OWNERS MANUAL

Installation, Operation, Maintenance, Service Parts

THE BLACK CLAWSON COMPANY
SHARTLE DIVISION
605 Clark Street
Middletown, Ohio 45042
PHONE: (513) 424-7400 FAX (513) 424-1168

6" ULTRA-CLONE™ CLEANER

MANUAL(S) DELIVERED TO:

Black Clawson Company
605 Clark Street
Middletown, OH 45042

ATTENTION: Mr. Earl Hill

PREPARED FOR: First Urban Fiber

MILL: Hagerstown, Maryland

Customer order number: 00301

No. of manuals this order: 2

BC SHOP ORDER NO.	BLACK CLAWSON SERIAL NO.	SBCCS EQUIPMENT NO.
3357791	94-UC-80-6-S-0191	41-00-205-001
3357791	94-UC-80-6-S-0190	41-00-200-001
3357891	94-UC-56-6-S-0192	41-00-210-001
3357991	94-UC-32-6-S-0193	41-00-215-001
3358091	94-UC-12-6-S-0194	41-00-200-001

Thank you for purchasing a Black Clawson product.

READ THIS MANUAL carefully to learn how to operate and service your machine correctly; failure to do so could result in personal injury or equipment damage. This manual should be considered a permanent part of the machine and should remain with the machine.

Measurements in this manual are Metric units or their American Engineering equivalents.

Contents

This manual is for General Information and Guidance

For specific information concerning parts or items refer to the certified print of the equipment.

The instructions contained in this manual are recommended procedures for installing, operating and maintaining your unit.

This unit was designed to meet a definite set of specifications.

It will provide many years of dependable service when installed, operated and maintained according to our recommended procedures.

We wish to stress the importance of erecting the unit correctly. Reasonable operation and maintenance will not compensate for a poor installation.

All information, illustrations, and specifications in this manual are based on the latest information available at the time of publication.

THE RIGHT IS RESERVED TO MAKE CHANGES AT ANY TIME WITHOUT NOTICE.

SHARTLE DIVISION
605 Clark St., Middletown, OH 45042
Phone: (513) 424-7400
TOLL FREE 24 HOUR EMERGENCY SERVICE
1-800-448-5422

This information provides the reader with information to install,operate and maintain your BLACK CLAWSON Unit

Use this information as a guide in the care and operation of your BC equipment. The contents of this manual are not to be considered the only way to perform an operation. It is to be used as a guide for safe and trouble - free production.

Training and instruction of personnel in the safe method of operation is the customer's responsibility.

Note - If

Black Clawson offers, as service to you, **qualified field service instructors for training of your operators and maintenance personnel.**

Refresher sessions covering safety, operation and maintenance procedures are recommended periodically throughout the usage life of your BC equipment. You may improve and revise these procedures to suit your needs, as your production requirements demand greater efficiency and continued safe operation.

Safe Operation of your BC UNIT **benefits:**

you, your employees, and the production life of the equipment.

FOLLOW THE SAFETY INFORMATION CONTAINED IN THIS MANUAL.

RECOGNIZE SAFETY INFORMATION

This is the International SAFETY-ALERT SYMBOL.

When you see this symbol on your equipment or in this manual, be alert to the potential for personal injury.

Follow recommended precautions and safe operating practices.

UNDERSTAND SIGNAL WORDS

A signal word - DANGER *for* WARNING *for* CAUTION - *is used with the Safety-Alert Symbol.*

DANGER - Immediate hazards which WILL result in severe personal injury or loss of life.

WARNING - Hazards or unsafe practices which COULD result in severe personal injury or loss of life.

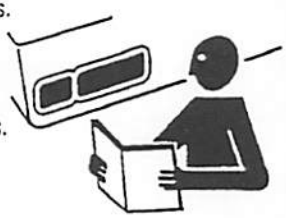
CAUTION - Hazards or unsafe practices which COULD result in minor injury or product or property damage.

FOLLOW SAFETY INSTRUCTIONS

Carefully READ all safety messages in this manual and on your machine safety signs.

Keep SAFETY SIGNS in good condition.

Replace missing or damaged safety signs.



Learn how to operate the machine and how to use controls properly.

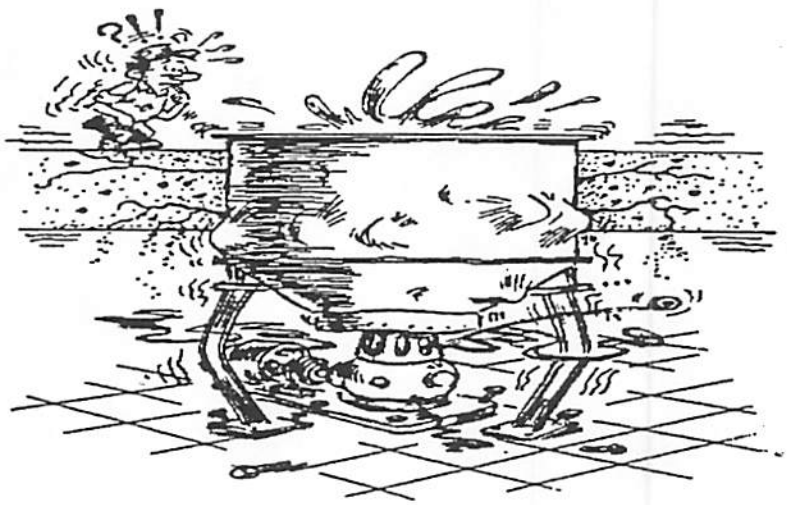
DO NOT let anyone operate the machine without instruction.

Keep your machine in proper working condition.

UNAUTHORIZED MODIFICATIONS

may impair the function ,shorten the machine life and /or render built-in safety features useless.

INSPECT BEFORE STARTING



All guards and covers are in good condition and fastened in place.

Check for loose, worn, damaged, or missing parts.

All personnel are clear of the equipment.

PRACTICE SAFE MAINTENANCE

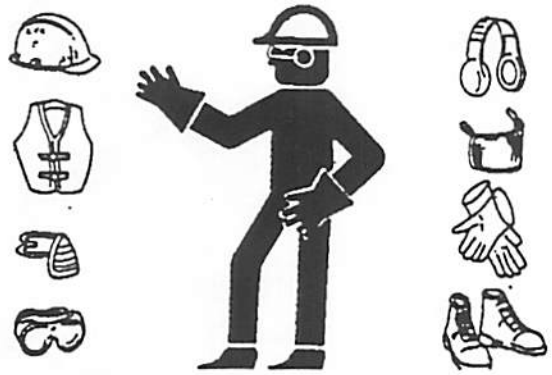
Keep all equipment parts in good condition and properly installed.

Understand service procedures before you do the work.

Replace worn, broken or missing parts.

DO NOT OPERATE damaged equipment - fix damage immediately.

KEEP EQUIPMENT AREA **CLEAN & DRY.**



PROTECTIVE CLOTHING

Wear close fitting clothing and safety equipment appropriate to the job

IMPORTANT
SAFETY GUIDELINES

Preventing Equipment Problems Improves **USER SAFETY.**

DO NOT PROCEED until YOU READ and UNDERSTAND these guidelines and instructions for your BC equipment.

If you have any questions, **CONTACT YOUR SUPERVISOR.**

The following SYMBOLS are used to help you **recognize safety related information.**

PAY ATTENTION TO THESE SYMBOLS AND HEED THEIR MESSAGES.

UNDERSTAND SIGNAL WORDS.

A signal word - DANGER */or* WARNIING */or* CAUTION *- is used with the Safety-Alert Symbol.*

⚠DANGER

Immediate hazards which
WILL result in severe personal injury or loss of life.

⚠WARNING

Hazards or unsafe practices which
COULD result in severe personal injury or loss of life.

⚠CAUTION

Hazards or unsafe practices which
COULD result in minor personal injury or equipment damage.

Note:

Notes contain important information
that is set off from the text for you to pay special attention to about the care of your unit.

IMPORTANT
SAFETY GUIDELINES

Preventing Equipment Problems Improves **USER SAFETY.**

DO NOT PROCEED until YOU READ and UNDERSTAND these guidelines and instructions for your BC equipment.

If you have any questions, **CONTACT YOUR SUPERVISOR.**

WHAT TO LOOK FOR	WHAT COULD HAPPEN	HOW TO PREVENT IT
Stock Leaks pipe connection(s) blind flange(s) body joint(s)	Skin Irritation or Scalding skin contact with stock may result in chemical or thermal skin reaction	**Lockout** Isolate unit - follow shut down and start up guidelines in the maintenance section of this manual. Tighten/or replace loose,leaking connections. **Be sure you have locked out all energy sources.**
Valve(s) air and electrical operated	Amputation or Severe Injury finger(s) hand(s) forearm(s)	**Lockout** Valve(s) and their energy source(s). Do Not insert finger(s), hand(s), arm(s), head or any appendage into, such device(s). Note: CONTROLS MAY NOT BE INDEPENDENT. Extreme care must be used when isolating power source(s). **Be sure of what will shut down when energy source(s) are locked out.** Other automatic equipment connected to source will, also, shut down.
Discharged Debris Reject Outlet **(atmospheric)** Plugged Cleaner Reject Outlet Cleaner Damaged/Worn	**Cut(s) or Abrasion(s)** **Skin Irritation** **Scalding** Debris contains chemical(s) glass plastic(s) wire(s) etc.	**Conditional Hazard** **(Atmospheric Discharged Rejects)** Do Not place your hand(s) or other body parts directly over or inline with discharge —— high pressures can develop & serious injury can result.

