



Security Engineered Machinery Co., Inc

OPERATIONAL & MAINTENANCE MANUAL

SEM Model 800 Series



As of May 1, 2009

Security Engineered Machinery Co., Inc

NATIONWIDE SERVICE

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UNLOADING/UNPACKING

Your new SEM shredder has been secured to a pallet for shipping. Please inspect equipment immediately for shipping damage.

- Using a lift truck with a minimum capacity of 1500 pounds, remove the machine from the carrier and transport to operation site. Remove pallet and discard responsibly. The feed tables and optional discharge hoop are located in a box on top of the shredder pallet.
- All light duty machines are equipped with casters for ease of handling.
- Remove all guards (see fig. 2, page 19) and inspect interior of machine for shipping damage. Check oil level in reducer (see fig. 4, page 21). Add oil if necessary. See lubrication section on page 12.
- After inspection, reinstall all guards including feed table and optional discharge hoop. A bag must be installed in the hoop before starting to shred.

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ELECTRICAL INSTALLATION

All electrical installation and service must be accomplished by a qualified electrician. Follow all national and local electrical codes and ordinances.

“WARNING”

LOCK POWER IN OFF POSITION

All internal wiring has been factory installed and tested prior to shipping. Electrical installation consists of providing adequate machine power only.

Check building service to ensure correct voltage is available and that current requirements can be met.

Install receptacle (provided) to properly protect building circuit. Select appropriate wire size and current protection to accommodate current requirements as shown on nameplate. Plug in power cable.

Clear all personnel from machine area. Ensure machine is clean and no tools, rags, or debris have been left on conveyor belt or near cutters or drive mechanism.

Turn building service drop power on. Check voltage at installed receptacle.

Ensure area is clear. Turn key switch on. Jog reverse. Check for proper motor rotation. If rotation is wrong, unplug power cable. Check that power is off with voltage meter at panel. Remove any two power wires from the motor starter, reverse and reconnect.

Clear area, turn on power and recheck rotation.

Electrical installation is complete. Lock out building disconnect.

Replace all guards.

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SAFETY WARNINGS

1. Read and understand instruction manual and be aware of all warning stickers.
2. Make sure that ALL guards and access panels are in place at all times, **EXCEPT** when the power is locked off for maintenance work or cleaning.
3. **ALWAYS** know where emergency stop buttons are located.
4. **ALWAYS** know, or have quick access to, emergency phone numbers.
5. **ALWAYS** ensure that all maintenance and operating personnel read and understand this manual, including those personnel working second or third shift.
6. **ALWAYS** have a standard break-in time for a new operator A minimum of two hours suggested.
7. **ALWAYS** wear safety glasses when operating shredder.
8. **ALWAYS** "lock out" power at the, disconnect when shredder is not in use, when servicing shredder, or when performing routine shredder maintenance including cleaning.
9. **NEVER** operate this or any other machine while under the influence of drugs, alcohol or medications.
10. **NEVER** wear loose fitting clothing, ties, or jewelry while in the vicinity of this shredder.
11. **NEVER** allow long hair to be worn in the vicinity of the machine without use of a protective hair net.

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Safety Warnings Cont...

12. **NEVER** place any part of your body in or on any part of this machine while in operation.
13. **NEVER** allow tools, rags, lunch pails, or debris to be placed on the input conveyor or on top of the machine.
14. **NEVER** change machine direction without first allowing machine to come to a complete stop.
15. **NEVER** allow other personnel within ten feet of this machine while in operation.
16. **NEVER** remove guards, perform maintenance or clear jam-up debris without first locking out power disconnect.
17. **NEVER** allow horseplay around machine.
18. **NEVER** remove paper from cutter heads while power is on.
19. **NEVER** attempt to remove paper from input conveyor after paper has begun to move toward cutter head.
20. **NEVER** hold forward button in the depressed position.

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START-UP PROCEDURE

Pre-start-up procedure (see fig. 1, page 18)

- ⊞ Familiarize yourself with all controls and button locations.
- ⊞ Ensure that all guards and covers are in place.
- ⊞ Ensure the area is clean.
- ⊞ Check input conveyor for debris, discarded tools, etc.

Start-up

Plug power cable into installed receptacle. Turn key switch on. Depress momentarily the Forward pushbutton. Cutters will begin to rotate, conveyor will begin to run forward and crusher blades will rotate.

For machines equipped with optional automatic cutter lube system, depress Lube pushbutton momentarily and allow machine to run for approximately four minutes without feeding material to be shredded. This allows time for cutter lubrication to be accomplished without soaking the material to be shredded unnecessarily.

To stop machine at any time depress the red Stop pushbutton. For emergency situations the Stop pushbutton may be depressed at any time. For normal stop situations, wait for input conveyor to empty itself and the optional output chute or output conveyor to discharge all shredded material before depressing Stop button.

Begin feeding material to be shredded. It is recommended that during the familiarizing period the operator should proceed with small amounts of paper. After several hours experience the operator may wish to increase the amount of material being fed. The operator will soon be able to judge the efficiency of the operation and feed material accordingly. It is nearly inevitable that during this learning process the machine will jam. A jam condition will automatically turn off the machine just as if the operator had depressed the Stop button. This is normal.

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CLEARING A PAPER JAM

Should a jam occur, the machine will turn itself off, ensure that all personnel are clear of both the input conveyor and the cutter head.

Momentarily depress the yellow Reverse pushbutton. This will cause both the conveyor and the cutters to run backwards for as long as the Reverse pushbutton remains depressed.

Release the Reverse pushbutton. The machine will come to a stop. After the machine has completely stopped, remove some of the offending material.

Re-start machine in the forward direction to resume operation.

NOTE:

This machine has been engineered to allow paper to be fed with paper clips, staples, fasteners, credit cards, aluminum offset plates and similar materials without harm to the machine.

SHUT-DOWN PROCEDURE

Allow input conveyor and optional output chute or output conveyor to clear all material before shut down.

Depress red Stop pushbutton. Remove power cable from receptacle.

Clean any remaining debris from the machine and from the immediate area.

Remove top guard and inspect cutters for damage.

Clear any shredded paper from cutter area. Pull tray from lower front of machine and empty.

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MAINTENANCE

Cleaning

ALWAYS lock off power before cleaning, lubricating, maintaining, removal of any guard, and after shredding operation is complete.

Daily cleaning: (After each 8 hours of operation)

- Remove top guard (see fig. 2, page 19).
- Remove paper buildup from cutters and combers (compressed air (maximum 40 PSI) or vacuum may be used).
- Visually inspect cutters for damage.
- Replace all guards.
- Remove side guard (see fig. 2, page 19).
- Remove paper buildup from crusher area and belt pulley area.
- Replace all guards.
- Empty tray (lower front of cabinet).

Weekly cleaning: (After each 40 hours of operation)

- Repeat all daily cleaning steps.
- Remove side guards and end guards (see fig. 2, page 19).
- Remove paper buildup from base.
- Wipe entire machine clean being careful to observe any evidence of oil leaks. Should leakage be observed, request the attention of the appropriate maintenance personnel.
- Check for loose hardware on the reducer collars, the crusher paddles, etc.
- Remove all tools, rags, solvents from machine.
- Replace all guards.

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LUBRICATION

ALWAYS lock off power before cleaning, lubricating, maintaining, removal of any guard, and after shredding operation is complete.

Daily lubrication: (After 8 hours of operation)

- Machines equipped with auto cutter lube, depress Cutter Lube button momentarily while machine is running and allow machine to run empty for approximately 4 minutes.
- Check oil level in auto cutter lube reservoir. (Level can be seen through a slot in guard just below the fill tube.)
- Machines not equipped with auto cutter lube follow the steps listed below.
- Remove top guards (see fig. 2, page 19).
- Apply light machine oil to cutters.
- Replace all guards.

