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1.1 Safety Symbols

The operating instructions use the following designations or symbols to emphasize information of particular importance:

Work Safety Symbols:



You will find that this symbol accompanies the work safety tips in the Operating Instructions to draw your attention to the risk of possible injury or death. Comply with these safety tips and use extra caution. These symbols will only appear in the Operating Instructions. Additional safety decals are located on the machine. Apart from these safety tips, Comply with any general safety and accident prevention rules. Contact your employer with any safety concerns regarding the operation or maintenance of this machine. Contact Blastrac Customer Service for further clarification if necessary.



Special information regarding the economical use of the machine.



Information or rules and prohibitions to help prevent personal injury or extensive property damage.



Warning of dangerous high voltage.

1.1 Safety Symbols (Cont'd.)



Tips regarding the Lock Out/Tag Out procedures for this equipment also referred to as the "Maintenance Mode"!



Information requiring inquiries addressed to the manufacturer of the equipment.



Tips regarding regular control checks.



Information regarding important advice given by the operating instructions.



This symbol represents any and all troubleshooting tips and suggestions presented in this manual.

1.2 Organizational Measures



The Operating Instructions shall be kept at the location where the equipment is used at all times!

Obey all other applicable legal and other binding rules regarding accident prevention and environmental protection!

The Blastrac® Operating Instructions have been specifically prepared for operating and maintenance personnel working with the Model 2-20DT and 8-54 Dust Collector shot blasting system. The information in this manual is intended to provide an understanding of the equipment and minimize the safety risks associated with operation, maintenance and transportation.

1.2 Organizational Measures (Cont'd.)



All operating and maintenance personnel must observe all warnings and precautions that are listed in this manual for the Model 2-20DT and 8-54 Dust Collector. All safety and warning labels posted on the machine must be followed as well as the safety program instituted by your individual management.

This Blastrac equipment has been manufactured for specific floor preparation applications. The engineering design of this airless media blast machine incorporates several basic elements. These include the airless media blast wheel, media recycling system and dust collection system. As a result of many years of operating and engineering experience, the features of these machines when used with the proper operating and maintenance procedures enable them to operate efficiently with little “down-time.”

A thorough understanding of your Blastrac machine will help ensure that the machine can be operated efficiently and safely. No instructions, written or verbal, can be effective without the use of sound judgment and good work practices in the operation and maintenance of the equipment. Comply with all recommendations throughout the Operating Instructions.



CAUTION: Always keep the abrasive valve control lever in the off/closed position except when the machine is actually blast cleaning!

If the machine acts in an irregular, unusual or hazardous manner, immediately close the abrasive control valve, release the handle mounted traverse control lever to deactivate the travel limit switch and shut off the blast wheel motor. An emergency stop switch is also provided on the front of the control panel that may also be used in the event of an emergency situation.

Before actual shot blasting can begin, the operator should be certain that all obstructions are removed from the work area. Work areas must be dry and clean (no loose debris) before cleaning can begin.



Maintain all guards in place! Blastrac machines are equipped with guards or coverings for parts that may be hazardous!

Such duties may include, e.g., proper handling of hazardous materials, the providing/wearing of personal protective gear, as well as obeying all traffic laws and rules.

Owners, operators and maintenance personnel are responsible for complying with all applicable site or location based requirements for the use of the BLASTRAC equipment.



Before beginning their work, any personnel performing tasks at the machine must have read and understood the Operating Instructions and, specifically, the Section on safety tips contained therein. Once the work has started, it is too late. This especially applies to personnel that performs work at the system only occasionally, e.g., during set-up and maintenance work.



The use of safety-conscious work methods and risk prevention measures by personnel in accordance with the Operating Instructions should be spot-checked regularly.

Personnel must not wear long hair, or loose, baggy clothes or jewelry including rings. These pose a risk of injury, e.g., by getting hung up or pulled into the machine. Protective clothing is recommended. Long sleeve shirts and safety shoes should be worn. The abrasive used in the machine impacts the work surface at a high velocity. Any leakage during normal operation can sting personnel in the surrounding area. **The blast head must be sealed to the work surface during operation to prevent abrasive leakage.**



Comply with all safety recommendations in the Operating Instructions, machine decals and any other operating manuals supplied with this equipment. Follow OSHA guidelines for the appropriate personal protective equipment.



1.2 Organizational Measures (Cont'd.)

Shut down, report and correct any condition with these machines that may be hazardous to personnel that may be operating, maintaining or standing around these machines.



No changes, additions or rebuilding may be performed on the machine without the express written consent of the manufacturer! Changes to the machine could cause damage to the equipment and/or injury or death to personnel.

This especially applies to the installation and adjustment of safety devices, as well as to any welding performed on weight-bearing components. Make sure all safety devices are in place and are working correctly.

All spare parts must correspond with the technical requirements established by the manufacturer. This is always guaranteed with Blastrac spare parts.



The prescribed time intervals for the performance of test procedures/inspections listed in the Operating Instructions must be observed!

Always select the correct tools for the job.

The **location** and operating instructions for **fire extinguishers** must be publicized at every construction site!

Pay attention to fire reporting and fire extinguishing options!

1.3 Operator and Maintenance Personnel

Basic Requirements:

Only properly trained personnel should be allowed to perform any work on the machine.

Observe the legal minimum age! Clearly establish your personnel's responsibilities regarding operation, set-up, maintenance, and repair!

Ensure that only **specifically assigned** personnel perform work at the machine!

Machine Operator – Establish responsibilities even with respect to **traffic regulations** and empower him/her to refuse to carry out instructions by third parties if they violate safety considerations!

Any personnel who are yet to be instructed or trained or those who are still in training should be allowed to perform work at the machine **only under the direct supervision of a properly trained person!**

1.4 Maintenance Mode

Definition:

The machine is in the “Maintenance Mode” when the equipment has been secured to minimize safety risks associated with maintenance and repair.

Putting the system into a “Maintenance Mode” means:

- Ensure every power source that can produce mechanical movement has been deactivated and locked in the off position.
- Ensure all potential energy sources have been minimized. (Example: Move the machine to level ground before performing any maintenance so machine cannot move by gravitational force.)
- Ensure loose or freely moveable parts of the machine have been secured against accidental movement.
- Ensure that all moving parts have stopped.
- Ensure that no dangerous electrical energy is present.

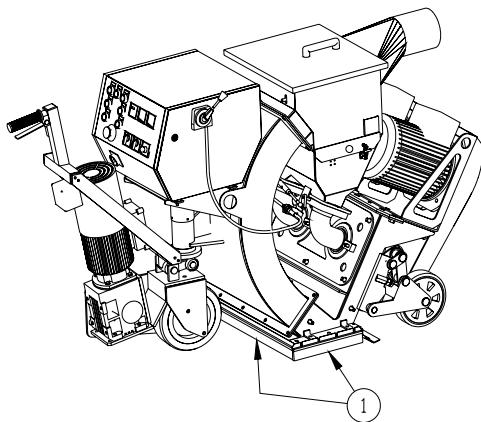
Maintenance Mode Checklist:

- Shut magnetic valve.
- Turn all systems off.
- Turn dust collector off.
- Wait until moving parts have stopped.
- Pull power plug.
- Follow Lock-out/Tag-out rules.

1.5 Special Danger Points of the System

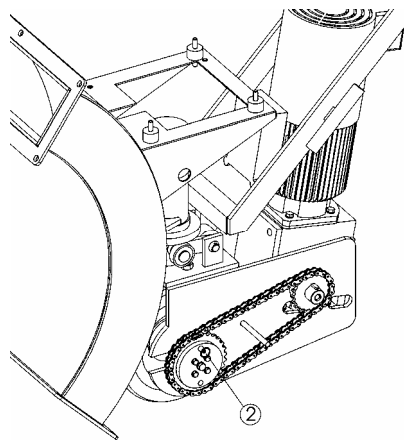


If not used in accordance with instructions, any machine can pose a danger to the operator, as well as set-up and service staff. It is the operator's responsibility to adhere to the safety provisions in the use and maintenance of the included safety devices or to provide appropriate safety facilities!



1. Opening for blast wheel
Danger of Injury!
Blast media exiting at high speed!
Moving parts!

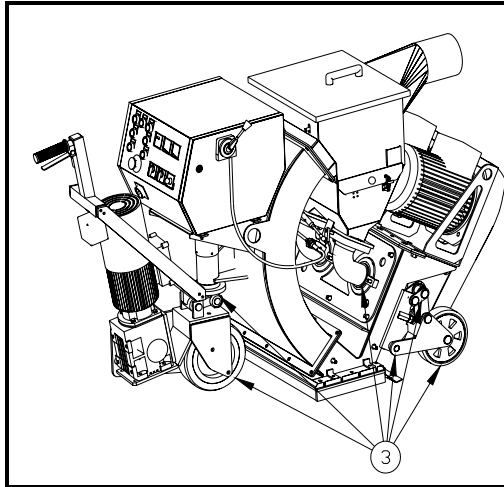
Lift and tilt the machine only in the "Maintenance Mode" Section 1.4. Absolutely do not get within the machine's working radius! See Section 1.7 for working radius.



2. Drive mechanism, quick release pin
Danger of Injury!
Moving parts!

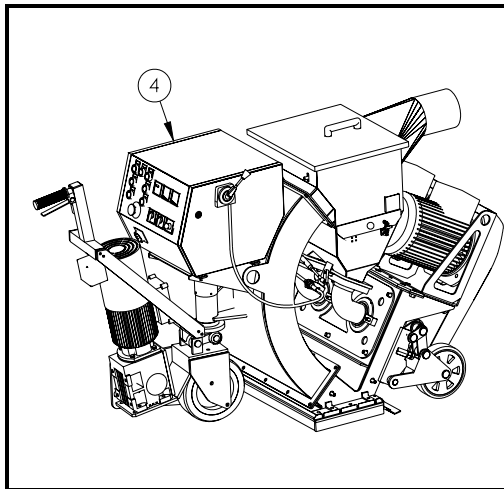
Exercise extreme caution when inserting the quick release pin. Allow only trained personnel to operate the blast cleaning system! Be sure machine is in "Maintenance Mode", Section 1.4, before inserting pin.

1.5 Special Danger Points of the System (Cont'd.)



3. Moving parts!
Danger of Injury!

Be aware of moving parts. Absolutely do not get within the machine's working radius! See Section 1.7 for working radius.



4. Electrical Enclosure
Danger of Injury!
Electric Shock!

Never work on electrical components or open panel doors. If machine is not in "Maintenance Mode" Section 1.6. Refer to Section 1.8 for electrical safety. **Follow Lock-out/Tag-out rules when working with all electrical components and systems.**

1.6 Dust Collection and Ventilation



All abrasive blast equipment must be properly ventilated to be environmentally effective. This benefits the operator, machine efficiency and helps minimize wear.

With all types of dust collectors, the dust hoppers must be kept from overfilling and should be emptied on a regular basis. The hopper must also be emptied at the end of every working day or shift. Many types of dust can be fire and explosion hazards. The hazards of fires and explosions are minimized when the dust is properly removed from the hoppers as recommended.

1.7 Operation and Maintenance

Any work methods that compromise safety must be stopped!



Operate the machine only if all protective devices and safety-related facilities, e.g., removable protective devices, emergency disconnect units, suction devices are connected and working correctly!



The machine must be inspected for external noticeable damage and defects at least once daily!

In the event of **problems**, **stop the machine immediately**, follow the **lock out procedure and troubleshooting instructions** and correct the problem!



If any work is performed in public settings, secure the machine's working radius of, at least, 10 ft.

Before turning on the machine ensure that all unnecessary personnel are clear of the work area. Do not turn off or remove any dust collection devices while the machine is running!



Comply with all safety recommendations in the Operating Instructions, on machine decals and in any other operating manuals supplied with this equipment. Follow OSHA guidelines for the appropriate personal protective equipment.



To extend the main cable, only use extension cords that are dimensioned and marked in accordance with the total power requirement of the machine and applicable standards. Refer to Section 1.8 "Electrical."

1.7 Operation and Maintenance (Cont'd)

Mechanical Maintenance Work:



Before performing any type of maintenance on this equipment, be sure that all moving parts have completely stopped and that the machine is in a “Maintenance Mode”! Refer to Section 1.6 “Maintenance Mode.”

The blast wheel, for example, may continue to rotate for a period of time once it has been deactivated.



All drive guards must be kept in place and in good condition except during maintenance or when repair work is being performed. Once maintenance or repair work is complete, be sure all guards are securely in place.



Comply with all safety recommendations in the Operating Instructions, on machine decals and in any other operating manuals supplied with this equipment. Gloves, when applicable, can be worn for added protection. Follow OSHA guidelines for the appropriate personal protective equipment.

Loose fitting clothing and gloves should not be worn when working near belts, chains, sprockets, shafts and other moveable components.

The blast machine and all areas around the machine should be kept clean. **Loose media in particular can become hazardous for foot traffic. All abrasive leaks should be repaired immediately to help keep the work area free of loose abrasive.**



Any condition(s) that may result in additional damage to the equipment or cause injury to nearby personnel should be repaired immediately following proper lock out procedures.



Do not attempt to make adjustments to the feed spout or any control cage components while the machine is in motion or the blast wheel is operating. All adjustments must be made when the machine is stationary, the blast wheel is completely stopped and power has been disconnected! Refer to Section 1.6, “Maintenance Mode”.



Obey all safety and danger signs posted on the machine and all information posted where the machine is being operated.

1.7 Operation and Maintenance (Cont'd)

Do not operate Blastrac machinery in the rain or when heavy moisture is present. Do not expose the abrasive supply to any type of moisture. Sticky, tar related and rubber surfaces should be avoided when using Blastrac machinery. Always drain unused abrasive from the machine and empty the dust collector hopper before transporting the equipment.

For all maintenance work performed on the machine, please, put the system into the **“Maintenance Mode”** as described in **Section 1.4**, in order to prevent an unexpected start-up.

Additional information regarding maintenance can be found in Section 7, “Maintenance.”



Do complete the prescribed adjustment, maintenance, and inspection work at the prescribed time intervals and comply with the instructions on replacing components/equipment parts!

Only Trained personnel may carry out these duties.

Do not use any **corrosive** cleaners!

Use non-fibrous **cleaning cloths!**

Any screw connections loosened during maintenance and repair work must be retightened!



If, during set-up, maintenance or repair work, it becomes necessary to remove safety devices, the safety devices must be remounted and checked for proper operation immediately after the maintenance and repair work has been completed.

Dispose off all items according to EPA regulations.

1.8 Electrical



Any work on electrical systems or electrical components should only be performed by a qualified electrician or by persons with proper training under the guidance and supervision of a qualified electrician under adherence to Section 1.8.



CAUTION: Line terminals may be energized even when main switch is in “OFF” position. Disconnect all power and make sure machine is in “Maintenance Mode”, Section 1.4”, before opening enclosure doors!



WARNING: DO NOT operate the equipment with the electrical panel door(s) open.



WARNING: The opening of any branch circuit protective devices is usually an indication that a fault has occurred. To ensure continued protection against fire or electric shock, current carrying parts and other components of the combination controller should be examined and replaced if damaged. If burnout of the current element of an overload relay occurs, the complete overload relay must be replaced.



Some overload devices in the control panel have an adjustable feature. Ensure these settings comply with settings provided for each device in the electrical schematics.

Never bypass over-load devices provided in this equipment!

Never use oversized fuses or bypass any fuses to operate the machinery!

Always refer to the electrical drawings provided for the individual machines for proper size and type of over-load protection and fuses.

When replacing electrical components, care should be taken to use the exact component that was originally supplied with the machine. These parts are listed in the electrical section of this manual. The electrical components in these systems have been coordinated for optimum protection of personnel and equipment – **DO NOT SUBSTITUTE ANY OF THESE COMPONENTS!**



Never connect or disconnect power cables with voltage present or while under load!

1.8 Electrical (Cont'd.)



Disconnect all power connections and observe lock out/ tag out procedures before attempting maintenance or repair of any electrical component! Refer to Section 1.4, "Maintenance Mode".



Avoid all contact with rotating motor parts, drives, or driven components!



Before energizing the equipment, check the condition of all power cables. While extra hard usage Type W cable is provided with this equipment, damage can occur during equipment transit. All cabling should be checked for cuts and worn condition prior to connection to the power source to ensure against electrical shock and fire!

Cable strain relief devices are provided for all power cabling. Ensure that these strain relief devices are secured to the frame of the equipment with the hardware provided prior to energizing the equipment.

While safeguards have been provided in this equipment to protect operating personnel and equipment, **ALWAYS CHECK** that the proper power source is connected (voltage, frequency and phase). Check the motors for proper rotation once the power source has been verified. Operation with improper motor rotation can damage machine components.



To extend the main cable, only use extension cords that are dimensioned and marked according to the total power requirements of the machine and the applicable standards.



Regularly check the electrical components of your system. Take special care to conduct regular inspections.



Defects, such as loose connections or damaged cables have to be remedied immediately. Call a licensed electrician or Customer Service!



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1.8 Electrical (Cont.)

If work is required on any energized components, a **second** person should be included who, in the event of an emergency, could disconnect or shut off the equipment. The work area should be restricted with appropriate barriers and warning signs.

Use **shock-resistant** tools.

Do **not** begin your work until you have familiarized yourself with **Section 1.8, "Electrical"**.

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Section 2 – Technical Data

- 2.1 Ratings
- 2.2 Equipment – Specifications
- 2.3 Area of Application and Proper Use
- 2.4 Energy Back-up Facilities
- 2.5 Machine – Type – Designation

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2.1 Ratings

Facility/Designation: Blastrac Blast Cleaning System

Model: 2-20DT & 8-54DC99

Manufacturer: **BLASTRAC**
Blastrac
6215 Aluma Valley Drive
Oklahoma City, OK 73121
(800)-256-3440

2.2 Equipment Specifications

Dimensions:

	2-20DT	8-54DC99
Length	75"	75"
Width	39"	42"
Height	48"	58"
Weight	1575 lbs.	1235 lbs.

Connected load electrical system:

The stated current inputs are those of the respective motor – nominal current at a full-load output. This is not reached under normal operating conditions.

2.2 Equipment Specifications (Cont.)

	2-20DT	8-54DC99
Power requirement/ Current consumption Blast wheel drive	Max. 2x17 A	N/A
Traction motor	Max. 2.85 A	N/A
Connection to the auxiliary filter system	480 V, 60 Hz, 60 A	480 V, 60 Hz, 100 A

Blast wheel size: 8"

Working Width: 22"

Travel Speed: 1.5 – 100 ft/min.

Blast Capacity: Heavily dependant on application

Dust-collecting Hose Connection: 6"

Blasting Medium Consumption: 15 to 20 lbs/hr

Recommended Filter System: 8-54DC99

2.3 Area of Application and Proper Use

The blast cleaning system 2-20DT is designed for performance on dry, frost-free, horizontal surfaces (lateral and longitudinal slope angle of area less than 10°). Any use that exceeds this recommendation must be considered improper. The manufacturer does not assume any liability for damages resulting from improper use. The operator assumes sole responsibility.

2.4 Energy Back-up

If the blast cleaning system 2-20DT is to be used with a generator, the latter must be operated in accordance with currently applicable standards (this especially applies to the ground conductor) to ensure that all safety features are in proper working condition and to exclude damage to any of the electrical components.

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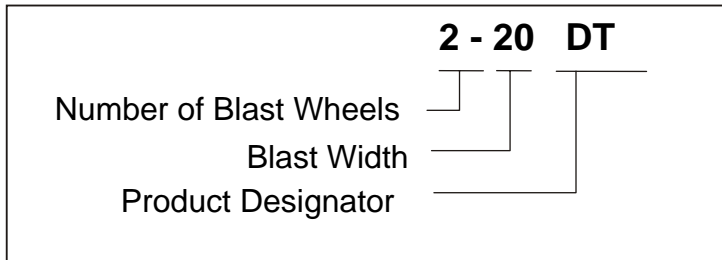
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2.5 Machine – Type - Designation



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- 3.10 The Separator
- 3.11 The Drive Mechanism
- 3.12 Abrasive Seals
- 3.13 The Required Air Extraction System
- 3.14 Operating Materials

3.1 Introduction

Blastrac thanks you for your decision to use the blast cleaning system 2-20DT for your horizontal surface work.

The machine incorporates a closed abrasive cycle with a dust separator. Thus, to the extent possible, it avoids risk factors both for the environment and the operator.

The 2-20DT is suitable for the removal of coatings, bitumen and asphalt and can be used on a wide variety of horizontal surfaces.

3.2 Operating Instructions

The Operating Instructions were devised, in order to help your operator personnel to become familiar with the way this machine operates and to ensure an optimal operation, maintenance and repair.



It is important that all operating, maintenance and repair personnel have read the Operating Instructions carefully and understands it completely.

The delivered machine was manufactured for the country in which it will be used. In accordance with the applicable statutes, all descriptions and tips were formulated in the language of the country in which the machine will be used or in English or in pictograms. In the event that the personnel in the country in which the machine is used cannot understand the language, ensure that they are appropriately trained and instructed.



Before the machine is turned on, all personnel must be familiar with the machine operations, with all of its critical parts, its manner of working and its dimensions.



In order to familiarize your operating, maintenance and repair personnel with all elements of the machine, Blastrac offers a training course in the use of the machine. Contact your local Blastrac representative for further details.

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3.2 Operating Instructions (Cont'd)

Great care must be taken in the first start-up of the machine. The machine operator must have fully understood the start-up sequence of the individual components and their function.



When the machine is in operation, anyone in its vicinity must wear protective goggles with side shields, as well as ear protection and safety footwear. The operator is instructed to wear snug-fitting protective clothing.

3.3 Connections

	Voltage	Type of Connection
2-20DT	480V 60Hz	60 AMP
8-54DC99	480V 60Hz	100 AMP

3.4 Care and Maintenance



Thorough care and regular maintenance performed on the system and the components are necessary for proper performance, safety, and operational efficiency!

To avoid unnecessary downtime, we recommend that you keep on hand the original spare parts and replacements contained in the maintenance kit.

So that you can quickly perform the above-mentioned chores, refer to **Section 10, "Spare Parts"**, for further detail concerning the maintenance kit and the spare parts involved.

3.5 Items Included With Delivery

Items included with the machine:

- Blast cleaning machine (2-20DT)
- Filter system (8-54DC99)
- Dust collector hose
- Operating Instructions 1 x

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3.6 Description

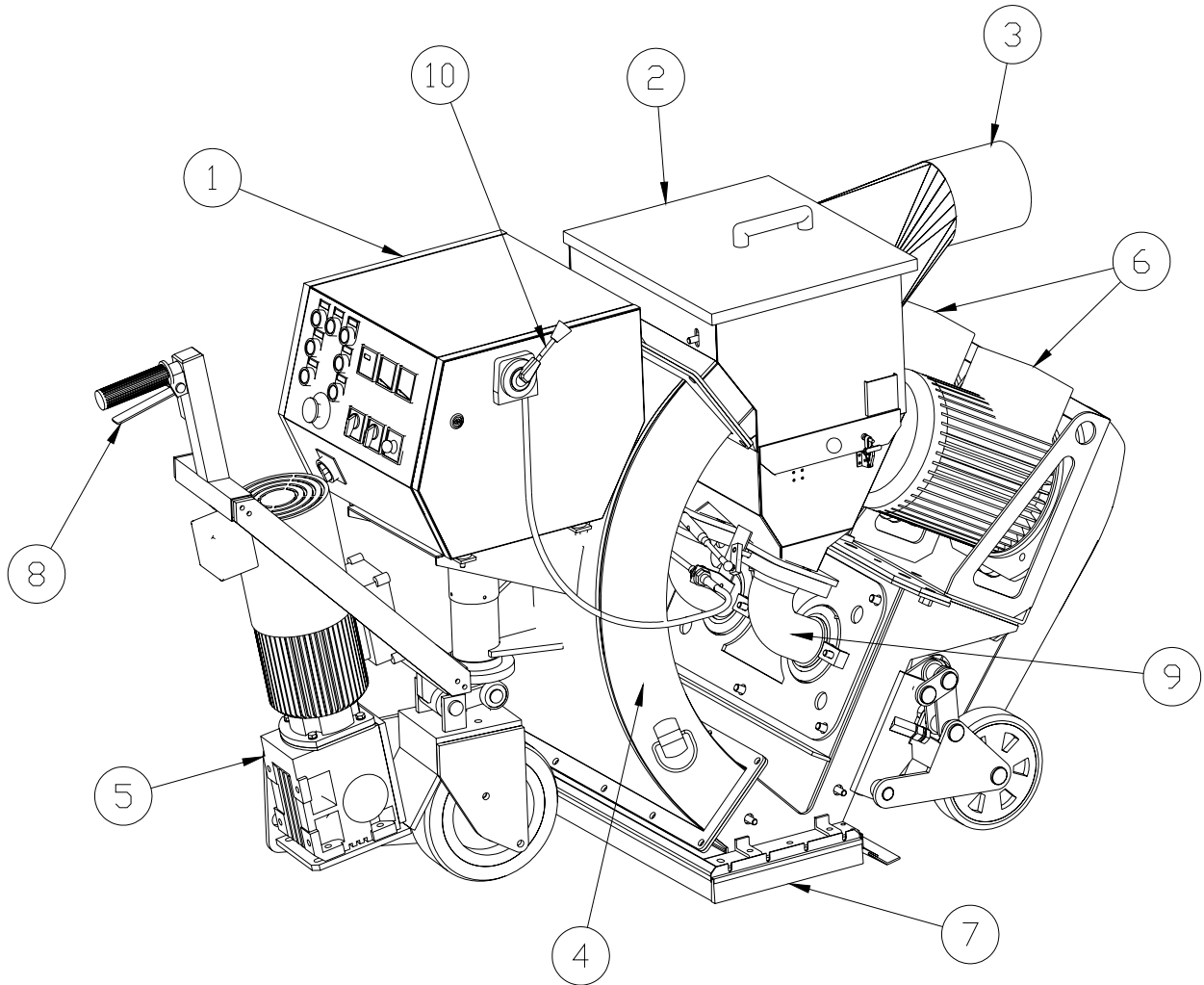


Figure 3.1

- | | |
|-----------------------------|------------------------------------|
| 1 Control Panel | 6 Blast wheel motor |
| 2 Separator | 7 Blast head, magnets, brush seals |
| 3 Dust Collector Connection | 8 Dead man's switch |
| 4 Rebound plenum | 9 Feed Spout |
| 5 Drive mechanism | 10 Abrasive Control Lever |

3.6 Description (Cont'd)

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The **Blastrac** - Blast Cleaning System 2-20DT is a closed cycle downward-blasting machine for the pre-treatment of horizontal surfaces. A thorough removal of surface grime, paint sealers and thin coatings is achieved through impinging metallic abrasive on the treated surface.

Like many revolutionary inventions, the centrifugal blast process is based on a simplistic principle: after a mechanical pre-acceleration, the abrasive is propelled on the surface by the centrifugal wheel at a high speed. Following its impingement on the surface, the abrasive rebounds through a rebound plenum. The rebound plenum deflects the abrasive into an airflow separator. Here, dust and other contaminants are removed from the abrasive, so that only a abrasive with extremely minor residual dust content is supplied to the storage hopper for repeated use by the wheel.

For dust separation purposes, it is necessary to connect an appropriate filter system to the machine. A specifically designed dust collector provides for a machine operation that is low in dust and helps keep the air clean at the work site.



Figure 3.2

3.7 Control Panels (Cont'd)



Any work on electrical systems or operating materials should only be performed by a qualified electrician or by persons with proper training under the guidance and supervision of an electrician. See Section 1.8 “Electrical”



Before maintenance or repair is performed, refer to Section 1.4 “Maintenance Mode” and all other sections in the Operating Instructions.



If the control panel has been removed or replaced ensure that the grounding strap is connected correctly. Using a voltmeter to do a continuity check between the main machine chassis and the control panel ensure that the control panel is correctly grounded.



CAUTION: Line terminals may be alive even when main switch is in “OFF” position. Disconnect all power and follow Lock-out/Tag-out procedures before opening enclosure doors!



WARNING: The opening of any of the branch circuit protective devices may be an indication that a fault current has been interrupted. To ensure continued protection against fire or electric shock, current carrying parts and other components of the combination controller should be examined and replaced if damaged. If burnout of the current element of an overload relay occurs, the complete overload relay must be replaced.



Never connect or disconnect power cables with voltage present or while under load!



To extend the main cable, only use extension cords that are dimensioned and marked according to the total power requirements of the machine and the applicable standards.



