Crippen
Manufacturing Company

NORTHLAND SUPERIOR

OPERATION, MAINTENANCE AND PARTS MANUAL

NS-B6
CYLINDER CLEANER

PROVEN SUPERIOR QUALITY AND DESIGN
FOR TODAY'S GRAIN AND SEED INDUSTRY

CAUTION

DO NOT OPERATE MACHINERY WITHOUT ALL PRESCRIBED GUARDS AND PANNELS IN PLACE.

LOCKOUT POWER SUPPLY BEFORE ATTEMPTING ANY SERVICING OR INTERNAL INSPECTION.

KEEP HANDS, HAIR AND CLOTHING CLEAR OFF ALL MOVING PARTS, INLETS AND OUTLETS WHILE MACHINE IS IN OPERATION. USE EYE PROTECTION.

FAILURE TO FOLLOW PROPER SAFETY PRECAUTIONS MAY RESULT IN SERIOUS INJURY OR EVEN DEATH.

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RECEIVING AND UNLOADING EQUIPMENT
PRE-INSTALLATION CHECK

THE CYLINDER MACHINE REQUIRES A BOOM TRUCK FOR UNLOADING. LIFTING LUGS ARE PROVIDED AND MUST BE USED. THE CYLINDER MACHINE CANNOT BE UNLOADED WITH A FORKLIFT TRUCK.

All equipment should be checked as soon as it arrives. A quick visual check should reveal any damage that may have occurred during transit from the factory. Once this is done, insure that all shipping blocks and packing materials are removed.

This section of the manual dealing with installation should be carefully read to insure that any items shipped loose or wired to the equipment are assembled before proceeding. All equipment is test run at the factory, however a rough and/or long transport may loosen bolts. Check all bolts visually and also with proper tools where this is practical.

All equipment leaves the factory suitably protected. These protective measures have been designed to accommodate a normal shipping and installation schedule. If the equipment is going to be subjected to weather for more that a few days before installation, special arrangements should be made to keep it dry. An accumulation of moisture on sensitive parts could lead to premature failure and unnecessary maintenance cost.

FIELD ASSEMBLY INSTRUCTIONS

1 - Position machine in place on floor.

2 - Ensure machine is supported at base angles.

4- Ensure machine is square especially within +/- 1/8" in plan.

5 - Anchor machine solidly to floor.

INSTALLATION

GENERAL

Installation of the **NS-B6 Cylinder Machine** depends on the individual requirements of the user. However, observe the following precautions during installation to assure proper machine performance. The NS-B6 Cylinder Machine should be mounted on a solid base, and should be set level to insure proper operation of all moving parts.

Refer to general arrangements drawings for overall dimensions, as well as identifying the various product inlet and outlets.

Be sure to provide adequate clearance around the machine to permit servicing.

FEED HOPPER

Provide a suitable connection at the gravity feed box between the spouting and the cylinder cleaner. The cylinder machine operates most efficiently with a constant feed capacity.

INSTALLATION CONT'D.

ELECTRICAL CONNECTIONS

Make electrical connections to the drive motor in accordance with all applicable local codes and regulations.

Electrical motors should be interlocked and started up and shut down in the following order:

START UP	-	1)	Down stream equipment.
		2)	Cylinder driving motor - 5 HP.
		3)	Up stream equipment
SHUT DOWN	-	1)	Up stream equipment
		2)	Cylinder driving motor - 5 HP.
		3)	Down stream equipment.

A time delay should be installed so that after the feeding equipment is shut down the cylinders and the conveyors have a chance to clear out. A delay of 30 seconds is sufficient for this.

If for any reason, any part of the machine becomes plugged, it is recommended that the machine be vacuumed to clear all the grain in the cylinders before starting it.

GEAR BOXES

Gearboxes are filled with oil at the factory. However, oil level should be checked before test running the machine. Refer to QUANTIS installation service and repair manual at the end of this manual.

QUANTIS

UNIT FILLED WITH MOBIL SHC629 SYNTHETIC LUBRICANT

OPERATING RANGE:
–40°C to +40°C (12.5°F to 104°F)

INTRODUCTION

This manual has been especially prepared to facilitate operation and maintenance of the **CRIPPEN NS-B6 CYLINDER MACHINE**. In some instances the contents of this manual are generalized since certain specific information can only be determined by actual operation. However, give careful consideration to all information presented herein to assure optimum performance and service of your NS-B6 cylinder machine.

DESCRIPTION

GENERAL

The NS-B6 Cylinder Machine is designed for high capacity length separating.

NOTE: The right and the left-hand sides of the machine are determined by viewing the front of the machine. (Front - is the end of the machine where grain is fed into the top row splitting cylinder).

PRINCIPLE OF OPERATION

The principle of operation of the NS-B6 as described in the following paragraphs, trace the product flow from the feed hopper to the splitting cylinders to the discharge spouts at floor level.

MACHINE FEED

This machine is supplied with a gravity feed box, which feeds the top two cylinders (A).

CYLINDER SEPARATION

Grain moves through the top, middle and bottom rows, and the separations are made by lifting the seeds, small, and medium grain into the trough and rejecting the longer grain (tailings). The liftings from the II row are combined with the tailings from the III row and discharged through a cross conveyor at discharge – B. The tailings from II row and liftings from the III row are discharged at discharges – C & D respectively.