Weekly lubrication: (After each 40 hours of operation)

- Repeat steps from daily lubrication.
- Remove guards (see fig. 2, page 19).
- Apply oil to drive chains (see fig. 3, page 20). Use chain and cable lubricant.
- Replace all guards.
- Fill auto cutter lube reservoir with SAE 20W Non-Detergent oil. (For machines equipped with auto cutter lube only).

Monthly lubrication: (After each 173 hours of operation)

- Repeat steps from weekly lubrication.
- Remove guards (see fig. 2, page 19).
- Check reducer oil level by loosening the top jam nut and adjusting nut on torque rod enough to pivot the reducer to the horizontal position (see fig. 4, page 21). Remove level plug. Oil will run out if filled to proper level. The proper level is to bottom of plug. **DO NOT OVERFILL.**
- Lubricate spur gears.

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- Apply lubricant directly to teeth of both spur gears liberally. (Use heavy duty open gear lube.
- Replace all guards.

Annual lubrication: (After 2080 hours of operation)

- Repeat steps from monthly lubrication.
- Drain oil from reducer by removing plug "D" (see fig. 4, page 21).
- Clean magnetic drain plug.
- If excessive metal filings are detected on the magnetic drain plug, flush reducer with cleaning solvent (kerosene).
- Replace drain plug and refill to proper level using a high grade petroleum base, rust and oxidation inhibited gear oil SAE 40W. (AMOCO Industrial Oil No. 150 or equivalent.)

CAUTION:

Too much oil will cause over heating, and too little oil will result in gear failure. Check oil level monthly. Also, under extreme operating conditions, such as rapid rise or fall of temperatures, dust, dirt, chemical particles, chemical fumes, or oil temperatures above 200 degrees F., the oil should be changed every one to three months depending on the severity of conditions.

CONVEYOR BELT ADJUSTMENT

NOTE:

Belt may run slightly off center. When machine is run in reverse, the belt may run slightly off center to the opposite side. This is normal. **The belt may stretch during the first few days of operation.** This will affect alignment since the belt alignment relies in part on proper tensioning for effective tracking.

Alignment and Tensioning

- Read all safety warnings (see page 8) before proceeding.
- Lock power off.
- Remove both end guards and side guards from input conveyor (see fig. 2, page 19).
- Replace end guards

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- - ⊞ All rollers and pulleys must be set square with the frame before making any belt tracking adjustments. All guards should be in place (**except** conveyor side guards) before proceeding.
- Mark the initial position. Make all adjustments in small increments.
 - ⊞ By design, the conveyor belt should have 1/16" or less clearance to side frames. This assists in preventing paper from getting under the belt but some side rubbing may be expected. This is normal.
- Loosen jam nuts, each side of machine (see fig. 5, page 22).
- Turn jam nuts half turn each side, repeating until belt is at proper tension.
- Ensure all personnel are clear and that no tools are on machine or input conveyor.
- Turn power on.
- Run machine in Forward.
- Stop machine and turn power off.
- Adjust alignment by tightening take-up bolt on side of conveyor where belt is rubbing side frame. Tighten only one quarter turn at a time.
- Tighten jam nuts.
- Replace all guards.
- Turn power on.
- Run machine forward for five minutes. If further alignment is required, repeat the above steps.

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DRIVE BELT ADJUSTMENT

- Lock power off.
- Remove guard, drive side (see fig. 2, page 19).
- Check sheave alignment by placing a straight edge or a stretched string across the sheave faces so that it touches all four points of contact. **Misalignment of more than one half of one degree (1/8" in 12") may adversely affect belt life, cause belt rollover, and/or cause internal belt damage.**
- Ideal tension is the lowest tension at which the belt will not slip under peak load conditions.
- **Check tension frequently during the first 48 hours of run-in operation.**
- Over tensioning shortens belt and bearing life.
- Keep belts free of foreign material which may cause slippage.
- Make V-drive inspection on a periodic basis. Tension only when slipping. Never apply belt dressing as this will damage the belt and cause early failure.
- Adjust tensioning by measuring the distance between sheaves center to center. At the midpoint between centers, apply a force (perpendicular to the span) large enough to deflect the belt 1/64" for each inch of span length. For example, the deflection of a 100 inch span would be 100/64 or 1-9/16 inches. Compare this measured force to the accompanying chart. If the force is between "normal" and 1-1/2 times "normal", the drive tension would be satisfactory. A force below the "normal" value indicates an under-tensioned drive. If the force is more than 1-1/2 times "normal", the drive is tighter than it needs to be.

Model No.	Deflection	Normal	New Belt
AMS-300	3/8"	10.5 lbs	15.8 lbs
AMS-500	3/8"	15.9 lbs	21.9 lbs
AMS-750	3/8"	15.9 lbs	21.9 lbs

(See Fig. 9, page 25)

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- To adjust belts, loosen the jam nuts (both top and bottom) and the lower lock nut on the reducer torque arm.
- Turn the upper lock nut until proper tension is achieved.
- Re-tighten lower lock nut and both jam nuts.
- Replace all guards.

NOTE:

Purchase of Dodge V-belt tester, Model #109082 is recommended.

CHAIN SAG

Chain drives have fixed centers and are not equipped with either take-ups or adjusting features. (Chain sag is permissible within the limits shown on fig. 6, page 23).

Chain sag distances may be measured by placing a straight edge across the two sprockets being checked.

- Lock power off.
- Remove access guard (see fig. 2, page 19).
- Check chain sag according to figure 6, page 23.
- Loosen two bolts on idler sprocket, and slide toward the chain only enough to take up sag.
- Replace chain if stretched beyond the limits shown in figure 6.
- Retighten bolts on take-ups.
- Replace all guards.

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TORQUE LIMITER

Torque limiters are used to drive the crusher mechanism and the input belt conveyor and act as a safety device to protect against inadvertent overloads. They are factory preset and should not require field adjustments.

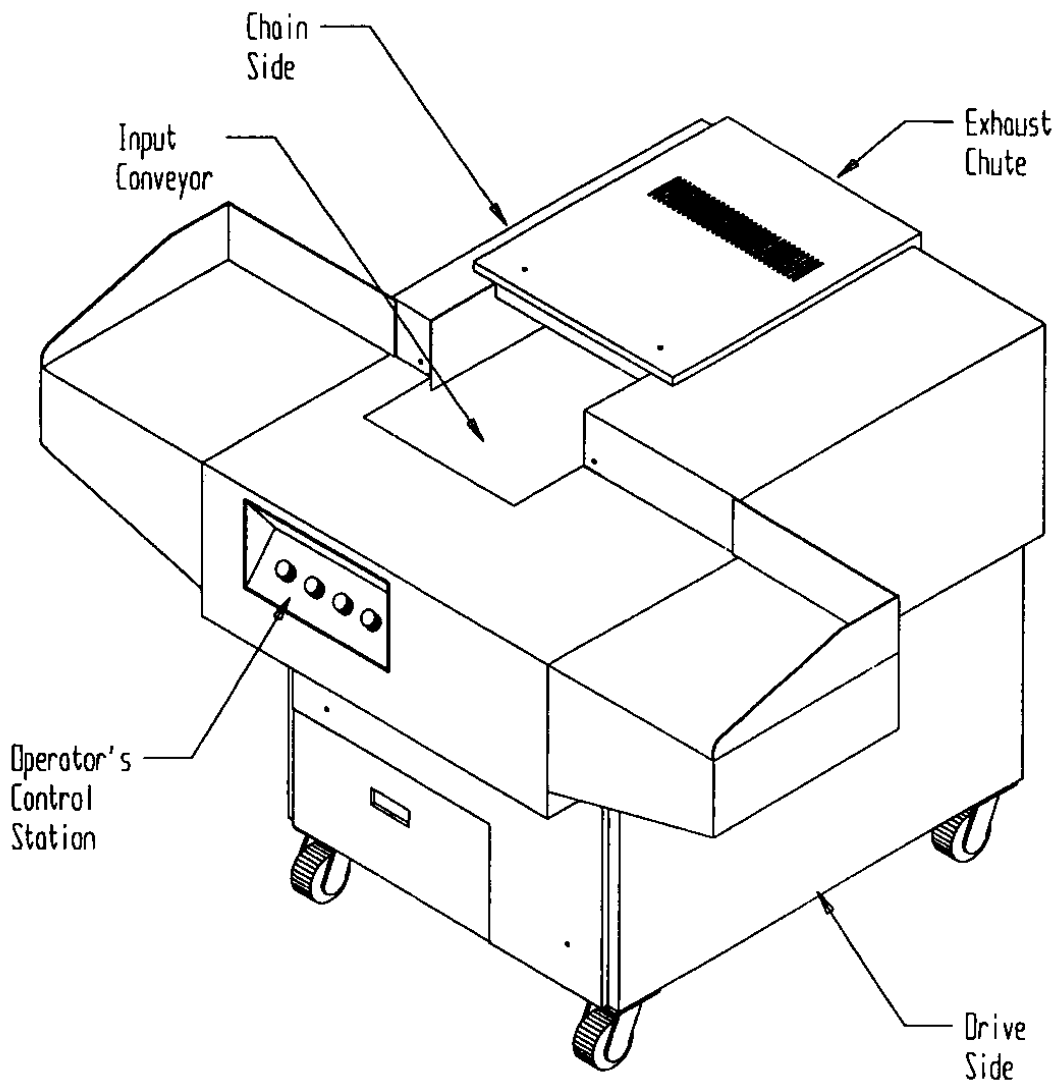
To ensure proper operation, the friction discs must be kept clean and free of oil and moisture.

