



Security Engineered Machinery Co., Inc

OPERATIONAL & MAINTENANCE MANUAL

SEM Model DS-22



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Security Engineered Machinery Co., Inc.

NATIONWIDE SERVICE

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DISINTEGRATOR SAFETY RULES

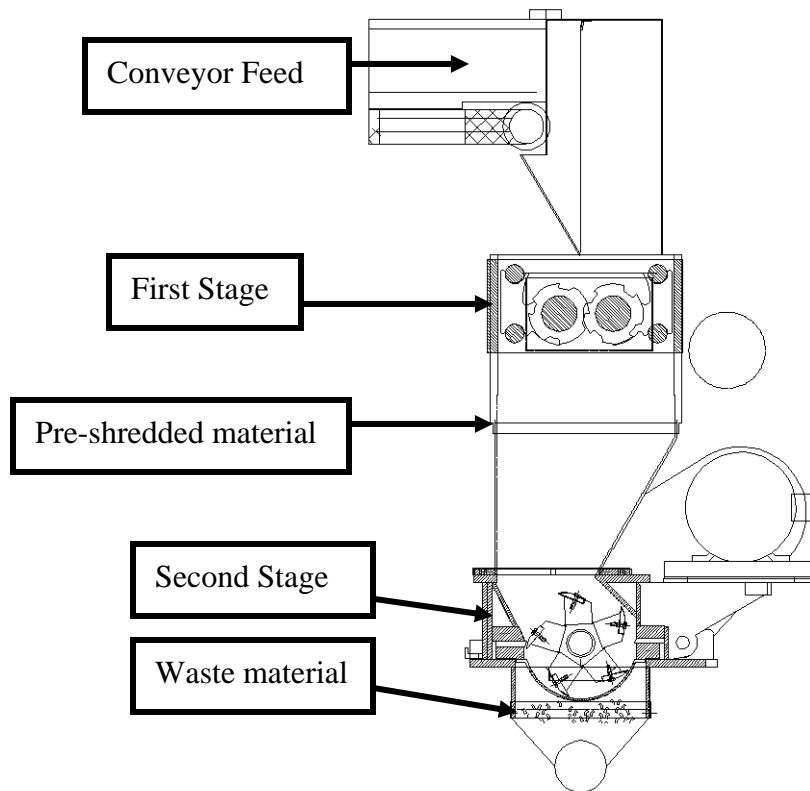
1. **Learn and obey your company's safety policy regarding disintegrating equipment.**
2. **MOVING OR LIFTING THE DISINTEGRATOR:** Although our equipment is built and engineered for great ruggedness in operation, care must be taken when moving the machine along the floor or when lifting it. Damage may occur to sheet metal covers, electrical cabinets, or small brackets if pressure is applied to them when moving the disintegrator. When lifting the disintegrator, be certain of total machine weight and the capability of the lifting equipment.
3. **DISINTEGRATOR LOCATION:** Adequate area for routine maintenance should be provided in order to open the machine for knife, screen, or cleanout service. Proper service area clearances also allow people who are working on the machine to be clearly visible to others thereby reducing potential safety hazards.
4. **SAFE HOUSEKEEPING:** The work area should be kept clean and uncluttered to allow personnel safe movement around the disintegrator during periods of operation or maintenance. No hand or power tools should be left on or about the machine. Any tools or other metal objects which mistakenly fall into the hopper feed opening can cause severe damage to internal screen chamber and cutting chamber components.
5. **SAFETY GLASSES OR A FACE SHIELD MUST ALWAYS BE WORN** when operating or servicing the machine. Although our machines are designed for the maximum in flyback control, caution must be used when operating near the area of the hopper feed opening in order to guard against unexpected material flyback.
6. **EAR PROTECTION** may be required when operating the machine during granulation of very hard/noisy materials. The Occupational Safety and Health Act of 1970 have established guidelines for Permissible Noise Exposures (OSHA 1910.95) that should be followed.
7. **NEVER** attempt to operate the disintegrator unless it is fully assembled with all guards and interlocks in place and functional.
8. Observe all **DANGER, WARNING, CAUTION** and safety labels on the equipment.
9. Upon completion of any machine maintenance, be certain all safety guards and covers are securely and properly fastened prior to resuming machine operation. All fasteners must be in place and properly tightened.
10. **NEVER** wear any loose fitting clothes, neckties, or dangling items such as earrings, belts, or shoestrings. Jewelry such as wristwatches, bracelets, or rings should **NEVER** be worn. Long hair must be tied back or placed within a tight fitting hairnet.
11. **ROTATION OF MOTORS:** All rotating items in the disintegrator are clearly marked on the machine. Always check for proper rotation of motors.
12. **ELECTRICAL GROUNDING:** All electrical equipment on the disintegrator must be grounded in accordance to all local codes and Article 250 of the National Electric Code.
13. **Always Disconnect and Lockout the Main Electrical Power to the Disintegrator Before Performing any Service.**
14. **SAFETY INTERLOCKS MUST NOT BE BYPASSED.** The mechanical and electrical safety interlocks ensure the safety of personnel. They should never be tampered with or removed for ANY reason. They should be frequently checked by a qualified mechanic for proper operation.
15. Do not modify the machine configuration or any individual component without written consent from the SEM Co., Inc.

SEM has long recognized the importance of safety and has designed and manufactured our equipment with operator safety as a prime consideration. As a user, we expect you will abide by the foregoing recommendations in order to make operator safety a reality.

INTRODUCTION

The Model DS-22 dual-stage industrial shredder is comprised of four basic units:

1. An inclined conveyor is used to feed materials on a cleated belt, to the feed hopper of the pre-shredder. This allows for easy loading and control of feed lots, as well as operator safety
2. A first stage pre-shredder, a unit with counter-rotating shafts with cutters that turn at low speed and high torque, for reducing bulk materials.
3. A second stage Disintegrator / Knife Mill for reduction of shredder bulk into a smaller particle, using interchangeable security screens.
4. A fan-based waste evacuation unit that conveys the confetti-particle end waste through ductwork to collection bags. The air pressure is exhausted through a filter.



GENERAL DESCRIPTION

SEM Disintegrators are designed to uniformly and consistently reduce the size of waste products.

The rotor on which the cutting knives are mounted, is a fabricated, steel unit supported by bearings mounted outside the cutting chamber. The rotor is driven by a motor which is capable of producing high torque loads. The disintegrator is equipped with a magnetic starter that is protected by manually resettable overload heaters. The slanted rotor knives and counter slanted bed knives produce a scissors cutting action which reduces the possibility of feedstock jamming in the cutting chamber.

Motors have overload heaters for maximum protection in compliance with the National Electric Code.

The control enclosure houses all of the necessary wiring, circuit breakers, overload heaters, motor starter coils, along with the 115V control transformer and disintegrator operating controls. The control enclosure is built to meet NEC regulations.