CENTRIFUGAL CLEANERS

Centrifugal cleaners have no internal moving parts and are designed to operate in a specific pressure range. Their overall geometry and materials of construction promote stock cleaning through centrifugal action. Continuous stock accepts flow through the cleaners. Rejects are continuously discharged into a trough or other collector at the bottom of the units.

Safety considerations should include:

- Piping systems which permit cleaner by-pass or shut-off.

- Do not reach into the cleaner. If a cleaner becomes clogged, a mechanical assist should be used to clear the obstruction.

If it becomes necessary to work on the cleaner,

- Close off and divert stock lines

- Use mechanical assists in cleaning.
Do not reach into the cleaner.

- Take special care in handling these units as any blemish or distortion will adversely affect their effective cleaning action.

Black Clawson accepts no responsibility for use or misuse of its products other than that the specific usage application for which the product was originally designed.....any usage other than the product's intended application will render Black Clawson free and harmless from any safety and/or liability claims that may result from the misapplication or deviation from the product's intended usage.

BLACK CLAWSON has provided a *Safety Instruction Tag* for this unit

POST ON/OR NEAR THE EQUIPMENT

⚠ WARNING

IMPORTANT SAFETY INSTRUCTIONS for Stock Preparation and Pulp Mill Equipment

FAILURE TO FOLLOW THESE SAFETY INSTRUCTIONS MAY RESULT IN SERIOUS PERSONAL INJURY

DO NOT PROCEED until you READ and UNDERSTAND these instructions:

1. READ and UNDERSTAND the machine's instruction/operation manual and ALL the applicable OSHA regulations (29CFR1910.261).
2. FOLLOW the SHUT DOWN PROCEDURE in the manual.
3. ALL SERVICE to the machine must be LOCKED OUT with YOUR PADLOCK BEFORE any maintenance, inspection, cleaning, adjusting or servicing is performed.
   a) The MOTOR MAIN POWER DISCONNECT switch must be LOCKED OUT.
   b) CHECK DISCONNECT - try to start motor BEFORE proceeding further.
   c) ALL SOURCES OF POWER AND FLOW OF MATERIAL must be SHUT OFF including BLEEDING OFF of pressure and LOCKING OUT ALL:

PNEUMATICS	STEAM SYSTEMS
HYDRAULICS	ELECTRICAL CIRCUITS
CHEMICAL and or GAS SYSTEMS	
FLOW of MATERIAL STOCK	

WARNING!!! NEVER REMOVE another person's lockout (padlock) or tag. DO NOT assume the machine is locked out. ALWAYS check yourself.

NOTE: If services are not independent of the main supply DO NOT PROCEED - Contact your Supervisor.

   d) Place or attach a "DANGER - PERSONNEL WORKING" sign near lockout.
   e) BLOCK any rotating elements to prevent accidental rotation.

4. - DO NOT ENTER vessel or unit unless you have at least ONE OTHER PERSON OUTSIDE the vessel or unit at all times. Certain vessels require use of harness, gas masks and other specialized safety equipment. BEFORE ENTERING ANY VESSEL CHECK WITH SUPERVISOR FOR CORRECT SAFETY PROCEDURE. See OSHA 1910.261(b)(5).
5. Upon completion, follow the START UP PROCEDURE in the manual.
6. NEVER START the machine UNLESS:
   a) All personnel are clear of the machine.
   b) All doors and hatches are closed.
   c) All guards and covers are in place.

If you have any questions, contact your supervisor.

Black Clawson
The Black Clawson Company — Shartle Division
Middletown, Ohio 45042 Phone (513) 424-7400
Toll Free 24 Hour Emergency Service 1-800-448-5422

READ SAFETY SIGNS

and

Follow recommended precautions and safe operating practices

The Black Clawson Company furnishes a series of Safety Signs with each piece of equipment purchased by our customers.

These Signs are factory installed and should remain on the Unit for the Life of the Machine.

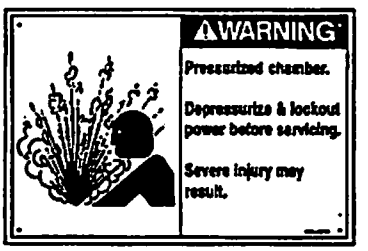
Do Not Remove the Signs unless Replacement Signs are in hand and installed immmediately after old signs are removed.

Our experience indicates that the vast majority of mill equipment has been and continues to be operated Safely.

It is the unforeseen lapses in Safety Observance that can be significantly prevented by the appropriate Posting of the Visual Warnings.

Black Clawson does not assume any responsibility for the effect or non-effect of the signs.

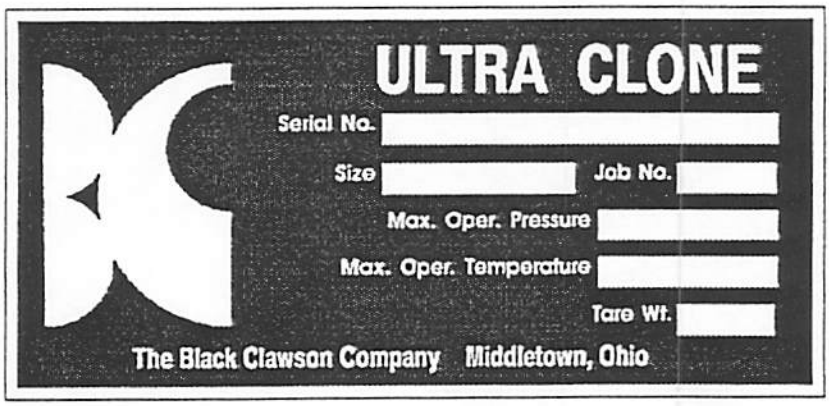
One or more of these Safety Signs are attached to the Unit



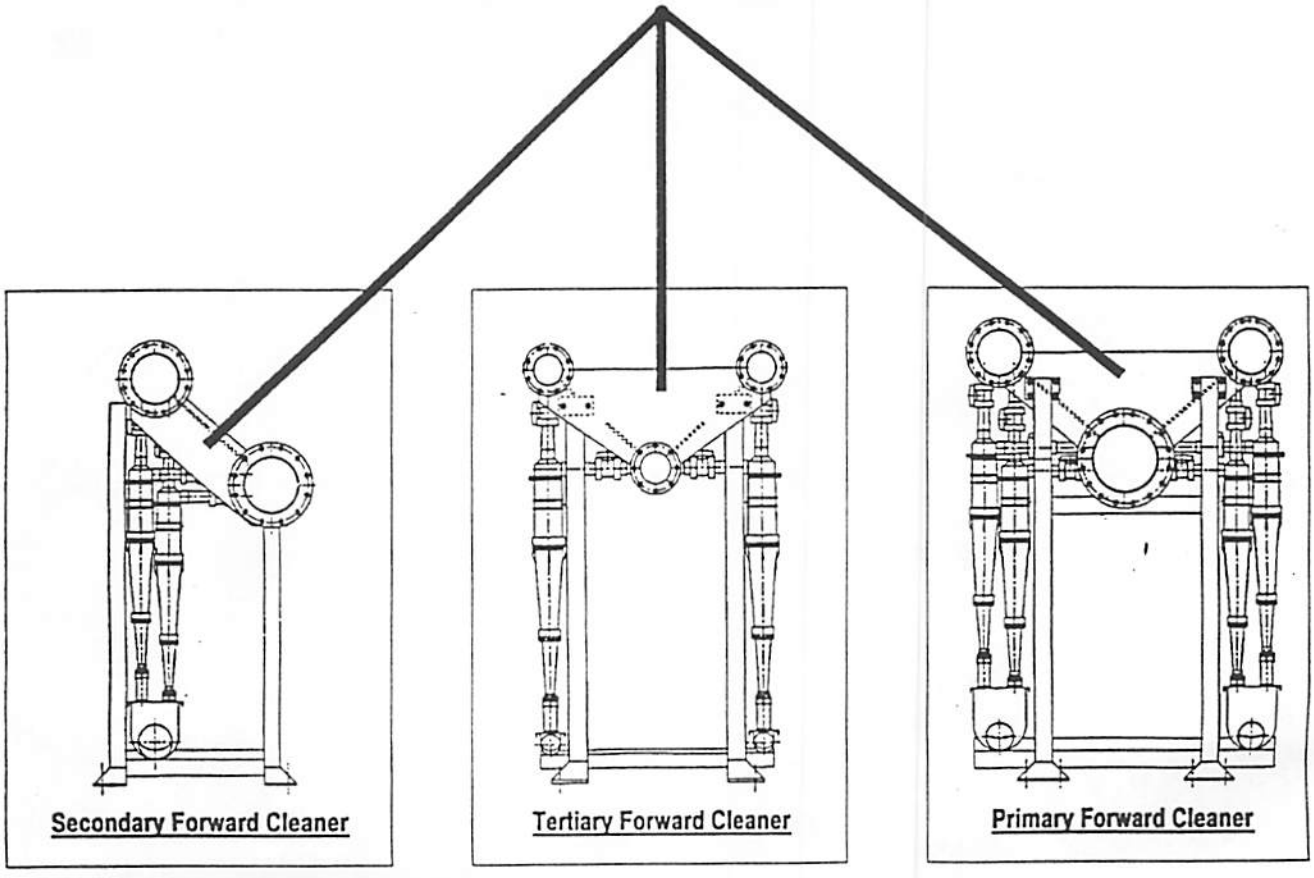
PRODUCT IDENTIFICATION NUMBERS

Are Provided to help in tracing this Unit
should it need servicing

Black Clawson, also, needs these numbers when you order parts.



