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EV-2051-M Electric Motor

Operation and Maintenance Manual





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Table of Contents

Safety	3
General.....	3
Safety Notices.....	6
Cautions, Warnings and Dangers.....	7
Cautions.....	8
Warnings.....	11
Dangers.....	13
Important Contacts	15
General Description	16
Product Overview	17
Variable Speed Control Assembly.....	18
Main Body Assembly.....	19
Installation and Setup	20
Operating Procedure	21
Troubleshooting	22
Appendix A – Mechanical Assembly	
Appendix B – Electrical Schematic	
Appendix C – Replacement Parts List	
Appendix D – Warranty	



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Safety

General

Congratulations on your purchase of a B&D Manufacturing EV-2051-M Electric Motor.

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 Align Boring Machine's EV-2051-M Electric Motor.

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 EV-2051-M Electric Motor. 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 EV-2051-M Electric Motor.

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 EV-2051-M Electric Motor.

The operator **must** follow all specific site procedures and guidelines when operating, performing maintenance on, or troubleshooting of the Align Boring Machine and the EV-2051-M Electric Motor. 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 EV-2051-M Electric Motor 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 EV-2051-M Electric Motor, 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 operate 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 EV-2051-M Electric Motor and immediately notify your supervisor.

NEVER permit anyone to operate, or perform maintenance on, or perform troubleshooting of your Align Boring Machine or EV-2051-M Electric Motor 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 EV-2051-M Electric Motor.


CAUTION	
	Refer to this Operation Manual before operating, maintaining or troubleshooting your EV-2051-M Electric Motor.

- Read the Cautions, Warnings, and Dangers in this section before you operate or perform maintenance on, or perform troubleshooting on your EV-2051-M Electric Motor.
- Read instructions and procedures thoroughly before you start to operate or perform maintenance on, or perform troubleshooting on your EV-2051-M Electric Motor.
- 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 EV-2051-M Electric Motor.
- 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 EV-2051-M Electric Motor.
- 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 EV-2051-M Electric Motor.

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 EV-2051-M Electric Motor.

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 EV-2051-M Electric Motor.

Although not all of the personnel protective safety equipment is necessary to perform all instructions, procedures and tasks on the Align Boring Machine or EV-2051-M Electric Motor, 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 EV-2051-M Electric Motor.


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 EV-2051-M Electric Motor. 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 EV-2051-M Electric Motor. 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 EV-2051-M Electric Motor, 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 EV-2051-M Electric Motor.</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 EV-2051-M Electric Motor.</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 EV-2051-M Electric Motor.</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 EV-2051-M Electric Motor.

CAUTION



Head Protection Caution.

Wear a Hard Hat at all time when operating, maintaining or troubleshooting your Align Boring Machine and EV-2051-M Electric Motor.

CAUTION



Hand Protection Caution.

Do not wear Protective Gloves around the Align Boring Machine and EV-2051-M Electric Motor when in operation.

Wear Protective Gloves at all times when maintaining or troubleshooting your Align Boring Machine and EV-2051-M Electric Motor.



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CAUTION



Clothing Protection Caution.

Never wear loose Clothing in and around the Align Boring Machine and EV-2051-M Electric Motor.

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 EV-2051-M Electric Motor.

CAUTION



Long Hair Caution.

Never wear long hair in and around the Align Boring Machine and EV-2051-M Electric Motor.

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 EV-2051-M Electric Motor.

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.



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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 EV-2051-M Electric Motor.</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 EV-2051-M Electric Motor.</p> <p>Never place any parts of your body, including hair or jewelry, in close proximity to the EV-2051-M Electric Motor, the cutting tool or any of the moving parts of the Align Boring Machine and EV-2051-M Electric Motor.</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 and its 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 EV-2051-M Electric Motor surfaces during operation and shortly after you shut the Electric Motor off. These surfaces may become extremely hot while the Electric Motor is operating and may seriously burn you.


Wait until the EV-2051-M Electric Motor cools before performing maintenance on or troubleshooting of your Electric Motor.


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 EV-2051-M Electric Motor's electrical power source when performing maintenance on or troubleshooting of the EV-2051-M Electric Motor.

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 EV-2051-M Electric Motor supplied with your Align Boring Machine provides variable speed drive power with a high torque output to the Align Boring Machine.

The output speed of the EV-2051-M can be varied from 15 to 170 rpm (revolutions per minute) depending on your boring requirements.