INSTALLATION

SCOPE

This section contains all instructions required for experienced installation personnel to install the SEM Disintegrator and prepare it for production. It is essential to follow all instructions carefully and in the sequence presented. Be sure to observe all DANGER, WARNING, and CAUTION statements in order to prevent personal injury or machine damage and all NOTE statements which are designed to assist in the performance of procedures.

GENERAL

The site selected for installation of the disintegrator should be prepared in advance. Be certain that the area to be occupied by the machine is clean, level, and free of obstructions. The site selected must have a floor rated to easily support the weight of the machine; it is recommended that the customer talk to their engineer / architect regarding floor type.

SHIPPING

To prepare the disintegrator for shipment, it is mounted on wooden skids, then blocked and banded to prevent movement. All non-painted items subject to corrosion are coated with a quality rust preventative and the machine is then covered with heavy duty polyethylene to protect it from moisture and dirt.

SEM Disintegrators are normally shipped completely assembled unless the size of the machine or an agreement for special shipping arrangements causes partial disassembly.

UNPACKING

Note: When the machine arrives at your plant, inspect it carefully for shipping damage **BEFORE** unpacking. Report any damage immediately to the transporting company that delivered it. Sign the freight bill - noting all damage.

If inspection revealed no shipping damage, unpack the unit by removing the polyethylene protective covering and banding. Attached to the machine is an envelope containing "Installation Instructions". The usual contents of this envelope are Parts List, Assembly Drawings, Electrical Diagrams, and a copy of this manual.

The machine may now be lifted from the skid. A fork lift is ideal for the purpose, but care must be taken to properly position the forks. It is recommended to move the machine from the front side.

CAUTION: DO NOT ATTEMPT TO LIFT THE DISINTEGRATOR BY MEANS OF ANY SHAFT OR PROTRUDING MEMBER, ESPECIALLY THE HOPPER.

SETUP

Make certain the floor is clean, level, and free of obstructions before placing the machine into position.

Visually inspect the hopper in-feed opening to ensure that no stray packing material or debris is present.

Open the machine by loosening the hex coupling nut(s) at the front of the machine enough to allow for rotation of the threaded swing bolts out of the clamp(s)

NOTE: It is never necessary to loosen the spring-block locknuts located on the front of the cutting chamber. The spring blocks are factory set and require no adjustment.

INSTALLATION (CONTINUED)

Remove the bolts on the bottom surface of the cutting chamber to drop the screen cradle and down to the extreme open position.

NOTE: In the extreme open position, the machine is designed to remain open without the use of any devices.

CAUTION: The knives mounted on the rotor and also located at the edges of the cutting chamber are extremely sharp. Wear heavy gloves and exercise care when working in the cutting chamber.

Remove the screen from the screen chamber and wipe it clean. The screen should then be placed aside and should always be positioned standing upright on its side. Wipe the inside of the screen chamber clean.

Carefully inspect the interior of the cutting chamber for foreign material or debris. Slowly turn the rotor by hand to verify that it freely rotates without obstruction or contact between rotor and bed knives. Wipe the inside of the cutting chamber clean. Before closing the machine check the chamber carefully to insure nothing has been left inside the machine.

Place the screen back into its original position before closing the machine.

Securely close the machine by rotating the threaded swing bolts up into the clamps and tightening the hex coupling nut(s) at the front of the machine.

Make certain all electrical connections are properly made and supported between accessories and the control enclosure (refer to the wiring diagram for wire and terminal connections).

Open the sheave guard(s) by removing the bolts attaching the cover. Check the belts for proper tension and alignment (refer to page 14). Upon completion, close the sheave guards by placing the cover back into position, insert all of the bolts originally removed, and tighten them fully.

ELECTRICAL SERVICE CONNECTIONS

Carefully check the diagrams packed with the machine. All internal wiring has been done at the factory. All safety interlocks have been verified to be functional before shipment. It is only necessary to connect the electrical power source to the machine at the control enclosure.

NOTE: All equipment must be grounded in compliance with Article 250 of the National Electric code and all Local codes. The customers' disconnecting means and branch circuit protection must also be in compliance with the National Electric Code and all Local Codes.

PRE-OPERATIONAL PROCEDURES

This section contains the information required to carry out pre-operational procedures, and the checklist of items which should always be reviewed prior to a production run.

CAUTION: Before undertaking any machine repairs or maintenance, always make certain that the machine disconnect switch is turned to the “**OFF**” position or that the control enclosure is disconnected from the main power source. Lockout all sources of power including the main disconnect switch and follow all of your plant lockout procedures.

ELECTRICAL TEST

Before applying power to the machine, check the incoming voltage from L1 to L2, L2 to L3, and L1 to L3. The voltage should be the same as indicated on the silver tag in the control enclosure. If the voltage is not the same, contact the SEM Service Department for voltage modification instructions.

Once it has been determined that the voltages are proper, it is necessary to start the motors and check for the proper direction of rotation.

Turn the main disconnect switch to the “**ON**” position.

Press the Disintegrator Start push-button to power the Disintegrator motor. Visually compare the direction of motor shaft rotation to the rotation arrow label (CW when viewed from the shaft end). If the motor turns in opposite direction, reverse any two incoming power leads.

Once the rotation direction is correct, the remaining electrical controls need to be tested as follows:

Press the Disintegrator Stop pushbutton and allow the machine to stop. If customer orders a Master Control Panel, the machine will be equipped with a time-shutdown. This feature allows the disintegrator to finish its cycle and shutdown over a short period of time.

For disintegrators equipped with conveyors, fans, etc., test their operation also by pressing the appropriate pushbutton. Check fan outlet for proper airflow.

For disintegrators with Emergency Stop pushbuttons, test the buttons to insure all motion stops.

Loosen the hex coupling nut on the threaded swing bolts at the front of the machine to verify the safety interlock switch shuts, the machine off.

NOTE: If there is an access door on the hopper, (for inspection or clean-out purposes) that its limit switch interlocked, make certain that removal of the limit switch actuator bracket shuts the machine off.

PRE-OPERATIONAL CHECKLIST

PRE-OPERATIONAL CHECKLIST

- After all electrical and mechanical machine elements have been inspected and any defects corrected, the following pre-operational checklist should be used to ensure the disintegrator is ready for operation.
- Have all installation and preparation instructions been read and followed?
- Have the disintegrator operator and all other necessary personnel been fully trained on machine operation and all machine safety mechanisms?
- Have sufficient location clearances been allowed?
- Has the equipment been grounded as required by local codes and/or Article 250 of the National Electric Code?
- Have all motors been checked for rotation?
- Have all machine controls, pushbuttons, and limit switch safeties been checked for proper functioning?
- Have the cutting and screen chambers been checked for foreign matter?
- Have the drive belts been checked for alignment and tension?
- Is the machine properly closed with all visible fasteners tight?
- Are all accessory components electrically and mechanically connected with proper support and with all fasteners tight?
- Is the cyclonic air separator and filter bags empty? (Optional equipment)
- Has the fan/cyclone been verified for proper rotation direction?
- Are all electrical enclosure boxes tightly closed and clamped shut?
- Are all personnel clear of the machine?