Before presuming torque limiter requires adjustment, check for paper buildup and other conditions, such as bearing failures and proper belt alignment.

Should adjustment be required, the following procedure is recommended.

- Tighten hex nut to a "finger tight" position (see fig. 7, page 24).
- An additional half turn will closely approximate the factory setting.
- An additional 1-2/3 turns will result in the maximum torque setting.
- Should sprocket replacement be necessary, sprocket should be ground flat and parallel with a surface finish of 65 to 125 micro-inches.
- With new sprocket installed, provide a five minute run-in period at minimum torque before final adjustment.

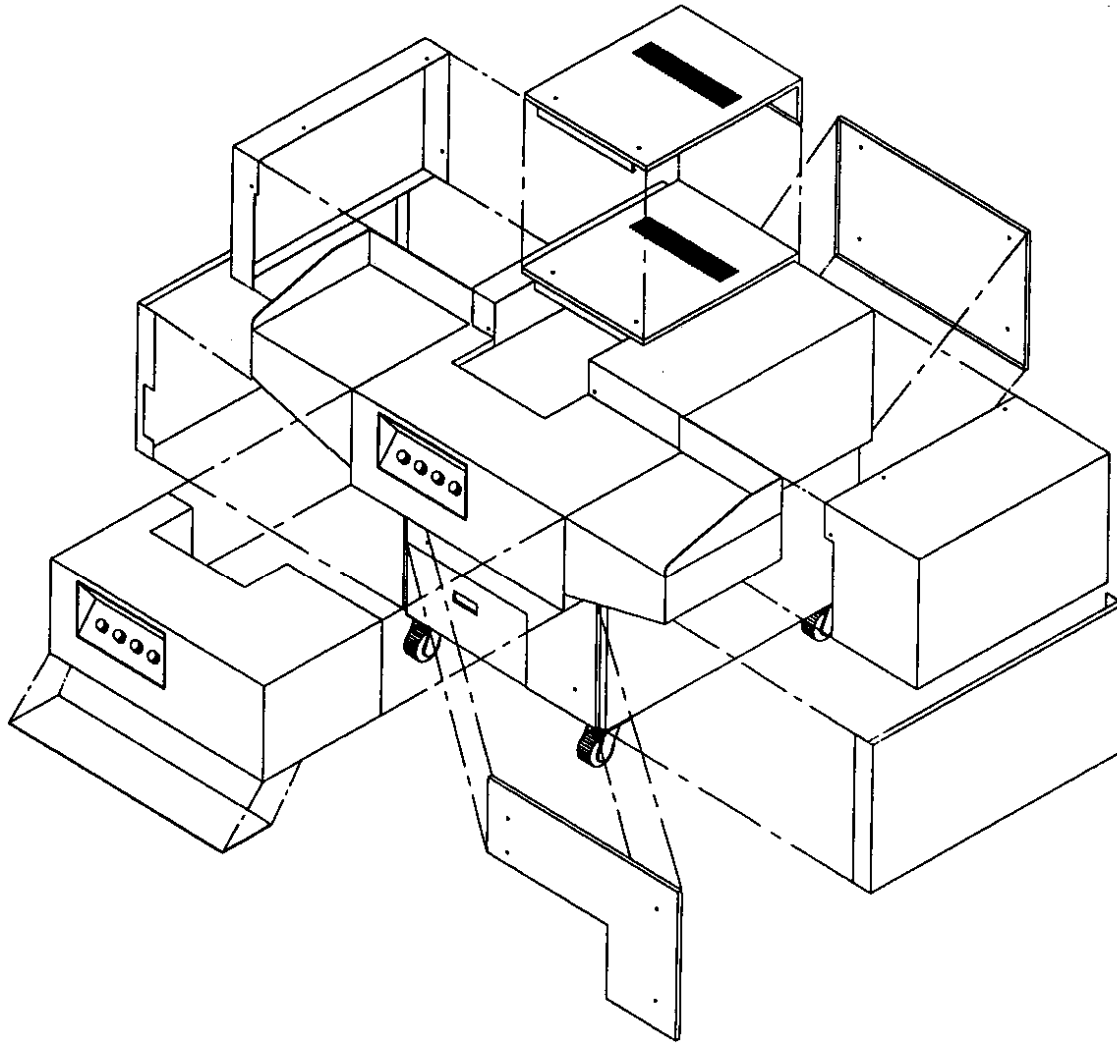
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SHREDDER OPERATION

Figure 1

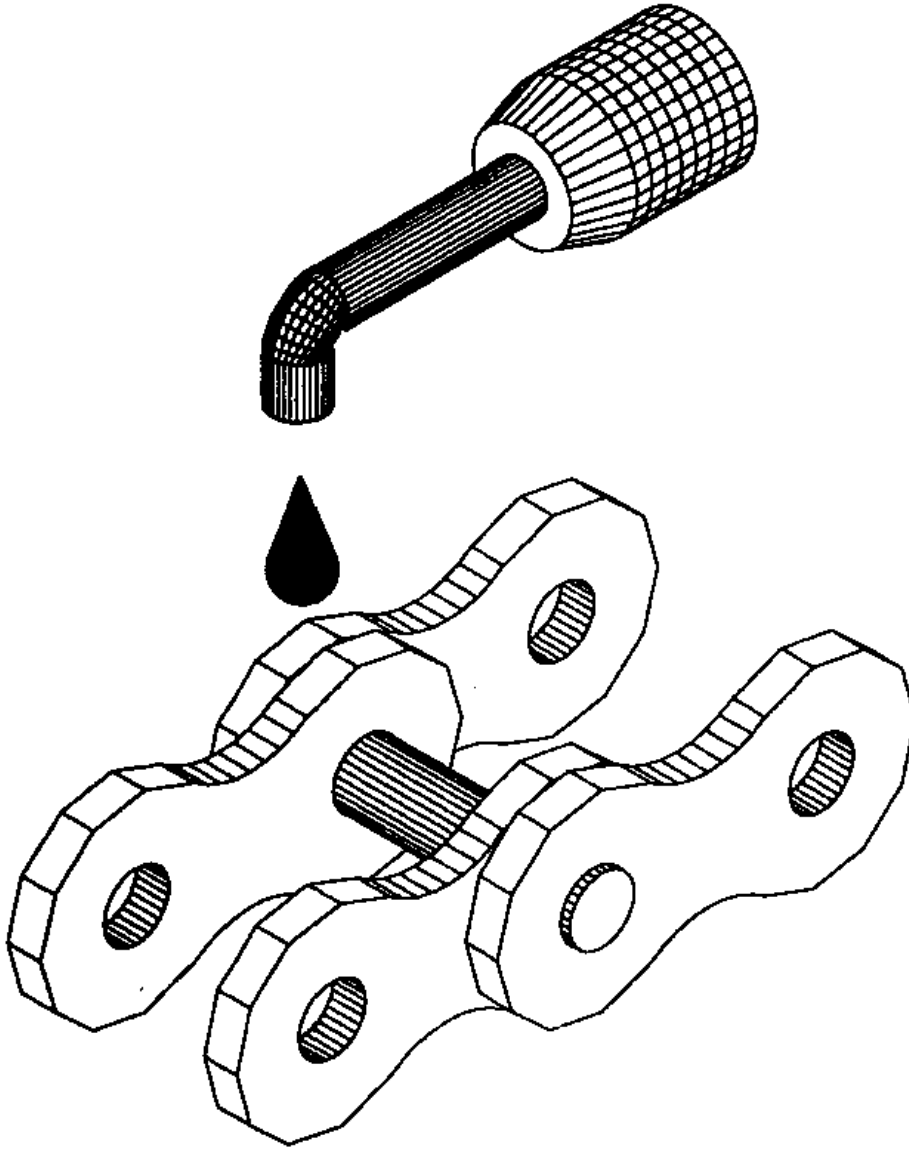
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GUARD IDENTIFICATION