The EV-2051-M Electric Motor requires either a 115 volt 60 hertz or 220 volt 50 hertz AC electric power supply. Refer to the technical information located on the EV-2051-M Electric Motor's B&D Nameplate for your Electric Motor's power supply requirements.



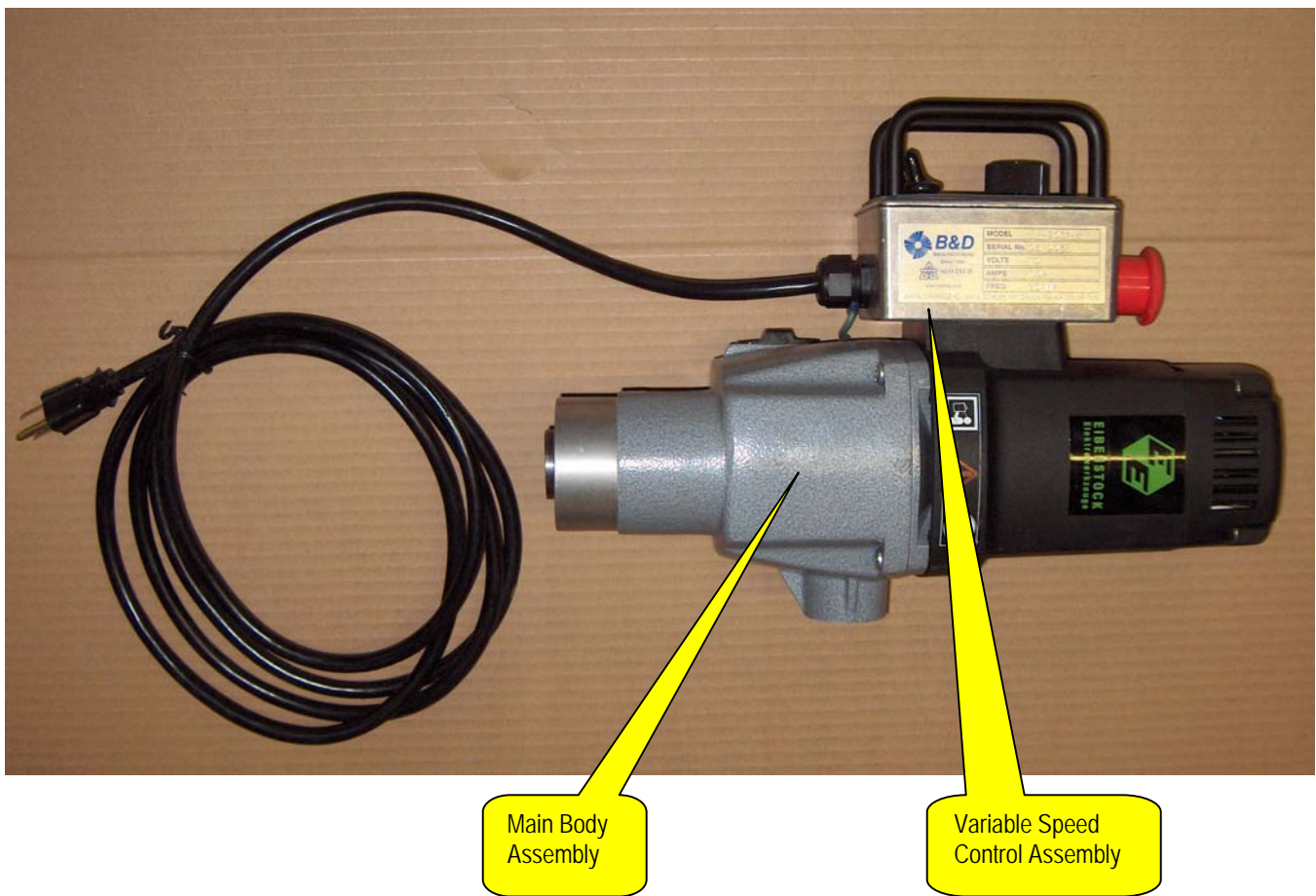
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Product Overview

This section of the Manual provides an overview of the major components and assemblies of the EV-2051-M Electric Motor supplied by B&D Manufacturing.

The EV-2051-M Electric Motor consists of the following major components.

- Variable Speed Control Assembly
- Main Body Assembly



Refer to the Appendices attached at the end of this document for detailed drawings and the replacement parts list of the major components and assemblies incorporated in the EV-2051-M Electric Motor.



