

SPEED SANDER

by Timesavers



OPERATION AND MAINTENANCE MANUAL
Machine Models S311-13-1 (37") / S311-14-1 (43")



SPEEDSANDER® LIMITED WARRANTY

TIMESAVERS warrants to the original purchaser in North America that any part of our machine which, under normal operating and prescribed maintenance, proves defective in material or workmanship will be replaced or repaired free of charge for: **One (1) Year from the date of purchase.**

WARRANTY PROCEDURE:

Should you require warranty support, contact your local Speedsander distributor/dealer. They will promptly arrange for repair and/or replacement parts under the coverages set forth above. Warranty parts are shipped prepaid using standard carrier. Timesavers may invoice the customer for all-applicable parts. Credit will be issued upon the return and evaluation of the defective part, less any express shipping charges.

OTHER PROVISIONS:

This warranty does not cover consumable items such as platen felt pads and graphite, micro switch tips, fuses, and other normal wear items, or parts damaged due to accident or misuse. Timesavers is not responsible for, and will not pay for, work done, material furnished, or repairs made by others unless agreed to in writing prior to performing that work. All express delivery charges, repair labor and expenses are the responsibility of the customer. This warranty starts on the date of machine installation. This warranty becomes null and void if the hour meter (if equipped) has been disconnected or tampered with. Parts repaired or replaced under warranty are covered for the balance of the original machine warranty, or a standard 90-day parts warranty, whichever is longer.

Except as stated above, there are no warranties, expressed or implied, including the warranties of merchantability and fitness for a particular purpose. The purchaser's sole and exclusive remedy against Timesavers shall be for the repair or replacement of defective parts as provided for herein. The warranty stated above is in lieu of any other warranty or remedy. In no event, be it due to a breach of any other warranty or any other cause arising from the performance or non-performance of the goods sold hereunder, shall Timesavers be obligated or liable for consequential or incidental damages, including, but not limited to, lost profits, plant downtime or suits by third parties.



11123 89th Avenue North – Maple Grove, MN 55369
(763) 488-6600 FAX (763) 488-6601 TOLL FREE (800) 537-3611

Table of Contents

This operation and maintenance manual is for
Timesavers Models S311-13-1 and S311-14-1.

Table of Contents	(SpeedSander S311-13-1 & S311-14-1(04)TOC.fm).....	1
Introduction	(d089-01-introduction Econo Speedsander.fm).....	5
1.0	Widebelt Sanders.....	5
2.0	How To Contact.....	6
General Machine Safety Summary		
	(d028-00 general safety-wood econo speedsander.fm).....	7
1.0	Safety Summary.....	7
2.0	Potential Hazards.....	9
3.0	Safety Features.....	17
Public law	(A030-00 - public law - wood.fm).....	19
1.0	Occupational Safety and Health Act (excerpt).....	19
2.0	Occupational Safety and Health Standards for General Industry (summary).....	20
3.0	National Fire Protection Association Standards.....	22
4.0	Fire Prevention Wood Processing Equipment.....	24
5.0	Electrical Troubleshooting Safety.....	26
6.0	Equipment Lockout Requirements.....	27
Shop Safety	(Speedsander DS37-2 Shop Safety.fm).....	29
1.0	Home and Shop Safety.....	29

Supply Voltage Specifications (A025-01 Supply Voltage Spec..fm).....	33
1.0 Supply Voltage Specifications.....	33
Electrical Grounding (a024.00-grounding.fm).....	35
Dust Hoods and Collection Systems (d023.00-dusthood collection system econo speedsander.fm).....	37
1.0 Dust collection summary.....	37
2.0 How to connect the dust collector to the dust hood outlet.....	40
Machine Installation (d011-03 Econo SpeedSander installation.fm).....	41
1.0 How to install the machine.....	41
Adjusting the machine for work piece thickness. (d021-01 set mach for sanding Econo speedsander.fm).....	45
1.0 Sanding Head Configuration.....	45
2.0 How to Set the Machine for Material Thickness.....	46
Daily Start up and Shut down (d090-02 Daily startup and shut down Econo Speedsander.fm).....	47
1.0 Daily Machine Checks.....	47
2.0 Machine Functions.....	48
3.0 Control Panel Functions.....	50
4.0 How to start up the machine to run parts.....	50
5.0 How to shut down the machine.....	51
6.0 End of day shut down.....	51
Conveyor Feed Drive (d004-00-feed speed-ac-dc econo speedsander.fm).....	53
1.0 Variable Speed Electric Motor Feed Drive AC.....	53
Compressed Air Supply (d010.00-airsupply speedsander.fm).....	55
General Operating Tips (d032-00 general tips econo speedsander.fm).....	57
1.0 Chatter Calculation Formulas.....	58
2.0 Feed Hesitation and Work Piece Slipping.....	60
3.0 Typical Finish Defects.....	61
4.0 Approximate stock removal and depth of scratch for abrasive sanding equipment.....	65
5.0 How to check stock removal and sanding accuracy.....	66
Abrasive Belts (d016-01 abrasive belts-tracking econo speedsander.fm).....	69
1.0 How To Install The Abrasive Belt.....	69

2.0	Abrasive Belt Care.....	70
3.0	Abrasive Belt Tracking.....	71
	Conveyor Belt Care (d041-00 Conveyor belt care Econo Speedsander.fm).....	73
1.0	How To Replace The Conveyor Belt.....	73
	Platen Graphite Installation	
	(d117-01 Platen graphite install econo speedsander.fm).....	77
1.0	How to install the platen graphite cloth.....	77
	General Maintenance (d020-02 general maintenance Econo speedsander.fm).....	79
1.0	Introduction.....	79
2.0	Lubrication.....	81
3.0	Daily Machine Checks.....	81
4.0	Weekly Machine Check.....	81
5.0	Inspect and Test the Safety Equipment.....	83
	Cleaning (d003-00 cleaning inside machine Econo Speedsander.fm).....	85
1.0	How To Clean Your Sander.....	85
	Replacement Parts (d012-02 Speedsander S311-13-1 & S311-14-1 parts list.fm).....	89
1.0	How To Order Parts.....	89
2.0	Warranty Replacement Parts.....	90
3.0	Replacement Parts List.....	90
	Machine Drawings and Parts Lists	
	Model S311-13-1	
	Model S311-14-1	

Introduction

Widebelt Sander - a brief overview. For service contact Timesavers Service Department. This chapter includes the telephone number and address.

1.0 Widebelt Sanders

This widebelt sander is a sanding machine designed for high production surface sanding or finishing in a single pass. The part is placed on a moving conveyor that carries the part under an abrasive belt. The part is sanded and finished on the top side. This sander is capable of heavy cutting or very fine finishing with virtually no edge dubbing.

To operate at maximum efficiency, the sander must be installed, operated, and maintained with care.

Equally important in obtaining maximum performance is the quality of material you want sanded and finished. Straight, squared, and clean material will greatly increase production and extend the abrasive media life while reducing maintenance costs.

The operation manual contains a safety summary, instructions for safe installation, operation and maintenance.



Attention! Please read the machine manual carefully and understand it before installing, operating, or performing maintenance on this widebelt sander. Do this for your personal safety and the safety of your co-workers.

2.0 How To Contact

Timesavers, Inc.
11123-89th Avenue North
Maple Grove, MN 55369
Telephone: (763) 488-6600
(800) 537-3611
Parts & Service Direct 1-(866) 298-9763
Fax: (763) 488-6647

Please give the following information to the service representative:

1. Your name.
2. Your company name.
3. Your company telephone number.
4. The machine serial number and model.

The machine serial number is stamped on the identification plate on the machine.

General Machine Safety Summary

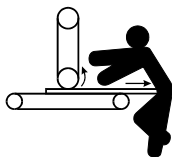
Read this section before you set up your machine.

This section is designed to provide you with a safety summary. It is recommended that you obtain copies of the laws and regulations governing your industry to assist you in providing a safe work environment. Contact your dealer for assistance on specific safety issues.

1.0 Safety Summary



Important: This symbol is an international standard and is used in this manual to call your attention to the words Danger, Warning, and Caution.



Warning! Remember to put safety first. Think! Failure to heed the following warnings may result in serious injury or death.

1. **READ AND UNDERSTAND** the operator's manual before operating this machine.

This machine is **DANGEROUS** unless it is:

- **PROPERLY GUARDED** for personal safety.
- **PROPERLY ALIGNED** and **ADJUSTED**.
- **PROPERLY MAINTAINED** in good working condition.
- **PROPERLY USED** for its intended use.

2. Avoid **ACCIDENTAL STARTUP AND ELECTRICAL SHOCK**.

- **ALWAYS DISCONNECT** electrical power and lockout main disconnect switch before performing maintenance, service, adjustment, or cleaning.

3. **KICKBACK OR KICKOUT:** (Work piece being sanded and ejected at high speed, toward infeed or outfeed) may occur unless you:

- **NEVER** allow work pieces to overlap, double feed or ride on top of each other.
- **FIRMLY** hold work piece against feed conveyor belt or roll to control part.



- **STAY OUT** of the path of a work piece kickout to further protect against personal injury.

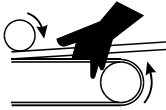
4. FIRE OR EXPLOSION may occur unless you:

- **CLEAN** the sander daily, properly disposing of potential fuel.
- **KEEP** sparks & flames (smoking, welding, etc.) at least 20 feet from sander and duct work.
- **NEVER** use your wood sander to process material with nails, staples, or other foreign objects.
- **NEVER** process short or overthick work pieces which could cause jam-ups, forcing holddown shoes into abrasive belt, creating sparks.



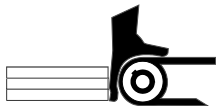
5. CRUSHING injuries may occur unless you:

- **KEEP** all shields, guards, covers and doors in place.
- **KEEP** hands, fingers, feet, clothing, etc. away from all moving parts, revolving rolls and conveyor belts.
- **NEVER** clean, oil or repair machinery while it is in motion.
- **NEVER** wear gloves when operating machine.
- **NEVER** place hands or fingers between work pieces and the conveyor belt. Your hands may become caught and pulled into the sander.
- **DO NOT** create pinch point when adding feeding and/or unloading equipment.



6. ABRADING or **CRUSHING** injuries may occur unless you:

- **NEVER** clean the abrasive belt while it is on the sander. Remove the abrasive belt and clean separately.



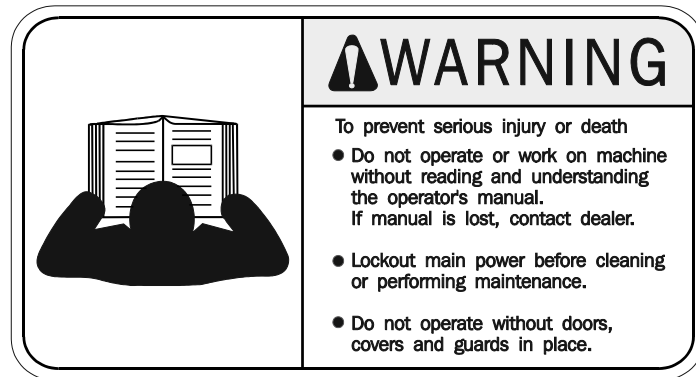
2.0 Potential Hazards

This page and the following pages describe potential hazards relating to the use of your machine. Read them carefully before you operate your machine. We want you to have a safe and efficient sanding operation. If you have any questions, please contact your dealer or the machine manufacturer.

The following labels should be on your machine. An explanation of each label is also included.

FIGURE 1.

Part No. 82693-53



Read the operation manual carefully. It contains important information and warnings. Improper use of this machine can result in fire, explosion or serious injury.

Always lockout main power disconnect before attempting oiling, cleaning, maintenance or repair. Accidental start-up could result in a serious injury. Refer to the maintenance section of the operation manual for proper lockout procedures.

The doors, covers and guards on this machine are intended to protect against the hazards behind them. Operation without these safety devices is **DANGEROUS**. Inspect the machine periodically to be certain these covers, and warning labels, are in place. If any items are missing, contact the dealer immediately to obtain replacements.

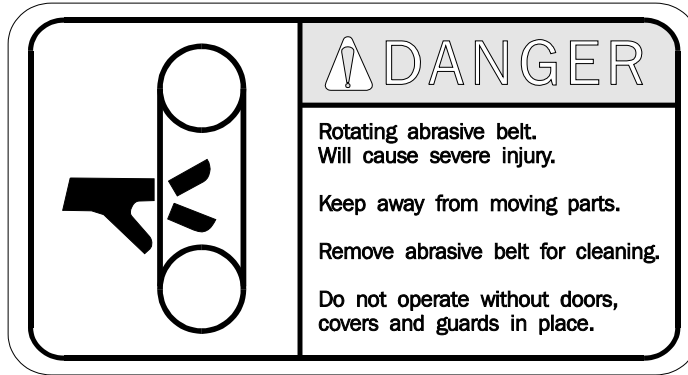
The procedures listed in these sheets are necessary for the safe operation of your sander. If you think your process does not allow you to comply with any of these safety requirements, please contact the manufacturer safety director to address the hazard.

Rotating Abrasives and/or Cutters

Rotating abrasive belt behind the doors. The belt does not stop immediately. Make certain the belt has come to a complete stop before putting hands near belt.

FIGURE 2.

Part No. 82693-48



A rotating abrasive belt can cause serious abrasion injury. Keep away from the belt and rolls.

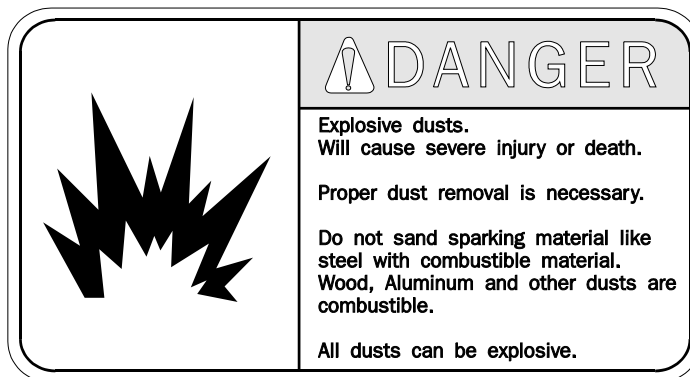
Do not clean the abrasive belt while it is on the machine. Do not use cleaning sticks, serious abrasion injury could result. Remove the abrasive belt for cleaning.

Fire and Explosion Safety

All dusts are potentially explosive. A spark from any source can start a **FIRE** or **EXPLOSION**. Spark generation must be prevented.

FIGURE 3.

Part No. 82693-49



Sparks can be generated from many sources in most woodworking machinery. For example: processing product with tramp metal, product jam-up, improper set-up, overheated bearings, etc. Efforts must be made to reduce the chance of sparking.

- **KEEP** your machine clean and free from dust for safe operation.
- **ALWAYS** inspect product for imbedded material. Remove nails, screws, staples, etc.
- **NEVER** sand metal in your machine.
- **NEVER** double-feed, overlap, or feed overthick product. This could overload specific areas of the sander, create SPARKS, cause product kickout or other hazards that could cause personal injury.
- **KEEP** machine set up and maintained properly.
- **INSPECT** tracking system periodically to be sure it is functioning properly and mistrack limit switches have the proper ceramic tips in place.
- **NEVER** allow open flames or sparks (smoking, welding, etc.) within 20 feet of the sander.
- **ELECTRICALLY GROUND** sander and ductwork in accordance with National Fire Protection Association (NFPA) codes.

An efficient and well designed dust collection system is essential for a safe sanding operation. A properly designed system, constructed in accordance with NFPA codes, will greatly reduce the hazard of fire. Refer specifically to NFPA 664, and NFPA 91.

The NFPA requires that all woodworking dust collectors be protected with explosion venting and dampers (NFPA 664, 8-3.4, 8-3.7).

The manufacturer and the NFPA recommend a spark detection and extinguishing system be installed in the ductwork.

Good housekeeping and an efficient dust collection system, installed by a reputable, qualified industrial ventilation contractor, will effectively remove any dust build-up that is potential fuel for a fire.

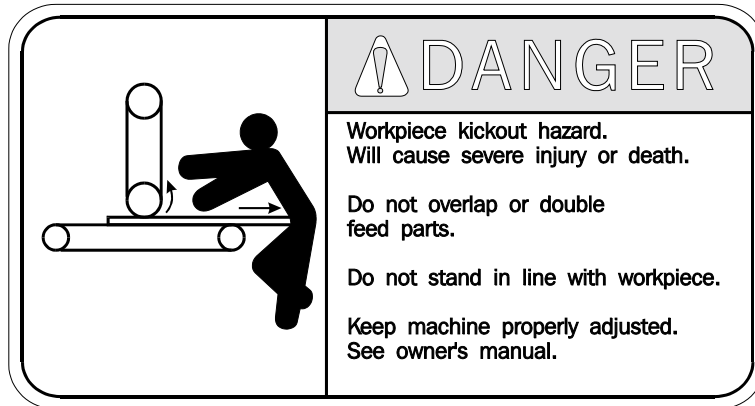
Consult NFPA codes when installing or modifying any dust collection system.

Refer to the section on *Dust Collection* for more information and a brief listing of manufacturers of dust collectors, spark detection equipment and extinguishing systems.

Kickout Safety

FIGURE 4.

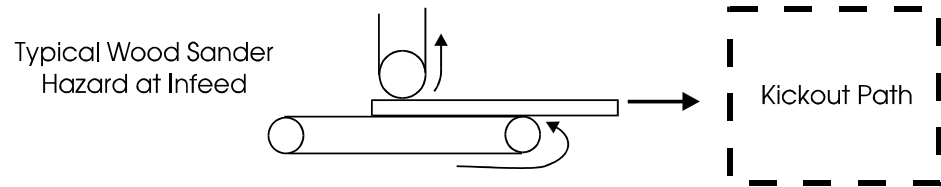
Part No. 82693-50



Product kickout occurs when the part is not firmly held down to the conveyor belt and the abrasive belt throws the part out of the machine. This can be dangerous because the ejected part can approach the speed of the abrasive belt rotation. The distance the part can travel after kickout can be considerable and can cause severe bodily injury.

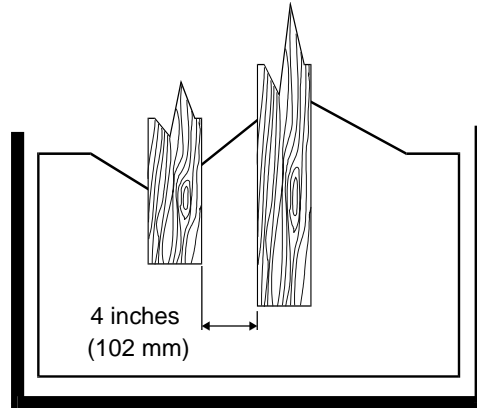
FIGURE 5.

The direction of kickout depends on the direction of rotation of the abrasive belt.



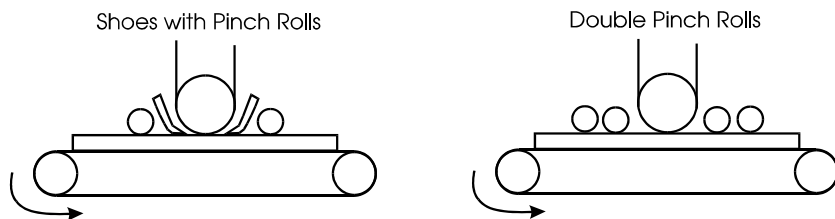
Do not stand in-line with the work piece (the hazard area). Stand off to the side. If you feel your process requires an operator in the hazard area, a barrier guard should be used. Due to the variety of products and methods of handling, the machine manufacturer cannot supply a generic guard to handle all situations. If you have questions regarding barrier guards, please contact your local OSHA office for assistance.

FIGURE 6. Narrow Parts & Segmented Shoes



Danger! On machines with the segmented shoe, parts narrower than 5 1/8 inches (130 mm) must be spaced 4 inches (102 mm) between parts when feeding parts side by side. Personal injury may result from kickback if parts are not spaced 4 inches (102 mm) apart.

FIGURE 7. Shoes and Pinch rolls

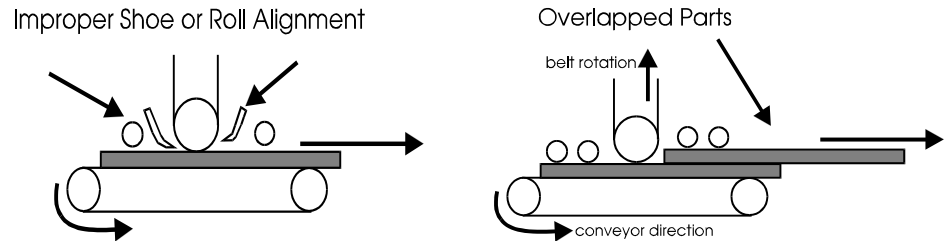


Spring loaded shoes or pinch rolls are used to **FIRMLY** hold the part to the conveyor belt. The conveyor belt must control the feeding of the product.

Some causes of kickout:

FIGURE 8.

Shoe or Roll Alignment - Overlapped Parts

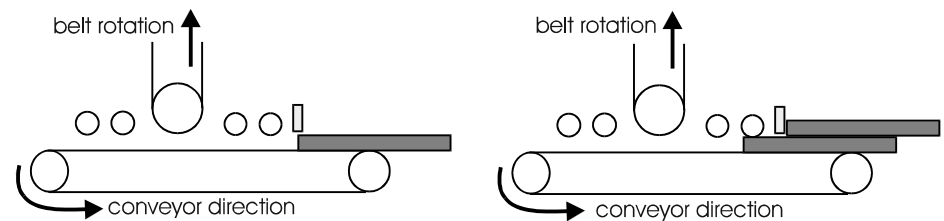


- Slippery parts and/or conveyor belt: A good friction surface between the conveyor belt and the product is necessary. Worn or hard conveyor belts, oily parts, or anything that reduces friction between the parts and conveyor belt can cause kickout.

Some parts cannot sit flat on the conveyor belt. These parts cannot be processed on your sander. Fixtures have been used to sand these parts. The manufacturer cannot recommend the use of such fixtures. Fixtures that rely on friction with wood, styrofoam, etc. are **NOT** acceptable and present a hazard of **KICKOUT**.

FIGURE 9.

Overthick Sensing Unit



A Overthick Sensing Unit is used to prevent double feeding. These devices must be properly set. These bars must be set to prevent two parts from entering the machine.

Pinch Points Safety

FIGURE 10.

Part No. 82693-51



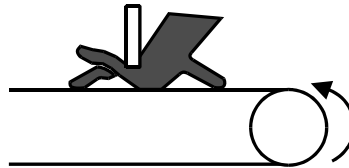
Keep away from moving parts at the infeed end of the machine. A pinch point here is dangerous because the machine is very powerful and will not stop if a foreign object (hands, fingers, etc.) enters it. A severe crushing or abrasion injury will result.

The pinch rolls hold the product to the conveyor belt with a great deal of force. Hands, fingers, clothing, etc. caught underneath the part are very difficult to remove. As the product is conveyed into the machine, anything caught under the product is also conveyed into the machine.

Wearing gloves or loose clothing near rotating machinery is **DANGEROUS**. These items can become entangled and draw the operator in the machine. Do not wear gloves or loose clothing when operating this machine.

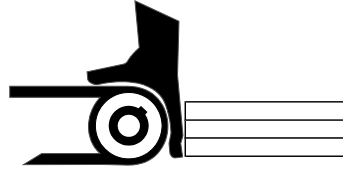
FIGURE 11.

Pinch Points



If you are in danger of becoming entangled in a pinch point, activate the nearest emergency stop immediately. Be certain you know where all the emergency stops are before you operate this machine.

FIGURE 12. Feeding - Unloading Pinch Points



Take care when developing a feeding/unloading method. Additional conveyors, baskets, tables, etc. can create a pinch point. Extra emergency stop buttons and/or guards may be needed. If parts are allowed to accumulate at the outfeed end, a pinch point may be created.

Entanglement Safety Precautions

FIGURE 13. Part No. 82693-52



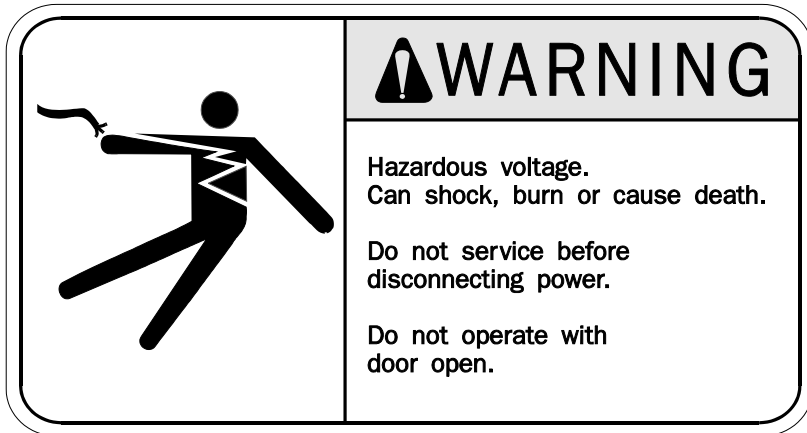
Keep away from moving parts. A severe crushing or abrasion injury could result.

Wearing gloves or loose clothing near rotating machinery is **DANGEROUS**. These items can become entangled and pull the person into the machine. Do not wear gloves or loose clothing when operating this machine.

Hazardous Voltage Safety

FIGURE 14.

Part No. 82693-54



Hazardous voltage inside cabinet. Only qualified personnel should open cabinet.

ALWAYS lockout main power disconnect before attempting oiling, cleaning, maintenance or repair. Accidental start-up could result in a serious injury. See “*Equipment Lockout Requirements*” for recommended lockout procedures.

Do not run machine with any door open.

3.0 Safety Features

Your sander has several safety features built in. These features should be periodically examined to ensure they are functioning properly. Operation without these features can be **DANGEROUS**.

- Controls buttons - On or near the controls panel.
- Enclosed sanding head - Shields personnel from sanding belt and some moving parts during operation.
- Brake on abrasive drive - Stops coasting of the abrasive belt.
- Operator activated palm-style emergency stop buttons located within reach of operator’s workstation. - Stops the machine *within 4 to 7 seconds*.
- Brake on conveyor feed drive - Stops coasting of the conveyor belt.
- Conveyor belt edge guards - Prevents access to pinch points and moving parts.
- Various machine guards - Restricts access to pinch points and moving parts.

Safety Features

- Attached **DANGER** and **WARNING** labels - Alerts operators of potential hazards.
- Access door interlock switches - Shuts down machine when an access door is opened. These switches are magnetic to prevent tampering.
- Overthick part sensor at infeed of the machine activates the machines emergency stop system. Stops the machine *within 4 to 7 seconds*.

If any of these features are missing or not functioning, do not operate the machine. Notify your supervisor, or safety director, and/or OSHA, immediately. Contact your dealer, for repair service or replacement parts.

Public law

A safety law summary, wood processing machines

The following chapter is provided as a starting point for your safety director. We recommend that you obtain the full text copy of the topics discussed in this chapter. Contact your local OSHA office for more information. The paragraphs are taken out of context and do not represent the full applicable codes and regulations.

This sample of existing codes and standards is to inform and warn plant management and users of their existence. The paragraphs listed below have been taken out of context and do not list all applicable codes and standards. We suggest that you obtain a volume of the National Fire Codes, the Occupational Safety and Health Standards for General Industry, and other local codes related to your in-plant safety program. It is important to your company to know the hazards and the necessary safety precautions to reduce the risk of injury and damage to equipment and property.

1.0 Occupational Safety and Health Act (excerpt)

The following are excerpts from Public Law 91-596, 91st Congress, S. 2193, December 29, 1970.

To assure safe and healthful working conditions for working men and women; by authorizing enforcement of the standards developed under the Act; by assisting and encouraging the States in their efforts to assure safe and healthful working conditions; by providing research, information, education, and training in the field of occupational safety and health; and for other purposes.

Be it enacted by the Senate and the House of Representatives for the United States of America in congress assembled, that this Act may be cited as the Occupational Safety and Health Act of 1970.

SECTION 5

(a) Each employer

(1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;

(2) shall comply with occupational safety standards promulgated under this Act.

(b) Each employee

(1) shall comply with Occupational Safety and Health Standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.

2.0 Occupational Safety and Health Standards for General Industry (summary)

Listed below are pertinent excerpts from the Occupational Safety and Health Standards for General Industry. It is not the complete and official position of the Occupational Safety and Health Act, on the referenced subject which is represented only by the standard in its entirety.

Subpart A - General

1910.1 Purpose and scope.

(b) It contains occupational safety and health standards which have been found to be national consensus standards or established Federal standards.

1910.2 Definitions

(f) Standard means a standard which requires conditions, or the adoption or use of one or more practices, means, methods, operations, or processes, reasonably necessary or appropriate to provide safe or healthful employment and places of employment.

1910.5 Applicability of standards.

(a) The standards contained in this part shall apply with respect to employment performed in a workplace in a State.

(c) (1) If a particular standard is specifically applicable to a condition, practice, means, method, operation, or process, it shall prevail over any different general standard which might otherwise be applicable to the same condition, practice, means, method, operation, or process.

(2) On the other hand, any standard shall apply according to its terms to any employment and place of employment in any industry.

(d) In the event a standard protects on its face a class of persons larger than employees, the standard shall be applicable under this part only to employees and their employment and places of employment.

1919.145 Specification for accident prevention signs and tags.

(ii) All employees shall be instructed that danger signs indicate immediate danger and special precautions are necessary.

1910.212 General requirements for all machines.

(a) Machine guarding. (1) Types of guarding. One or more methods of machine guarding shall be provided to protect the operator and other employees in the machine area from hazards such as those created by point of operation, ingoing nip points, rotating parts, flying chips and sparks. Examples of guarding methods are; barrier guards, two-hand tripping devices, electronic safety devices, etc.

(2) General requirements for machine guards. Guards shall be affixed to the machine where possible and secured elsewhere if for any reason attachment to the machine is not possible. The guard shall be such that it does not offer an accident hazard in itself.

1910.213 Woodworking machinery requirements.

(9) All belts, pulleys, gears, shafts, and moving parts shall be guarded in accordance with the specific requirements of 1910.219.

(10) It is recommended that each power-driven woodworking machine be provided with a disconnect switch that can be locked in the off position.

(n) Planing, molding, sticking, and matching machines. (3) Feed rolls shall be guarded by a hood or suitable guard to prevent the hands of the operator from coming in contact with the in-running rolls at any point.

(4) Surfacer or planers used in thickening multiple pieces of material simultaneously shall be provided with sectional infeed rolls having sufficient yield in the construction of the sections to provide feeding contact pressure on table stock, over the permissible range of variation in stock thickness specified or for which the machine is designed. In lieu of such yielding sectional rolls, suitable section kickback finger devices shall be provided at the infeed end.

(p) Sanding machines. (1) Feed rolls of self-feed sanding machines shall be protected with a semicylindrical guard to prevent the hands of the operator from coming in contact with the in-running rolls at any point.

(4) Belt sanding machines shall be provided with guards at each nip point where the sanding belt runs on to a pulley. These guards shall effectively

prevent the hands or fingers of the operator from coming in contact with the nip points. The unused run of the sanding belt shall be guarded against accidental contact.

(a) Inspection and maintenance of woodworking machinery. (6) Emphasis is placed upon the importance of maintaining cleanliness around woodworking machinery.

3.0 National Fire Protection Association Standards

National Fire Codes is a registered trademark of the National Fire Protection Association, Inc., Quincy, MA 02269

There are several volumes of the National Fire Codes® published annually by the National Fire Protection Association. Material set forth herein is a partial excerpt from the referenced standards. It is recommended that you obtain a copy of the standards to get complete information. The complete set contains the codes, standards, recommended practices and manuals developed by the technical committees of the Association and processed in accordance with the NFPA Regulations Governing Committee. We recommend that you purchase the published codes relevant to your operation. To purchase, contact:

National Fire Protection Association
Batterymarch Park, Quincy, MA 02269

Some definitions used by NFPA are useful to understand.

- Approved is acceptable to the authority having jurisdiction.
- Authority Having Jurisdiction is the organization, office, or individual responsible for approving equipment, an installation, or a procedure.
- Shall indicates a mandatory requirement.
- Should indicates a recommendation or that which is advised but not required.

Exhaust Systems

The following are excerpts from NFPA 91 Standard for Exhaust Systems for Air Conditioning of Materials, 1992 Edition.

From Chapter 1, Introduction:

1-1 Scope. This standard provides minimum requirements for the design, construction, installation, operation testing, and maintenance of exhaust systems for air conveying materials except as modified or amplified by other applicable NFPA standards.

1-2 Purpose. The purpose of this standard is to eliminate or reduce known fire and explosion hazards inherent in the use of exhaust systems and to prevent them from becoming a means for spreading fire.

1-2.1 The design and installation of exhaust systems shall be the responsibility of persons having a knowledge of these systems. Maintenance and operations shall be performed by persons having exhaust system experience.

From Chapter 2, Design and Construction:

2-1 The design of any exhaust system shall consider the physical and chemical properties and hazard characteristics of the materials being conveyed.

2-2 Incompatible materials shall not be conveyed in the same systems.

2-2.1 Operations generating flames, sparks or hot materials, such as from grinding wheels and welding shall not be consolidated in the same exhaust system that air conveys flammable or combustible materials.

2-3 Plans and specifications for new systems and systems to be modified shall be submitted to the authority having jurisdiction for approval prior to installation or modification. The submittal shall provide adequate information to describe the hazard and demonstrate safe performance of the system.

From Chapter 7, Testing and Maintenance:

7-1 Exhaust systems shall be tested, inspected, and maintained to assure safe operating conditions.

7-1.1 The responsibility for proper maintenance shall be assigned to trained personnel who are capable of recognizing potential hazards.

The above material was reprinted with permission from the NFPA 91-1992, Exhaust Systems For Air Conveying of Materials, Copyright ©1992, National Fire Protection Association, Quincy, MA 02269. This reprinted material is not the complete and official position of the National Fire Protection Association, on the referenced subject which is represented only by the standard in its entirety.

4.0 Fire Prevention Wood Processing Equipment

The following are excerpts from NFPA 664 *Standard for the Prevention of Fires and Explosions in Wood Processing and Wood Working Facilities*, 1987 Edition as it pertains to Wood Processing and Wood Working Facilities.

From Chapter 1, General:

1-1 Scope. This standard contains the minimum requirements for the proper construction and protection of facilities that handle, store, or process wood or wood products that produce or utilize finely divided wood particles or wood fibers.

1-2 Purpose.

1-2.1 The purpose of this standard is to provide a reasonable degree of protection for life and property against fire and explosion in facilities where finely divided wood dust is produced or handled.

1-3 Retroactively. This standard shall apply to new facilities and to those portions of existing facilities being rebuilt or remodeled.

From Chapter 3, Explosion Venting:

3-1 General Requirements.

3-1.2 If a dust explosion hazard exists in equipment, rooms, buildings, or other enclosures, such areas shall be provided with explosion venting. An acceptable alternative to explosion venting is an approved explosion suppression system installed in accordance with NFPA 69, *Standard on Explosion Prevention Systems*.

From Chapter 4, Housekeeping:

4-1 Removal of Static Dust.

4-1.1 Provisions shall be made for systematic, thorough cleaning of the entire plant at frequent intervals to remove the accumulations of finely divided wood dust that might be dislodged and lead to an explosion.

4-1.4 The use of compressed air or other similar means to remove dust accumulations from areas not readily accessible for cleaning by other methods shall be permitted only if done frequently enough to prevent hazardous concentrations of dust in suspension. Any open flame or spark-producing equipment shall not be used during blowdown.

4-2 Metal Scrap. Provisions shall be made for separately collecting and disposing of any metal scrap, such as nails, band iron, or any wood containing metal, so that it will not enter the wood handling or processing equipment, the dust collecting system, or the scrap wood hog.

From Chapter 5, Electrical Equipment:

5-1 Electrical Wiring and Equipment.

5-1.1 All electrical wiring and equipment shall comply with the requirements of NFPA 70, National Electric Codes®.

From Chapter 6, Control of Ignition Sources:

6-1 Cutting and Welding.

6-1.1 Cutting and Welding shall comply with applicable requirements of NFPA 51B, *Standard for Fire Prevention in Use of Cutting and Welding Processes*, and with the following specific requirements.

6-2 Static Electricity and Lightning Protection.

6-2.1 Static electricity shall be prevented from accumulating on machines or equipment subject to static electricity buildup by permanent grounding and bonding wire and from moving belts by grounded metal combs or other effective means.

6-3 Smoking. Smoking shall only be allowed in safe, designated areas.

From Chapter 8, Woodworking Dust-Control Systems:

8-2.4 Duct System.

8-2.4.1 Every branch duct and every section of main duct shall be sized for not less than the minimum air velocity and volume required to transport the wood dust or shavings through the ducting and into the collection equipment.

8-2.5 Collecting Equipment. The system shall be provided with collecting equipment of sufficient size and capacity to separate the wood dust from the air before the air is vented. The collecting equipment shall be of noncombustible construction except for filter bags, if provided.

8-2.7 Exhausting Dissimilar Matter. Woodworking exhaust systems shall be restricted to handling wood residues and under no circumstances shall another

operation generating sparks, such as from grinding wheels, be connected to a woodworking exhaust system.

8-3.4 Ducts shall be protected by explosion vents or an approved explosion suppression system (see Chapter 3) unless the duct is sufficiently strong to withstand maximum explosion pressures. Explosion dampers shall be used, where practical, to minimize the possibility of explosion flashback from the collecting equipment through the duct system.

8-3.7 Sander systems shall be protected by explosion venting or an approved explosion suppression system (see Chapter 3).

The above paragraphs were reprinted with permission from NFPA 664-1987, Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities, Copyright ©1987, National Fire Protection Association, Quincy, MA 02269. This reprinted material is not the complete and official position of the National Fire Protection Association, on the referenced subject which is represented only by the standard in its entirety.

5.0 Electrical Troubleshooting Safety

NFPA 70E states that employees shall not be permitted to work on electrical circuit parts or equipment that have not been de-energized and locked out and tagged out unless they are qualified and trained to use safe work practices.