Regularly check the electrical components of your system. Always conduct regular inspections.

The control panel is equipped with all control elements and instruments required for the monitoring and control of the blast cleaning system.

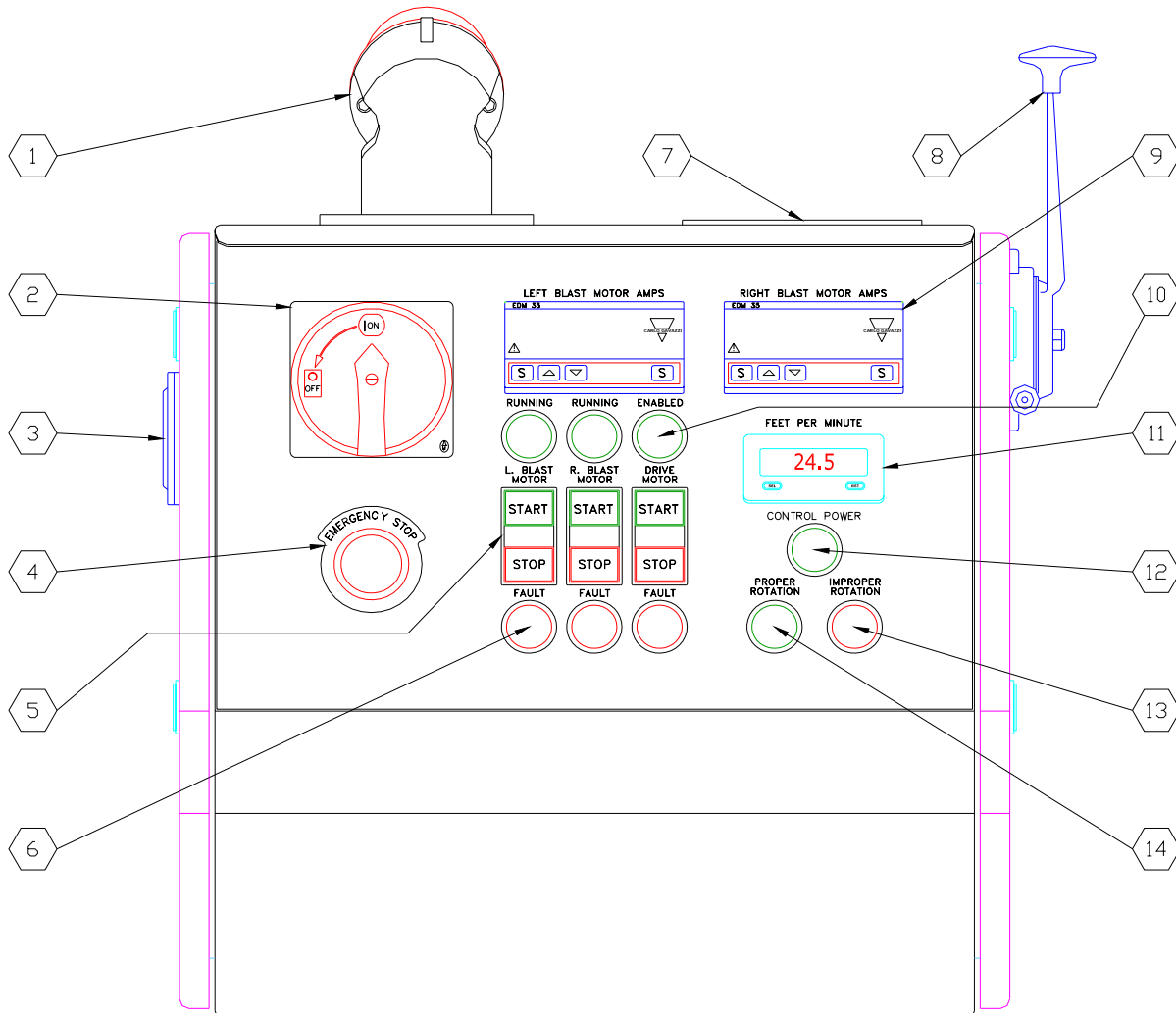


Figure 3.3

- | | |
|------------------------------|--------------------------------------|
| 1 Power Receptacle | 8 Abrasive Control Lever |
| 2 Main Disconnect Switch | 9 Blast Motor Amp Displays |
| 3 Hour Meter | 10 Motors Enabled Indicators (Green) |
| 4 Emergency Stop Switch | 11 Feet Per Minute Display |
| 5 Start/Stop Switches | 12 Control Power Indicator (Green) |
| 6 Fault Indicators (Red) | 13 Improper Rotation Indicator (Red) |
| 7 Blast Current Legend Plate | 14 Proper Rotation Indicator (Green) |

3.7 Control Panel (Cont'd)

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1. **Power Receptacle** - 480 Volt, 60 Hz, 60 Amp plug for main power.
2. **Main Disconnect Switch** - Must be turned on in order to supply machine with power.
3. **Hour Meter** - Indicates how many hours of use the machine has endured.
4. **Emergency Stop Switch** - Activate in the case of an emergency to shutdown all power to the entire machine.
5. **Start/Stop Switches** - Activate to start and stop motors accordingly.
6. **Fault Indicators** - Indicate when a power fault is present.
7. **Blast Current Legend Plate** - Indicates full load amps and maximum motor amps at appropriate voltages.
8. **Abrasive Control Lever** - Used to control the opening and closing of abrasive control valve.
9. **Blast Motor Amp Displays** - Displays amperage of blast motor.
10. **Motors Enabled Indicators** - Indicates when appropriate motors are enabled.
11. **Feet Per Minute Indicator** - Indicates speed of machine travel.
12. **Control Power Indicator** - Indicates when control power is present and 'On'.
13. **Improper Rotation Indicator** - Indicates when motor rotation is not correct.
14. **Proper Rotation Indicator** - Indicates when motor rotation is correct.

3.7 Control Panel (Cont'd)

The 2-20DT control panel is equipped with all control elements and instruments required for the monitoring and control of the blast cleaning system.

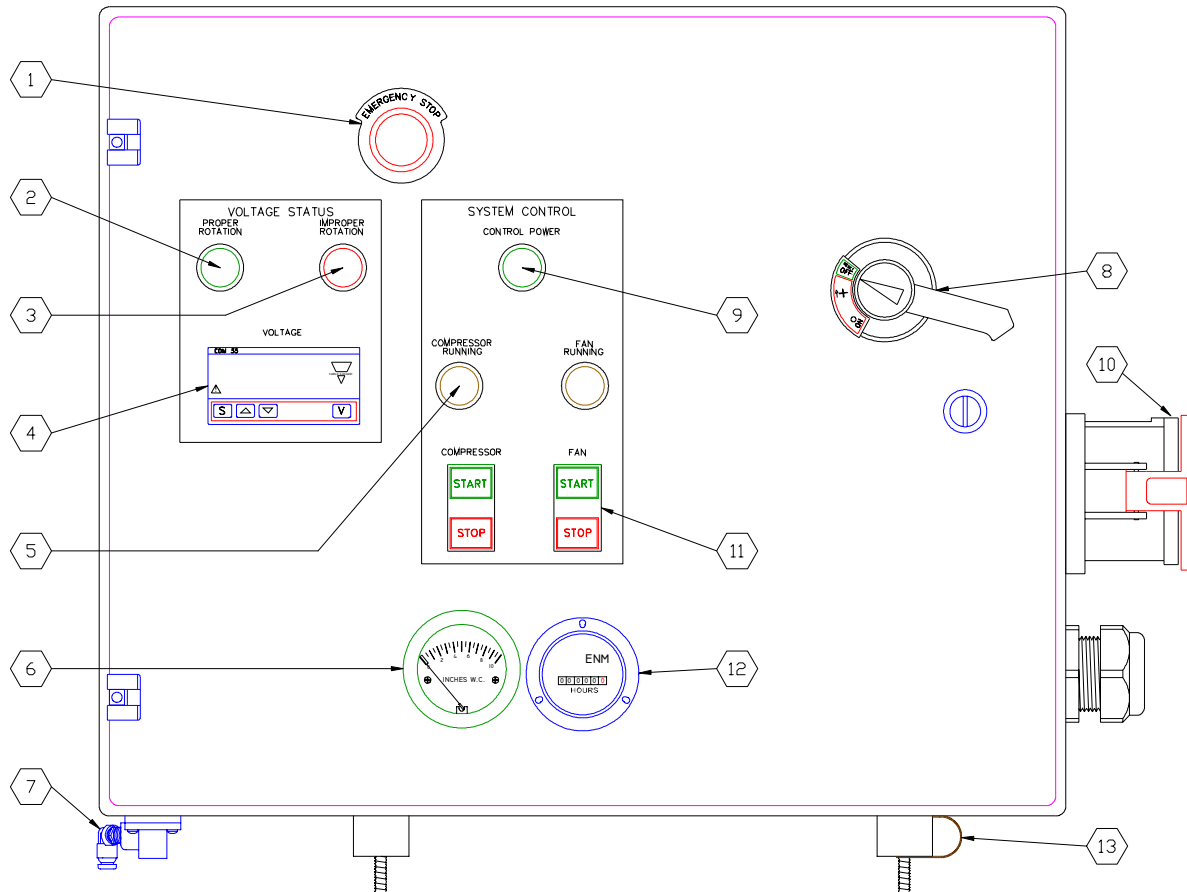


Figure 3.4

- | | |
|---------------------------------------|-----------------------------------|
| 1 Emergency Stop Switch | 8 Main Disconnect Switch |
| 2 Proper Rotation Indicator (Green) | 9 Control Power Indicator (Green) |
| 3 Improper Rotation Indicator (Red) | 10 Power Receptacle |
| 4 Voltage Display | 11 Start/Stop Switches |
| 5 Motors Enabled Indicator (Amber) | 12 Hour Meter |
| 6 Differential Pressure Gauge (0-10") | 13 Grounding Strap |
| 7 'Pulse' Solenoid Valves | |

3.7 Control Panel (Cont'd)

1. **Emergency Stop Switch** - Activate in the case of an emergency to shutdown all power to the entire machine.
2. **Proper Rotation indicator** – Indicates when motor rotation is correct.
3. **Improper Rotation Indicator** - Indicates when motor rotation is not correct.
4. **Voltage Display** – Displays current voltage readings.
5. **Motors Enabled Indicators** - Indicates when appropriate motors are enabled.
6. **Differential Pressure Gauge** – Displays the current differential pressure within its range of 0-10 inches of water.
7. **'Pulse' Solenoid Valves** – Produces high-pressure pulses of air for the purpose of blowing dust off of filters and into the appropriate dustbins.
8. **Main Disconnect Switch** - Must be turned on in order to supply machine with power.
9. **Control Power Indicator** - Indicates when control power is present and 'On'.
10. **Power Receptacle** - 480 Volt, 60 Hz, 60 Amp plug for main power.
11. **Start/Stop Switches** - Activate to start and stop motors accordingly.
12. **Hour Meter** - Indicates how many hours of use the machine has endured.
13. **Grounding Strap** – Electrical grounding strap needed to ground the control panel to the main machine chassis.



Make sure that the control panel-grounding strap is connected correctly. Using a voltmeter to perform a continuity check between the main machine chassis and the control panel will ensure that the control panel is correctly grounded.

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The Abrasive Magnetic Valve:

To regulate the abrasive supply to the blast wheel, a permanent magnetic valve has been installed between the abrasive reservoir and the feed spout. Any change in the degree to which the magnetic valve opens, causes different amounts of abrasive to be supplied. The change of the apportioned amount of abrasive is displayed on the ammeter. The valve is operated manually and can be adjusted so that the desired amount of abrasive can pass through. **An optimum blasting performance is achieved if the ammeter for the 2-20DT displays 30 amps. Do not blast at a higher ampere number!**

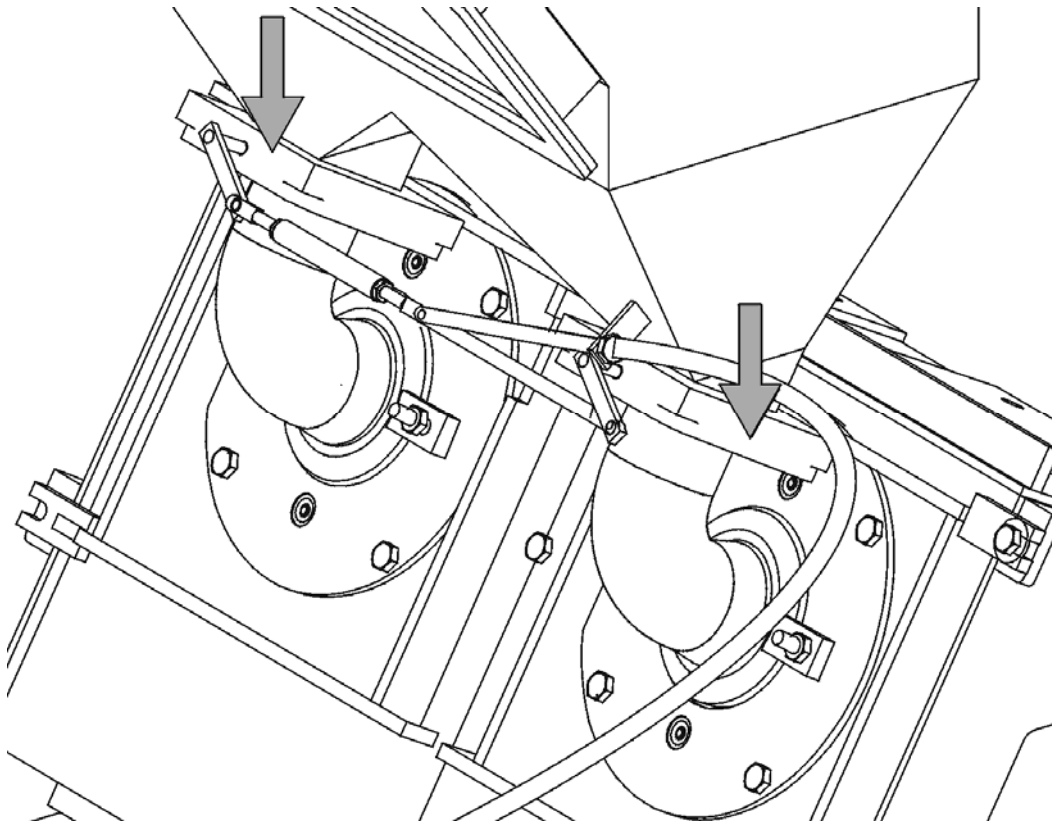


Figure 3.5

Abrasive – Control Lever:

This lever, which is provided on the control panel, controls the supply flow of abrasive to the blast wheel via abrasive magnetic valve. This valve is operated manually and can be adjusted to the desired output of abrasive by shifting the lever. Position 1 is open and position 2 is closed.

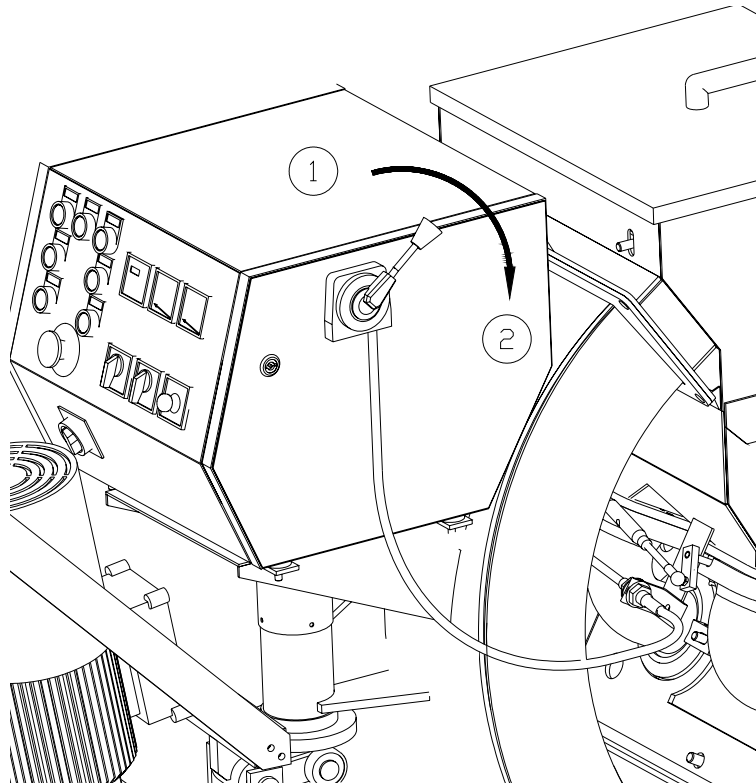


Figure 3.6

Drive Motor On/Off Switch:

The drive motor is operated with the switch lever (1) below the control handle. Upon actuation, the electric circuit is completed and the driving motor is switched on; when the switch lever is released, the driving motor is turned off. (Dead man's switch)

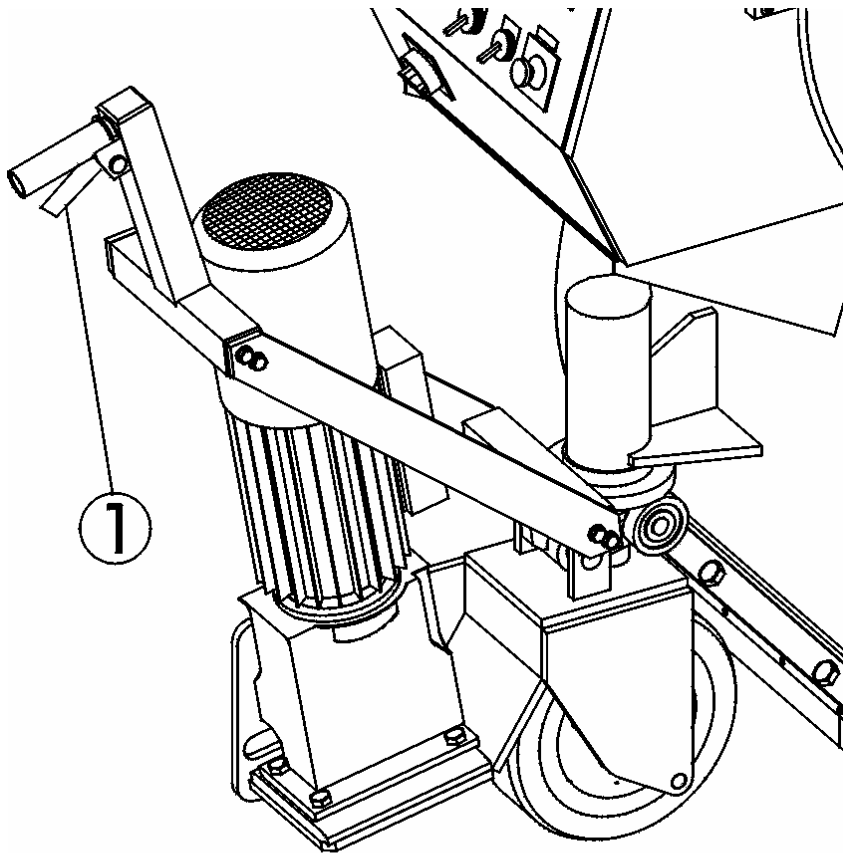


Figure 3.7

3.9 The Blast Wheel

The component at the heart of the blast cleaning system is the blast wheel that propels the abrasive, by centrifugal force, on the surface to be cleaned. This wheel is built into a protective housing that is lined with replaceable anti-wear plates. This wheel is driven by an electric motor.

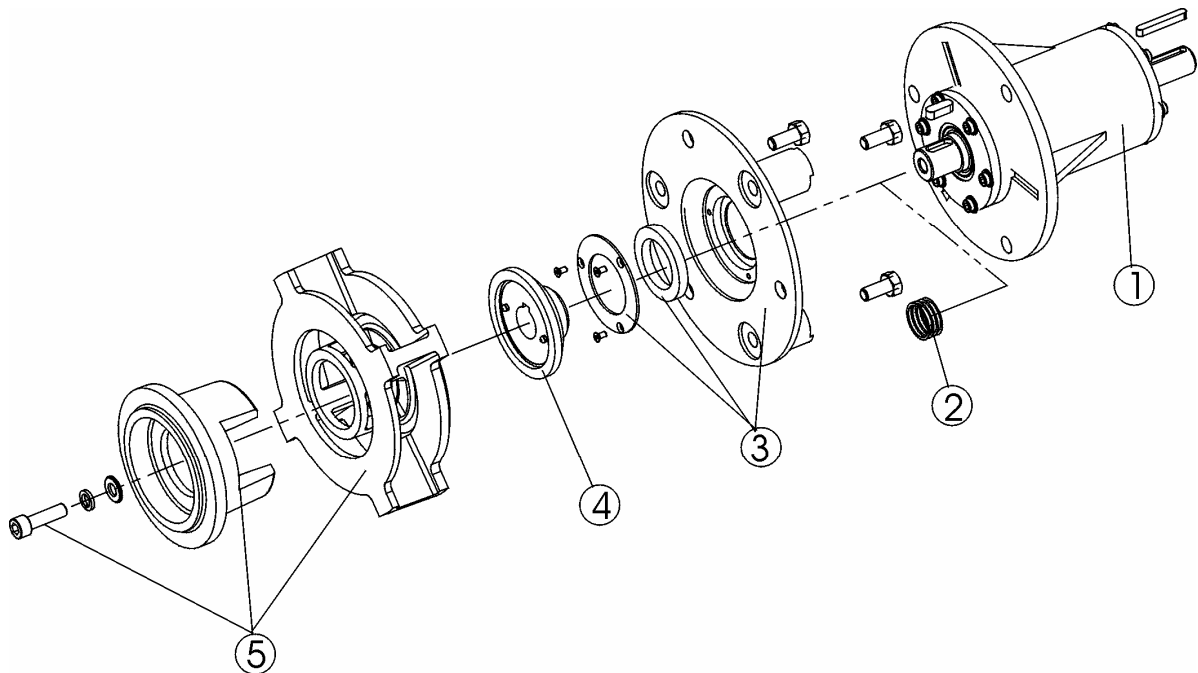


Figure 3.8

The shaft is located towards the center of the blast wheel. This is the impeller that supplies the apportioned quantity of the abrasive to the agitator paddles of the rotating wheel. Above them, the control cage is located which, upon careful adjustment, regulates the abrasive flow.

- 1 Bearing unit
- 2 Spacer ring
- 3 Mounting flange
- 4 Wheel Hub
- 5 Wheel Kit

3.10 The Separator

At the end of the rebound plenum, the abrasive separator has been added. The separator separates the abrasive from contaminants and recycles the purified abrasive into abrasive circulation.

To prevent any coarse-grained contaminants from reaching the blast wheel, a separator tray has been installed inside the abrasive reservoir. **Before removing the tray, put the machine in "Maintenance Mode" Section 1.4.** To clean the separator tray, the separator lid can be removed and the separator tray can be pulled out from the side.

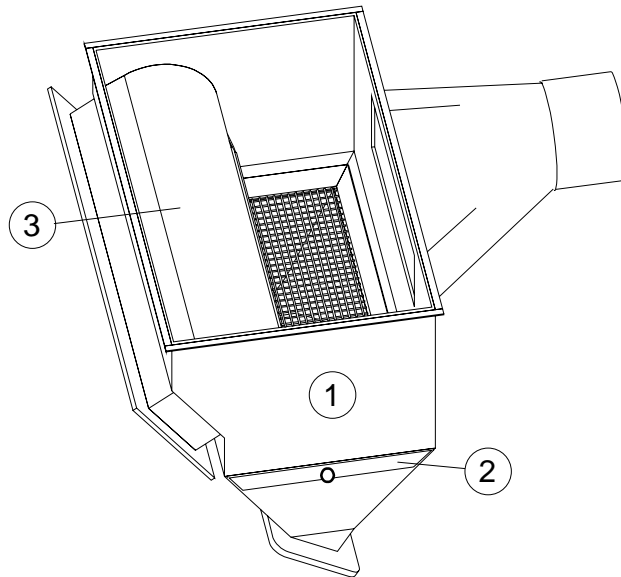


Figure 3.9

1. Separator
2. Separator tray
3. Baffle plate

3.11 The Drive Mechanism

Model 2-20DT is driven by a **1.5 HP electric motor**. The power transmission is handled by a chain drive. The chain sprocket and the hub of the chain drive are not permanently connected. The chain sprocket is connected to the hub only after a quick-release pin has been inserted.

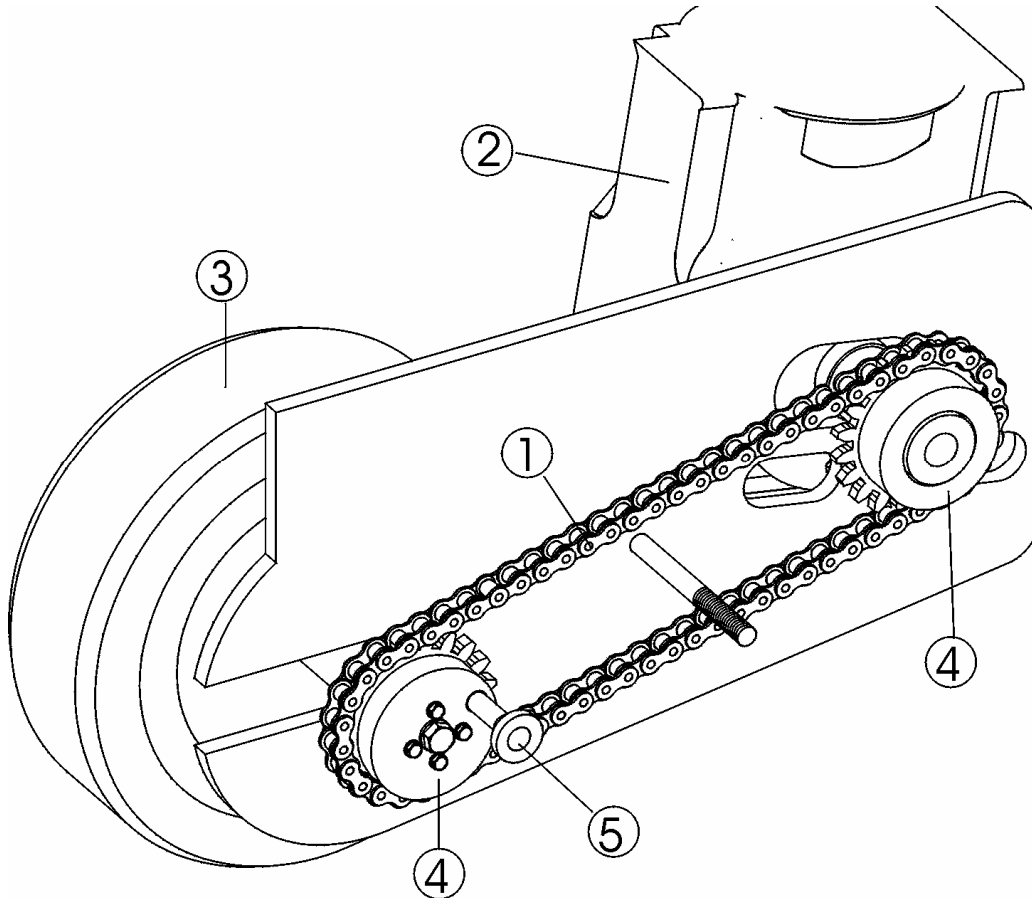


Figure 3.10

- 1 Drive Chain
- 2 Drive Motor
- 3 Drive Wheel
- 4 Chain Sprockets
- 5 Quick Release Pin

3.12 Abrasive Seals

In front of and on the sides of the blast head, a magnetic seal has been installed which is enclosed by a brush seal. In the rear, two seals have been installed which drag over the ground.

These seals are to seal of the blast head area so that no abrasive can leak out.

A correct height adjustment of the magnets (**5/16"-3/8"**) is of major significance for optimum machine performance. Adjustments can be made by means of adjusting screws on the wheels and at the machine's drive mechanism.