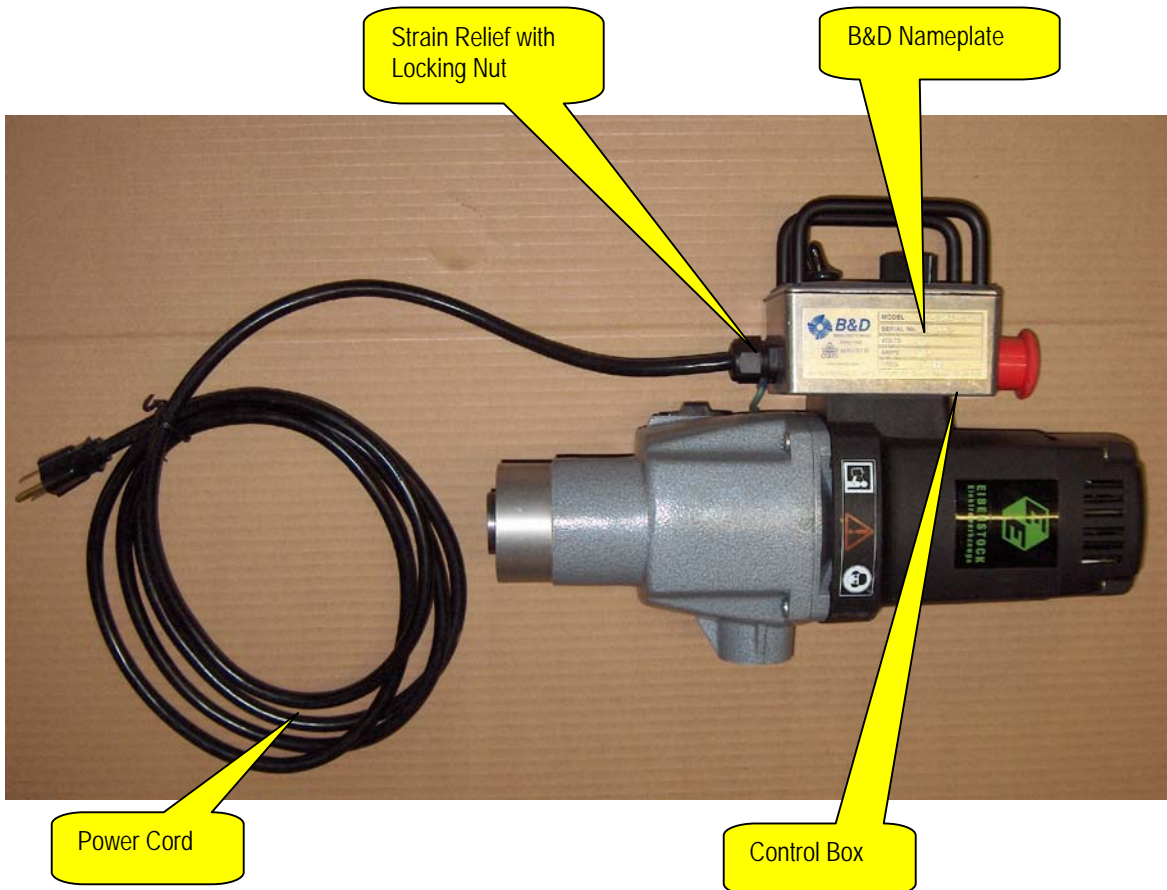
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Variable Speed Control Assembly

The Variable Speed Control Assembly is screwed in place to the Electric Motor Main Body Assembly's Motor Housing.