The standard states further that all employees shall be instructed in the following:

- Personnel must be alert at all times when they are working near exposed electrical parts and where unexpected electrical hazards may exist.
- Personnel must not reach into areas that may contain energized electrical parts.
- Employees shall not knowingly be permitted to work in areas containing exposed energized parts or other electrical hazards while their alertness is recognizably impaired due to illness, fatigue, or other reasons.

The NFPA -70 also covers the following employee safety related information.

- Adequate illumination of spaces containing exposed energized parts.
- Conductive articles of jewelry and clothing worn by employees exposed to energized parts.
- Conductive materials and equipment.
- Insulated tools and equipment.

It is highly recommended that NFPA codes be obtained.

6.0 Equipment Lockout Requirements

To prevent personal injury or equipment damage when the machine is being inspected or repaired, the following lockout procedure must be observed.

Machine lockout must comply with the following provisions:

1. Every power source that can produce the movement of any machine part shall be shut off at the closest possible power source.
2. The mechanical energy of all parts of the machine must be reduced to a zero energy state.
 - The opening of any pipe, tube, hose or the actuation of any valve must not produce any movement that could cause injury.
3. Holding a machine member against gravity or a spring force by a blocking member, by suspension, or by brackets or pins designed specifically for that purpose is permissible if:
 - All machine members are at a zero energy state.
 - All machine members are secured against accidental motion.
4. A work piece or material supported or retained by the machine shall be considered part of the machine.
5. Any power source that can produce a machine movement will be locked and identified by the person signing the lockout tag and working on the machine.
6. When power sources have been locked out, a test must be performed to insure that machine movement cannot be initiated.

Machine lockout procedure

1. Personnel authorized to lockout equipment must have the necessary number of locks to perform the job function.
2. Before proceeding with repair or inspection work, the employee must do the following.
 - a. Physically disconnect all electrical power to the machine or lockout the appropriate breakers or disconnect switches.

FIGURE 1.

Recommended lockout tag. The last maintenance person removes their padlock and re-connects power to the machine.

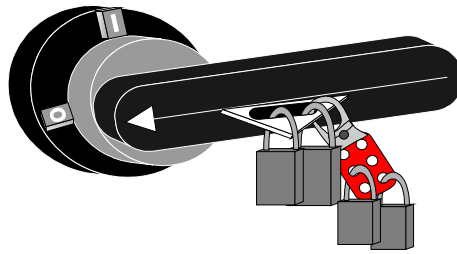


Equipment Lockout Requirements

- b. Lockout valves for air or hydraulic sources and bleed off any pressure that could result in any machine movement.
- c. Physically block all machine members that could move from gravity or spring pressure.
- d. Test lockout for power by attempting a start with the machine controls.
- e. Identify the Lockout Condition with a tag on the electrical disconnect and pneumatic shutoff valve.
- f. When the work is complete, restore the machine to its original state and remove all tags.
- g. Remove only the tags and the lock you installed. If other personnel have placed additional locks on the machine, do not disturb or remove them.

FIGURE 2.

Recommended lockout tag in use on the main electrical box of typical sanding machine. The last maintenance person removes their padlock and re-connects power to the machine. (If your machine does not have a disconnect on the machine, lockout the power at the main electrical box to the machine.)



Shop Safety

This section is designed to provide you with safety guidelines that apply to small shops as well as industrial settings.

1.0 Home and Shop Safety



CAUTION: NEVER OPERATE EQUIPMENT IF YOU ARE FATIGUED, TAKING MEDICINE OR DRINKING ALCOHOL.

1. **KNOW YOUR POWER TOOL** - read the owners manual carefully. Learn the applications and limitations of your sander as well as the potential hazards of the tool.
2. **GROUND ALL TOOLS** - check the electrical receptacles in you shop. They should all be the three prong grounded type. If they are not, a qualified electrician should install grounded receptacles throughout your shop. Any tool that has a three pronged plug should be connected to a grounded electrical receptacle. Double insulated tools do not require this type of plug, however, only a small proportion of the tools manufactured are double insulated.
3. **PROTECT YOURSELF** - use a full face shield or approved safety glasses with side shields. Everyday eye glasses should not be use as safety glasses. Use a dust mask when operating this machine. Wear safety approved hearing protectors. Extended exposure to noise from power tools can damage your hearing.
4. **KEEP ALL MACHINE GUARDS IN PLACE AND IN WORKING ORDER** - always close all of the machine covers before connecting the power. Never reach under a cover when the tool/machine is operating.

5. REMOVE ADJUSTMENT KEYS AND WRENCHES - anytime that you attach accessories, change belts or make adjustments, make sure that all keys, adjusting wrenches and other tools are removed from the machine before turning it on.
6. KEEP YOUR SHOP CLEAN, WELL LIT AND DRY - clutter invites accidents. You can make your shop time more comfortable with proper lighting - eye strain fatigues your entire body. Special attention should be paid to moisture. Using power tools in damp or wet locations can result in electrocution.
7. KEEP CHILDREN AWAY - all children and visitors should be kept at a safe distance from work areas and should wear eye and ear protection.
8. MAKE THE WORKSHOP CHILDPROOF - use padlocks, master switches or any system that prevents children or other unauthorized persons from starting the machinery.
9. USE THE RIGHT TOOL AT THE RECOMMENDED RATE - do not force tools or attachments to do a job for which they were not designed. Learn the recommended rate of use for each tool.
10. WEAR PROPER CLOTHING - do not wear loose clothing, gloves, rings, bracelets, wristwatches or other jewelry which can get caught in moving parts. Roll your sleeves up above your elbows. Wear comfortable nonslip shoes. Tie back long hair or wear a hair net.
11. SECURE THE WORK - use clamps, dogs or a vice to hold the work when practical **and** recommended by the tool/machine manufacturer. Support long, heavy or oversize parts with roller stands, feed tables, manufacturer recommended accessories or a qualified helper. Make sure that there is sufficient clearance around the tool/machine for the part to be processed in and out of the tool/machine. Keep proper footing and balance at all times.
12. MAINTAIN YOUR TOOLS - your safety and quality of work are improved when you keep your tools clean. Follow the lubrication schedules for all tools and accessories.
13. DISCONNECT TOOLS - never rely on a tools on/off switch when changing belts or making adjustments. Always unplug the tool or machine before servicing or changing belts.
14. BEWARE OF UNINTENTIONAL START-UPS - check the switch before connecting any machine to the power source. Be sure that the switch is in the "Off" position.
15. CHECK FOR DAMAGED PARTS - repair or replace any part that becomes damaged or worn **before** using the tool again. Every time that a repair or adjustment is made, check the alignment of all moving parts. Check for breakage of parts, correct mounting and any other conditions that might affect the tools operation.
16. ALWAYS TURN OFF THE TOOL BEFORE LEAVING IT - do not walk away from a tool until it comes to a complete stop.

17.DO NOT USE THE MACHINE AS A STEP STOOL OR LADDER - serious injury could result if the machine tips over.

Supply Voltage Specifications

This chapter is provided as a guideline and basic information about electrical supply voltage for your new machine.

We recommend that you obtain a current copy of the National Electrical Codes and that you consult a licensed electrical contractor to assist you when working with your electrical service.

1.0 Supply Voltage Specifications

In general, the power and control systems on Timesavers machines are built to comply with ANSI C84.1 - 1995, "Electrical Power Systems and Equipment - Voltage Ratings (60 Hz)". The machines will safely operate on supply systems that also comply with ANSI C84.1 - 1995. Derived control voltages will be within limits for 120 VAC as shown in the table that follows. Supply power is expected to be balanced 60 hertz, three phase with the nominal voltage measured phase to phase.

Specifically, the following table outlines the voltage limits expected to safely operate Timesaver machines

Supply Voltage Specifications

TABLE 1.

Supply voltage table

Nominal Utilization Voltage	Specified minimum	Specified Maximum Voltage
115 VAC	106 VAC	127 VAC
200 VAC	184 VAC	220 VAC
230 VAC	212 VAC	254 VAC
460 VAC	424 VAC	508 VAC
575 VAC	530 VAC	635 VAC



Warning! Supply voltages outside of these specifications may cause erratic operation of the machine. Supply voltages that are higher than the maximum may cause non-warranty damage to standard industrial components such as variable frequency drives.

Requirements for nominal supply voltages other than 208/230/460/575 require special design considerations.

Electrical Grounding

For ground fault and static discharge

This chapter is provided as a guideline and basic information about electrical grounding for your new machine.

We recommend that you obtain a current copy of the National Electrical Codes and that you consult a licensed electrical contractor to assist you in connecting your electrical service and earthen grounding system.



Warning! You shall connect your machine to an Electrical Ground in accordance with the National Electrical Codes, Article 250.

This recommendation is for your safety and on findings that static electric charges can be created by a moving abrasive belt or conveyor belt.

Three areas of this machine can be affected by a static charge

- The abrasive belt sometimes will attract abraded particles. This will cause the inside or outside surface of the belt to form streaks of particles. This may show on the finished surface on your work parts. The usual fix for this condition is to change the abrasive belt. A properly grounded machine will reduce the frequency of abrasive belt changes and improve the finish of the sanding process.
- Machine bearing life can be extended if static charges are reduced. The indication is that static charges that build up can erode bearing balls and races.
- Machines using coolants in the process, such as metal finishing machines, normally will use a rust inhibitor and grinding aid blended in with water as

coolant. On those machines, the earthen ground has reduced rust and corrosion significantly when compared to ungrounded machines.

The exact method of grounding cannot be totally described here as it is dependent on local factors:

- Moisture content of your soil.
- Type of soil.
- Local Codes
- ANSI/NFPA 70
- Your manufacturing process

(FPN No. 1): Systems and circuit conductor are grounded to limit voltages due to lightning, line surges, or unintentional contact with higher voltage lines, and to stabilize the voltage to ground during normal operation. Equipment grounding conductors are bonded to the system grounded conductor to provide a low impedance path for fault current that will facilitate the operation of overcurrent devices under ground-fault conditions. (ANSI/NFPA 70, Article 250)

(FPN No. 2): Conductive material enclosing electrical conductors or equipment, or forming part of such equipment, are grounded to limit the voltage to ground on these materials and to facilitate the operation of overcurrent devices under ground-fault conditions. (ANSI/NFPA 70, Article 250)

Dust Hoods and Collection Systems

1.0 Dust collection summary

The design of the dust hoods in your sanding machine is based on:

- A manual of recommended practice, “Industrial Ventilation”, published by the American Conference of Governmental Hygienists
- Codes and Standards listed in the National Fire Codes®, published by the National Fire Protection Association (NFPA)
- OSHA
- Fifty (50) years of experience

The dust hood(s) must be connected to a properly designed dust collection system supplying the sander with the recommended static pressure and CFM. When these conditions are met, the dust hood will perform efficiently and maintain the proper pick-up and conveying velocities.



DANGER! If the dust hood(s) are not connected to a properly designed dust collection system supplying the sander with the recommended static pressure and cfm, inadequate dust collection will result and present a hazard of fire or explosion.

The dust collection system is a vitally important, separately designed and purchased system, to do specific jobs in a specific work place.



DANGER! The small particle size of most dusts makes them potentially explosive. Proper design of the dust collection system is essential to minimize the hazard of fire or explosion.

Long-term exposure to some dusts (including wood and metal dust) may cause adverse health effects. We recommend that you contact the proper authorities to determine the potential health hazards of the material you are processing. An efficient dust collection system is necessary to reduce exposure to these dusts.

Your plant engineer or authorized personnel responsible for this installation must consider the individual requirements of each machine, the material being processed, the local, State and National Codes and Standards which apply. These requirements vary from plant to plant and must be considered individually for each installation.

Recommendations to assist you in designing and installing a proper dust collecting system:

1. Consult OSHA, NFPA, State and local codes related to dust collection systems.
2. Contact a reputable, qualified industrial ventilation contractor.
3. Contact a dust collector manufacturer or designated representative.
4. Know the fire hazards of the material being processed.
 - Some materials (aluminum and magnesium, for example) require special fire extinguishing equipment. Use of standard fire fighting equipment will intensify the fire.
5. Notify the local fire department of dust collector location and materials being processed.

For woodworking applications

1. Dust collector must discharge outdoors. (NFPA 664, 8-2.1)
2. A spark detection and extinguishing system should be installed. (NFPA 664, 3-3.4) You will find a brief list of manufacturers at the end of this section.
3. All dust collection systems for sanders must be protected with explosion venting, or an approved explosion suppression system, and explosion dampers. (NFPA 664, 3-3.4, 8-3.7)
4. Never use a wood dust collecting system for operations that generate sparks. (NFPA 664, 8-2.7)
5. Maintain a minimum carrying velocity of 4500 fpm throughout the entire dust collection system (3500 fpm for wood applications).

6. Duct systems, dust collectors, and dust producing equipment must be bonded and grounded to prevent accumulation of static charge. (NFPA 664, 6.2-1)

and the NFPA recommends a spark detection and extinguishing system be installed in your dust collection duct work.

Good housekeeping and an efficient dust collection system, installed by a reputable qualified industrial ventilation contractor, will effectively remove dust build-up that is potential fuel for a fire.

Consult NFPA codes when installing or modifying any dust collection system.



DANGER! Most dusts are potentially explosive. You must have a properly designed and installed dust collection system for the safe operation of your sander.

There are many dust collection system and spark detection extinguishing system suppliers available in the U.S.A. and Canada. The following companies can assist you in locating qualified suppliers in your area. This list is not inclusive, it is a brief guide as a starting point for you.

CLARKS INTERNATIONAL PYROGUARD DIVISIONS

660 Conger Street, P. O. Box 2428
Eugene, OR 97402
541/343-3395

FLAMEX

322 Edwards Drive
Greensboro, NC 27409
910/299-2933

HANSENTEK

1260 Lakeshore Road East
Suite 7
Mississauga, Ontario, Canada L5E 3B8
416/274-2224

2.0 How to connect the dust collector to the dust hood outlet

On a constant machine passline, you must install flexible ducting from the dust hood outlet on the machine to your dust collection system.

If the machine is a variable passline you can use rigid ducting from the dust hood outlet on the machine to your dust collection system.

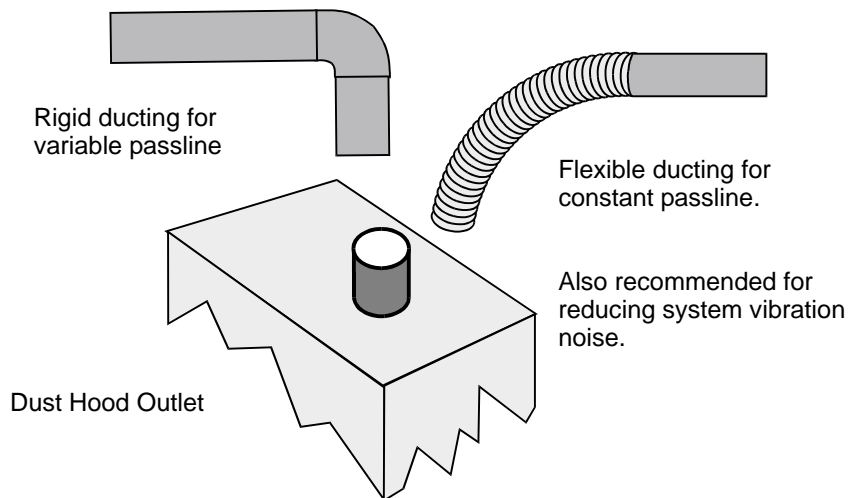
A constant passline machine is designed to fit with existing machinery with fixed conveyor heights. The machine was designed to your specified height. The top half of the machine frame moves up and down to adjust to the thickness needed for the work piece, while the conveyor and/or bottom heads stay at a constant height.

On a variable passline machine the machine heads and frame stay put and the conveyor bed moves up and down to adjust to the thickness needed for the work piece.

1. Identify if your new machine is a constant or variable passline.
 - If your machine is constant passline you must use flexible or telescoping ducting to connect to the dust collection system.
2. Connect the dust collection ducting to the machine.
 - You may use sheet metal screws or rivets to fasten the ducting to the dust hood outlet. The screws must be the minimum length needed to hold the ducting in place.

FIGURE 1.

Top view of typical machine and dust hood outlet.



Machine Installation

This machine is designed to operate at a high performance level. When properly installed and operated it will give you years of service. Read and understand this chapter before using the machine.

1.0 How to install the machine.

The Sanding machine you have purchased is designed to operate at a high performance level. To reach this expectation it requires careful installation. The methods and care used to install this machine affect its sanding performance and ability to hold tolerances.

When the machine arrives, CHECK FOR ANY SHIPPING DAMAGE. If there is damage, accurately record the damage on the Bill of Lading before the transport company leaves your plant. This will provide the insurance company with a clear record of the damage. *Immediately make a claim for damages against the transport company. We are not responsible for shipping damages.*

Have the proper equipment and personnel to assist you in removing the skid and placing the machine. We recommend you have trained machine riggers to assist you in uncrating and placing the machine.

Set the machine in place.

Read and understand this operation and maintenance manual before operating or doing any maintenance on this machine. Read and understand the Safety Summary.

You will need a set of open/closed end metric wrenches, a large adjustable wrench, and a accurate bubble type level

How to install the machine.

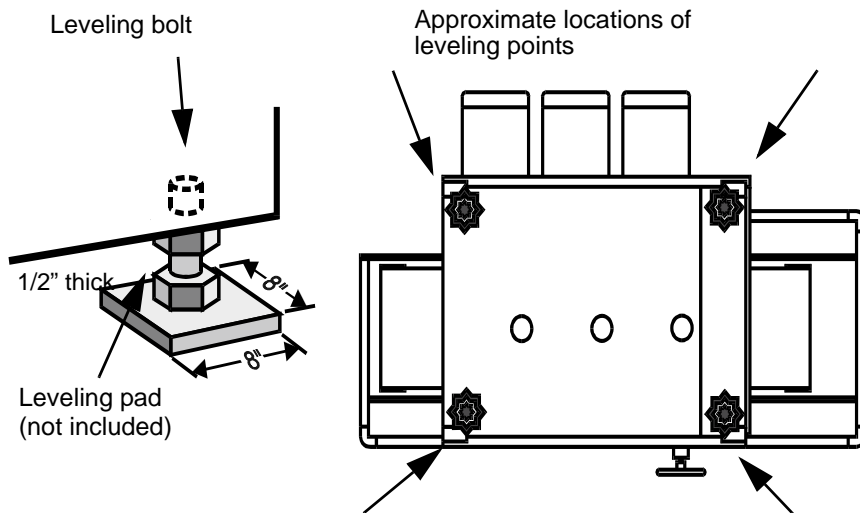
Read all of the tags and decals attached to the machine. They contain needed information for the safe operation, proper placing, and setup of the machine.

NOTE: A Constant Passline sander conveyor bed must be set and leveled to the same height as the conveyor bed of the machine sending product to it and/or the machine receiving product from the sanding machine.

1. Review the assembly drawings in Appendix I of this manual. They show the detailed construction of your machine.
2. Locate the air and electrical attachment points, and dust collection outlets.
 - Use the drawings in Appendix I for the dimensions of the machine and the exact location of the utility connection points.
3. Move and prepare to place the machine.
 - Allow space for opening the inboard and outboard doors, for loading abrasive belts, and material handling at the infeed and outfeed of the machine.
 - Use the proper equipment to lift and move the machine. Slots are located on the top of the frame to hook to for lifting.
 - Have trained machine riggers assist you in moving and placing the machine.
4. Remove machine from skid (see figure that follows).
 - Install leveling bolts or casters optional.
 - Place a 8 inch X 8 inch X 1/2 inch steel plate (not included) under each leveling bolt and support points.

FIGURE 1.

Typical installation of leveling bolts and leveling pad under leveling bolts. See the dimensional drawing in the appendix for exact installation locations!

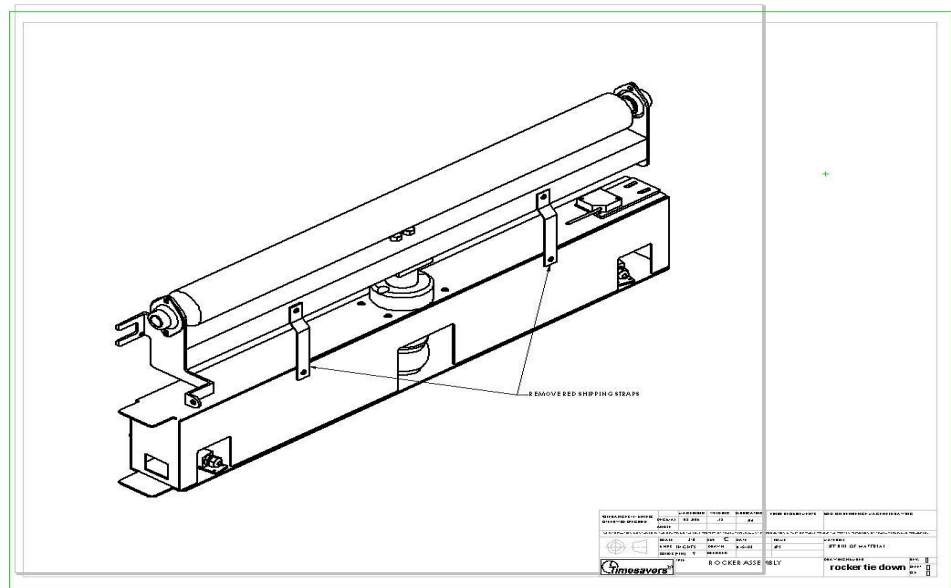


How to install the machine.

5. Remove all shipping blocks, brackets or straps.
 - Remove two test sanding belts and shipping blocks from under conveyor bed.
 - Remove outfeed panel to remove shipping brackets from center bar and idler yoke. Replace panel before installing electrical. See figure that follows.

FIGURE 2.

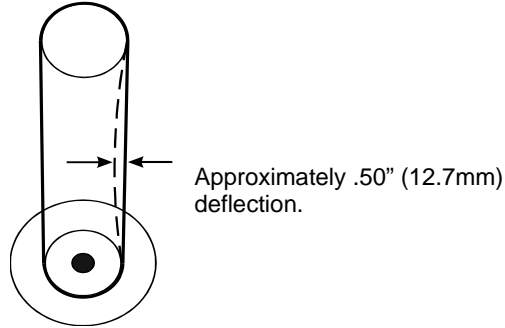
Location of shipping brackets/blocks



6. Remove Anti-Corrosive coating applied to metal rolls for shipping. Failure to do so may cause unsatisfactory sanding results.
7. Connect the compressed air line to the air filter.
 - Read “Compressed air supply”.
8. Install and connect the dust collector to round outlet dust pipe on the machine.
 - Read “Dust Hoods and Dust Collection Systems”
9. Tighten main drive belts and level motor by measuring the distance from motor base plate to the frame (all four corners), **if needed**.
 - Do not over-tighten the drive belts. Damage can occur to the contact drum and bearings and may show up as chatter on the material finish.

FIGURE 3.

Main drive belt tension



10. Determine proper rotation of abrasive head per machine order. The abrasive belt rotates towards dust hood pick up inlet.

- The electrician needs to know this to connect the electrical power lines correctly.

11. Connect the electrical supply service.

- Read the Electrical Ground chapter in this manual.
- We recommend that you have a qualified electrician perform this installation. Obtain a copy of and understand the National Electric Codes and the local codes where the machine is installed.
- **CAUTION:** All conduit fittings, cord grips and devices mounted through the enclosure doors or body must be listed or recognized devices for NEMA Type 12 or to the same rating as the enclosure hazard rating (Class 2, Div 2, Class 3 Div 1,2 hazardous locations) as marked on the enclosure label. All such devices must be mounted and used in accordance with the manufacturers instructions improperly rated or installed may degrade the integrity of the enclosure, reducing the level of protection against fire.

12. Track conveyor belt by tightening conveyor belt adjustment bolt on the side in which the belt is overriding. Do not overtighten; if belt seems too tight, loosen the adjustment bolt on the opposite end.

13. Check air pressure settings and proper adjustment of tracking valve.



Danger! Operation without proper alignment can result in product kick out, which can cause severe injury or death. Check alignments of machine.

Adjusting the machine for work piece thickness.

Contact Timesavers, Inc. for assistance on specific issues.

1.0 Sanding Head Configuration

The sanding head of this machine has two modes of sanding.

1. One mode is using the contact drum to remove material or dimension the product to a specific thickness. Coarse to medium grit belts (36 - 120) are used to achieve this.
 - Maximum 1/2 turn of the handwheel equals approximately .011".
2. The second mode of sanding is using the platen to create a finer finish on the surface of the product. Medium to fine grit belts (150 or higher) are used for this application. The platen should not be used to remove more than .005" material.
 - 1/4 turn of the handwheel equals approximately .005".
3. If the contact drum is selected as the mode of sanding, the **platen must be removed** from the sanding head. This can be done by releasing the tension on the abrasive belt and sliding the platen assembly out of the machine. Refer to "Platen Graphite Installation" section.
 - The platen is positioned lower than the contact drum, thus it must be removed for the drum to contact the product.
4. If the platen is selected as the mode of sanding, the drum will not contact the product.

2.0 How to Set the Machine for Material Thickness



Danger! Keep clothing and hands from chains and moving parts. Stop the machine before making adjustments.

1. Install proper abrasive belt and grit size. Refer to the section on “Installation of Abrasive Belt” for procedure. Leave the belt loading door open.
 - The sanding head can not start under this condition.
2. The opening of machine is varied by raising or lowering the conveyor bed.
 - One turn of the handwheel opens or closes machine by .025".
3. Push the BRAKE RESET button on the pushbutton.
4. Place a work piece under the first sanding head. Then close the conveyor bed until a slight drag of the abrasive belt occurs on the work piece.

This is best determined by manually turning abrasive belt as conveyor bed is closed until a slight drag of abrasive is felt.
5. Open the conveyor bed with three clockwise turns of the handwheel.
6. Run the part out of the machine.
7. Close the belt loading door.
8. Close the conveyor bed three turns.
9. Start the abrasive belt head.
10. Run one part and examine it.
11. Adjust the conveyor bed from this point depending on stock removal or finish required.

You are now ready for sanding parts.



Danger! Too small an opening for a work piece could present a kickout hazard and/or machine damage. Verify the machine opening before running any work piece through the machine. Personal injury or death could result from a kickout.

Daily Start up and Shut down

This machine is designed to operate at a high performance level. When properly installed and operated it will give you years of service. Read and understand this chapter before you use the machine.

1.0 Daily Machine Checks

Before you start up the machine each day do the following:

1. Review the “Daily Machine Checks” and the Safety Summary chapters provided with this manual.
2. Shut off and lock out the power supply to the machine.
3. Dress appropriately for safe operation and always wear safety glasses.
Review OSHA and local regulations to determine the correct and most current safe way to dress for work in your type of production plant.



Danger! You must wear eye protection when blowing off the machine with compressed air. Permanent eye damage could occur.

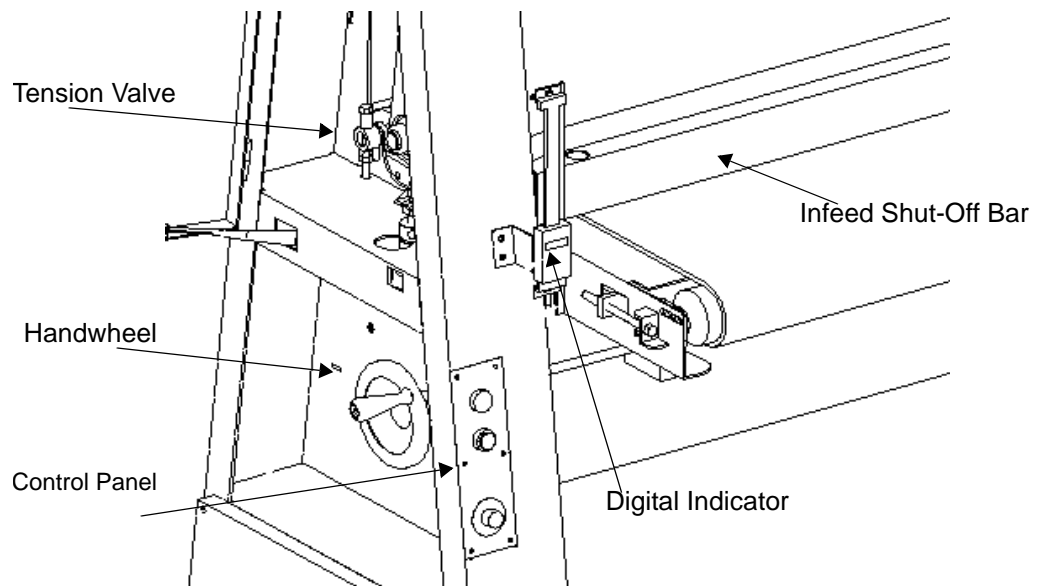
4. Clean the machine. Read the “Cleaning” chapter before beginning. Clean the inside of the machine, the conveyor bed, hold down rollers and/or shoes, and electric tracking eyes. This removes settled dust that may cause poor production performance.
5. Clear and clean the work area around the machine of any obstructions to a safe working environment.
6. Check all of the safety devices, the emergency stop, and perimeter stop for visible damage.
7. Check the dust hood for blockage and blow it out with compressed air.

8. Restore power to the machine.
9. Connect or turn on the air supply to the machine

2.0 Machine Functions

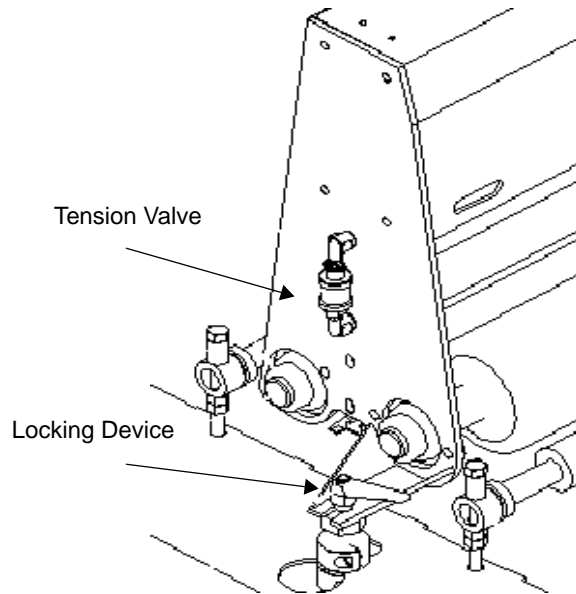
1. EMERGENCY STOP - All machine functions stop when this large red button is pressed. This is located on the outfeed side of the machine above the Air Filter supply (not shown on figure 1).
2. OVERTHICK INFEED SHUT-OFF BAR - This hinged red bar is located at the infeed of the machine and functions like an emergency stop if it is tripped. It is used to prevent double feeding.
3. CONVEYOR BED ADJUSTMENT - The handwheel located under the abrasive belt loading door is used to raise and lower the conveyor bed. A combination of scale (mounted on the bed) and pointer (mounted on the frame) is used to indicate the position of the conveyor in the machine.

FIGURE 1.



4. ABRASIVE BELT TENSION SLIDE VALVE - This valve raises and lowers the idler roll (the roll at the top of the sanding head). This movement increases or decreases the tension on the abasive belt.
5. SANDING HEAD LOCKING DEVICE LEVER - The sanding head is locked in place on the outboard side (belt loading side) of the machine with the removable locking device. To replace abrasive belt the locking device must be removed from the frame, and then replaced once the new abrasive belt is in position.

FIGURE 2.



6. AIR REGULATOR (valve and gauge) - This valve is located at the base of the machine under the conveyor feed drive. It governs the amount of air pressure fed to the abrasive belt tracking cylinder, the brake cylinder, and the abrasive belt tension air bag. Under normal operation, the gauge should read approximately 50-60 psi.
7. DIGITAL INDICATOR (Read-out) - Measure a board using caliper or another accurate measuring method. Turn scale on end set the indicator to the measured reading using the up/down buttons (readings will increase or decrease speed when buttons are depressed longer).



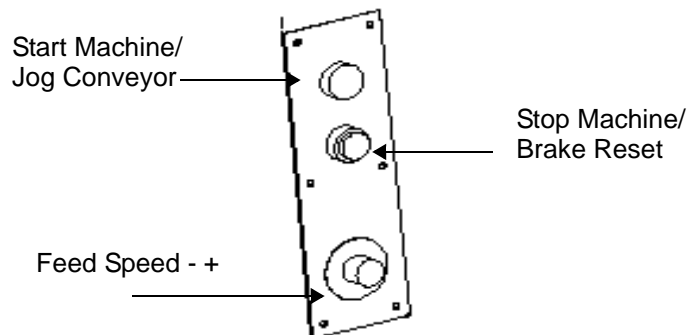
Warning! Never operate the machine if you know that there is something wrong with it. Notify your supervisor immediately. You may cause injury to yourself, others, and/or damage the machine.

3.0 Control Panel Functions.

Make sure that you know what machine function is controlled by each control on the control panel before starting up the machine. The figures and descriptions that follow identify the control functions.

1. **START MACHINE / JOG CONVEYOR** - This button has dual functionality. With the abrasive belt loading door closed, pushing this button will start the sanding head and conveyor feed. With the abrasive belt loading door open, holding this button down will jog the conveyor belt. The conveyor will stop when the button is released.
2. **STOP MACHINE \ RESET BRAKE** - This is NOT an emergency stop button. When this button is pressed, the sanding head and conveyor bed stop. The brake is not applied to stop the sanding head when this button is pushed. If the brake had been applied for an emergency stop condition, pushing this button will reset (release) the brake. This must be done before the START MACHINE button will operate.
3. **FEED SPEED (-, +)** - This dial is used to increase or decrease the speed of the conveyor belt. A line on the knob identifies the conveyor speed on the scale.

FIGURE 3.



4.0 How to start up the machine to run parts.

Review the “Abrasive belts” and “Adjusting the machine for work piece thickness” chapters.

1. Make sure the main power switch on the control panel is ON.
2. Make sure that there is compressed air service to the machine. Review “Compressed Air Supply” chapter.
3. Install the abrasive belt. Review the “Abrasive belts” chapter.
4. Slide the belt tension valve to tension the abrasive belt.

5. Turn on the dust collection air flow to the machine's dust collection hood(s).
6. Set the machine for sanding your work pieces. Review "Adjusting the machine for work piece thickness."



Caution! Never leave the machine running unattended.

5.0 How to shut down the machine.

Be sure all product has been run out of machine.

1. Shut down using the **Stop Machine** button located on control panel.
2. When *all machine movement has stopped* shut off the main power on the control panel.
3. Release the tension on the abrasive belt(s).



Use the emergency stop devices for emergency stops only.

Using the emergency stop devices every stop will cause excess wear and down time for repairs because the brake block is an original manufactured part and must be ordered from the manufacturer to maintain the safety specification of the brake system.

6.0 End of day shut down

At the end of your production day do the following:

1. Follow the instructions above *How to shut down the machine*.
2. Turn off the electrical power at the disconnect..
3. Turn off the air supply.
4. Clean the machine for the next production day. Review "Cleaning machine" chapter of this manual.
5. Perform any necessary preventative maintenance. Review "General Maintenance" chapter of this manual.

End of day shut down

Conveyor Feed Drive

1.0 Variable Speed Electric Motor Feed Drive AC

Your machine is equipped with the variable speed electric drive motor.

The feed speed of your machine is infinitely adjustable within the speed range indicated on the General Specifications page. This adjustment is located on the push button panel of machine.

For best sanding results, operate the feed no faster than necessary to achieve necessary production. Also, feed speed must be reduced if amount of material removal causes main motors to be overloaded.

To perform maintenance on the electric motor drive use the drive manufacture's maintenance guide located at the back of this manual.

Compressed Air Supply

This chapter provides information so you can correctly connect a compressed air supply to your sanding machine.

The incoming compressed air requirement for your machine is 50-60. Compressed air is used on your machine for the following areas:

- Abrasive belt tracking
- Abrasive belt tension
- Main motor brakes
- Conveyor belt tracking

An air filter is provided to remove contaminants; such as, water, oil, etc., from your compressed air supply. However, where contaminants are excessive, dryers or permanent type filters are recommended.

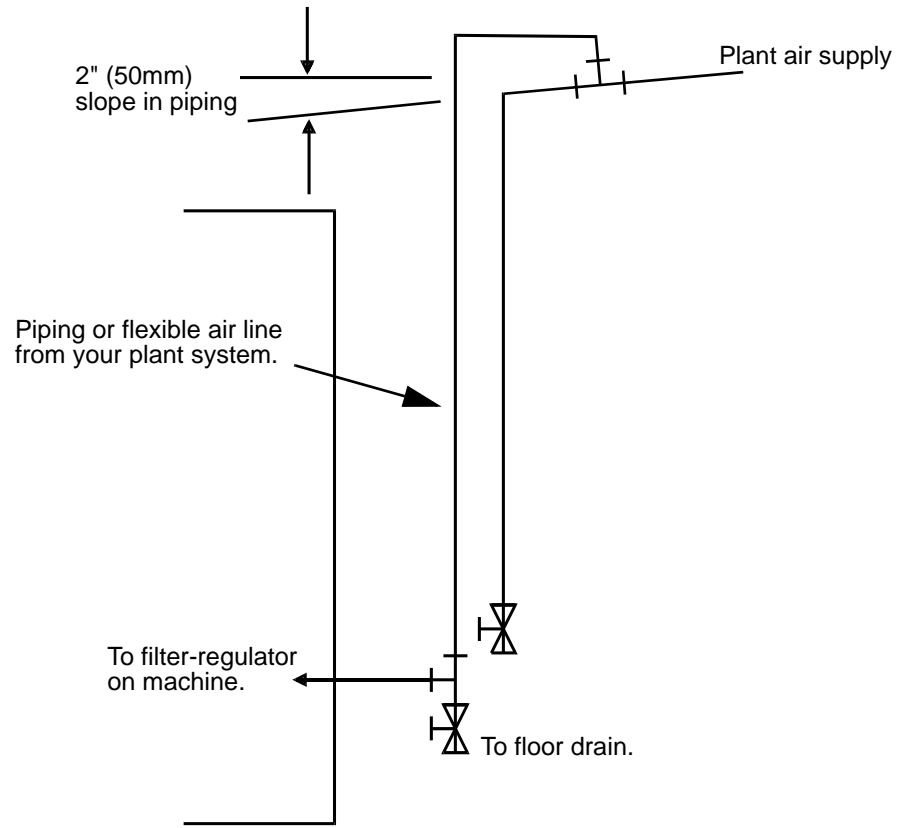
Observe and drain filter bowl daily. Replace the filter when it becomes dirty, also clean out the filter bowl. Dry, clean air is important for continued correct performance of the air controls on this machine.

