</p>



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CAUTION



Foot Protection Caution.

Wear Foot Protection at all time when operating, maintaining or troubleshooting your Align Boring Machine and AXT PowerPak.

CAUTION



Head Protection Caution.

Wear a Hard Hat at all time when operating, maintaining or troubleshooting your Align Boring Machine and AXT PowerPak.

CAUTION



Hand Protection Caution.

Do not wear Protective Gloves around the Align Boring Machine and AXT PowerPak when in operation.

Wear Protective Gloves at all times when maintaining or troubleshooting your Align Boring Machine and AXT PowerPak.



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CAUTION



Clothing Protection Caution.

Never wear loose Clothing in and around the Align Boring Machine and AXT PowerPak.

Ensure that any loose items of clothing, such as sleeve cuffs and pant legs, are buttoned up or tucked in at all time when operating, maintaining or troubleshooting your Align Boring Machine and AXT PowerPak.

CAUTION



Long Hair Caution.

Never wear long hair in and around the Align Boring Machine and AXT PowerPak.

Operators with long hair must ensure that their long hair is tied, pinned or capped up prior to operating, maintaining or troubleshooting your Align Boring Machine and AXT PowerPak.

CAUTION




Ear Protection Caution.


Although the Align Boring Machine does not typically produce harmful levels of noise, operators are cautioned to wear Ear Protection as appropriate to protect against other harmful levels of noise that may be present in the immediate area near the Align Boring Machine and AXT PowerPak.



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Warnings

WARNING	
	<p>Improper usage can cause injury to personnel, or damage to equipment and property.</p> <p>Read and understand your site specific safety instructions thoroughly before operating, maintaining or troubleshooting your Align Boring Machine and AXT PowerPak.</p>

WARNING	
	<p>Rotating Parts Warning.</p> <p>Always ensure that the supplied Safety Guards are in place before operating your Align Boring Machine and AXT PowerPak.</p> <p>Never place any parts of your body, including hair or jewelry, in close proximity to the AXT PowerPak, the cutting tool or any of the moving parts of the Align Boring Machine and AXT PowerPak.</p> <p>Failure to do so could result in serious injury or death to personnel.</p>



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WARNING



Pinch Point Warning.

Never place any parts of your body in between the Align Boring Machine, AXT PowerPak and any of their components during operating.

Failure to do so could result in serious injury or death to personnel.

WARNING



Burn Warning.

Keep your hands and other body parts away from potential hot AXT PowerPak surfaces during operation and shortly after you shut the AXT PowerPak off. These surfaces may become extremely hot while the AXT PowerPak is operating and may seriously burn you.


Wait until the AXT PowerPak cools before performing maintenance on or troubleshooting of AXT PowerPak.


Failure to do so could result in serious injury to personnel.



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Dangers

DANGER	
	<p>Rotating Parts Danger.</p> <p>Always visually inspect the area around the Align Boring Machine for other personnel, before beginning boring operations with the Align Boring Machine.</p> <p>Advise all personnel to immediately clear the area around the Align Boring Machine prior to beginning boring with your Align Boring Machine.</p> <p>Failure to do so could result in serious injury or death to personnel.</p>

DANGER	
	<p>Pinch Point Danger.</p> <p>Always visually inspect the area around the Align Boring Machine for other personnel, before beginning boring operations with the Align Boring Machine.</p> <p>Advise all personnel to immediately clear the area around the Align Boring Machine prior to beginning boring with your Align Boring Machine.</p> <p>Failure to do so could result in serious injury or death to personnel.</p>



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DANGER



Electrical Shock Danger.

Always disconnect the AXT PowerPak's electrical power source when performing maintenance on or troubleshooting of the AXT PowerPak.

Failure to do so could result in serious injury or death to personnel.



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Important Contacts

B&D Manufacturing

4703 Regional Road 15
P.O. Box 519
Chelmsford, Ontario
Canada, P0M 1L0

Telephone: 705-855-2363
Fax: 705-855-4134

Toll Free Number: **1-800-668-0324**

Internet Website: <http://www.bdmfg.com>
E-mail: <mailto:info@bdmfg.com>



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General Description

The AXT PowerPak supplied with your Align Boring Machine provides a constant speed drive power with a high torque output to the Align Boring Machine.

The AXT PowerPak requires either a 115 volt 60 hertz or 220 volt 50 hertz AC electric power supply. Refer to the technical information located on the AXT PowerPak's B&D Nameplate for your AXT PowerPak's power supply requirements.



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Product Overview

This section of the Manual provides the operator with an overview of the major components and assemblies incorporated into the design AXT PowerPak supplied by B&D Manufacturing.

The AXT PowerPak consists of the following main assemblies and their components.

- Electrical System
- Hydraulic System

Refer to Appendix C for the Replacements Parts List of the components incorporated in the AXT PowerPak's design.

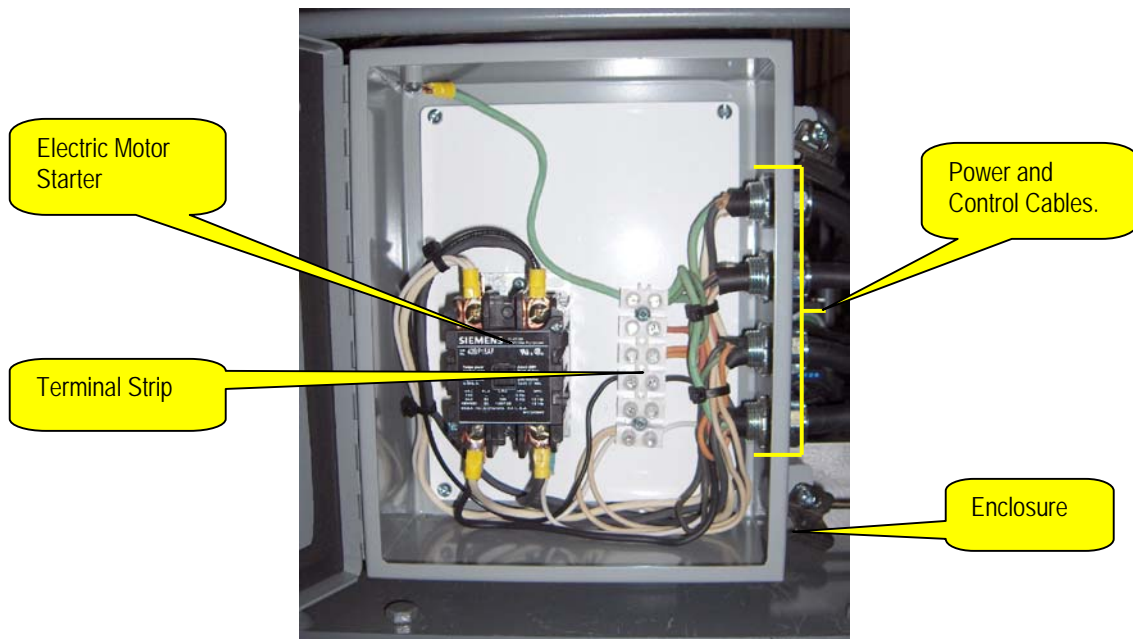
Electrical System

The AXT PowerPak's Electrical System consists of the following main components.