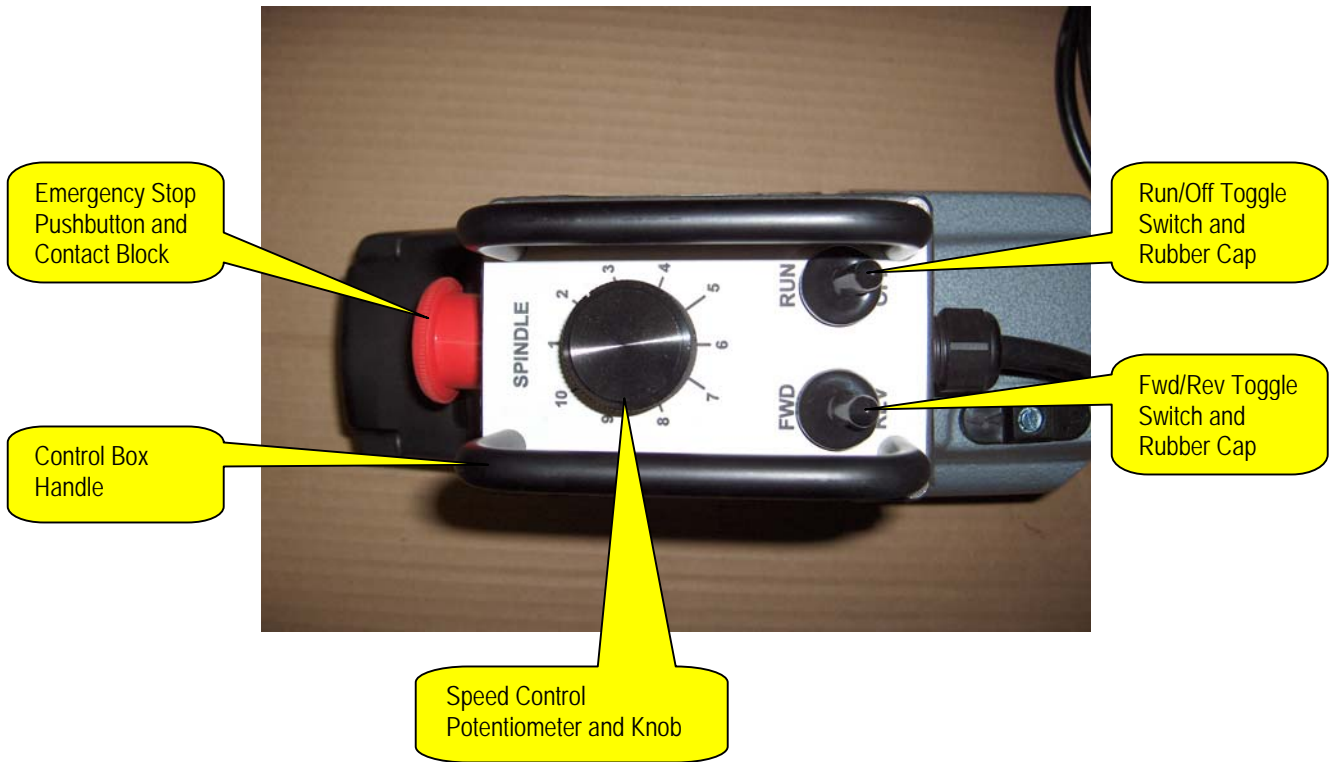
The Variable Speed Control Assembly consists of the following components.

- B&D Nameplate
- Control Box
- Strain Relief with Locking Nut
- Power Cord
- Run/Off Toggle Switch
- Forward/Reverse Toggle Switch
- Toggle Switch Rubber Cap
- Speed Control Potentiometer
- Speed Control Potentiometer Knob
- Emergency Stop Pushbutton
- Emergency Stop Contact Block
- Control Box Handle





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Main Body Assembly

The EV-2051-M Electric Motor's Main Body Assembly supplied by B&D Manufacturing has been custom modified specifically for the requirements of the Align Boring Machine.

The output of the EV-2051-M Electric Motor is coupled to the Align Boring Machine once installed in place on the Align Boring Machine.