OPERATION INSTRUCTIONS

NOTE: Please read this section carefully, as most problems occur during the first days of operation. These problems can be eliminated by a careful review of this section.

Before operation, check that:

1. The proper size security screen is in place.
2. The dust filter bags should be shaken (with the fan motor off)

Machine ready - all doors, covers, guards, and limit switches are in place, securely fastened, and functional. All accessory components are properly connected.

Turn the main disconnect switch to the ON position.

1. Press the “**Fan Start**” pushbutton on the control panel.
2. Press the “**Disintegrator Start**” Pushbutton on the disintegrator control panel.
3. Press the Pre-Shredder “**Control ON**” pushbutton, followed by the Pre-Shredder “**Equipment ON**” pushbutton. Lamp will illuminate, indicating that the motor is running.
4. At this point, check the conveyor belt to ensure that no tools or foreign materials have been placed on the unit. Press the “**Conveyor Start**” pushbutton and feed materials. The belt will stop and run intermittently by timers.

Load feedstock at a uniform rate that does not exceed the capacity of the machine.

Start with feed rates of 5lbs. per minute to get a feel for the output rates. Visual bag collection and sound of the machine will usually give you a feel for different materials being cut effectively. Allow a pause between feed lots for cutting time and evacuation.

NOTE: Overfeeding can cause the disintegrator to jam. However, the stage 1 shredder has a built-in auto reverse feature to clear moderate jams. Depending on final particle size desired, and security screen hole size, output rates can vary.

NOTE: If there is an access door on the hopper (for inspection or clean-out purposes) that is limit switch interlocked, make certain the limit switch actuator bracket is re-installed and is properly in contact with the limit switch or the machine will not start.

Temporary machine stops:

When temporarily stopping the machine, allow all material to run out of the cutting chamber. **NEVER** try to restart the machine with material remaining inside the cutting chamber.

Final machine stops:

When shutting the machine down, allow all material to pass through the fan (optional) and into the cyclonic air separator (optional) before pressing the Stop Disintegrator pushbutton.

Emergency stops:

Feedstock must be cleaned out of the hopper and cutting chamber prior to restarting.

TROUBLESHOOTING

Possible Problems and Solutions:

1. Pre-Shredder will not Start:
 - a. Check that the emergency stop button is pulled out.
 - b. Check that the power supply switch is on.
 - c. Lastly, contact an electrician to check the electrical panel for blown fuses or overload resets.
2. No Particle Output:
 - a. Feedstock may be jammed inside the hopper, shut the machine down and check.
 - b. Security screens are jammed or plugged, refer to page 6 on accessing the screens.
 - c. Duct run to the fan may be clogged, clean as required.
3. Excessive Power Required – Blown Fuses:
 - a. Machine is overloaded. Reduce amount of feedstock put into the machine per unit of time.
 - b. Knives are dull. Sharpen or replace knives and re-install. (See Page 12-13)
 - c. Knife gap is too large. Adjust knives to proper gap specification.
 - d. Clearance between the rotor knives and screen is too small. Check that the screen is properly seated in the screen chamber.
4. Machine Stalls:
 - a. Machine is overloaded. Reduce amount of feedstock put into the machine per unit of time.
 - b. Pieces of feedstock jammed in the rotor. Clear the jammed material then visually inspect the rotor to ensure it is not damaged and that the knife gaps are correct.
 - c. Machine has loose or thrown belts. Inspect, and if acceptable for use, re-install and tighten per maintenance instructions.
5. Bearings are Noisy or Hot:
 - a. Lack of lubrication. Lubricate per maintenance instructions.
 - b. Machine is overloaded. Reduce amount of feedstock put into the machine per unit of time.
 - c. Bearings have exceeded their rated life. Consult with the SEM Service Department for replacement instructions.
 - d. Bearings are not properly installed or tightened. Consult with the SEM Service Department for installation instructions.
6. Belts Slip or Squeal:
 - a. Belts are too loose. Tighten per maintenance instructions.
 - b. Machine is overloaded. Reduce amount of feedstock put into the machine per unit of time.
 - c. Machine has thrown belts. Inspect, and if acceptable for use, re-install and tighten per maintenance instructions.

TROUBLESHOOTING (CONTINUED)

7. Motor Will Not Start

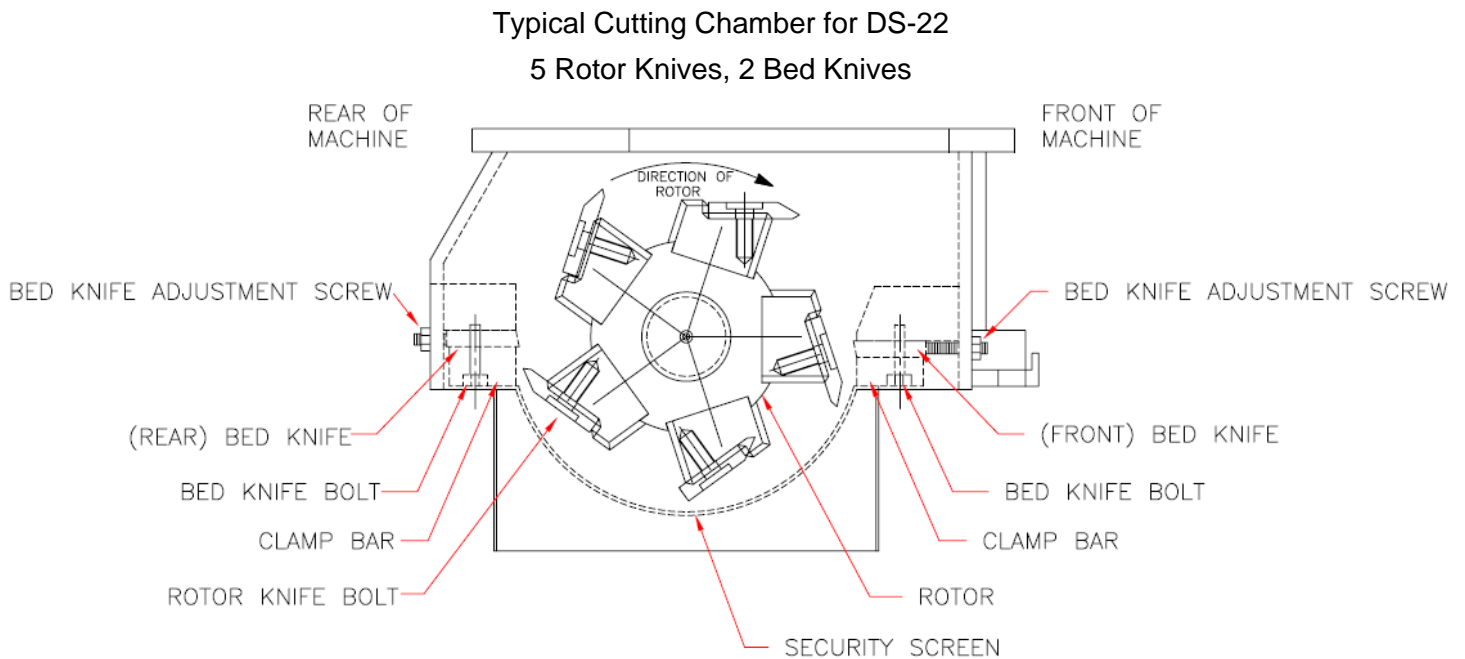
- a. Fuses are blown. Replace fuses with the size and type shown on the wiring diagram (located in the control enclosure)
- b. A limit switch is open. Check the limit switches at the machine front doors and any hopper cleanout door. Ensure proper actuation and replace if required.
- c. Verify that the correct pushbuttons are being depressed and that the main disconnect switch is in the ON position.