- Electric Control Cabinet Assembly
- Electric Motor
- Operator Control Pendant Station

Electric Control Cabinet Assembly

The Electric Control Cabinet Assembly is mounted to the AXT PowerPak's Electric Motor mounting base.





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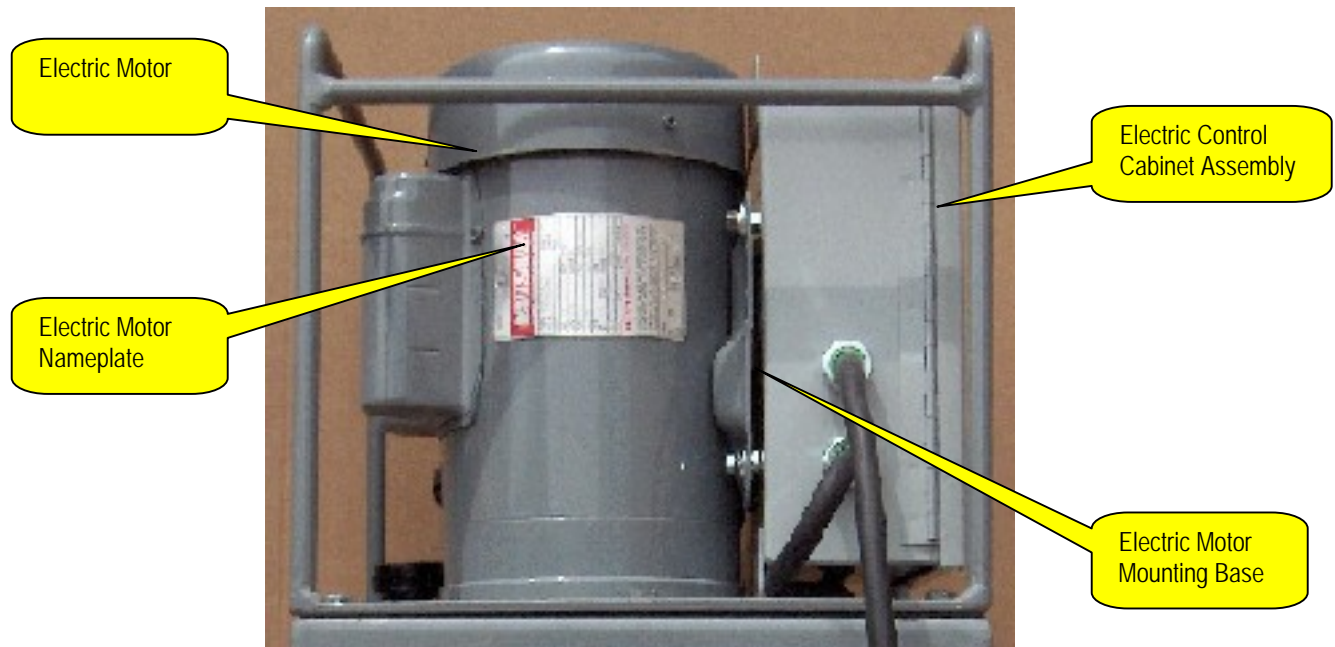
The Electric Control Cabinet Assembly includes the following components.

- B&D Nameplate, front exterior of the Enclosure door.
- Painted Mild Steel Enclosure
- Electric Motor Starter
- Terminal Strip
- Power and Control Cable wiring

Electric Motor

The Electric Motor supplied with your AXT PowerPak requires either a 115 volt 60 hertz or 220 volt 50 hertz AC electric power supply. Refer to the technical information located on the AXT PowerPak's B&D Nameplate for your Electric Motor's power supply requirements.

The Electric Motor is mounted to the top of the Hydraulic Fluid Tank Reservoir.