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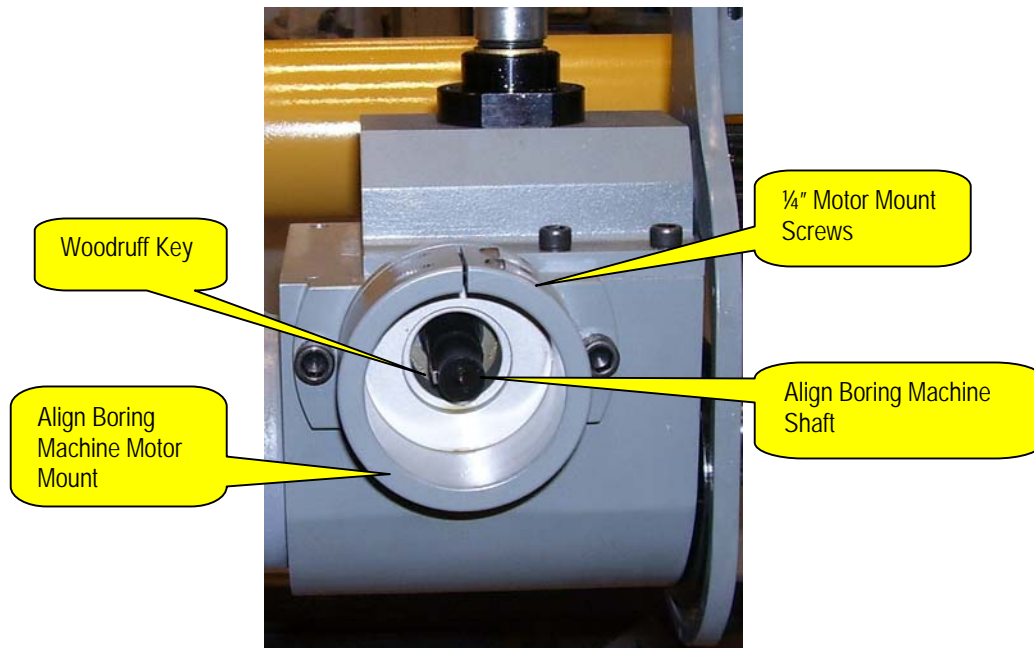
Installation and Setup

This section of the Manual describes the procedure for the installation and setup of the EV-2051-M Electric Motor with the Align Boring Machine.

Before starting with the installation of the EV-2051-M Electric Motor, ensure that the Electric Motor's power cord is not plugged into an AC receptacle.

The following list the steps to be completed to install the EV-2051-M Electric Motor to the Align Boring Machine.

- Verify that the Tapered Drill Shaft, part number EV-2048, has been installed in the end of the Electric Motor.
- Slide the Electric Motor onto the shaft of the Align Boring Machine. The shaft of the Align Boring Machine includes a woodruff key. Align the woodruff key with the slot, machined keyway, in the EV-2051-M Electric Motor's Tapered Drill Shaft.
- Once the woodruff key on the Align Boring Machine has been mated with the slot on the Electric Motor's Tapered Drill Shaft, slide the Electric Motor into the Motor Mount, part number EV-2016, on the Align Boring Machine. Continue to slide the Electric Motor until the Electric Motor rests against the Align Boring Machine's Motor Mount.
- Rotate the Electric Motor until its Variable Speed Control Assembly is in your preferred direction of orientation for operation.
- Tighten the two (2) $\frac{1}{4}$ " mounting screws on the Align Boring Machine's Motor Mount.



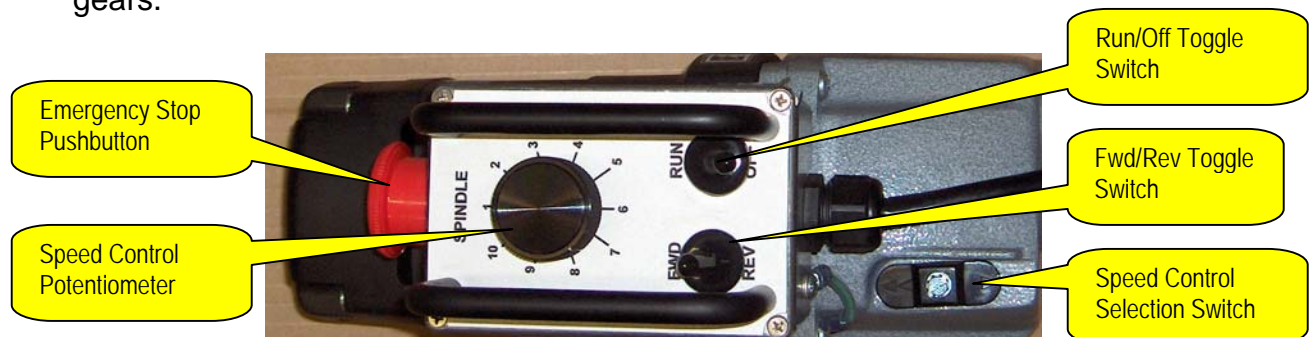


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Operating Procedure

Use the following procedure to start and operate your EV-2051-M Electric Motor.