TROUGH POINTERS

Indicators on each trough show the position of the grading edge of the trough. Refer to the general trough setting diagram at the end of this section.

PRINCIPLE OF OPERATION CONTINUED.

TROUGH HANDWHEELS

Hand-wheels are used to set the position of the cylinder troughs to obtain best separation. If too much long material is going into the trough, raise the grading edge of the trough. If too much short material is going into the trough, lower the grading edge.

NOTE: The indicator of each cylinder extension indicates the position of the trough grading edge. (A thumbscrew is mounted on top of the casting to lock the trough setting after the desired separation is achieved.)

RETARDERS

Each cylinder is equipped with a **retarder**, which acts to dam up the grain discharge, thus assisting in the lifting of the shorter material. This adjustment can be adjusted by mainly by experience. If the retarder is set too high, long material will wash into the trough, and if it is set too low, short material will discharge with the longer material (tailings).

SEQUENCE OF OPERATION

The following paragraphs describe the general sequence of operation applicable to the NS-B6 cylinder machine. As mentioned earlier, the actual control setting can be determined mainly by experience, and it is recommended that the operator maintain a record of control settings for various products as an aid for future operations.

INITIAL START-UP - DRY RUN

Before introducing the main product to the machine run it with no load for 15 - 20 minutes. During this dry run check rotation of shafts. Refer to general arrangement drawings for proper shaft rotation. If rotation is not correct, reverse the electrical connections to the motor.

PRINCIPLE OF OPERATION CONTINUED.

INITIAL START-UP OPERATION

1) Set all cylinder trough levels.

2) Move all retarders approximately three inches into opening.

3) Before opening feed spout to the machine, make sure that the aspirator feed gate is in zero position.

4) Start down stream equipment.

5) Start machine motors.

6) Open feed spout to the machine.

7) On initial start up, start product flow slowly. The machine will not reach its maximum capacity until all cylinder indents are polished.

OPERATING ADJUSTMENTS

1) Check separation in cylinders and adjust trough hand-wheels as required to achieve desired separation.

2) Adjust retarders in each cylinder to obtain optimum separation.

CAUTION

WHEN CHANGING PRODUCT AND / OR CONTROL SETTINGS, WAIT AT LEAST THREE MINUTES TO OBSERVE EFFECTS OF CONTROL CHANGES. THIS ENABLES THE NEW PRODUCT TO PASS COMPLETELY THROUGH THE MACHINE BEFORE MAKING FURTHER CONTROL ADJUSTMENTS.

WARNING

DO NOT STOP MACHINE WHEN FULL OF GRAIN.