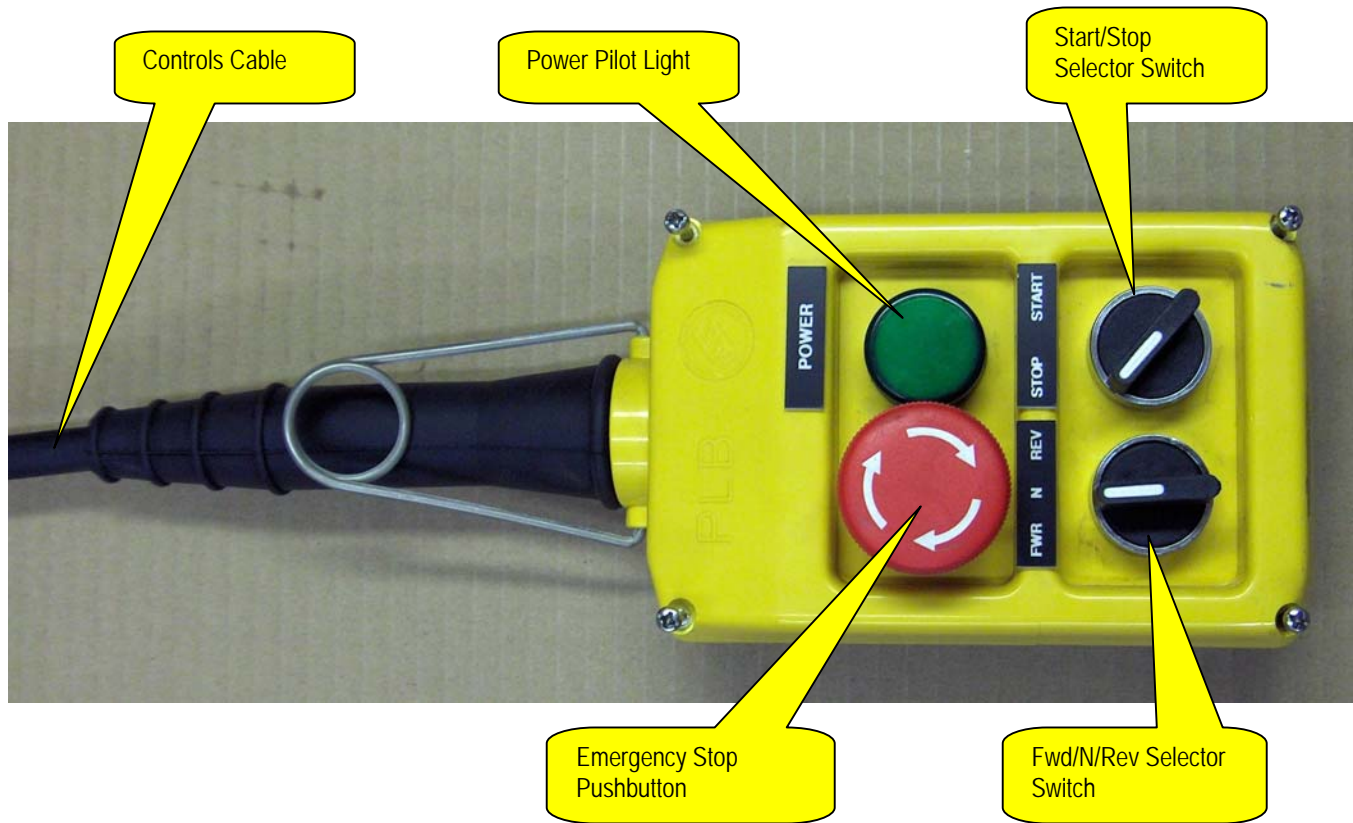




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Operator Control Pendant Station

The Operator Control Pendant Station supplied with your AXT PowerPak is tethered to the AXT Power Pak via a controls cable. It serves as the controls station that provides the operator with a means to manipulate the various Align Boring Machine functions that are associated with the AXT PowerPak.



The Operator Control Pendant Station includes the following components and their functions.

- Emergency Stop Pushbutton – Shutdown of AXT PowerPak’s hydraulic and electric systems when pushed.
- Power Pilot Light – Status indicator to confirm that AC power is present.
- Forward/Neutral/Reverse Selector Switch – Three position selection that controls the direction of rotation of the Align Boring Machine’s Cutting Tool.
- Start/Stop Selector Switch – Two position selection that controls the starting and stopping of the AXT PowerPak’s Electric and Hydraulic Motors and the rotating of the Align Boring Machine’s Cutting Tool.

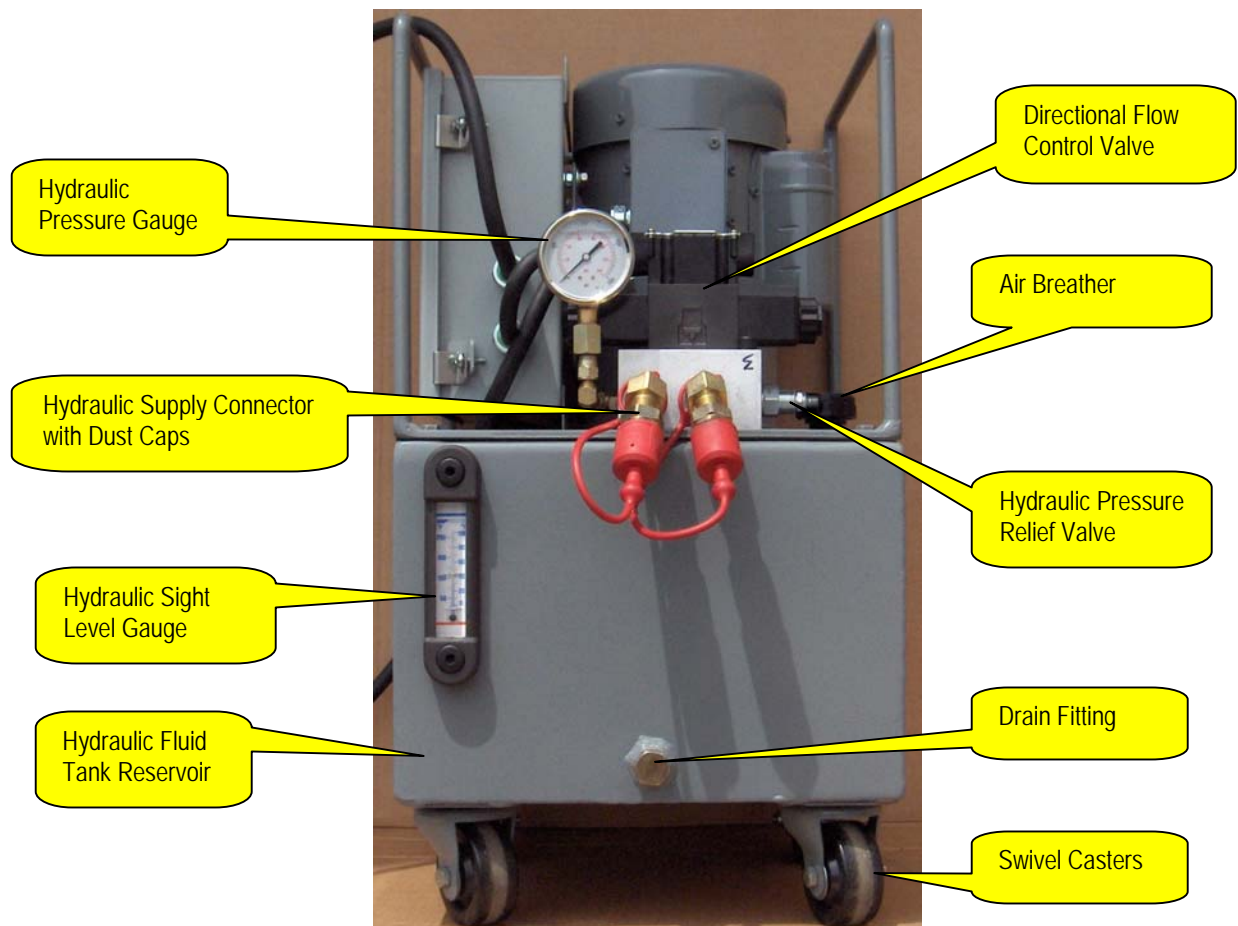


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Hydraulic System

The AXT PowerPak's Hydraulic System Assembly consists of the following main components.