- Prior to starting the EV-2051-M Electric Motor, 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 EV-2051-M Electric Motor's Power Cord into an AC receptacle. If using an extension cord ensure the extension cord has a maximum length of 25 feet (7.63 meters) and a conductor size of 12 gauge or larger.
- Twist and pull out the Emergency Stop Pushbutton located on the EV-2051-M Electric Motor's Variable Speed Control Assembly.
- Prior to starting the EV-2051-M Electric Motor, verify that the Speed Control Selection Switch is in the Low RPM speed position.
- Start the EV-2051-M Electric Motor by moving the Run/Off toggle switch to the "Run" position.
- Verify that the EV-2051-M Electric Motor is rotating in the proper direction for the tool bit. If the Electric Motor is not rotating in the proper direction, stop the Electric Motor by moving the Run/Off toggle switch to the "Off" position and then wait several seconds until the Electric Motor stops rotating. Once the Electric Motor is at rest, change the position of the Forward/Reverse toggle switch and then re-start the Electric Motor by moving the Run/Off toggle switch to the "Run" position.
- Now that the EV-2051-M Electric Motor is rotating in the proper direction, use the Speed Control Potentiometer located on the Variable Speed Control Assembly and the Speed Control Selection Switch located on the Main Body Assembly to vary the speed of rotation of the Electric Motor.
- Turn the Speed Control Potentiometer located on the Variable Speed Control Assembly in the clockwise direction to increase the speed of rotation, rpm output, of the EV-2051-M Electric Motor. Turn the Speed Control Potentiometer in the counterclockwise direction to decrease the speed of rotation, rpm output, of the EV-2051-M Electric Motor.
- Move the Speed Control Selection Switch located on the Main Body Assembly to the high speed position to engage the EV-2051-M high speed gears. Move the Speed Control Selection Switch to the low speed position to engage the EV-2051-M low speed gears.





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Troubleshooting

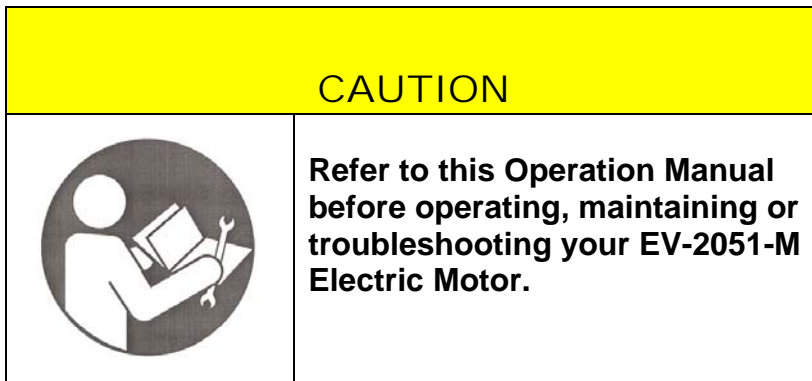
This section of the Manual provides the operator with suggestions to help troubleshoot, diagnose and resolve issues that may arise with your EV-2051-M Electric Motor.

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

- Appendix A – Mechanical Assembly
- 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 EV-2051-M Electric Motor 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 EV-2051-M Electric Motor.




- 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 EV-2051-M Electric Motor.
- Read instructions and procedures thoroughly before you start to operate or perform maintenance on, or perform troubleshooting on your EV-2051-M Electric Motor.
- Review all warnings, cautions and dangers that accompany any instruction or procedure.



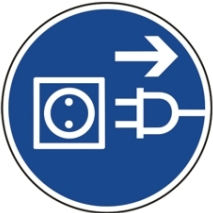
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- Review the **Safety** section and all relevant cautions, warnings and dangers each time you prepare to perform maintenance on or troubleshoot of your EV-2051-M Electric Motor.
- Read and understand the Align Boring Operation and Maintenance Manual 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 EV-2051-M Electric Motor.
- Contact B&D Manufacturing for additional training opportunities.

Unplug the EV-2051-M Electric Motor's power cord from the AC receptacle when performing troubleshooting on the EV-2051-M Electric Motor or Align Boring Machine. **Failure to do so could result in serious injury or death to personnel.**

DANGER	
	Electrical Shock Danger. Always disconnect the EV-2051-M Electric Motor's electrical power source when performing maintenance on or troubleshooting of the EV-2051-M Electric Motor 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 Variable Speed Control Assembly.	Unplug the power cord from the AC receptacle. Check wiring connection inside the Variable Speed Assembly's Control Box.
Electric Motor is rotating in the wrong direction	Forward/Reverse toggle switch is in the wrong position.	Change the selected position of the Forward/Reverse toggle switch.
Electric Motor is not rotating	Loose wire inside the Variable Speed Control Assembly.	Unplug the power cord from the AC receptacle. Check wiring connection inside the Variable Speed Assembly's Control Box.