8. Particle Builds up in Transition or Tubing:

- a. Fan is too small. Replace with larger unit or fan wheel.
- b. Transition or tubing is clogged. Clean as required.
- c. Return air vents are covered or too small. Ensure the vents are open.
- d. Fan is not evacuating properly. Check for loose fan wheel on shaft, worn fan wheel, or loose fan drive belts.

9. Feedstock Hangs up in Hopper or Cutting Chamber:

- a. Material being placed into the machine for processing is too large for the hopper, cutting chamber, or rotor diameter. Reduce the initial size of the feedstock.
- b. Knives are dull. Sharpen or replace knives and re-install.
- c. Overloading of the machine. Regulate the in-feed of scrap to uniformly feed the machine over an extended time period.



KNIFE REPLACEMENT AND SETTINGS

Changing Knives:

1. Disconnect all power
2. Unbolt and lower the screen cradle, exposing the knife chamber for access. The safety limit switch is now open, preventing accidental start circuit continuity.
3. Prior to replacing or removing the rotor knives, cover the edge of each knife with heavy gauge tape, such as Scotch filament or cloth tape. All rotor knife bolts should be loosened before removing any one knife, this will keep the rotor in balance. Remove all knives prior to replacing any one knife.
4. Bed Knives: A clamp bar holds bed knives in place. Note that the rear bed knife cutting edge is pointed downward. Take the spare bed knife with the original clamp bar and replace the bed knife. Be sure that the clamp bar lip is in towards rotor cavity. Repeat this procedure for the front bed knife, except the cutting edge should face up.
5. Rotor Knives: Remove the tape covering the edge of all rotor knives. Then, adjust the distance between the rotor and bed knives by means of the bed knife adjusting screws, and by manually rotating the rotor in reverse. Adjust to a minimum of .005 inch clearance using a feeler gauge.
6. Rotor knife hex head cap screws should be adjusted according to the torque table.

Model DS-22: 190 ft. lbs. Rotor Blades 175 ft. lbs. Bed Knife

Note: Before tightening bed knives to full torque, determine that knives are set properly by manually rotating the rotor in the operating direction, ensuring that the bed knives do not touch.

Sharpening Knives:

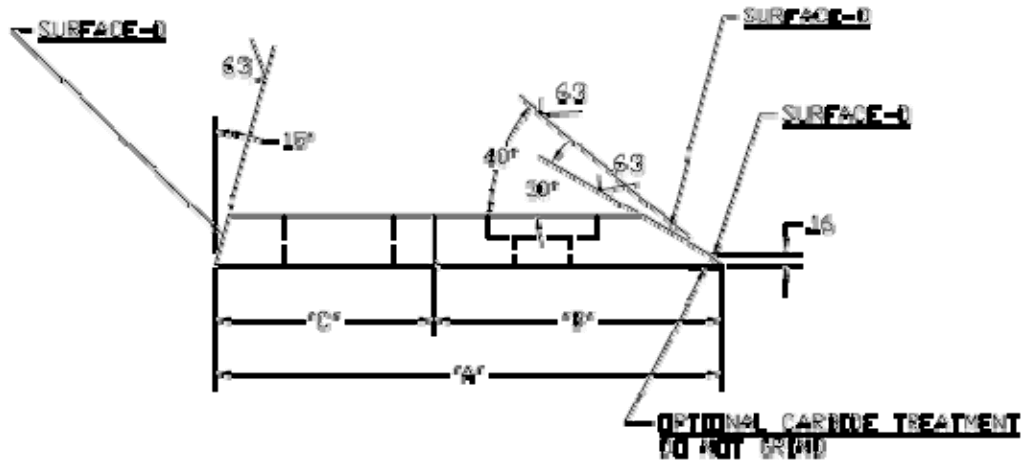
Knives may be sent to SEM, or a capable machine shop in your area for sharpening. When sharpened, the rotor knives must be sharpened as a set to maintain consistency in tolerances between the bed knives. If knives are badly knicked or damaged, they will function after sharpening if 75% of the cutting surface is effective.

NOTE: The rotor and bed knives are subjected to severe work and it is recommended that they be inspected periodically for sharpness. The sharper the knives are kept, the better the machine will operate and the better the quality of the particle being produced. Waiting until the knives have been severely rounded, chipped, or otherwise damaged will result in heavy shock loading during operation causing a subsequent reduction in knife life.

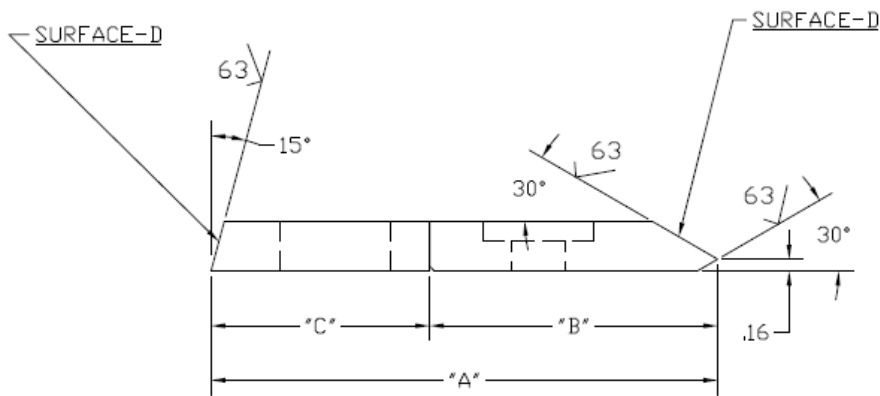
(For re-sharpening diagrams refer to Page 13)

KNIFE SHARPENING

Standard Form Rotor Knife W/Standard Form Bed Knife



Low Angle Form Rotor Knife W/Standard Form Bed Knife



NOTES ON KNIFE GRINDING:

After regrinding a number of times, the knives must be checked to be sure that there will be adjustment left in the bed knives. The general rule is to place a rotor knife and bed knife back to back as shown on Figure A, B, C and measure the total distance' dimension "A".