- Hydraulic Fluid Tank Reservoir
- Hydraulic Sight Level Gauge
- Air Breather
- Hydraulic Pressure Gauge
- Hydraulic Pressure Relief Valve
- Directional Flow Control Valve
- Hydraulic Supply Connectors
- Hydraulic Supply Hose Assembly
- Hydraulic Gear Pump
- Hydraulic Motor Coupling
- Hydraulic Fluid Strainer





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Hydraulic Fluid Tank Reservoir

The Hydraulic Fluid Tank Reservoir is located at the base of the AXT PowerPak. It can hold a nominal volume of approximately 32 liters (7 gallons) of hydraulic fluid. Use only a premium grade hydraulic oil with a viscosity range of 17 to 65 mm²/s with your AXT PowerPak and Align Boring Machine.

There are two (2) rigid casters and two (2) swivel casters mounted to the AXT PowerPak beneath the Hydraulic Fluid Tank Reservoir.

A Drain Fitting is installed on the bottom of the Hydraulic Fluid Tank Reservoir. The Drain Fitting serves as a hydraulic fluid drain port in the event that the operators need to empty the Hydraulic Fluid Tank Reservoir of hydraulic fluid.

Hydraulic Sight Level Gauge

A Hydraulic Sight Level Gauge is located on the side of the Hydraulic Fluid Tank Reservoir. The Hydraulic Sight Level Gauge provides the operator with a visual indication of the hydraulic fluid level currently present in the Hydraulic Fluid Tank Reservoir.

Air Breather

An Air Breather is inserted into the top of the Hydraulic Fluid Tank Reservoir. The Air Breather functions as a ventilator designed to filter particulates and to provide clean flow of air entering the Hydraulic Fluid Tank Reservoir.

Hydraulic Pressure Gauge

A Hydraulic Pressure Gauge has also been incorporated in the design of the AXT PowerPak's Hydraulic System. Your AXT PowerPak's Hydraulic System has been factory calibrated to operate from 600 to 750 psi.

Hydraulic Pressure Relief Valve

The Hydraulic Pressure Relief Valve is a normally closed valve connected between the hydraulic supply line from the Hydraulic Gear Pump and the Hydraulic Fluid Tank Reservoir. Its main purpose is to limit the hydraulic pressure in the AXT PowerPak to a prescribed maximum by diverting some or all of the Hydraulic Gear Pump's output to the Hydraulic Fluid Tank Reservoir, when the designed pressure setpoint is exceeded.



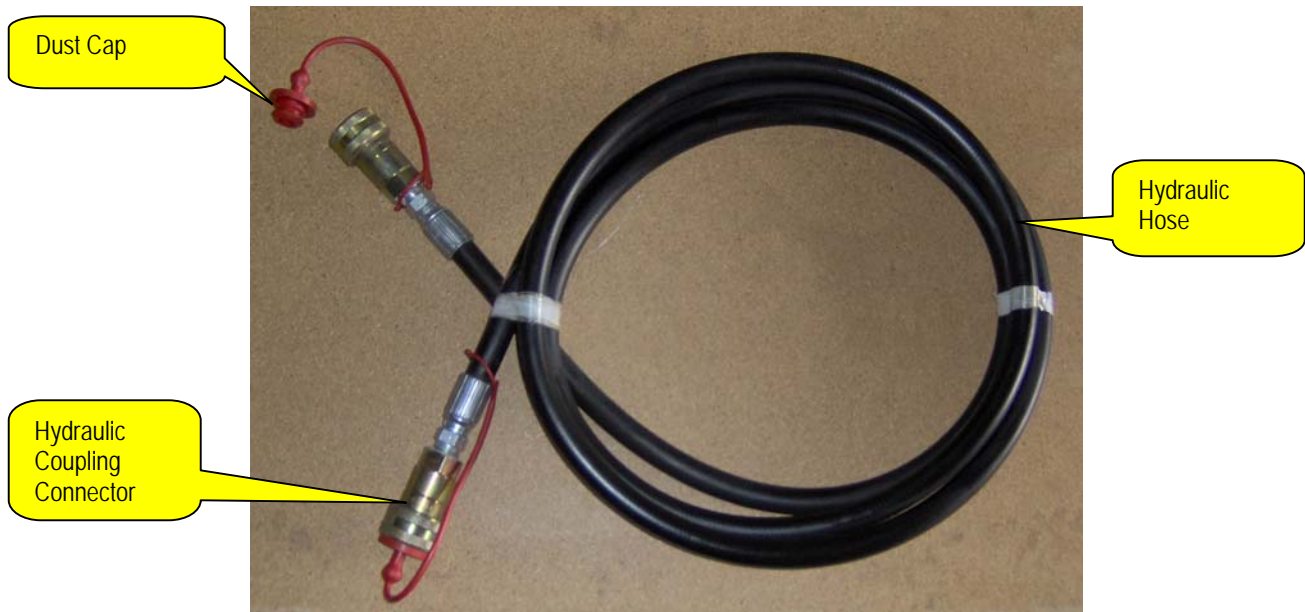
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Directional Flow Control Valve

The Directional Flow Control Valve incorporated in the design of the AXT PowerPak controls the direction of hydraulic fluid flow through the supply lines between the AXT PowerPak and the Hydraulic Motor on the Align Boring Machine. The direction of hydraulic fluid flow is ultimately controlled by the operator via the Operator Control Pendant Station's Forward/Neutral/Reverse selector switch and results in the forward or reverse rotation of the Align Boring Machine's cutting tool.

Hydraulic Supply Connectors

Two Hydraulic Supply Connectors are located on the AXT PowerPak for interconnecting of the hydraulic fluid supply lines between the AXT PowerPak and the Align Boring Machine. The Hydraulic Supply Connectors are of the quick disconnect coupling type. The operator installs one end of the Hydraulic Supply Hose Assembly to the Hydraulic Supply Connectors upon the setup of the AXT PowerPak to the Align Boring Machine. Dust caps have been installed on the AXT PowerPak to cover the ports of the Hydraulic Supply Connectors whenever the operator disconnects the Hydraulic Supply Hose Assembly from the AXT PowerPak.