Figure 2

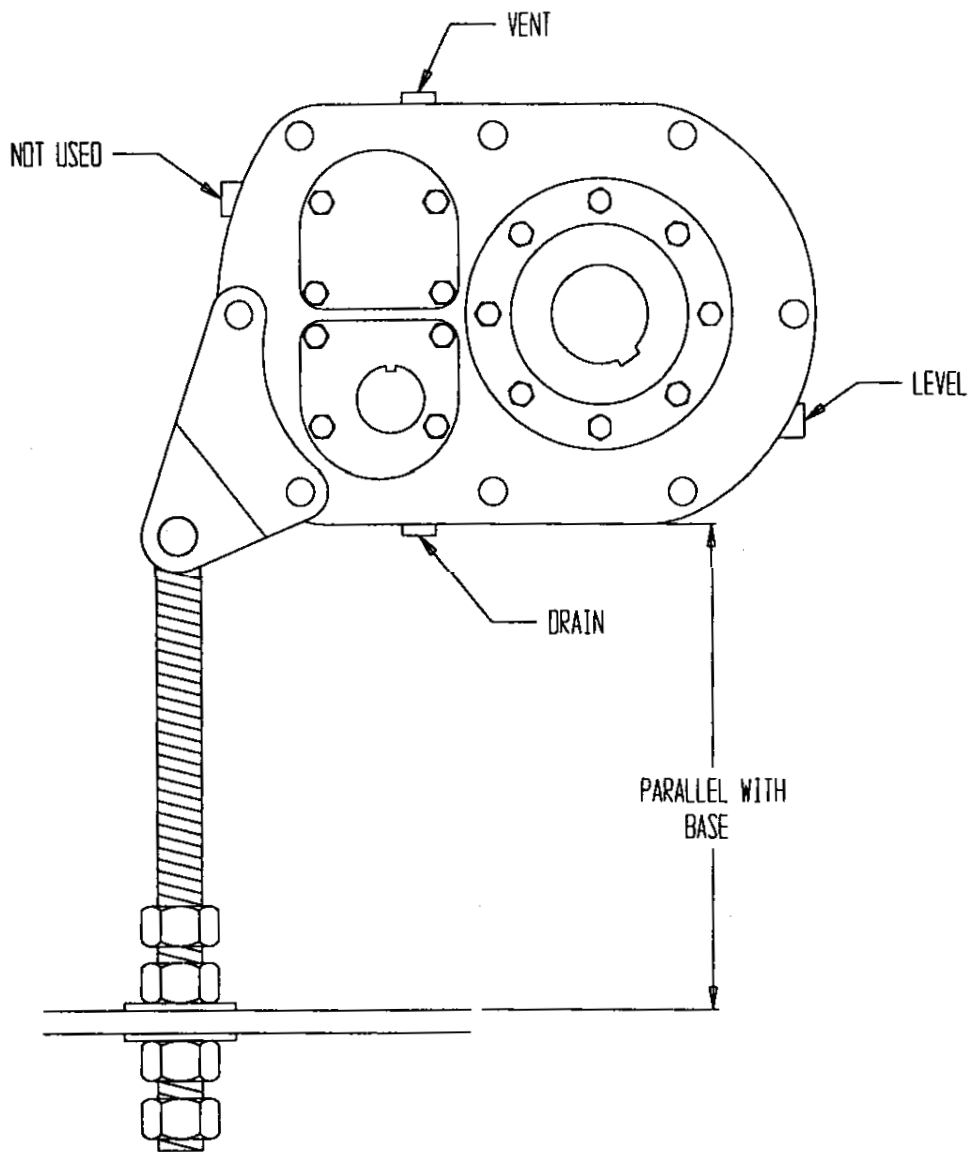
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CHAIN LUBRICATION

Figure 3

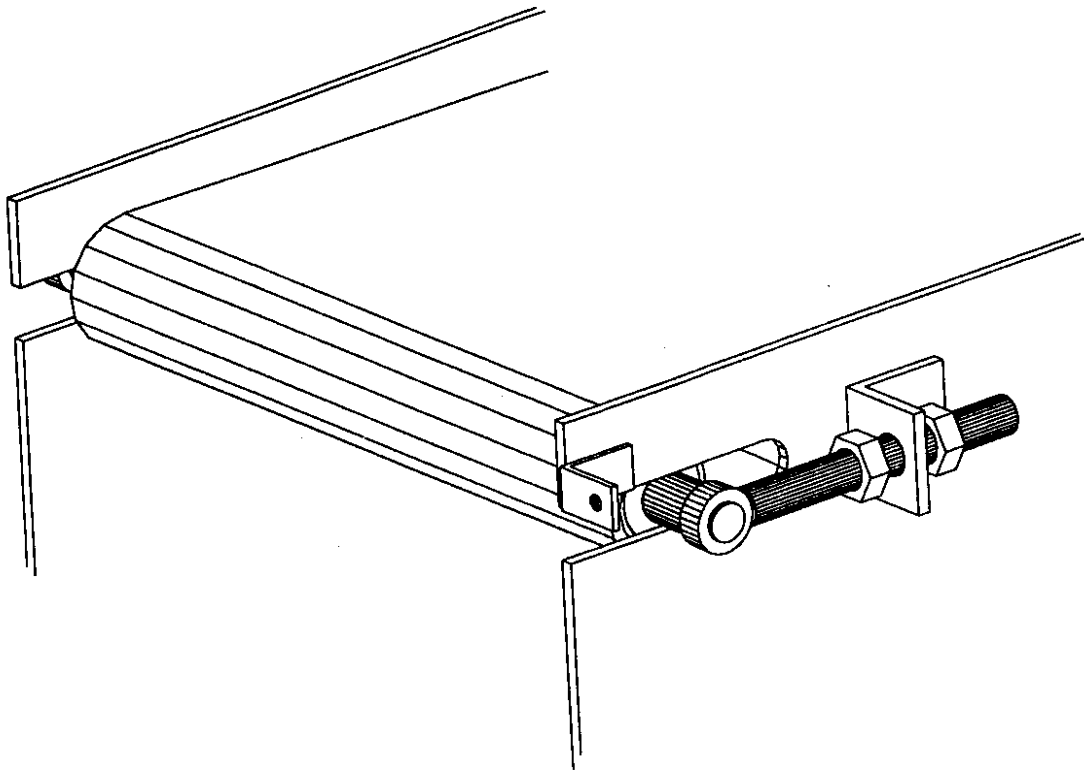
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REDUCER LUBRICATION