GENERAL TROUGH SETTINGS

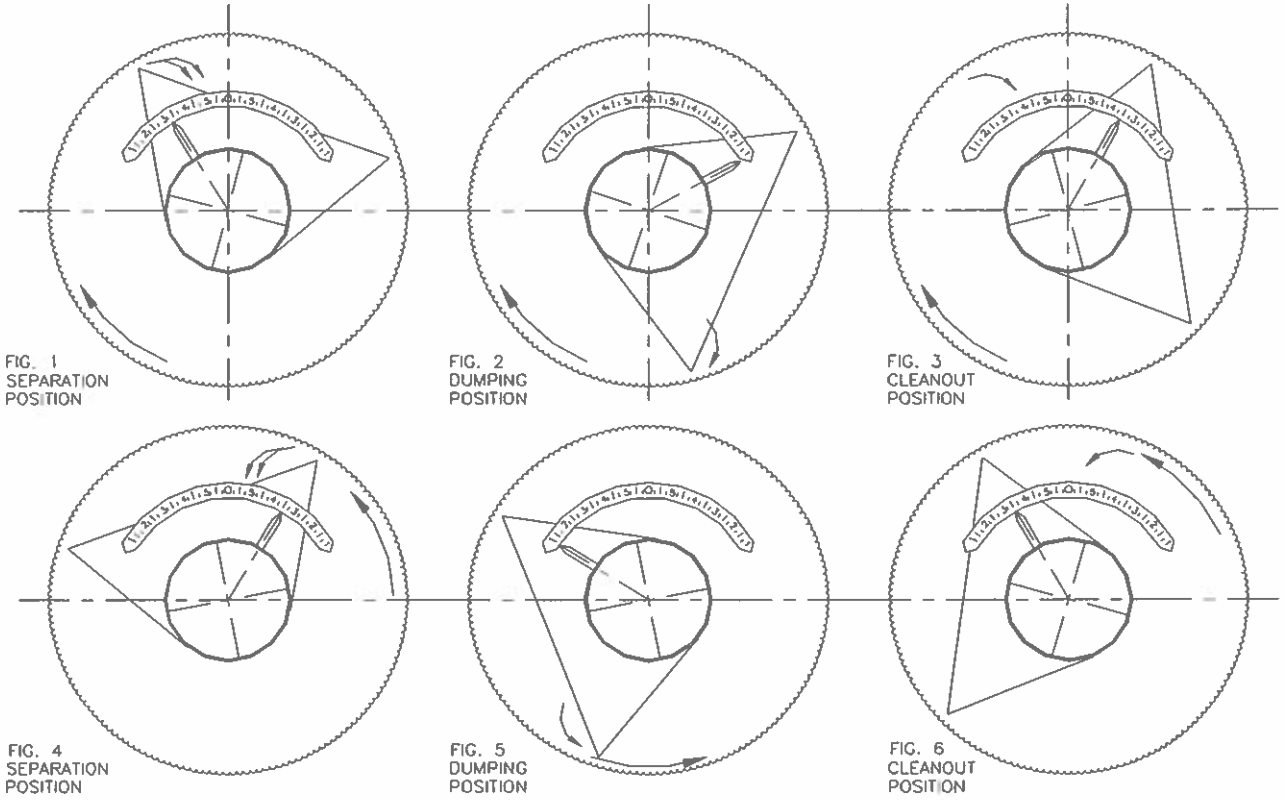

FIG. 1 SEPARATION POSITION

FIG. 2 DUMPING POSITION

FIG. 3 CLEANOUT POSITION

FIG. 4 SEPARATION POSITION

FIG. 5 DUMPING POSITION

FIG. 6 CLEANOUT POSITION

Fig 1: shows top three splitting cylinder troughs in separation position

Fig 2: shows top three splitting cylinder troughs in dumping position

Fig 3: shows top three splitting cylinder troughs in cleaning out position

Fig 4: shows bottom splitting cylinder trough in separation position

Fig 5: shows bottom splitting cylinder trough in dumping position

Fig 6: shows bottom splitting cylinder trough in cleaning out position

MAINTENANCE / LUBRICATION

GENERAL

To assure continued satisfactory operation of the Crippen NS-B6 cylinder machine, perform the periodic maintenance described in this section. In general this covers cleaning, lubrication and a few miscellaneous preventive maintenance checks. The recommended intervals are based on average use of the machine. If the machine is operated continuously for extended periods of time, reduce maintenance intervals accordingly.

DO NOT PERFORM ANY MAINTENANCE ON THE MACHINE WHILE IT IS OPERATING. ALWAYS BE SURE MACHINE MOTOR IS TURNED OFF.

DAILY MAINTENANCE

1) Clean grain and dust accumulations from areas around machine. Excessive accumulation of dirt can lead to operational difficulties.

WEEKLY MAINTENANCE

1) After first week of operation, check set screws on all bearings and sprockets for tightness. Inspect rest of machine for loose nuts and bolts and tighten as necessary.

NOTE:

Friction roller bearings, and sealed type flange bearings are sealed for life. **NO LUBRICATION IS REQUIRED.**

MAINTENANCE / LUBRICATION CONTINUED

PERIODIC MAINTENANCE

Periodically check all nuts and bolts for tightness. Check sprockets for drive alignment and set screw tightness.

Inspect belts tension according to the instructions in this manual. Tighten if necessary. **DO NOT OVERTIGHTEN.**

CAUTION

In sub-zero weather, shut off spouts feeding the machine and let it run until there is no grain load in cylinders. **NEVER START MACHINE WITH A HEAVY LOAD OF GRAIN IN THE CYLINDERS.** Damage to drive components and/or shafts may occur. If for any reason the machine is shut down when loaded, the cylinders must be cleaned our before restarting machine.

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ANY GUARDS REMOVED DURING INSTALLATION SHOULD BE REPLACED IN THEIR PROPER POSITIONS BEFORE OPERATING THE MACHINE.

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TO ORDER PARTS

This manual includes a set of drawings to facilitate identifying and ordering spare or replacement parts.

When ordering, have this manual handy, and try to identify the piece by part number and description.

Due to constant changes and improvements in our equipment the **MACHINE TYPE, AND SERIAL NUMBER** of the machine should be quoted. This information is found on the first sheet of this manual, and on the serial number plate on the machine.

ORDER PARTS FROM:

Crippen Manufacturing Co.
400 Woodside Drive
St. Louis, MI, 48880, USA

Phone: (989) 681-4323
Toll Free: 1-800-872-2474
Fax: (989) 681-3818

ALL THE ABOVE INFORMATION IS IMPORTANT TO ASSURE QUICK AND CORRECT DELIVERY.

THE INDENT CYLINDER

The indent cylinder is designed primarily to make a separation by length, as is the disc type indent unit. But you will see that there are other physical characteristics that enter into the separation made by the cylinder indent as well. In addition to the indent size, the cylinder utilizes the forces of gravity and centrifugal force. The particles to be removed from the mass are loaded into the indent by a combination of gravity and centrifugal force. After locating themselves in the pockets, they are retained by the centrifugal force to a point of the rotation of the cylinder were gravitational forces overtake and the material discharges from the indent and is dropped or falls into a receiving trough where it is conveyed to a discharge spout. The smaller particles are placed in the trough and longer particles are discharged as "throughs". These pass out the far end of the cylinder, opposite from the feed and without being lifted by the indents.