If you do not already have air service, have it installed by a reputable air systems installer.

Recommended pneumatic installation provides a positive path for moisture to drain from the system and not contaminate the machine. See the figure below.

FIGURE 1.

Pneumatic Installation



General Operating Tips



Danger: Feed parts with care. Never allow work pieces to overlap or ride on top of one another. Parts being sanded must be firmly held to the feed conveyor or kickout may occur.

KEEP YOUR MACHINE CLEAN. A DIRTY MACHINE CAN CAUSE FEED HESITATION, STOCK SLIPPAGE, SAND-THROUGH ON VENEERS, POOR TOLERANCE, ETC.

Release tension on conveyor belt when not in use for long periods of time. Do not over-tension the conveyor belt. Use only enough tension to properly drive and track the belt. Excessive tension will cause early failure.

Feed hesitation generally shows up as a rippled or wavy surface on the sanded product. The causes are readily identified by their length and location. A ripple is sometimes caused by the abrasive belt dwelling longer over one part of the product, due to hesitation.

1.0 Chatter Calculation Formulas

The following formulas will help you in identifying the cause of defect marks for various drum diameters at different feed speeds. This should enable you to immediately identify any drum rotation or belt splice patterns.

1. Determine the conveyor speed in feet per minute (fpm).
2. Determine the contact drum speed in revolutions per minute (rpm).
3. Run a work part through the machine.
4. Measure the distance between each defect mark.
5. Then do each formula calculation.

If the drum is the cause of the marks on the work part the measurement you took will equal “Sd”.

(EQ 1)

$$((Cfpm \times 12) \div (Drpm)) = Sd$$

- Cfpm* Conveyor speed in feet per minute.
12 Is inches in a foot (a conversion factor).
Drpm Drum revolutions per minute.
Sd Spacing of marks on work part in inches.

If the abrasive belt splice is the cause of the marks of the work part, the measurement you took will equal “Sb”.

(EQ 2)

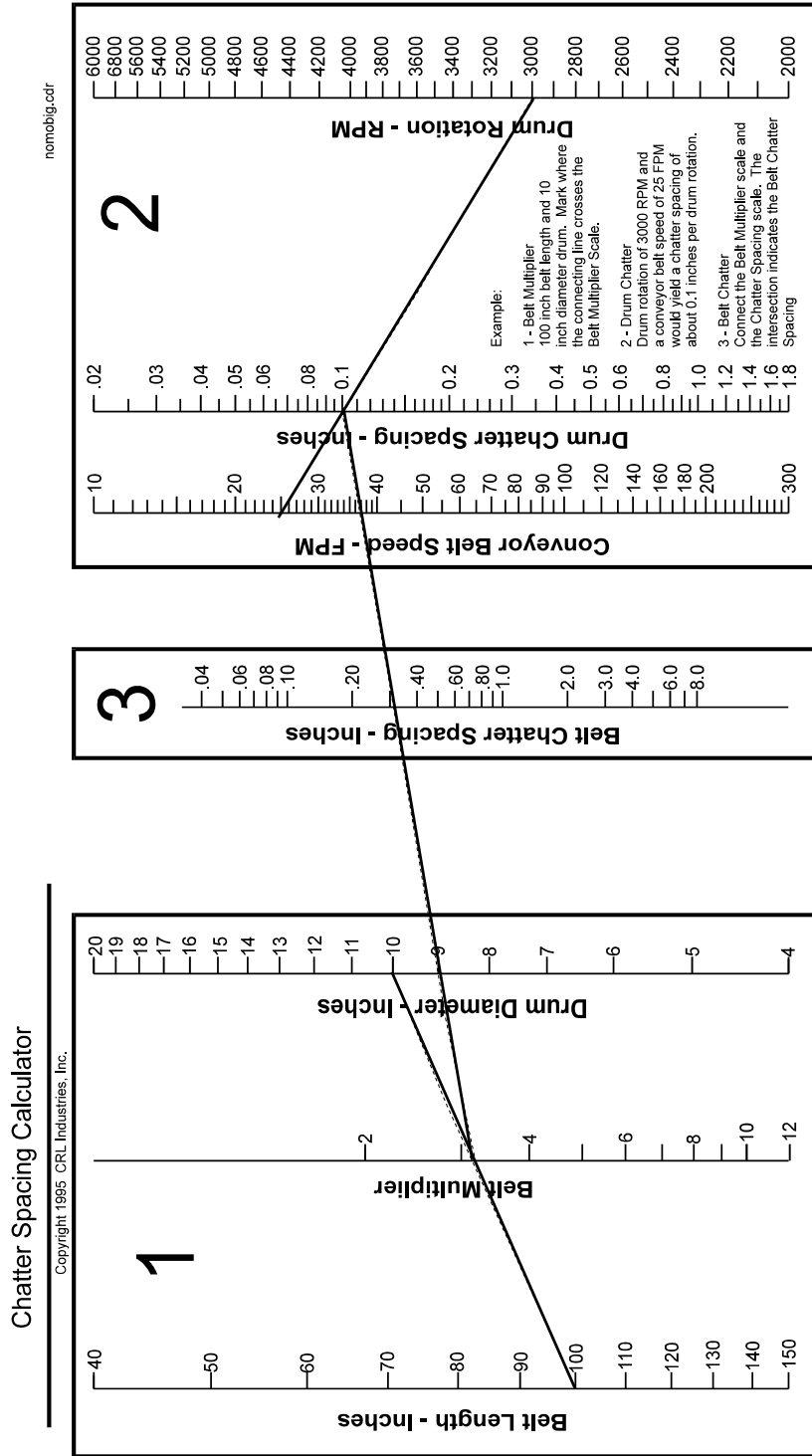
$$(\{(Cfpm \times 12) \times A\} \div \{(D\varnothing \times 3.14) \times Drpm\}) = Sb$$

- Cfpm* Conveyor speed in feet per minute.
12 Is inches in a foot (a conversion factor).
A Length of the abrasive belt in inches.
D∅ Is the diameter of the contact drum in inches.
3.14 ,, (pi), a diameter to circumference conversion
Drpm Drum revolutions per minute.
Sb Spacing of marks on work part in inches.

- Important: There may be more than one position of drum or belt causing marks, so check to see if some mark recurs cyclically at spacing shown.

TABLE 1.

Chatter calculator



2.0 Feed Hesitation and Work Piece Slipping

KEEP YOUR MACHINE CLEAN. A DIRTY MACHINE CAN CAUSE FEED HESITATION, WORK PIECE SLIPPING, AND FINISH DEFECTS.

Feed hesitation generally shows up as a rippled or wavy surface on the sanded product. The causes are readily identified by their length and location. A defect on the surface of the product is sometimes caused by the abrasive belt sanding one part of the product too long due to hesitation or stock slippage.

1. A long depression near the leading edge of the product is most likely due to insufficient pressure on the infeed pinch rolls.
2. A long depression near the trailing edge of the product is most likely due to insufficient pressure on the outfeed pinch rolls.
3. Erratic waviness may be caused by one or more of the following:
 - A Flat spot on the pinch rolls. Do not allow material to build up on the pinch rolls.
 - A Bad U-joint on the pinch roll(s), billy roll(s), or sanding head(s) drive line. Replace damaged U-joint(s). *If your machine is equipped with u-joints.*
 - A Feed drive or head drive connector hub that is out of alignment. Realign the hub.
 - A Billy roll that is out-of-round. *If your machine is equipped with billy roll(s).*
 - Improper setting of the feed bed rolls or pinch rolls.
 - Feed bed rolls or pinch rolls that are glazed or coated with product dust buildup.
 - A glazed, hard, or saturated conveyor belt that has lost its feeding quality. Most conveyor belts may be dressed to restore their driving friction. *See side bar.*
 - The conveyor belt is slipping. If it is loose, tighten the take-up bolts and keep the conveyor belt and bed clean.
 - Variable speed drive belt for feed drive reducer slipping. Check for worn belt, replace if necessary. *If your machine is equipped with a belt type variable speed drive.*

Most conveyor belts may be dressed to restore driving friction. You can accomplish this by slowly bringing a running 80 grit sanding belt into light contact with the running conveyor belt for six to ten revolutions of conveyor belt. Open machine and check conveyor belt. Repeat as needed, removing a few thousandths of an inch, creating a uniform flat surface and restoring the original belt grip

3.0 Typical Finish Defects

Chatter marks run crosswise, the full width of the workplace surface. The six usual causes of chatter are:

- Lack of sanding pressure.
- Vibration in the machine.
- Uneven conveyor feed speed.
- Bad bearings on any roll or contact drum.
- Bad abrasive belt splice.
- Out-of-round or flat spot in contact and/or main sanding drum.

Inadequate sanding pressure

If marks show up in spots on the workpiece, it is probably due to inadequate sanding pressure or an uneven surface on the product. Close the machine opening to increase sanding pressure. If marks run across the full width of the workpiece and are evenly spaced over its full length, the problem is probably not pressure. Consider problems with vibration, part feed hesitation or the contact roll.

Vibrations

If the machine is part of a new installation, check the floor on which the machine is mounted and determine if it is level. If it is not level, make adjustments so that the machine operates in a level condition.

Vibrations in the machine generally result from out-of-balance idler or contact rolls, worn V-belts or an out-of-balance motor pulley. If this develops, check the V-belts. Then check the contact, feed roll and motor bearings. If the contact or idler roll have been changed or the contact roll dressed, check them for balance and make adjustments as necessary.

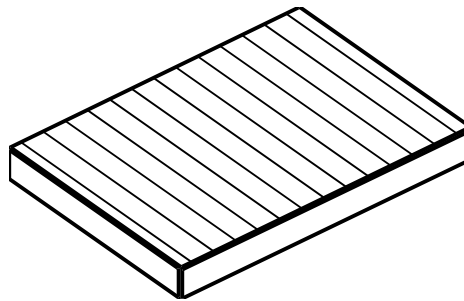
Part feeding hesitation (*variable feed speed drive only*)

After vibration has been ruled out as a problem, check the conveyor feed. Run a piece of material through the machine at any feed speed and measure distance between the defect marks. Then change the feed speed and run a second piece of material through the machine and measure the distance between the defect marks. If the distance between the marks on each part is the same; the problem is in the feed drive. Clean the conveyor. Check the conveyor belt and rolls for feed quality. Dress the belt if it is necessary. *See previous side bar.* Check to make sure there is not excessive backlash in the chain or the gear reducer. Correct the condition if it exists.

Contact roll

The contact roll should be checked for roundness if it has recently been dressed or changed. A dial indicator is used for an accurate measurement. A rough roundness indication can also be made. Manually rotate the roll while holding a piece of chalk lightly and steady against the roll. Move the chock across the face of the roll as it rotates. It will touch the high spots on the roll marking them. This does not, of course, show the depth of the low spots as does a dial indicator.

FIGURE 1.

Chatter mark*causes*

- Belt splice
- Worn contact drum bearing
- Vibration in the machine
- Worn drive motor bearings
- Worn idler roll bearings
- Loose or worn drive belts
- Flat spots on the drum
- Out of balance drum or idler
- Conveyor bed not feeding at a constant rate

Actions to cure chatter marks

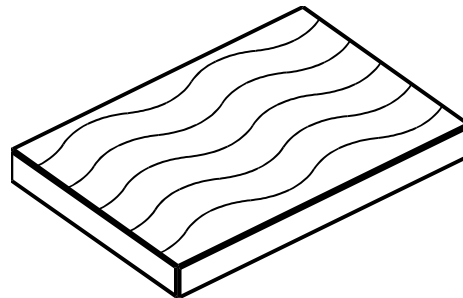
- Use an abrasive belt with a butt splice
- Replace the contact drum bearings
- Identify and stop the machine vibration
- Replace the drive motor bearings
- Replace the idler roll bearings
- Tighten the drive belts

- Replace or dress the contact drum
- Balance the contact drum
- Check the conveyor bed drive coupler/drive belt
- Relieve tension from the abrasive belt when it is not in use to avoid flat spots on drums.

Chatter marks on the product are most often caused by the sanding belt splice. A good way to check is to use a black crayon to mark the splice. Then, run a new, clean workpiece through the machine. If the belt splice is the problem, the black crayon will mark the workpiece with chatter marks. Most of the time, using more pressure or making a heavier cut into the product will cure chatter. An exception to this guideline is a product application on a machine with a hard contact drum, that is not designed for finishing.

FIGURE 2.

Streaks – Wavy type



Causes

- Loaded or damaged abrasive belt.

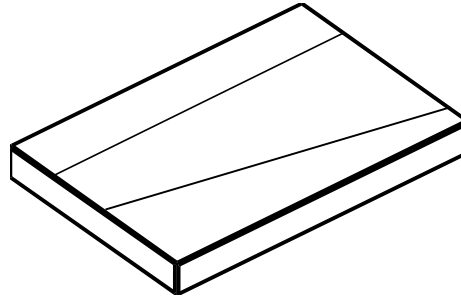
Cures

- Replace the abrasive belt.
- Use a lighter cut.
- Use another type of abrasive belt (open coat).
- Slow the conveyor bed speed (belt will not load).
- Stagger part on bed (do not use only one area of abrasive belt)

You may have to run parts with a coarser grit first, for part “clean-up.”

FIGURE 3.

Streaks – Straight type



Causes

- Mark on sanding drum.
- All of the abrasive material on the abrasive belt is worn in straight line (with belt set to a narrow track).
- Pinch roll(s) not turning.

Cures

- Replace the sanding drum and bearings.
- Remove large burrs or sharp edges on the product before sanding.
- Grind with a courser grit sandpaper first.
- Replace the pinch roll(s) or the pinch roll bearings.

Dubbing leading and/or trailing ends

Dubbing is caused by incorrect pinch roll spring tension or height adjustment.

1. If a dubbed leading edge should occur, lower the infeed roll slightly.
2. If a dubbed trailing edge should occur, lower the outfeed or roll slightly.
 - A dubbed trailing edge could be caused by excessive infeed or roll pressure.
 - Dubbing on leading end of material is caused when part is forced into outfeed pinch roll which is too low or too much spring tension.
 - Dubbing on trailing end of material is caused when part comes out of infeed pinch rolls which are too low or too much spring tension.

NOTE: A dubbed trailing edge could be caused by excessive infeed roll pressure.

4.0 Approximate stock removal and depth of scratch for abrasive sanding equipment

Example of 1/32" or .031 Stock Removal

Grit Sequence

Grit 180 100
Stock Removal.004.010.018
Depth of Scratch.004.008.011

Average abrasive belt stock removal with average belt life yet capable of removing previous grit scratch:

Grit	Depth of Cut
60	.035– .045
80	.020– .030
100	.015– .020
120	.010– .012
150	.006– .008
180	.004– .005
220	.003– .004

Average depth of scratch created by the following grit abrasive belt:

Grit	Depth of Scratch
36	.028– .030
60	.025– .022
80	.015– .018
100	.010– .012
120	.008– .010
150	.005– .006
180	.004– .005
220	.003– .004

It is important to remove previous abrasive grit scratch pattern, but not to exceed abrasive belt stock removal capability. Skipping more than one abrasive grit (80 to 150) will put added work to final grit causing lower belt life. Also, previous scratch (80) pattern may not be totally removed.

5.0 How to check stock removal and sanding accuracy

A method of "quick" checking stock removal would be to sand a long board (longer than total length from first sanding head to last sanding head). When the piece is under all sanding heads, stop machine using the emergency stop.

Open conveyor bed assembly and remove board. Measure board at proper locations. This can also be used on multiple head sanders to check tolerance side to side by running two boards simultaneously. Repeat above process, and measure. This will indicate what each sanding head is removing and how accurate each sanding head is sanding side to side.

Contact Roll Hardness (Durometer) For Given Abrasive Grits

Hardness	Abrasive Grit
60 - 70	80–120

Recommended Abrasive Grit for Polishing Platens

White wood sanding 120–240

UV or fill sanding 280 - 400

(Note: Average stock removal of polishing platen should not exceed .002–.004.)

4" dia drum @ 1750 rpm, 60" belt

Conveyor Speed	Drum Marks	Belt Splice
20 FPM	0.137	0.655
25 FPM	0.171	0.819
30 FPM	0.206	0.983
35 FPM	0.240	1.147
40 FPM	0.275	1.310
45 FPM	0.309	1.474
50 FPM	0.342	1.638

How to check stock removal and sanding accuracy

Conveyor Speed	Drum Marks	Belt Splice
55 FPM	0.377	1.802
60 FPM	0.410	1.965
65 FPM	0.446	2.129
70 FPM	0.480	2.293
75 FPM	0.514	2.457
80 FPM	0.550	2.621
85 FPM	0.583	2.784
90 FPM	0.616	2.948
95 FPM	0.651	3.112
100 FPM	0.685	3.276

For any other feed speed or drum diameter or RPM see “Chatter calculator”.



Caution! There may be more than one position of drum or belt causing marks, so check to see if some mark recurs cyclically at spacing shown.

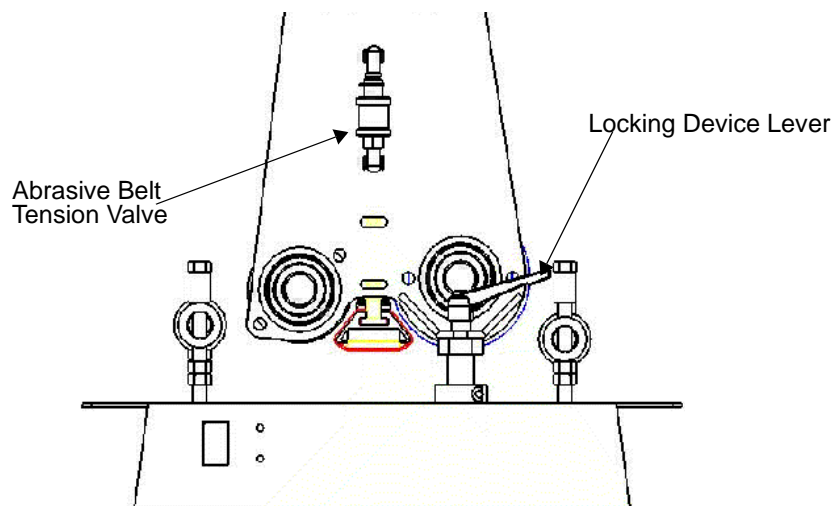
Abrasive Belts

Installation and proper care of abrasive belts

1.0 How To Install The Abrasive Belt

1. Shut down the machine and wait for it to come to a complete stop.
2. Open the outboard door of the machine for access to the belt.
3. Retract the top roll by shifting the belt tension valve in center of abrasive head.
4. Release the locking device lever, lift it out of the way.

FIGURE 1.



5. Install the abrasive belt, positioning the arrow printed on the inside of the belt with the direction of the drum rotation.
 - Some abrasive belts do not have an arrow printed on the inside surface. Read the instructions that came with your abrasive belt to determine the correct-mounting direction of the belt.
6. Center abrasive belt on idler roll.
7. Re-install and secure locking device.
8. Tension abrasive belt by shifting belt tension valve.
 - Do not leave the tension on the belt for an extended time when the machine is not running.
9. Press the “Brake Reset” button to release the brake.



Danger! Keep clothing and hands from chains and moving parts. Stop the machine to oil, adjust, or clean.

2.0 Abrasive Belt Care

Request assistance and recommendations from your abrasive belt salesman to determine the correct type, backing and grit.

- See your salesman for recommended storage and treatment of abrasive belts.
- Low humidity causes abrasive belts to become brittle. A brittle belt is easily nicked and will break.
- High humidity causes abrasive belts to become limp and crease easily.
- Distribute wear on the abrasive by staggering the product across the full width of conveyor for sanding products.
- Schedule to sand wide products first, then narrower, etc., to the narrowest product last. This reduces the possibility of an objectionable mark caused by product being sanded with a used and unused portion of the abrasive belt at the same time.
- Use moderate oscillation of abrasive belt. This will slightly vary the surface of the abrasive belt being used and reduce objectionable edge marking.
- When narrow product is being run, utilize unused portions of the abrasive belt by placing each piece on a different area of the conveyor belt.
- A nick or tear along the edge will cause premature belt breakage. Replace the belt.
- Install abrasive belt with care before starting main motor, turning belt by hand to check alignment between idler roll and contact drum.

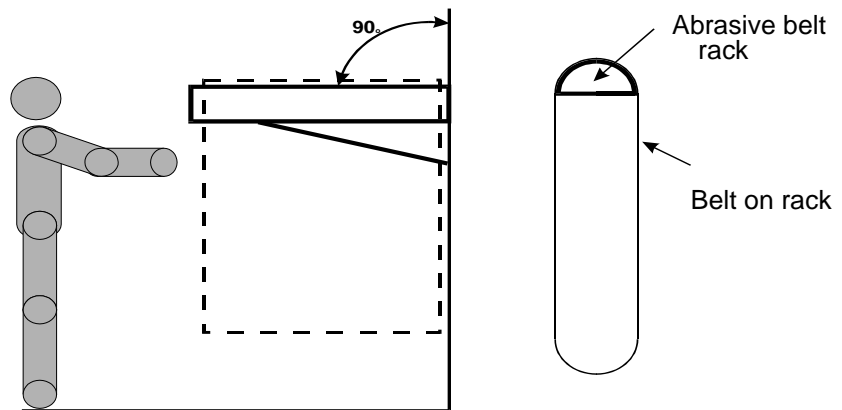
A cocked belt may crease or break under power.
- Release tension on abrasive belt when not in use.



Danger! Never clean the abrasive belt while it is in the machine. Severe bodily injury can occur. Remove the abrasive belt from the machine before attempting to clean the abrasive belt.

FIGURE 2.

Example of a belt storage rack.



All abrasive belts should be stored on a rack like this for best results and longer belt life. Use one rack per abrasive grit grade.

3.0 Abrasive Belt Tracking

The abrasive belt tracking for this machine has been factory set and should not require any adjustments by the operator when the machine is used under normal operating conditions with a good quality abrasive belt.

Conditions that could affect the ability to track an abrasive belt are:

1. Dust covering the tracking eye or infrared reflector.
2. Defective tracking eye or tracking solenoid valve.
3. Insufficient air pressure to the machine.
4. Damage to the cover of the contact drum.
5. Tapered contact drum, high-speed roll, or idler roll due to wear.
6. The use of lower quality abrasive belts.
7. Improper abrasive belt care.
8. Running abrasive belts with directional arrows in the opposite direction.
9. Attempting to remove too much material in a single pass may pinch the abrasive belt and prevent it from making the required tracking adjustment.

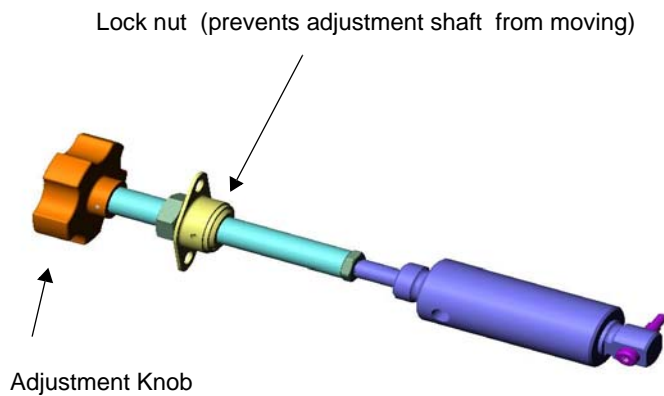
Tracking Adjustment:

Only after it has been determined that none of the above conditions exist, should a tracking adjustment be made. It is also important to know to which side of the sanding head the abrasive belt is mistracking. This information is required to make adjustments in the proper direction.

The following is a sequence of steps required to make a tracking system adjustment.

1. First make sure when tracking eye is blocked or not blocked, idler roll moves left or right.
 - This can be done by opening the abrasive belt door. Move belt inboard, (opposite side of belt loading door) tension belt and cover tracking eye, and observe if idler roll moves.

FIGURE 3.



2. Loosen lock nut so adjustment knob can be moved by hand.
3. Turn adjustment knob either clockwise or counterclockwise to adjust mistracked abrasive belt. Adjust until belt runs even on idler roll.
 - If the abrasive belt is mistracking towards the outboard (belt loading side), turn knob counterclockwise, until belt will run back toward the inboard side on right.
 - If the abrasive belt is mistracking towards the inboard, turn knob clockwise, until belt will run back toward the outboard side on the left.
4. Tighten lock nut so tracking adjustment shaft can not move at this point.

Conveyor Belt Care

Conveyor belt replacement

1.0 How To Replace The Conveyor Belt

Replacing the conveyor belt of your machine requires equipment for removal of the conveyor bed from the machine. Read through the following procedure, prior to removing the conveyor bed, to familiarize yourself with the process and to determine what you need for equipment.

1. Adjust the conveyor bed height to the mid-point of its travel limits.
2. Lockout and tagout the electrical and pneumatic power source controls. See the Machine Lockout Procedures in the Equipment Lockout Requirements section of the “Public Law” chapter in this manual.
3. The conveyor bed must be removed from the machine towards the infeed, so the feed drive package and conveyor drive roll have to be removed first. Refer to the Conveyor Bed Assembly drawing in this manual for identifying the components that must be disassembled and later reassembled. See figures that follow.



Warning! Use equipment designed to lift heavy objects to remove the conveyor bed.

FIGURE 1.

Machine Outboard side view

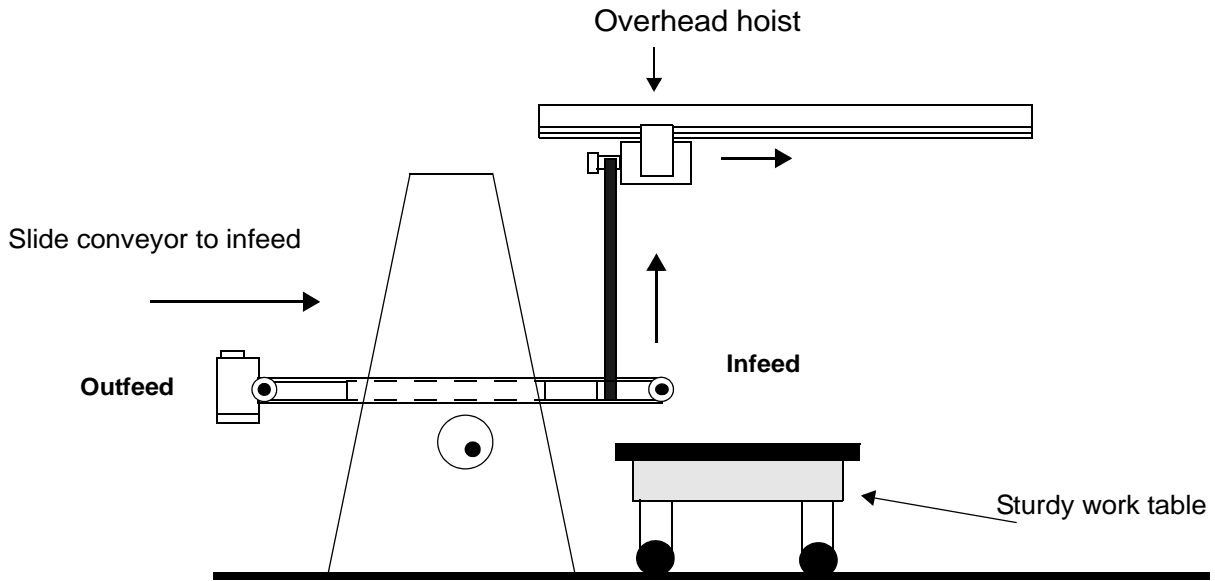
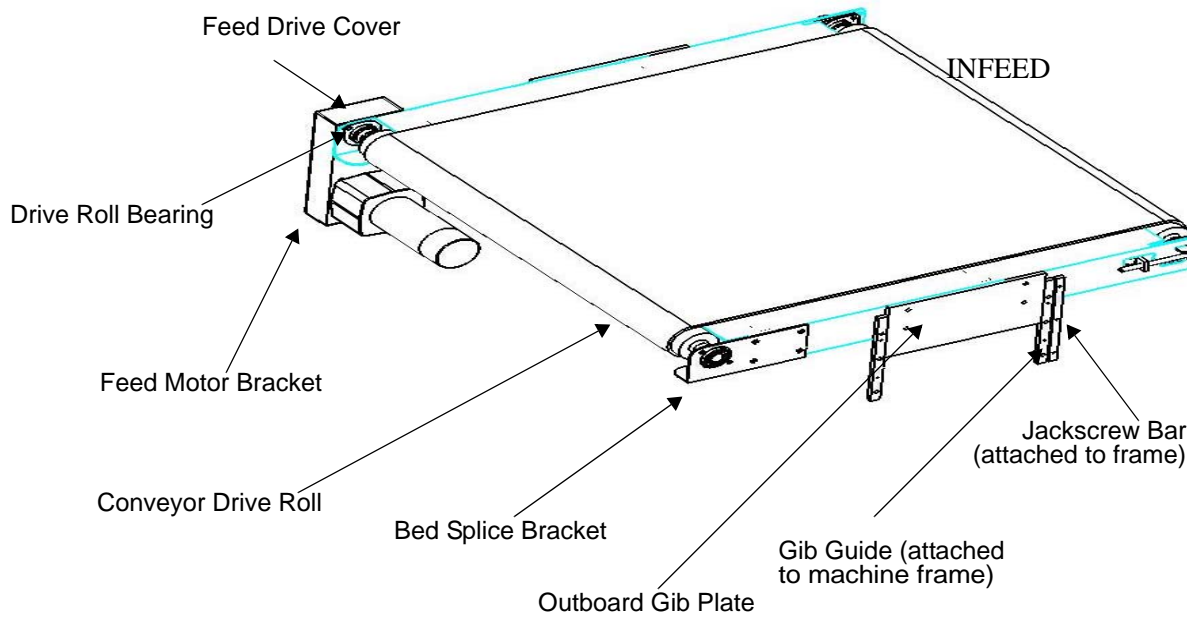


FIGURE 2.

Conveyor Bed



4. Remove the feed drive cover.
5. Remove the drive chain from the sprockets.
6. Remove the sprocket from the conveyor drive roll.
7. Remove the feed motor bracket from the conveyor bed. (The feed motor does not have to be unwired.)
8. Remove the conveyor drive roll next.



Before removing the drive roll bearings, place a support under the conveyor drive roll that will hold 200 pounds.

9. Remove the bed splice bracket from the outboard side of the bed. You can now slide the drive roll out of the conveyor bed.
10. Next, at the infeed of the conveyor, on both sides of the machine, remove both jackscrew bars and gib guide bars.
11. While supporting the conveyor bed at the infeed of the machine with a sturdy work table or overhead hoist, unbolt the lifting jacks from the underside of the bed.
12. Carefully lift and slide the conveyor towards the infeed of the machine while supporting it with an approved lifting device. Remove the conveyor bed completely from the machine and set it on a sturdy work surface.
13. Once the bed is out of the machine, remove the outboard gib plate.
14. Remove the conveyor belt by pulling the slack to the outfeed end and swinging the belt around and off of the outboard side of the bed.
15. Install new conveyor belt.
 - a. Locate directional arrow on insided of new conveyor belt. The arrow must point toward the outfeed end of the conveyor bed when installed.
 - b. Install the conveyor belt by placing it over the outfeed end of the conveyor. Pull the slack to the infeed end of the conveyor
16. Reinstall the conveyor bed.
 - a. Reverse steps 4 –13 to install the conveyor bed.

When reinstalling the conveyor drive roll, check it's alignment to insure that it is parallel to the infeed take-up roll. Misaligned rolls will make tracking the conveyor belt difficult.



Warning! Reinstall and adjust all guards when reassembling the conveyor.

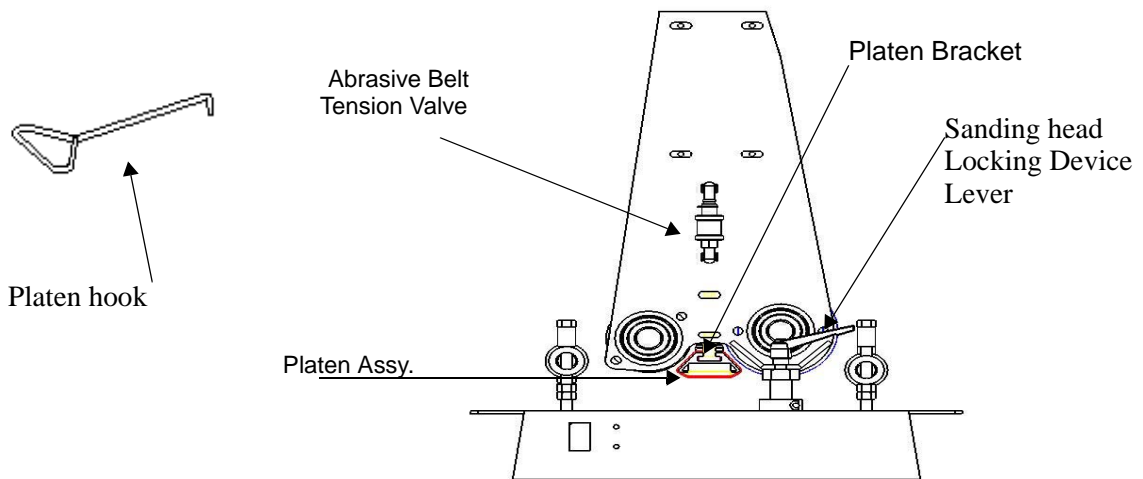
Platen Graphite Installation

1.0 How to install the platen graphite cloth

1. Shut down the machine and wait for it to come to a complete stop.
 2. Open the outboard door of the machine for the belt installation.
 3. Release the tension on the abrasive belt by sliding the tension valve up.
-

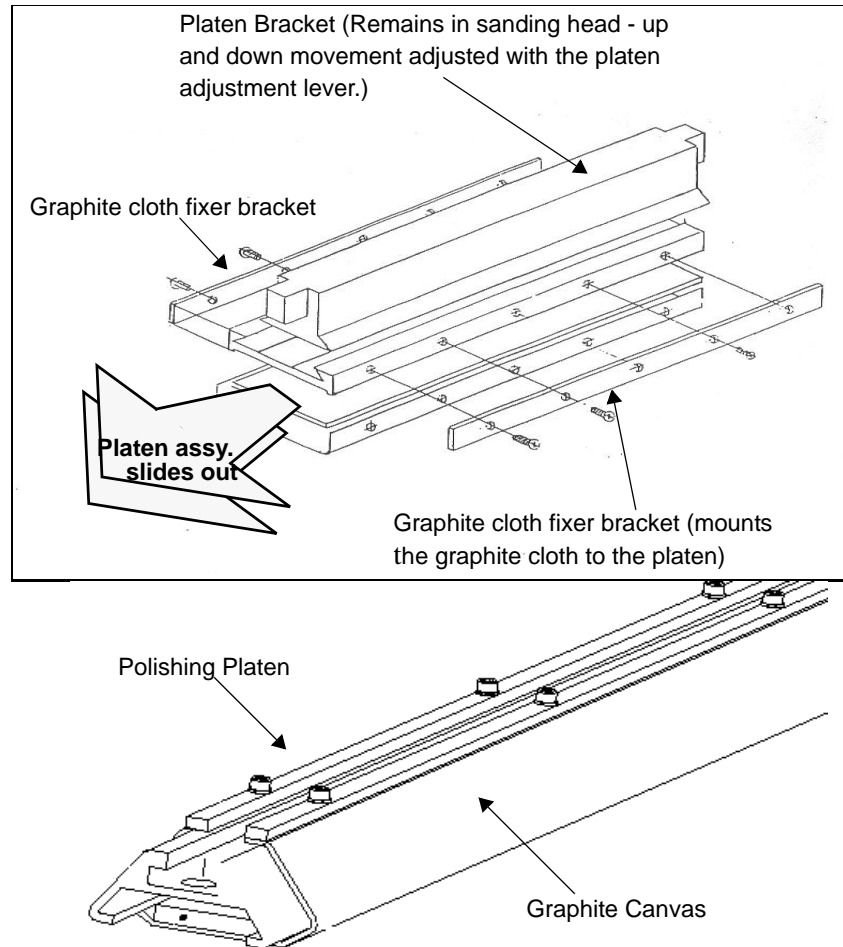
FIGURE 1.

Sanding head components



- Using the platen hook, slide the platen off of the platen bracket and out the sanding head.

FIGURE 2.



- Remove the screws and the graphite cloth fixer bracket from the platen.
- Carefully remove the graphite cloth from the platen. **Use the old graphite cloth as a pattern for cutting the new graphite cloth to size and for punching the screw holes.**
- Mount the new graphite cloth over the asphalt felt and to the platen with the screws and graphite cloth fixer brackets.
- Slide the platen assembly into the machine and on to the platen bracket.
- Center the abrasive belt on the idler roll.
- Tension the abrasive belt by sliding the tension valve down.
 - Do not leave the tension on the belt for an extended time when the machine is not running.

General Maintenance

Machine maintenance information and Safety related work practices.

This chapter will provide you with the necessary information to keep your sander operating for many years.

1.0 Introduction

We recommend that the employer review the following codes to assure employee safety compliance:

J.I.C	Joint Industrial Council
O.S.H.A.	Occupational Safety Health Act 1970
N.F.P.A.	National Fire Protection Association
	Federal, State or Local Codes as applicable.

The practices and procedures described in the above codes and regulations are intended to be implemented by the employee, but it is the responsibility of employers that their employees use these safety related work practices.

Instruct your employees to always be alert when they are working near exposed energized parts and work situations where unexpected electrical hazards may exist.

Instruct your employees not to reach blindly into areas that may contain energized parts.

Employees shall not knowingly be permitted to work in areas containing exposed energized parts or other electrical hazards while their alertness is recognizably impaired due to illness, fatigue, under the influence of drugs or other reasons.

N.F.P.A.-70E covers electrical safety related work practices and procedures for employees who work on, or near, or with electric circuits and equipment in the work place.

The N.F.P.A. Codes state: the employer shall provide training to assure that all employees who are assigned to work on or near de-energized circuits or equipment, understand the purpose of the disconnect lockout-tagout procedure, and understand the requirements of the procedure that applies to their specific work assignments.