Figure 4

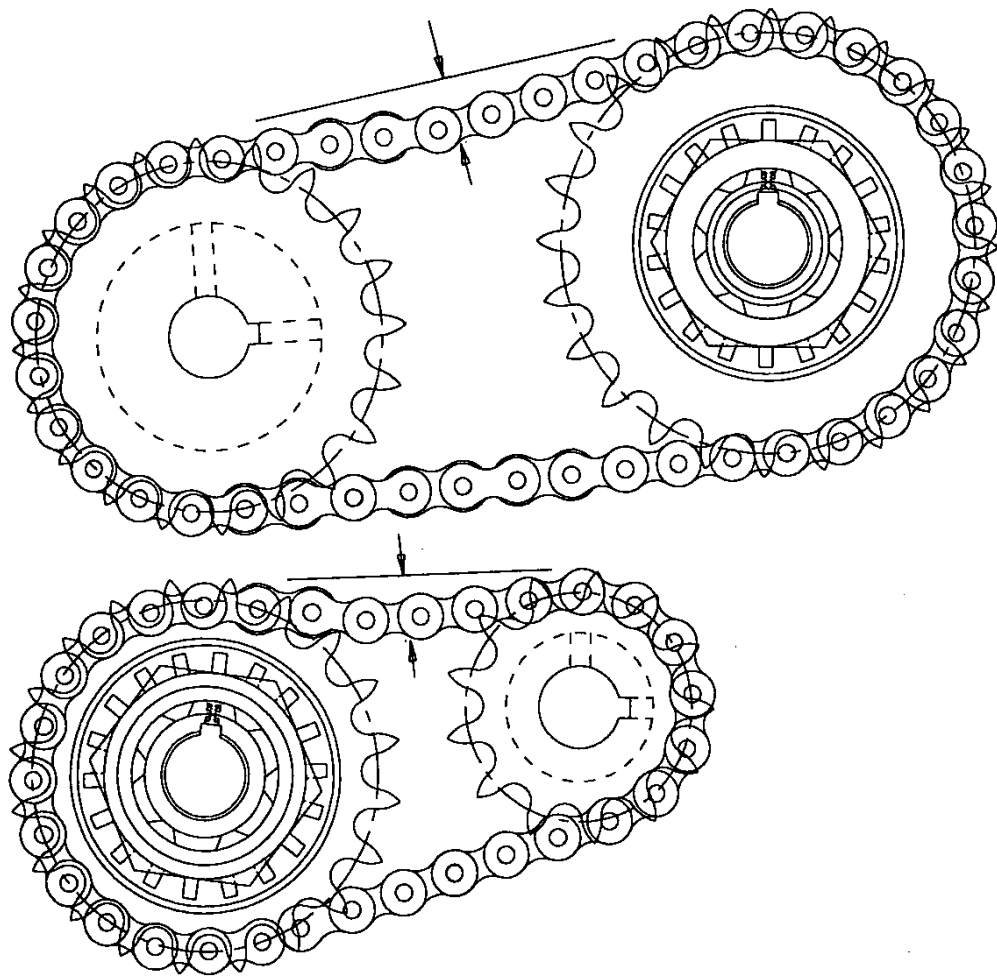
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CONVEYOR BELT TAKE UP

Figure 5

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CHAIN SAG

Figure 6

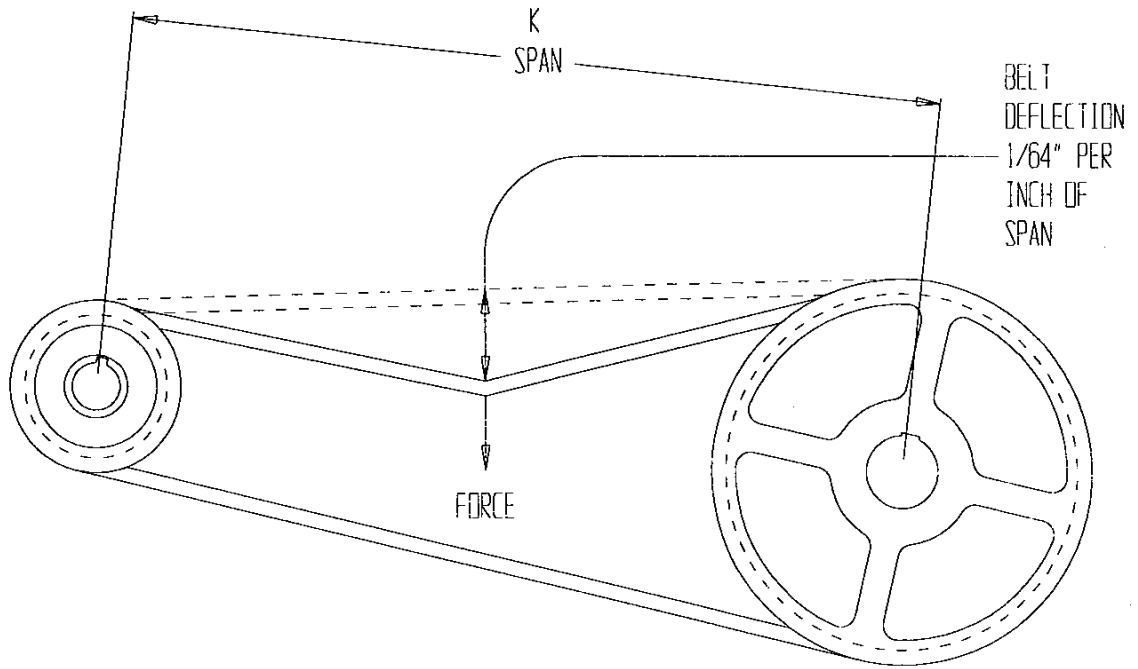
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TORQUE LIMITER CLUTCH

Key	Req'd	Part No.	Description
1	1	SA103468	Sprocket – Input Conveyor 20 Teeth
2	1	SA103469	Sprocket – Crusher Shaft 24 Teeth
3	2	SA103515	Fiber Disc
4	1	SA103517	Spring Washer
5	1	SAGL 303642	Adjusting Nut
6	1	SA103514	Bushing
7	1	SA101307	Set Screw
8	1	SAG L325112	Steel Hub
9	1	SAGL100812	Lock Washer
10	2	SAGL303445	Pressure Plate
11	--	SA103508	Complete Torque Limiter – Less Sprocket

Figure 7

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DRIVE BELT ADJUSTMENT

Figure 9

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Troubleshooting

“WARNING”

LOCK OUT POWER before performing any cleaning, oiling, maintenance, or trouble shooting.

PROBLEM	POSSIBLE CAUSE	REMEDY
Machine will not turn off using stop buttons.	<p>Defective stop button.</p> <p>Contacts burned together in reversing contactor.</p>	<p>Check continuity (N.C.) If bad, replace.</p> <p>Check each leg of forward side of contactor for continuity. There should be no continuity. If there is, consult factory for replacement part.</p>
Machine will not run in forward or reverse.	<p>If power light is illuminated, proceed to possible cause seven.</p> <p>1) No power.</p> <p>2) Key switch off.</p> <p>3) Fuse blown in disconnect.</p> <p>4) Overload tripped in panel.</p>	<p>Check power supply.</p> <p>Turn on.</p> <p>Remove each fuse and check for continuity. If bad, replace.</p> <p>Reset.</p>

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Troubleshooting (continued)

PROBLEM	POSSIBLE CAUSE	REMEDY
Machine will not run in forward or reverse. (continued)	5) Control transformer fuse blown. 6) Stop button stuck "in". 7) Loose wire in panel. 8) Defective contact block on stop button.	Remove fuse and check for continuity. If bad, replace. Check buttons. Check terminal strip for disconnected or loose wires. Reconnect and tighten loose wires to proper location on strip. Check block for continuity. If bad, replace.
Motor hums or buzzes, but will not turn in either forward or reverse.	One leg of the 3 phase power is dead (single phasing). Contacts burned in contactor and not making a connection on one leg. Defective motor.	Remove each fuse. Check for continuity in the power supply and disconnect. Consult factory for replacement contactor. Consult factory for replacement motor.
Overload tripping.	Low voltage. Current relay set too high.	Check voltage. Consult factory.