Nameplate located on end opposite pipe connections



Your Black Clawson Unit is designed to give trouble free operation with minimum maintenance required. However, certain precautions and procedures must be observed in handling, installing, operating and servicing the unit in order to obtain optimum performance.

The information in this manual should cover most situations.

Should questions arise that are not covered in this manual, additional information can be obtained by contacting:

Customer Service
The Black Clawson Company
Shartle Division
Middletown, Ohio 45042
(513) 424 - 7400

Serial Numbers
Serial Numbers are assigned at the Shartle Division.

This identifying number will be found on the nameplate. It will, also, appear on the certified drawings which you receive pertaining to your unit.

When inquiring about service or maintenance problems,
ALWAYS STATE SERIAL NUMBER, as well as, SIZE and TYPE of UNIT.

Renewal Parts
Orders for renewal parts should state the serial number(s) and include the item number, description and part number as shown on the parts-list of the certified drawing.

Part Numbers are not specified in this manual.
Refer to your certified drawings for corresponding part numbers.

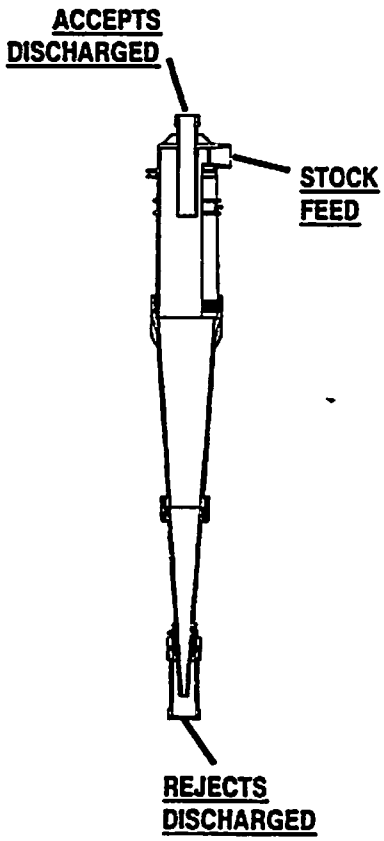
The Black Clawson Ultra-Clone is a fine forward cleaner designed to remove contaminants from papermaking slurries by use of centrifugal force. This high efficiency cleaner can be installed in the following locations:

Paper Machine (approach flow system)
Extracts contaminants of specific surface area characteristics lower than that of water and fiber.

Deinking System
Removes ink specs, grit, shives, chop.....etc.

Secondary Fiber System
Displaces dirt, grit, shives, chop.....etc.

Basically, any application where separation on the basis of positive settling characteristics is desired.



The Ultra-Clone cleaner has an initial cylindrical cross section (diameter - 5.75 inches). Stock is fed in through a tangential opening in the unit. The fiber, water and other contraries enter the cleaner and begin rotating downward. Centrifugal force increases as the particle rotates down the conical section of the cleaner.

Material with a low specific surface area (surface area/density) move outward and down due to the centrifugal and fluid forces. These materials are rejected from the cleaner at the apex of the cone.

Material of high specific surface area is displaced to the central axis of the cleaner where it is carried upwards and accepted through the cleaner overflow pipe.

Bank Designs

The Black Clawson Ultra Clone Cleaner assembly is manufactured in three different bank style configurations to suit the customer's needs. The configurations are designed to give the customer maximum accessibility for cleaner maintenance with the smallest floor space usage to assist in system layout design. The three configurations offered allow the greatest degree of design flexibility to the customer while maintaining a safe, convenient working environment for the operator.

All header configurations are designed for:

- Optimum flow velocity
- Manufactured out of 316L stainless steel
  (support steel is painted mild steel)

The three (3) configurations and descriptions are as follows:

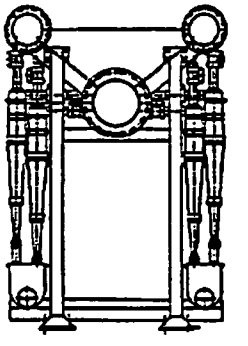
Primary Forward Cleaner

Single feed header

Two (2) accept and reject headers

Double row of stagger mounted cleaners
(both sides of the feed header)

Banks of 64, 80, 96, 112 and 144 cleaners

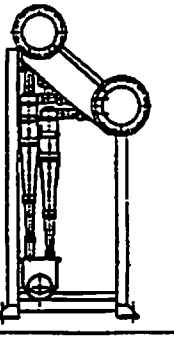


Secondary Forward Cleaner

Single feed, accept and reject header

Double row of staggered cleaners

Banks of 32, 40, 48 and 56 cleaners



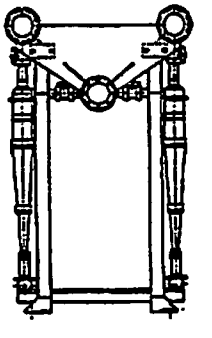
Tertiary Forward Cleaner

Single feed header

Two (2) accept and reject headers

Single row of cleaners
(each side of feed header)

Banks of 4, 8, 12, 16 and 24 cleaners



The Ultra-Clone cleaner is the result of many years of research and mill experience in centrifugal cleaning. The highly technical design gives the customer an economical cleaner that does not sacrifice efficiency.

Some other definite advantages of the cleaner includes:

Various rejects outlet (patented)
which resists plugging at higher feed consistencies

Low hydraulic reject rates
to minimize pumping and capital costs

High efficiency
to ensure final stock cleanliness

Low pressure drop
which reduces system energy consumption

High capacity per cleaner

Space-efficient cleaner bank design
to lower floor space usage and increase system flexibility

Bank styles
4 to 144 cleaners

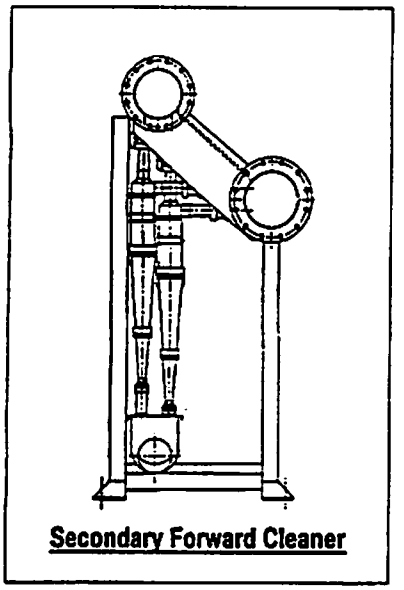
Direct plug-in installation (available)

Valved arrangements
for maximum ease of operation and maintenance
for mill personnel

Rugged, lightweight, temperature resistant
thermoplastic construction for improved durability

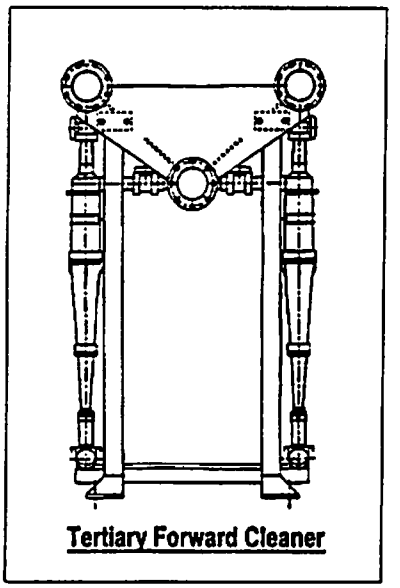
Sight glass
on every reject tip for easy visual inspection

Pressure rating of 65 p.s.i.
for safety and system flexibility.