N.F.P.A.-70E states: employees shall not be permitted to work in an area where they are likely to encounter electrical hazards unless they have been trained to recognize and avoid the electrical hazards to which they are exposed.

N.F.P.A.-70E also states: employees shall not be permitted to work on electric circuit parts or equipment that have not been de-energized and locked out or tagged out unless they are qualified and trained to use safe work practices.

The N.F.P.A.-70 covers a wide variety of employee safety related information, including:

- Adequate illumination of space containing exposed energized parts.
- Conducive articles of jewelry and clothing worn by employees exposed to energized parts.
- Conducive materials and equipment.
- Insulated tools and equipment.

The items listed here have been taken out of context and do not list all applicable codes or standards. **We suggest that your firm acquire the N.F.P.A. Codes for the protection of all parties concerned.**

Always disconnect power and lock main disconnect switch of machine before doing any maintenance work.

The lock must prevent other personnel from connecting power to the machine while maintenance work is being performed. A lockout device that permits several padlocks to be installed is recommended.

The device provides safety to all parties working on this machine for accidental start-up. This device is commercially available.

Before power is restored to the machine, all personnel in the area must be warned to stand clear.

All affected employees must be notified to stay clear of the circuits and equipment. There shall also be a visual verification that all employees are in the clear.

Do not operate this machine without all safety guards securely in place. Guarding was provided to reduce the exposure and hazards of moving components that could cause severe personal injury or death.

2.0 Lubrication

All bearings for the sanding head and conveyor bed are the same. These bearings are sealed for life bearings.

3.0 Daily Machine Checks

Before, during, and after use

1. Check Compressed Air Supply Filters and Water Traps daily and drain water accumulation as required.
2. Clean dust from machine daily or more frequently, if necessary.
 - Due to the hazardous nature of these materials, review the National Fire Code on methods of handling and disposal.
 - Consult your dust collector or filter manufacturer for cleaning intervals and methods for their equipment.



Danger! Most dusts, including wood dust, and light metal swarf, aluminum, magnesium, etc., are FLAMMABLE. Failure to keep equipment clean presents a hazard of fire or explosion.

4.0 Weekly Machine Check

1. Check conveyor belt and V-belts; tighten, if required. After making any adjustments to the conveyor belt system, the conveyor belt must be inspected while in operation to assure the required belt tracking path is maintained. **Do Not** over-tighten. Use only enough tension to prevent belt slippage. Too much tension decreases belt drive component life.
 - Never leave an untested conveyor belt in operation unattended. Permanent conveyor belt damage can occur if the tracking path is not properly balanced and the belt drifts into contact with a rigid frame member.

2. Check pinch rolls once a week or anytime a jam-up occurs in the machine; adjust, as required.

- The pinch rolls should be set approximately 1/16" below the level of the abrasive belt for the top surface sanding drum.



Danger! Pinch roll adjustment is important to maintain an even feed through the machine and to reduce kickback or kickout of work piece or pieces. The high velocity of a kickback or kickout presents a hazard of severe personal injury or death.

3. Check abrasive belt mistrack limit switches to confirm that the ceramic tips are in place and positioned in the path of the abrasive belt to detect a mistrack if the belt should drift away from the designated path.

- The machine operator should inspect the mistrack limit switches every time a new abrasive belt is installed. If the ceramic tip is missing, it must be replaced immediately.



Danger! If the ceramic tip is missing or worn through so bare metal could come in contact with the abrasive belt the ceramic tip on the limit switch **MUST** be replaced. A fire and/or explosion hazard will be present if the ceramic tip is not replaced when missing, broken, or worn through.

4. Examine the condition of the conveyor belt, on models with conveyor belt feed system. The conveyor belt is considered a low maintenance item, if it is used as intended.

- Machine jam-ups or the processing of thin parts can shorten the useful life of the conveyor.
- Processing of thin parts exposes the conveyor to the abrasive belt and will accelerate wear. In thin part processing, the conveyor must be considered an expendable item and will require a more frequent replacement.

The conveyor belt is a primary factor in holding machine processing tolerance and must remain in an acceptable condition. Early detection of acceleration wear should be analyzed for cause and corrective action required. The useful life should be determined based on monthly inspection and a replacement should be placed on order before the machine can no longer produce an acceptable product.

5. Examine the rubber covered rolls for wear, delamination, grooving, or gouging. Roll covering defects on contact drums will be transmitted to the product being sanded and could make your product unsandable. If there is

excessive wear or damage contact the dealer service department for the best course of action.

- The process of recovering a rubber covered roll is time consuming and will cause a loss of production time.
6. Examine the tracking eye to make sure they are clean and in good condition.

5.0 Inspect and Test the Safety Equipment

Inspect and test the safety equipment supplied on this machine to assure the safety of personnel operating this machine. Test the following to make sure they are in good operating condition and that they perform the tasks intended.

1. When the emergency stop buttons are pushed, the system was designed to perform the following:
 - a. Turn off sanding head.
 - b. Apply brake on sanding head.
 - c. Turn off conveyor feed drive.
2. System brake:
 - a. It is recommend that the maintenance check outlined be completed four times per year.
 - b. If the *emergency stop* is use more than once a week a maintenance check should be completed at least once a month.
 - Inspect for excessive wear or glazing on the flat side of the main drive V-belts. Also, Check the condition of the brake block to insure it still makes contact with the V-belts when it is activated. Replace any damaged or worn parts.
3. Door Interlock Limit Switch:
 - a. Visually check limit switches for manual by-pass which would make the system nonfunctional.
 - b. Verify that the circuits and equipment are in proper working condition.
 - c. The following procedure should be used to check out this system:
 - Have all personnel stand clear of the machine.
 - Start machine sanding head and conveyor feed drive.
 - Open the abrasive belt loading access door.
 - d. The safety interlock system was designed to perform the following:
 - Turn off sanding and/or brush head.
 - Apply brake on sanding head.
 - Turn off conveyor feed drive.

- e. The door safety interlock system is a vital element in protecting the operators from hazardous moving components and must be maintained in proper operating condition (NFPA 70E).
- 4. Machine safety guards are in place.
- 5. Abrasive belt mistrack switches function and are in good condition.
- 6. Check machine safety decals and operating instruction tag for legibility and make sure that they are in place.

We recommend that you observe the machine while it is in operation. Production down-time can be held to a minimum if problems are detected early. This will allow you to obtain replacement parts and schedule maintenance at appropriate times.

We strongly recommend that you keep a maintenance log book as a permanent machine record. Using the history of a machine is a good method to determine future replacement part needs.

Cleaning

1.0 How To Clean Your Sander

Your widebelt sander is designed to operate at a high performance level. To reach this expectation it requires careful care and maintenance. The methods and care used to maintain this sander affect its sanding performance and ability to hold tolerances.

The frequency of cleaning will depend on the environment the sander is placed in and how often you use it. We recommend that you clean your sander daily.



Attention! Cleaning this sander is considered normal maintenance and **DANGER** exists if not performed according to instructions. Follow the instructions below to clean the sander:

1. Turn off all power to abrasive head or heads and feed drive(s) and depressurize the machine's compressed air system.
2. Determine that abrasive belts are at a complete STOP.
3. Disconnect power and lock out main disconnect switch and the compressed air system of sander before doing any maintenance work.
4. Turn on your dust collection system.
 - This will help collect the dust you will stir up when cleaning the sander.
5. Open the outboard door (belt loading door).

6. Move slide valve or tension cylinder air valve to retract idler roll.
7. Remove abrasive belt.



Warning! Never use a standard industrial vacuum cleaner. An explosion-proof vacuum cleaner must be used for cleaning the machine.

8. Using a clean rag wipe off all excess grease, debris or swarf inside the sander.
9. Remove all objects clogging dust hood.
10. Remove dust by using a brush and pan. Use low pressure compressed air (30 psi / 2.1 bar) only to blow off areas not accessible by brushing.



Warning! Take care using compressed air. Do not cause dust clouds to form. Dust clouds are potentially explosive.

11. Clean the following areas:
 - Dust hood.
 - Center bar, inside and out.
 - Tracking eye module; Do not use a brush on the modules, this will scratch the optical eye. Use a clean, soft cotton cloth with optical lens cleaner.
 - Under the conveyor bed.
12. Drain the compressed air filter bowl and clean it out.
 - Clean all components of the air filter and regulators with mild household soap only (dish soap for example).
 - Rinse with clean water.
 - Dry the components completely before reassembly.
13. Clean around the sander. For a good and safe work area read and follow all OSHA and local code regulations for a safe and properly organized work area.



Warning! The polycarbonate plastic material used to manufacture the plastic bowl and other components of the air filtering and control system may be attacked by certain chemicals. Do not use air supply compressor systems lubricated with synthetic oils or oils containing phosphate esters or chlorinated hydrocarbons. These oils carry over into the air lines and chemically attack and possibly rupture the filter bowl or cause the failure of

other components. Also, do not expose the air filtering and control units to carbon tetrachloride, trichlorethylene, acetone, paint thinner, cleaning fluids or other harmful materials. These will cause the plastic to craze and/or rupture.

Replacement Parts

How and where to order parts.

1.0 How To Order Parts

You will receive quick service when ordering replacement parts using the form on the last page in this section.

Make photocopies of the blank form at the end of this section, then mail or fax a completed copy to your local Speedsander representative or to Timesavers.

Timesavers, Inc.
11123-89th Avenue North
Maple Grove, MN 55369
Telephone: 763-488-6600
1-800-537-3611
Parts & Service Direct 1-866- 298-9763
Fax: (763) 488-6601

To process your order request correctly please provide the following information:

- Your Company Name
- Shipping Address
- Your Name

- Telephone number, include extension
- The exact method of delivery you want (air mail, Federal Express, UPS Red, DHL, motor freight, rail freight, etc.)
- Machine **Model & Serial Number**; found on the ID plate attached to the machine.
- Item Number; found on the Bills of Material in the Operator's Manual.
- Part Number; found on the Bills of Material in the Operator's Manual.
- Quantity Needed
- Description; found on the Bills of Material in the Operator's Manual.
- Reference Drawing Number; found on the Bills of Material in the Operator's Manual.

2.0 Warranty Replacement Parts

For replacement parts under warranty submit a photo copy of the original Speedsander Bill-of-Sale with your parts order. For further information on warranty see the Speedsander Warranty located in the front of the Owners Manual.

3.0 Replacement Parts List

These are parts that we recommend you purchase. These are replacement parts that will normally be needed during the service life of your machine. By having these on hand, your machine down-time will be minimized.

Qty	Description
1).....	Contact Drum
2).....	Pinch Rolls
1.....	Idler Roll
1.....	High Speed Rollt
4).....	Pinch Roll Bearings
4).....	Pinch Roll Springs
6).....	Bearings, Flange
1.....	Conveyor Belt
1.....	Jack (Lift Screw)
1.....	Complete Platen Assembly
1.....	Graphite Canvas
1.....	Felt Pad for Platen
1.....	Brake Puck
2).....	V-Belts

Replacement Parts List

- 2Solenoid Valve
- 2Limit Switch Tip kit (includes: ceramic tip, spring, & fastners)
(Use ceramic tips or tips that do not spark, steel may cause sparks)
- 1Door Switch
- 1Door Switch Key
- 1Tracking Eye w/Reflector
- 1Tracking Cylinder Bearing
- 1Tracking Spring
- 1 Digital Indcator
- 1Caster Kit (2-each)
- 1 Regulator Filter

Order form:

Spare and Repair Parts Order Form

Company: _____

Shipping Address: _____

Contact Name: _____

Telephone: _____

Ship Via: _____

Machine Serial No.: _____

Machine Model No.: _____

Line No.	Item No.	Part No.	Reference Drawing No.	Description	Qty
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					

Spare and Repair Parts Order Form

Company: _____

Shipping Address: _____

Contact Name: _____

Telephone: _____

Ship Via: _____

Machine Serial No.: _____

Machine Model No.: _____

Line No.	Item No.	Part No.	Reference Drawing No.	Description	Qty
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					

Replacement Parts List

COVER SHEET

Date: 4-14-08

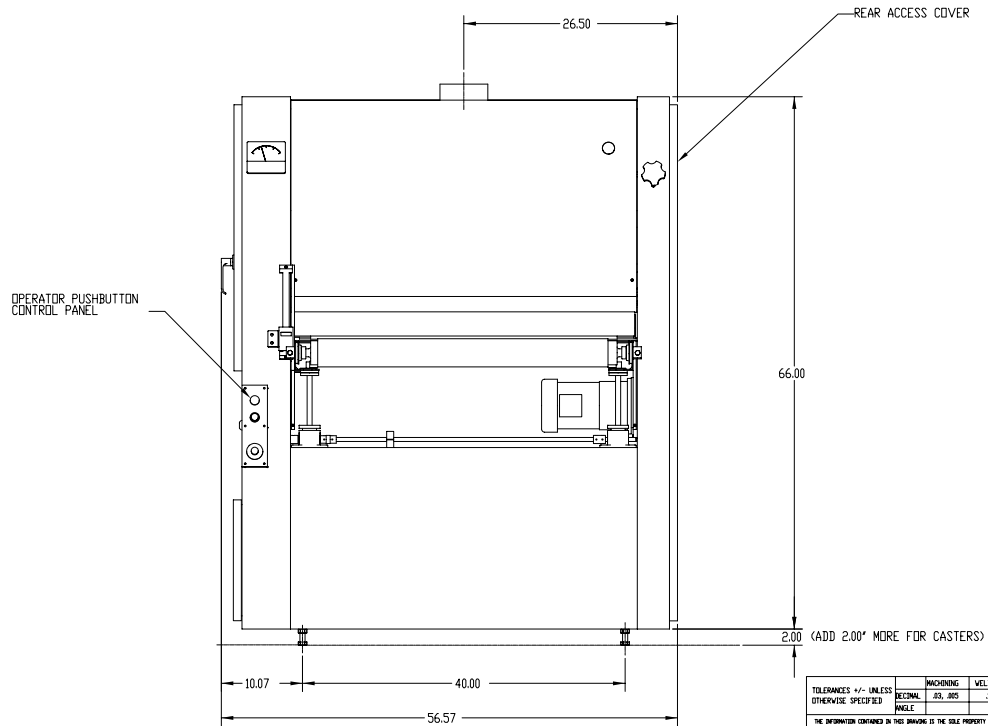
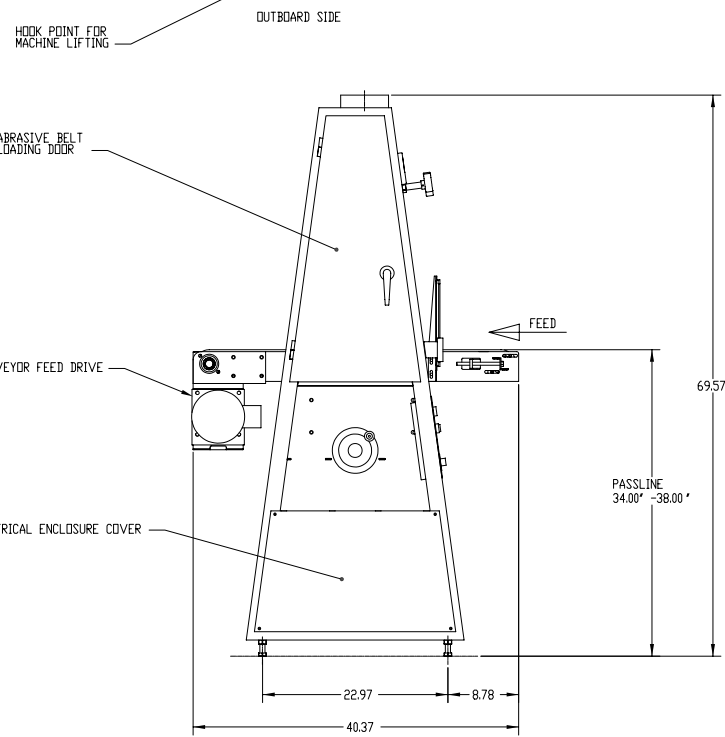
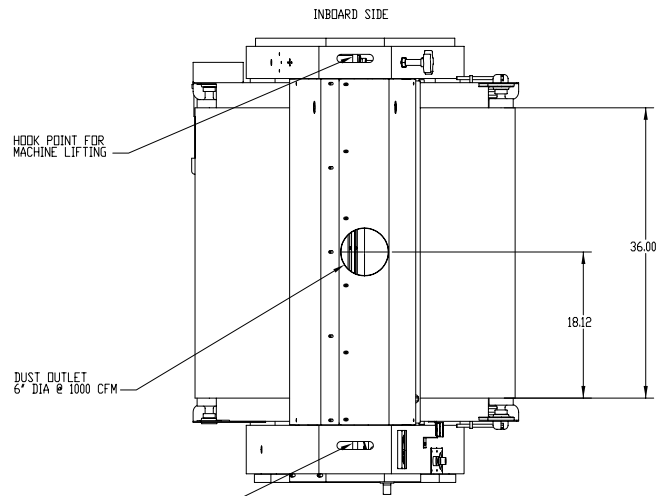
Page 1

SPEEDSANDER MODEL S311-13-1

ITEM	PART NO	DESCRIPTION	QTY
	D30459101	Dimensional	Ref
AA	D30247607	Basic Machine Assembly	1
AB	D30247704	Panel & Cover Assembly	1
AC	D30452600	Label Assembly	1
AD	D30248001	Lift Assembly	Ref
AE	D30028402	Conveyor Bed Assembly	Ref
AF	D30252602	Drum Assembly	Ref
AG	D30233701	Polishing Platen Assembly	Ref
AH	B30339701	Locking Device Assembly	Ref
AI	D30252502	Rocker Assembly	Ref
AJ	D30252701	Drive & Brake Assembly	Ref
AK	B30339601	Infeed Shut-Off Bar Assembly	Ref
AL	D30439901	Caster Kit	Ref
AM	P83018-4-150	Digital Scale	Ref
	304233020	Pneumatic Parts List	
	D30423302	Pneumatic Schematic	
	304230042	230/1/60 Electrical Parts List w/VFD Parameter Table 7.5HP	
	304230042A	230/1/60 Electrical Parts List w/VFD Parameter Table 10HP	
	D30423004	230/1/60 Electrical Schematic	
	304231032	230/3/60 Electrical Parts List w/VFD Parameter Table 10HP	
	D30423103	230/3/60 Electrical Schematic	

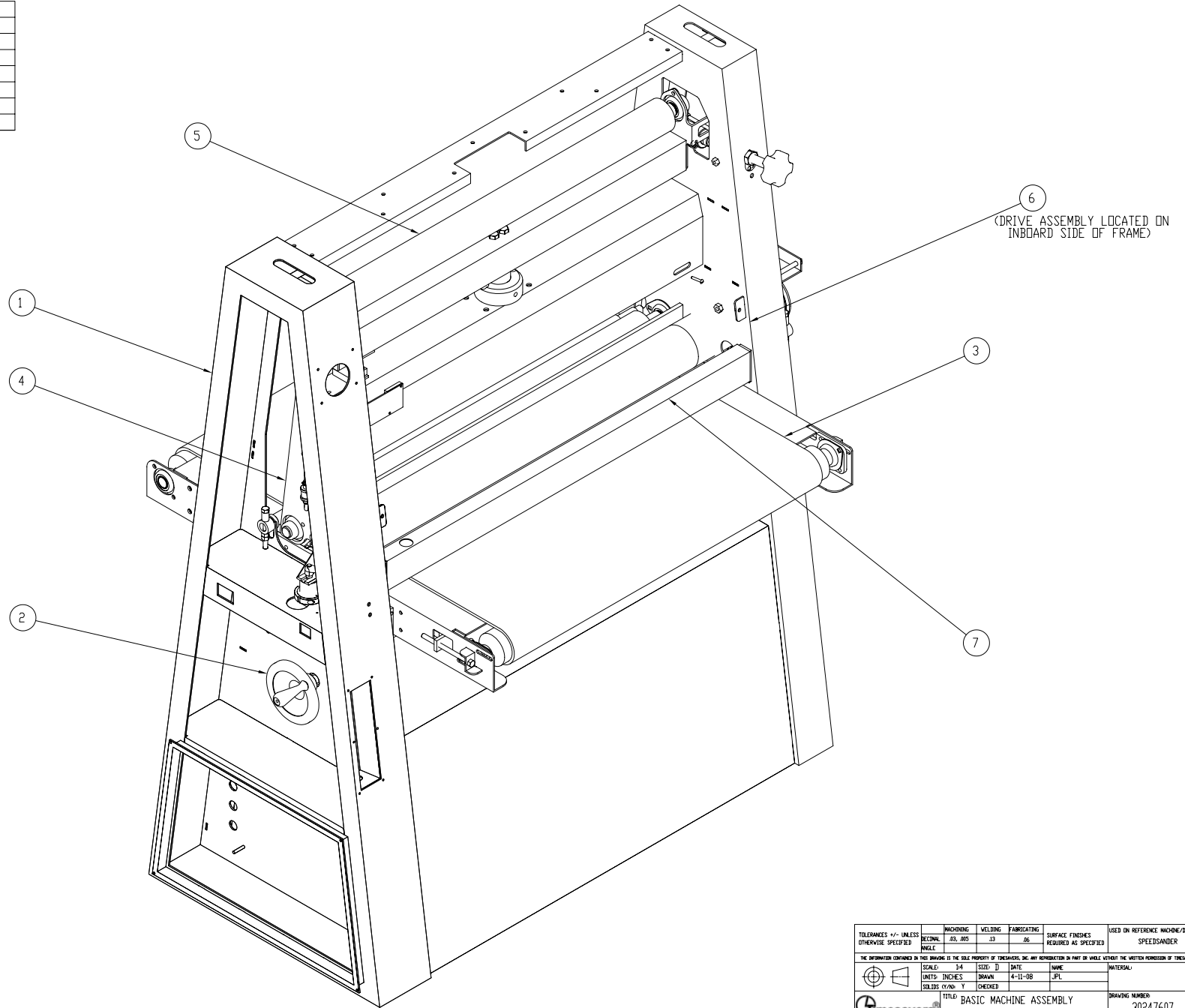
Revisions

Speedsander\csS311-13-1(4-16-08).



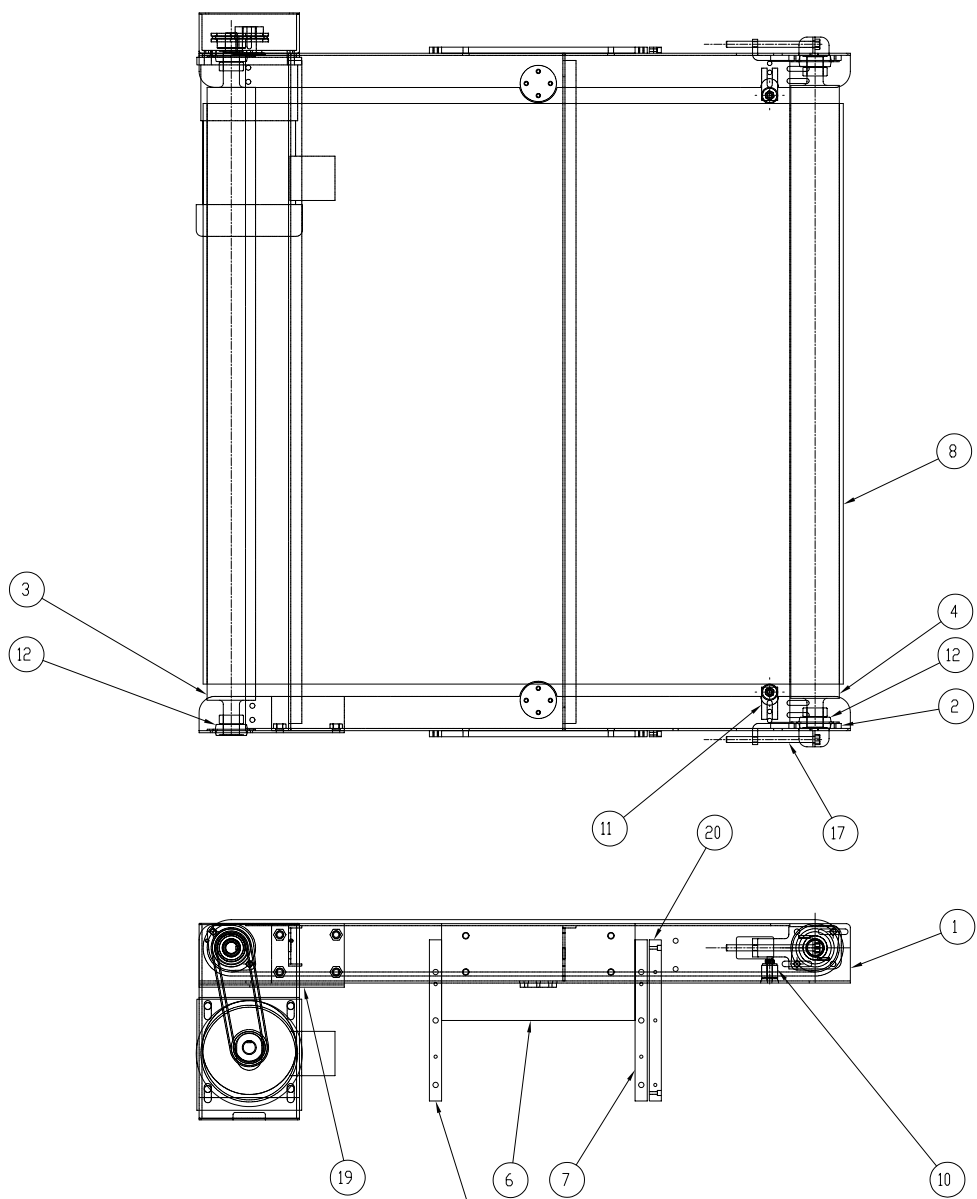
TOLERANCES +/- UNLESS OTHERWISE SPECIFIED	MACHINING DECIMAL ANGLES	WELDING .03, .015 .13	FABRICATING .06	SURFACE FINISHES REQUIRED AS SPECIFIED	USED ON REFERENCE MACHINE/DRAWING
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF TIMESAVERS, INC. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF TIMESAVERS, INC. IS PROHIBITED.					
	SCALE: 1/8"	ISSUE: 3	DATE: 4-14-08	NAME: JPL	MATERIAL:
	UNITS: INCHES	DRAWN: [blank]	CHECKED: [blank]	TITLE: DIMENSIONAL SPEEDSANDER	DRAWING NUMBER: 30459101
					REV. SHEET 1 OF 1

ITEM NO.	QTY.	PART NO.	PART DESCRIPTION
1	1	30005304	MAINFRAME WELDMENT
2	1	30248001	LIFT ASSEMBLY
3	1	30028402	CONVEYOR BED ASSEMBLY
4	1	30252602	DRUM ASSEMBLY
5	1	30252502	ROCKER ASSEMBLY
6	1	30252701	DRIVE AND BRAKE ASSEMBLY
7	1	30339601	INFEED SHUT-OFF BAR ASSEMBLY

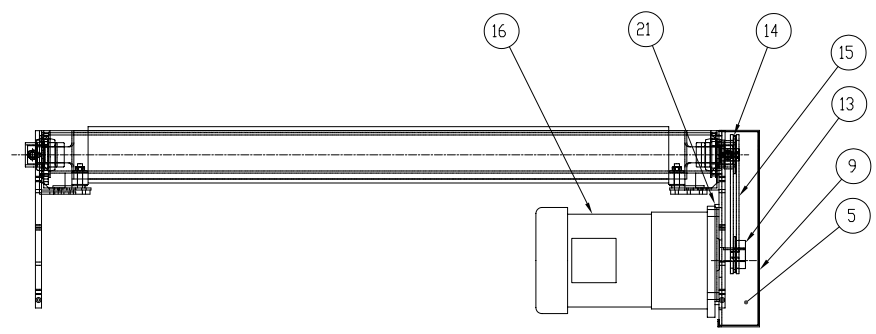


TOLERANCES UNLESS OTHERWISE SPECIFIED	MACHINING DECIMAL FRACTION	WELDING .03, .05	FABRICATING .13 .06	SURFACE FINISHES REQUIRED AS SPECIFIED	USED ON REFERENCE MACHINE/DRAWING SPEEDSANDER
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF TIMESAVERS, INC. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF TIMESAVERS, INC. IS PROHIBITED.					
	SCALE: 1:1	ISSUE: 01	DATE: 4-11-08	NAME: JPL	MATERIAL:
	UNITS: INCHES	DRAWN: [blank]	CHECKED: [blank]		
	SOLIDS: (Y/N) Y				
TITLE: BASIC MACHINE ASSEMBLY				DRAWING NUMBER: 30247607	REV. SHEET 1 OF 1





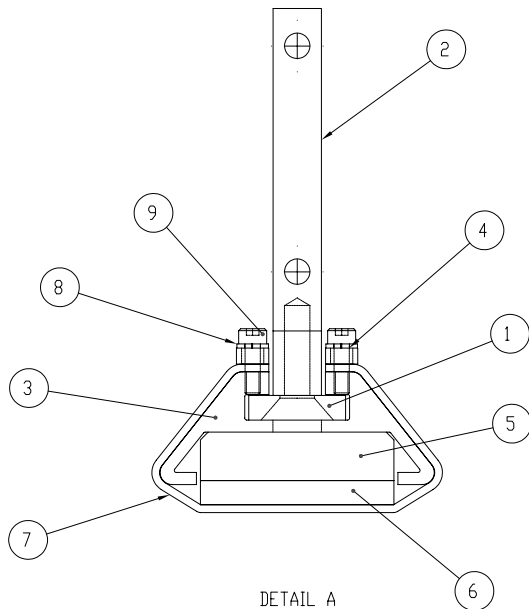
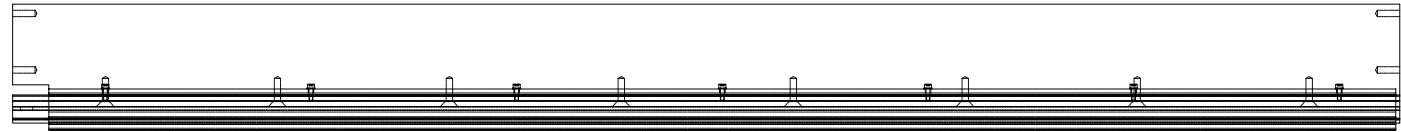
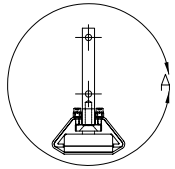
ITEM NO.	QTY.	PART NO.	PART DESCRIPTION
1	1	30140502	CONVEYOR BED WELDMENT
2	2	30233801	TAKE-UP BRACKET
3	1	30235501	CONVEYOR DRIVE ROLL
4	1	30235601	CONVEYOR TAKE-UP ROLL
5	1	30234702	FEED MOTOR BRACKET
6	2	30234801	GIB PLATE
7	4	30234901	GIB GUIDE BAR
8	1	P80186-36-82	CONVEYOR BELT SPARKS TS2100 36" w x 82" lg ENDLESS
9	1	30235401	COVER, FEED DRIVE
10	2	30320900	GUIDE ROLLER
11	2	30321001	BRACKET - ROLLER GUIDE
12	4	P80001-25-16	BEARING FLANGE FAFNIR #RAT-16
13	1	P81235-22MM-117	SPROCKET 35B17 - 22mm B. 2 SS @ 90 deg
14	1	P81235-12-118	SPROCKET 35B18 - 3/4" B. KWY & 2 SS
15	1	P83001-35	CHAIN #35 x 19.13" LG
16	1	SEE ELECT. P/L	GEARMOTOR CPG #CV22, 1/2 HP, 60I
17	2	EXPEND	HEX HEAD CAP SCREW 3/8-16NC x 5" LG
18	2	EXPEND	HEX NUT M8-1.25
19	1	30447000	BED SPLICE
20	2	30370801	JACKSCREW BAR
21	1	30447100	FEED MOTOR SPACER



PIN BOTH OUTFEED GIB GUIDES TO THE FRAME USING 5mm DIA. SPLIT PINS

NOTE: CALL FOR 1/8" DIA SPLIT PINS (ECC #4019) JPL 1-25-08

TOLERANCES UNLESS OTHERWISE SPECIFIED		MACHINING	WELDING	FABRICATING	SURFACE FINISHES	USED ON REFERENCE MACHINE/DRAWING
DECIMAL	.03, .05	.13	.06		REQUIRED AS SPECIFIED	SPEEDSANDER
ANGLE						
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF TIMESAVERS, INC. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF TIMESAVERS, INC. IS PROHIBITED.						
	TOTAL	DATE	NAME	MATERIALS		
	UNITS: INCHES	DRAWN	4-8-03	JPL		
SOLIDS (Y/N)	CHECKED					
TITLE: CONVEYOR BED ASSEMBLY						DRAWING NUMBER: 30028402
						REV. 1 SHEET 1 OF 1



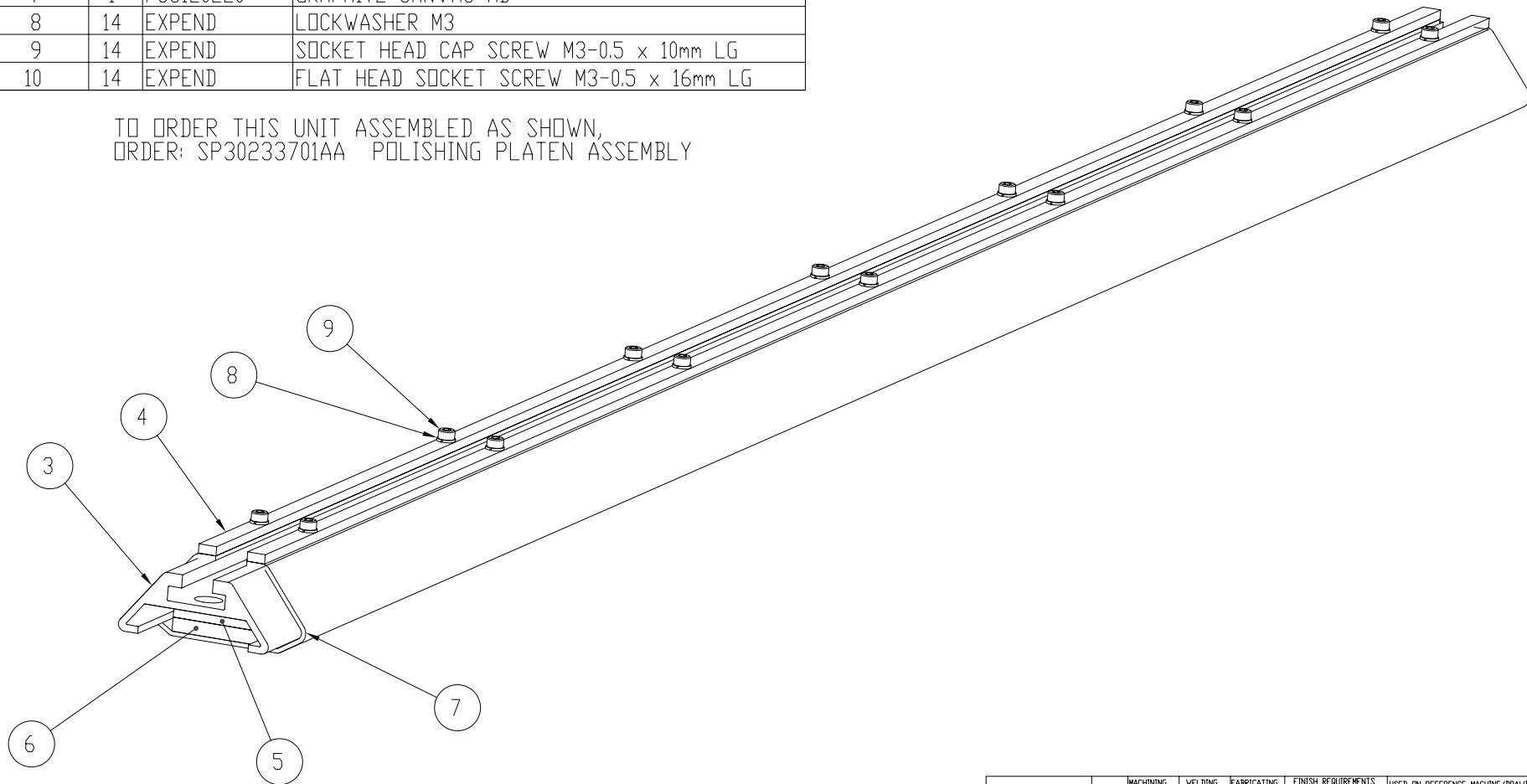
DETAIL A
SCALE 2 : 1

ITEM NO.	QTY.	PART NO.	PART DESCRIPTION
1	1	30233100	PLATEN BAR
2	1	30233102	PLATEN MOUNTING BAR
3	1	30233201	PLATEN EXTRUSION
4	2	30233300	CLAMP BAR
5	1	30233501	PLATEN BAR
6	1	99803-10-418	FELT
7	1	P83120220	GRAPHITE CANVAS HD
8	14	EXPEND	LOCKWASHER M3
9	14	EXPEND	SOCKET HEAD CAP SCREW M3-0.5 x 10mm LG

THE DIMENSIONS SHOWN ARE UNLESS OTHERWISE SPECIFIED. DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.		DATE: 6-4-03 DRAWN BY: JPL CHECKED BY: JPL SCALE: 1:2	DATE: 6-4-03 DRAWN BY: JPL CHECKED BY: JPL SCALE: 1:2	REMOVE (D) NO FLATHEADS FOR ATTACHING TIE RODS AND WIG EYED SHEET. JPL 2-9-96
MATERIALS: ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED. DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.	FINISH: ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED. DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.	ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED. DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.	ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED. DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.	TIME SAVERS, INC. POLISHING PLATEN ASSEMBLY SIZE: 30233701 SHEET 1 OF 2