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Troubleshooting (continued)

PROBLEM	POSSIBLE CAUSE	REMEDY
Overload tripping. (continued)	Motor overheating.	Check motor cooling fan for objects obstructing air flow.
	Dirty or unlubricated cutter head.	Clean and lube.
	Defective motor.	Conduct amperage test. Consult factory for replacement motor.
Machine will not run in forward but will run in reverse.	Defective forward button.	Check contact block for continuity. If bad, replace.
	Disconnected wire on forward button.	Check and reconnect.
	Disconnected wire on current relay.	Check and reconnect.
	Current relay stuck open.	Clean relay. Free up center spool. Check continuity. If bad, consult factory for replacement relay.
Machine will not run in reverse but will run in forward.	Defective reverse button.	Check for continuity. If bad, replace.

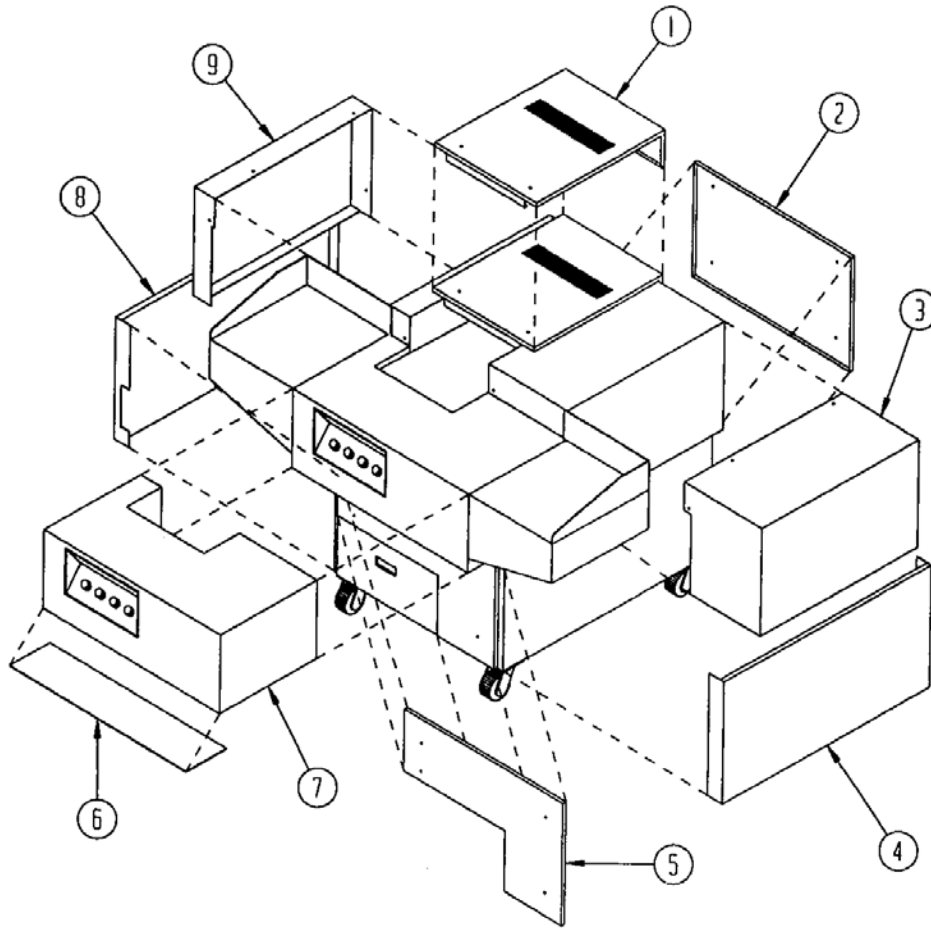
Troubleshooting (continued)

PROBLEM	POSSIBLE CAUSE	REMEDY
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<p>Machine will not run in reverse but will run in forward. (continued)</p>	<p>Disconnected wire on reverse button. Defective coil in reverse side of contactor.</p>	<p>Check and reconnect. Consult factory for replacement coil.</p>
<p>Shredding capacity is low.</p>	<p>Unlubricated cutter head. Low voltage. Current relay set too low.</p>	<p>Clean and oil cutter head. Check voltage at power supply. Consult factory before making any adjustments.</p>
<p>Motor runs, but cutters are not turning.</p>	<p>Drive belts loose. Drive belts flipped off. Drive belts broke.</p>	<p>Tighten drive belts. Check pulley alignment. Install new belts and retighten. Consult factory for replacement parts.</p>
<p>Input belt not turning.</p>	<p>Input belt loose. Broken input drive chain. Torque limiter slipping.</p>	<p>Tighten input belt. Check input conveyor for alignment, bearing failure, paper buildup and sprocket alignment. See torque limiter section (see page 17).</p>

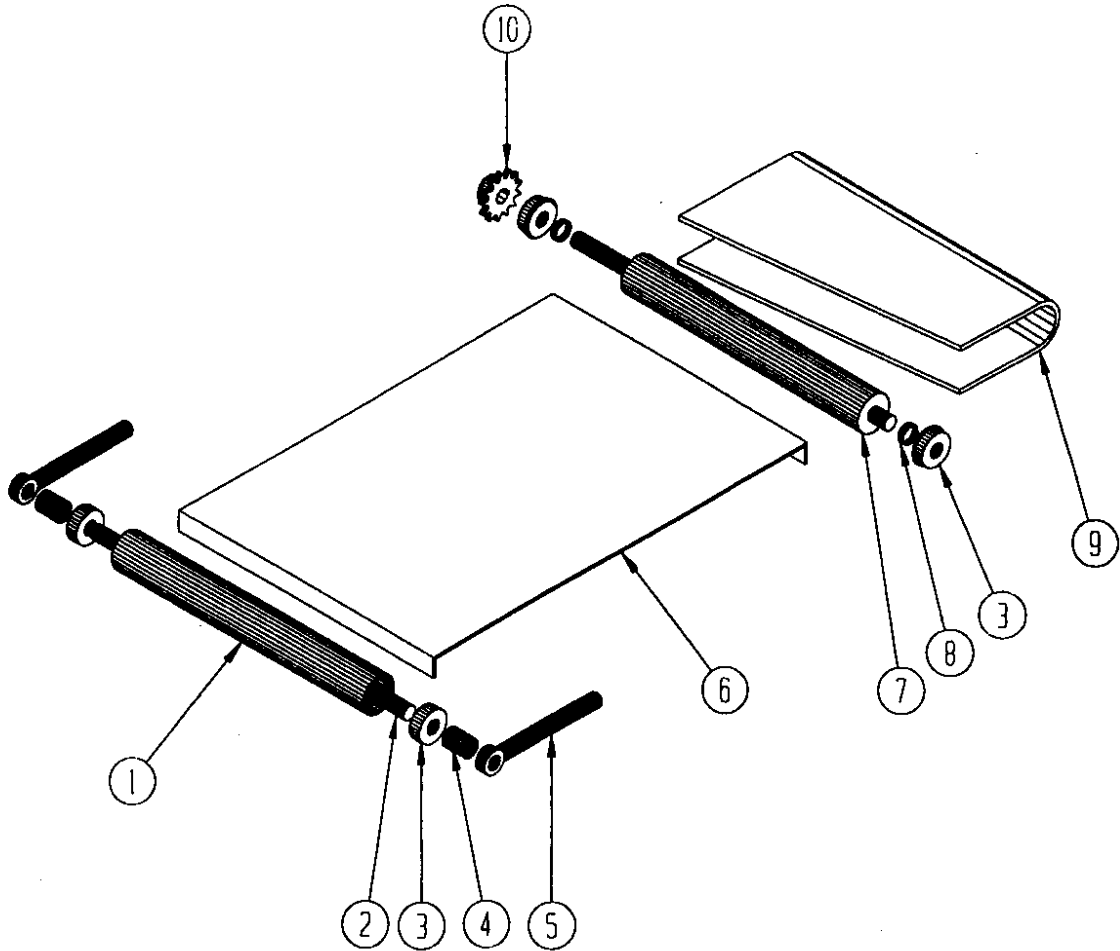
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GUARDS & COVERS