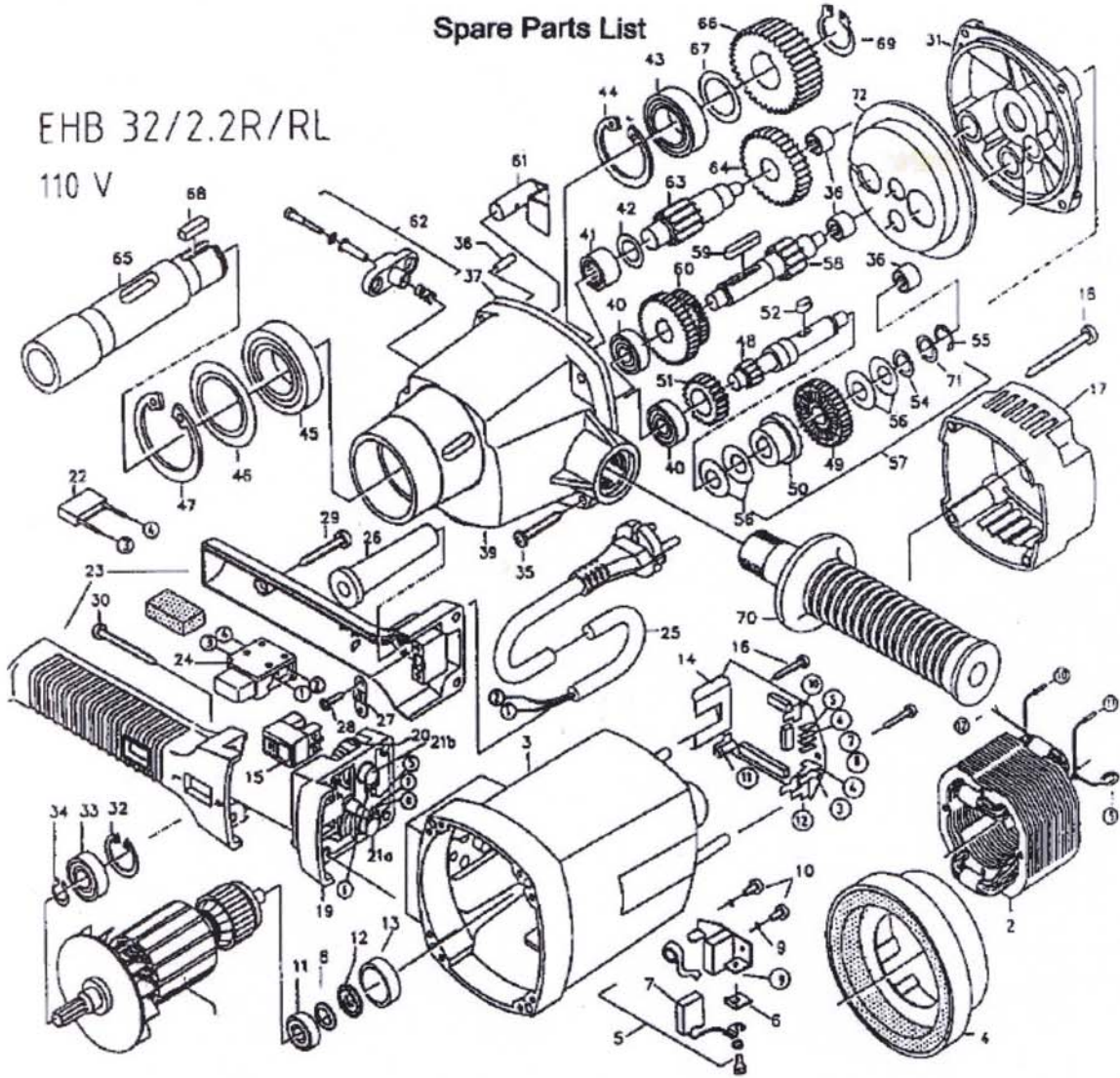
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Appendix A – Mechanical Assembly