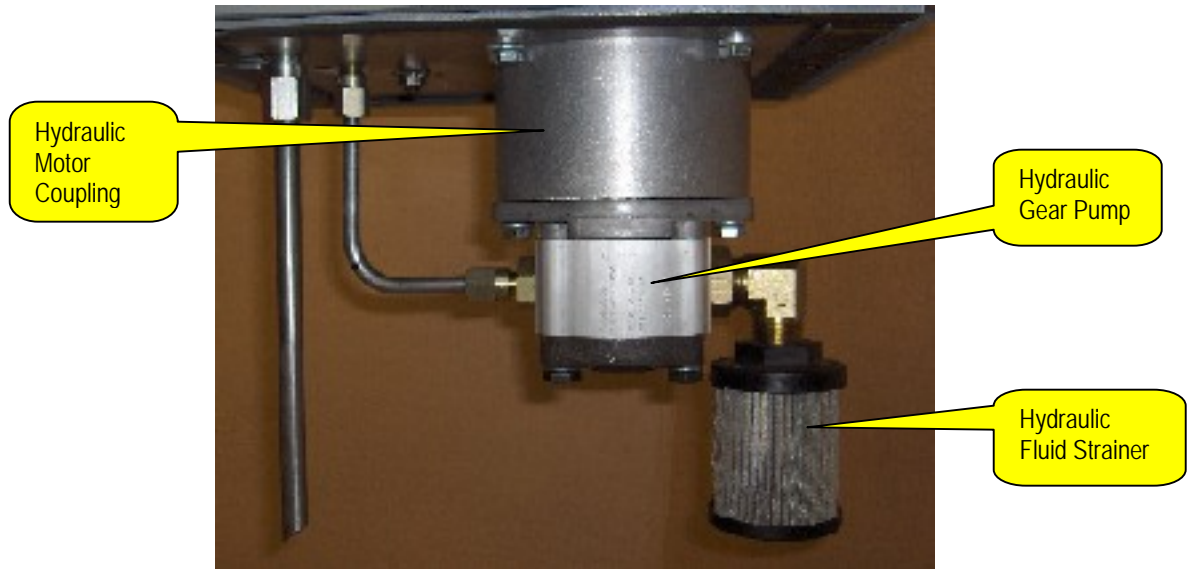
Hydraulic Supply Hose Assembly

Two Hydraulic Supply Hose Assemblies have been included with your AXT PowerPak. The operator connects the Hydraulic Supply Hose Assembly between the Hydraulic Supply Connectors on the AXT PowerPak and the Align Boring Machine. The connectors on each end of the Hydraulic Supply Hose Assembly are of the quick disconnect coupling type. Dust caps have been installed on the Hydraulic Supply Hose Assembly to cover the ports of the



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Hydraulic Supply Hose Assembly connectors whenever the operator disconnects the Hydraulic Supply Hose Assembly from the AXT PowerPak or Align Boring Machine.



Hydraulic Gear Pump

The Hydraulic Gear Pump is linked to the Electric Motor via the Hydraulic Motor Coupling. The Hydraulic Gear Pump is located below the Electric Motor inside of the Hydraulic Fluid Tank Reservoir. The Hydraulic Gear Pump's purpose is to displace the hydraulic fluid from the Hydraulic Fluid Tank Reservoir through the Hydraulic Fluid Strainer and out to the Align Boring Machine. The Hydraulic Gear Pump creates the hydraulic pressure and flow that drives the Hydraulic Motor on the Align Boring Machine by means of suction of fluid on its inlet and displacement of fluid on its outlet.

Hydraulic Motor Coupling

The Hydraulic Motor Coupling is installed between the Electric Motor's output shaft and the Hydraulic Gear Pump. The purpose of the Hydraulic Motor Coupling is to link the output of the Electric Motor to the input of the Hydraulic Gear Pump thereby converting electrical input energy to hydraulic output energy.



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Hydraulic Fluid Strainer

A Hydraulic Fluid Strainer has been incorporated in the design of the AXT PowerPak. The Hydraulic Fluid Strainer is located inside the Hydraulic Fluid Tank Reservoir and has been installed on the inlet of the Hydraulic Gear Pump . The purpose of the Hydraulic Fluid Strainer is to inhibit particulates from entering into the Hydraulic System.



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Installation and Setup

This section of the Manual describes the procedure for the installation and setup of the AXT PowerPak and the Align Boring Machine.

Minimal setup is required to get your AXT PowerPak interconnected with your Align Boring Machine.

The following list the steps to be completed to setup the AXT PowerPak and connect it to the Align Boring Machine.

- Roll the AXT PowerPak to a suitable location near the Align Boring Machine. The Hydraulic Supply Hose Assemblies are twelve feet in length.
- Connect one end of both of the Hydraulic Supply Hose Assemblies to the Hydraulic Supply Connectors on the AXT PowerPak.
- Connect the other end of both of the Hydraulic Supply Hose Assemblies to the Hydraulic Supply Connectors to the Align Boring Machine.
- Check the Hydraulic Sight Level Gauge and visually verify that the hydraulic fluid level in the Hydraulic Fluid Tank Reservoir is ok. Add more hydraulic fluid if the hydraulic fluid level is not ok.



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Operating Procedure

Use the following procedure to start and operate your AXT Power Pak.

- Prior to starting the AXT PowerPak, verify that all of the mounts on the Align Boring Machine are secured in place and that the Align Boring Machine can rotate freely.
- Plug the AXT PowerPak's Power Cord into an AC receptacle and verify that the Power Pilot Light is illuminated on the Operator Control Pendant Station.
- Twist and pull out the Emergency Stop Pushbutton located on the AXT PowerPak's Operator Control Pendant Station.
- Start the AXT PowerPak by moving the Start/Stop selector switch to the "Start" position.
- Verify that the Align Boring Machine's Cutting Tool is rotating in the proper direction. If the Align Boring Machine's Cutting Tool is not rotating in the proper direction, change the direction of rotation of the Align Boring Machine's Cutting Tool by moving the Forward/Neutral/Reverse selector switch on the AXT PowerPak's Operator Control Station Pendant.





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Maintenance

Performing routine maintenance is important in keeping your AXT PowerPak in good operating condition. This section of the Manual outlines the maintenance requirements for your AXT PowerPak.

B&D Manufacturing recommends that all maintenance be performed indoors, whenever possible, to prevent environmental conditions, such as rain, wind, or snow from damaging any of the AXT PowerPak's components.

The following is a summary of the maintenance requirements and suggested check intervals to be performed on your AXT PowerPak.

System	Item	Daily
Hydraulic	Check hydraulic fluid level of the Hydraulic Fluid Tank Reservoir	•



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Troubleshooting


This section of the Manual provides the operator with suggestions to help troubleshoot, diagnose and resolve issues that may arise with your AXT PowerPak.

Refer to the Appendices attached at the end of this document for further assistance in troubleshooting.

- Appendix A – Hydraulic Schematic
- Appendix B – Electrical Schematic
- Appendix C – Replacement Parts List

NEVER permit anyone to operate, or perform maintenance on, or perform troubleshooting of your Align Boring Machine or AXT PowerPak without first receiving proper training. Failure to do so could result in serious injury to personnel.

- Read and understand this Manual before you operate or perform maintenance on or troubleshooting of your AXT PowerPak.


CAUTION	
	Refer to this Operation Manual before operating, maintaining or troubleshooting your AXT PowerPak.