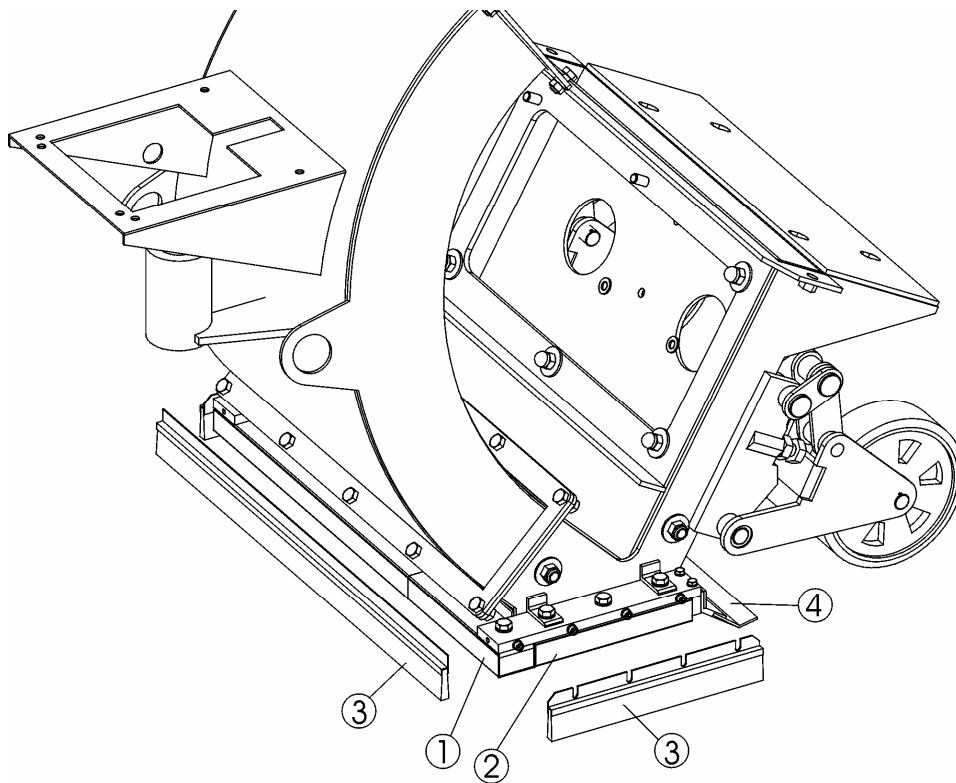


Figure 3.11

- 1 Front magnet
- 2 Side magnet
- 3 Rear seals
- 4 Side brushes
- 5 Front brushes

3.13 Dust Collection and Ventilation

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The intake air, which flows through the entire system during the use of the blast cleaning machine and the filter installation, fulfills the following functions:

- Cooling of blast wheel
- Cooling of abrasive
- Transportation of abrasive
- Transportation of dust through the system
- Separation of dust from reusable abrasive
- Transportation of dust to the filter system

Motor Output: 7.5 HP
Airflow rate: 1000 CFM
Connecting hose length: 50'



A correct height adjustment of the machine (5/16"-3/8") is crucial. Leaks must be prevented from occurring at the blast wheel housing, the control cage and the dust separator.



All connecting components must be thoroughly sealed and the dust collector hose must be fastened with hose clamps!



The filter housing must be well sealed; all seals must be in good condition!



In the event that dust exits the filter system instead of air, this is a sign that the cartridge filters are either damaged, need to be changed or that they are not correctly fastened inside the filter chamber.

3.13 Dust Collection and Ventilation (Cont'd)

The flow of air takes the following route through the machine:

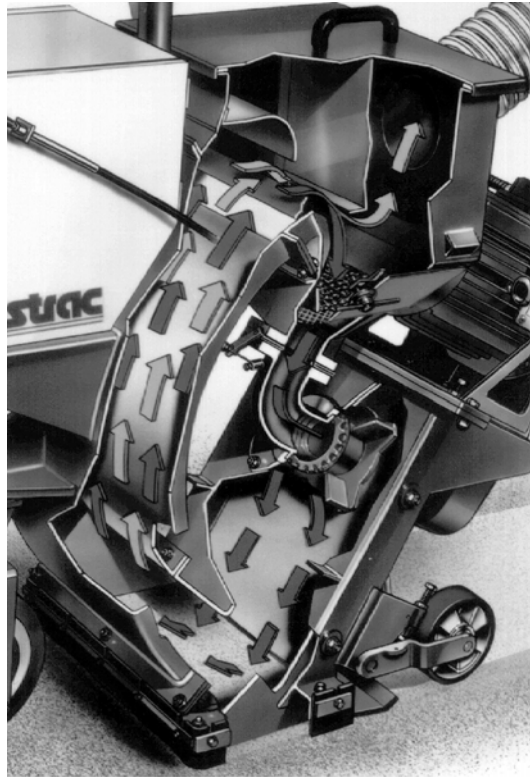


Figure 3.12

- Air is taken in at the rear seal and takes blasting medium and dust along with it.
- The air flows through the rebound plenum and transports abrasive and dust. During this process, the flow of air cools the abrasive and the housing walls.

3.13 Dust Collection and Ventilation (Cont'd)

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- The air enters the separator and separates the fine dust from the abrasive and transports the dust to the outlet opening. The separator lid must be sealed airtight, in order to facilitate an optimal effectiveness of the separator.
- Next, the air flows through a 6" x 50' flexible dust collector hose taking the dust and the fine particles along with it.
- Now, the flow of air enters the filter chamber of the filter system, where the dust and fine particles are separated from the air. The clean air is released into the environment.

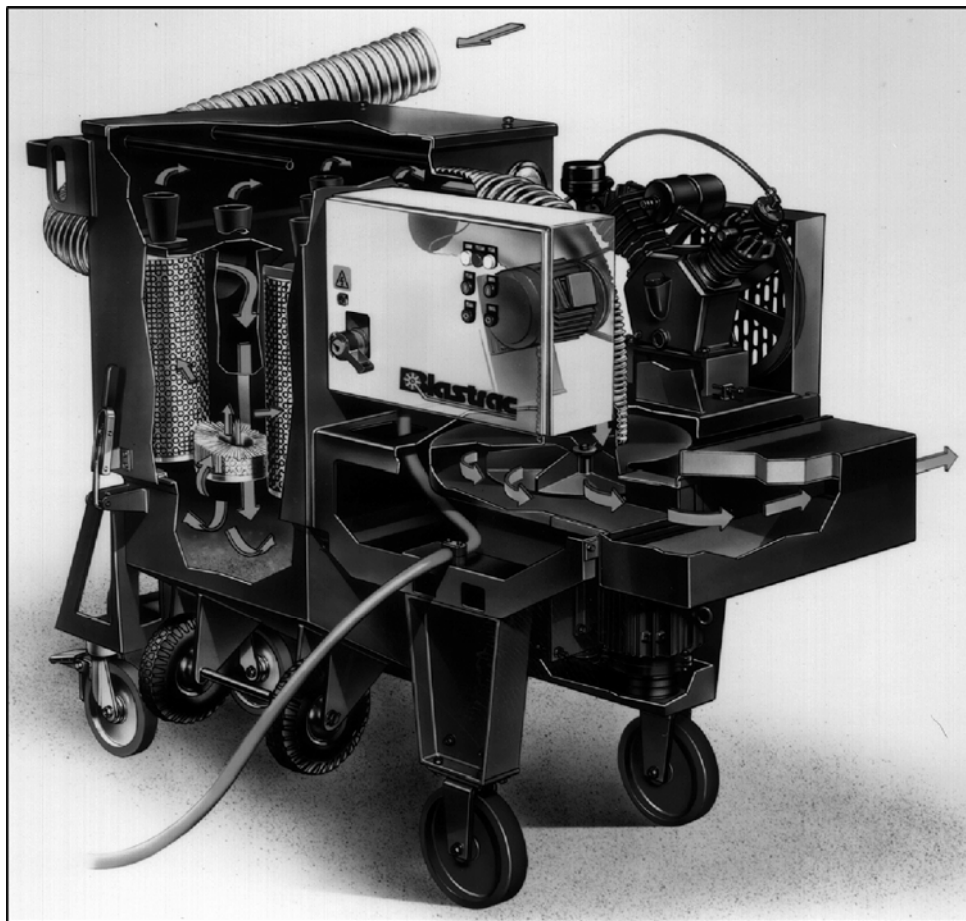


Figure 3.13

3.14 Operating Materials

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To operate the **Blastrac** machine 2-20DT, you will need a hardened, spherical abrasive. Model 2-20DT was designed especially for use with **Blastrac** abrasive.

Blastrac abrasives are high-quality abrasives and have the rebound force required for an efficient use of model 2-20DT. Selecting the proper abrasive is crucial if one considers that this is the material with which the surface will be treated.

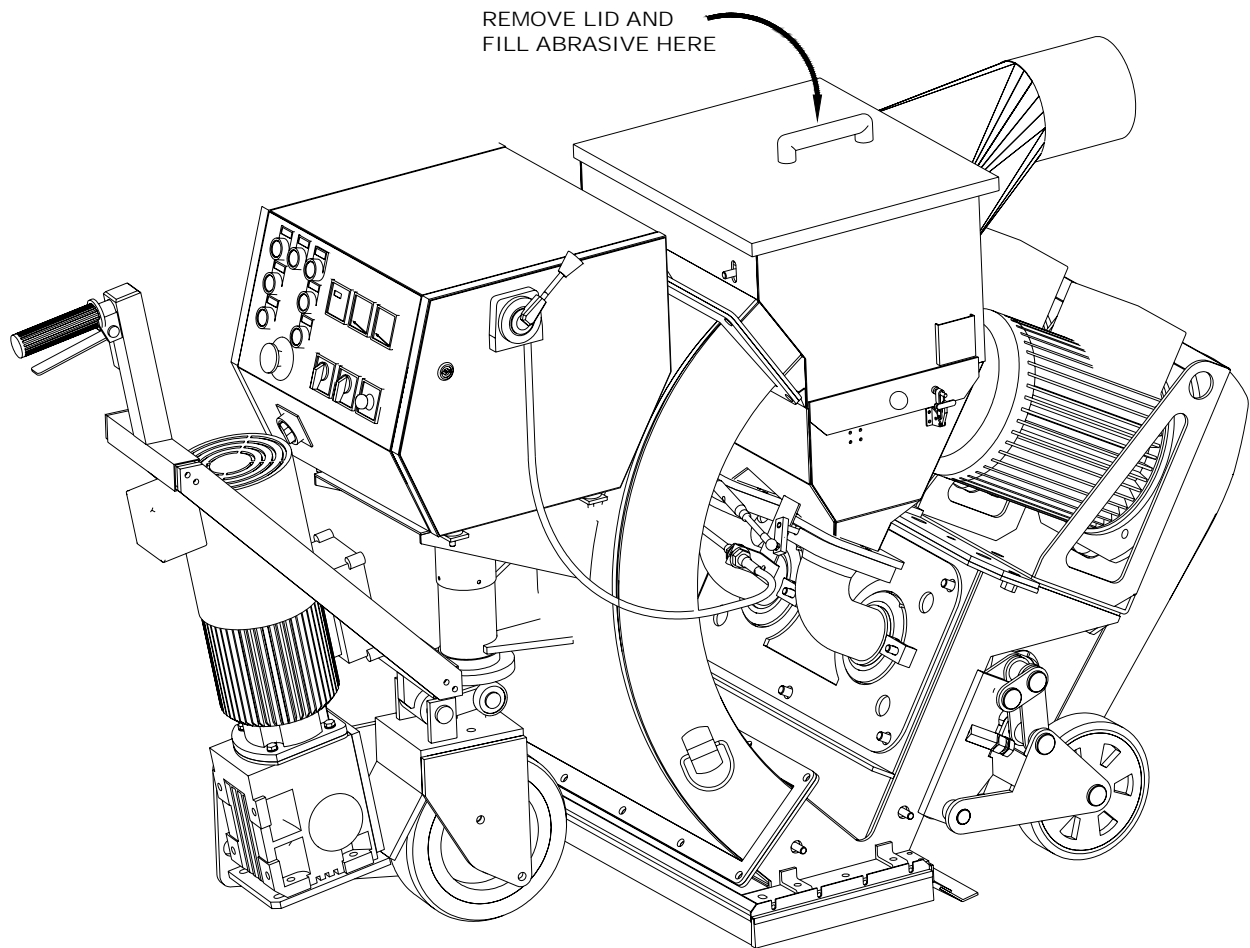


Figure 3.14

3.14 Operating Materials (Cont'd)

Selecting the Abrasive:**S 230 Shot:**

Applications:

- Produces a fine texture, e.g., on vacuum concrete and unglazed tile
- Removes thin layers of paint
- Frequently used if surface is to be sealed only.

S 280 Shot:

Applications:

- Produces a fine to medium texture on concrete
- Removes glazing from tile, e.g., in order to subsequently apply skid-proof sealers
- Blasts off old finishes, sealants and coatings in a thickness range of around 1 mm.

S 330 Shot:

Standard abrasive is suitable for approx. 50-60% of all applications. It produces a medium pattern on concrete. It fulfills the same purpose as Medium #3 if process has to be driven at a higher speed, e.g., on asphalt, in order to keep thermal stress factors low.

Applications:

- Removal of laitance from new concrete
- Roughen smooth concrete or natural stone
- Blast off coatings in a range of 1-3 mm and scour steel

3.14 Operating Materials (Cont'd)

S390/S460 Shot:

Produces a rough texture and is used to accelerate work speed.

Applications:

- Blast off deposits on concrete prior to coating
- Remove thick layers of paint or rust on steel surfaces, bridges, tanks, etc.
- Blast off flexible floor coverings from parking garage decks
- Remove driving lane marker strips and retextures concrete roads

GL 25 Grit:

This is **only** for mixing in with media #3, 4, and 5 at a maximum proportion of **30%**.

Applications:

- Removal of polyurethane coatings
- Removal of adhesive residues
- Removal of flaking rubber
- Tear up difficult to remove coatings
- Also suitable for use on steel



Never use Medium # 8 as an exclusive abrasive because this would excessively increase wear and tear on the whole system.

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3.14 Operating Materials (Cont'd)

The degree of effectiveness displayed by the 2-20DT is based on the rebound effect that secures the abrasive for recycling.

Please, note that the selection of an inappropriate abrasive will expedite wear and tear.

Your service technician is experienced in the selection of an appropriate abrasive for your respective situation.



If you have any questions regarding the most beneficial abrasive for your blast-cleaning job, please, contact the Blastrac Customer Service Center near you!

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Transportation

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Section 4 - Transportation

- 4.1 General information
- 4.2 Transportation
- 4.3 Set-up Requirements
- 4.4 Start-Up
- 4.5 Dimensions, Space Requirements, and Weights

4.1 General Information

Before using your machine for the first time, **Blastrac** authorized dealers are offering an orientation course, in order to familiarize your maintenance staff and operators with all of the machine's components. We do not assume any liability for damages incurred as a result of the improper use of the equipment by any staff members who were not trained by **Blastrac**.



For further detail about our **Blastrac** training courses, contact your local **Blastrac** Customer Service.

4.2 Transportation

When transporting the machine from a vehicle to the working area you can put the machine in its transport position by using the lever of the lifting mechanism.

To do this, place the lever onto the bracket, as shown in fig. 4.1 position 2. Now press the lever down until the pivot bracket noticeably locks over its point of rotation.

To replace the brackets in operating position, place the lever and move it slowly upward (1), until the pivot bracket sits close at the height adjustment screw. Use caution when lower the machine. When the pivot bracket moves over the point of rotation the handle will move faster and must be controlled.

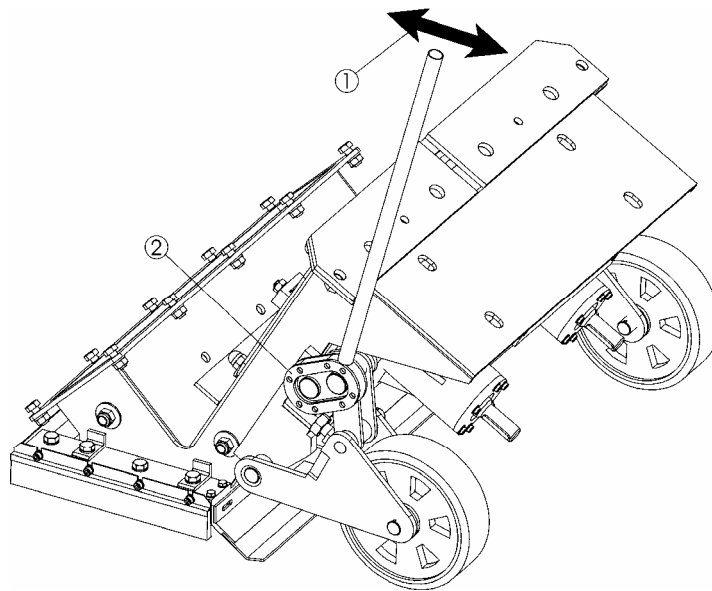


Fig. 4.1

4.2 Transportation (Cont'd)

When transporting the machine with hoisting equipment like a crane or a lift, check the total weight permitted. Only use appropriate, allowed and qualified hoisting equipment. Please look in Chapter 1 to find the weight of the machine, or see the serial plate on the machine. **Never force the machine while transporting.**

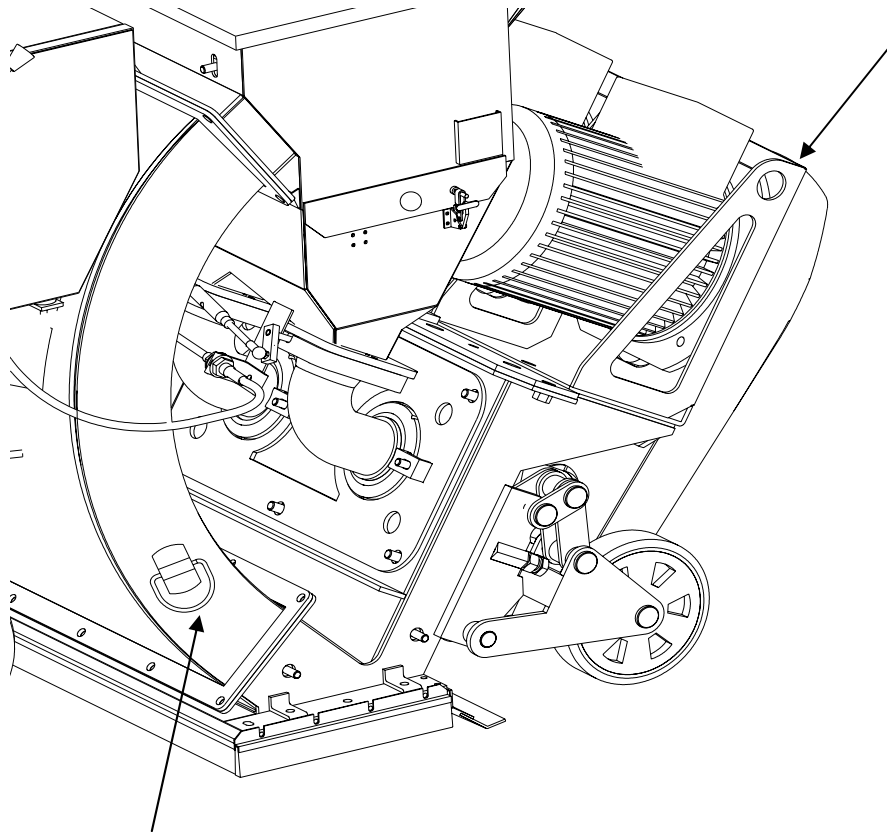


Figure 4.2



Empty the abrasive from the machine prior to transporting it. The machine may only be secured through its eyelets. (Figure 4.1) The weights and dimensions of the machine can be found in Section 1, "Technical Data".

The machine is transported separately in parts:

- Machine
- Filter system
- General accessories

4.3 Set-Up Requirements

Check the surface to be treated for loose parts (rocks, screws, etc). If necessary, the surface must be swept clean. Make sure that the machine can navigate across all uneven spots on the surface. The machine can overcome small uneven areas, such as seams or floor joints.

4.4 Start-Up

The start-up of the machine should be handled in accordance with the instructions provided in Section 5 “Start-Up”.



Whenever the machine is not in use for blasting, the abrasive valve must be kept shut at all times!

The figurative representations and drawings are depicted in a simplified form.

4.5 Dimensions, Space Requirements and Weights

Dimensions:

Principal machine measurements in an assembled state:

(See Section 2 “Technical Data”)

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Start-Up

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Chapter 5 – Start Up

5.1 Preparations for Start-Up

5.2 Start-Up

5.1 Preparations for Start-Up

Before turning the machine on, the operator must ensure that all of the guards are in place and the dust collector is connected and working correctly.



Anybody working near the operating machine must wear protective goggles with side shields as well as ear protection and safety footgear. The operator is instructed to wear snug-fitting protective clothing.

Handle all connectors, cables, hoses and operating elements with care.



Avoid any contact with live wires!

Only trained personnel may perform any work on the electrical system.

Check the surface to be blasted for loose material (rocks, screws etc.). If necessary, the surface must be swept. Ensure that the machine will be able to overcome any rough areas in the surface. The machine can overcome small areas of unevenness, such as welding joints or floor joints.



It is important to perform regular inspections, in order to avoid any downtime of your blast system. Before every start-up, the following inspections should be conducted:

Put machine in “Maintenance Mode” as described in Section 1.4.

- Check all parts of the machine to ensure that they are assembled safely and correctly.
- Check all screws and other fastening elements to ensure that they are tight.
- Check the storage hopper, feed spouts and the blast wheels for foreign bodies and remove those found.
- Blast wheels, impellers, control cages, liners, and fastening screws should be checked for damage and wear.

5.1 Preparations for Start-Up (Cont.)

- ☑ Check the magnetic seals and brush seals for wear.
- ☑ Lubricate the wheel bearings of the drive wheel every 100 operating hours.
- ☑ Empty the dust collector's dust bin. Observe any local disposal regulations for the blast material and dust.
- ☑ Check all separator parts for wear and defects. Remove any foreign material and dust that may prevent the separator working correctly.
- ☑ Check electrical connections for deposits of debris or foreign matter.
- ☑ Inspect the electric motors for dirt and other contaminants.
- ☑ Check the abrasive fill level in the storage hopper. Refill if necessary.



Before start-up, please, ensure that all personnel understand the safety rules contained in the Operating Instructions.

- ☑ Take the blast machine and the dust collector to the surface to be treated. Remove the quick release pin to operate the machine manually.
- ☑ Check the height adjustment (approx. 1/4" to 3/8") of the blast machine.

5.1 Preparations for Start-Up (Cont.)

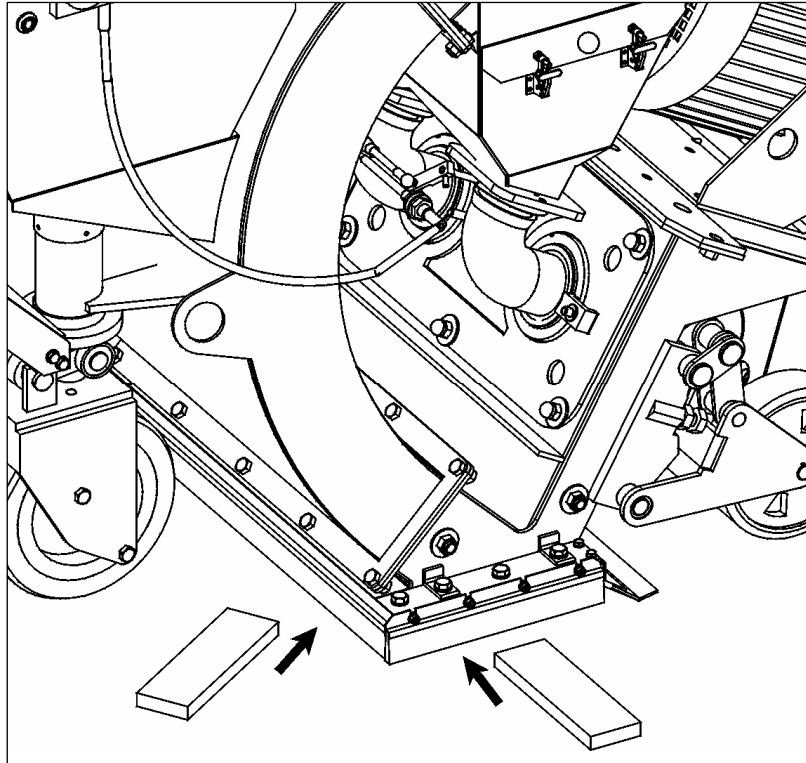


Figure 5.1

- ☑ A ¼" sheet metal strip pushed under the magnetic seal is sufficient as an adjustment aid.
- ☑ Check the main power cable and the dust collector hose for damages. Replace or repair any damaged parts before starting the machine.
- ☑ Connect the blast machine and dust collector with the dust collector hose. Use hose holder clamps at the connection points.
- ☑ **Model 2-20DT:**

Connect the supply cable of the blast machine model 2-20DT with the dust collector 8-54DC99. Connect the electric cable of the dust collector with the power supply at the construction site (480 V, 60 Hz, 60 A).

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5.1 Preparations for Start-Up (Cont.)



Check the Fault Interrupt switch function by operating the test key!

- ☑ Evenly fill the storage receptacle of the blasting machine with approx. **65 lbs** of the selected abrasive (**See Section 3.14**). During this process, the abrasive magnetic valve must remain shut.

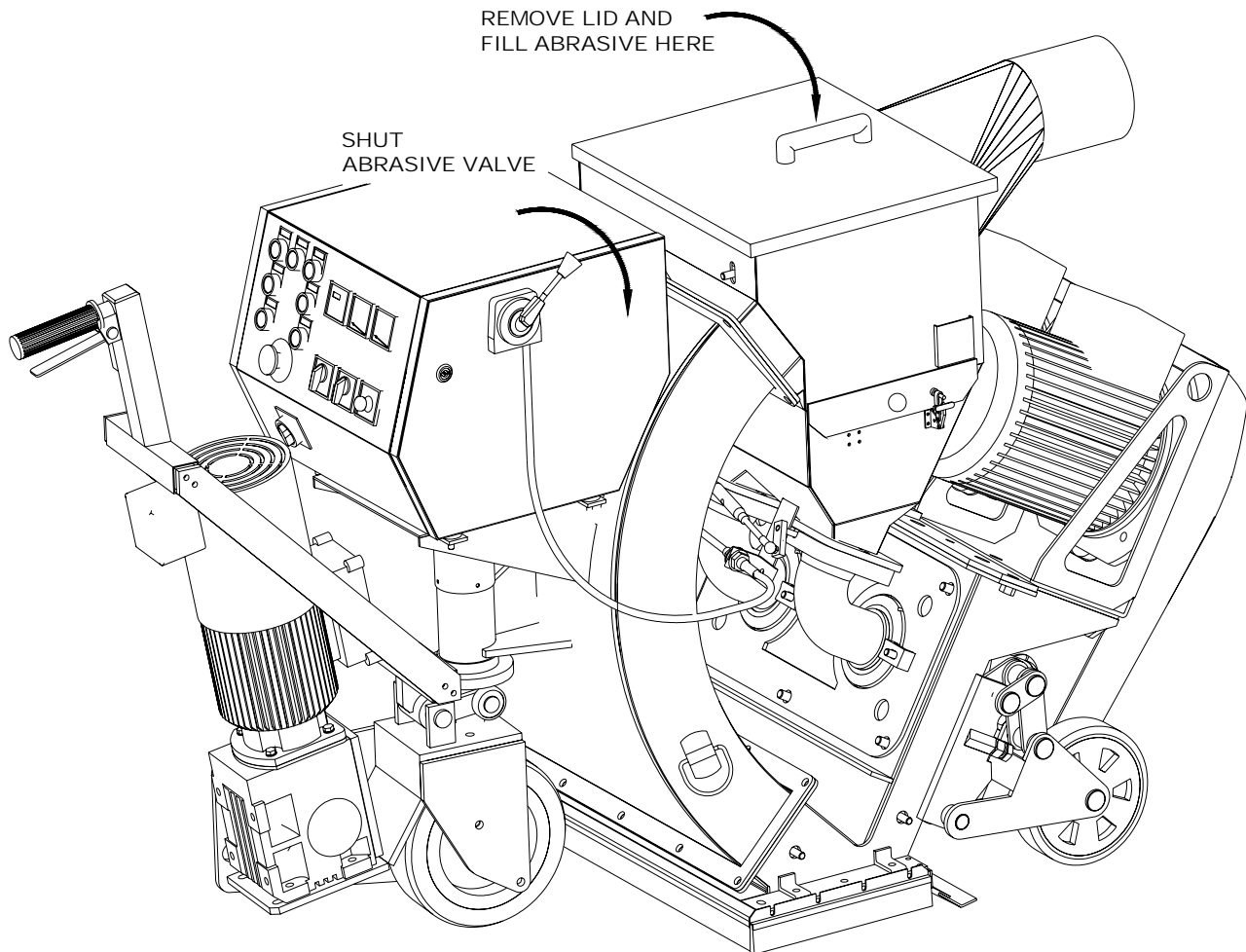


Figure 5.2

5.2 Start-Up

- Check to ensure that the dust bin of the dust collector has been emptied.