Dimension "A" - Model 22 & DS-22 = 5-3/4"

Note: If dimension "A" is close to minimum, a new set of knives should be ordered from Security Engineered Machinery. Please contact our Customer Service Department.

Dimension B: Bed knives tolerance must be held alike and parallel in sets within .010".

Dimension C: Rotor knives tolerance must be held alike and parallel in sets within .002"

SERVICE INSTRUCTIONS

PROCEDURE - BELTS

Prior to startup of this machine it is recommended that the drive belt tension be checked for proper "RUN IN" deflection force as shown in illustration. After the equipment has run between 24 and 48 hours, drive belt tension must again be checked for proper "OPERATIONAL" deflection.

A V-belt drive will successfully transmit its rated capacity if the belts are properly tensioned. The method of tensioning is explained here in detail for your information.

1. Verify that the alignment of the pulleys is correct. Utilizing a straightedge of sufficient length to span from one pulley to the other, place it along the sides of both pulleys. The entire edge of each pulley should fully contact the straightedge.

2. Measure the belt span (see figure on right)

3. Using a spring scale, apply a perpendicular force to any ONE of the belts at the mid point of the span.

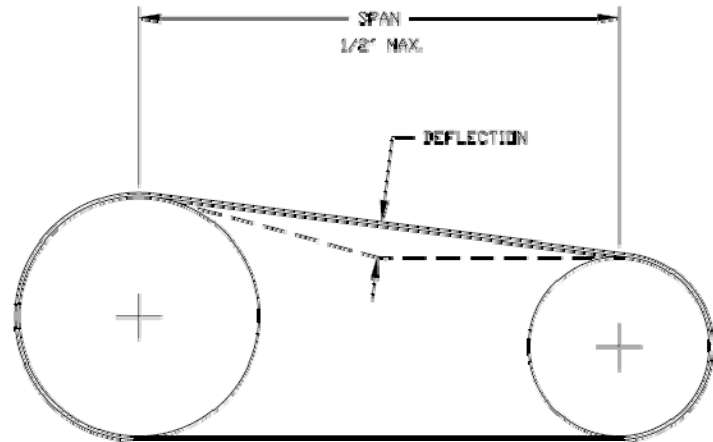
4. Measure the force (lbs.) required to deflect any one of the belts 1/64th of an inch for every inch of span. For example: the deflection for a 32 inch span would be 1/64th of an inch times 32 or 1/2 of an inch.

5. The motor position should be adjusted until the actual deflection force matches the distance of deflection referenced in Line 4 above.

6. There will normally be a drop in belt tension during the first 24 to 48 hours of operation due to belt stretch and the belts seating themselves in the sheave grooves.

7. After this initial "RUN IN" period the machine should be stopped and the belts should be rechecked for tension. The motor position should be adjusted until the deflection force matches the values in column "B".

8. Over-tensioning the belts can significantly reduce belt and bearing life.



CONVEYOR BELTS – Removal (Refer to page 22 for parts list)

1. Remove (3) end cap guards #18.

2. Remove side rails, #17, and hopper by loosening bolts and sliding off the end of the conveyor.

3. Lay conveyor on its side with the drive side down and remove legs, #39, from side opposite drive.

4. Loosen locking nuts on threaded roll support assembly, #11, on each side of free roll, #5.

5. Mark location on frame of motor plate support bracket, #31, and remove the bolt that secures the bracket to the frame.

6. Carefully slide the belt upward and off over leg support brackets, #36.

SERVICE INSTRUCTIONS (CONTINUED)

CONVEYOR BELTS - Installation (Refer to page 22 for parts list)

1. Carefully slide the belt down and over both rollers and over leg support brackets, #36.
2. Partially tighten the bolt that secures the motor plate support bracket, #31. Align to previously marked location and tighten bolt.
3. Tighten locking nuts on threaded roll support assembly, #11, on each side of free roll. Ensure that "V" guide on bottom of the bolt is located the center of the groove on each roller. Tighten only enough to remove most of the slack in belt. **Do not over-tighten!**
4. Install legs, #39, and stand conveyor up on the floor.
5. Slide side rail, #17, onto conveyor from end and tighten bolts.
6. Run conveyor and check the belt tension. Adjust nuts on threaded roll support assembly, #11, if necessary, to remove most of the belt slack. **Do not over-tighten!** Adjust nuts on each side of the conveyor to have the same distance from the center of the free roll shaft to the end of the frame.
7. Install (3) end cap bearings, #18.

CONVEYOR DRIVE CHAIN - Removal (Refer to page 22 for parts list)

1. Remove chain guard, #19.
2. Loosen bolts securing the switch bracket, #51, to the frame, #1 towards the rear of the conveyor.
3. Locate and remove clip on master link on drive chain.
4. Relieve chain tension by pushing switch bracket, #51, towards the rear of the conveyor, then remove the master link and chain.

CONVEYOR DRIVE CHAIN - Installation (Refer to page 22 for parts list)

1. Install chain around motor and roller sprockets, hold in place and install new master link and clip.
2. Slide switch bracket forward and tighten bolts to secure in place when proper chain tension has been reached. Chain should be snug, but not over-tight. Apply light grease to chain.
3. Replace chain guard.

DISINTEGRATOR LUBRICATION SPECIFICATIONS

Description - Bearings

Grease fittings are accessible when hopper and cutting chamber are pushed back. Grease twice yearly with Gulflex "A" multi-purpose or equivalent. Grease fittings are located on rotor bearings. Lubricate the chain every six months.

All SEM Security Disintegrators and accessories are supplied with pillow block bearings which are pre-lubricated from the factory.

The external mounting of bearings on the SEM Security Disintegrators results in a trouble free, low maintenance, and long life bearing design.

The pillow block bearings used require a high quality, lithium based, EP (extreme pressure) type of grease which conforms to the NGLI Grade 2 consistency. This grease has been chosen due to its suitability for use in heavy duty applications under heavy shock loads. It also contains rust inhibitors, has high temperature stability, and exhibits good water resistance.