- Read the Cautions, Warnings, and Dangers in the **Safety** section of this manual before you operate or perform maintenance on, or perform troubleshooting on your AXT PowerPak.
- Read instructions and procedures thoroughly before you start to operate or perform maintenance on, or perform troubleshooting on your AXT PowerPak.
- Review all warnings, cautions and dangers that accompany any instruction or procedure.



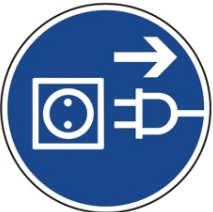
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- Review the **Safety** section and all relevant cautions, warnings and dangers each time you prepare to perform maintenance on or troubleshoot of your AXT PowerPak.
- Read and understand the Align Boring Operation and Maintenance Manual before you operate or perform maintenance on or troubleshooting of your Align Boring Machine.

CAUTION	
	Refer to the Align Boring Operation and Maintenance Manual before operating, maintaining or troubleshooting your Align Boring Machine.

- Improper usage can cause injury to personnel or damage to equipment. Read and understand your site specific safety instructions **thoroughly** before using your Align Boring Machine or AXT PowerPak.
- Contact B&D Manufacturing for additional training opportunities.

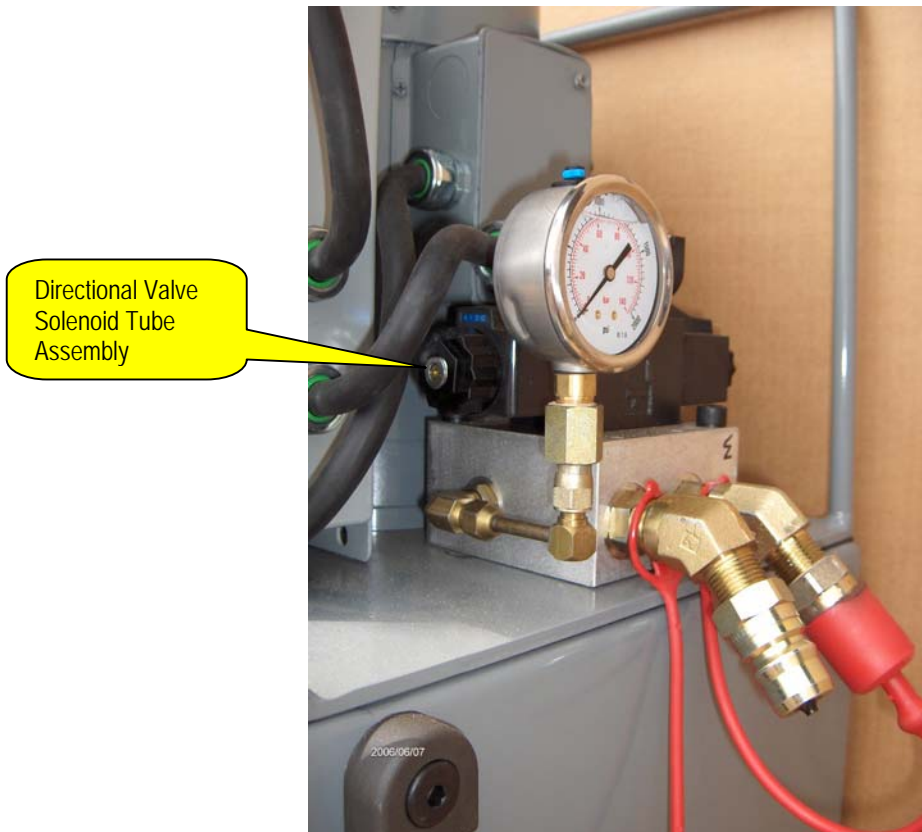
Unplug the AXT PowerPak's power cord from the AC receptacle when performing troubleshooting on the AXT PowerPak or Align Boring Machine. **Failure to do so could result in serious injury or death to personnel.**

DANGER	
	Electrical Shock Danger. Always disconnect the AXT PowerPak's electrical power source when performing maintenance on or troubleshooting of the AXT PowerPak or Align Boring Machine. Failure to do so could result in serious injury or death to personnel.



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Condition or Symptom	Possible Cause	Corrective Action
Electric Motor will not start	Power cord is not plugged in.	Plug power cord into AC receptacle.
	Emergency stop pushbutton is activated.	Pull out emergency stop pushbutton.
	AC receptacle has no power.	Have a qualified electrician verify that AC power is present at the receptacle.
	Loose wire inside the Control Pendant or Electrical Control Cabinet.	Unplug the power cord from the AC receptacle. Check wiring connection inside the Control Pendant or Electrical Control Cabinet.
	Faulty motor starter.	Replace motor starter.
Electric Motor is rotating counterclockwise	Incorrect termination of the Electric Motor's power supply conductors.	Swap the termination of the power supply conductors.
Align Boring Machine's Cutting Tool is rotating in the wrong direction	Forward/Neutral/Reverse switch is in the wrong position.	Change the selected position of the Forward/Neutral/Reverse selector switch.





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<p>Hydraulic Motor is not rotating</p>	<p>Quick Coupler not properly engaged.</p> <p>Electric Motor is not operating.</p> <p>Electric Motor is rotating in wrong direction.</p> <p>Control wiring problem.</p> <p>Solenoid Coil, Solenoid Tube Assembly or Directional Valve Failure</p>	<p>Unplug the power cord from the AC receptacle. Check and verify that Quick Couplers are properly engaged.</p> <p>See "Electric Motor will not start" condition above.</p> <p>See "Electric Motor rotating counterclockwise" condition above.</p> <p>Verify if Pilot Light on Controls Pendant is illuminated. If it is not illuminated check the electrical wiring of the controls circuit.</p> <p>Disconnect the hoses from the Hydraulic Motor and manually shift the directional valve by pushing on the pin in the center of the solenoid tube assembly, see picture above.</p> <p>If pressure is observed on the pressure gauge then the issue is with either a faulty solenoid, or the solenoid tube assembly, or the directional valve.</p> <p>The solenoid coil can be tested by removing it from the valve, connecting its leads in a safe manner to the correct power source. Insert a screwdriver or some other piece of steel into the center of the coil. When the solenoid coil is energized by switching the power source on, the steel item inserted into the coil should be pulled into the coil due the electromagnetic force generated by the coil. If the steel item is not pulled in, replace the solenoid coil. If the item of steel is pulled in, replace the directional valve.</p> <p>If pressure is not observed on the pressure gauge then the issue is most likely with the directional valve or the Hydraulic Pump.</p>
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Appendix A – Hydraulic Schematic