For a particle to be lifted, it's center of gravity must fall within the indent itself, otherwise it will tumble out. For some seeds the center of gravity is at, or near, the geometric center, and at others it is displaced greatly from this geometric point. Therefore, it will depend which way a seed orients itself in the indent as to whether or not it is lifted, and the seeds must have the opportunity to enter the indent properly before being discharged as a "through". No matter what cylinder machine is used, there are five main sections or functional areas of the machine and each perform a definite part of the separation process.

1. THE CYLINDER ITSELF - This of course is the main element, in that it is the actual divider of the machine and all other parts simply aid the cylinder in accomplishing it's purpose. As stated earlier the cylinder's function is to lift the smaller particles out of the grain mass the correct distance to most accurately and evenly make the desired separation. The cylinder is simply a thin walled tube with indents formed from the inside to a shape approximating a hemisphere. The indent sizes are usually listed in 64's of an inch similar to screen sizes used in screen machines. There are no other figures or letters normally used to describe the indents, other than this diametrical number.

It has been stated that the first cylinder was fashioned out of a hollow log by drilling from the inside a series of shallow holes. We feel that much progress has been made since this first attempt but the basic principle still remains the same.

The modern cylinder as we know it today, utilizes a special steel which is precisely punched by large mechanical presses to the desired indent. This is usually done on the flat in small size sheets, as the pressure required for the formation of these indents is very great. These sheets are then welded on an automatic seem welder and rolled to form the tube and are then case hardened. It is this hardening of the cylinder that gives it extremely long life. Were if it was not hardened its life expectancy would be very short.

2. THE RECEIVING TROUGH - In different machines the shape of the receiving trough varies somewhat, but the purpose remains the same. To accumulate the lifted particles and convey them to a discharge spout. This trough is adjustable in order to make the cut or the separation at the exact point of particle size variation desired. The separation is usually made within an area of 60 to 45 degrees ahead of top dead center of the cylinder. By proper adjustment of this trough very good flexibility that gives the cylinder it's definite advantage over competitive length separation equipment. also this receiving trough is normally adjustable to the point that it can be dumped. This is extremely important when an unit of this type is used for seed cleaning and this allows the trough to be cleaned out.

3. THE LEVELER OR CONVEYOR - It is necessary in the cylinder to have some method of conveying the grain through the cylinder and to discharge the particles too large for the indents. There are actually several methods of accomplishing this.

When grain is placed in the rotating cylinder, it itself rotates in a mass, and therefore it is feasible that the small particles at the center of this rotating mass, which has been nick-named "THE WALTZING KIDNEY" , could pass through the machine without ever being exposed to the indented surface. The leveling mechanism should break up the core of this rotating mass as well as slowly conveying the grain and disturbing the rotation of the core. These are:

a) The use of a small screw conveyor which runs approximately in the center of this rotating mass of grain.

b) The use of a stationary grain line blades which are used in the superior machines today.

Grain line blades are blades set at an angle projecting from the bottom of the pickup trough and these very efficiently move the grain through the cylinder and break up the rotating mass in the process. They also aid greatly in the cleanout of the machine, when the trough is in the dump position.

4. THE RETARDER - This is most easily described as a dam at the discharge end of the cylinder, and it should be of the adjustable type. In order to be most accurate the grain bank in the cylinder should be relatively uniform. Without the retarder the grain mass would be less at the discharge end of the cylinder due to the depletion of the smaller particles, which may result in surging of the grain bank. By this we mean that the material will not roll as it should but the entire mass will move or slide with the cylinder up to a point where friction will no longer support it, and then it all slides back in a single mass. This will also occur in the cylinder if it is insufficiently loaded. By retarding the discharge of the cylinder, grain depth can be built up to the desired level and maintained at that point where best operation occurs. The adjustment of the retarder will depend on the type of

seed being processed. If the grain level was allowed to drop near the discharge end of the cylinder, inaccurate separation will result.

As the grain passes through the cylinder we can readily see the following procedures taking place. The smaller particles are lifted out near the feed end of the machine. Sometimes with more than one particle located in a single indent. As the grain progresses through the cylinder the slightly longer particles are lifted into the receiving trough. The toughest division always takes place near the discharge end after the small particles are depleted. If the cylinder was allowed to starve at the end, large particles will be lifted if the grain bank is not maintained at a proper level. The indent size cannot accurately perform a length separation unless sufficient depth of material is present. The same retarder must also be designed so it can be removed or displaced so that the cylinder can be quickly and completely cleaned cut. This of course, is especially true where cylinder indents are cleaning seed.

5. FEEDER TO THE INDENT CYLINDER - It is very important that the metering be constant if the separation to be accomplished is to be consistent. If the feed varies, all particles will not have the same length of time to be separated as did others. Also with an uneven feed your trough settings cannot be accurate due to the fact that for a heavier feed trough settings should be lowered slightly and vice versa.

These five components are usually in a housing consisting of an intake hopper or spouting and also the discharge spouting from the unit or to additional cylinders. In this housing, there are usually visual ports which allows the operator to actually view the internal operation of the unit, and assist in making necessary adjustments. This housing also incorporates the trough adjusting mechanism and a dial to indicate the trough positioning. The housing also usually includes the necessary drive for the cylinder itself, whether singly or in multiple units.

We now come to the actual operation of the cylinder indent, and of course the first choice is the actual indent size required. As mentioned previously the indents are sized in 64's of an inch similar to screens and in the case of the superior units are available in indents from #4 to #36.