RECOMMENDED GREASE PRODUCTS

AMOCO:	AMOLITH EP 2
CASTROL:	EP2
EXXON:	RONEX MP
GULF:	CROWN #2
MOBIL:	MOBILITH AW #2
SHELL:	ALVANIA EP LF #2
SUNOCO:	SUNAPLEX #2
TEXACO:	MULTIFAK EP #2

The pillow block bearings should be lubricated with care. Too much grease applied to the bearings at one time can rupture the bearing seals. Under normal operating conditions, a moderate amount of grease applied every 2000 hours should be adequate to ensure long life. Severe operating conditions will require more frequent lubrication intervals

ELECTRICAL CURRENT and TOOL REQUIREMENTS

Disintegrator - TABLE 1

DISINTEGRATOR	FULL LOAD CURRENT THREE PHASE POWER			
Model # / HP	208V	230V	460V	575V
22HDS @30 HP	87.0	75.5	38.0	30.2

MATERIAL UNLOADING- TABLE 2

FAN UNIT Model # / HP	SINGLE PHASE	
	115V	230V
F-034 - 3/4 HP	9.6	4.8
3-PHASE MOTOR	460V	230V
F-112 - 1½ HP	4.2	2.1

TOOL REQUIREMENT – TABLE 3

TORQUE WRENCH					ALLEN HEAD	OPEN END			
MODEL	BED KNIVES	TORQUE SETTING	ROTOR KNIVES	TORQUE SETTING	BED KNIFE ADJUSTMENT	MOTOR ADJUSTMEN T BOLT	HOP -PER	BELT GUARD	
DS-22	1/2	175 Ft.Lb	15/16	190 Ft.Lbs	3/16	15/16	3/4	7/16	9/16

NOTE: .005- inch feeler gauge required for knife gap setting.

Rear bed knife adjustment bolts have square heads, a short stamped out open end wrench required.

RECOMMENDED SPARE PARTS

For DS-22 System:

1 – Set of Rotor Knives and Screws

1 – Set of Bed Knives and Screws

1 – Screen or Set of Screens

1 – Set of Belts

1 – Set of Fuses

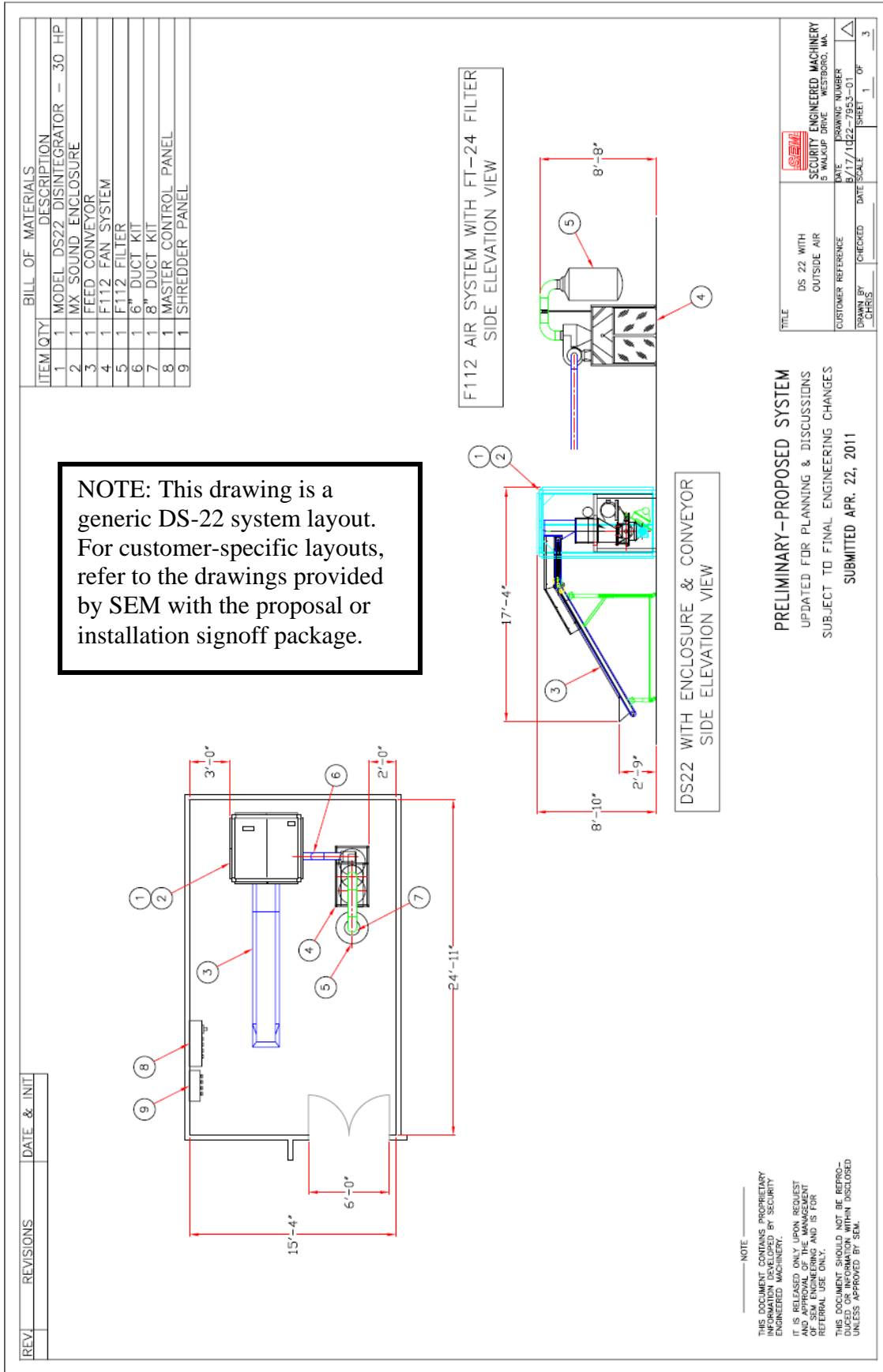
1 – Set of Motor Starters Heaters

1 – Fan/Cyclone Filter Bag (optional)

NOTE: Refer to part numbers when ordering replacement parts. Check the parts carefully as knives and screens generally have their numbers etched or stamped on them. The serial number of the machine will also be required when ordering parts from SEM. This listing of recommended parts does not include all parts which are available for purchase. The SEM Parts Department can be reached via a toll free number (1-800-225-9293) or www.semshred.com.

WARNING: The use of replacement parts not manufactured or approved by SEM may void the products' warranty.

BASIC LAYOUT WITH SINGLE F112 FAN SYSTEM



BASIC LAYOUT WITH DUAL F112 FAN SYSTEM

REV	REVISIONS	DATE	INIT

ITEM	QTY	DESCRIPTION
1	1	MODEL DS22 DISINTEGRATOR - 30 HP
2	1	MX SOUND ENCLOSURE
3	1	FEED CONVEYOR
4	2	F112 FAN SYSTEM
5	1	FT-24 DUST FILTER
6	1	6" DUCT KIT
7	1	8" DUCT KIT
8	1	MASTER CONTROL PANEL
9	1	SHREDDER PANEL
10	1	6" KINDT COLLINS VALVE

NOTE: This drawing is a generic DS-22 system layout. For customer-specific layouts, refer to the drawings provided by SEM with the proposal or installation signoff package.