Anybody working near the operating machine must wear protective goggles with side shields as well as ear protection and safety footwear. The operator is instructed to wear snug-fitting protective clothing.

Now, the blasting machine and dust collector are started in the following sequence:

1. Turn on the Dust collector:

- Master switch of dust collector to 'ON'
- Compressor to 'ON'
- Fan to 'ON'
- Check the rotational direction of the blower fan and compressor motor.
 - The correct direction of rotation corresponds with the rotational direction arrow on the protective belt cover.

Correction of the Drive Motors Direction of Rotation:

- Turn off the drives.
- Turn off the master switch.
- Put machine in "Maintenance Mode" Section 1.4
- Open the control panel at the dust collector.
- Turn the changeover switch in the opposite direction
- Shut the control panel.
- Check the drives' direction of rotation again.

5.2 Start-Up (Cont.)

- Turn off the blast motor and controls.
- Turn off the master switch.
- Put machine in "Maintenance Mode" Section 1.4
- Open the control panel on the left side of the blast machine.
- Turn the changeover switch 1S1.1 into the opposite position.
- Shut the control panel.
- Recheck the rotational direction of the blast wheel motor.

2. Blasting Machine Start-Up:

- Check to ensure that the black lever, on the abrasive magnetic valve is in the 'Shut' position.
- Make sure that the Emergency Stop Switch has not been activated.
- Turn the master switch to 'On'. The light for 'Engine Protection Down' should begin to blink.
- Press the 'Controls On' key. The light for 'Engine Protection Down' should go out.

5.2 Start-Up (Cont.)

Inserting the Quick-Release Pin:

- Open the cover on the protective guard over the drive mechanism.
- Turn the Maximum Speed Switch to "Off".
- Turn the potentiometer to position "1". (The lowest speed)
- Place the quick release pin into the bore of the hub as you press the spring pressure button.

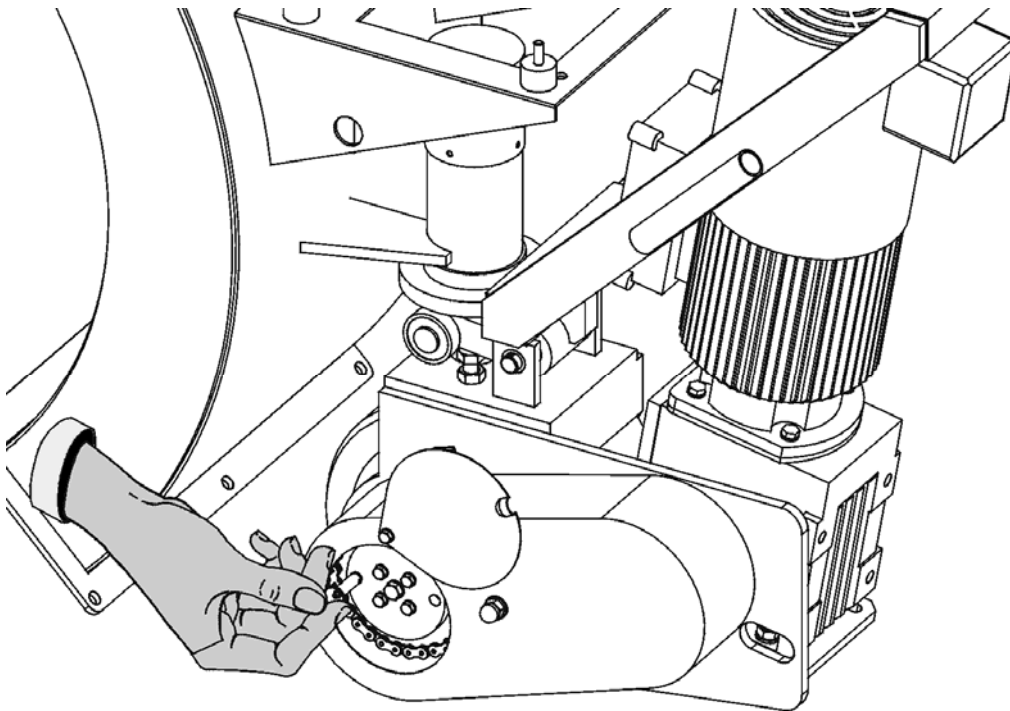


Figure 5.3

- Operate the drive switch. The hub begins to rotate. With light pressure, follow the rotation of the hub with the quick release pin until it noticeably locks in place. Now, the drive motor is driving the machine.
- Close the protective cover of the drive mechanism.

5.2 Start-Up (Cont.)

- ☑ Press the 'Blast Wheel On' button located on the control panel. The blast wheel motor should start running.
- ☑ Observe the ammeter, in order to monitor the power intake of the blast wheel motor. When the motor is started, it requires a lot of current (starting current) until it reaches its maximum number of revolutions.
- ☑ Once the blast wheel motor has reached its nominal speed, the current should drop to no-load voltage intake.
- ☑ In the event that the ammeter shows a high load intake after the idle running speed has been reached, the abrasive magnetic valve may be partially open or there may be some other kind of disturbance.
- ☑ Investigate the cause, and if necessary, please contact your **Blastrac** service technician.
- ☑ Set the driving direction selector switch to 'Forward'. (Working direction) Select the speed by using the rotary switch 'Speed Adjustment'.
- ☑ Operate the Dead Man's Switch to set the drive motor of the machine in motion (item 1).

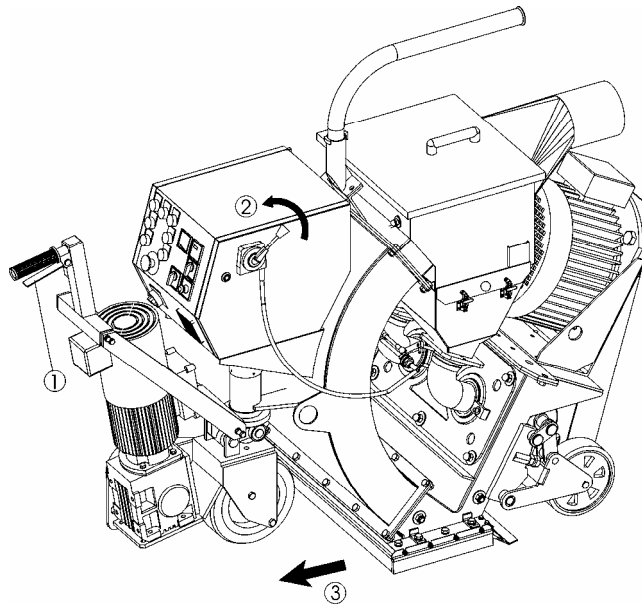


Figure 5.4

5.2 Start-Up (Cont.)



During blasting operations on concrete, the abrasive valves must not be opened until the blasting machine is rolling! If the machine stops rolling, deep holes are blasted into the treated surface within a period of a few seconds.

- ☑ When the machine rolls, pull the black lever to operate the abrasive magnetic valve (item 2). Watch the ammeter. It may display the full-load ampere number (40 A).
- ☑ A display above the full-load means that the motor is being overloaded; a display below the full-load indicates that an insufficient amount of the abrasive is reaching the blast wheel. The cable to the abrasive magnetic valve may have to be readjusted or the abrasive might require refilling.
- ☑ After blasting for approx. 7 ft, close off the abrasive supply, stop the machine, and look at the blasted surface.
- ☑ In the event that the blasted area does not present a uniform appearance, the blasting pattern might have to be adjusted (**See Sections 7.5 & 7.6**) or an alternate driving speed of the machine may have to be selected.



WARNING: When the blast head is lifted off the floor, blast media exit from the sides of the blast head at a high speed. If the machine is driven with a raised blast head, the abrasive magnetic valve must be shut.



Change your driving direction only after you have shut the abrasive valve.



The dust bin under the dust collector must be emptied on a regular basis. Please, adhere to any local disposal regulations for the blasted material and dust.

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Section 6

- 6.1 Day-to-Day Operations
- 6.2 Information Regarding Forward-Speed
- 6.3 Recommended Blasting Paths
- 6.4 Turning the Machine Off
- 6.5 What to do in the Event of Interferences
- 6.6 Maintenance Mode
- 6.7 Restarting After Troubleshooting
- 6.8 Restarting After Extended Downtime

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6.1 Day-to-Day Operation

The normal start-up and operation of the blasting system 2-20DT is no different from the procedure described in **Section 5 "Start-up"**.

Blasting should occur in parallel widths in such a way that the dust collector hose and electric cable do not become twisted.

Figure 6.1 depicts the recommended blasting paths away from the dust collector.



To keep down unnecessary operating expenses, ensure that no vehicles, such as forklifts or other equipment drive over the electric cable and the dust collector hose.

Selecting the right speed at which to drive the blasting machine is important in the achievement of satisfactory blasting results. In the event that the surface possesses varying characteristics, (e.g., various degrees of hardness or coatings of varying thickness), one can achieve a uniform blasting result by varying the forward speed.

6.2 Information Regarding Forward-Speed

The speed at which the machine is driven depends upon the material of the blasted surface and the desired texture.

Watching the surface and varying the speed during the blasting process can gauge the correct forward-speed.

A higher speed is necessary for a light texture on concrete, than that needed for a rough texture (6 - 10).

When blasting steel, an extremely slow forward speed is required (0-2).

6.3 Recommended Blasting Paths

Place the dust collector near a power supply system.

Place the blast machine near the dust collector and expand the hose as depicted in Figure 6.1.

6.3 Recommended Blasting Paths (Cont.)

Work with the blasting machine when the hose is expanded in the opposite direction by repeating the work process away from the dust collector.

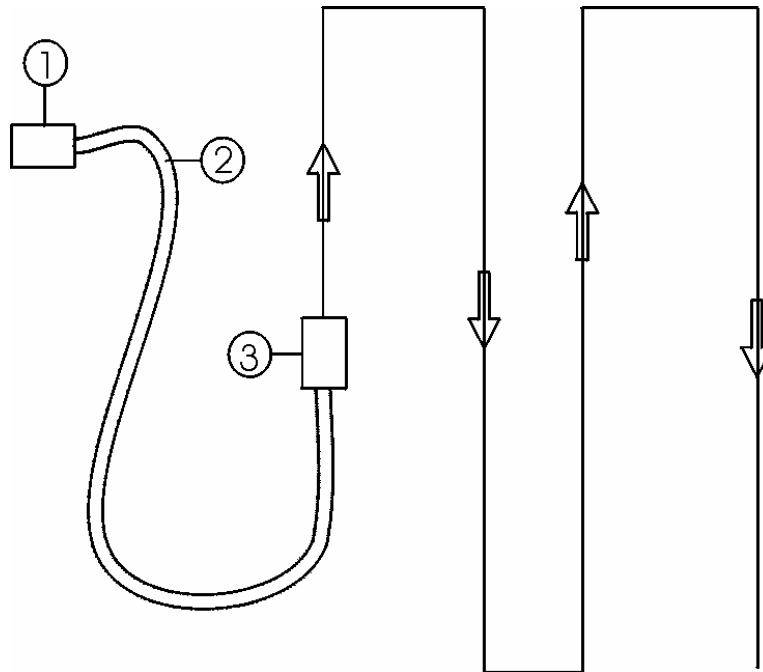


Figure 6.1

- 1 Dust collector
- 2 Dust collector hose
- 3 Blast machine

Drive into the work area and take into consideration the usable length of the dust collector hose.

Complete your work in the area by finishing your blasting in the area where the dust collector was located initially.

6.4 Turning the Machine Off

- Shut down the blast medium supply with the blast medium control lever.
- Continue driving the machine until you are sure that no deeper holes are being blasted into the surface.
- Let go of the actuating lever for the drive motor, so that it resets in its original position. The drive motor disconnects.
- Press the key "Blast Wheel Off". The blast wheel motor is turned off.
- Press the key "Controls Off" on the control panel of the machine. The machine controls are turned off.
- Set the master switch of the blasting machine to "Off".
- After a few minutes, turn off the fan and the compressor of the dust collector.
- Turn the master switch of the dust collector to "Off".



Make sure that all rotating machine parts have come to a standstill before performing any type of inspection or maintenance work. Be sure machine is in "Maintenance Mode" Section 1.4.

In the event that the **Blastrac** blasting system is taken out of operation for an extended period of time, disconnect any mains plugs and cover the machine with a waterproof covering.

6.5 What to do in the Event of Interferences

Local safety regulations prevail in any event, regardless of the following advice regarding machine operations.

First, put the machine into a "**Maintenance Mode**", **Section 1.6**. Then, begin troubleshooting.

6.6 Maintenance Mode

In the event of any repair work, the system should be put into its Maintenance Mode. **See Section 1.6, "Maintenance Mode"**.

6.7 Restarting After a Disturbance

See Section 5, “Start-up”.



Personnel working in the vicinity of the machine, when it is in operation, must wear safety glasses with side shields as well as ear protection and safety footwear. The operator is instructed to wear snug-fitting safety clothing.

6.8 Restarting After Extended Downtime

Machine downtime up to maximum 3 months:

Prior to extended downtime:

- Turn off machine. (See Section 6.4, “Turning the Machine Off”)
- Protect electric motors from moisture, heat, dust, and impact.
- Clean the machine and cover it with a waterproof covering.
- Preserve any polished parts of the machine with a rust inhibitor before storage.

After extended downtime:

See Section 5, “Start-up” and Section 7, “Maintenance”.

Section 7 - Maintenance

- 7.1 Information
- 7.2 Maintenance and Inspection List
- 7.3 Repair Work
- 7.4 The Blast Profile
- 7.5 Adjustment of Blast Profile
- 7.6 Adjustment of Control Cage
- 7.7 Adjustment of All Seals
- 7.8 V-Belts
- 7.9 Belt Assembly
- 7.10 Belt Tension
- 7.11 Taper-Lock Collars
- 7.12 The Chain Drive
- 7.13 Installation of Chain Sprockets
- 7.14 Mounting of Chain
- 7.15 Chain Maintenance and Repair
- 7.16 Tensioning the Chain of the Drive Motor
- 7.17 Worn Parts
- 7.18 Tune-Up Kit Replacement
- 7.19 Liner Replacement

7.1 Information

Before performing any maintenance or repair work, please, take note of **Section 1, “Safety”**.



Before beginning any maintenance work on the system or its drives, the system should be secured against an unintended start-up. Put system into a “Maintenance Mode”, Section 1.6



Any functional defects caused by insufficient or inappropriate maintenance work can result in extremely high repair costs and lengthy downtime of the machine.

Therefore:



Regular maintenance performed at regular time intervals reduces downtime and increases productivity.

Among other factors, the operational safety and life of the machine depend upon proper maintenance.

The table on the following page contains advice concerning time intervals, inspections, and maintenance.

The chronological information is based upon uninterrupted service. In the event that the stated number of operating hours is not reached within the appropriate time, this period can be extended. However, a complete tune-up has to be done, at least, once a year.

Due to varying operational conditions, it is impossible to establish how often an inspection for worn parts, general inspection, maintenance, and repair will be required. You should establish an expedient inspection schedule based on your own operational conditions.



For further details or advice concerning your maintenance scheduling, contact your local Blastrac representative.

7.2 Maintenance and Inspection List

Always put machine in “Maintenance Mode” Section 1.4, before maintenance or repair work starts.

Hours in Operation/Interval	Checkpoint, Maintenance Advice
12 hour interval repair	<p>Check all safety devices for effectiveness.</p> <p>Check all accessible screw connections to ensure that they are tight.</p>
Every 3 hours	<p>Check for foreign bodies in receptacles, supply pipes, or blast wheel aggregate.</p> <p>Check blast wheel, control cage, liners and fastening screws for damage or wear.</p> <p>Check magnetic and brush seals for wear.</p> <p>Check electrical connections for deposits of grime or foreign materials.</p> <p>Check electric motor for grime and other contaminants.</p>
Daily and before starting work	<p>Check proper function of Fault Interrupt switch.</p> <p>Check hose connections for leaks and tight fit.</p> <p>Check the hose leading to the filter to locate any defects.</p> <p>Check to ensure that the dust collector bin has been emptied.</p> <p>Check blast wheel, control cage, liners, and fastening screws for damage and wear.</p> <p>Check separator parts for wear and defects. Remove foreign bodies and dust accumulations.</p> <p>Examine fill level of abrasive in the storage hopper. Refill, if necessary.</p>
Annually	Complete tune-up and cleaning of entire machine.

7.3 Repair Work



As with the start-up, we recommend consulting Blastrac personnel when performing initial repair work on the machine. In this way, your maintenance personnel will have the opportunity to obtain some intensive training on the machine.

The following descriptions only pertain to repairs that occur in the framework of maintenance and in the replacement of worn parts.

When replacing parts, the following advice and individual sequential steps should be observed.



Keep in stock any spare parts or replacements for worn parts that cannot be delivered at short notice. As a rule, production delays are more expensive than the costs for a spare part.

As a matter of principle, any stripped screws should be replaced with those of equal quality (stability, material) and design.



Prior to beginning any repair work on the machine and its drives make sure that they are not turned on unintentionally. Refer to Section 1.6, "Maintenance mode"

7.4 The Blast Profile

The abrasive, which leaves the paddles of the blast wheel, is not indiscriminately centrifuged in all directions. The spread is limited to an angle of approx. 50°. This is achieved by means of a control cage, which encloses the impeller. The position of the window in the control cage determines the blast profile.

An erroneous adjustment of the control cage results in extreme wear and an early rupturing of the blast housing's liner plates, due to blasting stress, as well as in a reduced blasting performance, and to a potential loss of the abrasive's rebound energy.

An accurate adjustment of the control cage and, thus, of the blast profile, is the most crucial factor for optimally working with the blast system 2-20DT.

7.4 The Blast Profile (Cont.)

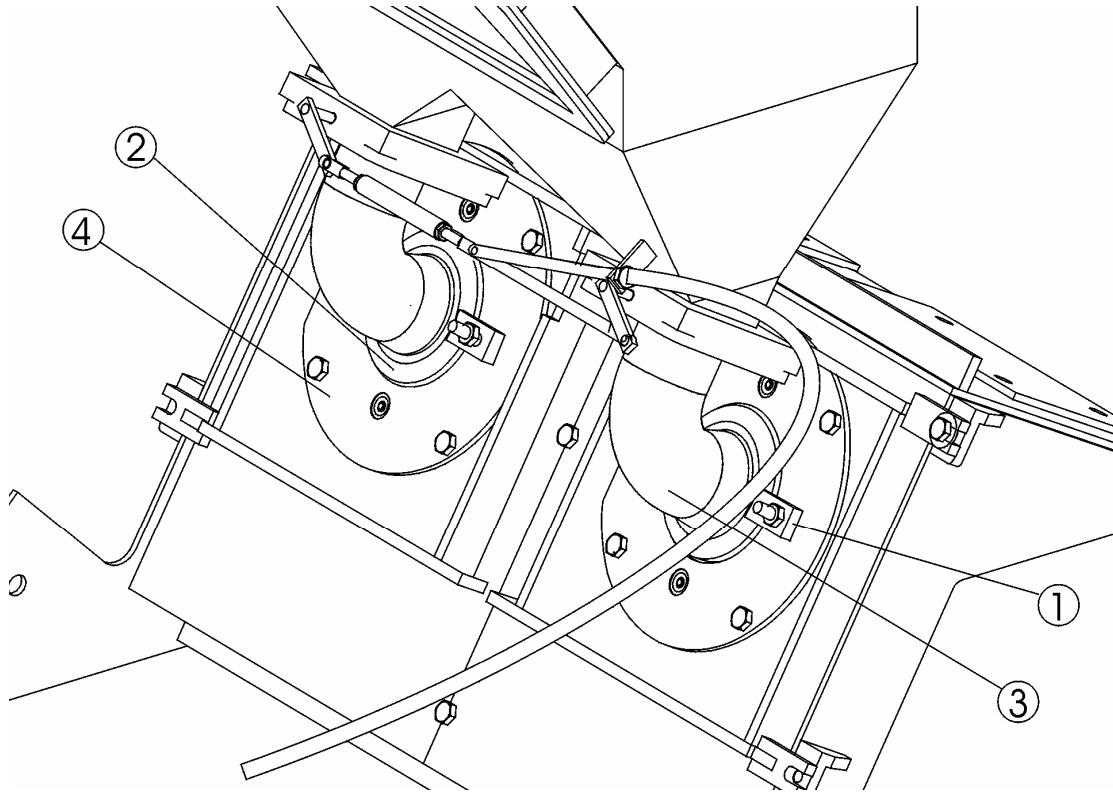


Figure 7.1

- 1 Holding clamp
- 2 Control cage
- 3 Feed spout
- 4 Support plate for control cage

If the tune-up kit is replaced, the thread of the blast wheel fastening screw should be checked each time. Please, ensure that the blast wheel screw is driven home all the way. In addition, care should be taken to ensure that no dust or blast media are present on the thread.

After each repair performed on the blast wheel, the blast wheel motor should be turned on briefly (without supplying the abrasive) to determine whether the rotating parts revolve freely and without vibrations. After that, the blasting process may be continued.

7.4 The Blast Profile (Cont.)

The blast wheel motor is designed for a long service life. Damages to the blast wheel motor are noticeable due to unusual noises or a breakdown of the electric motor.



If you suspect a blast motor failure, please contact your local Blastrac representative.

7.5 Adjustment of Blast Profile

In order to achieve a uniform, clean blast profile on the treated surface, the correct adjustment of the blast profile is of extreme importance.



Prior to beginning any repair work on the machine and its drives, the system should be secured to prevent it from being turned on unintentionally. Put system into the "Maintenance mode", refer to Section 1.6

An erroneously adjusted blast profile results in:

- Inconsistent cleaning (shadows on the right or left side)
- Exceptionally high amount of wear to the tune-up kit and the liners

The following 4 factors impact upon the blast profile:

Blast wheel's direction of rotation:

- The blast wheel's direction of rotation must correspond with the setting on the housing (arrow indicating direction of rotation).

Worn Tune-up Kit:

- With increasing wear of the tune-up kit (impeller, control cage), the blast profile changes.

7.5 Adjustment of Blast Profile (Cont.)

Abrasive Size:

- The abrasive's size influences the blast profile. If the abrasive is changed, the blast profile must be adjusted accordingly.

Position of Control Cage:

- The correct adjustment of the control cage is the most important factor in the achievement of an optimal blast profile. Each control cage is equipped with a lateral window. The window's position determines in which location the abrasive reaches the blast wheel paddles and where it impinges upon the treated surface.
- After each tune-up kit replacement, the adjustment of the control cage must be checked and corrected by producing a test blast profile. The same applies to blasting on a different surface.

7.6 Control Cage Adjustment

The adjustment is made by detaching the holders and by turning the control cage in the desired direction. The recesses molded into the control cage indicate the position of the exit opening. The feed spout remains in its position unchanged. The following standard value applies in the setting: The opening of the cage should be approximately opposite to the blasting angle. The grain size of the abrasive is of great significance here. Various blast media have different flight directions due to differences in weight and frictional drag. That means: **Never use different blast media simultaneously.**



After installing new spare parts, you should always produce a test blast profile to review the blasting direction. This is the only way to guarantee that you operate economically and avoid excessive wear and repair costs.

7.6 Control Cage Adjustment (Cont.)

Adjustments can be made as follows:

- Determine the upper and lower edge of the window.
- Set the upper edge of the window of the left control cage on 11:30 compared to the face of the clock. The right side should be handled the same in mirror symmetry (see Figure 7.2).

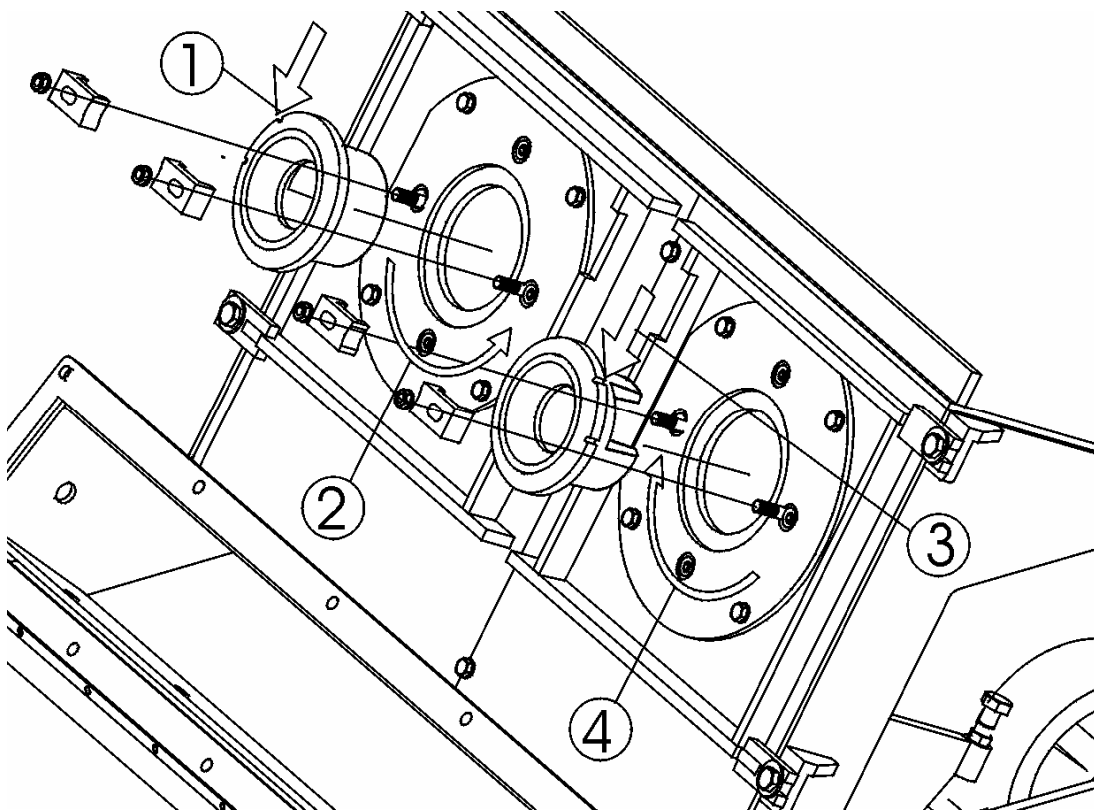


Figure 7.2

- Put the blast head of the blasting machine on a steel plate, which is (1/4"-5/16") in thickness and blast at the full ampere level for 45 seconds without moving the machine out of its place.
- Drive the machine away from the blast zone and carefully examine the steel plate.

7.6 Control Cage Adjustment (Cont.)

You will find the hot spot of the blasted surface where the machine has developed its maximum blast intensity. Due to a greater heat development, this spot normally is slightly brighter than the rest of the blast area.

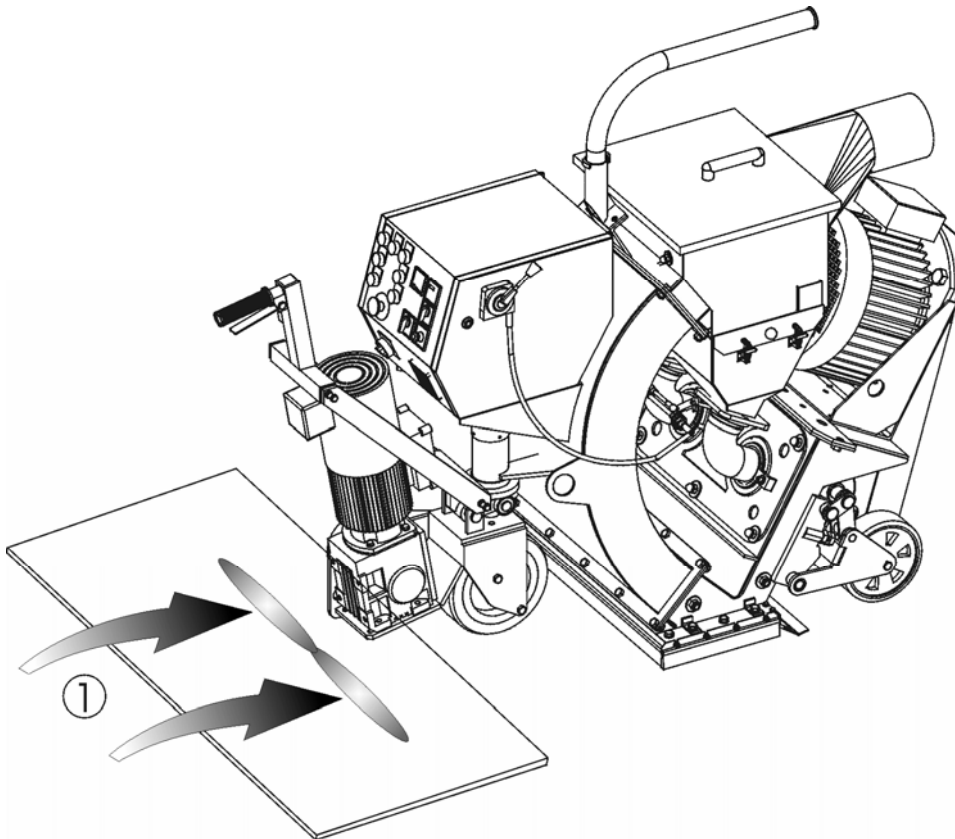


Figure 7.2

- Now, the control cage is adjusted until the hot spot is located exactly in the center of the respective blast profile.
- Now, the blasting process can begin. If the blasted surface consists of concrete, you should again check the blast profile after several feet and, if need be, make another small adjustment. As the tune-up kit wears out increasingly, or if the size of the abrasive is changed, the blast profile will change.