As you can see these would cover the majority of small seeds and cereal grains. Having chosen the indent size required for the separation desired the actual cylinder speed is of the next prime importance.

The average Superior utilizes a cylinder of 23" diameter and according to quite a long formula the theoretical equilibrium speed of this cylinder is 55.5 R.P.M. At exactly this speed material would cease to empty. However, several physical properties change our frictionless conditions by introducing friction of various amounts. This friction is dependent on the shape of the seed, seed coat textures, size of seed, and moisture content. Also the specific gravity of the seed has some effect on the separation. These frictional forces tend to cause particles to follow the circumferential travel further than calculated,

so the speed must be reduced considerably below the theoretical; 55.5 R.P.M. In actual operation, cylinder speeds from 42 to 53 R.P.M. are used; and as an example we have found that on wheat, a top speed of 51 R.P.M. is indicated.

Due to the fact that various seeds, moisture, and surface conditions require a different speed for optimum separations, it is desirable to have each unit equipped with a variable speed drive and this now general practice in units that are being used for seed cleaning purposes. Whatever the motive power of the cylinder indent, it is of prime importance that the speed is constant. Any fluctuation in speed of the cylinder will effect the trough setting and separations radically.

Also as mentioned previously the trough adjustment should be such that the trough itself can be dumped into a clean-out position. This of course is a prime requisite if the unit is used for cleaning seed. The accuracy of the trough setting is also dependent to some degree on the actual diameter of the cylinder. As you can see, the larger the diameter of the cylinder the more trough movement you have available within the operating range.

The 23" diameter cylinder as used in the superior units gives a good degree of accuracy to the trough setting and also we feel, a reasonable capacity per cylinder.

The capacity per cylinder unit is dependent on three basic factors:

1) The number of pockets or indents per square foot area, and this is governed by the indent size.

2) The amount of cylinder surface that can be run under the grain bank in a given time, and this is relative to the indent length of the cylinder. The cylinders are manufactured in various lengths depending on the type of job required, but in the superior machines the most common length is approximately 85".

3) The third factor governing capacity is the percentage of seed mass that must be lifted into the receiving trough.

Due to the wide variety of the seed separations that are made on the cylinder indent, it is very difficult to give any statement as regards to capacity. It is possible it could vary anywhere between 25 to just over thirty bushels per hour per cylinder.

You may ask where in a cleaning line up, cylinder indent machines might be used, and to this we would say, any place where you have a length separation to make. Where a cylinder indent is used strictly by itself as a single purpose separator, it is usually used in a line-up after scalping, and quite often after width separation has been made.

It is common practice in seed cleaning plants, cleaning cereal grains, to use the cylinder machine equipped with a scalper aspirator, positioned first in the line-up. The theory behind this that the cylinder machine will work very well having a high degree of

separation to make. Having it first in the line-up on cereal grains, means that relatively clean product is able to go through the screen machine, or width separators, resulting in an increase in capacity from these units. It must be remembered that the cylinder indent is strictly a length grader and not an all purpose cleaner or separator. Any two seeds that are relatively the same length and same specific gravity will be impossible to separate on the indent.

The cylinder indent is relatively service free, one thing that should be made clear in order to eliminate some potential dissatisfaction with a new machine, is that it will not operate properly until the indent surface has had an opportunity to become polished. Due to the increased friction of the unpolished surface, cylinder speeds may have to be reduced and/or trough settings raised.

It should also be pointed out that when cylinders are replaced or a machine is brand new, that in some instances, it is desirable to run a coarse grain, like barley, through the cylinders to absorb the oil that is used as a rust preventative for shipping purposes, or wash the cylinders in solvent. If a small dusty type seed is cleaned with the cylinders in this condition, it is quite possible that the indent pockets will become plugged. Also, when the unit is handling an oil material such as flax, the indent may have a tendency to fill up with dust imbedded in the oil. Thus the effective depth of the indent is lowered, and periodical scouring may be needed.

Compared to other methods of length separation of grain, the cylinder indent utilizing the case-hardened punched indent steel cylinder, enjoys a relatively long life. As the cylinder indent wears, it will be necessary to lower the trough slightly and/or increase the speed slightly; because as the pocket should wears down the degree of friction in the cylinder is less. Cylinders will quite often make reasonable separations even when worn to a point of being perforated at the shoulder. The amount of grain or seed that can be put through and given cylinder is a difficult thing to pin down, due to the various soil conditions the grain is grown in, moisture content, and seed surface texture. The life of a cylinder on cereal grains will vary anywhere from one half million to two, or three million bushels. Where a unit is used first in the cleaning line-up, the cylinder life is less than it would be if it is further down the line due to the fact that all the sand, stones and abrasive material in the grain goes to the cylinder indent first.

The indent cylinder unit is no better than the operator running it, and if you will take the time to understand the operation of your unit and allow a reasonable amount of time after making adjustments, so that the machine can settle down to these adjustments; we are sure you will find that the indent cylinder -- regardless of make -- will do a job for you and will do this job with a minimum of attention and service for an extended period of time.

We trust this has given you a better understanding of the design and operation of one of your basic separating units.