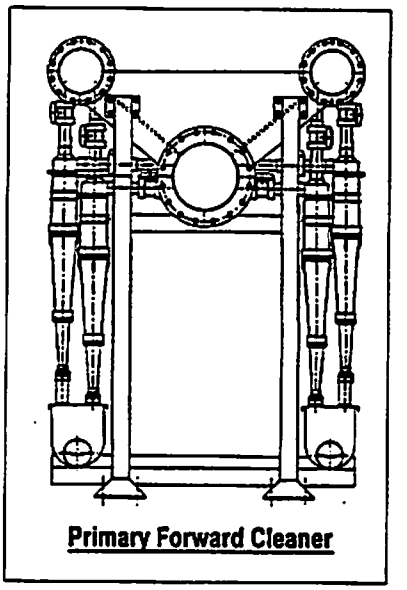
Secondary Forward Cleaner

Staggered - Single Row



Tertiary Forward Cleaner

Straight - Double Row



Primary Forward Cleaner

Staggered - Double Row

Bank mounted ULTRA - CLONES may be single spaced (4 to 24 cleaners) or staggered in double rows (32 to 144 cleaners). Atmospheric reject discharge into troughs allows the operator to spot plugged cleaners quickly.

Typically, ULTRA - CLONES are installed in a deinking system to remove ink specs, or in a secondary fiber system to separate dirt and other contaminants with positive settling characteristics. It is a 5 3/4" diameter cleaner with bank designs from (4) to (144) cleaners to meet any requirement.

Normal operating conditions are:

Inlet Pressure - 25 to 35 psi (65 psi maximum)

Accept Pressure - 5 to 15 psi

Reject Pressure - Atmospheric or less than 5 psi

Hydraulic Reject Rate - 6% to12% of Feed flow

Solids Reject Rate - 20% to 24% of Solids /depending on Furnish

Feed Consistency - up to o.8%

MAXIMUM OPERATING TEMPERATURE — 185° F.

If your application requires a higher temperature, consult a Black Clawson represenative

Inspect the shipment and the condition of the unit

before unloading from the carrier's equipment (truck/trailer).

Any apparent shipment damage should be noted and discussed, immediately, with the Carrier or his representative before you unload the unit or sign receipt form(s).

The shipping document(s) and bill of lading must match the equipment being received before you unload the shipment.

The packing list is your key to the contents of a particular shipment.

Weight(s)
Equipment and any components packed in containers or on skids in the shipment.

Contents
Items - This Shipment

Back Order
List of items not in this shipment

Any missing item(s) must be noted

with the Carrier and Black Clawson notified immediately.

Carrier
Black Clawson units and accessory equipment are shipped by truck.

Shipping Papers
One set of shipping papers is attached to the shipment in a place where it is easily seen by the men who unload it. Check weights shown on shipping papers and determine if your crane or hoist can lift the heaviest item safely.

Check-Off
As each part is unloaded, check it off shipping papers. Report shortages to Black Clawson within twenty-four hours. File damage claims against transportation company within twenty-four hours.

Unloading Pattern
Trucks are generally unloaded from back to front. Crane operator must be sure of a clear lift or piece being lifted may swing against other parts and cause damage.

Protective Covers
Waterproof covers are used to protect the unpainted surfaces during shipment. Remove these covers before unloading.

If shipment is to be stored outdoors, replace covers after shipment is moved to storage area.

Wood Boxes (Crates)
Clamps, bolts, nuts, cap screws, eyebolts and other small parts are shipped in one or more wood boxes.

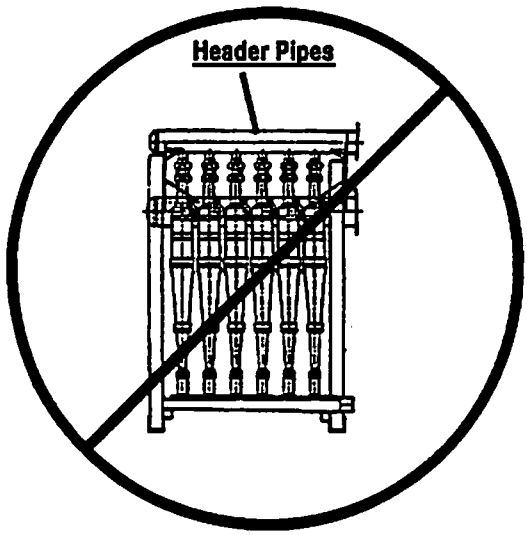
Do not store these boxes outdoors.

Bracing Material
Leave wood blocks, steel strapping and other bracing materials in place until hoisting sling is in place and piece is ready to be lifted.

Lifting
- Check to be certain eyebolts and hooks are attached securely.

- Straighten sling as slack is removed and make a test lift by allowing weight of piece to be supported by crane while piece itself is not more than an inch or two above the truck bed.

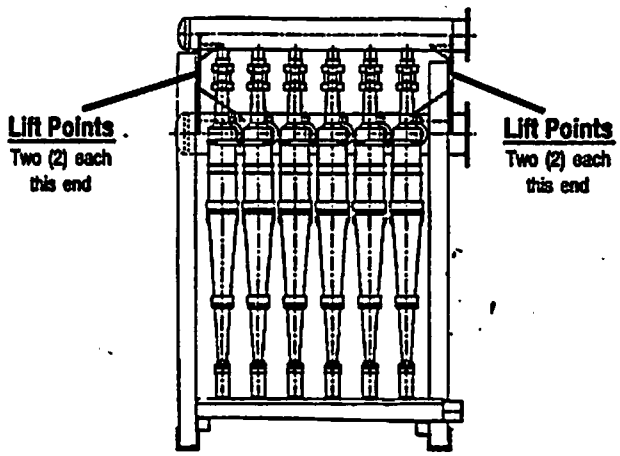
- Lift pieces carefully and smoothly; with cast parts, the flanges will break next to the cored holes if pieces are jerked suddenly by the crane.



Do Not Lift the Unit by slinging or chaining around header pipes.

Lift your **ULTRA - CLONE Cleaner** by making your lift connection at four points(two each end) on upright framework.

Spreader Bar Required
Damage to the Unit can occur if not used



Check with your Shipping Department for lifting equipment

Note:

Use the **shipping weight** as a guide to determine **lifting requirements.**

The Ultra-Clone unit is constructed of corrosion resistant materials.

If long term outside storage is planned

We recommend the unit be covered with a protective wrap (tarp).

Outside Storage - should include the following:

No water should be allowed to stand or accummulate in/or on the unit. Especially, if the weather condition (climate) is approaching or below freezing (32 degrees F.).

The cleaner body and internal parts are subject to deterioration from ultra violet rays and must be shielded from the direct sunlight.

It must be noted, then, that when you are ready to install the unit,

all the protective coatings must be removed (cleaned-off) with care not to damage unit.

Items such as valves, cylinders, switches, etc. can be damaged by adverse weather conditions. **Do not store these components outside.**

Black Clawson equipment is shipped to locations all over the world. Climate and environmental conditions vary widely.....depending on the mill location. Outside storage of this equipment is of major concern. Improper storage can severely affect service life of components and the unit . Black Clawson can only make general recommendations as to the most severe of these conditions.

Black Clawson assumes no liability as to specific storage requirements for components and the unit.

IMPROPER STORAGE CAN AND WILL RENDER WARRANTIES NULL AND VOID.

Black Clawson Units are designed for Operator and Maintenance personnel SAFETY.

Unauthorized Modification(s)
may impair the function,
shorten the machine life and can render
built-in safety features useless.

DO NOT PROCEED Until YOU
READ and UNDERSTAND
the PRECAUTIONS for your BC UNIT.

If you have any questions,
Contact your Supervisor.

PRESSURE (Maximum)
DO NOT EXCEED
OPERATE below a MAXIMUM INLET
Pressure of 65 psi.

LOCK OUT
Zero Mechanical State (ZMS)
All Service to the machine must be
Locked Out with Your Padlock BEFORE or during installation and /or any maintenance, inspection, cleaning, adjusting or servicing is performed.

a).The Main Power DISCONNECT SWITCH must be Locked out.

b).CHECK DISCONNECT - Try to start MOTOR before proceeding further:

c).All SOURCES of POWER and FLOW of MATERIAL must be Shut Off including Bleeding Off of Pressure and Locking Out ALL Valves

PNEUMATIC STEAM SYSTEMS HYDRAULICS
ELECTRICAL CIRCUITS CHEMICAL and/or GAS SYSTEMS
FLOW OF MATERIAL /OR STOCK

⚠WARNING

NEVER REMOVE
another person's lockout (padlock) or tag.

to and from the Unit:
DO NOT assume the machine is Locked Out.
ALWAYS CHECK
to be sure for Your Own SAFETY.

—— NOTE ——
If services are not independent of the main supply.
DO NOT PROCEED -Contact your Supervisor.

FOLLOW
Installation and Maintenance Procedures in this Manual.

Valves used on this Unit must be designed for LOCK OUT /OR TAGGING.

NEVER START the feed pump UNLESS

a). All personnel are clear of the unit.

b). All doors and/or hatches are closed.

c). All guards and covers are in place.

If you have any questions,
Contact your Supervisor.

Installation preparations for your unit and its accessories

Involves preliminary preparations which may be performed before the unit arrives at your mill. It will save time if all possible preliminary arrangements are completed before the unit is received. This section may be used as a check list for preparations prior to erection.

The following information will be helpful to the millwright because:

- It shows what tools, equipment and materials must be available for installation.
- It explains the use of information supplied with the unit.