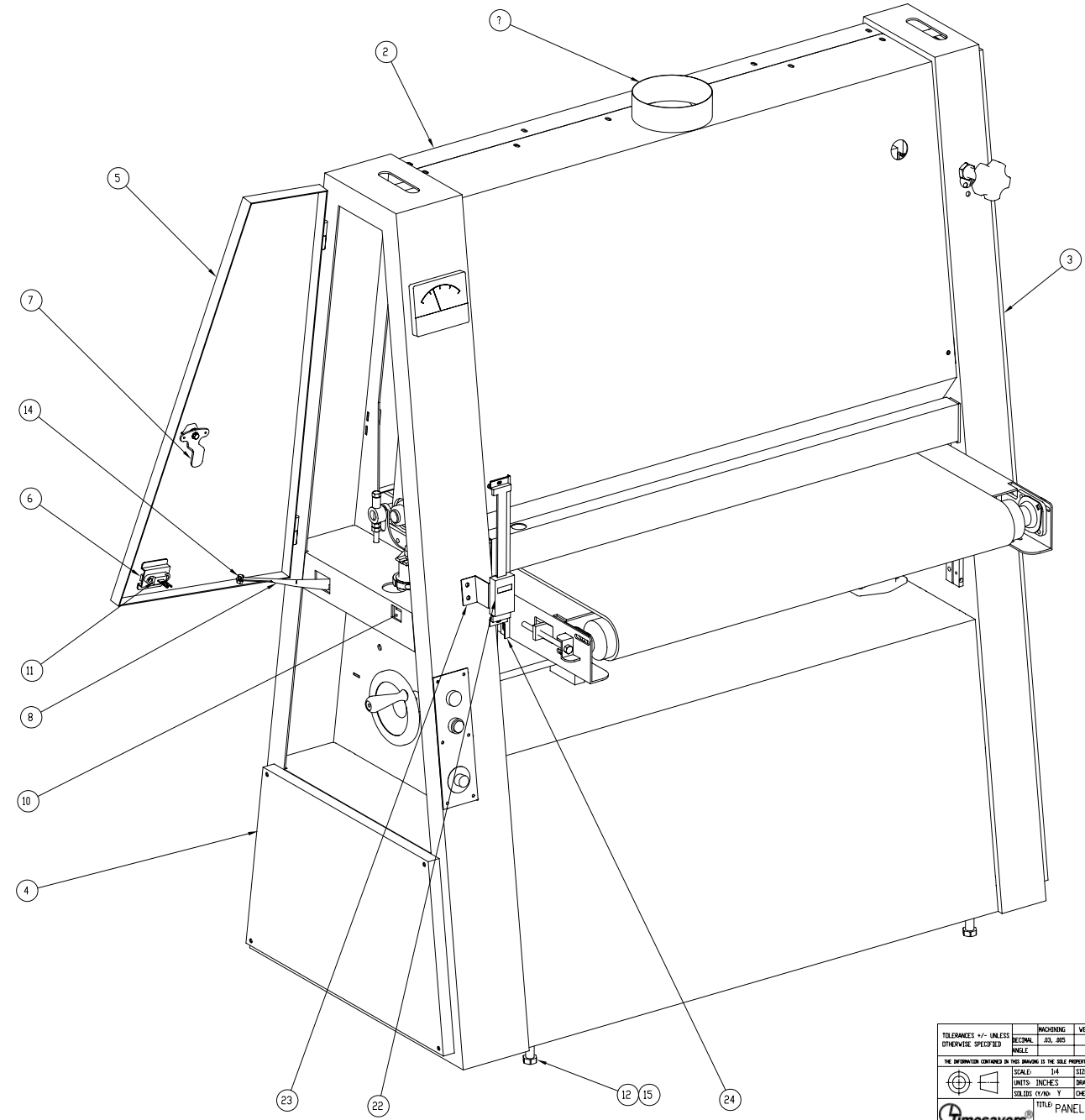
ITEM NO.	QTY.	PART NO.	PART DESCRIPTION
3	1	30233201	PLATEN EXTRUSION
4	2	30233300	CLAMP BAR
5	1	30233501	PLATEN BAR
6	1	99803-10-418	FELT
7	1	P83120220	GRAPHITE CANVAS HD
8	14	EXPEND	LOCKWASHER M3
9	14	EXPEND	SOCKET HEAD CAP SCREW M3-0.5 x 10mm LG
10	14	EXPEND	FLAT HEAD SOCKET SCREW M3-0.5 x 16mm LG

TO ORDER THIS UNIT ASSEMBLED AS SHOWN,
 ORDER: SP30233701AA POLISHING PLATEN ASSEMBLY



TOLERANCES +/- UNLESS OTHERWISE SPECIFIED	MACHINING	WELDING	FABRICATING	FINISH REQUIREMENTS	USED ON REFERENCE MACHINE/DRAWING REPLACEMENT PARTS DOCUMENT
	DECIMAL	.03, .005	.13		
	ANGLE				
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF TIMESAVERS, INC. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF TIMESAVERS, INC. IS PROHIBITED.					
	SCALE: 1:1	SIZE: C	DATE	NAME	MATERIAL:
	UNITS: INCHES	DRAWN	6-4-03	JPL	
	SOLIDS (Y/N): Y	CHECKED			
				TITLE: POLISHING PLATEN ASSEMBLY	DRAWING NUMBER: 30233701
				REV. SHEET 2 OF 2	

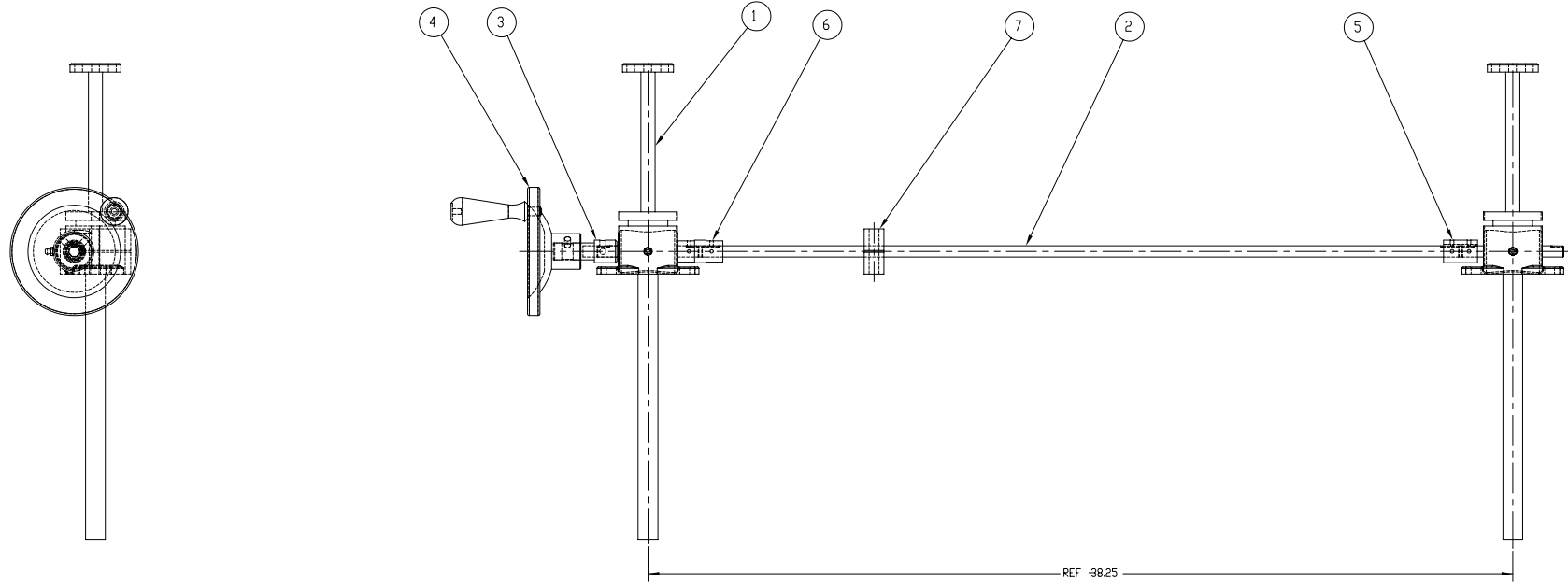
ITEM NO.	QTY.	PART NO.	PART DESCRIPTION
1	1	3025200237	DUST HOOD
2	1	30147401	OUTFEED COVER
3	1	30006401	REAR COVER PANEL
4	1	30006404	ELECTRICAL COVER
5	1	30006405	BELT LOADING COVER
6	1	30341901	NUT PLATE (ABB DOOR KEY)
7	1	P82007-HS-013	DOOR HANDLE, SQUARE-N #A-2055-B
8	1	30449700	DOOR LATCH
9	1	30453700	ACCESS COVER
10	1	REFERENCE	KEYED DOOR SWITCH (SEE ELECTRICAL PARTS LIST)
11	1	REFERENCE	SWITCH KEY EMRON D4DS-K3
12	4	EXPEND	HEX HEAD CAP SCREW M16-2.0 x 80mm LG
13	4	EXPEND	HEX NUT M16-2.0
14	1	EXPEND	HEX HEAD CAP SCREW M6-1.0 x 10mm LG
22	1	P83018-4-150	DIGITAL SCALE 150mm
23	1	30477800	FRAME BRACKET - INDICATOR
24	1	30477700	BED BRACKET - INDICATOR
27	1	30709300	LOADMETER COVER



◇ SHOW LOADMETER & ADD ITEM #27; JPL 4-2-08

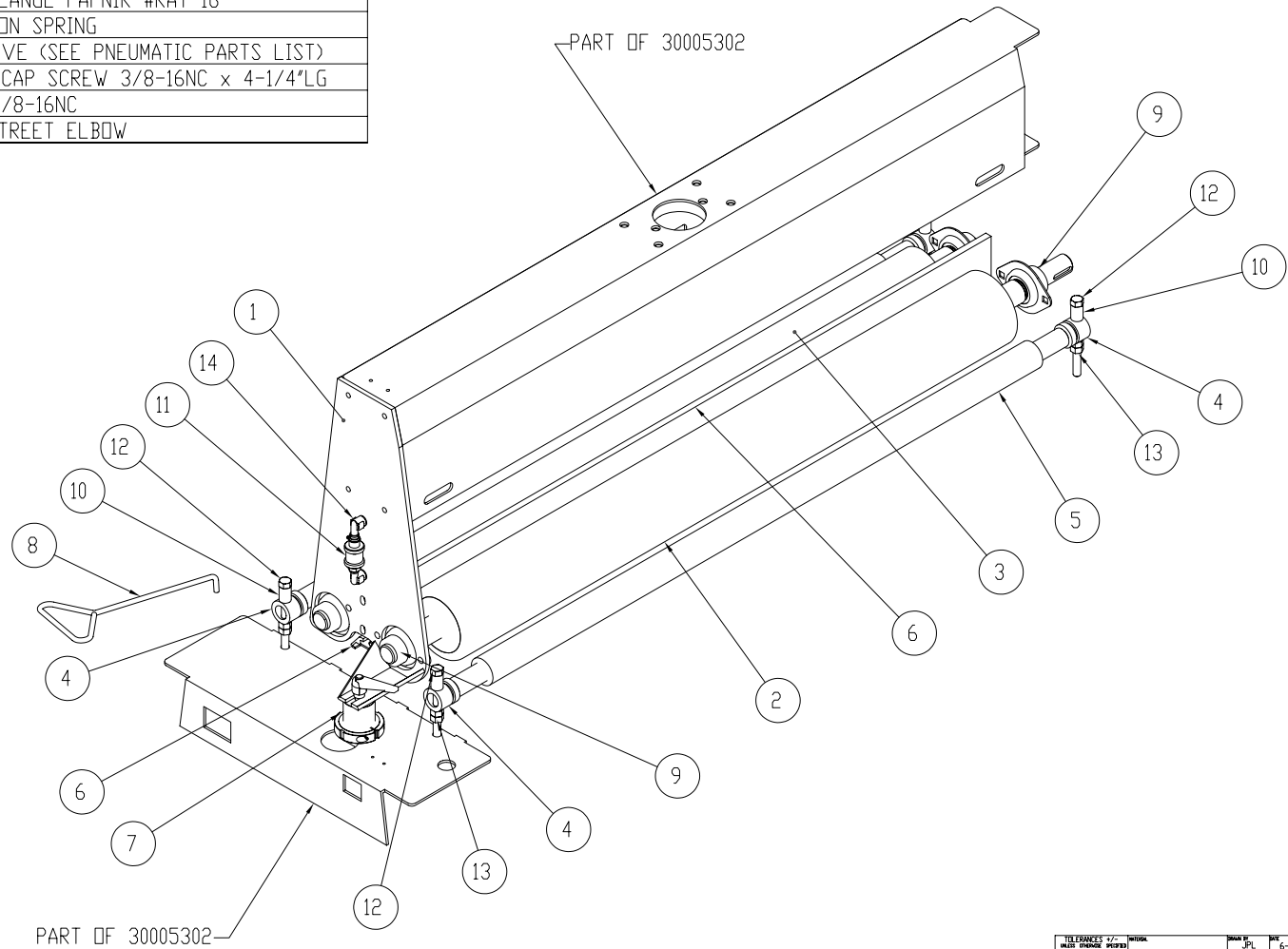
TOLERANCES UNLESS OTHERWISE SPECIFIED	MACHINING			WELDING			FABRICATING			FINISH REQUIREMENTS			USED ON REFERENCE MACHINE/DRAWING																
	DECIMAL	FRACTIONAL	ANGLE	AS	BS	CS	DS	ES	FS	GS	HS	IS	JS	KS	LS														
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF TIMESAVERS, INC. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF TIMESAVERS, INC. IS PROHIBITED.												SPEEDSANDER																	
<table border="1"> <tr> <td>SCALE: 1:1</td> <td>DATE: 9-17-07</td> <td>NAME: JPL</td> <td>MATERIAL:</td> </tr> <tr> <td>UNITS: INCHES</td> <td>DRAWN: JPL</td> <td>CHECKED:</td> <td></td> </tr> <tr> <td>SOLIDS (Y/N): Y</td> <td></td> <td></td> <td></td> </tr> </table>												SCALE: 1:1	DATE: 9-17-07	NAME: JPL	MATERIAL:	UNITS: INCHES	DRAWN: JPL	CHECKED:		SOLIDS (Y/N): Y				DRAWING NUMBER: 30247704			REV. 1 SHEET 1 OF 1		
SCALE: 1:1	DATE: 9-17-07	NAME: JPL	MATERIAL:																										
UNITS: INCHES	DRAWN: JPL	CHECKED:																											
SOLIDS (Y/N): Y																													
												TITLE: PANEL & COVER ASSEMBLY DRAWING NUMBER: 30247704 REV. 1 SHEET 1 OF 1																	

ITEM NO.	QTY.	PART NO.	PART DESCRIPTION
1	2	P82041T-40-091	JACK 1/2 TON - 11"RAISE - 40T/IN
2	1	30180000	JACK SHAFT
3	1	30451900	HANDWHEEL ADAPTOR SHAFT
4	1	P82004	HANDWHEEL 6"DISHD 3/4"B. 2SS w/ REV. HANDLE
5	1	P81400-08	SLEEVE COUPLING CS-12 3/4"B w/ K/WY & 2SS
6	1	P81411-08-08	JAW COUPLING BOSTON #FA10-1/2 x 1/2 w/ DBL. SS
7	1	30452700	JACK DRAG (P/P)



TOLERANCES +/- UNLESS OTHERWISE SPECIFIED	MACHINING			WELDING	FABRICATING	SURFACE FINISHES REQUIRED AS SPECIFIED	USED ON REFERENCE MACHINE/DRAWING SEE BILL OF MATERIAL	
	DECIMAL	FRACTIONS	ANGLES					
				.13	.06			
<small>THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF TIMESAVERS, INC. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF TIMESAVERS, INC. IS PROHIBITED.</small>								
	SCALE:	3/8	SIZE:	D	DATE:	NAME:	MATERIAL:	
	UNITS:	INCHES	DRAWN:	JPL	11-5-01	JPL		
	SOLIDS (Y/N):	Y	CHECKED:					
							TITLE:	LIFT ASSEMBLY SPEEDSANDER
							DRAWING NUMBER:	30248001
							REV.:	SHEET 1 OF 1

ITEM NO.	QTY.	PART NO.	PART DESCRIPTION
1	1	30006502	BEARING SUPPORT
2	1	30180200 LI60	CONTACT DRUM
3	1	30180300	HIGH SPEED ROLL
4	4	30006700	PINCH ROLL BEARING
5	2	30252900 EE45	PINCH ROLL
6	1	30233701	POLISHING PLATEN ASSEMBLY
7	1	30339701	LOCKING DEVICE ASSEMBLY
8	1	47922	PLATEN HOOK
9	4	P80001-25-16	BEARING FLANGE FAFNIR #RAT-16
10	4	P82055-1-20	COMPRESSION SPRING
11	1	REFERENCE	SLIDE VALVE (SEE PNEUMATIC PARTS LIST)
12	4	EXPEND	HEX HEAD CAP SCREW 3/8-16NC x 4-1/4"LG
13	10	EXPEND	HEX NUT 3/8-16NC
14	2	EXPEND	1/8 NPT STREET ELBOW



ECR#2771 TMA 4-28-05
ITEM #7 WAS 30339700

ITERATIONS	DATE	INITIALS	REVISION	DATE	INITIALS
1	6-5-03		1	6-5-03	
2	6-9-03		2	6-9-03	

SEE BILL OF MATERIAL

DATE: 1-3

SCALE: 1:3

DRUM ASSEMBLY

DATE: 1-3

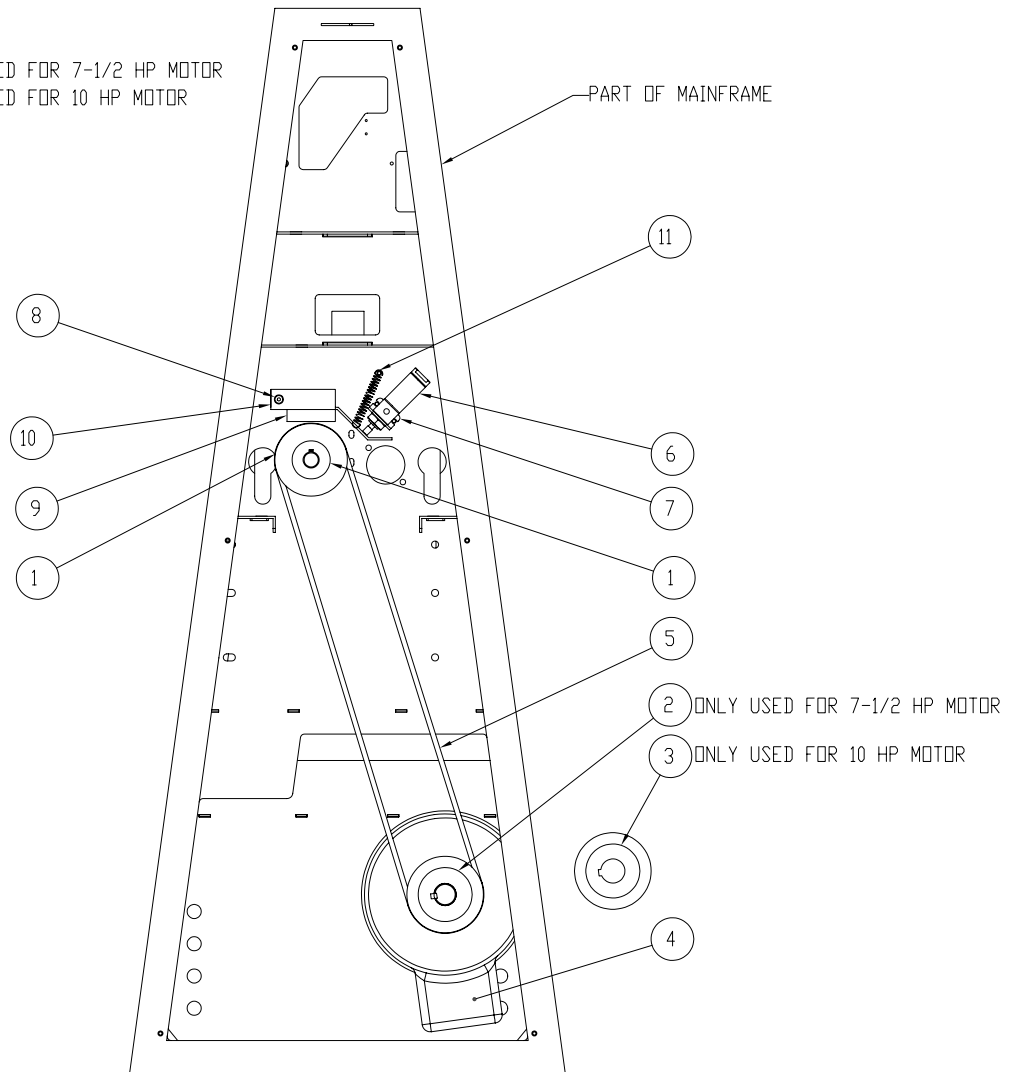
SCALE: 1:3

ITEM NO: 30252602

SHEET 1 OF 1

ITEM NO.	QTY.	PART NO.	PART DESCRIPTION
1	1	30729800	SHEAVE - DRUM
2	1	30730000	SHEAVE - 7-1/2 HP MOTOR
3	1	30729900	SHEAVE - 10 HP MOTOR
4	1	REFERENCE	MOTOR (SEE ELECT P/L)
5	2	P80404-3-71	V-BELT #3VX-710
6	1	P88006-09-016	SEE AIR DIAGRAM
7	1	P88006-01	SEE AIR DIAGRAM
8	1	P81910-06-48	SHOULDER BOLT 3/8"DIA x 3"LG
9	1	77628-2	BRAKE PUCK
10	1	30359800	BRAKE BRACKET
11	1	P82057-24-32	SPRING EXTENSION LEE #LE-037E-5

◇ ONLY USED FOR 7-1/2 HP MOTOR
◇ ONLY USED FOR 10 HP MOTOR

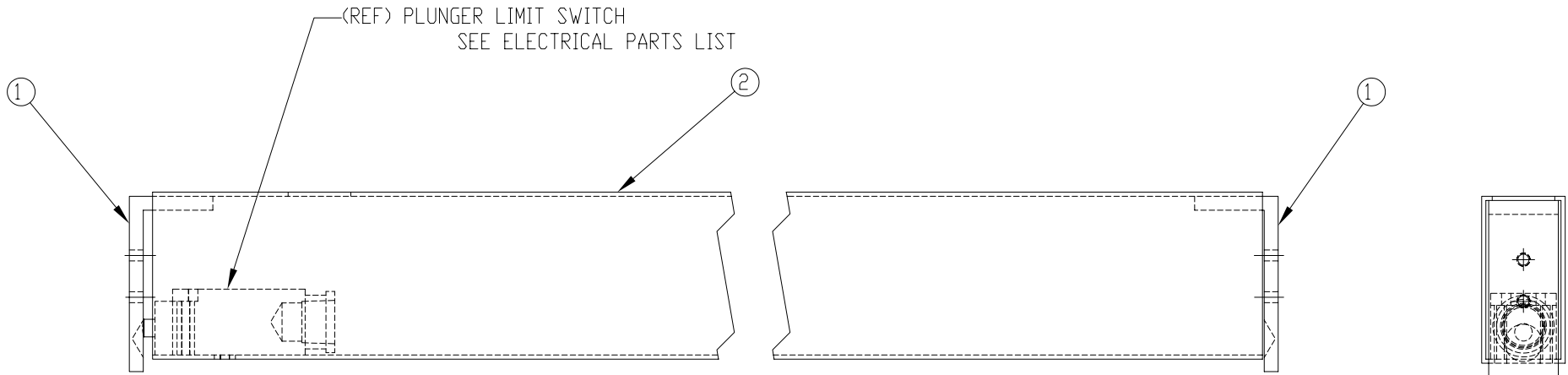





2 ONLY USED FOR 7-1/2 HP MOTOR
3 ONLY USED FOR 10 HP MOTOR

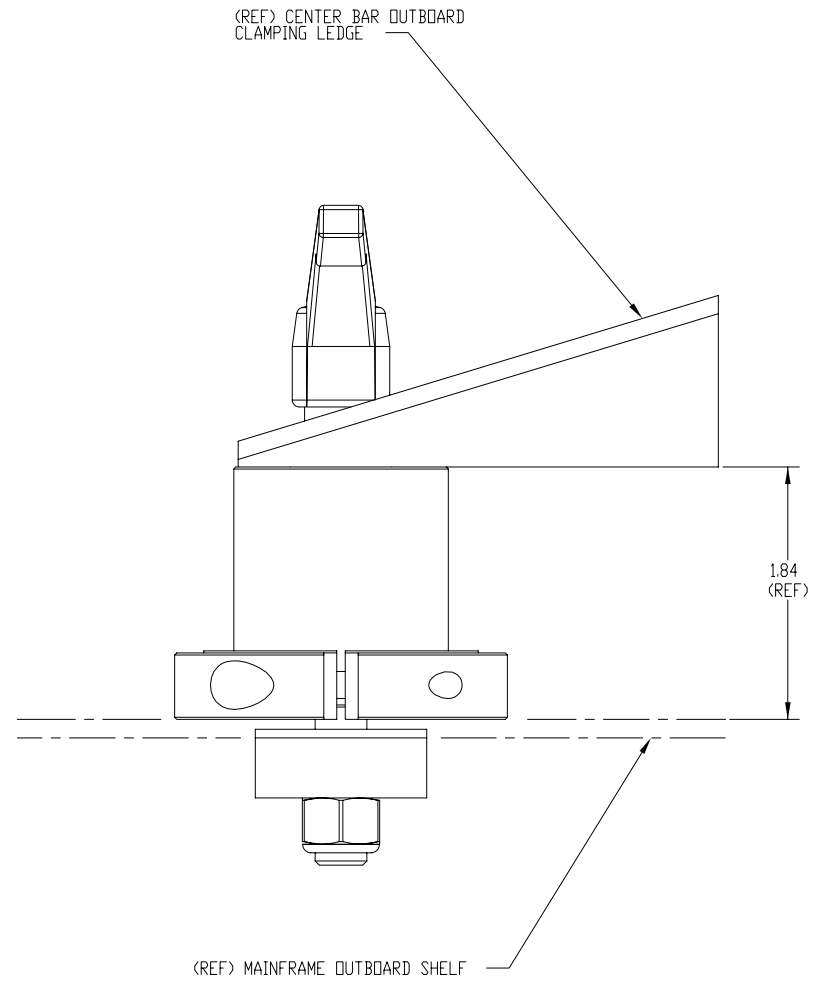
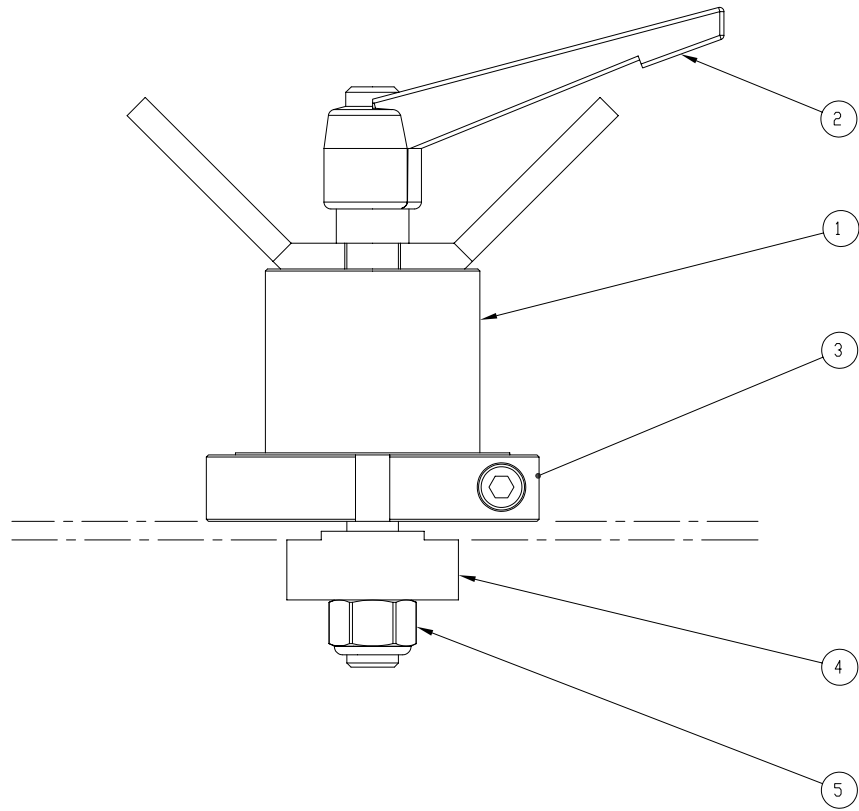
◇ ITEM #1 WAS P80203-2-45;
ITEM #2 WAS P80203-2-475;
ITEM #3 WAS P80203-16;
ITEM #4 WAS P80203-25;
ADD MOTOR SHEAVE NOTES;
ECC #40990 JPL 4-11-68

ITERATIONS	DATE	INITIALS	DESIGNED BY	DATE	SCALE	REV. NO.	DATE	BY	CHKD BY
SEE BILL OF MATERIAL									
SCALE 1/4									
DRIVE AND BRAKE ASSEMBLY									
D 30252701									

ITEM NO.	QTY.	PART NO.	PART DESCRIPTION
1	2	30455100	BRACKET - OVERTHICK
2	1	30339501	SHUT-OFF BAR



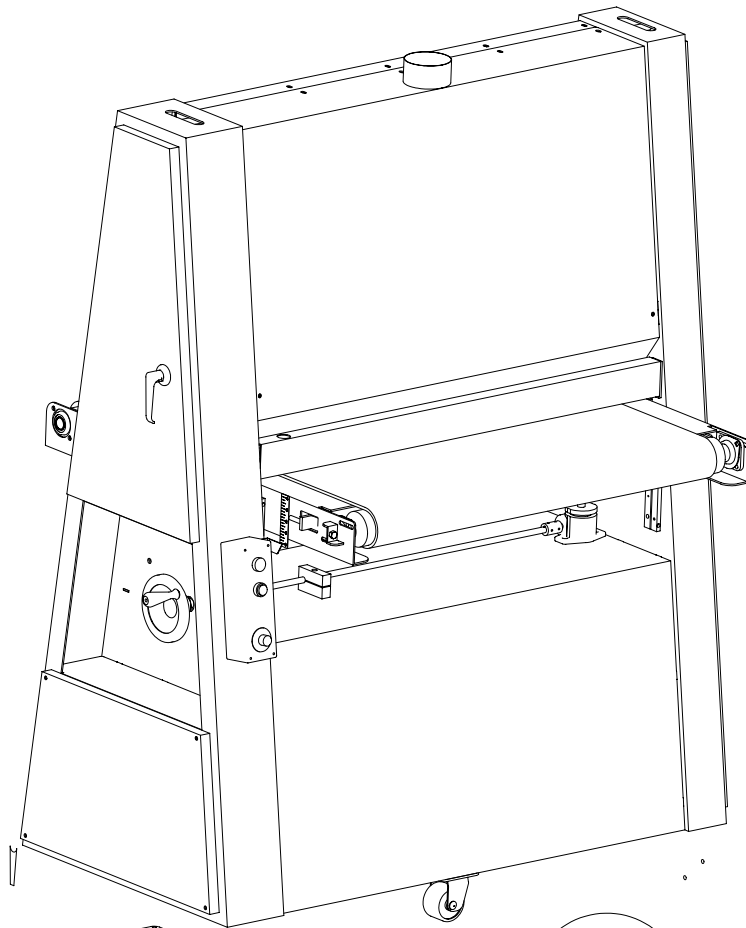
TOLERANCES +/- UNLESS OTHERWISE SPECIFIED	MACHINING	WELDING	FABRICATING	SURFACE FINISHES REQUIRED AS SPECIFIED	USED ON REFERENCE MACHINE/DRAWING: ECONOMY SANDER	
	DECIMAL	.03, .005	.13			.06
	ANGLE					
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF TIMESAVERS, INC. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF TIMESAVERS, INC. IS PROHIBITED.						
 	SCALE: 1:2	SIZE: B	DATE	NAME	MATERIAL:	
	UNITS: INCHES	DRAWN	6-3-03	JPL		
	SOLIDS (Y/N): Y	CHECKED				
		TITLE: INFEED SHUT-OFF BAR ASSEMBLY			DRAWING NUMBER: 30339601	REV. SHEET 1 OF 1



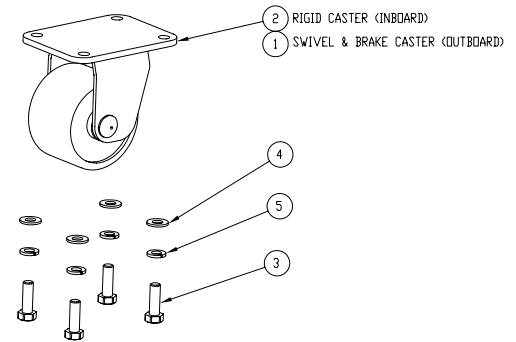
ITEM NO.	QTY.	PART NO.	PART DESCRIPTION
1	1	30547600	SPACER, QUICK LOCK
2	1	P82007-H5-02	HANDLE
3	1	P83034-26	LOCK COLLAR
4	1	30057001	TEE NUT 3/8-16
5	1	EXPEND	NYLOCK HEX NUT 3/8-16

TOLERANCES +/- UNLESS OTHERWISE SPECIFIED		MACHINING DECIMAL ANGLE	WELDING .13	FABRICATING .06	FINISH REQUIREMENTS	USED ON REFERENCE MACHINE/DRAWING
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF TIMESAVERS, INC. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF TIMESAVERS, INC. IS PROHIBITED.						
	SCALE: 1.5:1	SIZE: C	DATE: 4-27-05	NAME: TMA	MATERIAL: SEE BILL OF MATERIAL	
	UNITS: INCHES	DRAWN	CHECKED			
SOLIDS (Y/N): Y		TITLE: LOCKING DEVICE ASSEMBLY		DRAWING NUMBER: 30339701		REV. SHEET 1 OF 1

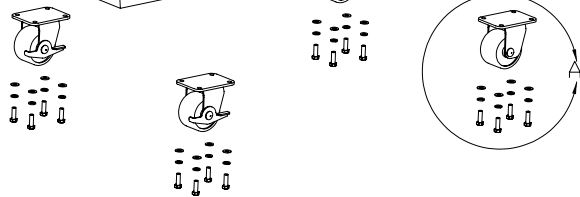




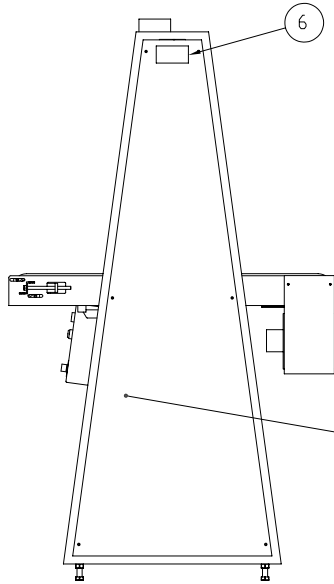
ITEM NO.	QTY.	PART NO.	PART DESCRIPTION
1	2	P83042-19	CASTER, SWIVEL & BRAKE #ML-316-1
2	2	P83042-20	CASTER, RIGID #ML-316R
3	16	EXPEND	HEX HEAD CAP SCREW M8-1.25 x 25mm LG
4	16	EXPEND	FLATWASHER M8
5	16	EXPEND	LOCKWASHER M8



DETAIL A
SCALE 1 : 2

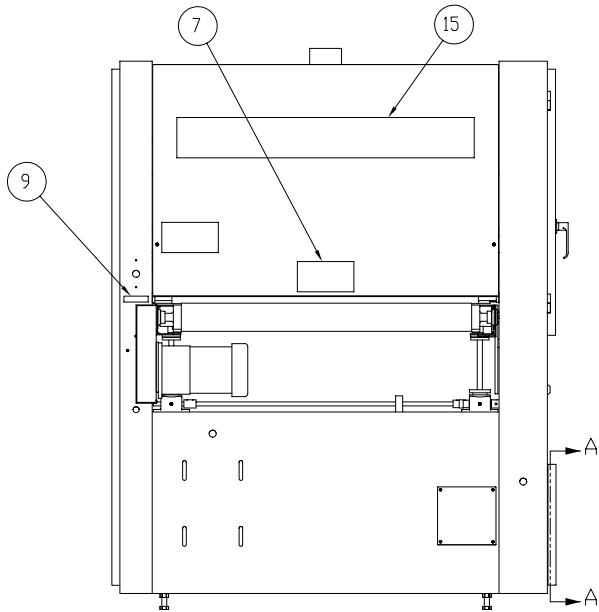


TOLERANCES +/- UNLESS OTHERWISE SPECIFIED		MACHINING	WELDING	FABRICATING	FINISH REQUIREMENTS	USED ON REFERENCE MACHINE/DRAWING
DECIMAL	.03, .05	.13	.06			SPEEDSANDER
INCHES						
<small>THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF TIMESAVERS, INC. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF TIMESAVERS, INC. IS PROHIBITED.</small>						
SCALE:	3/16	SIZE:	1	DATE:	NAME:	MATERIAL:
UNITS:	INCHES	DRAWN:	6-10-03	JPL		SEE BILL OF MATERIAL
SOLIDS (Y/N):	Y	CHECKED:				
Timesavers TITLE: CASTER KIT						DRAWING NUMBER: 30439901 REV. SHEET 1 OF 1