Key	Req'd	Part No.	Description
1	1	SA15022	Top Guard
2	1	SA10575	Rear Guard
3	1	SA10587	Top Right Cover
4	1	SA10573	Lower Right Cover
5	1	SA10585	Lower Front Guard
6	1	SA10583	Cover
7	1	SA10577	Front Guard
8	1	SA10574	Lower Left Guard
9	1	SA10586	Top Left Cover

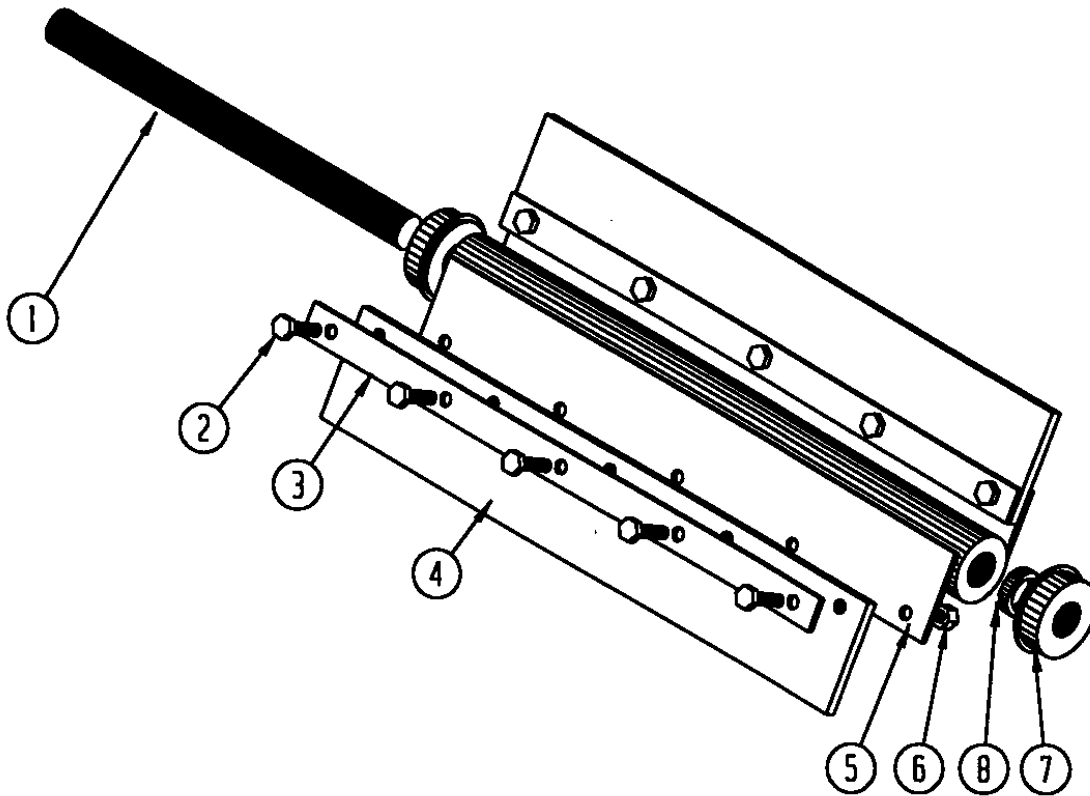
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INPUT CONVEYOR

Key	Req'd	Part No.	Description
1	1	SA10055	Tail Pulley
2	1	SA15901	Take-up Shaft
3	4	SA102002	Bearing
4	2	SA15602	Spacer
5	2	SA10056	Take-up
6	1	SA10570	Tray (Frame)
7	1	SA10054	Head Pulley
8	2	SA15601	Spacer
9	1	SA109041	Belt
10	1	SA103060	Sprocket

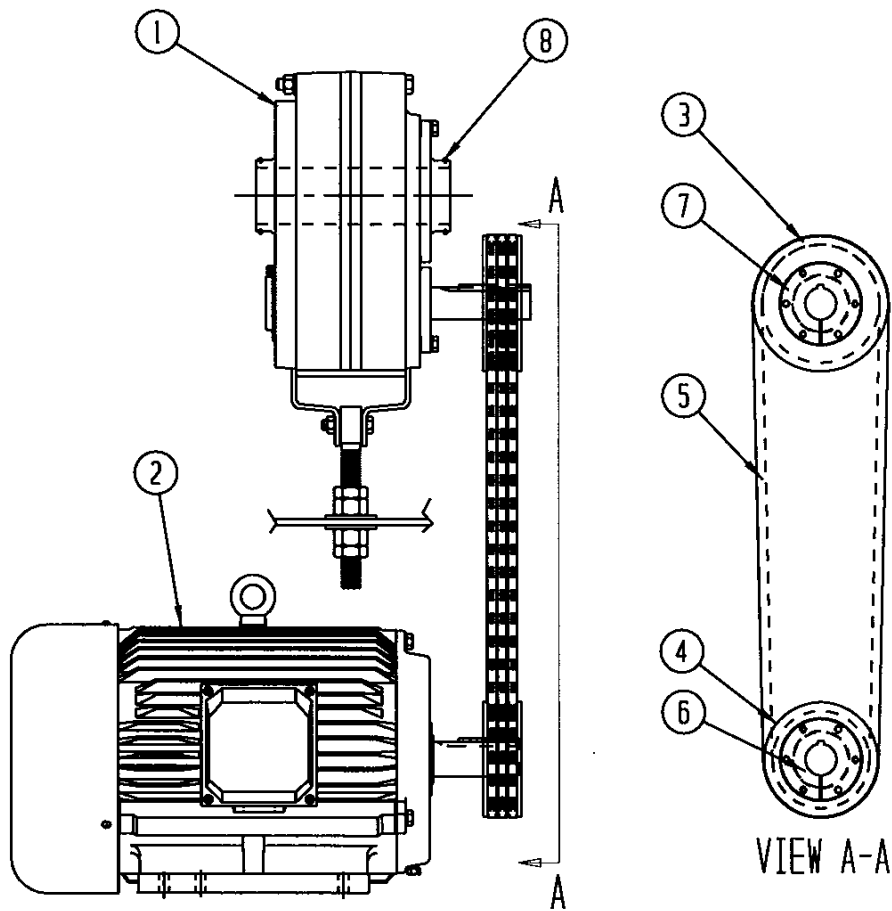
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CRUSHER ASSEMBLY

Key	Req'd	Part No.	Description
1	1	SA15001	Crusher Shaft
2	15	SA101014	HHCS – 1/4"-20 x 1" L Grade 5
3	3	SA10039	Retainer
4	3	SA10038	Paddle
5	1	SA15003	Paddle Weldment
6	15	SA101225	Nut – NYLOC – HEX 1/4"-20
7	2	SA102002	Bearing
8	2	SA15601	Spacer