7.6 Control Cage Adjustment (Cont.)



You should never detach the holding clamps or try to adjust the control cage while the machine is in operation.

Viewed from the center of the blast machine and looking at the control cage:

- If the blasting results are pronounced on the right side and weak on the left side (shadow), the upper edge of the control cage should be rotated clockwise by (1/8"-1/4"), respectively.
- If the blasting results are pronounced on the left side and weak on the right side, the control cage should be rotated counter-clockwise by (1/8"-1/4"), respectively.
- The left control cage must be turned exactly into the opposite direction.

7.7 Adjustment of All Seals

The adjusted height of the magnetic seals parallel to the treated surface should be $(5/16''-3/8'')$ all the way around.

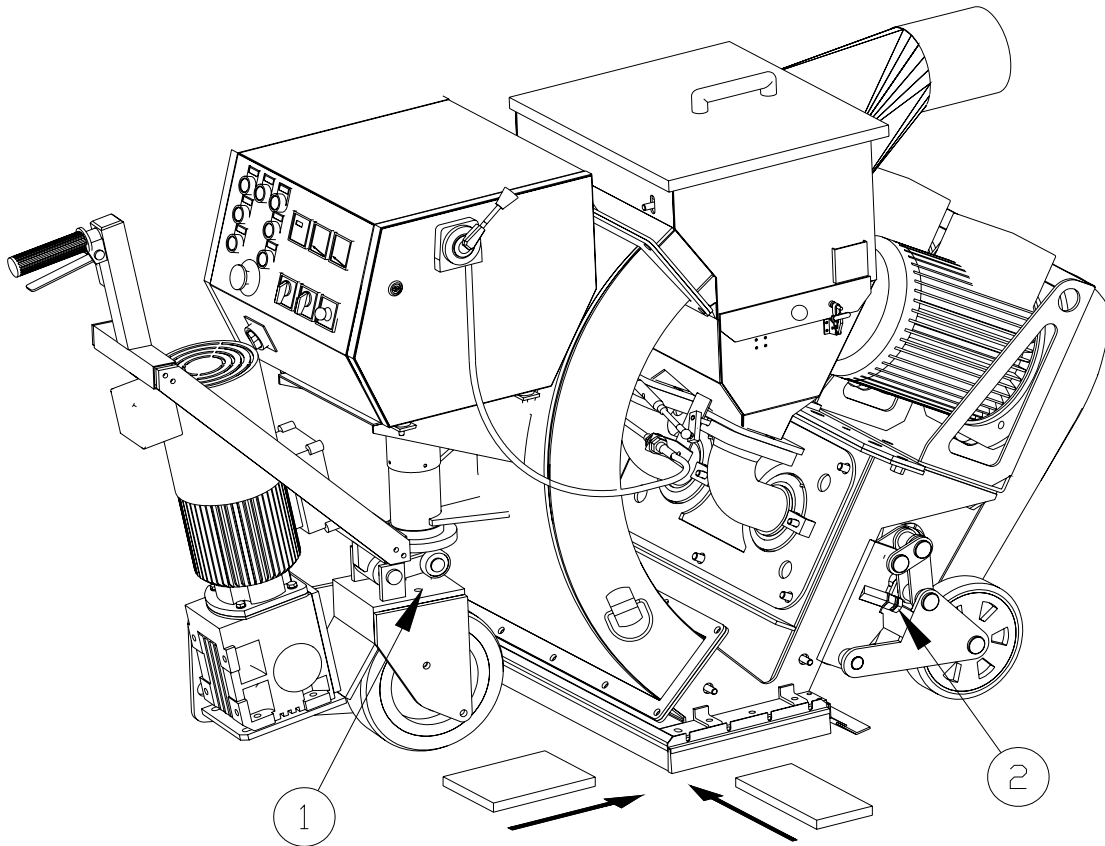


Figure 7.4

A piece of sheet metal that is $5/16''$ thickness, which is pushed under the magnetic seals, is a satisfactory adjustment aid.

Front end adjustment screw: Qty: 2
Rear caster adjustment screw: Qty: 2

The adjustment screws are adjusted in height until the correct distance of $(5/16''-3/8'')$ has been reached.

In the **Blastrac** Model 2-20DT, the adjustment is made on 4 adjustment screws (one, respectively, on the back wheels and two on the front frame under the control panel).

The height of the brush seals should be a maximum of 1 mm above the surface. The adjustment is made via slots.

7.8 V-Belts

The belt drive is designed for the required driving power. Forcing a higher performance by tensioning the belt excessively, will result in broken belts, damage to bearings, and, thus, to a reduced level of efficiency. Insufficient belt tension will lead to slippage and, therefore, to an increase of the belt's temperature and premature destruction of the V-belts. Prolonged temperatures over 158°F curtail the service life and reduce the efficiency of the belts. The grooves of the belt pulleys must be kept free of rust, grease, and dirt and should not be damaged. The use of belt wax or similar substances to increase the frictional coefficient is unnecessary and only damages the belts. Contaminations with oils, grease, or chemicals must be prevented.



To guarantee a trouble-free power transfer, the belt drive must be monitored on a continuous basis.

For V-Belt Data: See Section 10, "Spare Parts"

7.9 Belt Assembly



Remove the cover on the drive mechanism only if the drive motors have been stopped and the master switch of the blast system has been secured.

Relax the belt drive by reducing the distance between the drive motor and the blast wheel housing.

Insert belt in the grooves of the pulleys manually and without using any force.

Tension the V-belt by enlarging the axial distance between the drive motor and the blast wheel housing, to the required belt tension that is described below.



Re-mount the required protective cover over the drive motor, to ensure personnel safety.

7.10 Belt Tension



Prior to beginning any repair work on the machine and its drives, the system should be secured to prevent it from being turned on unintentionally. Put system into the “Maintenance mode”, refer to Section 1.6

See Figure 7.6 “Wheel Drive Components” for part identification.

1. Remove belt guard by removing the two acorn nuts (ITEM 1).
2. Loosen the four hex head bolts (ITEM 2) that connect the blast wheel motor to the motor bracket. **DO NOT REMOVE THE BOLTS COMPLETELY.**
3. Loosen the socket head screw (ITEM 3) that connects the eccentric sleeve (ITEM 4) to the blast wheel motor. **DO NOT REMOVE THE SCREW COMPLETELY.**
4. Use the hex head bolt (ITEM 5) located in the center of the eccentric sleeve (ITEM 4) to adjust the belt tension. Rotating the hex head bolt (ITEM 5) **counter-clockwise** will loosen the belt. Rotating the hex head bolt (ITEM 5) **clockwise** will tighten the belt.
5. To remove the belt, rotate the hex head bolt (ITEM 5) on the eccentric sleeve (ITEM 4) **counter-clockwise** until the socket head screw (ITEM 3) is in the 6:00 position or directly below the hex head bolt (ITEM 5).
6. Remove the belt from the sheaves. **Never force the belt off the sheaves.** Always release enough tension from the belt so it will slide off the sheaves easily.
7. **Before replacing the belt, inspect the condition of the sheaves.** Dusty, rusty or worn sheaves can reduce the belt life up to 50%. To replace and tension the belt, place belt around sheaves and rotate the hex head bolt (ITEM 5) on the eccentric sleeve (ITEM 4) **clockwise** to increase the belt tension. See Figure 7.5 “Belt Tension Requirements” for correct belt tension. Never force the belt on the sheaves. Forcing the belt can cause internal damage to the belt. **BE SURE THAT THE BELT IS SECURE IN THE GROOVES OF THE SHEAVES BEFORE CONTINUING.**

7.10 – Belt Tension Cont'd

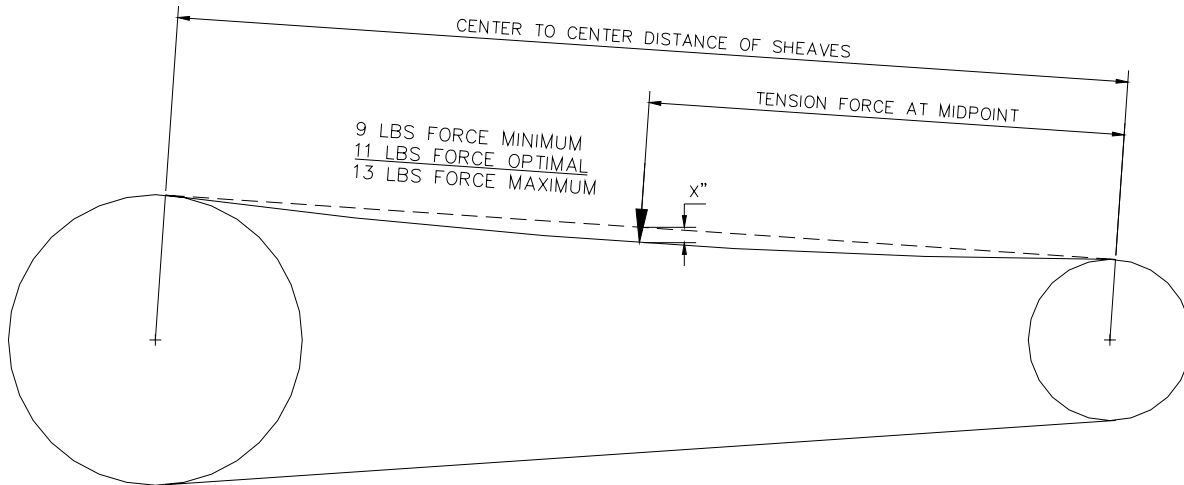


FIGURE 7.5 Belt Tension Requirements

Belt Tension

The correct belt tension is important for the life of the belt, sheaves and wheel bearing unit. Too much belt tension will reduce the operating life of these components. The correct belt tension is also important for the efficiency of power transmission. If the belt does not have enough tension, the belts may slip causing a decrease in production and an increase in belt and sheave wear. **As seen in Figure 7.5, the optimal tension for this system is 11 lbs of force.** The belt should deflect 1/64" per inch of "center-to-center" distance of the sheaves under the optimal tension force. For example, if the "center-to-center" distance of the sheaves was 64" then 64/64 would equal 1" of deflection under the optimal tension force. Measure the "center-to-center" distance of the sheaves and divide by 64. This will be your desired deflection with 11 lbs of force. **This particular system should deflect approximately 1/4" with 11 lbs of force.** It is recommended that a V-belt tension tester is used when adjusting the belt tension. V-belt tension testers are inexpensive and may be purchased from most V-belt manufacturers.

8. After the belt is properly tensioned, tighten the socket head screw (ITEM 3) that connects the eccentric sleeve (ITEM 4) to the blast wheel motor and the four hex head bolts (ITEM 2) that connect the blast wheel motor to the motor bracket.

7.10 – Belt Tension Cont'd

9. Replace the belt guard. **NEVER OPERATE THE MACHINE WITHOUT THE BELT GUARD IN PLACE.**
10. Check the belt tension after 50 hours of run time after replacing the belt. This “run-in” time will reduce the tension of the belt. The belt tension should be adjusted back to the optimal belt tension as described above.

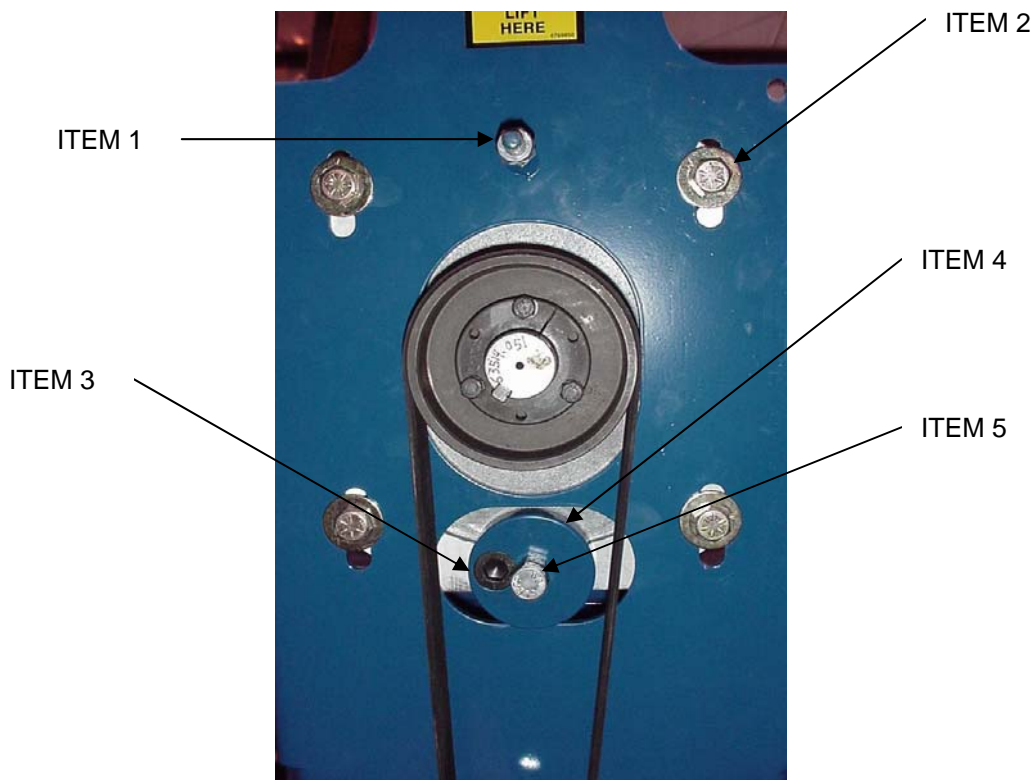


FIGURE 7.6 Wheel Drive Components

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7.11 The Chain Drive

Any installation, removal, or repair work should only be performed with the appropriate tools. Please, ensure that, under any circumstances, the applicable safety rules are observed.

Chain drives are relatively sturdy and safe to operate even under unfavorable operating conditions.



Improper installation, insufficient lubrication, and maintenance result in premature wear of the chain and chain sprocket. Therefore, a careful installation of the chain drives and proper maintenance are crucial for a long service life.



Remove the cover on the drive mechanism only if all drive motors have been stopped and the master switch of the blasting system has been secured.

7.12 Installation of Chain Sprockets

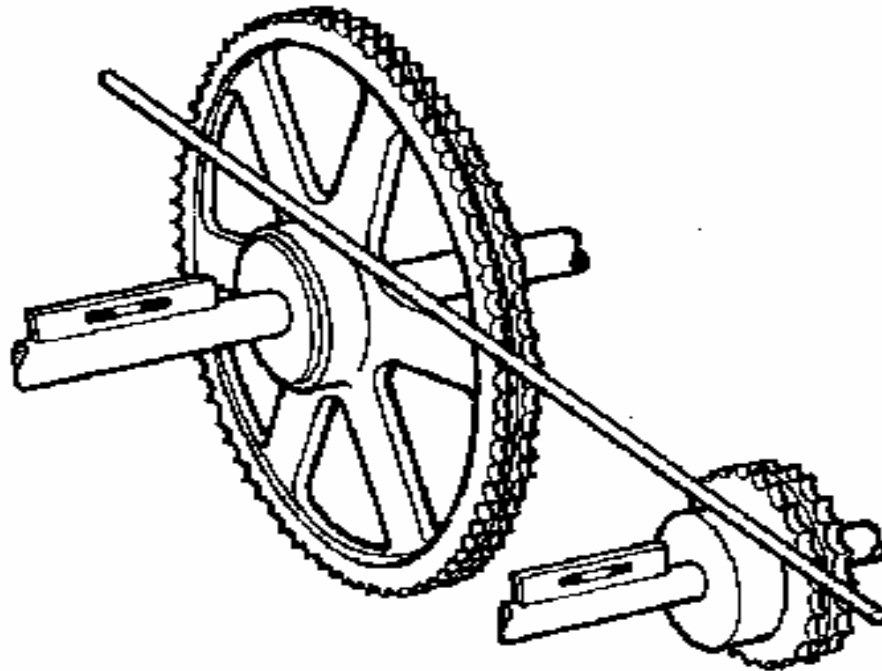


Figure 7.8

The chain sprockets must be in alignment.

For this, the prerequisites are shafts which are axially parallel and dimensioned appropriately for the stress load, as well as an exact rounding and engineering of the chain sprockets.

The installation check is conducted by laying a ruler against the toothed wheel rims.

This must be done several times in various chain sprocket positions.

As a result of an incorrect installation, the inside bracket is pressed against the outside bracket and, therefore, the chain wears out rapidly or a blockage can occur in the chain sprockets.

7.13 Mounting the Chain

Before mounting the chain, it should definitely be degreased, so that no dirt or abrasive particles can adhere to it.

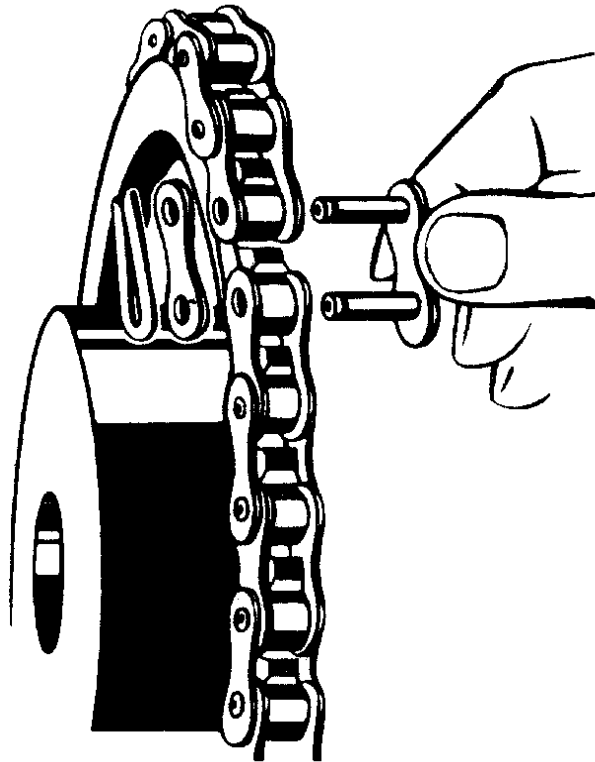


Figure 7.9

The chain is delivered as a chain string and must be locked when mounted. This is done as follows:

The chain is placed on the chain sprockets, so that the end links are positioned in two neighboring tooth gaps.

Now the chain is locked by means of the connecting link. If heavy chains are used or if the axial distance is great, a pre-tensioning tool is used to bring together the end links close enough that the insertion of the connecting link can be managed without the occurrence of any deformations.

7.14 Mounting the Chain (Cont.)

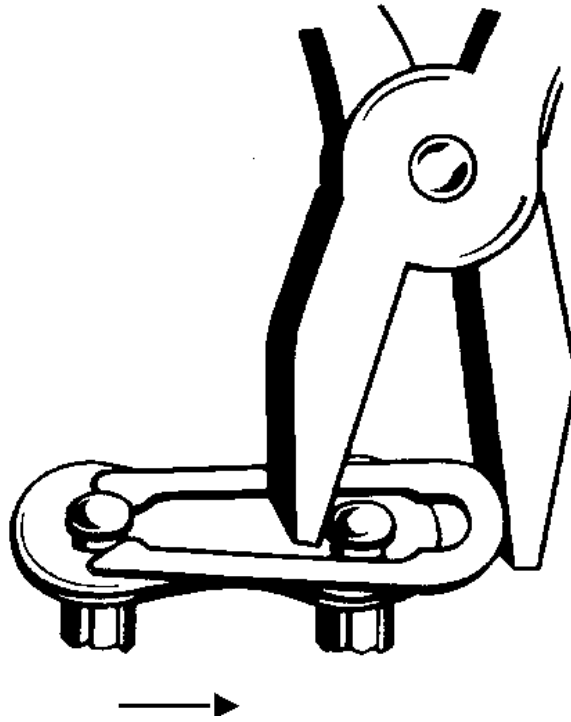


Figure 7.10

When assembling connecting links with a clip, the clip should point in the running direction of the chain with its closed side. The clip is placed on the connecting link and pressed into the ring groove with a pair of pliers. The removal of the spring is carried out in the reverse order.

7.15 Chain Maintenance and Repairs

A chain drive requires relatively little maintenance if the chain has been selected correctly and is installed properly and, in this application, is not lubricated. A chain box protects the drive chain. The chain box prevents an excessive build-up of dirt and protects against accidents.



The chain drive should be cleaned every three months, approximately. On that occasion, the alignment of the chain sprockets and the tension of the chain should be checked at the same time.

7.15 Chain Maintenance and Repairs (Cont.)

First, to achieve a thorough cleaning job, any dirt adhering to the outside of the chain drive should be cleaned off with a hard-bristled or steel brush. Further cleaning steps are specifically directed at the elimination of dirt from the chain's inner parts. For this purpose, the chain is immersed in petroleum, diesel oil, or another solvent, in order to soak the built-up dirt inside the links, as well as encrusted lubricant residues. By repeatedly moving the chain back and forth in the bath, the links are washed clean.

7.16 Tensioning the Chain of the Drive Motor

The drive motor is mounted on a holding plate with slots. If it becomes necessary to re-tension the chain, this can be accomplished by displacing the motor in the slots. The right chain tension has been achieved when the chain can be depressed by about (3/16") between the chain sprockets.

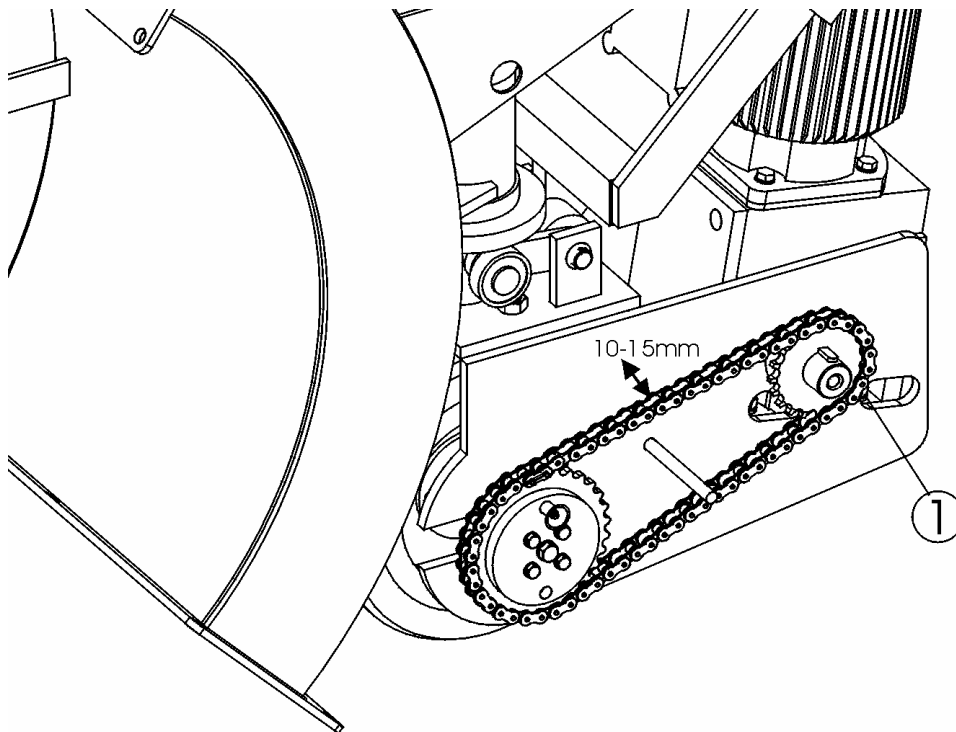


Figure 7.11

7.17 Worn Parts

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2-20DT:



Part	Inspection Interval (Hrs)	Indication of Wear	Replacement Method
Feed Spout	100	Thin, worn sections at wheel entry	Remove and replace
Control Cage	20	Eroded edge on opening	Remove and replace
Blast Wheel	20	Thin worn sections	Remove and replace
Rebound Chamber	100	Thin sections/wear at welds	Contact Blastrac Representative
Deflector Plate	50	Thin sections/wear at welds	Remove separator lid and replace
Separator	100	Thin sections/wear at welds	Contact Blastrac representative
Liners	100	Thin sections/warpage	Remove and replace
Wheel Hub	50	Thin, worn sections	Remove and replace
Blast Wheel Belt	50	Worn sections	Remove and replace

8-54DC99:



Part	Inspection Interval (Hrs)	Indication of Wear	Replacement Method
Cartridge Filters	50	High differential pressure gauge reading	Remove and replace
Compressor belts	50	Worn section	Remove and replace

7.17 Worn Parts (Cont.)

The Tune-up Kit:

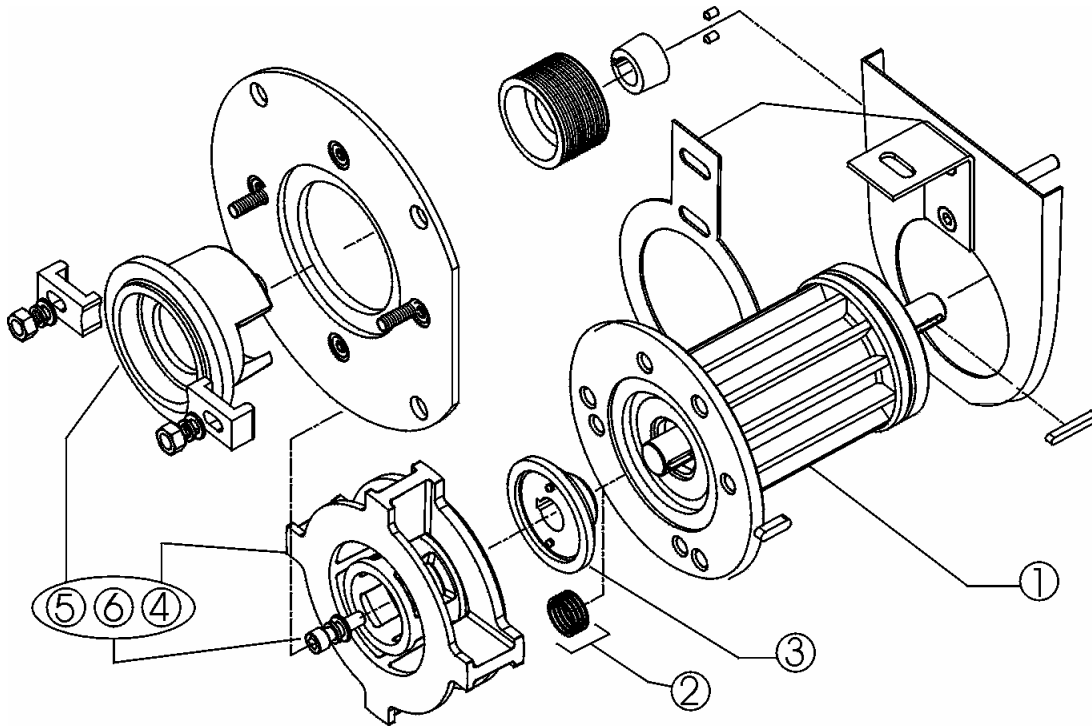


Figure 7.12

- 1 Bearing unit
- 2 Distance spacer
- 3 Wheel hub
- 4 Blast wheel
- 5 Control Cage
- 6 Fastening screw

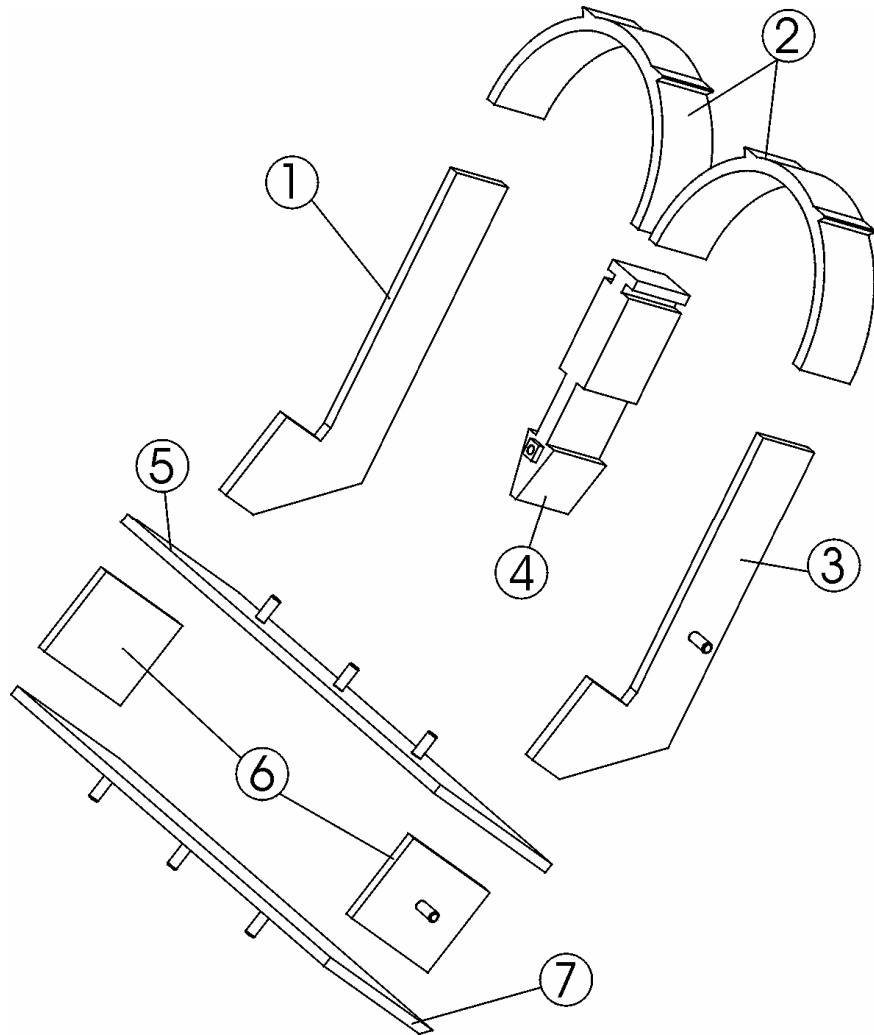


Figure 7.13

- 1 Liner Left
- 2 Liner Top
- 3 Liner Right
- 4 Liner Center
- 5 Top Liner for Rebound Plenum
- 6 Lateral Liner for Rebound Plenum
- 7 Bottom Liner for Rebound Plenum

7.18 Replacing the Tune-Up Kit

The tune-up kit consists of the blast wheel, control cage, and the fastening screw.