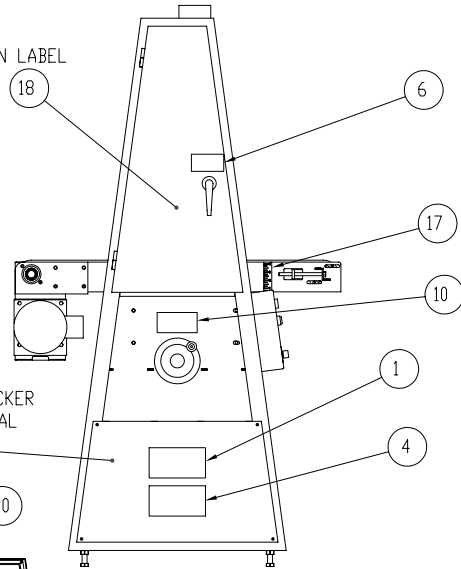


13 LOCATED ON THE FRAME
16 BEHIND REAR PANEL

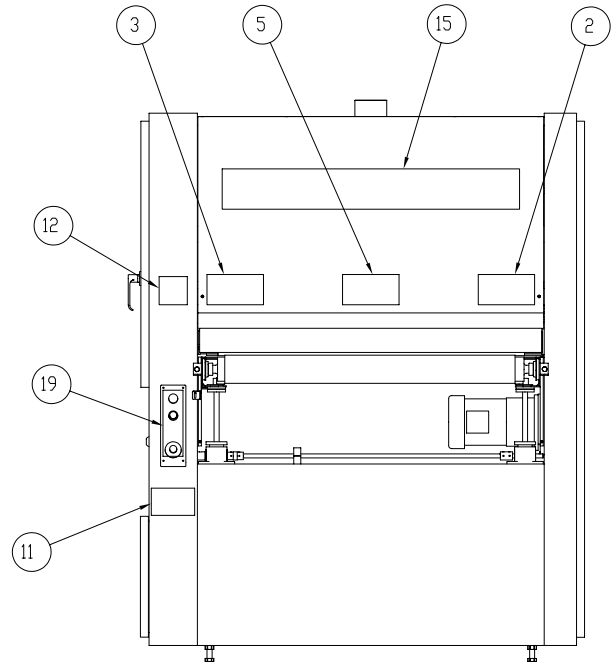
ITEM	QTY	PART NUMBER	NAME/DESCRIPTION
1	1	A82693-54	WARNING LABEL - VOLTAGE
2	1	A82693-51	WARNING LABEL - PINCH POINT
3	1	A82693-49	WARNING LABEL - EXPLOSION
4	1	A82693-53	WARNING LABEL - OWNERS MANUAL
5	1	A82693-50	WARNING LABEL - KICKOUT
6	2	A82693-48	WARNING LABEL - DANGER MOVING PARTS
7	1	A82693-52	WARNING LABEL - MOVING PART
8		-	-
9	1	-	AIR SUPPLY FILTER
10	1	-	OPEN ARROW CW ROTATION
11	1	A30449800	SERIAL NO. PLATE
12	1	-	DECIMAL EQUIVALENT CHART
13	1	-	SOLENOID ID TAG "SOL-1"
14	1	-	WIRING LABEL (INSIDE ELECT. ENCLOSURE)
15	2	30451600	LABEL SPEEDSANDER
16	1	-	SOLENOID ID TAG "SOL-2"
17	1	-	SCALE BED OPENING 4"
18	1	-	BELT TENSION LABEL (ON END OF CENTERBAR)
19	1	P86431-30424800	PUSHBUTTON PLATE
20	1	-	WARNING LABEL - MOTOR WARRANTY
21	1	-	WARNING LABEL - GROUND EQUIPMENT
22	1	-	WIRING LABEL - USE COPPER ONLY
23	1	-	VOLTAGE LABEL



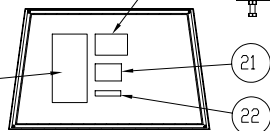
BELT TENSION LABEL
(ON END OF
CENTERBAR)



VOLTAGE STICKER
ON ELECTRICAL
PANEL



14
WIRING LABEL



SECTION A-A

TOLERANCES +/- UNLESS OTHERWISE SPECIFIED	MACHINING		WELDING		FABRICATING		FINISH REQUIREMENTS		USED ON REFERENCE MACHINE/DRAWING
	DECIMAL	FRACTIONAL	DECIMAL	FRACTIONAL	DECIMAL	FRACTIONAL	DECIMAL	FRACTIONAL	
			.03, .015	.13		.06			
<small>THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF TIMESAVERS, INC. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF TIMESAVERS, INC. IS PROHIBITED.</small>									
	SCALE:	1:8	SIZE:	D	DATE:	NAME:		MATERIAL:	
	UNITS:	INCHES	DRAWN:	23APR03	JJW/JPL				
	SOLIDS:	Y/N	CHECKED:						
TITLE: LABEL ASSEMBLY								DRAWING NUMBER: 30452600	
								REV. SHEET 1 OF 1	

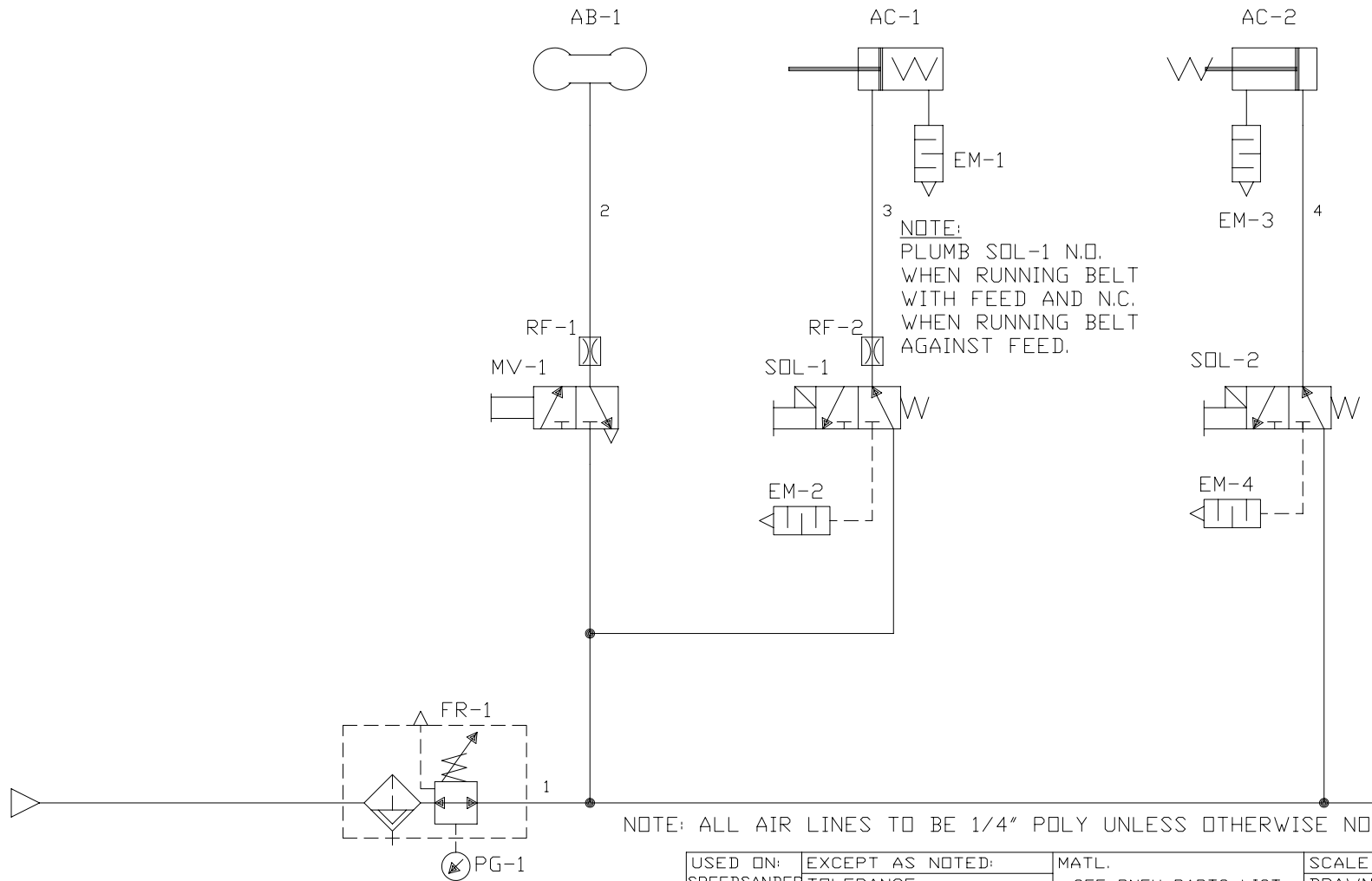
S311-13-1
PNEUMATIC PARTS LIST
6-14-05 DGL

			304233020	
QTY	SYMBOL	DESCRIPTION	PART NUMBER	ITEM
1		PNEUMATIC SCHEMATIC	30423302	
1	AB-1	AIR BAG FIRESTONE 1M1AA-0	P88021-09	P002
1	AC-1	AIR CYL FONRAY AMC-40N25	P88024-M40x25	P003
1	AC-2	AIR CYL FONRAY AMC-25N25	P88024-M25x25	P005
1	EM-1	EXHAUST MUFFLER, (1/4" NPT) CONE SL-02 FINEHUNT	P88378-13	P006
3	EM-2,3,4	EXHAUST MUFFLER, (1/8" NPT) HEX SLL-01 FINEHUNT	P88378-12	P007
1	FR-1	FILTER REGULATOR,AFC-2000 (135 PSI MAX)	P88108-71-0	P008
1	MV-1	MANUAL VALVE HS-22MF FINEHUNT	P88266-04	P009
1	PG-1	PRESSURE GAUGE, 1.5" FACE, 150 PSI, 1/8" NPT TEKLAND	P88156-15-150	P010
2	SOL-1,2	SOLENOID VALVE, MAC 111B-291JA	P86224-21-2A2	P012
2	RF-1,2	RESTRICTED FITTING, WEATHERHEAD 1068 X 4 .042	P88385-1	P013

ABRASIVE
BELT
TENSIONING

ABRASIVE
BELT
TRACKING

BRAKE



LAST TUBE NUMBER USED 5.

USED ON: SPEEDSANDER	EXCEPT AS NOTED: TOLERANCE FINISH	MATL. SEE PNEU PARTS LIST	SCALE DRAWN BY DATE	WT. DGL 6-14-05
ALL INFORMATION, DRAWINGS AND IDEAS HERIN CONSTITUTE A CONFIDENTIAL DISCLOSURE OF TIMESAVERS INC., AND ARE IT'S EXCLUSIVE PROPERTY, AND MUST NOT, WITHOUT WRITTEN AUTHORIZATION, BE DIVULGED, REPRODUCED, COPIED, OR APPROPRIATED IN WHOLE OR IN PART FOR ANY PURPOSE, AND THIS SHEET MUST BE RETURNED PROMPTLY UPON REQUEST.				

REVISIONS
PNEUMATIC SCHEMATIC
TIMESAVERS, INC 5270 HANSON CT MPLS, MN 55429

30423302

49.7 FLA

S311-13-1S 230/1/60
ELECTRICAL PARTS LIST
4-8-08 DGL

**7 1/2 HP
SINGLE PHASE
304230042**

QTY	SYMBOL	DESCRIPTION	PART NUMBER	ITEM
1		ELECTRICAL DIAGRAM	30423004	
3	CR-M,1,2	CONTROL RELAY, OMRON LY2NJ-AC220/240	P8615A-22-488	E001
3	CR-M,1,2	CONTROL RELAY SOCKET, OMRON PTF08A	P8615A-22-368	E002
2	FU-1	OR BUSSMAN FNM-4	P86509-20-4001	E003
1	FU-1	FUSE CARRIER TE GK1DD	P865AC-01-032C	E004
2	FU-2	FUSE BUSSMANN J2N-30 30A, 300V, CLASS T FAST BLOW	P86504-41-0303	E030
1	FU-2	FUSE HOLDER BUSSMANN T30030-2CR	P86524-01-0303	E031
1	LS-1	LIMIT SWITCH TEND 8112	P86234-00-001	E005
3	LS-2,3,4	LIMIT SWITCH TEND 8167	P86234-00-002	E006
1	LS-5	SWITCH LIMIT OMRON D4DS-35FS	P86230-01-007	E007
1	LS-5	SWITCH LIMIT KEY OMRON D4DS-K3	P86230-01-007K	E008
1	AM/CT-1	LOAD CONVERTER & INDICATOR TAHSING	14602800	E032
1	M-1	MOTORSTARTER TECO CN-35R 220VAC	P86166-20-050	E009
1	M-2	MOTORSTARTER TECO CN-11 220VAC	P86166-00-050	E010
1	MTR-1	FUKUTA AEEF 7-1/2 TEFC 1800 132M B3MNT 230/1/60	P85C62-18-03062	E011
1	MTR-2	1/2 TEF 1800 230/3/60 (.4KW) CGP # CV-22 60:1	P85262-18-00270	E012
1	OL-1	OVERLAD RELAY TECO RHN-80/502 37-50A	P86198-56-050A	E013
1	PB-1	PB E-STOP ASSY SHAN HO #SHAF-221 TWIST-TO-RELEASE	P86109-01-425T	E014
1	PB-3	PUSHBUTTON ASSY SHAN HO #SHAB-223-R	P86109-03-225	E015
1	PB-4	PUSHBUTTON ASSY SHAN HO #SHAB-221-G	P86109-02-155	E016
1	PC-1	PHOTO ELECTRIC CONTROL OMRON E3JK-R4M28	P87700-39-002	E017
1	PC-1	REFLECTOR #E39-L7 COMES WITH PHOTO-EYE		REF
1	PC-1	MOUNTING BRACKET #E39-R2 COMES WITH PHOTO-EYE		REF
1	POT-1	POTENTIOMETER ,5K OHM,2 WATT,1 TURN WITH KNOB	P87320-50-331G	E020 E021
2	SOL-1,2	SOLENOID VALVE, MAC 111B-291JA	P86224-21-2A2	REF
1	VFD-2	DELTA VFD-S1 VFD007S21A 1HP 230V 1or3PH IN,3PH OUT	P87722-31-0043S	E023
1		PB BOX SHAN-HO #172 4HOLE (56mmx166mm)	P86409-AA-004	E024
1		OPERATOR PANEL ENGRAVING	P86431-30424800	E025
1	RC-1	SUPPRESSOR POWERMATION 12859-009	P877330-60-600	E026
1		INPUT POWER WIRE SO0W-8-3 BLACK, 2 COND W/GND		REF
1		WARNING LABEL - ATTACH DURING START-UP **FOR CANADA MACHINES, ONLY	82693-136	REF**

4-10-08 DGL 230, 1 AND 3 PHASE

	PARAM	SETTING	PARAMETER DESCRIPTION
VFD-2			
DELTA VFD-B	00-02	10	RESET TO FACTORY DEFAULTS
	02-00	01	SPEED CONTROL BY ANALOG INPUT
FEED VFD	02-01	01	OPERATION COMMAND BY EXTERNAL INPUTS
10-30 FPM	01-00	90	MAX FREQUENCY
	01-02	230	MAX OUTPUT VOLTAGE
	01-09	6.0	ACCEL TIME
	01-10	1.0	DECEL TIME
	04-00	50	POTENTIOMETER BIAS (04-00=% AT 0V)
	04-02	67	ANALOG INPUT FREQ GAIN
	06-06	00	THERMAL OVERLOAD RELAY
	07-00	43	MOTOR RATED CURRENT % (FLA / VFD RATING X 100)

NOTE: ALL OTHER SETTINGS ARE TO REMAIN AT FACTORY DEFAULT

*** USE THE TABLE BELOW TO CALCULATE PARAMETER 07-00
1 AND 3 PHASE

HP	VOLTS	VFD RATING (AMPS)	MOTOR
1	230V	4.2	1.82/1730

59.7 FLA

S311-13-1U, S311-14-1U 230/1/60
ELECTRICAL PARTS LIST
4-7-08 DGL

**10 HP
SINGLE PHASE
304230042A**

QTY	SYMBOL	DESCRIPTION	PART NUMBER	ITEM
1		ELECTRICAL DIAGRAM	30423004	
3	CR-M,1,2	CONTROL RELAY, OMRON LY2NJ-AC220/240	P8615A-22-488	E001
3	CR-M,1,2	CONTROL RELAY SOCKET, OMRON PTF08A	P8615A-22-368	E002
2	FU-1	FUSE BUSSMAN FNM-4	P86509-20-4001	E003
1	FU-1	FUSE CARRIER TE GK1DD	P865AC-01-032C	E004
2	FU-2	FUSE BUSSMANN JJN-30 30A, 300V, CLASS T FAST BLOW	P86504-41-0303	E030
1	FU-2	FUSE HOLDER BUSSMANN T30030-2CR	P86524-01-0303	E031
1	LS-1	LIMIT SWITCH TEND 8112	P86234-00-001	E005
3	LS-2,3,4	LIMIT SWITCH TEND 8167	P86234-00-002	E006
1	LS-5	SWITCH LIMIT OMRON D4DS-35FS	P86230-01-007	E007
1	LS-5	SWITCH LIMIT KEY OMRON D4DS-K3	P86230-01-007K	E008
1	AM/CT-1	LOAD CONVERTER & INDICATOR TAHSING	14602800	E032
1	M-1	MOTORSTARTER TECO CN-50R 220VAC	P86166-20-051	E009
1	M-2	MOTORSTARTER TECO CN-11 220VAC	P86166-00-050	E010
1	MTR-1	FUKUTA AEEF 10 TEF 1800 132M B3MNT 230/1/60	P85C62-18-04062	E011
1	MTR-2	1/2 TEF 1800 230/3/60 (.4KW) CGP # CV-22 60:1	P85262-18-00270	E012
1	OL-1	OVERLAD RELAY TECO RHN-80/652 48-65A	P86198-56-065A	E013
1	PB-1	PB E-STOP ASSY SHAN HO #SHAF-221 TWIST-TO-RELEASE	P86109-01-425T	E014
1	PB-3	PUSHBUTTON ASSY SHAN HO #SHAB-223-R	P86109-03-225	E015
1	PB-4	PUSHBUTTON ASSY SHAN HO #SHAB-221-G	P86109-02-155	E016
1	PC-1	PHOTO ELECTRIC CONTROL OMRON E3JK-R4M28	P87700-39-002	E017
1	PC-1	REFLECTOR #E39-L7 COMES WITH PHOTO-EYE		REF
1	PC-1	MOUNTING BRACKET #E39-R2 COMES WITH PHOTO-EYE		REF
1	POT-1	POTENTIOMETER ,5K OHM,2 WATT,1 TURN WITH KNOB	P87320-50-331G	E020
				E021
2	SOL-1,2	SOLENOID VALVE, MAC 111B-291JA	P86224-21-2A2	REF
1	VFD-2	DELTA VFD-S1 VFD007S21A 1HP 230V 1or3PH IN,3PH OUT	P87722-31-0043S	E023
1		PB BOX SHAN-HO #172 4HOLE (56mmx166mm)	P86409-AA-004	E024
1		OPERATOR PANEL ENGRAVING	P86431-30424800	E025
1	RC-1	SUPPRESSOR POWERMATION 12859-009	P877330-60-600	E026
1		INPUT POWER WIRE SOOW-4-3 BLACK, 2 COND W/GND		REF
1		WARNING LABEL - ATTACH DURING START-UP	82693-136	REF**

**FOR CANADA MACHINES, ONLY

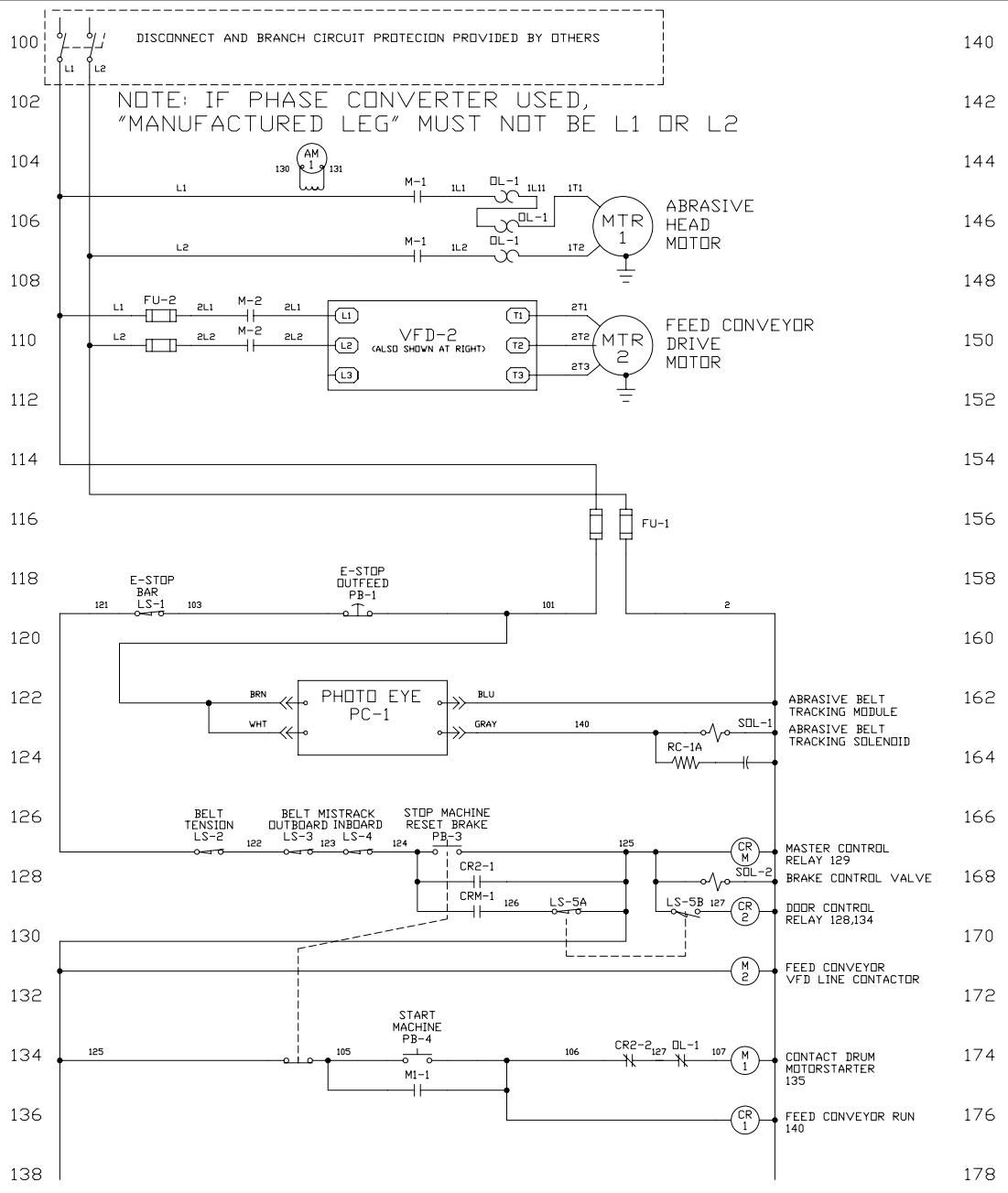
4-10-08 DGL **230, 1 AND 3 PHASE**

	PARAM	SETTING	PARAMETER DESCRIPTION
VFD-2			
DELTA VFD-B	00-02	10	RESET TO FACTORY DEFAULTS
	02-00	01	SPEED CONTROL BY ANALOG INPUT
FEED VFD	02-01	01	OPERATION COMMAND BY EXTERNAL INPUTS
10-30 FPM	01-00	90	MAX FREQUENCY
	01-02	230	MAX OUTPUT VOLTAGE
	01-09	6.0	ACCEL TIME
	01-10	1.0	DECEL TIME
	04-00	50	POTENTIOMETER BIAS (04-00=% AT 0V)
	04-02	67	ANALOG INPUT FREQ GAIN
	06-06	00	THERMAL OVERLOAD RELAY
	07-00	43	MOTOR RATED CURRENT % (FLA / VFD RATING X 100)

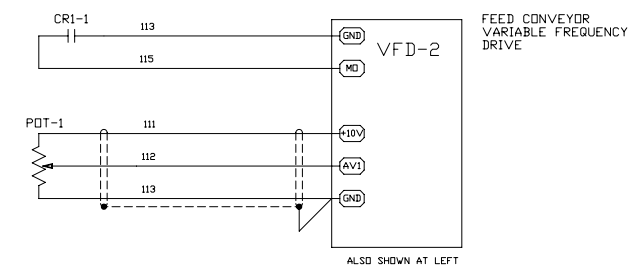
NOTE: ALL OTHER SETTINGS ARE TO REMAIN AT FACTORY DEFAULT

*** USE THE TABLE BELOW TO CALCULATE PARAMETER 07-00
1 AND 3 PHASE

HP	VOLTS	VFD RATING (AMPS)	MOTOR
1	230V	4.2	1.82/1730



140
142
144
146
148
150
152
154
156
158
160
162
164
166
168
170
172
174
176
178



SHEET 1 OF 1

USED ON: S311-13-1U S311-14-1U	EXCEPT AS NOTED: TOLERANCE FINISH	MATL. SEE ELEC PARTS LIST	SCALE DRAWN BY: <i>DGL</i> DATE: 4-7-08	REVISIONS
<small>ALL INFORMATION, DRAWINGS AND IDEAS HEREIN CONSTITUTE A CONFIDENTIAL DISCLOSURE OF TIMSAVERS, INC. AND ARE ITS EXCLUSIVE PROPERTY, AND MUST NOT, WITHOUT WRITTEN AUTHORIZATION, BE DIVULGED, REPRODUCED, COPIED, OR APPROPRIATED IN WHOLE OR IN PART FOR ANY PURPOSE, AND THIS SHEET MUST BE RETURNED PROMPTLY UPON REQUEST.</small>				ELECTRICAL SCHEMATIC <small>TIMSAVERS, INC. 3270 HANSON CT MPLS, MN 55429</small>

30423004

37.7 FLA		S311-13-1T, S311-14-1T 230/3/60 ELECTRICAL PARTS LIST 4-8-08 DGL		10 HP 3 PHASE 304231032	
REMAINDER LOAD FLA=.2	QTY	SYMBOL	DESCRIPTION	PART NUMBER	ITEM
	1		ELECTRICAL DIAGRAM	30423103	
	3	CR-M,1,2	CONTROL RELAY, OMRON LY2NJ-AC220/240	P8615A-22-488	E001
	3	CR-M,1,2	CONTROL RELAY SOCKET, OMRON PTF08A	P8615A-22-368	E002
	2	FU-1	BUSSMAN FNM-4	P86509-20-4001	E003
	1	FU-1	FUSE CARRIER TE GK1DD	P865AC-01-032C	E004
	2	FU-2	FUSE BUSSMANN J2N-30 30A, 300V, CLASS T FAST BLOW	P86504-41-0303	E030
	1	FU-2	FUSE HOLDER BUSSMANN T30030-2CR	P86524-01-0303	E031
	1	LS-1	LIMIT SWITCH TEND 8112	P86234-00-001	E005
	3	LS-2,3,4	LIMIT SWITCH TEND 8167	P86234-00-002	E006
	1	LS-5	SWITCH LIMIT OMRON D4DS-35FS	P86230-01-007	E007
	1	LS-5	SWITCH LIMIT KEY OMRON D4DS-K3	P86230-01-007K	E008
	1	AM/CT-1	LOAD CONVERTER & INDICATOR TAHSING	14602800	E032
	1	M-1	MOTORSTARTER TECO CN-25 220VAC	P86166-15-050	E009
	1	M-2	MOTORSTARTER TECO CN-11 220VAC	P86166-00-050	E010
	1	MTR-1	10 HP 1800 ,IP54, FR 132M, B3 MNT, F2 BOX, 208-230/460/3/60	P85C63-18-04058	E011
	1	MTR-2	1/2 TEF 1800 230/3/60 CHENG PANG PRECISION # CV-22 60:1	P85262-18-00270	E012
	1	OL-1	OVERLAD RELAY TECO RHN-80/322 23-32A	P86198-56-032A	E013
	1	PB-1	PB E-STOP ASSY SHAN HO #SHAF-221 TWIST-TO-RELEASE	P86109-01-425T	E014
	1	PB-3	PUSHBUTTON ASSY SHAN HO #SHAB-223-R	P86109-03-225	E015
	1	PB-4	PUSHBUTTON ASSY SHAN HO #SHAB-221-G	P86109-02-155	E016
	1	PC-1	PHOTO ELECTRIC CONTROL OMRON E3JK-R4M28	P87700-39-002	E017
	1	PC-1	REFLECTOR #E39-L7 COMES WITH PHOTO-EYE		REF
	1	PC-1	MOUNTING BRACKET #E39-R2 COMES WITH PHOTO-EYE		REF
	1	POT-1	POTENTIOMETER ,5K OHM,2 WATT,1 TURN WITH KNOB	P87320-50-331G	E020 E021
	2	SOL-1,2	SOLENOID VALVE, MAC 111B-291JA	P86224-21-2A2	REF
	1	VFD-2	DELTA VFD-S1 VFD007S21A 1HP 230V 1or3PH IN,3PH OUT	P87722-31-0043S	E023
	1		PB BOX SHAN-HO #172 4HOLE (56mmx166mm)	P86409-AA-004	E024
	1		OPERATOR PANEL ENGRAVING	P86431-30424800	E025
	1	RC-1	SUPPRESSOR POWERMATION 12859-009	P877330-60-600	E026
	1		INPUT POWER WIRE SOOW-8-3 BLACK, 3 COND W/GND		REF
	1		WARNING LABEL - ATTACH DURING START-UP	82693-136	REF**
			**FOR CANADA MACHINES, ONLY		

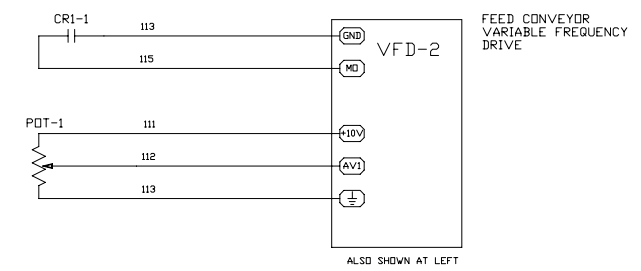
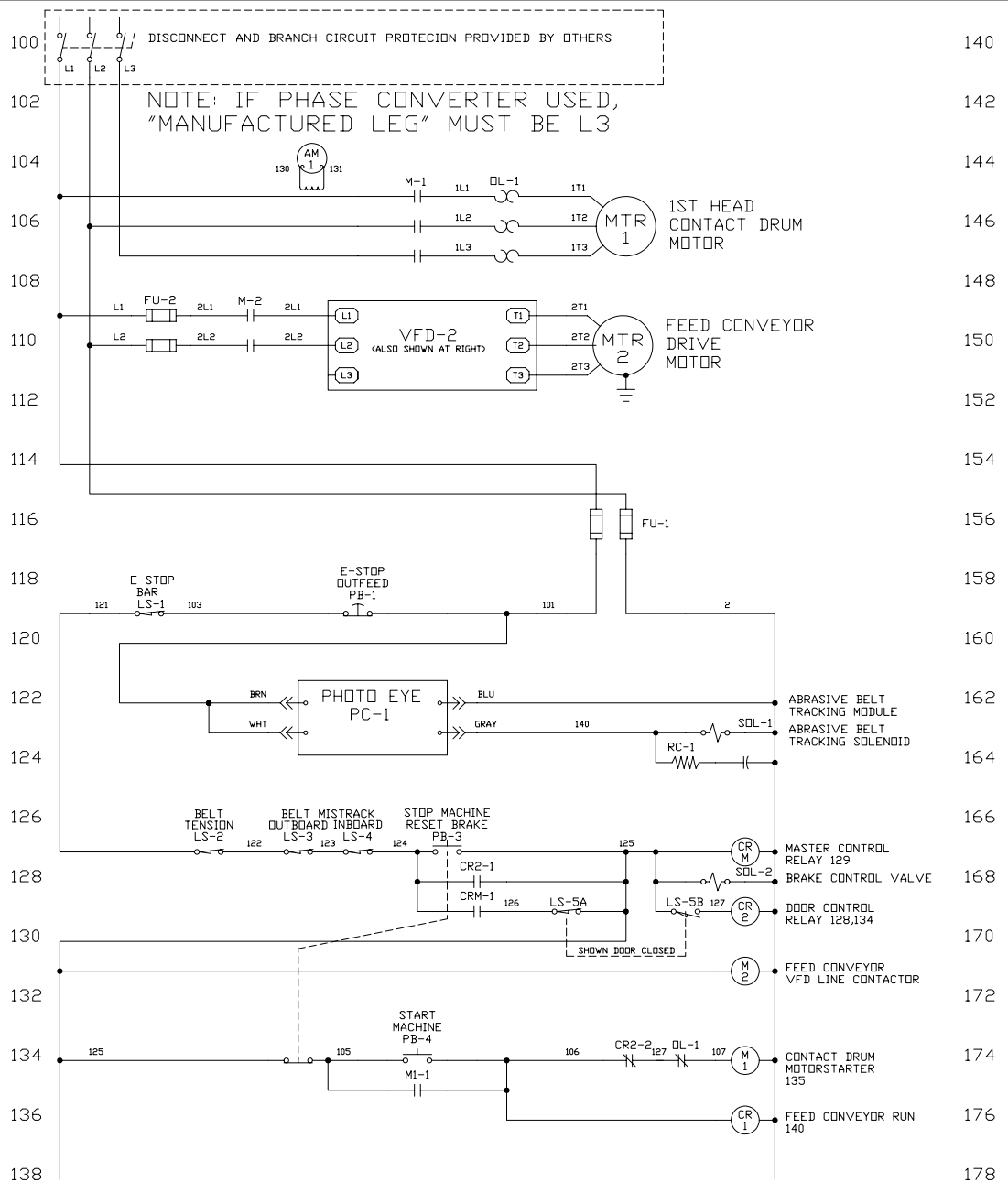
4-10-08 DGL 230, 1 AND 3 PHASE

	PARAM	SETTING	PARAMETER DESCRIPTION
VFD-2			
DELTA VFD-B	00-02	10	RESET TO FACTORY DEFAULTS
	02-00	01	SPEED CONTROL BY ANALOG INPUT
FEED VFD	02-01	01	OPERATION COMMAND BY EXTERNAL INPUTS
10-30 FPM	01-00	90	MAX FREQUENCY
	01-02	230	MAX OUTPUT VOLTAGE
	01-09	6.0	ACCEL TIME
	01-10	1.0	DECEL TIME
	04-00	50	POTENTIOMETER BIAS (04-00=% AT 0V)
	04-02	67	ANALOG INPUT FREQ GAIN
	06-06	00	THERMAL OVERLOAD RELAY
	07-00	43	MOTOR RATED CURRENT % (FLA / VFD RATING X 100)

NOTE: ALL OTHER SETTINGS ARE TO REMAIN AT FACTORY DEFAULT

*** USE THE TABLE BELOW TO CALCULATE PARAMETER 07-00
 1 AND 3 PHASE

HP	VOLTS	VFD RATING (AMPS)	MOTOR
1	230V	4.2	1.82/1730



140
142
144
146
148
150
152
154
156
158
160
162
164
166
168
170
172
174
176
178

SHEET 1 OF 1

USED ON: S311-13-11 S311-14-11	EXCEPT AS NOTED: TOLERANCE FINISH	MATL. SEE ELEC PARTS LIST	SCALE DRAWN BY: <i>DGL</i> DATE: 4-B-08	REVISIONS
				ELECTRICAL SCHEMATIC
<small>ALL INFORMATION, DRAWINGS AND IDEAS HEREIN CONSTITUTE A CONFIDENTIAL DISCLOSURE OF TIMSAVERS, INC. AND ARE ITS EXCLUSIVE PROPERTY, AND MUST NOT, WITHOUT WRITTEN AUTHORIZATION, BE DIVULGED, REPRODUCED, COPIED, OR APPROPRIATED IN WHOLE OR IN PART FOR ANY PURPOSE, AND THIS SHEET MUST BE RETURNED PROMPTLY UPON REQUEST.</small>				<small>TIMSAVERS, INC. 3270 HANSON CT MPLS, MN 55429</small>

30423103

COVER SHEET

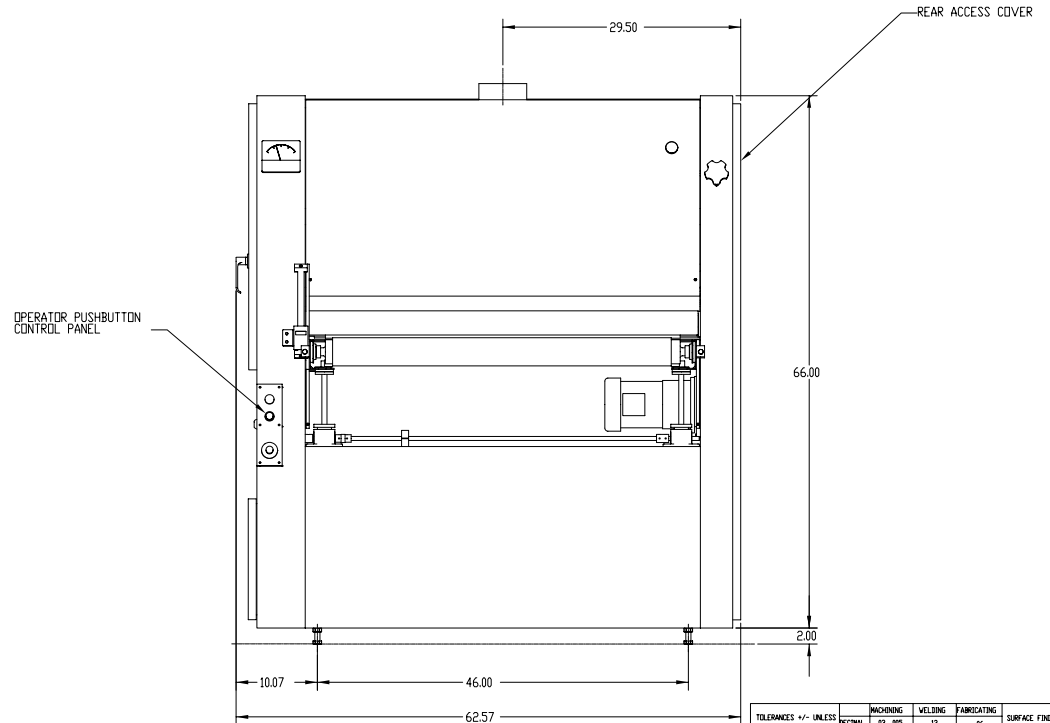
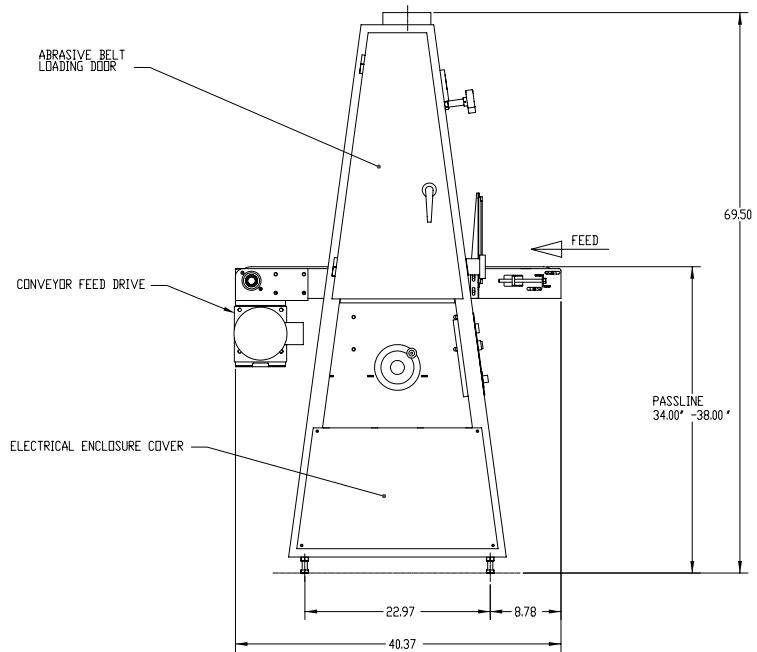
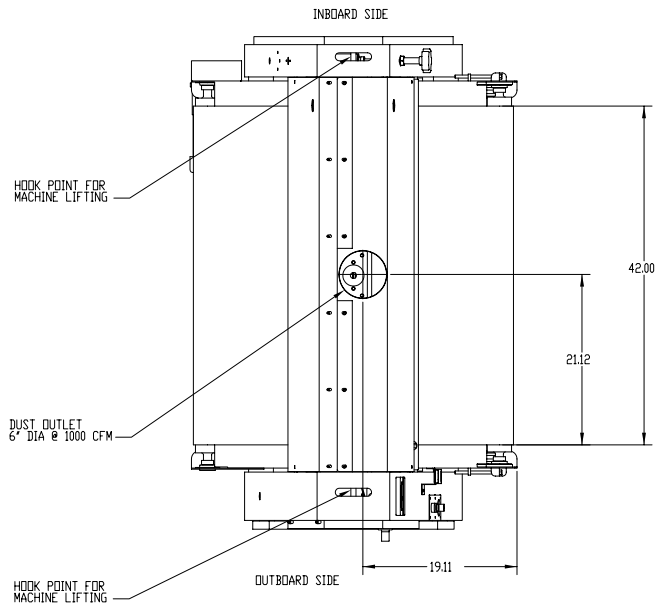
Date: 4-15-08