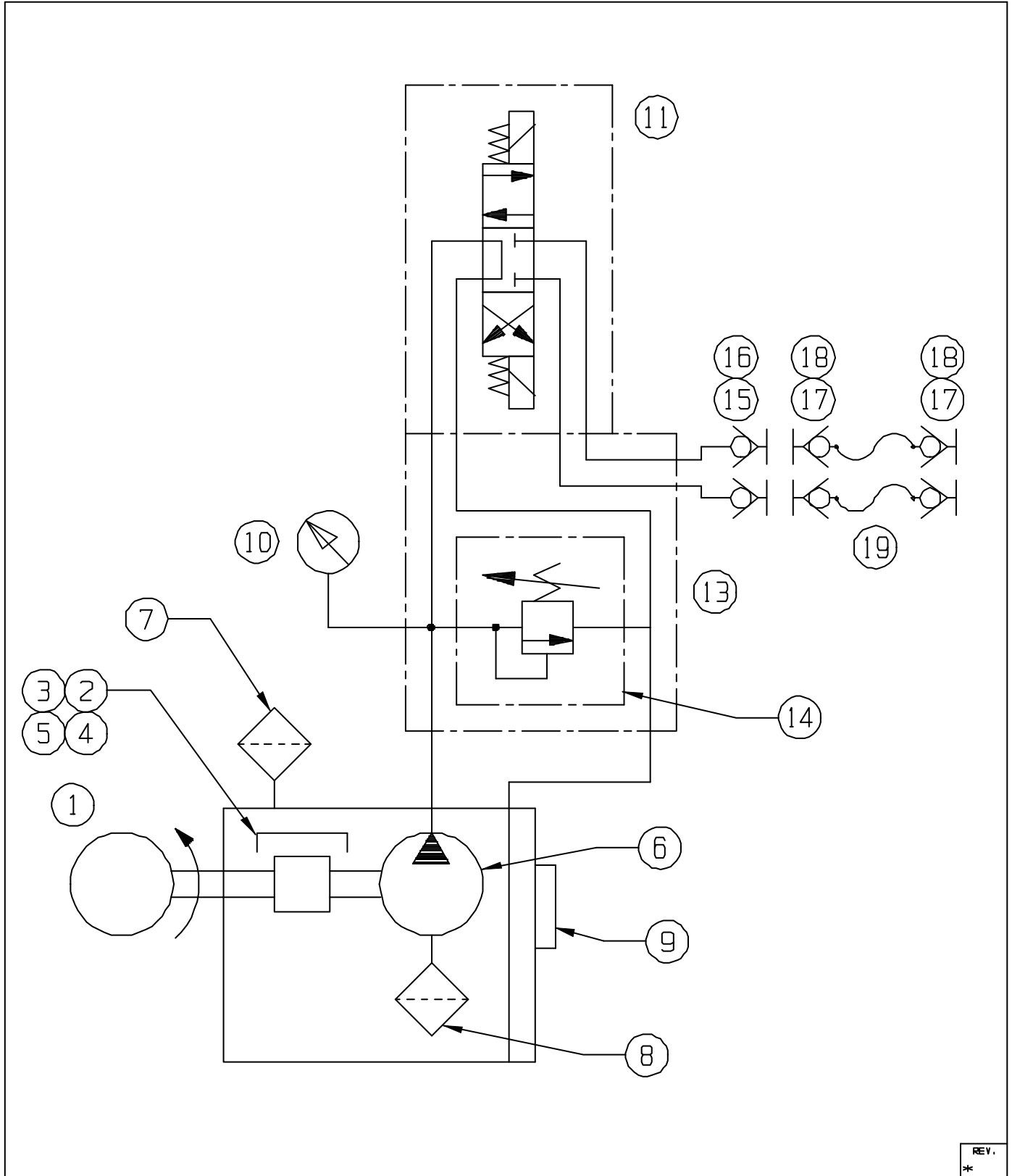


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The following lists the hydraulic components labeled on the Hydraulic Schematic.


- 1 – Electric Motor
- 2 and 3 – Pump/Motor Adapter with coupling
- 4 and 5 – Insert Buna N with coupling
- 6 – Hydraulic Gear Pump
- 7 – Breather
- 8 – Strainer
- 9 – Sight Gauge
- 10 – Pressure Gauge
- 11 – Directional Valve
- 13 – Subplate
- 14 – Relief Valve
- 15 – Quick Coupler
- 16 – Dust Cap for quick coupler
- 17 – Quick Coupler
- 18 – Dust Cap for quick coupler
- 19 – Hydraulic Hose Assembly with Quick Couplers

HYDRAULIC SCHEMATIC



REV.
*

CAD DRAWING - DO NOT MANUALLY ALTER

 B&D MANUFACTURING <small>ISO 9002-100% APPROVED</small>	AXT-POWERPAK HYDRAULIC SCHEMATIC	
	DRAWN BY: ROSS	SCALE NONE
CHK'D WAYNE D.	DATE - 2006-01-27	DRAWING NO.
TRACED *	APP'D WAYNE D.	B0S-0003