Removal:

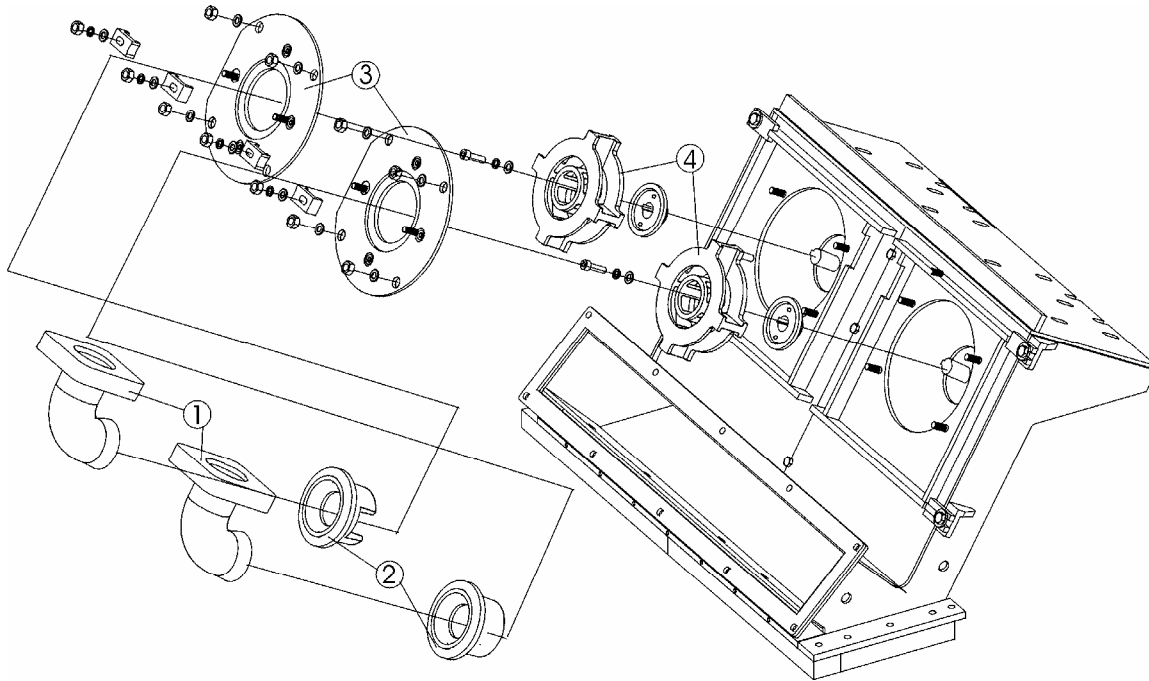


Figure 7.14

- 1 Remove the feed spouts pulling them out of the housing.
- 2 Loosen the holding clamps and extract the control cage.
- 3 Unscrew the 4 screws of the holding plate and take it off.
- 4 Loosen the fastening screw of the blast wheel by holding on to the blast wheel. Take the blast wheels out of the housing.
- 5 Check the tappets for wear and replace these, also, if they show excessive wear.

7.18 Replacing the Tune-Up Kit (Cont.)

Installation:

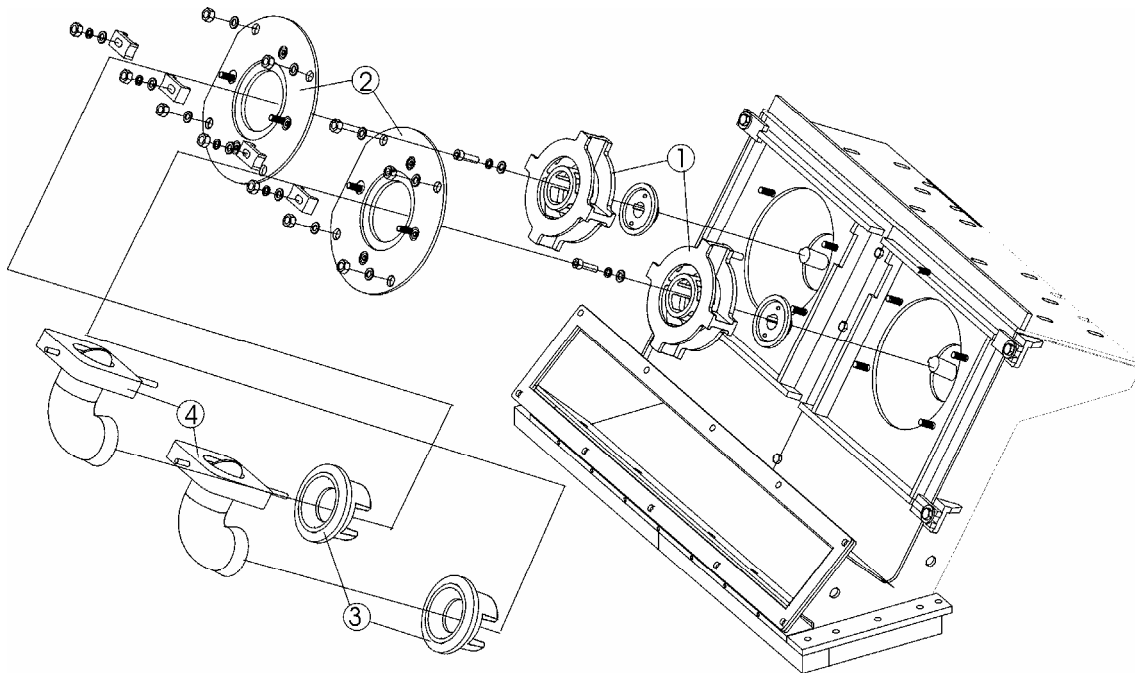


Figure 7.15

- 1 Clean all threads and use a new fastening screw for the blast wheel. Place the blast wheel through the opening in the housing on the wheel hub tappets. Screw the blast wheel down tight with the fastening screw.
- 2 Affix the holding plate with the 4 screws.
- 3 Install the control cage in the center and clamp down the control cage (**Follow the Section 7.5, „Adjustment of Blast Profile“**) with the holding clamps, so that the blast wheel rotates freely. Check the position of the control cage's lower edge. Manually rotate the blast wheel. It should rotate freely.
- 4 Insert the feed spout into the control cage.

7.19 Replacing the Liners

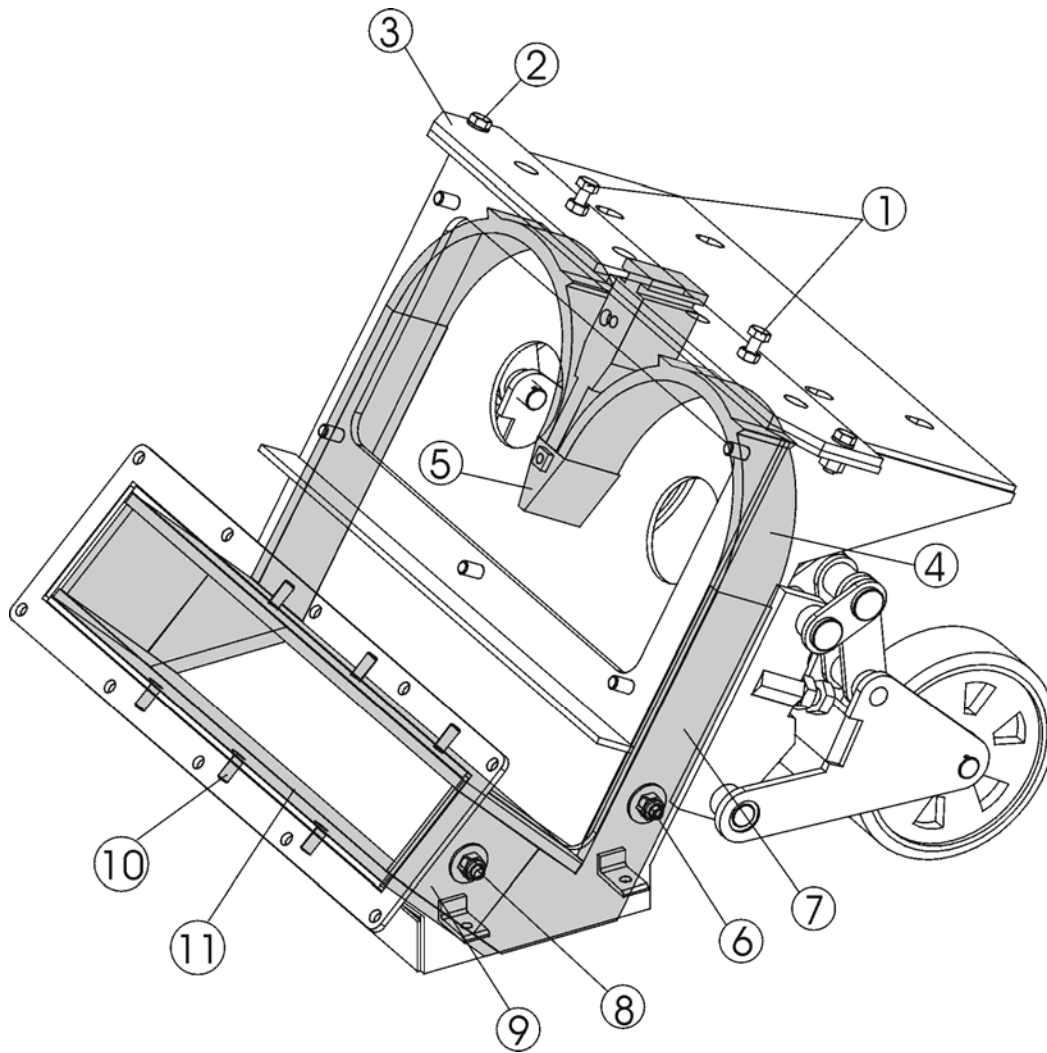


Figure 7.16

Removal:

- 1 Unscrew the front panel and remove it.
- 2 Loosen the pressure screws of the upper liner and remove it.
- 3 Loosen the fastening screws of the left and right liner and pull them out of the housing.

7.19 Replacing the Liners (Cont.)

- 4 To remove the center liner, detach the two fastening screws on the rear panel and take it out through the opening in the front panel.
- 5 To remove the liners in the rebound plenum, two fastening nuts are removed on the outside wall of the rebound plenum and the liners are taken out.

Installation:

- 1 Position the lateral liners in the housing in such a way that the bolt on the liner plate is aligned with the bore in the housing.
- 2 Insert the upper liner. Make sure that the upper liner rests flush against the edges of the lateral liners. You can achieve this by slightly tightening the pressure screws and, thereby pressing the upper liner against the lateral liners.
- 3 **Important Notice:** Make sure that all of the liners have the same height. Equalize differences in height by whetting them. This is important to achieve an optimal sealing of the blast housing by means of the front panel.
- 4 Insert the front panel and tighten the fastening screws. Now, drive home the pressure screws of the upper liners with a wrench.

Section 8

8.1 Blast Unit - Electrical Controls

- 8.1.1 Phase & Voltage Monitoring
- 8.1.2 Soft-Start Solid-State Relays
- 8.1.3 Variable Frequency Drive & Drive Motor Circuit
- 8.1.4 Overloads
- 8.1.5 Transformer and 120 Volt Circuit
- 8.1.6 Power Supply and 24 Volt DC Circuit

8.2 Dust Collector - Electrical Controls

- 8.2.1 Phase & Voltage Monitoring
- 8.2.2 Pulse Timer Board
- 8.2.3 Overloads
- 8.2.4 Transformer and 120 Volt Circuit
- 8.2.5 Power Supply and 24 Volt DC Circuit

8.3 Wiring Diagrams and Bill of Materials

8.1 Blast Unit - Electrical Controls



Before any electrical work is attempted on this machine or its control panel, the individual needs to have read all safety tips and warnings contained within these Operating Instructions before attempting to operate, maintain or repair the machine.



Comply with all safety recommendations in the Operating Instructions, machine decals and any other operating manuals supplied with this equipment. Follow OSHA guidelines for the appropriate personal protective equipment.



To extend the main cable, only use extension cords that are dimensioned and marked in accordance with the total power requirement of the machine and applicable standards.



Any work on electrical systems or electrical components should only be performed by a qualified electrician or by persons with proper training under the guidance and supervision of a qualified electrician under adherence to Section 1.8.

The 2-20DT control panel was designed to safely operate on a 3 phase, 60 Hertz, 460/480 voltage.



The basic controls and operations of this panel is covered in Section 3.7.

8.1.1 Phase & Voltage Monitoring

This control panel features phase and voltage sensing circuitry to protect the equipment. Operator interface elements on the control panel give an indication of “Proper Rotation” or “Improper Rotation”. The circuitry will not allow the equipment to operate unless the rotation is correct and the correct voltage is being supplied to the equipment.

While this equipment is provided with phase monitoring, it is good practice to check the voltage source prior to presenting power to the equipment. Use a reliable voltmeter for this check. This equipment will operate normally on $\pm 10\%$ of the 480 volts range. Since the supply voltage is 480 volts, the measured voltage should not be less than 432 volts, nor more than 528 volts. The site voltage must be corrected if it is above or below these parameters.

For wiring questions and to ensure correct wiring, refer to the wiring diagrams located at the end of this Section!

8.1.2 Soft-Start Solid-State Relays

This control panel incorporates soft-start solid-state relays to start the blast wheels. These are used to reduce physical trauma to the wheel drive train. Wired parallel to the blast motor starters, these devices also limit the high inrush current available to the blast motors during initial start-up.

For wiring questions and to ensure correct wiring, refer to the wiring diagrams located at the end of this Section!

8.1.3 Variable Frequency Drive & Drive Motor Circuit

This control panel features a variable frequency drive for the control of the drive motor circuit. This “VFD”, when wired and programmed correctly, is the device that allows for the operator to have complete control over the entire drive system of the blast machine.

The drive motor circuit overload (3MOL) and contactor (3M) are energized by turning the main disconnect switch to the “On” position. With these energized, the entire drive motor circuit is energized and waiting for the operators next command.

The drive motor circuit also features an input reactor, which has been incorporated solely to protect the VFD from transient voltages. This device allows for the VFD to run smoothly with proper impedance. **Never bypass this device!**

A 10K ohm speed potentiometer along with an overdrive switch has been incorporated with the VFD to allow the operator complete control of the drive system speed. These two devices are located in the handle control.

8.1.3 Variable Frequency Drive & Drive Motor Circuit (Cont.)

Also located in the handle control are the travel-enabling switch and the directional switch, both of which are also incorporated with the VFD. The travel-enabling switch allows no drive motion to take place until the operator has activated it accordingly.

Once the travel-enabling switch has been activated, the directional switch is available for the operator to control whether the machine drives in forward or reverse. This directional switch is “push to reverse”, therefore unless activated, the machine will drive forward accordingly.

Also incorporated with the VFD, are the thermistors and the thermistor relay. These devices, working together, are constantly sending a signal to the VFD. This signal is directly related to the temperature of the drive motor windings. If the drive motor windings become too hot for normal operation, the VFD will shut down, resulting in the shut down of the entire drive motor circuit. If this shutdown occurs, the VFD will display a fault reading of “**FL9**”

The brake overload (5MOL) and the brake contactor (5M) are connected to the half wave rectifier for the drive motor brake. This allows for the operator to manually stop the blast machine whenever desired by activating the brake.

The drive motor also features its own fan motor which has been incorporated to aid in the cooling of the drive motor and to prevent overheating. This fan motor also features an overload (4MOL).

For more information or questions regarding overloads, refer to Section 8.1.4

For wiring questions and to ensure correct wiring, refer to the wiring diagrams located at the end of this Section!

8.1.3 Variable Frequency Drive & Drive Motor Circuit (Cont.)

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The following is a copy of the VFD program:

CODE	NAME	SETTING
------	------	---------

GROUP 99 START-UP DATA		
9902	APPLIC MACRO	1
9505	MOTOR NOM VOLT	460
9906	MOTOR NOM CURR	2.7
9907	MOTOR NOM FREQ	60
9908	MOTOR NOM SPEED	1690

GROUP 10 COMMAND INPUTS		
1001	EXT1 COMMANDS	9
1002	EXT2 COMMANDS	0
1003	DIRECTION	3

default

GROUP 11 REFERENCE SELECT		
1101	KEYPAD REF SEL	1
1102	EXT1/EXT2 SEL	6
1103	EXT REF1 SELECT	1
1104	EXT REF1 MIN	0
1105	EXT REF1 MAX	52
1106	EXT REF2 SELECT	0
1107	EXT REF2 MIN	0
1108	EXT REF2 MAX	100

default

default

default

default

GROUP 12 CONSTANT SPEEDS		
1201	CONST SPEED SEL	0
1202	CONST SPEED 1	5
1203	CONST SPEED 2	10
1204	CONST SPEED 3	15
1205	CONST SPEED 4	20
1206	CONST SPEED 5	25
1207	CONST SPEED 6	40
1208	CONST SPEED 7	50

default

default

default

default

default

default

default

8.1.3 Variable Frequency Drive & Drive Motor Circuit (Cont.)

GROUP 13 ANALOG INPUTS			
1301	MINIMUM AI1	0	default
1302	MAXIMUM AI1	100	default
1303	FILTER AI1	0.1	default
1304	MINIMUM AI2	0	default
1305	MAXIMUM AI2	100	default
1306	FILTER AI2	0.1	default

GROUP 14 RELAY OUTPUTS			
1401	RELAY OUTPUT 1	4	default
1402	RELAY OUTPUT 2	2	default

GROUP 15 ANALOG OUTPUT			
1501	AO CONTENT	103	default
1502	AO CONTENT MIN	0	default
1503	AO CONTENT MAX	60	default
1504	MINIMUM AO	0	default
1505	MAXIMUM AO	20	default
1506	FILTER AO	0.1	default

GROUP 16 SYSTEM CONTROLS			
1601	RUN ENABLE	0	default
1602	PARAMETER LOCK	1	default
1604	FAULT RESET SEL	6	default
1608	DISPLAY ALARMS	1	default

GROUP 20 LIMITS			
2003	MAX CURRENT	5.4	default
2005	OVERVOLT CTRL	1	default
2006	UNDERVOLT CTRL	1	default
2007	MINIMUM FREQ	0	default
2008	MAXIMUM FREQ	60	default

8.1.3 Variable Frequency Drive & Drive Motor Circuit (Cont.)

GROUP 21 START/STOP			
2101	START FUNCTION	1	default
2102	STOP FUNCTION	2	
2103	TORQ BOOST CURR	4.3	default
2104	STOP DC INJ TIME	0	default
2105	PREMAGN SEL	0	default
2106	PREMAGN MAX TIME	2	default
2107	START INHIBIT	0	default???

GROUP 22 ACCEL/DECEL			
2201	ACC/DEC 1/2 SEL	0	
2202	ACCELER TIME 1	0.5	
2203	DECELER TIME 1	0.5	
2204	ACCELER TIME 2	60	default
2205	DECELER TIME 2	60	default
2206	RAMP SHAPE	0	default

GROUP 25 CRITICAL FREQ			
2501	CRIT FREQ SEL	0	default
2502	CRIT FREQ 1 LO	0	default
2503	CRIT FREQ 1 HI	0	default
2504	CRIT FREQ 2 LO	0	default
2505	CRIT FREQ 2 HI	0	default

GROUP 26 MOTOR CONTROL			
2603	IR COMPENSATION	10	default
2604	IR COMP RANGE	25	
2605	CARRIER FREQ 1=LOW NOISE	0	default
2606	V/f RATIO	1	default
2607	SLIP COMP RATIO	0	default

8.1.3 Variable Frequency Drive & Drive Motor Circuit (Cont.)

GROUP 30 FAULT FUNCTIONS			
3001	AI<MIN FUNCTION	1	default
3002	PANEL LOSS	1	default
3003	EXTERNAL FAULT	5	
3004	MOT THERM PROT	1	default
3005	MOT THERM TIME	350	
3006	MOT LOAD CURVE	100	default
3007	ZERO SPEED LOAD	70	default
3008	BREAK POINT	35	default
3009	STALL FUNCTION	0	default
3010	STALL CURRENT	4.3	default
3011	STALL FREQ HI	20	default
3012	STALL TIME	20	default
3013	AI1 FAULT LIMIT	0	default
3014	AI2 FAULT LIMIT	0	default

GROUP 31 AUTOMATIC RESET			
3101	NR OF TRIALS	0	default
3102	TRIAL TIME	30	default
3103	DELAY TIME	0	default
3104	AR OVERCURRENT	0	default
3105	AR OVERVOLTAGE	0	default
3106	AR UNDERVOLTAGE	0	default
3107	AR AI<MIN	0	default

GROUP 32 SUPERVISION			
3201	SUPERV 1 PARAM	103	default
3202	SUPERV 1 LIM LO	0	default
3203	SUPERV 1 LIM HI	0	default
3204	SUPERV 2 PARAM	103	default
3205	SUPERV 2 LIM LO	0	default
3206	SUPERV 2 LIM HI	0	default

GROUP 33 INFORMATION		
3301	SW VERSION	display only
3302	TEST DATE	display only

8.1.3 Variable Frequency Drive & Drive Motor Circuit (Cont.)

GROUP 40 PID CONTROL			
4001	PID GAIN	1	default
4002	PID INTEG TIME	60	default
4003	PID DERIV TIME	0	default
4004	PID DERIV FILTER	1	default
4005	ERROR VALUE INV	0	default
4006	ACTUAL VAL SEL	1	default
4007	ACT1 INPUT SEL	2	default
4008	ACT2 INPUT SEL	2	default
4009	ACT1 MINIMUM	0	default
4010	ACT1 MAXIMUM	100	default
4011	ACT2 MINIMUM	0	default
4012	ACT 2 MAXIMUM	100	default
4013	PID SLEEP DELAY	60	default
4014	PID SLEEP LEVEL	0	default
4015	WAKE-UP LEVEL	0	default
4019	SET POINT SEL	2	default
4020	INTERNAL SETPNT1	40	default
4021	INTERNAL SETPNT2	80	default
4022	INTERNAL SETPNT SEL	6	default

GROUP 52 SERIAL COMM		
	not applicable / not available	

8.1.3 Variable Frequency Drive & Drive Motor Circuit (Cont.)

The following is list of VFD alarm readings:

ALARMS	
CODE	DESCRIPTION
AL1	PARAMETER UPLOAD/DOWNLOAD FAILED
AL2	OPERATION NOT ALLOWED WHILE START IS ACTIVE
AL3	OPERATION NOT ALLOWED IN REMOTE CONTROL
AL5	START/STOP, DIR FROM CONTROL PANEL IS NOT FOLLOWED. POSSIBLE CAUSES: -REMOTE MODE: PARAMETERS DISABLE THE BUTTONS (APPENDIX) -LOCAL MODE: START/STOP BUTTON INTERLOCKED WITH I/O
AL6	OPERATION NOT ALLOWED. PARAMETER 1602 "PARAMETER LOCK" IS ACTIVE
AL7	USE OF FACTORY MACRO DISABLES OPERATION
AL10	OVERCURRENT CONTROLLER ACTIVE
AL11	OVERVOLTAGE CONTROLLER ACTIVE
AL12	UNDERVOLTAGE CONTROLLER ACTIVE
AL13	DIRECTION LOCK. SEE PARAMETER 1003 "DIRECTION"
AL14	SERIAL COMMUNICATIO LOSS ALARM
AL15	MODBUS EXCEPTION RESPONSE IS SENT
AL16	ANALOG INPUT 1 LOSS. ANALOG INPUT 1 VALUE IS LESS THAN MINIMUM AI1. (1301) SEE ALSO PARAMETER 3001 "AI < MIN FUNCTION"
AL17	ANALOG INPUT 2 LOSS. ANALOG INPUT 2 VALUE IS LESS THAN MINIMUM AI2. (1306) SEE ALSO PARAMETER 3001 "AI < MIN FUNCTION"
AL18	PANEL LOSS. PANEL IS DISCONNECTED WHEN START/STOP, DIR OR REFERENCE IS COMING FROM PANEL. SEE PARAMETER 3002 "PANEL LOSS" AND APPENDIX
AL19	HARDWARE OVERTEMPERATURE (AT 95% OF THE TRIP LIMIT)
AL20	MOTOR OVERTEMPERATURE (AT 95% OF THE TRIP LIMIT)
AL21	MOTOR STALL ALARM. SEE PARAMETER 3009 "STALL FUNCTION"

8.1.3 Variable Frequency Drive & Drive Motor Circuit (Cont.)

The following is list of VFD fault readings:

FAULTS	
CODE	DESCRIPTION
FL1	<p>OVERCURRENT: -POSSIBLE MECHANICAL PROBLEM -ACCELERATION AND/OR DECELERATION TIMES MAY BE TOO SHORT -INPUT POWER DISTURBANCES</p>
FL2	<p>DC OVERVOLTAGE: -INPUT VOLTAGE TOO HIGH -DECELERATION TIME MAY BE TOO SHORT</p>
FL3	<p>ACS 140 OVERTEMPERATURE: -AMBIENT TEMPERATURE TOO HIGH -SUSTAINED SEVERE OVERLOAD</p>
FL4	<p>FAULT CURRENT: -OUTPUT GROUND FAULT (240 VOLT UNITS) -SHORT CIRCUIT -INPUT POWER DISTURBANCES</p>
FL5	OUTPUT OVERLOAD
FL6	DC UNDERVOLTAGE
FL7	<p>ANALOG INPUT 1 FAULT. ANALOG INPUT 1 VALUE IS LESS THAN MINIMUM AI1 (1301) SEE ALSO PARAMETER 3001 "AI< MIN FUNCTION"</p>
FL8	<p>ANALOG INPUT 2 FAULT. ANALOG INPUT 2 VALUE IS LESS THAN MINIMUM AI2 (1304) SEE ALSO PARAMETER 3001 "AI less than MIN FUNCTION"</p>
FL9	MOTOR OVERTEMPERATURE. SEE PARAMETERS 3004-3008
FL10	<p>PANEL LOSS. PANEL IS DISCONNECTED WHEN START/STOP, DIR OR REFERENCE IS COMING FROM PANEL. SEE PARAMETER 3002 "PANEL LOSS" AND APPENDIX NOTE! IF FL10 IS ACTIVE WHEN THE POWER IS TURNED OFF, THE ACS 140 WILL START IN REMOTE CONTROL (REM) WHEN THE POWER IS TURNED BACK ON.</p>
FL11	<p>PARAMETERS INCONSISTENT: -MINIMUM AI1>MAXIMUM AI1 -MINIMUM AI2>MAXIMUM AI2 -MINIMUM FREQ>MAXIMUM FREQ</p>
FL12	MOTOR STALL. SEE PARAMETER 3009 "STALL FUNCTION"
FL13	SERIAL COMMUNICATION LOSS
FL14	EXTERNAL FAULT IS ACTIVE. SEE PARAMETER 3003 "EXTERNAL FAULT"
FL15	OUTPUT GROUND FAULT (480 VOLT UNITS)
FL16	DC BUS RIPPLE TOO LARGE. CHECK SUPPLY
FL17	ANALOG INPUT OUT OF RANGE. CHECK INPUT VOLTAGE

8.1.3 Variable Frequency Drive & Drive Motor Circuit (Cont.)

FL18-22	HARDWARE ERROR. CONTACT SUPPLIER.
FULL DIPLAY BLINKIN G	SERIAL LIN FAILURE. BAD CONNECTION BETWEEN THE CONTROL PANEL AND THE ACS 140.