In addition to the shipment, you will also receive:

- Accessory Equipment when ordered
- Owners Manual
- Certified Drawings

Accessory equipment is generally shipped at the same time, but on a separate truck. However, when one truck can accommodate the unit and its accessories, they are shipped together.

Certified Drawings are prepared by our engineering department upon receipt of the following:

- Your purchase order
- Return of Approval Drawings

Certified Drawings are mailed to you as soon as available and well ahead of the equipment shipment.

Shipping lists accompany each shipment and copies, mailed the day the shipment is made, generally arrive at your mill ahead of the shipment.

Some of the following items listed

Must be considered and completed before the unit can be installed. Other items are not involved until the time of installation. In general, the installation will progress better if all items are considered before the installation is started.

Equipment Location
Exact location and position of the unit is shown on our Certified Drawings. These drawings are based on information supplied by you regarding the space available, location of other equipment in the system, obstructions to be avoided and any unusual limitations which might effect operating efficiency.

We recommend
Checking the Certified Drawings to determine if any unusual clearance problems will arise while moving the unit through your mill. Adequate equipment clearances must be considered in your equipment layout.

Open Foundation
When ample space is available, such as in a basement room, large accessory equipment may be brought in for assembly as needed. When these items have to be lowered through an opening in the floor above, be sure they are in approximate foundation position before the unit is erected.

Electrical Requirements
Check to be sure power cables and control cables can be routed to unit with a minimum of bends and turns. Check also to be certain that electricity available is correct for the equipment it is to operate.

Water Requirements
Check pipe sizes shown on Certified Drawings to be certain correct sizes of pipe, fittings and adapters are on hand when piping is to be installed.

Weight Limits
Verification of how shipment is unitized and weights associated with your unit need to be confirmed by you. If units cannot be lifted safely with your in-plant material handling equipment, it may be necessary for you to lease lifting equipment or hire the services of a rigger.

Leveling Instruments
Use a sensitive, graduated tube spirit level reading to 10 seconds per graduation (.006 inch per foot). One provided with screw adjustment is best. The level in an ordinary machinist's square is not accurate enough.

Black Clawson Company assumes no responsibility for the type of site construction and/or preparation required for the installation of the unit. An adequate foundation, determined from machine weight and floor loading conditions, must be provided.

Maintaining "AsBuilt" specifications during the erection of this unit is the responsibility of the customer's erecting force and/or agents.

Report any excessive deviation from required specifications to the Black Clawson Field Service Department.

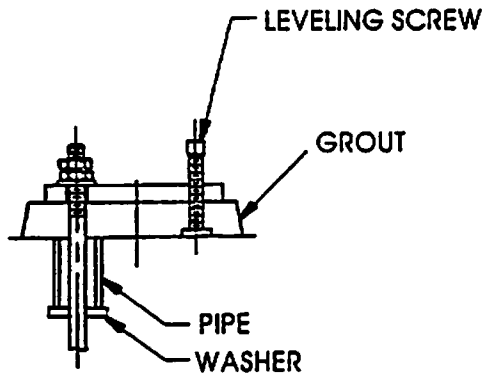
The establishment of general guidelines are suggested in this manual for those parties (persons) involved in scheduling and installing the unit.

FOUNDATION AND ANCHOR BOLTS

The Customer is to furnish all

Foundations, anchor bolts, piping, etc.

Refer to the Quotations and Certified Drawings
for a complete listing of parts and hardware
furnished by Black Clawson



Your Certified Print calls out the anchor bolt(s) sizes, typical spacing and layout.

Black Clawson recommends that anchor bolts be encased by using sleeves (as shown) to make allowance for minor deviations in mounting hole location(s). Several sleeve types are commercially available.

All grout design and placement of grout is the responsibility of the customer. Deviations from standard grouting practice, such as hollows, could result in structural failure.

Foundation tops
shall be cleaned of all loose concrete chips or dust.

Anchor bolt pockets
should be cleaned and free of particles and dust.

Bolts should be of sufficient length to project through the nuts approximately 1/4" after allowance has been made for grouting,bedplate thickness and nut thickness.

Leveling and Alignment

Refer to your Certified Drawings for correct placement and orientation of the unit on the foundation.

Black Clawson Company assumes no responsibility for the type of site construction and/or preparation required for the installation of the unit. An adequate foundation, determined from machine weight and floor loading conditions, must be provided. All grout design and placement of grout is the responsibility of the customer. Deviations from standard grouting practice, such as hollows, could result in structural failure.

Place a 3" x 3" x1/2" (thick) steel plate on the floor to provide a solid surface for the leveling screw to bear against during leveling of the unit.

Leveling screws should be removed after the anchor bolts are secured.

Shims are permanent & remain in place during & after grouting is in place.

Note

Check and make sure trough flow is in the proper direction ..... this may require a slight out of level condition from end to end for stock to flow through and out of the trough.

Recommeded Leveling Procedure

Check for level in two (2) directions — generally this is done inline with the corners on the base. Adjust the leveling screws on the base mounting pads to obtain a level condition of within 1/16" in both directions.

- **Be sure to make adjustments to the shims as the unit is being leveled.**
- It is standard practice to torque down the anchor bolts before grouting is in place.

TORQUE REQUIREMENTS will vary with screw thread & sizes used.

- Recheck the unit for level & be sure the unit is supported on the shims.
- **Be sure the unit is not supported by the leveling screws.**
- If no noticeable change has occurred, grouting can be placed and allowed to cure according to the manufacturer's recommendations.

A typical 3" x 3" shim pack should consist of the following combination of sizes:
Material Thickeness — 1" (1.000) — 1/2" (0.500) —1/4" (0.250) —1/8" (0.125) — 1/16" (0.062) —1/32" (0.031) — 1/64 (0.0156)

Piping

Connect the inlet and discharge piping. It is essential that all piping be well supported so that no strain is placed on the unit.

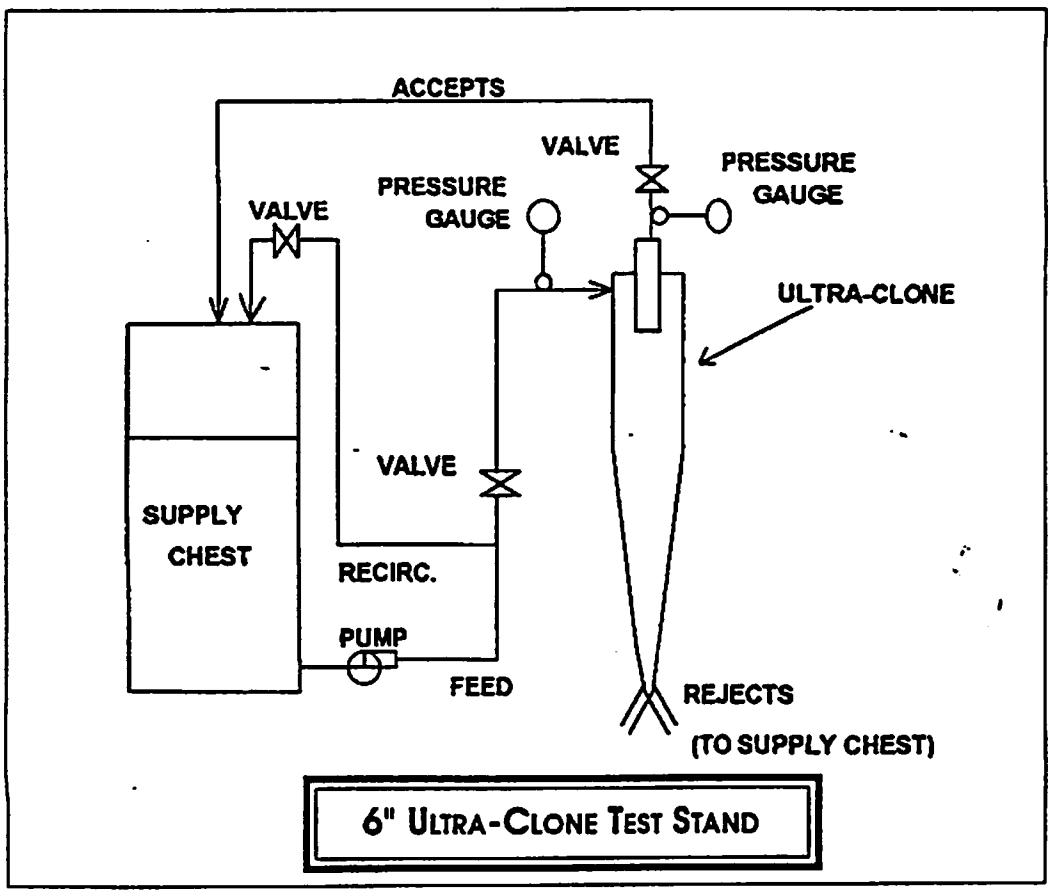
Piping must not be connected to the unit until the grout has throughly hardened and the foundation bolts have been tightened.