DS22 WITH ENCLOSURE & CONVEYOR
SIDE ELEVATION VIEW

F112 AIR SYSTEM WITH FT-24 FILTER
SIDE ELEVATION VIEW

NOTE

THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION DEVELOPED BY SECURITY ENGINEERED MACHINERY. IT IS RELEASED ONLY UPON REQUEST AND APPROVAL OF THE MANAGEMENT OF SECURITY ENGINEERED MACHINERY AND IS FOR REFERENCE USE ONLY. THIS DOCUMENT SHOULD NOT BE REPRODUCED OR INFORMATION WITHIN DISCLOSED UNLESS APPROVED BY SEM.

PRELIMINARY-PROPOSED SYSTEM

UPDATED FOR PLANNING & DISCUSSIONS

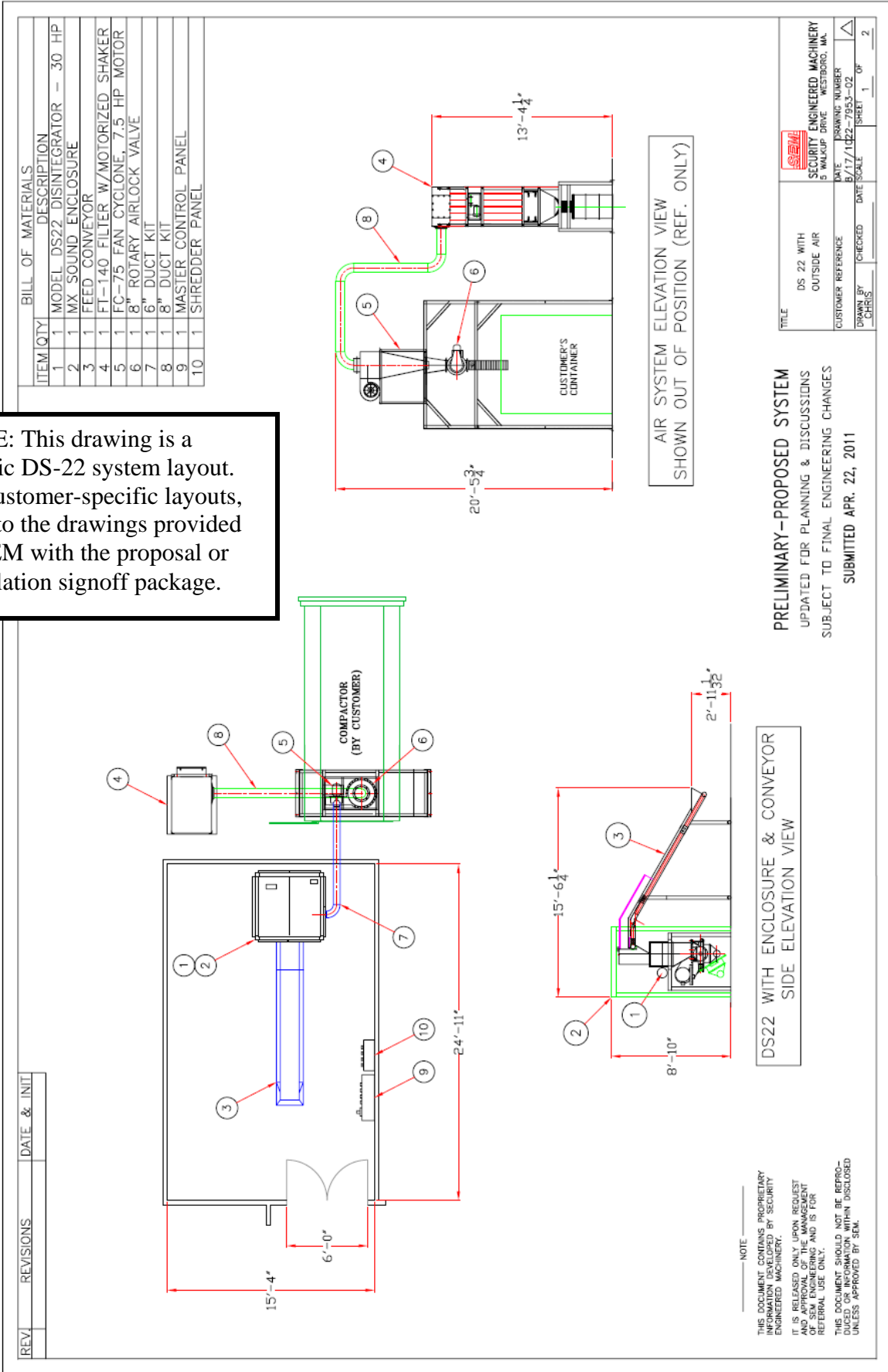
SUBJECT TO FINAL ENGINEERING CHANGES

SUBMITTED APR. 22, 2011

TITLE	DS 22 WITH OUTSIDE AIR	SECURITY ENGINEERED MACHINERY	BY	DATE	SCALE	SHEET	OF

BASIC LAYOUT WITH OUTSIDE AIR SYSTEM

NOTE: This drawing is a generic DS-22 system layout. For customer-specific layouts, refer to the drawings provided by SEM with the proposal or installation signoff package.