APPENDIX A

PARTS LIST

Northland Superior Supply - Machine Parts List

Job No.:	57-1391	*Revision:*	0
Machine:	NS-B6	*Revision Date:*	
Customer:	Flaman	*Engineer:*	JMG
Site:		*Serial No:*	B722
		Qty of Machines	1

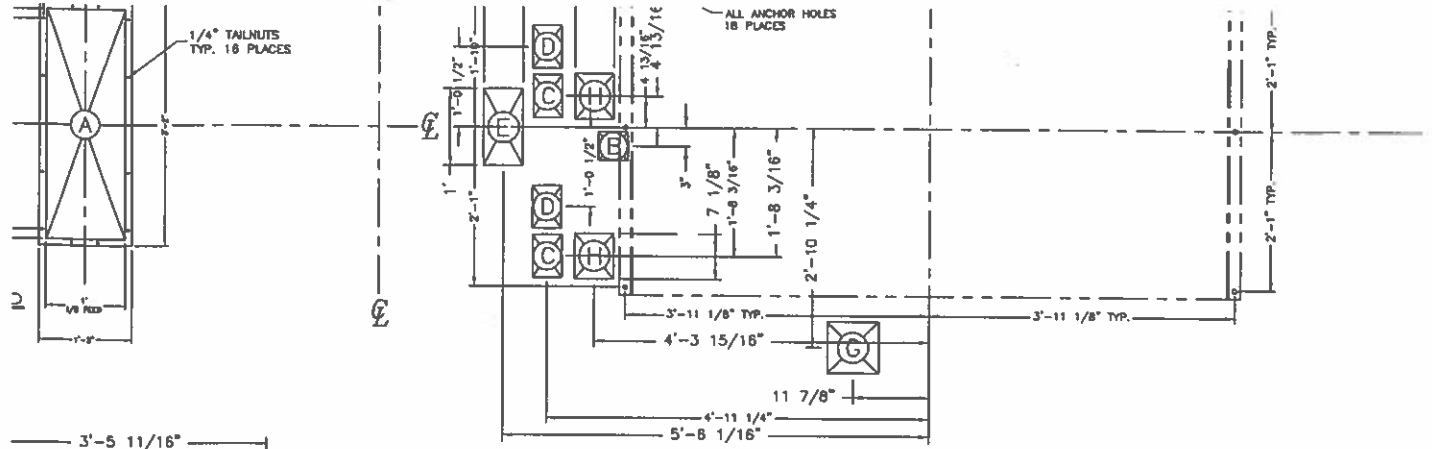
PART No.	Qty/M	Qty-T	DESCRIPTION	CODE
2012-B	7	7	BALL BEARING UNIVERSAL TAPERED IDLER BUSHING	P
2A785	4	4	TAPER-LOCK BUSHING - 1 5/16"	I
3815	6	6	WOOL SEAL	I
3850-RH	4	4	RETARDER	F
4162	6	6	RETARDER SPRING	I
6446	6	6	RETARDER WASHER	I
71111-B-16-12	6	6	WEAR BAND	I
9641	6	6	SPRING WASHER	I
A1075	4	4	1 11/16" BEARING ASS'Y	I
A1076	9	9	1 5/16" BEARING ASS'Y	I
A1077	12	12	FRICTION ROLLER ASS'Y	I
A113	4	4	WOOD BEARING	I
A139-2	6	6	WOOL BAND ASS'Y	F
A6411	2	2	DISCHARGE HEAD - ANGLED	I
A6412	4	4	DISCHARGE HEAD - STRAIGHT	I
B179	6	6	BEARING HOLDER	I
B240	12	12	FRICTION ROLLER BRACKET	I
B303	6	6	CYLINDER END RING	I
B329	6	6	INTAKE CASTING	I
B330-1	6	6	INTAKE CONE	I
B344	6	6	WORM	I
B382	10	10	GRAINLINE BLADE	I
B383	20	20	GRAINLINE BLADE	I
B414	6	6	HANDWHEEL	I
J812	2	2	RETARDER	F
MOTOR 1	1	1	5 HP, 1750 RPM, 575/60/3, TEFC C-Faced 184TC	P
REDUCER 1	1	1	HUB CITY HI4662E-12.88-184TC-B3 1 3/8" Output Shaft	P
SC750	12	12	3/4" SET COLLAR	I
T11709	2	2	VERTICAL DRIVE GUARD	F
T11710	2	2	VERTICAL DRIVE GUARD	F
T7134	1	1	FEED HOPPER	F
T11040	2	2	BASE ANGLE	F
T11074	2	2	LIFTINGS SPOUT	F
T11075	2	2	LIFTINGS SPOUT EXTENSION	F
T11076	2	2	TAILINGS SPOUT EXTENSION	F
T11077	2	2	LIFTINGS SPOUT EXTENSION	F
T11078	2	2	IDLER BRACKET	F
T1837	2	2	NTN UCFL 204-012D1 3/4" BEARING (2 HOLE FLANGE)	P
T5353	7	7	7720-1810 IDLER SPROCKET	P
T2538	7	7	OUTSIDE BRACE	F
T2539	6	6	INSIDE BRACE	F
T2568	1	1	ENDPLATE	F
T2584-2	1	1	SPLICE PLATE	F
T2615	2	2	SIDE SHEET - MIDDLE	F
T2740	2	2	IDLER BRACKET	F
T2741	2	2	IDLER BRACKET	F
T3342	2	2	IDLER BRACKET	F
T2742	2	2	DRIVE BRACE - UPPER VERTICAL	F
T2743	2	2	DRIVE BRACE - UPPER VERTICAL	F