When handling liquids at elevated temperatures, it is suggested that expansion loops or joints be properly installed in the inlet and outlet lines to allow linear expansion of the piping. If expansion joints are not used, the forces and movements due to thermal expansion of the piping system that can act upon the inlet and discharge flanges must not exceed 0.030 of an inch total.

- The accept control valve should be located near the accept port to ensure proper operation of the unit.
- Avoid substantial drop legs on the accept line. If this is not feasible then a vacuum breaker should be installed.
- Reject discharge lines should be kept to a minimum and direct as possible.
- Avoid all unnecessary elbows, bends, and fittings as they increase the friction losses in the piping.
- Size of the pipe and fittings should be carefully selected and of sufficient size to keep the friction loss as low as practical.
- With multiple units, individual reject lines are recommended.

6" Ultra-Clone Test Stand

The 6" Ultra-Clone test stand is a very simple set-up. Since the 6" Ultra-Clone processes 90 to 140 GPM at a pressure drop varying from 15 PSI to 40 PSI, it should have a pump that produces 150 GPM at approximately 80' TDH. This allows the flexibility necessary when testing the unit. The tank should be sized for approximately five (5) minutes retention time with a recirculation line. The unit is mounted above the tank with a hand operated ball valve of 2.0 inches I.D. on the feed and accept. Pressure guages for measurement of 0 ~ 60 PSI should be placed between the inlet valve and the unit and between the unit and the accept valve. A valve should also be placed on the recirculation line to control the flow to the cleaner. The rejects free discharge into the tank with the accepts also coming back into the chest. When samples of accept or reject are taken, both lines should be discharging from the tank to prevent overly clean or overly dirty stock concentration. For initial runs, the inlet pressure should be about 30 PSI with the accept pressure at 10 PSI. Pressures may be varied during optimization. The sketch below describes the test stand assembly.



6" ULTRA-CLONE TEST STAND

Start-Up Procedures

Start-Up procedures can provide important benefits for safety with new installations, or after modifications or repairs. A "Dry Run" under controlled conditions can verify proper installation and functioning of the control system before it is turned over to operating personnel.

Many programmable solid state systems have the capability of simulating operation in a mode known as "Test Mode" or "Dry Run Mode". These modes allow a user to check a program and correct obvious programming errors with outputs disabled. Unexpected machine motion and possible damage to workpieces and equipment is thus avoided. These modes can also be used to verify proper system operation after a repair.

Many programmable systems provide for "Force On" and "Force Off" of inputs and outputs. Use of these functions can reduce troubleshooting and maintenance time by enabling personnel to bypass certain operations without physically operating switches on a machine.

Note: Care must be taken when using "Force" functions to avoid exposing personnel to hazardous machine motions or process operations.

General Start-Up involves the following procedures, to be carried out in sequence:

1.) Inspect the installation before power is connected.

2.) Disconnect motors and other devices which cause machine motion.

3.) Test Inputs

4.) Test Outputs

5.) Enter and verify your program

6.) Test the system with motors and other motion-causing devices reconnected

7.) Go through a "Dry Run" of the application

The purpose of these procedures is to isolate such problems as wiring mistakes, equipment malfunction, and programming errors in a systematic controlled manner. We urge you to go through these procedures very carefully. Following a given set of steps will help avoid possible personal injury and equipment damage.

⚠WARNING During all phases of motion checkout, station a person ready to operate the Power switch if necessary.

A first time Checkout before start-up should include the following:

Black Clawson Ultra-Clone is designed to offer the customer consistent daily operation with minimal operator attention. The Ultra-Clone is a hydraulic mechanism deriving its separation energy from the feed pump transported through the fluid. There are no moving parts on the cleaner, and this results in no operational adjustments or normal rotating machinery maintenance.

The Ultra-Clone cleaner is designed to operate at a differential pressure, as measured from the inlet to the accept header, of 20 p.s.i.g.

The maximum inlet pressure the cleaner is designed for is 65 p.s.i. The minimum inlet pressure is 25 p.s.i.

The optimum inlet pressure will vary from mill to mill and can be obtained by consulting your Black Clawson representative.

On systems with atmospheric rejects, hydraulic reject rates will be increased as the inlet pressure increases, all other parameters being held constant.

Hydraulic accept flow will remain approximately constant as long as the differential pressure remains constant. If differential pressure is increased, accept flow will increase correspondingly.

The maximum temperature a 6" Ultra-Clone should be operated at is 185° F.

If your application requires a higher temperature, consult a Black Clawson representative.

If operation of cleaners becomes erratic, with cleaners plugging excessively or other operational problems, check equipment prior to cleaner. The cleaner depends on a consistent stream of feed furnish in order to operate efficiently.

Variations in inlet flow, inlet consistency or furnish make-up can affect the efficiency and operational characteristics.

If there isn't an obvious solution, please contact your Black Clawson representative.

Start-Up Sequence

Prior to initial operation of your Ultra-Clone cleaning system, all safety precautions should be observed.

Inspect all connection points and be certain that all of the safety equipment is in place.

Inspect all equipment in the system, including the pump, piping, flanges, cleaners, etc. for possible safety hazards.

If rejects are atmospheric, check to be sure that no foreign objects are left in the trough.

When system has been inspected, close the pump discharge valve and open the cleaner header accept valve wide open.

Be sure that individual cleaner valves are wide open, also ..... on systems with pressurized rejects, confirm that the reject valve is wide open.

Start the pump and slowly open the pump discharge valve.

Open this valve until inlet header pressure is between 30-35 p.s.i.g.

At this point, close down on the accept valve until a differential pressure of 20 p.s.i.g. is obtained.

On atmospheric reject systems, adjust the inlet pressure until the desired hydraulic reject rate is obtained.

For the multiple stage systems, repeat this process.

When all stages are operating as desired, start the initial stock flow to the system. At this point, it is recommended that the operator examine the inlet, accept and reject consistencies of each stage to confirm proper operation.

When re-starting the cleaning system after shut down, repeat the start-up sequence. Running water through the system will wash-out any fiber bundles or contraries that could prove detrimental to system operation.

Normal Shut-Down

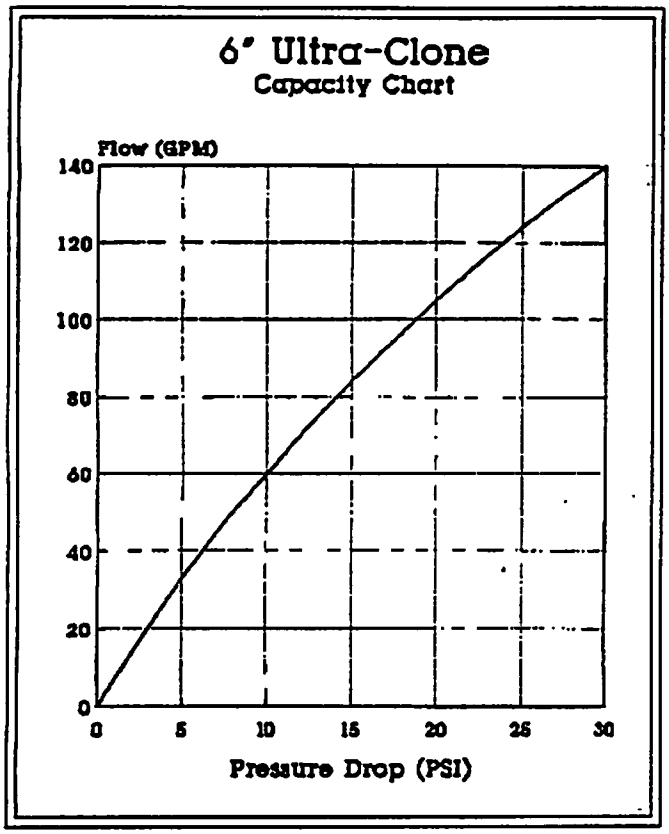
When discontinuing the operation of your Ultra - Clone system, observe all safety rules and precautions.

The following sequence should be used during cleaner system shut down:

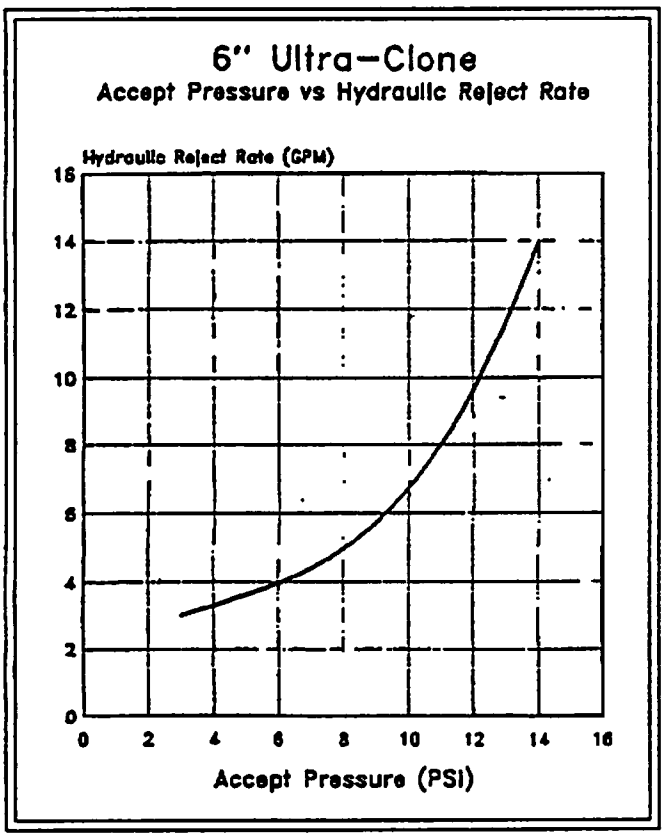
- Discontinue the stock feed to the system and flush system with white water.
- Shut down the feed pumps to all stages and close the pump discharge valve on all stages when pump impellers are no longer rotating.