8.1.4 Overloads

Overloads are used extensively throughout the entire circuitry of these machines. These overloads are to ensure continued protection against electrical fires &/or electric shock.



Never bypass any of the overloads incorporated in these machines! If an overload malfunction seems to have occurred, either replace the entire overload relay or contact your Blastrac representative!

The following is a list of each and every overload along with the appropriate setting. This information can also be found in the wiring diagrams at the end of this Section.

<u>Description</u>	<u>Label</u>	<u>Setting</u>
2-20DT Right Blast Motor O/L	1MOL	set at - 17 Amps
2-20DT Left Blast Motor O/L	2MOL	set at - 17 Amps
Drive Motor Circuit O/L	3MOL	set at - 3.2 Amps
Drive Motor Fan O/L	4MOL	set at - 0.12 Amps
Drive Motor Brake O/L	5MOL	set at - 0.21 Amps
Phase Monitor O/L	PMOL	set at - 0.3 Amps
120 Volt Circuit Protection O/L	CPOL	set at - 0.7 Amps

8.1.5 Transformer and 120 Volt Circuit

The 120-volt circuit protection overload (CPOL) feeds two legs of the main 460/480 voltage into transformer (CP1). This 200 VA transformer converts the main 460/480 voltage into the appropriate 120 volts needed to power the 120-volt circuit.

This 120-volt circuit powers such devices as the operating switches, pushbuttons, and pilot lights as well as the contactors, relays, the control panel cooling fan, the hour meter, the thermistors, and the DC power supply which is covered in the following section.

Also incorporated into this 120-volt circuit is circuit breaker (CB1). This circuit breaker is a 3-Amp circuit breaker installed to protect the 120-volt circuit from drawing too much power.

An emergency stop pushbutton is another safety device featured in this 120-volt circuit. This E-stop pushbutton can be energized at any time to shut down the entire blast machine instantaneously, in the event of an emergency.

For more information and questions regarding the operating devices listed above, refer to Section 3.7

For wiring questions and to ensure correct wiring, refer to the wiring diagrams located at the end of this Section!

8.1.6 Power Supply and 24 Volt DC Circuit

The 120-volt circuit covered in the previous section feeds into a 24-volt dc power supply, which is utilized to provide power to the 24-volt circuit.

This 24-volt dc circuit powers such devices as the left and right blast motor ammeters, left and right blast motor soft-start devices, as well as the foot per minute display.

This circuit, similar to the 120-volt circuit, also incorporates a circuit breaker (CB2). This circuit breaker is a 0.5-Amp circuit breaker installed to protect the 24-volt dc circuit from drawing too much power.

For more information and questions regarding the operating devices listed above, refer to Section 3.7

For wiring questions and to ensure correct wiring, refer to the wiring diagrams located at the end of this Section!

8.2 Dust Collector - Electrical Controls



Before any electrical work is attempted on this machine or its control panel, the individual needs to have read all safety tips and warnings contained within these Operating Instructions, especially Section 2 “Safety Tips”!!!



If necessary or required by applicable regulations, please, use personal protective gear! Do adhere to any and all safety and risk information posted on the machine!!



To extend the main cable, only use extension cords that are dimensioned and marked in accordance with the total power requirement of the machine and applicable standards.



Any work on electrical systems or operating materials should exclusively be performed by a trained electrician or by persons with proper training under the guidance and supervision of an electrician under adherence to Section 1.8 “Electrical”.

The 8-54DC99 control panel was designed to safely operate on a 3 phase, 60 Hertz, 460/480 voltage.



The basic controls and operations of this panel is laid out in Section 3.7!

This control panel features phase and voltage sensing circuitry to protect the equipment. Operator interface elements on the control panel give an indication of “Proper Rotation” or “Improper Rotation”. The circuitry will not allow the equipment to operate unless the rotation is correct and the correct voltage is being supplied to the equipment.

While this equipment is provided with phase monitoring, it is good practice to check the voltage source prior to presenting power to the equipment. Use a reliable voltmeter for this check. This equipment will operate normally on $\pm 10\%$ of the 480 volts range. Since the supply voltage is 480 volts, the measured voltage should not be less than 432 volts, nor more than 528 volts. The site voltage must be corrected if it is above or below these parameters.

For wiring questions and to ensure correct wiring, refer to the wiring diagrams located at the end of this Section!

8.2.2 Pulse Timer Board

This control panel features a pulse timer board that is powered by the 120-volt circuit.

This circuit board is the primary electrical control of the cartridge filter purge system. This circuit board alternately energizes each of the three solenoid valves, pulsing high pressure through the cartridge filters in the reverse direction of the vacuum. These high-pressure pulses force the dust and contaminants off of the cartridge filters and into the dust bins located below.

For wiring questions and to ensure correct wiring, refer to the wiring diagrams located at the end of this Section!

8.2.3 Overloads

Overloads are used extensively throughout the entire circuitry of these machines. These overloads are to ensure continued protection against electrical fires &/or electric shock.



Never bypass any of the overloads incorporated in these machines! If an overload malfunction seems to have occurred, either replace the entire overload relay or contact your Blastrac representative! Incorrect overload settings WILL damage the equipment.

The following is a list of each and every overload along with the appropriate setting. This information can also be found in the wiring diagrams at the end of this Section.

<u>Description</u>	<u>Label</u>	<u>Setting</u>
Compressor O/L	1MOL	set at – 2.8 Amps
Fan Motor O/L	2MOL	set at – 8.7 Amps
Phase Monitor O/L	PMOL	set at - 0.3 Amps
120 Volt Circuit Protection O/L	CPOL	set at – 0.7 Amps

For wiring questions and to ensure correct wiring, refer to the wiring diagrams located at the end of this Section!

The 120-volt circuit protection overload (CPOL) feeds two legs of the main 460/480 voltage into transformer (CP1). This 200 VA transformer converts the main 460/480 voltage into the appropriate 120 volts needed to power the 120-volt circuit.

This 120-volt dc circuit powers such devices as the compressor and fan motor stop/start switches, the compressor and fan motor contactors, the hour meter, the pulse timer board, as well as the “control power”, “compressor running”, and “fan running” pilot lights.

Also incorporated into this 120-volt circuit is circuit breaker (CB1). This circuit breaker is a 3-Amp circuit breaker installed to protect the 120-volt circuit from drawing too much power.

For more information and questions regarding the operating devices listed above, refer to Section 3.7

For wiring questions and to ensure correct wiring, refer to the wiring diagrams located at the end of this Section!

8.2.5 Power Supply and 24 Volt DC Circuit

The 120-volt circuit covered in the previous section feeds into a 24-volt dc power supply, which is utilized to provide power to the 24-volt circuit.

This 24-volt circuit powers such devices as the improper and proper rotation pilot lights, the acceptable voltage relay, the digital voltmeter, and the DC power supply that is covered in the following section.

This circuit, similar to the 120-volt circuit, also incorporates a circuit breaker (CB2). This circuit breaker is a 0.5-Amp circuit breaker installed to protect the 24-volt dc circuit from drawing too much power.

For more information and questions regarding the operating devices listed above, refer to Section 3.7

For wiring questions and to ensure correct wiring, refer to the wiring diagrams located at the end of this Section!

8.3 Wiring Diagrams and Bill of Materials

Section 9 Troubleshooting

- 9.1 Index/Table of Contents
- 9.2 Blower/Fan Problem
- 9.3 Compressor Problem
- 9.4 Differential Pressure Problem
- 9.5 Air Pressure Problem
- 9.6 Suction Problem
- 9.7 Blast Motor will not Come On or Wheel will not Turn
- 9.8 Reduced Blasting or No Blasting
- 9.9 Wear on Blast Wheel and/or Rebound Plenum
- 9.10 Shot Contaminated
- 9.11 Leakage of Abrasive Near Rebound Plenum or Onto Surface
- 9.12 Error Message on VFD
- 9.13 Controls Interrupt During Operation
- 9.14 Blast Motor Fault Light Blinking
- 9.15 Controls will not Come On
- 9.16 Machine will not Drive
- 9.17 Excessive Vibration or Noise

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Troubleshooting

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9.1 Index/Table of Contents

Air “Dust Collector”:	9.2 -- Blower/Fan Problem
	9.3 -- Compressor Problem
	9.4 -- Differential Pressure Problem
	9.5 -- Air Pressure Problem
	9.6 -- Suction Problem
Blast Performance:	9.7 -- Blast Motor will not Come On or Wheel will not Turn
	9.8 -- Reduced Blasting or No Blasting
	9.9 -- Wear on Blast Wheel and/or Rebound Plenum
Abrasive “Shot”:	9.10 -- Shot Contaminated
	9.11 -- Leakage Near Rebound Plenum or onto Surface
Controls “Electrical”:	9.12 -- Error Message on VFD
	9.13 -- Controls Interrupt During Operation
	9.14 -- Blast Motor Fault Protection Light Blinking
	9.15 -- Controls will not Come On
Drive System:	9.16 -- Machine will not Drive
General:	9.17 -- Excessive Vibration or Noise



This Section has been provided for the sole purpose of aiding the operator and/or maintenance personnel in troubleshooting any and all problems that may occur.



Prior to beginning any repair work on the system and its drives, the equipment should be secured against an unintentional start-up. Put system into the “Maintenance Mode”. Refer to Section 1.6



All service of Blastrac equipment requires a thorough awareness of the warnings and precautions in Section 1, “Safety” of these Operating Instructions.

9.2 Blower/Fan Problem



Prior to beginning any repair work on the system and its drives, the equipment should be secured against an unintentional start-up. Put system into the “Maintenance Mode”. Refer to Section 1.6

Lock out power supply at the source (generator, disconnect switch, distribution panel, etc.)

- First check for proper fan rotation, that all hoses and connections are secure, and that the air control gate is set appropriately.
- Open control panel door and check overload relay “2MOL” to ensure that it has not been tripped. If this device is tripped, **proceed with caution!**



The opening of a branch-circuit may be an indication that a **FAULT CURRENT has been interrupted. To ensure continued protection against fire &/or electric shock, current carrying parts and other components of the combination controller should be examined and replaced if damaged. If burnout of the current-element of this overload relay occurs, the complete overload relay must be replaced!**

ONLY after following the above instructions, proceed to reset the overload relay by turning it “off” and then back “on”. Also check that the overload relay is set properly, according to the wiring diagram at the end of Section 8.

- Ensure that the multi-pin connector on the left side of the control panel is properly seated, connected, and mechanically secure.
- If the above does not solve the problem refer to the sections below for further understanding and aid in troubleshooting:

**Section 3.7 “Control Panels”
Section 3.13 “The Air Extraction System”
Section 5.2 “Start-Up”
Section 8.2 “Dust Collector-Electrical Controls”**

9.3 Compressor Problem



Prior to beginning any repair work on the system and its drives, the equipment should be secured against an unintentional start-up. Put system into the “Maintenance Mode”. Refer to Section 1.6

Lock out power supply at the source (generator, disconnect switch, distribution panel, etc.)

- Open panel door and check overload relay “1MOL” to ensure that it has not been tripped. If this device is tripped, **proceed with caution!**



The opening of a branch-circuit may be an indication that a **FAULT CURRENT** has been interrupted. To ensure continued protection against fire &/or electric shock, current carrying parts and other components of the combination controller should be examined and replaced if damaged. If burnout of the current-element of this overload relay occurs, the complete overload relay must be replaced!

ONLY after following the above instructions, proceed to reset the overload relay by turning it “off” and then back “on”. Also check that the overload relay is set properly, according to the wiring diagram at the end of Section 8.

- Ensure that the multi-pin connector on the left side of the control panel is properly seated, connected, and mechanically secure.
- Ensure that the pulse timer board is functioning properly. Make sure that the fan motor is running; fan motor must be running in order for power to be presented to the pulse timer board.
- If pulse timer board is not functioning properly, check the glass fuse located in the bottom-left corner of the board. If blown, check solenoid coils. If bad, clean the valve and replace the solenoid coil. After this, replace the fuse on pulse board with **EXACT** replacement.

- If the above does not solve the problem refer to the sections below for further understanding and aid in troubleshooting:

Section 3.7 “Control Panels”
Section 3.13 “The Air Extraction System”
Section 5.2 “Start-Up”
Section 8.2 “Dust Collector-Electrical Controls”

9.4 Differential Pressure Problem



Prior to beginning any repair work on the system and its drives, the equipment should be secured against an unintentional start-up. Put system into the “Maintenance Mode”. Refer to Section 1.6

Lock out power supply at the source (generator, disconnect switch, distribution panel, etc.)

- Check for clogged filters. Check the filter pulsing rate and pressure. Pressure should be 80 to 100 PSI and should drop about 30 PSI for each pulse occurring once every 10 to 11 seconds.
- Check the filters for excess wear and/or saturation. Also ensure that dust bins are not overfilled.
- Check the screen located inside the filter chamber. Clean and/or replace if needed.
- If the above does not solve the problem refer to the sections below for further understanding and aid in troubleshooting:

Section 3.13 “The Air Extraction System”
Section 8.2 “Dust Collector-Electrical Controls”

9.5 Air Pressure Problem



Prior to beginning any repair work on the system and its drives, the equipment should be secured against an unintentional start-up. Put system into the “Maintenance Mode”. Refer to Section 1.6

Lock out power supply at the source (generator, disconnect switch, distribution panel, etc.)

Always depressurize the air tank before working with any components connected to the tank.

- Check for a pressurized air leak. Check all high-pressure connections for leakage; a hissing or whistling sound usually indicates that this is the problem. Locate leak and tighten components or replace faulty components.
- Check solenoid valves and replace if worn or faulty. Also check the Goyen diaphragms and clean and/or replace if necessary.
- Check to ensure that the unloader valve is properly holding pressure. If not adjust and/or replace if necessary.
- Check to ensure that the compressor is building air pressure properly. **For further troubleshooting on compressor refer to Section 9.3 “Compressor Problem”.**
- Check to ensure that the pulse timer board is functioning properly and replace if necessary. Each of the three solenoids energized by this board has a red light that blinks on when the board energizes that individual solenoid. If lights are blinking and solenoids are pulsing, this is not likely to be the problem.
- If the above does not solve the problem refer to the sections below for further understanding and aid in troubleshooting:

Section 3.13 “The Air Extraction System”

Section 8.2 “Dust Collector-Electrical Controls”



Prior to beginning any repair work on the system and its drives, the equipment should be secured against an unintentional start-up. Put system into the “Maintenance Mode”. Refer to Section 1.6

Lock out power supply at the source (generator, disconnect switch, distribution panel, etc.)

- Check to ensure that filters are not clogged and that dustbins are not over-filled. This is the most typical cause of suction problems. Also check to ensure that the fan motor is running and that rotation is correct. **For further troubleshooting on fan motor refer to Section 9.2 “Blower/Fan Problems”.**
- Check the vacuum adjustment gate for proper position. Closing this vent increases the dust collector’s suction. However, closing this gate too much can cause abrasive to be pulled into the dust collector, thus resulting in the loss of abrasive. This is particularly true when using small sizes of abrasive.
- For normal concrete surfaces, Blastrac does not recommend using more than 50 ft. of exhaust hose. Adding additional hose can drastically affect the suction. If hose has been added, try reducing it to the appropriate length.
- If the above does not solve the problem refer to the sections below for further understanding and aid in troubleshooting:

Section 3.13 “The Air Extraction System”

Section 8.2 “Dust Collector-Electrical Controls”



Prior to beginning any repair work on the system and its drives, the equipment should be secured against an unintentional start-up. Put system into the “Maintenance Mode”. Refer to Section 1.6

Lock out power supply at the source (generator, disconnect switch, distribution panel, etc.)

- Open panel door and check blast wheel overload relay “1MOL” to ensure that it has not been tripped. If this device is tripped, **proceed with caution!**



The opening of a branch-circuit may be an indication that a **FAULT CURRENT** has been interrupted. To ensure continued protection against fire &/or electric shock, current carrying parts and other components of the combination controller should be examined and replaced if damaged. If burnout of the current-element of this overload relay occurs, the complete overload relay must be replaced!

ONLY after following the above instructions, proceed to reset the overload relay by turning it “off” and then back “on”. Also check that the overload relay is set properly, according to the wiring diagram at the end of Section 8.

- If the above does not solve the problem, check the blast motor amperage. If the amperage is high, it may be that the motor is on, but that the blast wheel is obstructed or “locked”. This is often caused by too much abrasive entering the blast wheel area at one time. Free the movement of the wheel, double check the setting of the magnetic abrasive valve and try restarting the blast motor.
- If the above does not solve the problem refer to the sections below for further understanding and aid in troubleshooting:

Section 3.9 “The Blast Wheel”

Section 5.2 “Start-Up”

Section 8.1 “Blast Unit – Electrical Controls”



Prior to beginning any repair work on the system and its drives, the equipment should be secured against an unintentional start-up. Put system into the “Maintenance Mode”. Refer to Section 1.6

Lock out power supply at the source (generator, disconnect switch, distribution panel, etc.)

- Check for proper abrasive feed to the blast wheel. If ammeter reading is low, chances are that there is not enough abrasive being fed to blast wheel. If this is the case, check the hopper to ensure there is plenty of abrasive available, and then ensure that the magnetic abrasive valve is set correctly. Also check for obstructions in the abrasive feed, i.e. feed spout, magnetic valve, and separator screen.
- Check the abrasive for contaminants. If the filter system is not properly cleaning the abrasive of dust and contaminants, this can often interfere with proper feed of abrasive to the blast wheel. **For further troubleshooting on contaminants in abrasive refer to Section 9.6 “Suction Problem” and Section 9.10 “Shot Contaminated”.**
- Check the wheel impeller and control cage for excessive wear and replace the wheel kit if necessary.
- Also check the blast pattern to ensure that the control cage is set correctly. If not, adjust the control cage to obtain a correct blast pattern. **For further troubleshooting on the correct blast pattern refer to Section 7.6 “Control Cage Adjustment”.**
- Another cause of reduced blasting is an excessive drive speed. Try reducing the drive speed of the machine.

9.8 Reduced Blasting or No Blasting (Cont.)

- If the above does not solve the problem refer to the sections below for further understanding and aid in troubleshooting:

Section 3.7 “Control Panels”
Section 5.2 “Start-Up”
Section 3.9 “The Blast Wheel”
Section 8.1 “Blast Unit-Electrical Controls”

9.9 Wear on Blast Wheel and/or Rebound Plenum



Prior to beginning any repair work on the system and its drives, the equipment should be secured against an unintentional start-up. Put system into the “Maintenance Mode”. Refer to Section 1.6

Lock out power supply at the source (generator, disconnect switch, distribution panel, etc.)

- Check for improper adjustment of control cage. The abrasive could be aimed at the blast housing rather than the surface to be treated. If so, adjust the control cage. **For further troubleshooting on the correct blast pattern refer to Section 7.6 “Control Cage Adjustment”.**
- Ensure that the abrasive being used is the appropriate abrasive for this machine and for the surface being treated. Using the incorrect size of abrasive can damage both the surface to be treated as well as the blast machine itself. **For further troubleshooting on the correct abrasive to be used refer to Section 3.14 “Operating Materials”.**
- If the above does not solve the problem refer to the sections below for further understanding and aid in troubleshooting:

Section 5.2 “Start-Up”
Section 3.9 “The Blast Wheel”



Prior to beginning any repair work on the system and its drives, the equipment should be secured against an unintentional start-up. Put system into the “Maintenance Mode”. Refer to Section 1.6

Lock out power supply at the source (generator, disconnect switch, distribution panel, etc.)

- First try increasing the drive speed of the machine. The removal of very soft concrete should be done at higher speeds thus reducing the amount of concrete removal and dust quantities entering the machine.
- Also check to ensure there is proper airflow and suction from the filter system. **For further troubleshooting on suction refer to Section 9.6 “Suction Problem”.**
- If the above does not solve the problem refer to the sections below for further understanding and aid in troubleshooting:

Section 5.2 “Start-Up”

Section 3.13 “Air Extraction System”

Section 8.2 “Dust Collector-Electrical Controls”



Prior to beginning any repair work on the system and its drives, the equipment should be secured against an unintentional start-up. Put system into the “Maintenance Mode”. Refer to Section 1.6

Lock out power supply at the source (generator, disconnect switch, distribution panel, etc.)

- Check all seals for wear and proper adjustment. Adjust and/or replace seals as needed. **For further troubleshooting on seals refer to Section 7.7 “Adjustment of all Seals”.**
- Check for proper setting of control cage. An improper setting will often result in shot abrasive rebounding from side of machine. Adjust control cage if this appears to be the problem. **For further troubleshooting on control cage adjustments refer to Section 7.6 “Control Cage Adjustment”.**
- A poor quality of abrasive can also be a cause of abrasive leakage. If this is suspected contact your Blastrac representative.
- Also check the tune-up kit for excessive wear and replace if necessary. **For further troubleshooting on the tune-up kit refer to Section 7.18 “Tune-Up Kit Replacement”.**
- If the above does not solve the problem refer to the sections below for further understanding and aid in troubleshooting:

Section 5.2 “Start-Up”

Section 8.1 “Blast Unit-Electrical Controls”



Prior to beginning any repair work on the system and its drives, the equipment should be secured against an unintentional start-up. Put system into the “Maintenance Mode”. Refer to Section 1.6

Lock out power supply at the source (generator, disconnect switch, distribution panel, etc.)

- For a complete understanding of the variable frequency drive and for aid in troubleshooting refer to:

Section 8.1.3 “Variable Frequency Drive and Drive Motor Circuit”.

9.13 Controls Interrupt During Operation



Prior to beginning any repair work on the system and its drives, the equipment should be secured against an unintentional start-up. Put system into the “Maintenance Mode”. Refer to Section 1.6

Lock out power supply at the source (generator, disconnect switch, distribution panel, etc.)

- Check all overload relays for tripping or apparent damage and replace if necessary. **For further troubleshooting on the overloads refer to Section 8.1.4 and 8.2.3 “Overloads”.**
- Check the power connecting cable. Damage to this cable can often cause controls to cut out occasionally. If damage is apparent, replace entire cable.
- If the above does not solve the problem refer to the sections below for further understanding and aid in troubleshooting:

Section 8.1 “Blast Unit-Electrical Controls”

Section 8.2 “Dust Collector-Electrical Controls”

9.14 Blast Motor Fault Light Blinking



Prior to beginning any repair work on the system and its drives, the equipment should be secured against an unintentional start-up. Put system into the “Maintenance Mode”. Refer to Section 1.6

Lock out power supply at the source (generator, disconnect switch, distribution panel, etc.)

- This is often due to a tripped blast motor overload relay. This overload relay rarely trips without a mechanical problem to cause it; therefore finding the mechanical problem causing over-amperage should be done before resetting and/or replacing the overload relay. **For further troubleshooting on the overloads refer to Section 8.1.4 and 8.2.3 “Overloads”.**

- If the above does not solve the problem refer to the sections below for further understanding and aid in troubleshooting:

Section 8.1 “Blast Unit-Electrical Controls”

9.15 Controls will not Come On



Prior to beginning any repair work on the system and its drives, the equipment should be secured against an unintentional start-up. Put system into the “Maintenance Mode”. Refer to Section 1.6

Lock out power supply at the source (generator, disconnect switch, distribution panel, etc.)

- Check power connection, all disconnect and main power switches, overload relays, and circuit breakers. If this does not solve the problem refer to the sections below for further understanding and aid in troubleshooting:

Section 5.2 “Start-Up”
Section 8.1 “Blast Unit-Electrical Controls”
Section 8.2 “Dust Collector-Electrical Controls”

9.16 Machine will not Drive



Prior to beginning any repair work on the system and its drives, the equipment should be secured against an unintentional start-up. Put system into the “Maintenance Mode”. Refer to Section 1.6

Lock out power supply at the source (generator, disconnect switch, distribution panel, etc.)

- Check the drive speed to make sure that the speed control knob is not turned all the way down. If it is, increase the drive speed.

- Check to make sure that the blast head or front end of the machine is not stuck or hung-up on rough surface, rut, crack, etc... If this is the case, reverse the machine and bypass or carefully lift front end to overcome the obstruction.

- If the above does not solve the problem refer to the sections below for further understanding and aid in troubleshooting:

Section 8.1 “Blast Unit-Electrical Controls”



Prior to beginning any repair work on the system and its drives, the equipment should be secured against an unintentional start-up. Put system into the “Maintenance Mode”. Refer to Section 1.6

Lock out power supply at the source (generator, disconnect switch, distribution panel, etc.)