Page 1

SPEEDSANDER MODEL S311-14-1

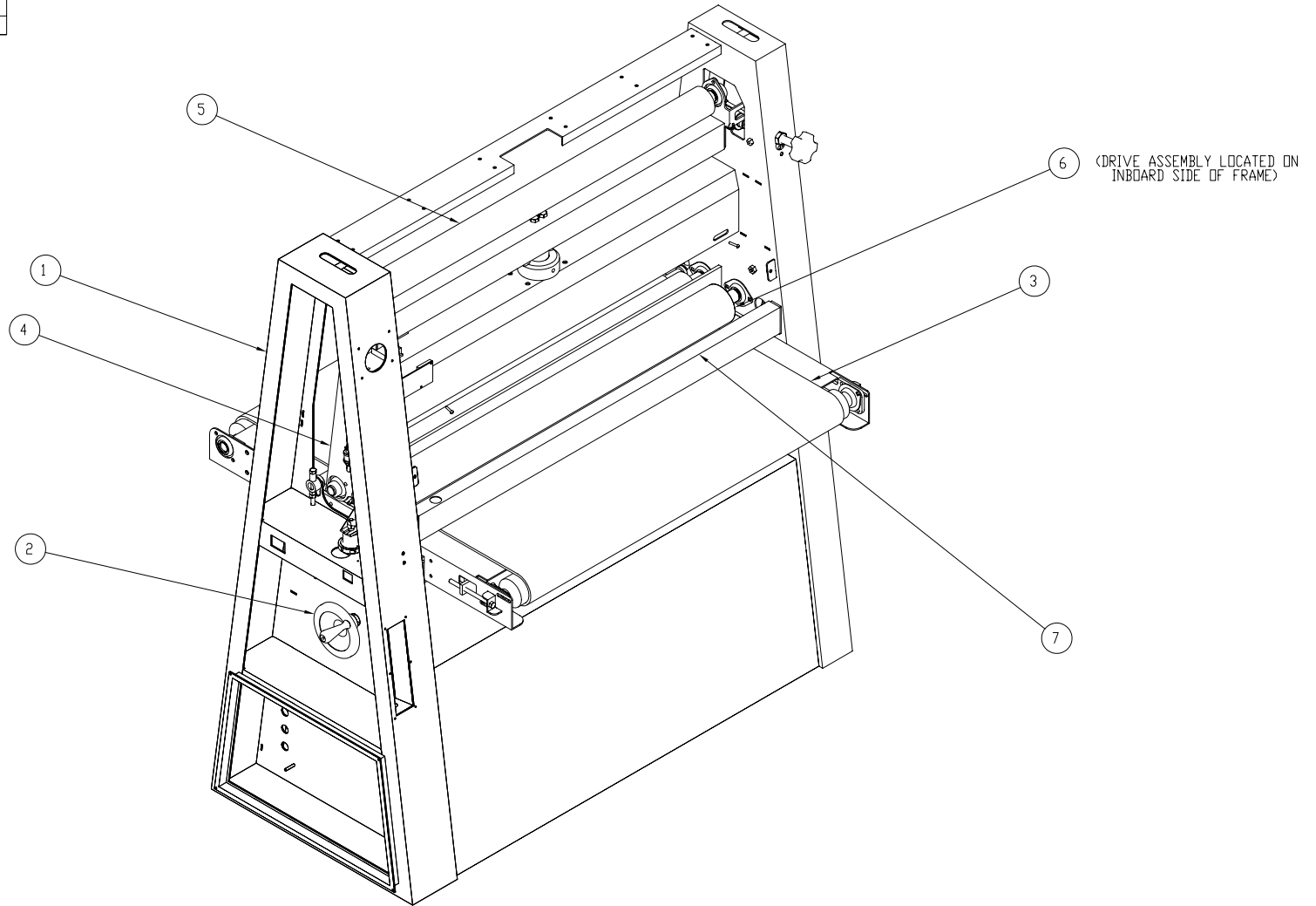
ITEM	PART NO	DESCRIPTION	QTY
	D3045910143	Dimensional	Ref
AA	D3024760743	Basic Machine Assembly	1
AB	D3024770443	Panel & Cover Assembly	1
AC	D30452600	Label Assembly	1
AD	D3024800143	Lift Assembly	Ref
AE	D3002840243	Conveyor Bed Assembly	Ref
AF	D3025260243	Drum Assembly	Ref
AG	D3023370143	Polishing Platen Assembly	Ref
AH	B30339701	Locking Device Assembly	Ref
AI	D3025250243	Rocker Assembly	Ref
AJ	D30252701	Drive & Brake Assembly	Ref
AK	B3033960143	Infeed Shut-Off Bar Assembly	Ref
AL	D30439901	Caster Kit	Ref
AM	P83018-4-150	Digital Scale	Ref
	304233020	Pneumatic Parts List	
	D30423302	Pneumatic Schematic	
	304230042A	230/1/60 Electrical Parts List w/VFD Parameter Table 10HP	
	D30423004	230/1/60 Electrical Schematic	
	304231032	230/3/60 Electrical Parts List w/VFD Parameter Table 10HP	
	D30423103	230/3/60 Electrical Schematic	

Revisions

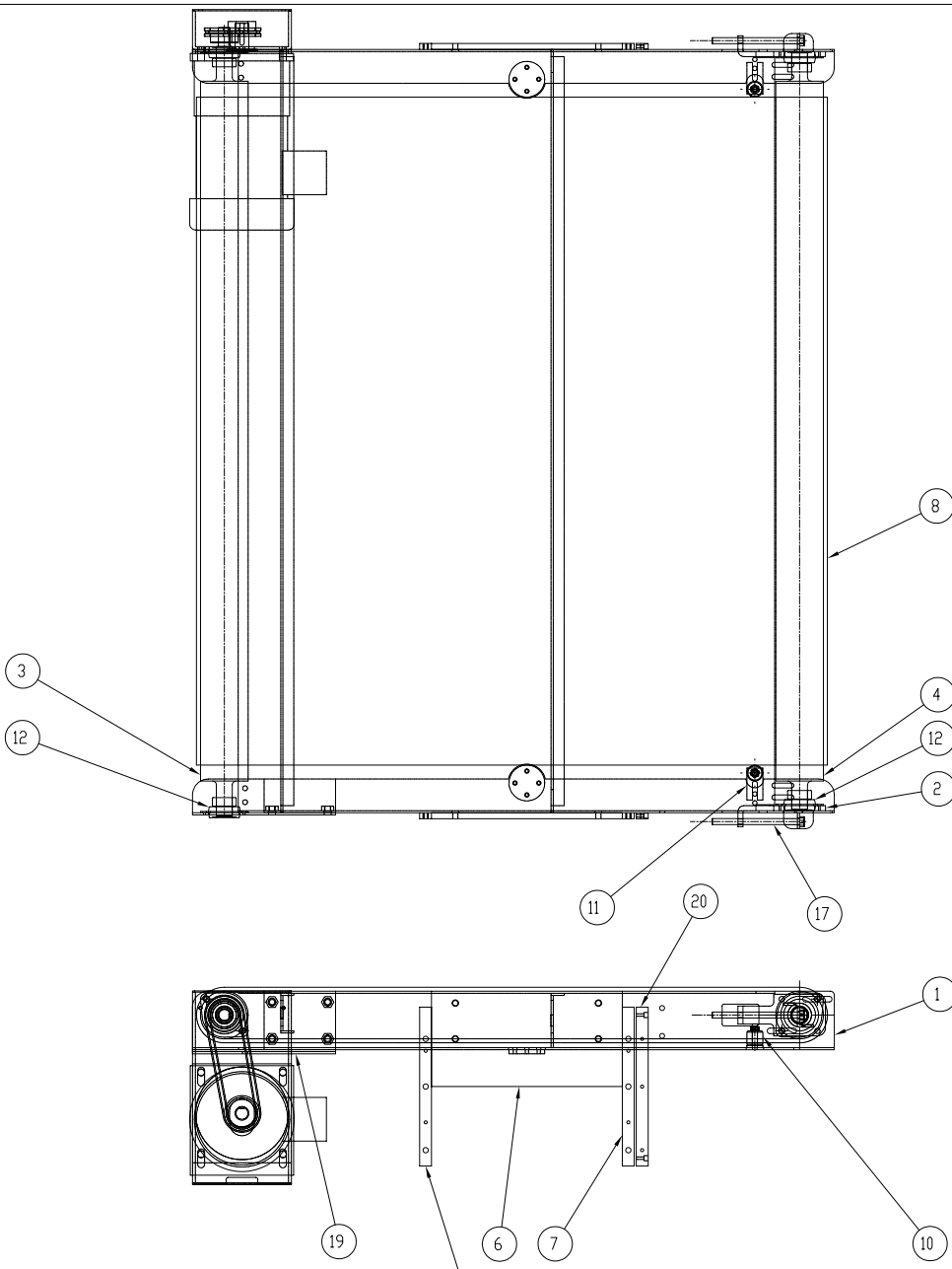


TOLERANCES +/- UNLESS OTHERWISE SPECIFIED	MACHINING DECIMAL INCHES	WELDING .03, .015	FABRICATING .13 .06	SURFACE FINISHES REQUIRED AS SPECIFIED	USED ON REFERENCE MACHINE/DRAWING
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF TIMESAVERS, INC. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF TIMESAVERS, INC. IS PROHIBITED.					
	TITLE	DATE	NAME	MATERIALS	
	UNITS	DRAWN	CHECKED		
	SOLIDS (Y/N)				
TITLE: DIMENSIONAL 43" SPEEDSANDER				DRAWING NUMBER: 3045910143	REV. SHEET 1 OF 1

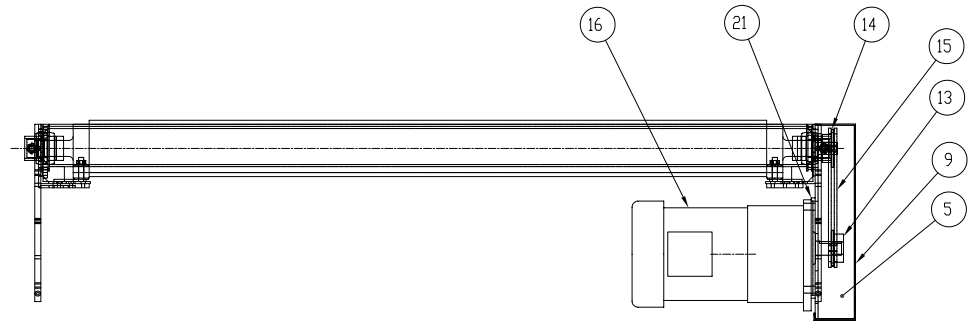
ITEM NO.	QTY.	PART NO.	PART DESCRIPTION
1	1	3000530443	MAINFRAME WELDMENT
2	1	3024800143	LIFT ASSEMBLY
3	1	3002840243	CONVEYOR BED ASSEMBLY
4	1	3025260243	DRUM ASSEMBLY
5	1	3025250243	ROCKER ASSEMBLY
6	1	30252701	DRIVE AND BRAKE ASSEMBLY
7	1	3033960143	INFEED SHUT-OFF BAR ASSEMBLY



TOLERANCES UNLESS OTHERWISE SPECIFIED	MACHINING DECIMAL FRACTIONAL	WELDING .03, .05	FABRICATING .13 .06	SURFACE FINISHES REQUIRE AS SPECIFIED	USED ON REFERENCE MACHINE/DRAWING SPEEDSANDER
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF TIMESAVERS, INC. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF TIMESAVERS, INC. IS PROHIBITED.					
	SCALE	SIZE	DATE	NAME	MATERIAL
	UNITS INCHES	DRAWN	4-11-08	JPL	
	SOLIDS (Y/N)	CHECKED			
TITLE: BASIC MACHINE ASSEMBLY					DRAWING NUMBER: 3024760743
					REV. SHEET 1 OF 1

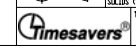


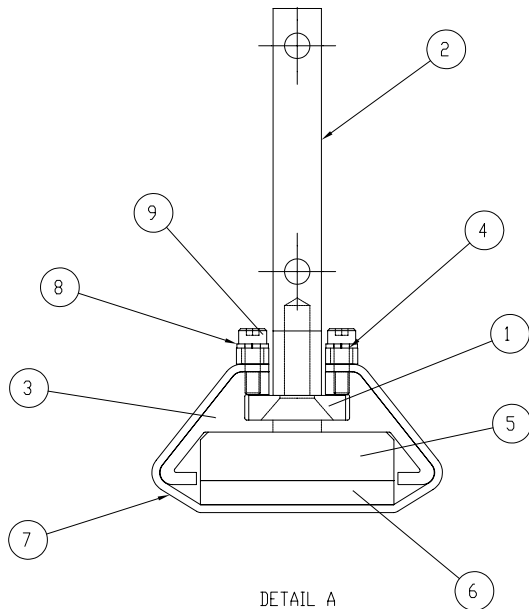
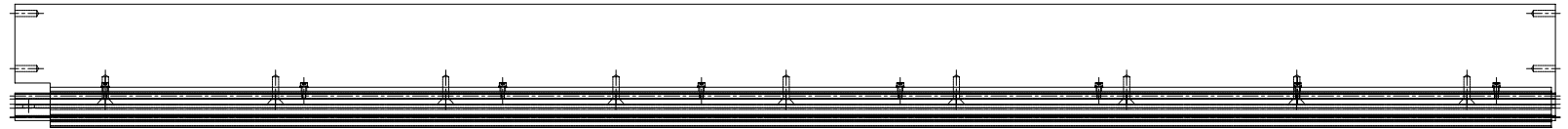
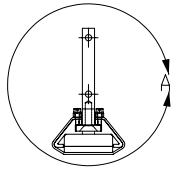
ITEM NO.	QTY.	PART NO.	PART DESCRIPTION
1	1	3014050243	CONVEYOR BED WELDMENT
2	2	30233801	TAKE-UP BRACKET
3	1	3023550143	CONVEYOR DRIVE ROLL
4	1	3023560143	CONVEYOR TAKE-UP ROLL
5	1	30234702	FEED MOTOR BRACKET
6	2	30234801	GIB PLATE
7	4	30234901	GIB GUIDE BAR
8	1	P80186-42-82	CONVEYOR BELT SPARKS TS2100 42"w x 82"lg ENDLESS
9	1	30235401	COVER, FEED DRIVE
10	2	30320900	GUIDE ROLLER
11	2	30321001	BRACKET - ROLLER GUIDE
12	4	P80001-25-16	BEARING FLANGE FAFNIR #RAT-16
13	1	P81235-22MM-117	SPROCKET 35B17 - 22mm B. 2 SS @ 90 deg
14	1	P81235-12-118	SPROCKET 35B18 - 3/4"B. KWY & 2 SS
15	1	P83001-35	CHAIN #35 x 19.13"LG
16	1	SEE ELECT. P/L	GEARMOTOR CPG #CV22, 1/2 HP, 60I
17	2	EXPEND	HEX HEAD CAP SCREW 3/8-16NC x 5"LG
18	2	EXPEND	HEX NUT M8-1.25
19	1	30447000	BED SPLICE
20	2	30370801	JACKSCREW BAR
21	1	30447100	FEED MOTOR SPACER



PIN BOTH OUTFEED GIB GUIDES TO THE FRAME USING 5mm DIA. SPLIT PINS

TOLERANCES UNLESS OTHERWISE SPECIFIED DECIMAL ANGLE .03, .015 .13 .06	MACHINING .03, .015 .13 .06	WELDING .13 .06	FABRICATING .06	SURFACE FINISHES RECOMMENDED AS SPECIFIED	USED ON REFERENCE MACHINE/DRAWING SPEEDSANDER
	THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF TIMESAVERS, INC. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF TIMESAVERS, INC. IS PROHIBITED.				
SCALE: 1:1 UNITS: INCHES SOLIDS: (Y/N) Y	DESIGNED BY: JPL DRAWN: JPL CHECKED:	DATE: 4-15-08	NAME: JPL	MATERIALS:	
TITLE: CONVEYOR BED ASSEMBLY				DRAWING NUMBER: 3002840243	REV. SHEET 1 OF 1





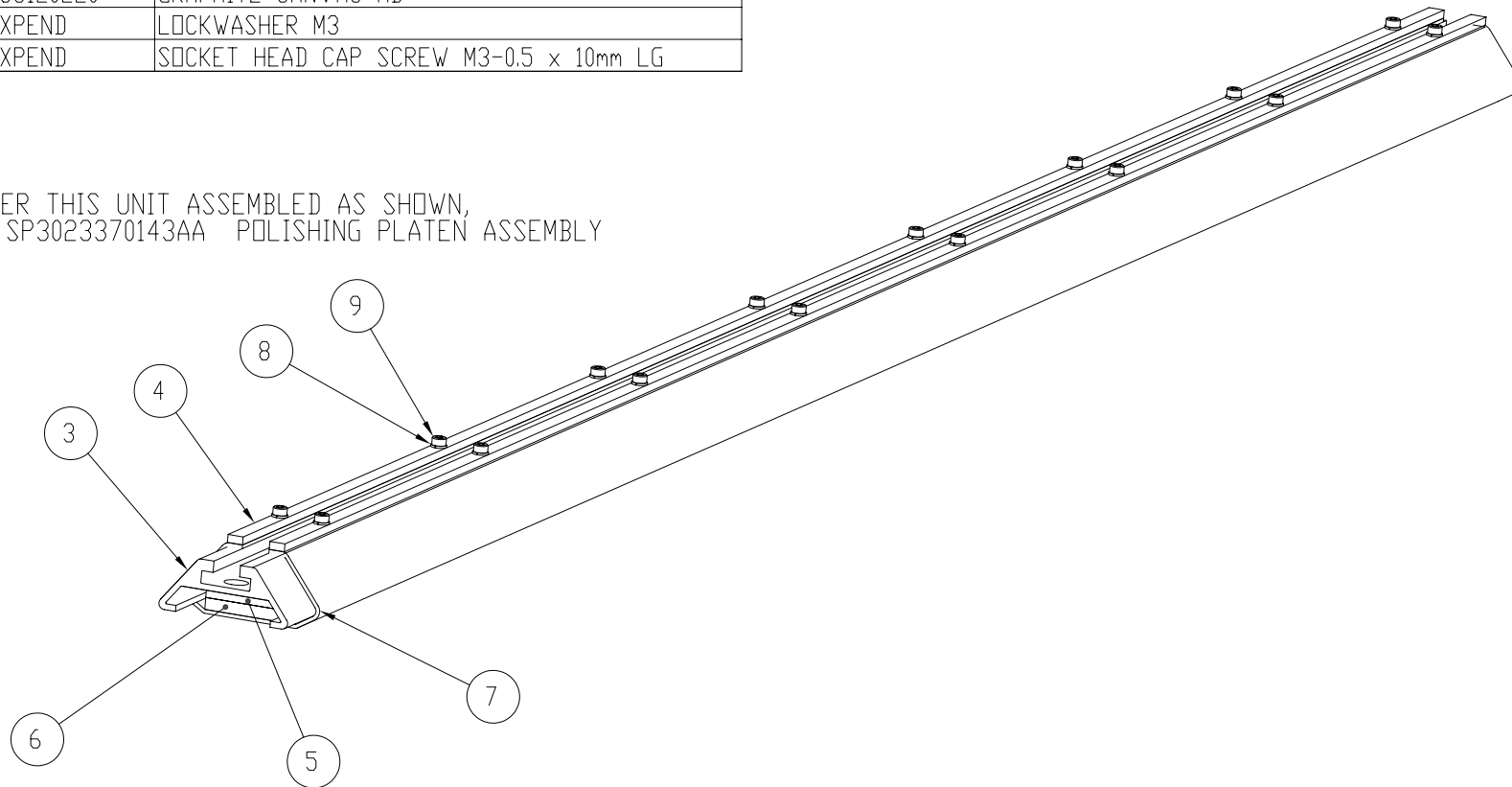
DETAIL A
SCALE 2 : 1



ITEM NO.	QTY.	PART NO.	PART DESCRIPTION
1	1	3023310043	PLATEN BAR
2	1	3023310243	PLATEN MOUNTING BAR
3	1	3023320143	PLATEN EXTRUSION
4	2	3023330043	CLAMP BAR
5	1	3023350143	PLATEN BAR
6	1	99803-10-478	FELT
7	1	P83120220	GRAPHITE CANVAS HD
8	16	EXPEND	LOCKWASHER M3
9	16	EXPEND	SOCKET HEAD CAP SCREW M3-0.5 x 10mm LG

TITELBLOCK		INITIAL		DRAWN BY		DATE		TIMESAVERS, INC.	
SCALE		REVISIONS		SCALE		DATE		POLISHING PLATEN ASSEMBLY	
DATE		BY		DATE		BY		REV.	
1		1		1		1		D	
3023370143		1		1		1		1	

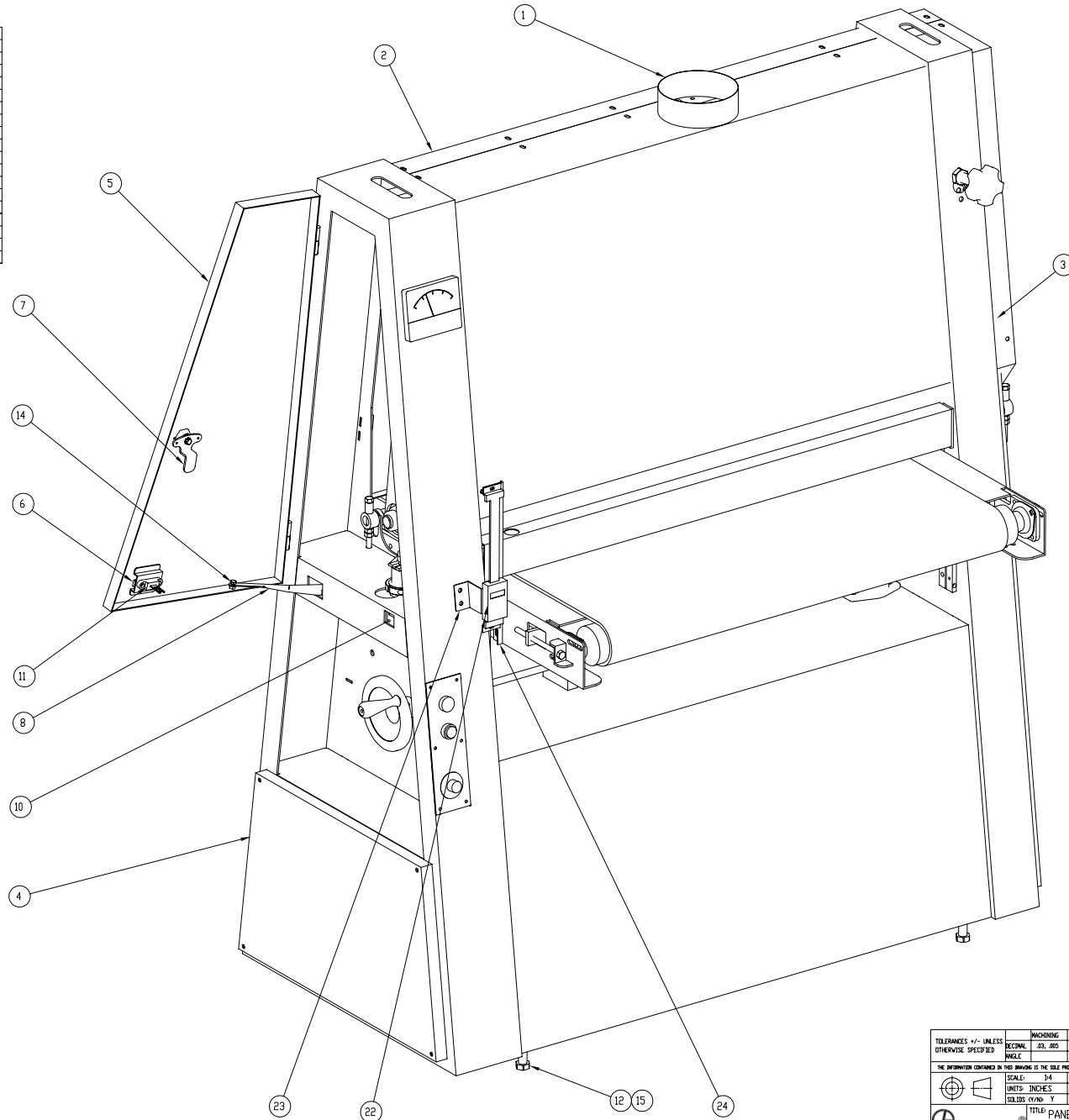
ITEM NO.	QTY.	PART NO.	PART DESCRIPTION
3	1	3023320143	PLATEN EXTRUSION
4	2	3023330043	CLAMP BAR
5	1	3023350143	PLATEN BAR
6	1	99803-10-478	FELT
7	1	P83120220	GRAPHITE CANVAS HD
8	16	EXPEND	LOCKWASHER M3
9	16	EXPEND	SOCKET HEAD CAP SCREW M3-0.5 x 10mm LG

TO ORDER THIS UNIT ASSEMBLED AS SHOWN,
 ORDER: SP3023370143AA POLISHING PLATEN ASSEMBLY



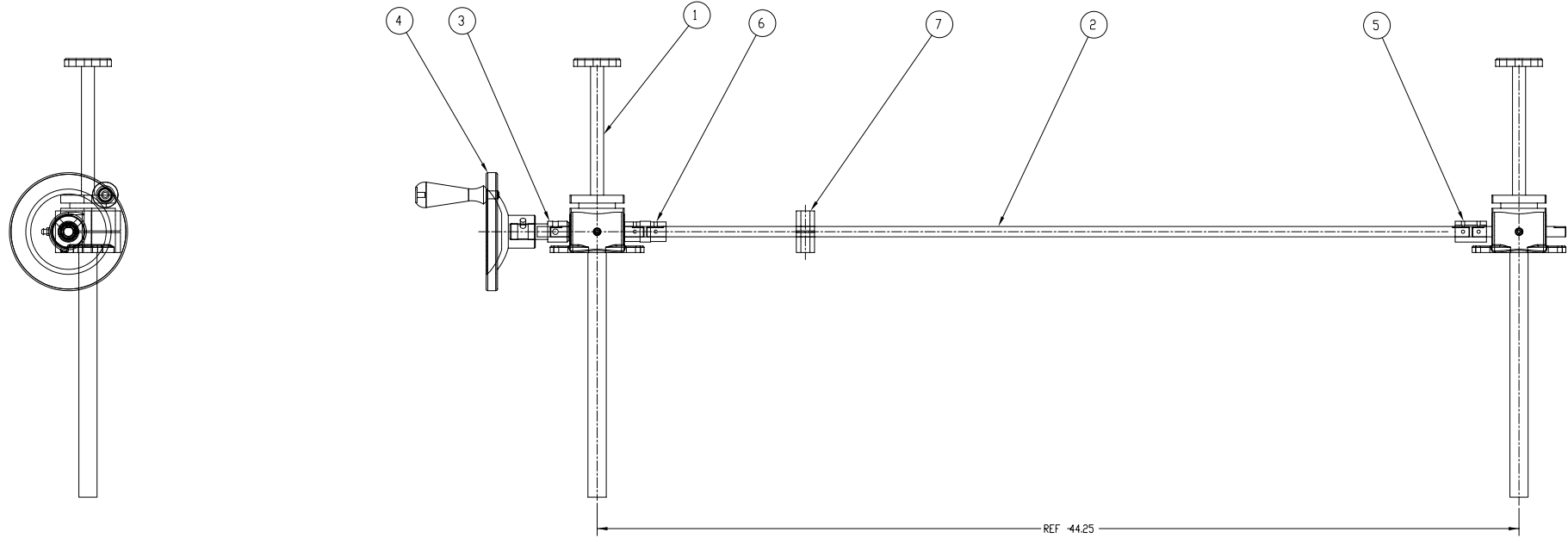
TOLERANCES +/- UNLESS OTHERWISE SPECIFIED	MACHINING	WELDING	FABRICATING	FINISH REQUIREMENTS	USED ON REFERENCE MACHINE/DRAWING REPLACEMENT PARTS DOCUMENT
	DECIMAL ANGLE	.03, .005 .	.13 .06		
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF TIMESAVERS, INC. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF TIMESAVERS, INC. IS PROHIBITED.					
	SCALE: 3/4	SIZE: C	DATE	NAME	MATERIAL:
	UNITS: INCHES	DRAWN	8-28-07	JPL	
SOLIDS (Y/N): Y	CHECKED				
				TITLE: POLISHING PLATEN ASSEMBLY DRAWING NUMBER: 3023370143 REV. SHEET 2 OF 2	

ITEM NO.	QTY.	PART NO.	PART DESCRIPTION
1	1	3025280243	DUST HOOD
2	1	3014740243	OUTFEED COVER
3	1	30006401	REAR COVER PANEL
4	1	30006404	ELECTRICAL COVER
5	1	30006405	BELT LOADING COVER
6	1	30341901	NUT PLATE (ABB DOOR KEY)
7	1	P82007-HS-013	DOOR HANDLE, SQUARE-N #A-2055-B
8	1	30445700	DOOR LATCH
9	1	30453700	ACCESS COVER
10	1	REFERENCE	KEYED DOOR SWITCH (SEE ELECTRICAL PARTS LIST)
11	1	REFERENCE	SWITCH KEY DMIRON D4DS-K3
12	4	EXPEND	HEX HEAD CAP SCREW M16-2.0 x 80mm LG
13	4	EXPEND	HEX NUT M16-2.0
14	1	EXPEND	HEX HEAD CAP SCREW M6-1.0 x 10mm LG
22	1	P83018-4-150	DIGITAL SCALE 150mm
23	1	30477800	FRAME BRACKET - INDICATOR
24	1	30477700	BED BRACKET - INDICATOR
27	1	30709300	LOADMETER COVER



TOLERANCES UNLESS OTHERWISE SPECIFIED		MACHINING	WELDING	FABRICATING	FINISH REQUIREMENTS	USED ON REFERENCE MACHINE/DRAWING	
DECIMAL	.03, .015	.13	.06			SPEEDSANDER	
ANGLE							
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF TIMESAVERS, INC. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF TIMESAVERS, INC. IS PROHIBITED.		SCALE:	1:1	ISSUE:	0	DATE:	9-17-07
UNITS: INCHES		DRAWN:	JPL	NAME:		MATERIAL:	
SOLIDS (Y/N): Y		CHECKED:					
TITLE: PANEL & COVER ASSEMBLY		DRAWING NUMBER: 302477044343		REV. 1		SHEET 1 OF 1	

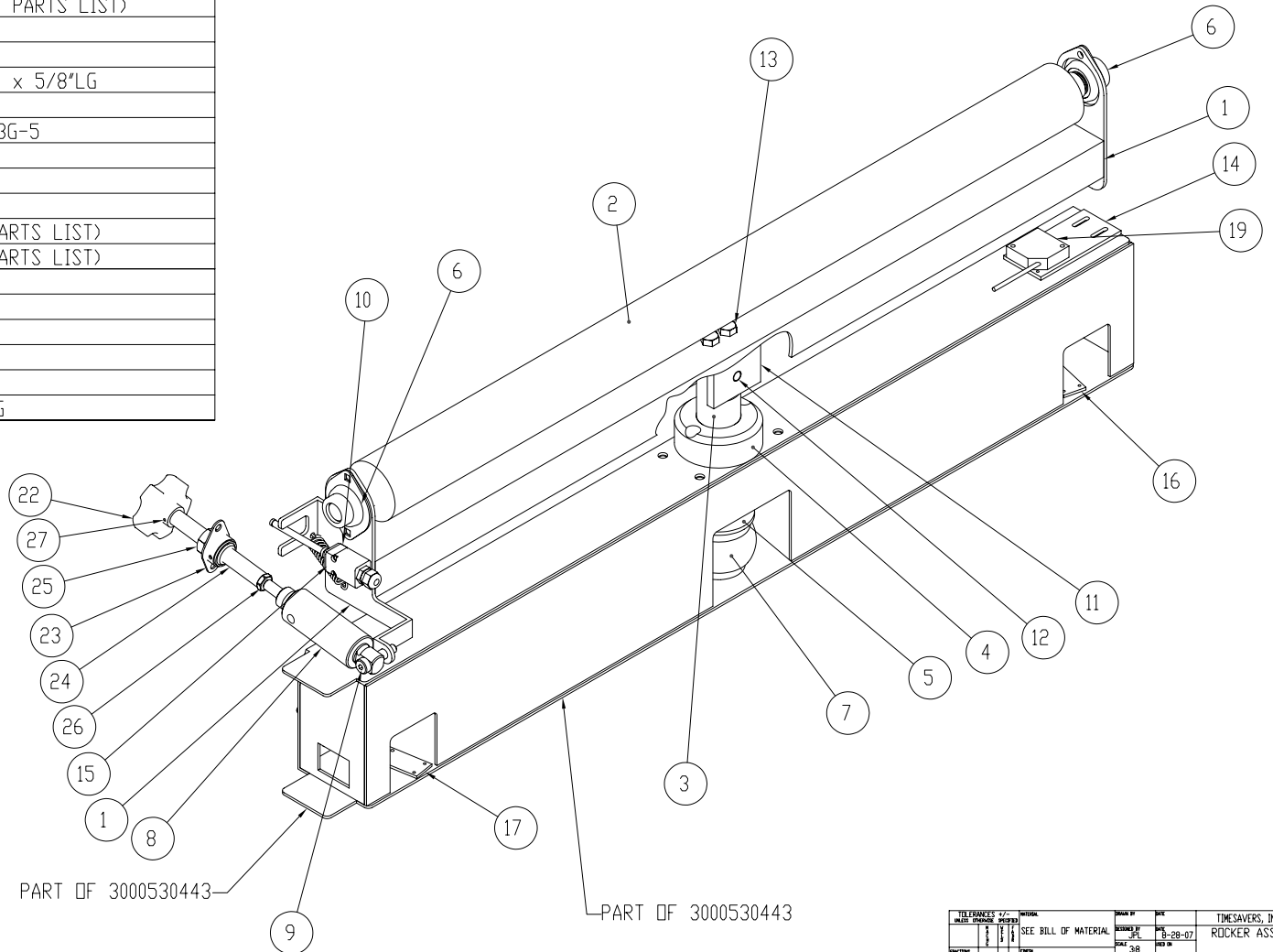
ITEM NO.	QTY.	PART NO.	PART DESCRIPTION
1	2	P82041T-40-091	JACK 1/2 TON - 11"RAISE - 40T/IN
2	1	301800043	JACK SHAFT
3	1	30451900	HANDWHEEL ADAPTOR SHAFT
4	1	P82004	HANDWHEEL 6"DISHED 3/4"B. 2SS w/ REV. HANDLE
5	1	P81400-08	SLEEVE COUPLING CS-12 3/4"B w/ K/WY & 2SS
6	1	P81411-08-08	JAW COUPLING BOSTON #FA10-1/2 x 1/2 w/ DBL. SS
7	1	30452700	JACK DRAG (P/P)



TOLERANCES +/- UNLESS OTHERWISE SPECIFIED DECIMAL ANGLES	MACHINING .03, .015	WELDING .13	FABRICATING .06	SURFACE FINISHES REQUIRED AS SPECIFIED	USED ON REFERENCE MACHINE/DRAWING SEE BILL OF MATERIAL
	THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF TIMESAVERS, INC. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF TIMESAVERS, INC. IS PROHIBITED.				
ISCALE: 3/8 UNITS: INCHES SOLIDS (Y/N): Y	(ISS: D) DRAWN	DATE 8-27-07	NAME JPL	MATERIAL:	
TITLE: LIFT ASSEMBLY SPEEDSANDER				DRAWING NUMBER: 3024800143	REV. SHEET 1 OF 1



ITEM NO.	QTY.	PART NO.	PART DESCRIPTION
1	1	3000540043	ROCKER ARM
2	1	3018040043	IDLER ROLL
3	1	30233601	ROCKER GUIDE PIN
4	1	59586-2	ROCKER GUIDE
5	1	61170	IDLER STOP
6	2	P80001-25-16	BEARING FLANGE FAFNIR #RAT-16
7	1	REFERENCE	AIR BAG (SEE PNEUMATICS PARTS LIST)
8	1	REFERENCE	AIR CYLINDER (SEE PNEUMATIC PARTS LIST)
9	1	P81910-12M-30M	SHOULDER BOLT 12mm DIA x 30mm LG
10	3	REFERENCE	LIMIT SWITCH (SEE ELECTRICAL PARTS LIST)
11	1	30439800	ROCKER PIVOT
12	1	EXPEND	DOWEL PIN .50" DIA x 2.5" LG
13	2	EXPEND	HEX HEAD CAP SCREW 1/2-13NC x 5/8"LG
14	1	30453400	MOUNTING PLATE, PHOTO EYE
15	1	P82057-26-48	SPRING EXTENSION LEE #LE-093G-5
16	1	30454700	PLATE
17	1	30454800	PLATE
18	1	30453501	REFLECTOR BRACKET
19	1	REFERENCE	PHOTO-EYE (SEE ELECTRICAL PARTS LIST)
20	1	REFERENCE	REFLECTOR (SEE ELECTRICAL PARTS LIST)
22	1	P82007-20-020	HANDKNOB MONROE #29633
23	1	78678	MODIFIED BEARING
24	1	76714-15	ADJUSTING ROD
25	1	EXPEND	HEX JAM NUT 3/4-16NF
26	1	EXPEND	HEX JAM NUT M12-1.75
27	1	EXPEND	DOWEL PIN 3/16"DIA x 1-1/4"LG

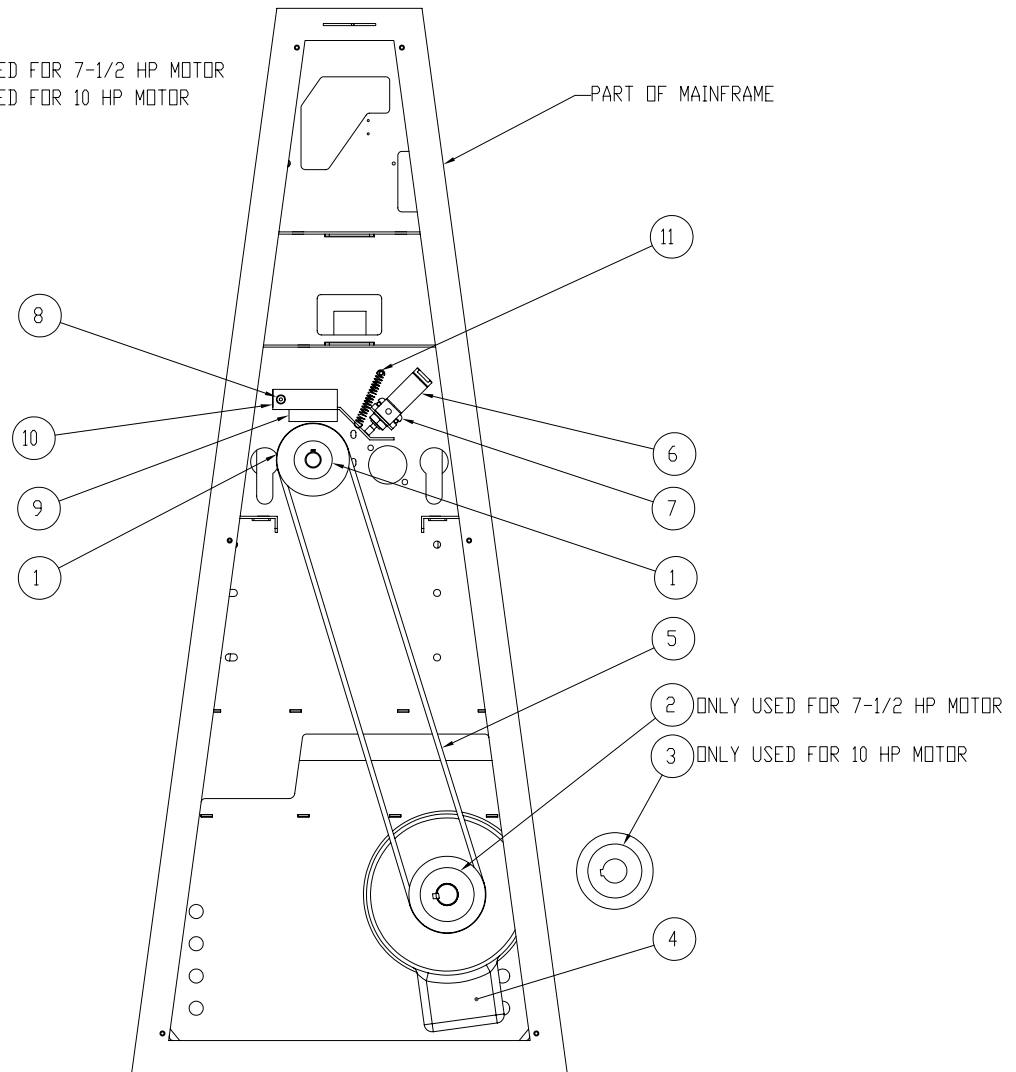


NOTE: 1. ITEMS #18, #20, & #23 ARE MOUNTED TO THE
OUTBOARD OF THE MAINFRAME.
2. USE ITEM #27 TO PIN ITEM #22 TO ITEM #24.