If the shutdown is scheduled for over one (1) hour, drain the cleaners to prevent flocculation of fiber or any other build-up to occur in the system.

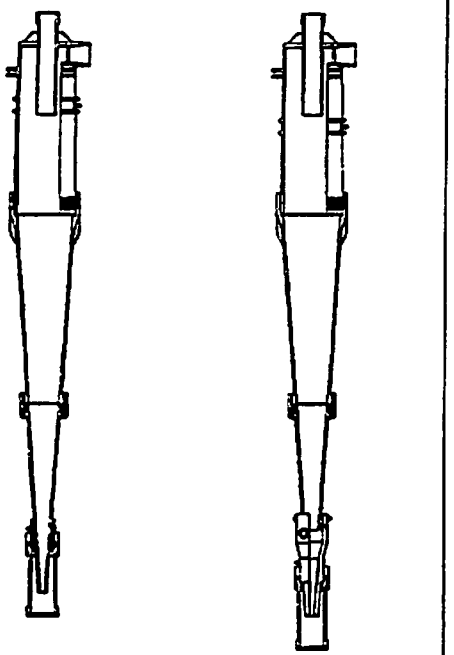
When the system is restarted, refer to start-up sequence on page 7-2-1 of this manual.



The Black Clawson 6" Ultra-Clone may be sized according to the flow versus differential pressure curve. As the feed consistency approaches a higher consisentency, (nominally 1.0%) wall friction will vary this chart slightly. Higher consistency will raise the pressure drop slightly for equal hydraulic flow rates. The 6" Ultra-Clone is generally operated with a 6% to 12% hydraulic rate with the amount of thickening varying depending on the fiber characteristics and the percent incoming debris. The accept pressure to acquire a 6% to 12% hydraulic reject rate will vary with the pressure drop and the feed consistency, but Black Clawson recommends that the accept pressure should not be greater than 10 P.S.I. unless specified by a Black Clawson Representative. For assistance in sizing subsequent stages, please contact Black Clawson.



As a fine forward centrifugal cleaner, the separation occurs due to the ability of the particle with a specific gravity greater than approximately 1.0 to move to the outside wall of the cleaner and be transported along this outer wall until it is rejected at the apex of the cleaner's conical section. Factors that prevent this movement or re-mix the fluid as the cleaner attempts to separate these particles will result in lower efficiency. Also, the hydraulic reject rate must be large enough that these particles can be transported from the cleaner once they are separated. If the materials are not removed, they will wear the cleaner tip out very quickly, or the particles will be pulled up into the accept stream.



6" ULTRA-CLONE CLEANER

6" ULTRA-SAVR CLEANER

The multiple stage systems are used to concentrate the rejects to a point where the concentration of debris is at a practical maximum. The subsequent stages of a system re-dilute and mix the fiber, water and debris so that the debris can be further concentrated. At the final discharge point in the system, an Ultra-Savr is used. The Ultra-Savr retrieves fiber from the agglomeration of solids that has concentrated at the apex of the cone. The high speed dilution water creates a small amount of shear, but, also, floods the area with water which allows the separated fiber to be carried backup into the accept flow of the cleaner. This final step drastically reduces the final fiber loss of the system. The hydraulic reject rate must still be maintained at a certain level, even on this final stage, or the material will build up to a point where the concentrated level will not be removed from the system, but will be accepted and detrimentally affect final cleaniliness.

The particles that are being removed from the system by the 6" Ultra-Clones are ink particles, shives, sand, grit, agglomerated ink, dirt, chop, and other materials that have specific gravity nominally greater than 1.0. The removal of these particles improves surface properties of paper and increases the visual properties of the paper.

The 6" Ultra-Clone is generally operated with a 20 P.S.I. pressure drop from the feed to the accept. Due to extensive laboratory testing and installations, this pressure drop was selected in order to offer an efficiency rating that is effective on the greatest variety of contaminants and doesn't drastically improve by greater pressure drops which will result in greater system energy input. The cleaner is built to operate at a maximum of 65 P.S.I., but is operated at a lower inlet pressure to control hydraulic reject rate and prevent excessive mixing in the cleaner. Therefore, at a higher pressure drop, more accept pressure is necessary to produce a 6% to 12% hydraulic reject rate.

The 6" Ultra-Clone is operated at consistencies less than 0.8%. Generally, the inlet consistency will be decreased to as low as 0.4%. Although a decrease in consistency will generally result in higher efficiency, a practical minimum has to be located based on the system design, the furnish and the type of contaminant targeted.

Please consult a Black Clawson Representative
for answers to questions on your specific application.

Safety Considerations

Safety considerations are an important element of proper trouble shooting procedures. Actively thinking about safety of yourself and others, as well as the condition of your equipment, is of primary importance. Several safety areas are discussed below.

Power Supplies
Before working on a power supply, always remove the AC power source at the main disconnect switch. When using more than one power supply, be sure to disconnect all of them.

Replacing Fuses
When replacing a fuse, be sure to remove all power from the system.

Main Power Disconnect
The main power disconnect switch should be located where operators and maintenance personnel have quick and easy access to it. Ideally, the disconnect switch is mounted on the outside of the enclosure, so that it can be accessed without opening the enclosure. In addition to disconnecting electrical power, all other sources of power (pneumatic and hydraulic) should be de-energized before working on a panel controlled machine or process.

Activating Devices when Trouble Shooting
When trouble shooting, never reach into the machine to actuate a device. Unexpected machine motion could occur. Use a wooden stick. A metal rod is more likely to damage the machine and could conduct electricity back to you.

Stand Clear of Machine
When trouble shooting any control panel problem, have all personnel remain clear of the machine. The problem could be intermittent, and sudden unexpected machine motion could occur. Have someone ready to operate an emergency stop switch in case it becomes necessary to shut off power to the machine.

Program Alteration
There are several causes of alteration to the user program, including extreme environmental conditions, electromagnetic interference (EMI), improper grounding, improper wiring connections, and unauthorized tampering. If you suspect the memory has been altered, check the program against an approved version such as on an EEPROM memory module.

Hardware Redundancy
Circuits installed on the machine for safety reasons, like overtravel limit switches, stop push buttons, and interlocks, should always be hard-wired directly to the master control relay. These devices must be wired in series so that when any one device opens, the master control relay is de-energized, thereby, removing power to the machine. Never alter these circuits to defeat their function. Serious injury or machine damage could result.

Safety Recommendations for Maintenance Personnel
All maintenance work should be done by qualified personnel familiar with construction, operation, and hazards involved with the equipment.

The appropriate work practices of NFPA 70E should be followed.

Make-Do test devices such as incandescent lamps or neon lamps should not be used for checking voltages in solid state systems. Incandescent lamps have low impedance; the low impedance of these devices can effectively change a voltage level from a logic "1" condition to a logic "0" condition when attempting to make a measurement. Unexpected machine motion can result if an output to a controlled device is energized as a result. Neon lamps do not respond to voltages typically used in logic circuits (e.g. 32 VDC or less). Use of a neon lamp tester could lead to false conclusions about the voltage present in a circuit

High input impedance meters are required to obtain accurate voltage measurements in high impedance circuits. Unless otherwise specified by the manufacturer, a meter with an input impedance of ten (10) megohms or greater is recommended for making voltage measurements. The meter must also have sufficient sensitivity to measure logic level voltages; some meters do not respond to low voltages.

SAFETY

The control panels are designed using all Nema and/or U.L. approved components suited for the environment in which it is being placed. Every effort is made to adhere to the N.E.C., OSHA, ANSI and mill standards as they apply to your application.

The power feed should include an equipment grounding conductor to bond the enclosure to building earth ground.

⚠WARNING **Contact with AC line potentials may cause injury to personnel.**

Power feed should have a disconnect or breaker capable of being locked in the open position

All field devices should be wired per Certified Installation Drawings furnished with the control panel.

The field wiring should be routed in such a way as to separate AC from DC and/or low level signals.

All the electronic instruments were factory programmed to a fail safe state (If a component failure occurs). The panel includes a power push button that, when pushed, will power down the main processor..... closing all valves.

Knowledge leads to Safety

Planning for an effective solid state circuit requires enough knowledge to make basic decisions that will render the system safe as well as effective. Everyone who works with a solid state control should be educated in its capabilities and limitations. This includes in-plant installers,operator, service personnel and system designers.