- Check blast wheel for excessive wear, misalignment, and/or broken parts. Replace and/or adjust components as necessary. Misalignment of rotating parts will most often not allow for sufficient clearance for free motion. **For further troubleshooting on the blast wheel and replacement parts refer to Section 7.5 “Adjustment of Blast Profile” and Section 3.9 “The Blast Wheel”**
- Check the entire machine for loose screws, nuts, bolts, etc... Tighten any that seem to be loose and replace if damaged in any way.
- Check the drive wheels for excessive squeaking and replace if necessary.
- Check all motors for defective and/or damaged bearings. If bearings are bad, replace the entire motor.
- If the above does not solve the problem refer to the sections below for further understanding and aid in troubleshooting:

All of Section 7 “Maintenance”

BLASTRAC

Operating Instructions

2-20DT & 8-54DC99

Spare Parts

May 2003

Section 10 – Spare Parts

BLASTRAC

Operating Instructions
Spare Parts

2-20DT & 8-54DC99
May 2003

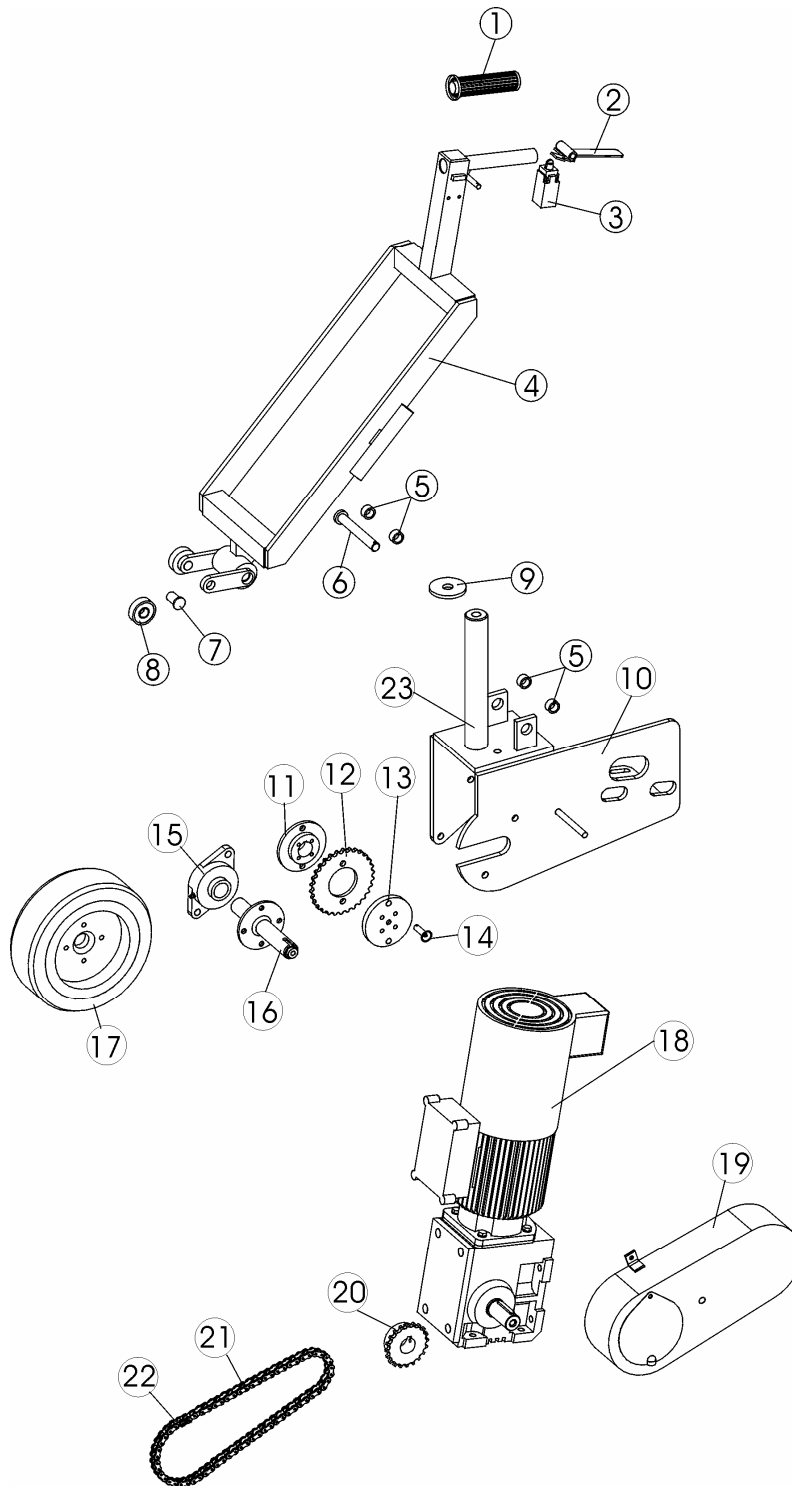


Figure 10.1

Figure 10.1

Item	Part Number	Description	Qty
1	453290	Handle grip	1
2	490074	Switch lever	1
3	454796	Limit switch	1
4	P001443	Steering handle	1
5	6940870	Bushing/Steering pivot	4
6	P001445	Bracket pin	1
7	P001446	Bearing shaft	2
8	6940880	Bearing/Up down steering	2
9	P001448	Disk	1
10	P001449	Steering bracket	1
11	488551	Hub	1
12	477631	Idler sprocket	1
13	477630	Sprocket retainer	1
14	478198	Quick release pin	1
15	6940850	Bearing SFT 1.1/8	2
16	6940830	Drive shaft	1
17	6940820	Traction wheel	1
18	P001452	Drive motor	1
19	6940860	Chain guard	1
20	P001454	Sprocket	1
21	6940810	Drive chain	FT
22	P001456	Connecting link	1
23	P001457	Lifting shaft	1

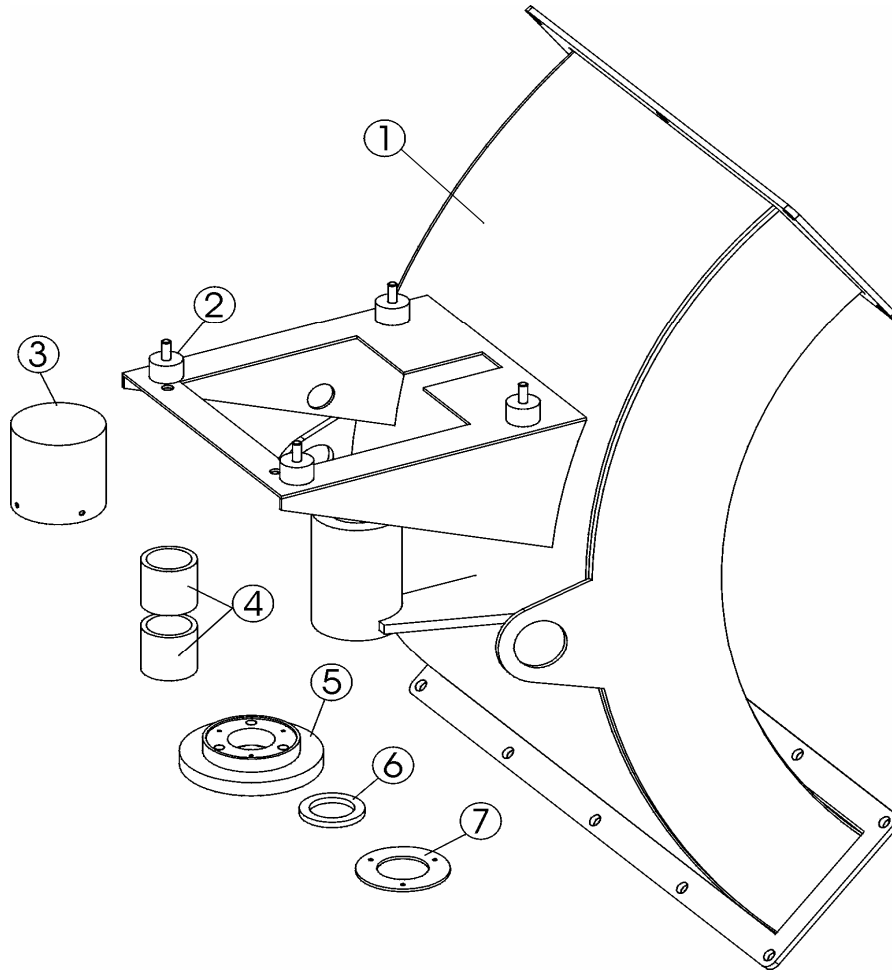


Figure 10.2

Item	Part Number	Description	Qty
1	P001458	Rebound plenum	1
2	456550	Cylindrical motor mount	4
3	P001459	Shaft cover	1
4	6940890	Bushing/Yoke	2
5	P001461	Lifting plate	1
6	P001462	Felt seal	1
7	P001463	Seal retainer	1

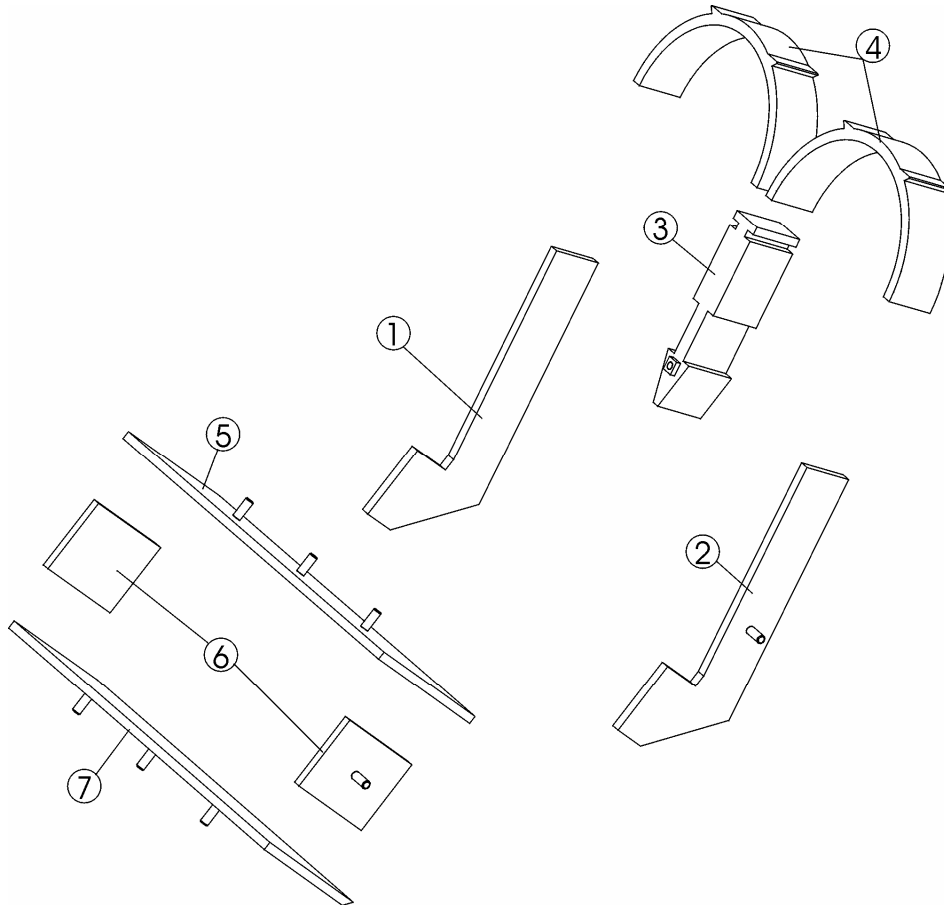


Figure 10.3

Item	Part Number	Description	Qty
1	P001464	Liner side LH	1
2	P001465	Liner side RH	1
3	P001466	Liner center	1
4	P001467	Top liner	2
5	P001468	Liner plenum top	1
6	P001469	Liner bottom side	2
7	P001470	Liner plenum bottom	1

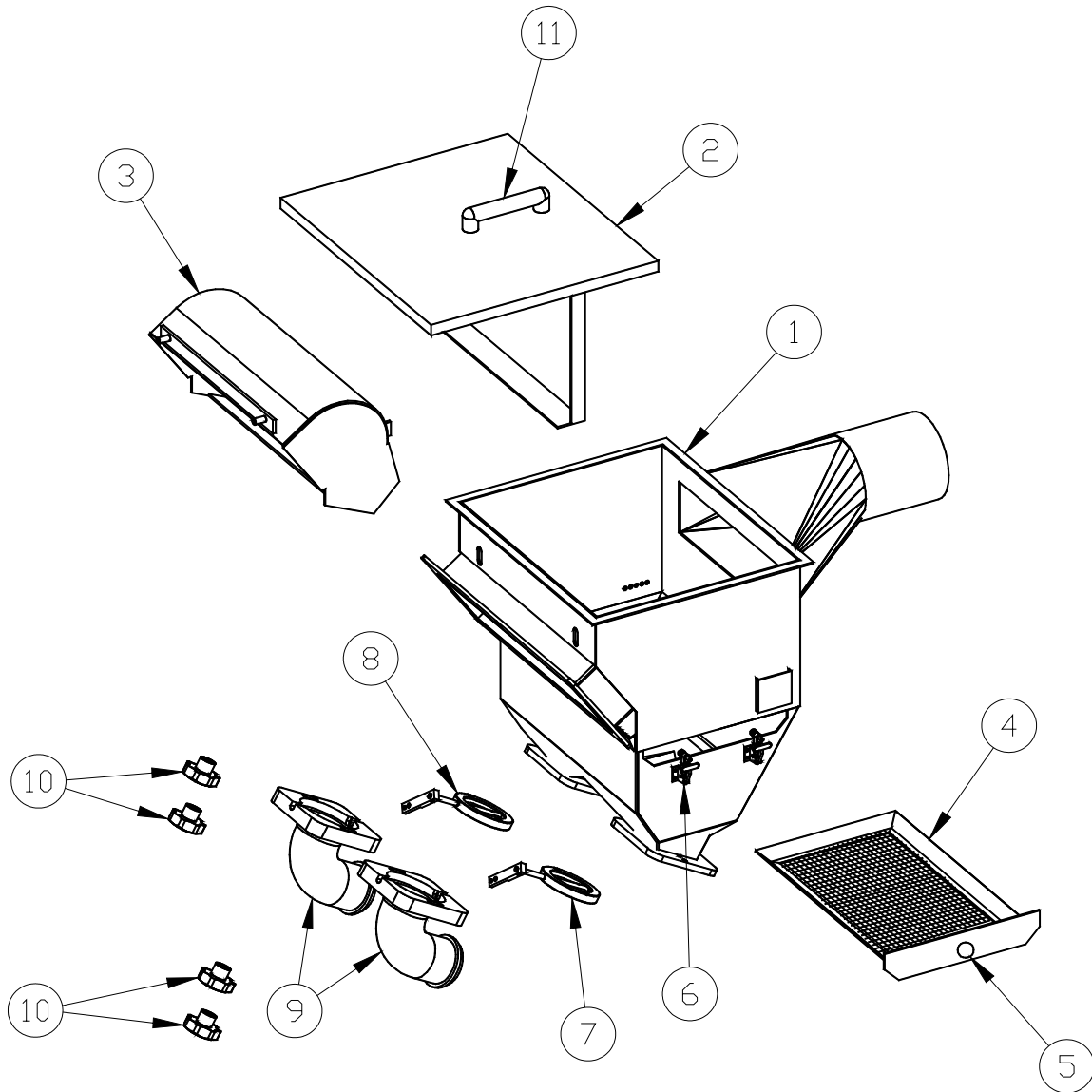


Figure 10.4

Figure 10.4

Item	Part Number	Description	Qty
1	P001471	Separator	1
2	P001472	Separator lid	1
3	P001473	Deflector	1
4	P001474	Separator tray	1
5	P001475	Separator tray button	1
6	P001476	Clamp	2
7	P001477	Lever magnetic valve	2
8	P001478	Magnetic valve	2
9	6940900	Feed spout	2
10	P001480	Nut for feed spout	4
11	9703850	Handle	1

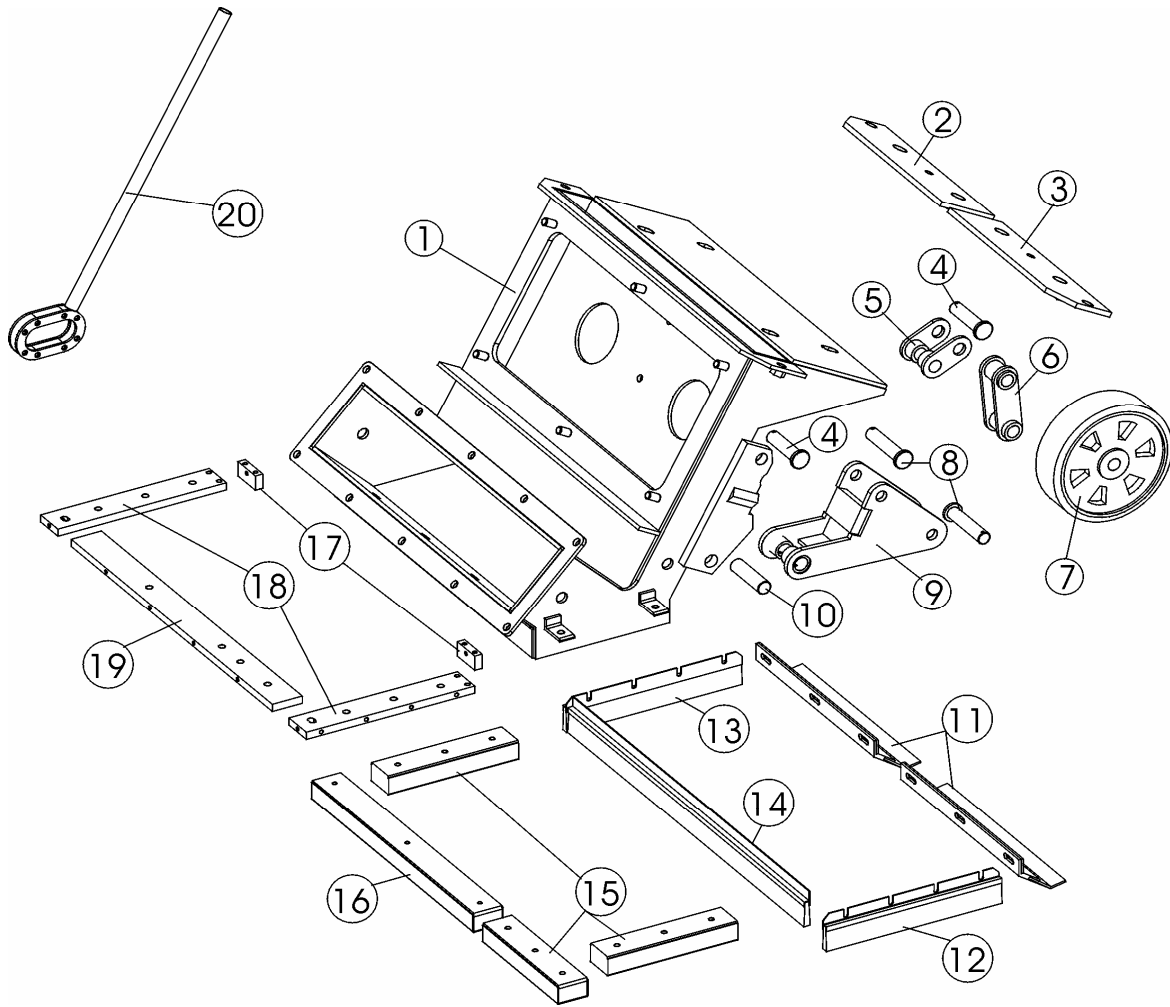


Figure 10.5

Figure 10.5

Item	Part Number	Description	Qty
1	P001484	Blast Housing	1
2	P001485	Housing left cover	1
3	P001486	Housing right cover	1
4	P001487	Pin short	4
5	P001488	Top lever	4
6	P001489	Bottom lever	2
7	P001490	Idler wheel	2
8	P001491	Pin long	4
9	P001492	Idler wheel bracket	2
10	P001493	Pin	2
11	P001494	Seal rear	2
12	7154430	Brush side (RH)	1
13	7154440	Brush side (LH)	1
14	P001497	Brush front	1
15	4900470	Side magnet	3
16	6940960	Front magnet	1
17	4813500	Magnet spacer	2
18	4899450	Side magnet insulator	2
19	P001499	Front magnet insulator	1
20	P001650	Lever	1

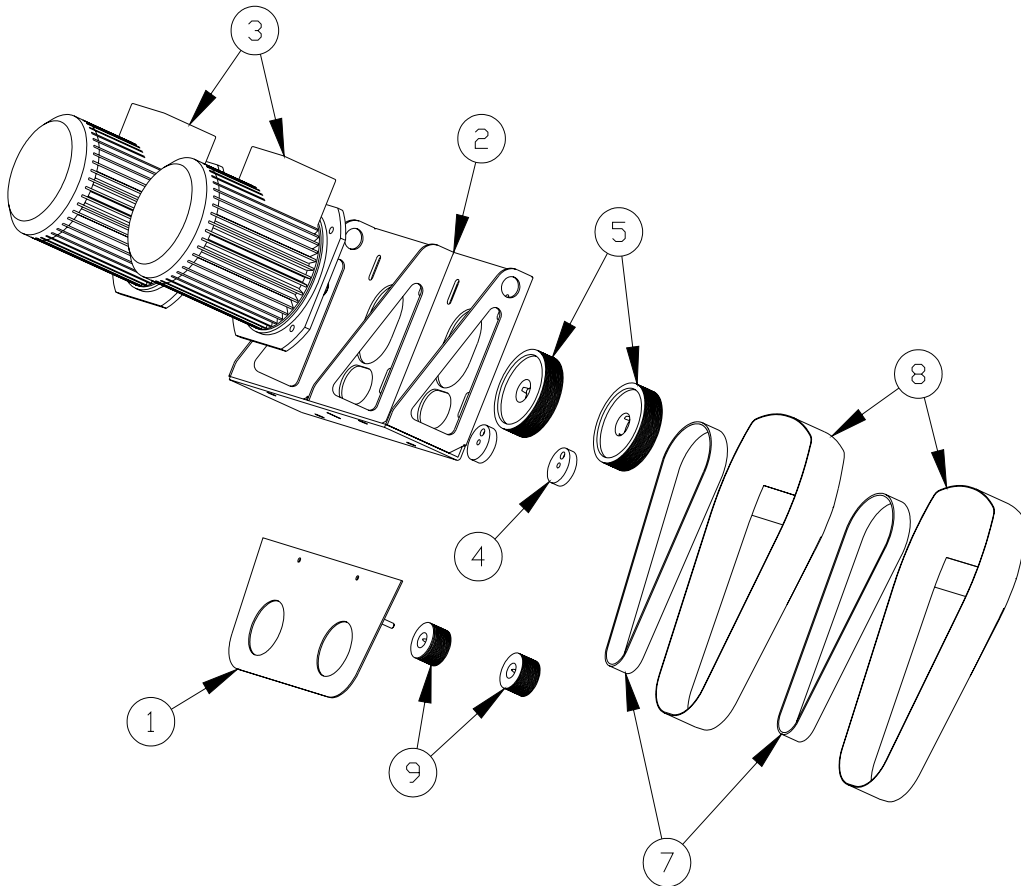


Figure 10.6

Item	Order No.	Description	Qty
1	E00953	Belt guard rear plate	1
2	4917670	Motor bracket	1
3	6976380	Motor 15 HP	2
4	P001653	Eccentric sleeve	1
5	4932650	Top pulley with QD Bushing	2
7	4932630	V-Belt	2
8	4917410	Belt guard	1
9	4932640	Bottom pulley with QD Bushing	2

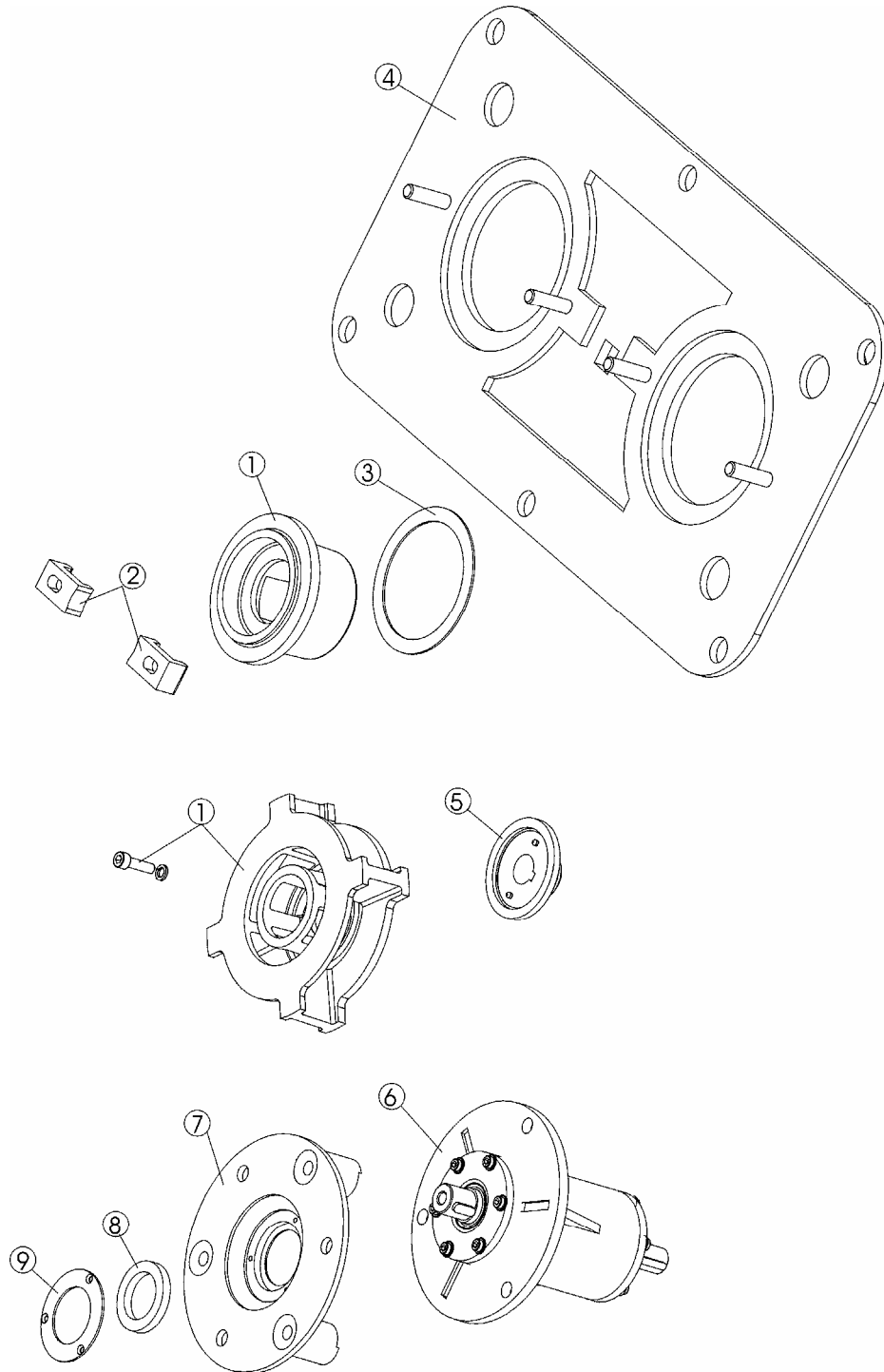


Figure 10.7

Figure 10.7

Item	Part Number	Description	Qty
1	6941010	Wheel kit	2
2	9698030	Control cage clamp	4
3	P001666	Control cage shim	2
4	P001667	Control cage housing	1
5	4959400	Wheel Hub	2
6	4892950	Bearing unit	2
7	4959430	Bearing flange	2
8	4959380	Felt seal	2
9	4959370	Cover felt seal	2

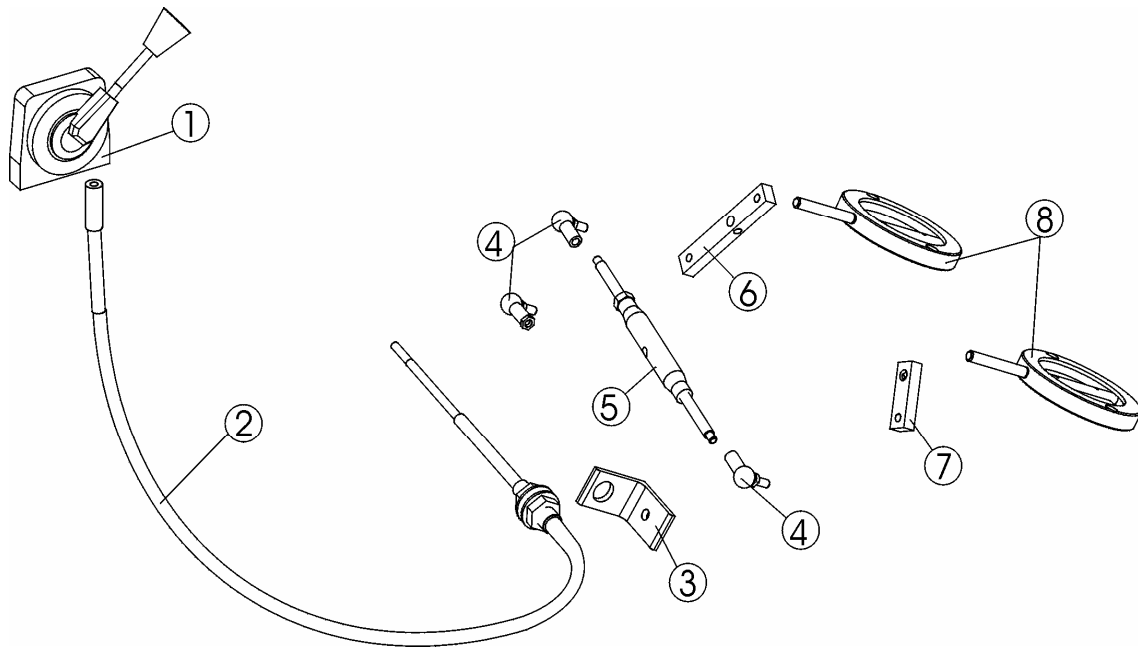


Figure 10.8

Item	Part Number	Description	Qty
1	6940940	Control cable lever	1
2	6940930	Control cable	1
3	P001675	Hold angle	1
4	P001676	Angle joint	3
5	P001677	Turnbuckle	1
6	P001678	Lever magnetic valve long	1
7	P001477	Lever magnetic valve	1
8	P001478	Magnetic valve	2