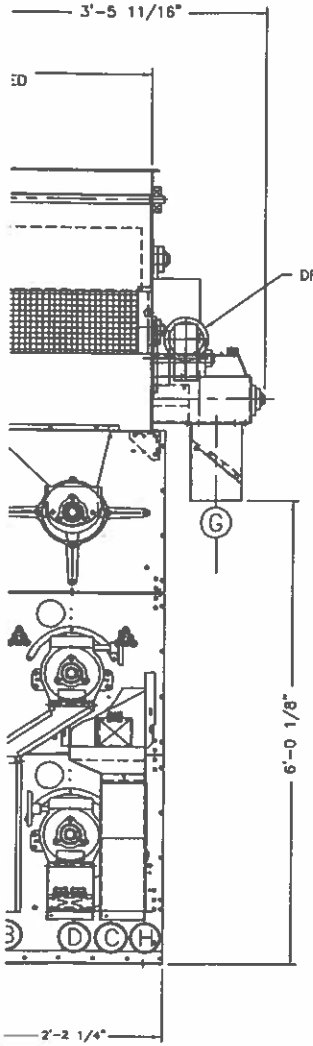
Northland Superior Supply - Machine Parts List

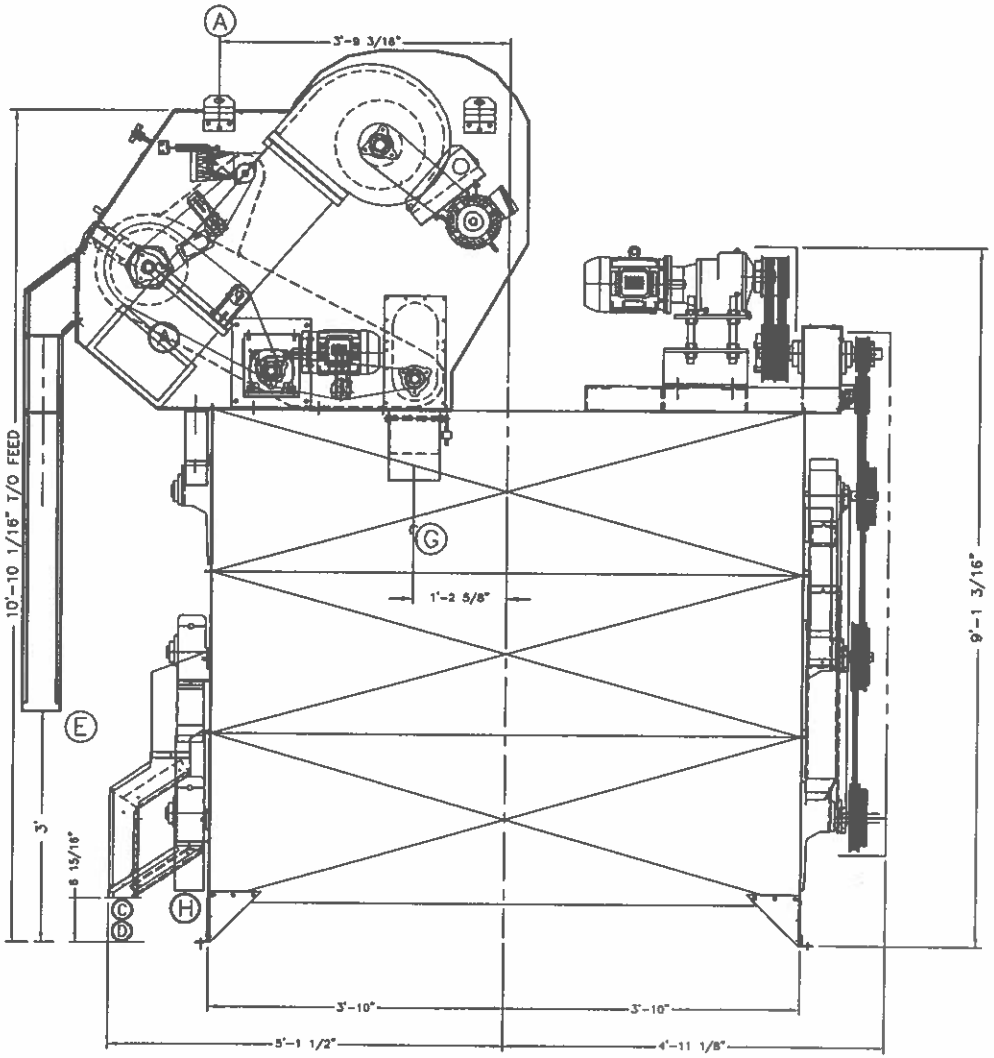
PART No.	Qty/M	Qty-T	DESCRIPTION	CODE
T3123	2	2	SIDE SHEET - BOTTOM	F
T3447	1	1	IDLER BRACKET	F
T3482	4	4	1-7/16" BEARING ASS'Y	I
T3483	2	2	WOOD BEARING	I
T3585	2	2	LIFTINGS SPOUT	F
T3600	2	2	TAPER-LOCK BUSHING - 1 7/16"	P
T3615	4	4	CORNER GUSSET	F
T3910	2	2	LIFTINGS SPOUT	F
T4005	1	1	ENDPLATE	F
T4015	1	1	ENDPLATE	F
T4018	1	1	ENDPLATE	F
T4068	6	6	STANLEY DOOR PULL HANDLE	I
T4071	2	2	SIDE SHEET - TOP	F
T11643	2	2	LOWER DRIVE BASE SHAFT	F
T4508	6	6	INSPECTION DOOR	F
T5317	3	3	ENDPLATE SUPPORT ANGLE	F
T5569	2	2	LIFTINGS RETURN SPOUT	F
T6117	4	4	LOWER & MIDDLE SCREW CONVEYOR	F
T6171-LH	2	2	LIFTING LUG	F
T6171-RH	2	2	LIFTING LUG	F
T6240	10	10	1/2" SPACER	F
T6426	2	2	TAILINGS SPOUT	F
T6427	1	1	ENDPLATE	F
T6429	1	1	ENDPLATE	F
T6489	1	1	ENDPLATE	F
T6491	1	1	ENDPLATE	F
T6495	1	1	ENDPLATE	F
T6497	1	1	ENDPLATE	F
T6592-LH	1	1	TOP SHEET - LEFT HAND	F
T6592-RH	1	1	TOP SHEET - RIGHT HAND	F
T661	2	2	ASPIRATOR SUPPORT ANGLE	F
T6920	1	1	ENDPLATE	F
T6922	1	1	ENDPLATE	F
T7127R	2	2	TAILINGS SPOUT	F
T8509-3020-4	4	4	14MX-50S-37 SPROCKET c/w 3020 x 1 7/16" BUSH	P
T8510	1	1	14MGT-1960-20 BELT	P
T8992	1	1	14MGT-1190-20 BELT	P
T8522	2	2	14MGT-1750-20 BELT	P
T8523-2012-8	1	1	14MX-32S-20 SPROCKET c/w 2012 x 1 3/8" BUSH	P
T8512	4	4	14MGT-2100-20 BELT	P
T8507-3020-2	2	2	14MX-48S-20 SPROCKET c/w 3020 x 1 11/16" BUSH.	P
T8598-2012-2	2	2	14MX-28S-20 SPROCKET c/w 2012 x 1 11/16" BUSH	P
T8516-3020-4	2	2	14MX-50S-20 SPROCKET c/w 3020 x 1 7/16" BUSH	P
T7070-571370	1	1	MOTOR / REDUCER DRIVE BASE	P
T4029	2	2	UPPER SCREW CONVEYOR (RH)	F
TTDIS	2	2	TAILINGS SPOUT	F
W6040	6	6	CYLINDER ENDPLATE	I
W6401	18	18	SNAP COVERS	F
W6816	4	4	TROUGH	I
W6818	2	2	TROUGH	I
W7000-14	2	2	INDENT CYLINDER - #14	I
W7000-20	4	4	INDENT CYLINDER -#20	I
W8131	6	6	WORM SEGMENT	I