A general inspection of the unit needs to be performed a minimum of every three months or after 1000 hours of running time. Locating and eliminating minor repairs will extend the service life of the unit. Down time is always a cost factor in operating a mill and the attitude of ***"If it runs - don't fix it"*** seems to prevail. Minor repairs develop into major component failure(s) and result in loss of productivity and customer orders.

Component(s) requiring routine maintenance:

Annular Rejects orifice —Check (weekly)

—Replace when hydraulic reject rate increases or when less than 1/8" wall thickness occurs.

Annular Rejects Opening

—Visually inspect for debris plugging in the annular rejects opening.

(Check daily — beginning and middle of each shift)

Operators should inspect the Ultra - Clone cleaners at least twice during an eight (8) hour shift.

A normal inspection would involve the operator checking the differential pressure from the inlet header to the accept header.

If there is no reject pressure, the header could be plugged.

This would have to be cleared during the next mill shutdown.

Do not try to unplug a reject header while the cleaners are in operation.

The operator should visually inspect all the cleaner bodies for leaks.

This is a sign that the cleaner should be replaced.

While visually inspecting cleaners, the operator should also check the cleaners for plugging.

- **If no flow is observed, the cleaner is plugged.**
- **If the flow is very slow or is not spinning inside the sight tube, this is a general indication that the cleaner is partially plugged and should be cleared.**

Atmospheric Rejecting Systems

On Ultra-Clone Cleaner systems with atmospherically discharged rejects (rejecting to an open trough), be especially careful not to be splashed. Also, observe all safety precautions and rules. If the trough becomes plugged, flush the trough with water or remove the item that is plugging the drain or trough. If there is an item that is plugging the trough or drain, remove it from the system to prevent problems in subsequent stages or downstream. On a system with individual valves on each cleaner and atmospheric rejects, a cleaner tip can be unplugged while the system is operating. A full cleaner body can also be replaced during operation.

Replacing a cleaner during operation ..... follow these steps :

1). Close the CPVC feed valve to the cleaner

2). Close the CPVC accept valve to the cleaner.

3). Allow the cleaner to drain

4). Break the accept and feed connection located between the cleaner body and the valve

5). Remove the cleaner and unplug the tip or replace with a new body

If the cleaner body is acceptable, but plugging is excessive, remove the nut attaching the cleaner tip to the body and clear the tip.

6). Replace the cleaner tip and nut to original position

7). Replace the accept and reject connections to original position

8). Open CPVC accept valve to the cleaner

9). Open CPVC feed valve to the cleaner

Steps 1).– 2). and steps 8).–9). should be done as close to simultaneously as possible. Otherwise the cleaner can be damaged and can result in severe personal injury to the operator.

⚠CAUTION

Having Trouble ?

Black Clawson recognizes downtime on a piece of equipment as a cost factor not only to you, the customer, but ultimately the continued dependable operation of our unit(s) is important to both of us. Emergency situations call for quick response and generally someone remembering "What was done the last time". With this in mind, we have compiled a Condition/Check List for you to refer to in time of need. Many times these situations result in only finding out what is not wrong with the equipment. Generally the problem is a cause/effect condition and can be isolated if you know how to identify the condition.

CONDITON	CHECK
Plugged Reject Tip	— Debris blockage in Cleaner Body — Feed Port for flow — Feed Furnish — Feed Consistency — Debris in Dilution Water (Sump Water)
High or Excessive Reject Flow	— Annular Accept opening — Feed Port — Accept Pressure — Differential Pressure — Reject orifice diameter
High Differential Pressure	— Cleaners for blockage/plugging — Feed & Accept Header valve positions — Number of active Cleaners — Accept Pressure
Low Differential Pressure	— Feed Pump condition & output line pressure — Active Cleaners — Feed & Accept header valve positions
Cleaner Blockage/Plugging	— Feed Furnish — Feed Consistency — Debris in Dilution Water (Sump Water)
Low or Sluggish Reject Flow	— Feed Port — Accept Pressure — Feed & Accept Header valve positions — Differential Pressure — Cleaner Body — Cleaner Inlet
Atmospheric Accepts	— Reject Flow — Feed Consistency — Differential Pressure — Feed Furnish

Check to be sure
all service connections are locked out or tagged.
- Feed Valve **Closed**
- Accept Valve **Closed**
- Feed Pump **Locked Out**

Removal /Tear-Down

1). Slide sight tube assembly towards the large end of the lower cone
Approximately One (1) inch
2). Unscrew the Lower Cone Nut
3). Remove lower cone section from upper cone
4). Unscrew hose clamp
5). Slide sight tube assembly from lower cone
6). Remove support channel from main body
7). Unscrew feed and accept valve nuts
8). Disengage main body from feed accept line

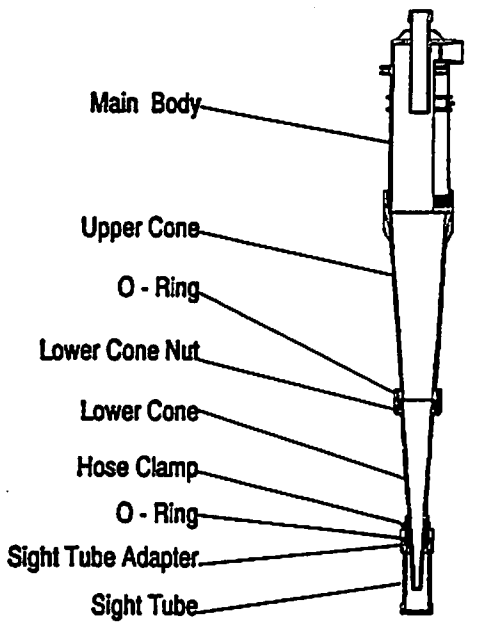
Assemble /Install

1). Engage main body in feed and accept lines
2). Install support channel to main body
3). Tighten feed and accept valve nuts
4). Slide sight tube assembly onto lower cone
5). Tighten hose clamp
6). Engage lower cone section into upper cone
7). Tighten lower cone nut

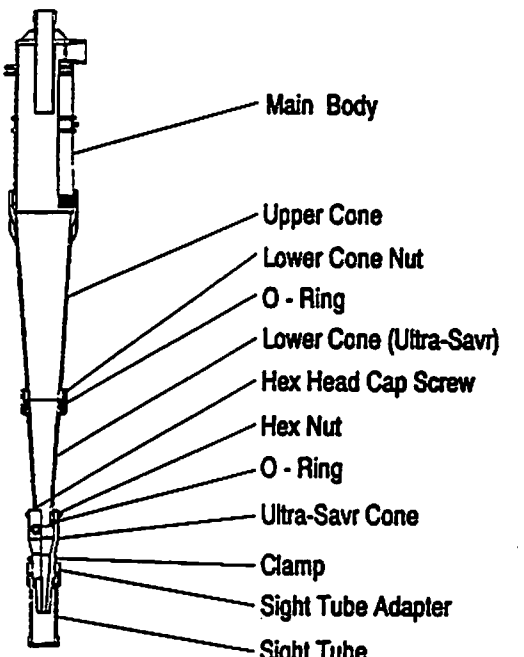
When re-assembling, the plastic parts need be only hand tightened.
Any plastic part will break if tightened excessively.

Reasonable care must be exercised to avoid dropping the unit,
or damaging the threads

SHARTLE DIVISION
605 Clark St.; Middletown, OH 45042
Phone: (513) 424-7400 FAX: (513) 424-1168
TOLL FREE 24 HOUR EMERGENCY SERVICE 1-800-448-6422



6" ULTRA-CLONE



6" ULTRA-SAVR

Suggested Spare Parts for your Mill Stock Room

Some of the Components for the ULTRA - CLONE Cleaner —

May require four (4) weeks or longer before Service Parts can fill and ship your order. Our Concern is to keep your **down time to a minimum** and your **ULTRA - CLONE Cleaner** in good mechanical condition.

We recommend you keep and maintain the **following components** on hand for repairing and/or maintaining your ULTRA - CLONE Cleaner:

Recommended Spares — 6" Ultra-Clone/Ultra-Savr Cleaner

1). **Main Body**
2). **Upper Cone**
3a). **Lower Cone** (Ultra-Clone only)
3b). **Lower Cone** (Ultra-Savr only)
4). **Ultra-Savr Cone** (Ultra-Savr only)
5). **Hex Head Cap Screw** (Ultra-Savr only) M6-6g x 90mm Long
6). **Hex Nut** — M6-6H (Ultra-Savr only)
7). **O - Ring** (Ultra-Savr Cone to Lower Cone Connection)
8). **Nut** - Lower Cone
9). **Clamp** - Worm Drive Hose
10). **Tube** - Sight
11). **Adapter** - Sight Tube
12). **O - Ring** (Upper Cone to Lower Cone Connection)
13). **O - Ring** (Lower Cone to Sight Tube Connection)

MINIMUM SPARES PARTS INVENTORY

One (1) each of items listed for every ten (10) Cleaner Body Assembles in your mill or system.

Refer to your CERTIFIED DRAWINGS for Specific Part No.'s