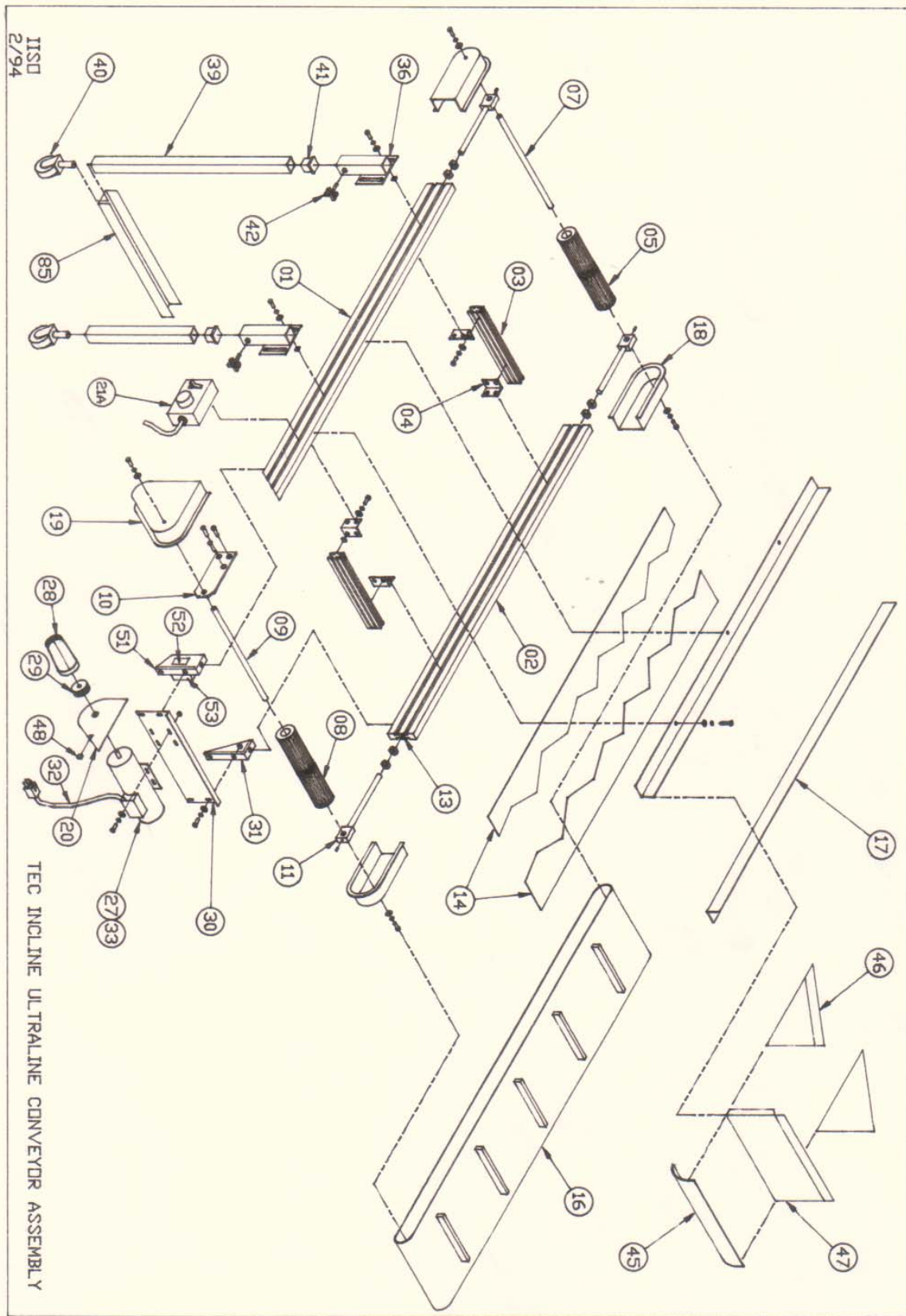


CONVEYOR PARTS LIST

TEC INCLINED ULTRALINE CONVEYOR PARTS LIST

KEY	PART NAME	QUANTITY
1	Frame Drive Side	1
2	Frame Opposite Side	1
3	Crosstie	2 Minimum
4	Connector Angle	4 Minimum
5	Free Roll Assembly	1
7	Free Roll Shaft	1
8	Drive Roll Assembly	1
9	Drive Roll Shaft	1
10	Drive Roll Plate	1
11	Thd. Roller Support Assembly	3
13	Support Assembly Sleeve	3
14	Belt Pan	1 Minimum
15		
16	Conveyor Belt	1
17	Side Rail	2
18	End Cap Guard	3
19	Chain Guard	1
20	Inside Guard	1
21A	DC Variable Speed Control (Optional)	1
23		
27	Motor Assembly	1
28	Drive Chain	1
29	Sprocket	1
30	Motor Mounting Plate	1
31	Motor Plate Bracket	2
32	Line Cord	1
33	Strain Relief Bushing	1
35		
36	Leg Bracket Assembly	4
37		
38		
39	Leg Tube	4
40	Caster	4
41	End Cap	4
42	Knob	4
43		
44		
45	Hopper Flapper	1
46	Hopper Sides	2
47	Hopper End	1
48	U Nut	3
51	Switch Bracket	1
52	Rocker Switch	1
53	Switch Box	1
85	Leg Tie	1

CONVEYOR ASSEMBLY DRAWING



SEM PRODUCT WARRANTY

SEM warrants, for a period of time listed below from date of shipment, that product will be free from defects in material and workmanship when used under normal operating conditions. Excluded from warranty coverage are normal wear items and electrical components. These items include and are not limited to Knives, Cutters, Belts, Chains, Switches, PC Boards, Optics and other electrical contactors. These items are not included for consideration unless the components are deemed defective. Any purchased part used in the assembly of a SEM System will carry the manufacturer's original warranty for the original SEM customer. Warranty does not cover damages by freight handlers, misuse, neglect, acts of nature, unauthorized modifications or the use of other than the factory SEM components.

WARRANTY TIME PERIOD

New Disintegrator System

Disintegrators	Lifetime parts, 90 days labor
Waste Collection System and Accessories	1 Year parts, 90 days labor

Remanufactured Disintegrator System

Disintegrator	3 Years parts, 90 days labor
Waste Collection System and Accessories	1 Year parts, 90 days labor

Reconditioned Disintegrator System

Disintegrator	1 Year parts, 30 days labor
Waste Collection System and Accessories	6 months parts, 30 days labor

Shredder Units ~ New & Demo

High Security Cross-Cut	1 Year parts, 90 days labor, 1 Year cutting head
Executive Deskside*(i.e. 1324 Series)	1 Year parts, 1 Year SEM factory labor
All other shredder units	3 Years parts, 90 days labor, 6 Years cutting head
Automatic Oilers	1 Year parts, 90 days labor

Reconditioned Shredders

All Units	1 Year parts, 30 days labor
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Fixed Magnet Degaussers

Model P3 Series	5 Year parts, 90 days labor
Model P2V	1 Year parts, 90 days labor
All other models	2 Year parts, 90 days labor

CD Declassifiers and IT Data Erasers

All units	1 Year parts, 30 days labor
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Hard Drive Crusher

Model 0101 Sledgehammer	1 Year parts, 90 days labor
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Hard Drive Shredder

Model 0301 Jackhammer	2 Year parts, 90 days labor
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*All warranty labor will be performed at SEM factory, Westboro, MA

WARRANTY PARTS RETURN

Warranty is conditional on notification to SEM's Customer Service Department by calling (800)225-9293. All materials being returned for warranty credit must have the requested Return Goods Authorization number from the Customer Service Department, and must be returned within 30 days after the discovery of the defect. All shipping costs on returned material must be prepaid by the customer. Cartons must be marked on the outside with the RGA number and "Warranty Parts". For executive model shredders, SEM, at our discretion reserves the right to repair or replace unit covered under warranty.



Security Engineered Machinery Co., Inc. Product Information



Paper Shredders, Disintegrators/Industrial Shredders

- Contract Number: GS-02F-0111P
- Contract Period: October 1, 2006 to September 30, 2011
- C3615 Shredders / Degaussers
- C3615 Accessories/Attachments for Shredders and Disintegrators
- C3615 Spare parts for Shredders and Disintegrators
- C3615 Disintegrators
- C3615 Remanufactured Disintegrators



**Paper Shredders • Disintegrators • Security Containers • Optical Media
Declassifiers
Shredding / Destruction Services**

For detail product information including all application and specifications, contact our Customer Service Department at 1-800-225-9293 or visit us on line at www.semshred.com for commercial customers and www.fedshred.com for government customers.