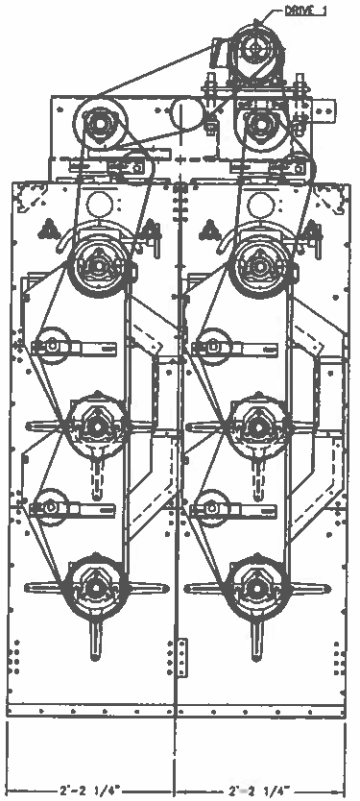
APPENDIX B

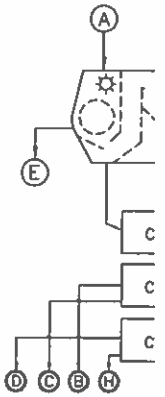
ASSEMBLY DRAWINGS











U
E
G
H

NOTES:

1. WEIGHT: CYLIND
2. CYLINDER DRIVE ELECTRICAL CONT
3. OPTIONAL CYLIND AND/OR FEED EI
4. SPOUTING LINED IMPACT AND HIGI CUSTOMER TO SI
5. ALLOW 1" FOR G
6. ASPIRATOR AIRLIF SAME SIDE AS TI OR OPPOSITE. (C
7. RECOMMENED AIF
8. SCALPING REEL I OTHER SIZES AV

DRIVE SCHEDULE