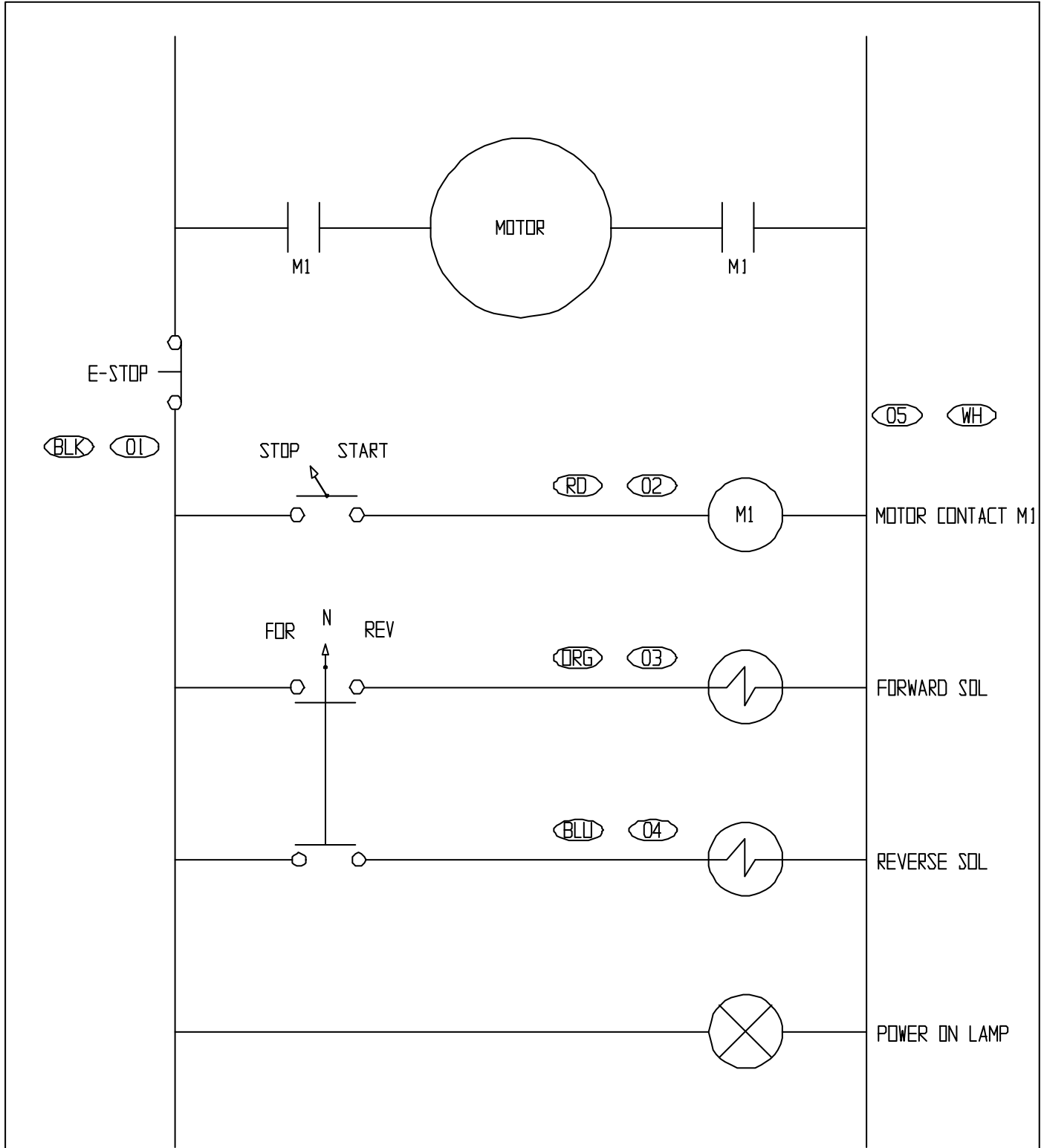
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Appendix B – Electrical Schematic

ELECTRICAL SCHEMATIC



REV.
*

CAD DRAWING - DO NOT MANUALLY ALTER

	B&D MANUFACTURING <small>ISO 9002-1004 APPROVED</small>	AXT-POWERPAK ELECTRICAL SCHEMATIC	
	DRAWN BY: ROSS	SCALE: NONE	
CHK'D: WAYNE D.	DATE: 2005-01-27	DRAWING NO. BUS-0002	
TRACED: *	APP'D: WAYNE D.		

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Appendix C – Replacement Parts List



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Replacement Parts

This section of the Manual includes a listing of the replacement parts for your AXT PowerPak.

To order replacement parts, call B&D Manufacturing. Refer to the **Important Contacts** section of this Manual for contact information.

Be prepared to provide the following information from the AXT PowerPak B&D Nameplate upon contacting B&D Manufacturing.

- Model
- Serial Number
- Volts
- Amps
- Frequency

If the replacement part does not appear on the list below, call B&D Manufacturing.

Part Description	Part Number	Part Location
Electric Motor c/w C Face	AXT-POWERPAK-4	Hydraulic System
Pump/Motor Adapter	PP-150	
Coupling	PP-157	
Insert Buna N	PP-159	
Gear Pump	PP-151	
Breather	PP-143	
Strainer	PP-154	
Sight Gauge	PP-144	
Pressure Gauge	PP-141	
Directional Valve	PP-140	
Solenoid Coil	PP-180	
Subplate	PP-142	
Relief Valve	PP-138	
Quick Coupling	LAXT-002	
Dust Cap	LAXT-005	
Quick Coupling	LAXT-003	
Dust Plug	LAXT-004	
Hose Assembly c/w Couplers	LAXT-001	
Rigid Caster	PP-031	
Swivel Caster	PP-030	
Enclosure	PP-183	Electrical System
Starter Contact	PP-182	
Control/Pendant Box	PP-184	
Selector Switch 2 Position	PP-185	
Emergency Stop Pushbutton	PP-186	
Contact Block for Emergency Stop	PP-187	
Selector Switch 3 Position	PP-188	
Contact Block	PP-189	
Pilot Light	PP-190	
Bulb for Pilot Light	PP-191	



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Appendix D – Warranty



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Warranty

All manufactured goods supplied by this Company are guaranteed against defective workmanship and material for a period of 1,000 hours or six (6) months from the date of installation or twelve (12) months from the date of shipment, whichever period expires first. If within that period, the Company receives from the customer, written notice of any alleged defect in, or non-conformances of any such product and if in the Company's sole judgment the product does not conform or is found to be defective in material or workmanship, then the Distributor or Customer shall at the Company's request, return the part or product transportation prepaid and the Company, at its option and expense shall repair or replace the defective part or product, or repay to Distributor or Customer, the full price paid for such part or product by Distributor or Customer. Any repayment of purchase price shall be without interest. Warranty on third party items shall be limited to the warranty passed on to the company by the original manufacturer of such items.

Limitations

The warranties of B&D do not cover, and the Company makes no warranty with respect to:

- Failures not reported to the Company within the warranty period specified above.
- Failures or damage due to misapplication, abuse, improper installation or abnormal condition of temperature, dirt or corrosion matter.
- Failures due to operation, either intentional or otherwise, above rate capacities or in an otherwise improper manner.
- Products which have been in any way tampered with or altered by anyone other than an authorized representative of the Company.
- Expenses incurred by Distributor or Customer in an attempt to repair or rework any alleged defective products.
- The Company shall not be responsible for any special, indirect or consequential damage of any nature arising out of or relating to the manufacture, sale or use of the Company's products. Such excluded damages include, but are not limited to, loss of business profits, revenues, opportunities, loss of goodwill, down time of equipment and facilities, and all other type of damages, direct or indirect, foreseeable or unforeseeable.
- Any damage to the equipment caused by the Customer's personnel, freight forwarder, installation contractor or other personnel handling the equipment, during shipment, installation or prior to completion of commissioning is to be repaired at the Customer's expense.

Unless stated otherwise by the Client, via written exceptions, these terms and conditions are considered accepted by the Client upon receipt of a purchase order.