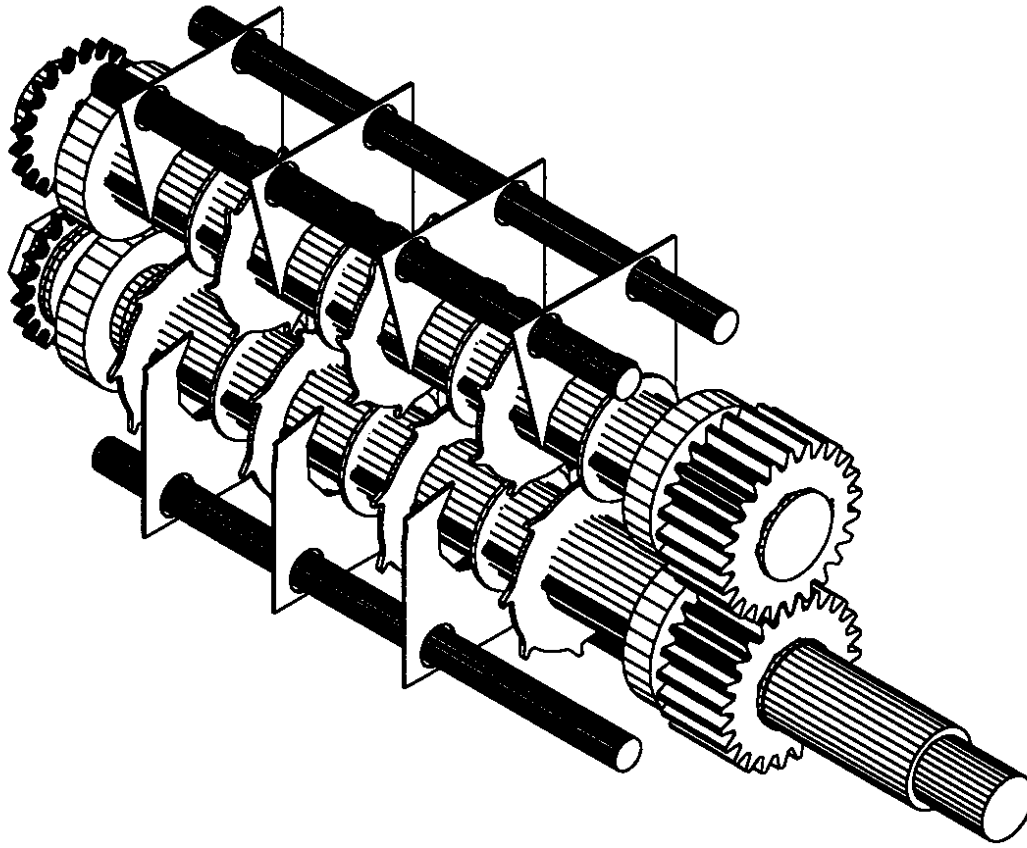
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DRIVE PACKAGE

Key	Req'd	Part No.	Description
1	1	SA103034	Reducer DODGE TXT – 425 – 24:1
2	1	SA104183	Motor 7.5 HP, 200 V – 213T Frame (208 Volt Only)
		SA104157	Motor 7.5 HP, 230/460 V – 213T Frame (230, 460 Volt Only)
3	1	SA103381	Sheave – 4.5 O.D. – 3 V – 3 Groove
4	1	SA103356	Sheave – 6.9 O.D. – 3 V – 3 Groove
5	3	SA103109	Belt – 3VX630
6	1	SA103166	Bushing
7	1	SA103036	Bushing
8	1	SA103323	Reducer Bushing

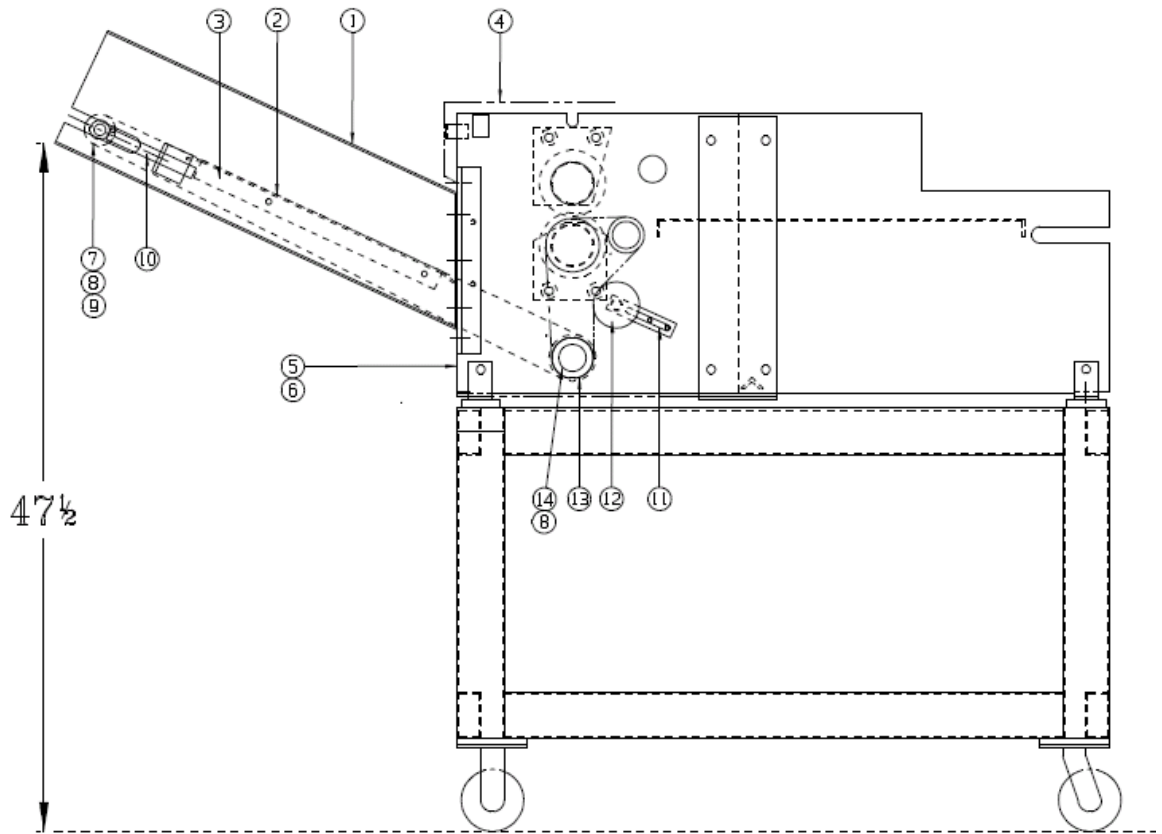
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CUTTER ASSEMBLY

Key	Req'd	Part No.	Description
1	1	SA103012	Sprocket
2	126	SA33190	Comber Spacers
3	32	SA33188	Top Comber
4	63	SA33264	1/4" x1 7/8" Crosscut Cutters
5	4	SA10032	Tie Bar
6	63	SA33190	Cutter Spacers
7	4	SA102003	Bearing
8	2	SA103040	Spur Gear
9	1	SA10511	Upper Shaft
10	1	SA15020	Lower Shaft
11	-	-	-
12	30	SA33189	Bottom Comber
13	1	SA15905	Cutter Key (Lower Shaft Key 15.75")
14	1	SA15906	Cutter Key (Upper Shaft Key 16.25")
15	2	SA33211	Spring Plates

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OUTPUT CONVEYOR

Key	Part No.	Description
1	SA32453	Side Frame Weldment
2	SA111494	Belt – 16" Wide (90.5" Long)
3	SA32455	Conveyor Bed
4	SA32462	Top Guard
5	SA32465	Top Right Cover Weldment
6	SA32464	Top Left Cover
7	SA10055	Tail Pulley
8	SA102002	Nice – SKF Bearing
9	SA15901	Shaft – 3/4" Dia. x 19-3/4" Long
10	SA10056	Take-up Weldment
11	SA32468	Take-up
12	SA103489	Idler Sprocket
13	SA103490	One-way Sprocket
14	SA32470	Head Pulley

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