Spare Parts List

EHB 32/2.2R/RL

110 V

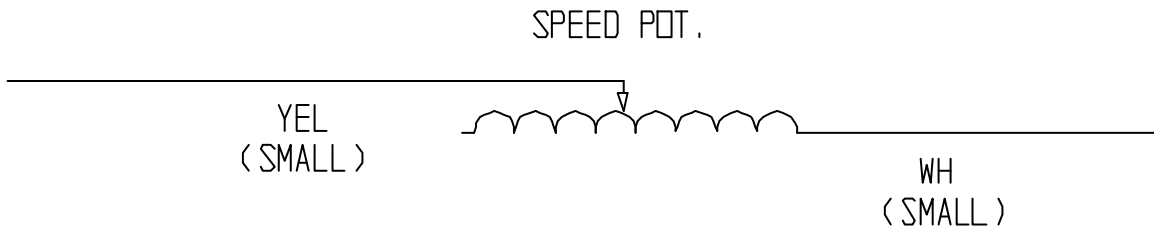
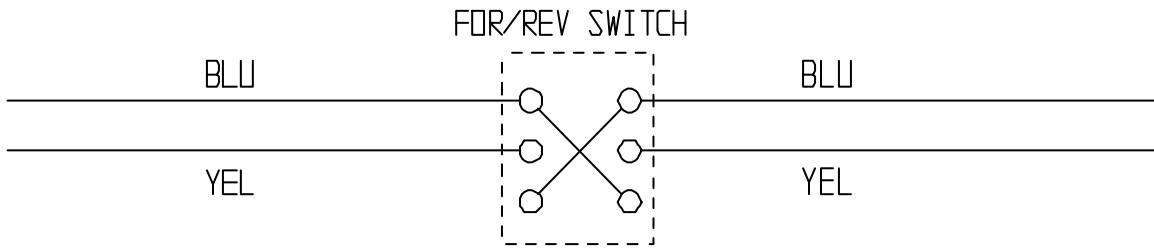
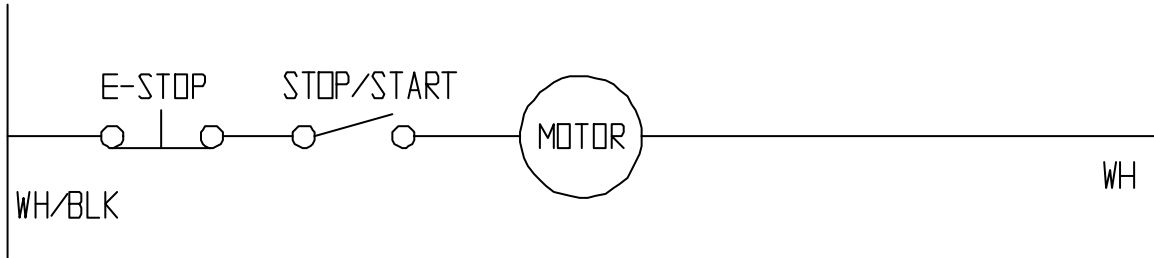




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Appendix B – Electrical Schematic


ELECTRICAL SCHEMATIC



REV.
*

CAD DRAWING - DO NOT MANUALLY ALTER

This drawing is the sole property of B&D Solutions part of the B&D Manufacturing Group and shall not be copied or altered in any way without the written consent of B&D Solutions

 B&D MANUFACTURING <small>ISO 9002-100% APPROVED</small>	EV2000 ELECTRICAL SCHEMATIC	
	DRAWN BY: ROSS	SCALE: NONE
CHK'D: WAYNE D.	DATE: 2007-04-02	
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 EV-2051-M Electric Motor.

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 EV-2051-M Electric Motor's 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
Control Box	EV-2071-6-B	Variable Speed Control Assembly
Strain Relief and Locking Nut	EV-2071-7	
Power Cord with Molded Plug	EV-2071-8	
Run/Off Toggle Switch	EV-2071-4	
Forward/Reverse Toggle Switch	EV-2071-3	
Toggle Switch Rubber Cap	EV-2071-9	
Speed Control Potentiometer	EV-2071-1	
Speed Control Potentiometer Knob	EV-2071-2	
Emergency Stop Pushbutton	EV-2071-5	
Emergency Stop Contact Block	EV-2071-10	
Control Box Handle	EV-2100	
Bevel Washer	AXT-3025-A	
O-Ring	EV-2071-25	
Electric Motor	EV-2051	Main Body Assembly
Circuit Board	EV-2065	



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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.