TIMESAVERS 2-1-77		INITIALS	DATE	TIMESAVERS, INC.	
MAILED	THROUGH	REVISION	DATE	REVISED BY	DATE
		SEE BILL OF MATERIAL	8-28-07		ROCKER ASSEMBLY
			SCALE	3:8	
PARTICLE		FORM		SIZE	
REVISION	DATE	THE INFORMATION CONTAINED IN THIS DRAWING IS THE PROPERTY OF TIMESAVERS, INC. IT IS TO BE USED FOR THE MANUFACTURE OF THE PARTS SHOWN HEREON. IT IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, WITHOUT THE EXPRESS WRITTEN PERMISSION OF TIMESAVERS, INC. OR ITS AFFILIATES.		SIZE	DWG. NO.
DATE	BY	NOT SCALE DRAWING		D	3025250243
DATE	BY				HEET 1 OF 1

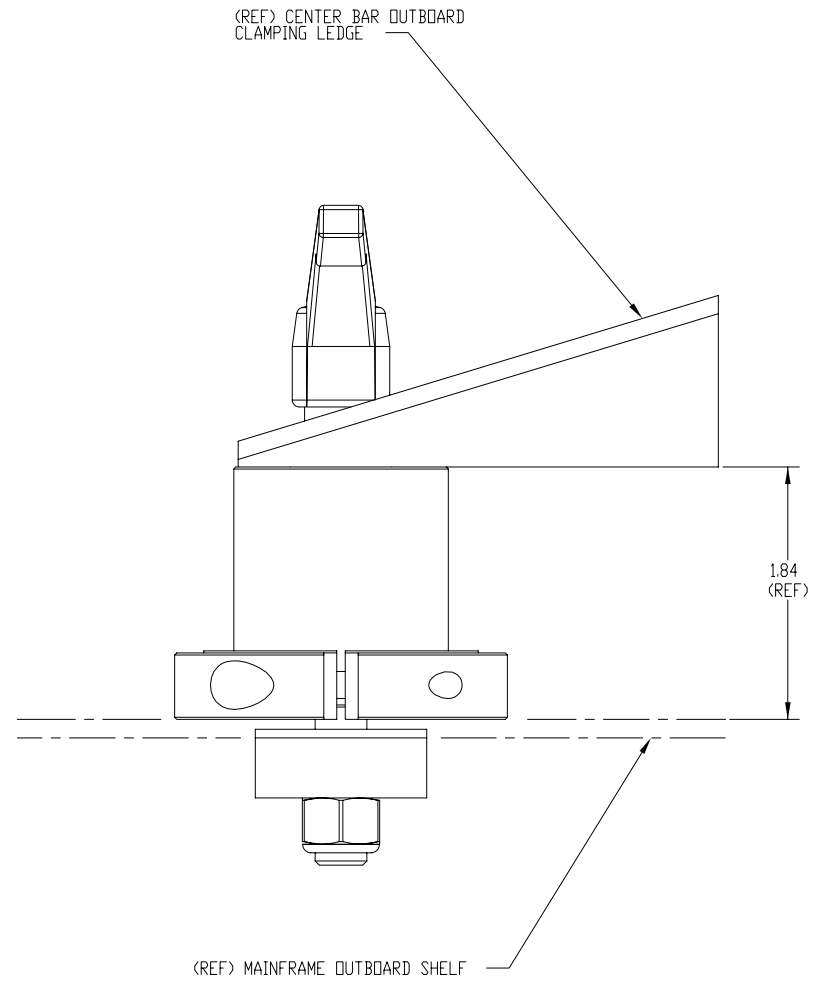
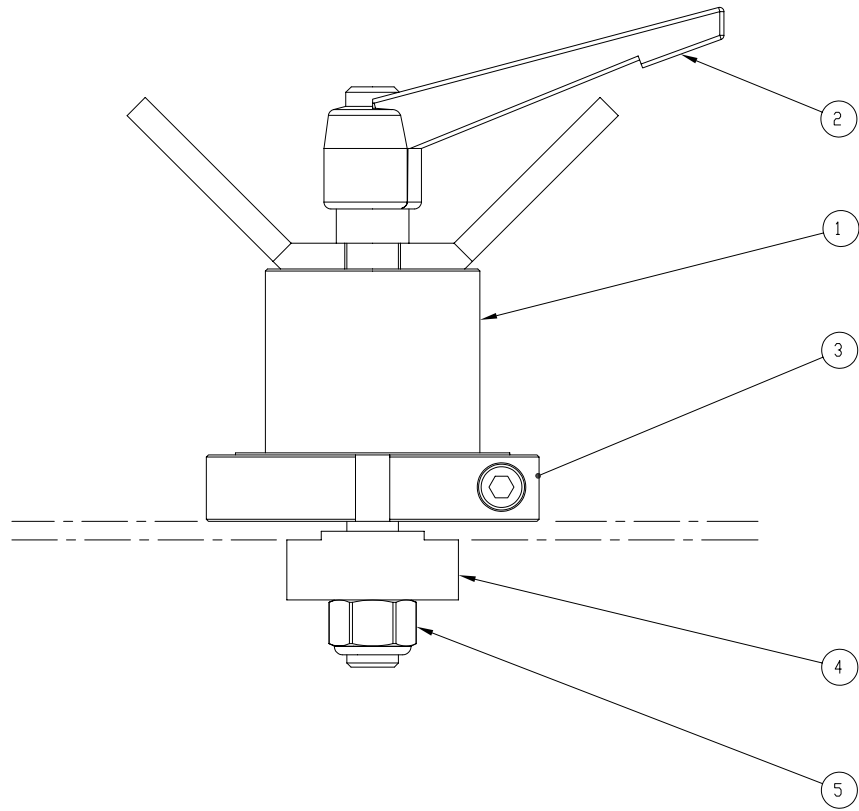
ITEM NO.	QTY.	PART NO.	PART DESCRIPTION
1	1	30729800	SHEAVE - DRUM
2	1	30730000	SHEAVE - 7-1/2 HP MOTOR
3	1	30729900	SHEAVE - 10 HP MOTOR
4	1	REFERENCE	MOTOR (SEE ELECT P/L)
5	2	P80404-3-71	V-BELT #3VX-710
6	1	P88006-09-016	SEE AIR DIAGRAM
7	1	P88006-01	SEE AIR DIAGRAM
8	1	P81910-06-48	SHOULDER BOLT 3/8"DIA x 3"LG
9	1	77628-2	BRAKE PUCK
10	1	30359800	BRAKE BRACKET
11	1	P82057-24-32	SPRING EXTENSION LEE #LE-037E-5

◇ ONLY USED FOR 7-1/2 HP MOTOR
 ◇ ONLY USED FOR 10 HP MOTOR



◇ ITEM #1 WAS P80203-2-45;
 ITEM #2 WAS P80203-2-475;
 ITEM #3 WAS P80305-19;
 ITEM #4 WAS P80305-29;
 ADD MOTOR SHEAVE NOTES;
 ECD #4090 .JPL. 4-11-08

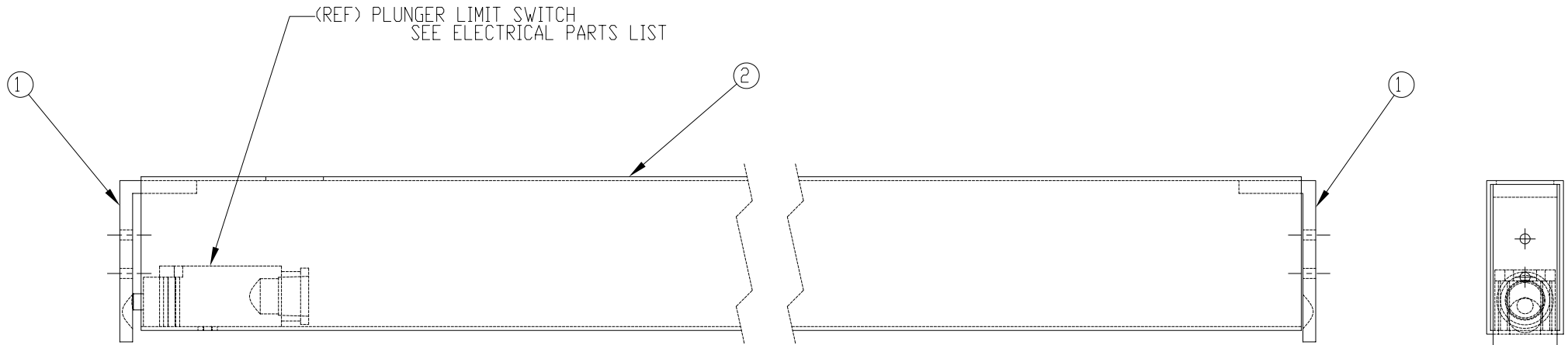
ITERANCES	±	UNLESS	INDICATED	DATE	11-29-01	TIME SAVERS, INC.
MAXIMUM TOLERANCE	±	SEE	BILL OF MATERIAL	REVISION	11-29-01	DRIVE AND BRAKE ASSEMBLY
SCALE	1:4	DATE	11-29-01	SCALE	1:4	REV
DATE	11-29-01	BY	JPL	DATE	11-29-01	BY
SCALE	1:4	DATE	11-29-01	SCALE	1:4	REV
DATE	11-29-01	BY	JPL	DATE	11-29-01	BY
SCALE	1:4	DATE	11-29-01	SCALE	1:4	REV
DATE	11-29-01	BY	JPL	DATE	11-29-01	BY
SCALE	1:4	DATE	11-29-01	SCALE	1:4	REV
DATE	11-29-01	BY	JPL	DATE	11-29-01	BY
SCALE	1:4	DATE	11-29-01	SCALE	1:4	REV
DATE	11-29-01	BY	JPL	DATE	11-29-01	BY

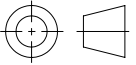



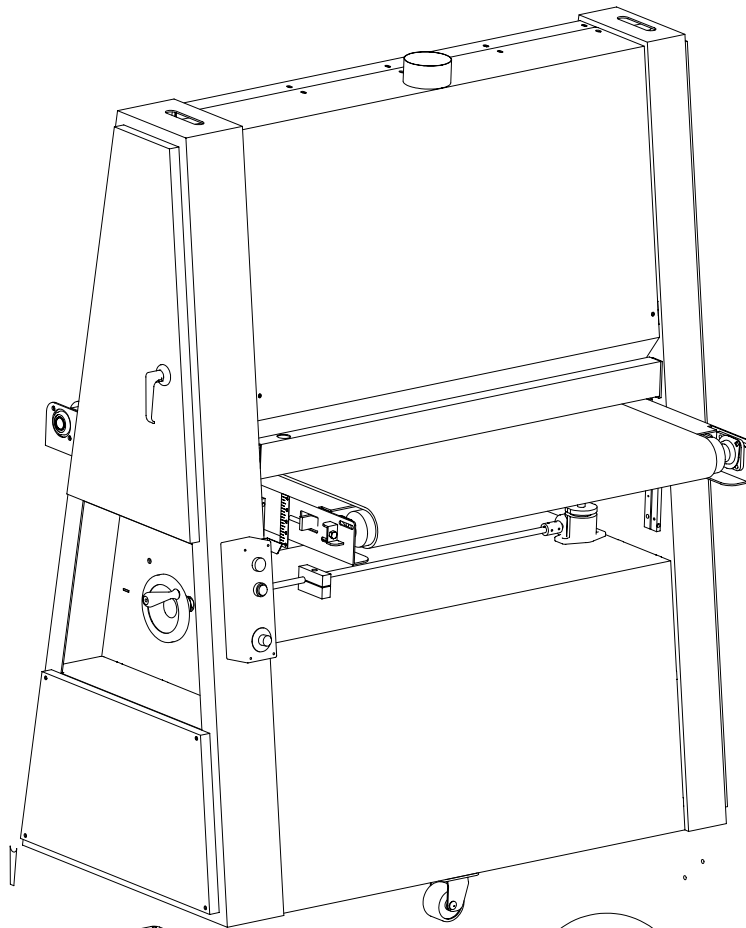
ITEM NO.	QTY.	PART NO.	PART DESCRIPTION
1	1	30547600	SPACER, QUICK LOCK
2	1	P82007-H5-02	HANDLE
3	1	P83034-26	LOCK COLLAR
4	1	30057001	TEE NUT 3/8-16
5	1	EXPEND	NYLOCK HEX NUT 3/8-16

TOLERANCES +/- UNLESS OTHERWISE SPECIFIED	MACHINING	WELDING	FABRICATING	FINISH REQUIREMENTS	USED ON REFERENCE MACHINE/DRAWING		
	DECIMAL	.03, .005	.13	.06			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF TIMESAVERS, INC. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF TIMESAVERS, INC. IS PROHIBITED.							
	SCALE:	1.5:1	SIZE:	C	DATE	NAME	MATERIAL: SEE BILL OF MATERIAL
	UNITS:	INCHES	DRAWN	4-27-05	TMA		
	SOLIDS (Y/N):	Y	CHECKED				
TITLE: LOCKING DEVICE ASSEMBLY							
DRAWING NUMBER: 30339701					REV. SHEET 1 OF 1		

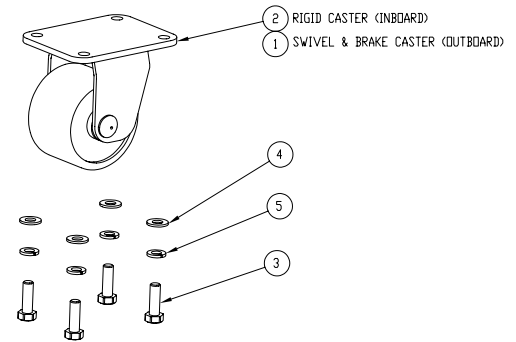
ITEM NO.	QTY.	PART NO.	PART DESCRIPTION
1	2	30455100	BRACKET - OVERTHICK
2	1	3033950143	SHUT-OFF BAR



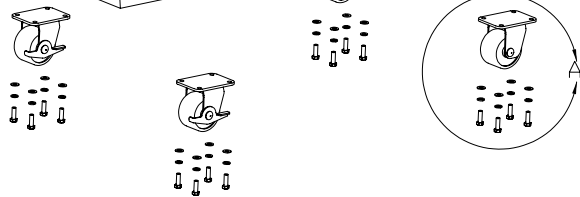
TOLERANCES +/- UNLESS OTHERWISE SPECIFIED	MACHINING	WELDING	FABRICATING	SURFACE FINISHES REQUIRED AS SPECIFIED	USED ON REFERENCE MACHINE/DRAWING: SPEEDSANDER	
	DECIMAL	.03, .005	.13			.06
	ANGLE					
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF TIMESAVERS, INC. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF TIMESAVERS, INC. IS PROHIBITED.						
	SCALE: 1:2	SIZE: B	DATE	NAME	MATERIAL:	
	UNITS: INCHES	DRAWN	8-27-07	JPL		
	SOLIDS (Y/N): Y	CHECKED				
		TITLE: INFEEED SHUT-OFF BAR ASSEMBLY			DRAWING NUMBER: 3033960143	REV. SHEET 1 OF 1



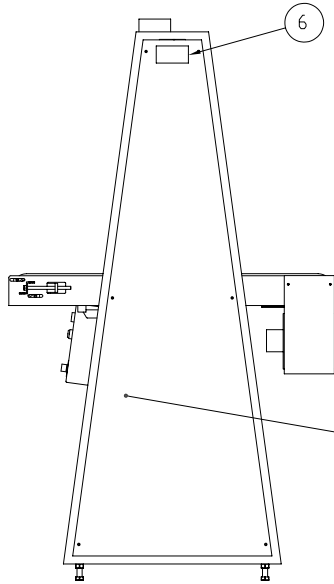
ITEM NO.	QTY.	PART NO.	PART DESCRIPTION
1	2	P83042-19	CASTER, SWIVEL & BRAKE #ML-316-1
2	2	P83042-20	CASTER, RIGID #ML-316R
3	16	EXPEND	HEX HEAD CAP SCREW M8-1.25 x 25mm LG
4	16	EXPEND	FLATWASHER M8
5	16	EXPEND	LOCKWASHER M8



DETAIL A
SCALE 1 : 2

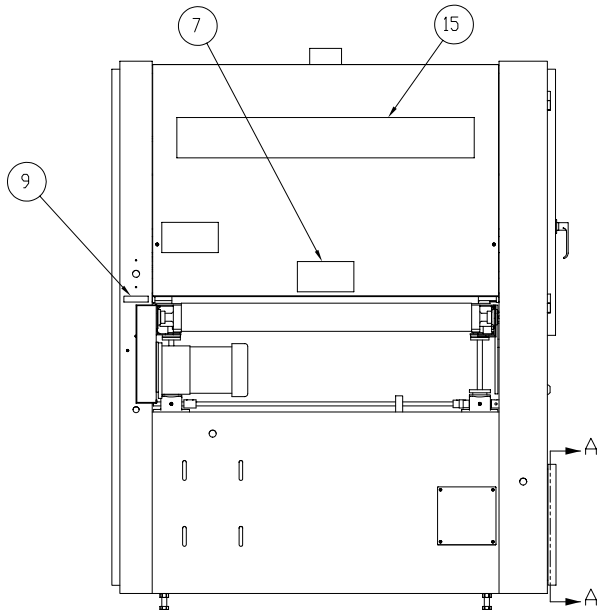


TEOLERANCES +/- UNLESS OTHERWISE SPECIFIED	MACHINING DECIMAL 03, .05	WELDING DECIMAL .13	FABRICATING DECIMAL .06	FINISH REQUIREMENTS	USED ON REFERENCE MACHINE/DRAWING
					SPEEDSANDER
<small>THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF TIMESAVERS, INC. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF TIMESAVERS, INC. IS PROHIBITED.</small>					
	SCALE: 316	SIZE: 11	DATE: 6-10-03	NAME: JPL	MATERIAL: SEE BILL OF MATERIAL
	UNITS: INCHES	DRAWN: Y	CHECKED:		
	SOLIDS (Y/N): Y				
				TITLE: CASTER KIT	DRAWING NUMBER: 30439901
					REV. SHEET 1 OF 1

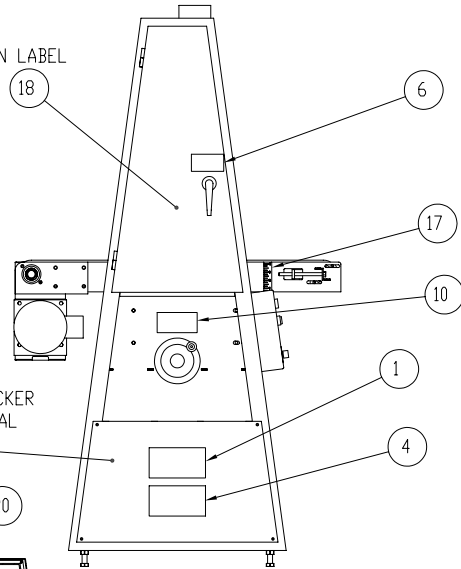


13 LOCATED ON THE FRAME
16 BEHIND REAR PANEL

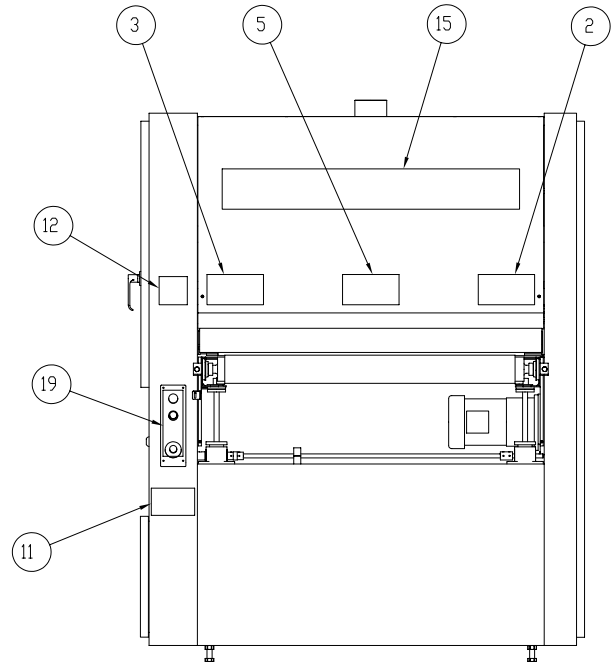
ITEM	QTY	PART NUMBER	NAME/DESCRIPTION
1	1	A82693-54	WARNING LABEL - VOLTAGE
2	1	A82693-51	WARNING LABEL - PINCH POINT
3	1	A82693-49	WARNING LABEL - EXPLOSION
4	1	A82693-53	WARNING LABEL - OWNERS MANUAL
5	1	A82693-50	WARNING LABEL - KICKOUT
6	2	A82693-48	WARNING LABEL - DANGER MOVING PARTS
7	1	A82693-52	WARNING LABEL - MOVING PART
8		-	-
9	1	-	AIR SUPPLY FILTER
10	1	-	OPEN ARROW CW ROTATION
11	1	A30449800	SERIAL NO. PLATE
12	1	-	DECIMAL EQUIVALENT CHART
13	1	-	SOLENOID ID TAG "SOL-1"
14	1	-	WIRING LABEL (INSIDE ELECT. ENCLOSURE)
15	2	30451600	LABEL SPEEDSANDER
16	1	-	SOLENOID ID TAG "SOL-2"
17	1	-	SCALE BED OPENING 4"
18	1	-	BELT TENSION LABEL (ON END OF CENTERBAR)
19	1	P86431-30424800	PUSHBUTTON PLATE
20	1	-	WARNING LABEL - MOTOR WARRANTY
21	1	-	WARNING LABEL - GROUND EQUIPMENT
22	1	-	WIRING LABEL - USE COPPER ONLY
23	1	-	VOLTAGE LABEL



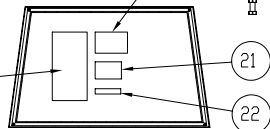
BELT TENSION LABEL
(ON END OF
CENTERBAR)



VOLTAGE STICKER
ON ELECTRICAL
PANEL



14
WIRING LABEL



SECTION A-A

TOLERANCES +/- UNLESS OTHERWISE SPECIFIED	MACHINING		WELDING		FABRICATING		FINISH REQUIREMENTS		USED ON REFERENCE MACHINE/DRAWING
	DECIMAL	FRACTIONAL	DECIMAL	FRACTIONAL	DECIMAL	FRACTIONAL	DECIMAL	FRACTIONAL	
			.03, .015	.13		.06			
<small>THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF TIMESAVERS, INC. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF TIMESAVERS, INC. IS PROHIBITED.</small>									
	SCALE:	1:8	SIZE:	D	DATE:	NAME:		MATERIAL:	
	UNITS:	INCHES	DRAWN:	23APR03	JJW/JPL				
	SOLIDS:	Y/N	Y	CHECKED:					
TITLE: LABEL ASSEMBLY								DRAWING NUMBER: 30452600	
								REV. SHEET 1 OF 1	

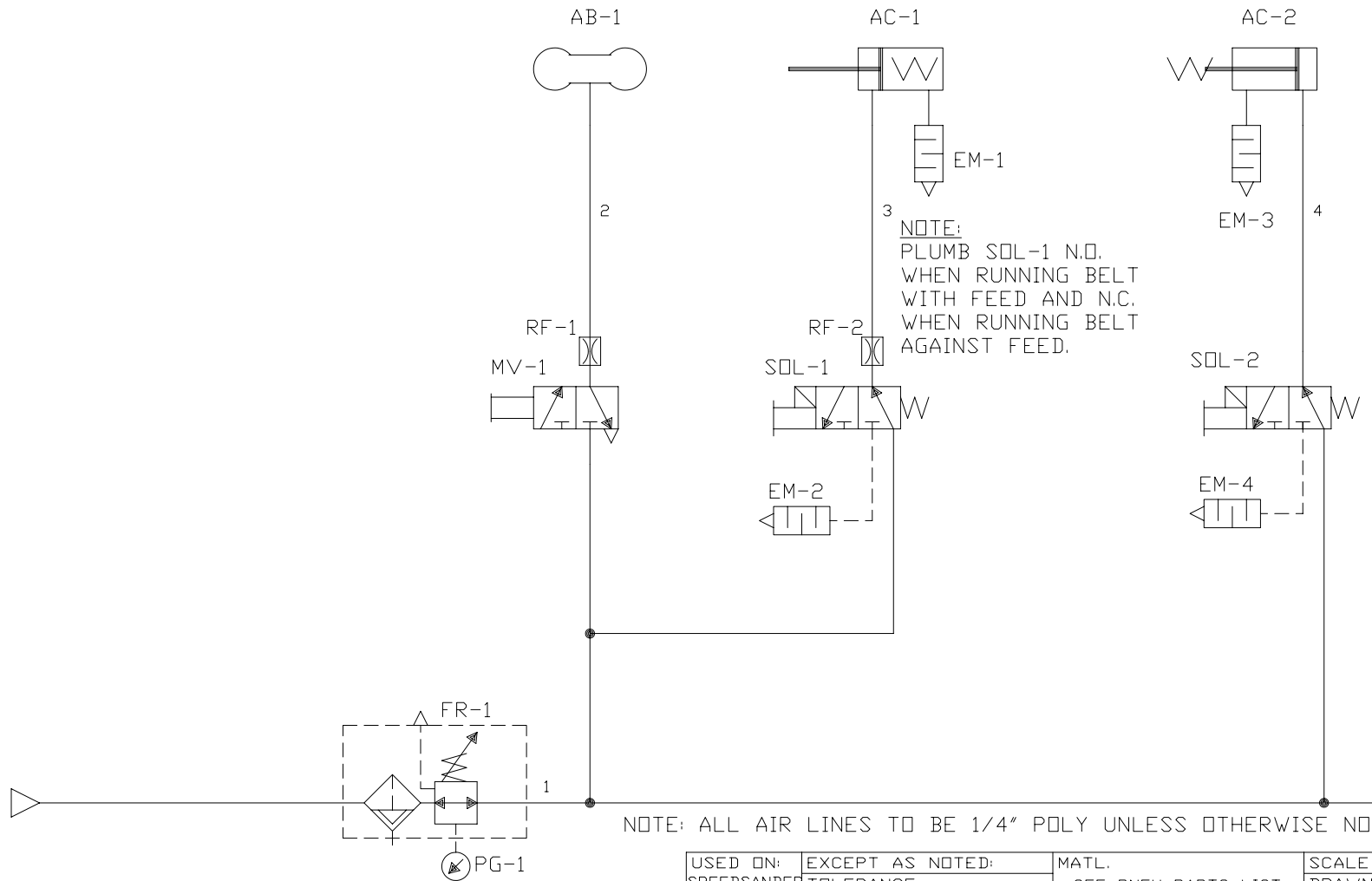
S311-13-1
PNEUMATIC PARTS LIST
6-14-05 DGL

			304233020	
QTY	SYMBOL	DESCRIPTION	PART NUMBER	ITEM
1		PNEUMATIC SCHEMATIC	30423302	
1	AB-1	AIR BAG FIRESTONE 1M1AA-0	P88021-09	P002
1	AC-1	AIR CYL FONRAY AMC-40N25	P88024-M40x25	P003
1	AC-2	AIR CYL FONRAY AMC-25N25	P88024-M25x25	P005
1	EM-1	EXHAUST MUFFLER, (1/4" NPT) CONE SL-02 FINEHUNT	P88378-13	P006
3	EM-2,3,4	EXHAUST MUFFLER, (1/8" NPT) HEX SLL-01 FINEHUNT	P88378-12	P007
1	FR-1	FILTER REGULATOR,AFC-2000 (135 PSI MAX)	P88108-71-0	P008
1	MV-1	MANUAL VALVE HS-22MF FINEHUNT	P88266-04	P009
1	PG-1	PRESSURE GAUGE, 1.5" FACE, 150 PSI, 1/8" NPT TEKLAND	P88156-15-150	P010
2	SOL-1,2	SOLENOID VALVE, MAC 111B-291JA	P86224-21-2A2	P012
2	RF-1,2	RESTRICTED FITTING, WEATHERHEAD 1068 X 4 .042	P88385-1	P013

ABRASIVE
BELT
TENSIONING

ABRASIVE
BELT
TRACKING

BRAKE



LAST TUBE NUMBER USED 5.

USED ON: SPEEDSANDER	EXCEPT AS NOTED: TOLERANCE FINISH	MATL. SEE PNEU PARTS LIST	SCALE DRAWN BY <i>DGL</i> DATE 6-14-05	WT.
ALL INFORMATION, DRAWINGS AND IDEAS HERIN CONSTITUTE A CONFIDENTIAL DISCLOSURE OF TIMESAVERS INC., AND ARE IT'S EXCLUSIVE PROPERTY, AND MUST NOT, WITHOUT WRITTEN AUTHORIZATION, BE DIVULGED, REPRODUCED, COPIED, OR APPROPRIATED IN WHOLE OR IN PART FOR ANY PURPOSE, AND THIS SHEET MUST BE RETURNED PROMPTLY UPON REQUEST.				

REVISIONS
PNEUMATIC SCHEMATIC
TIMESAVERS, INC 5270 HANSON CT MPLS, MN 55429

30423302

59.7 FLA

S311-13-1U, S311-14-1U 230/1/60
ELECTRICAL PARTS LIST
4-7-08 DGL

**10 HP
SINGLE PHASE
304230042A**

QTY	SYMBOL	DESCRIPTION	PART NUMBER	ITEM
1		ELECTRICAL DIAGRAM	30423004	
3	CR-M,1,2	CONTROL RELAY, OMRON LY2NJ-AC220/240	P8615A-22-488	E001
3	CR-M,1,2	CONTROL RELAY SOCKET, OMRON PTF08A	P8615A-22-368	E002
2	FU-1	FUSE BUSSMAN FNM-4	P86509-20-4001	E003
1	FU-1	FUSE CARRIER TE GK1DD	P865AC-01-032C	E004
2	FU-2	FUSE BUSSMANN JJN-30 30A, 300V, CLASS T FAST BLOW	P86504-41-0303	E030
1	FU-2	FUSE HOLDER BUSSMANN T30030-2CR	P86524-01-0303	E031
1	LS-1	LIMIT SWITCH TEND 8112	P86234-00-001	E005
3	LS-2,3,4	LIMIT SWITCH TEND 8167	P86234-00-002	E006
1	LS-5	SWITCH LIMIT OMRON D4DS-35FS	P86230-01-007	E007
1	LS-5	SWITCH LIMIT KEY OMRON D4DS-K3	P86230-01-007K	E008
1	AM/CT-1	LOAD CONVERTER & INDICATOR TAHSING	14602800	E032
1	M-1	MOTORSTARTER TECO CN-50R 220VAC	P86166-20-051	E009
1	M-2	MOTORSTARTER TECO CN-11 220VAC	P86166-00-050	E010
1	MTR-1	FUKUTA AEEF 10 TEF 1800 132M B3MNT 230/1/60	P85C62-18-04062	E011
1	MTR-2	1/2 TEF 1800 230/3/60 (.4KW) CGP # CV-22 60:1	P85262-18-00270	E012
1	OL-1	OVERLAD RELAY TECO RHN-80/652 48-65A	P86198-56-065A	E013
1	PB-1	PB E-STOP ASSY SHAN HO #SHAF-221 TWIST-TO-RELEASE	P86109-01-425T	E014
1	PB-3	PUSHBUTTON ASSY SHAN HO #SHAB-223-R	P86109-03-225	E015
1	PB-4	PUSHBUTTON ASSY SHAN HO #SHAB-221-G	P86109-02-155	E016
1	PC-1	PHOTO ELECTRIC CONTROL OMRON E3JK-R4M28	P87700-39-002	E017
1	PC-1	REFLECTOR #E39-L7 COMES WITH PHOTO-EYE		REF
1	PC-1	MOUNTING BRACKET #E39-R2 COMES WITH PHOTO-EYE		REF
1	POT-1	POTENTIOMETER ,5K OHM,2 WATT,1 TURN WITH KNOB	P87320-50-331G	E020
				E021
2	SOL-1,2	SOLENOID VALVE, MAC 111B-291JA	P86224-21-2A2	REF
1	VFD-2	DELTA VFD-S1 VFD007S21A 1HP 230V 1or3PH IN,3PH OUT	P87722-31-0043S	E023
1		PB BOX SHAN-HO #172 4HOLE (56mmx166mm)	P86409-AA-004	E024
1		OPERATOR PANEL ENGRAVING	P86431-30424800	E025
1	RC-1	SUPPRESSOR POWERMATION 12859-009	P877330-60-600	E026
1		INPUT POWER WIRE SOOW-4-3 BLACK, 2 COND W/GND		REF
1		WARNING LABEL - ATTACH DURING START-UP	82693-136	REF**
		**FOR CANADA MACHINES, ONLY		

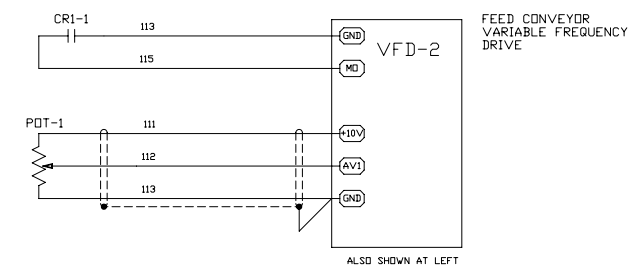
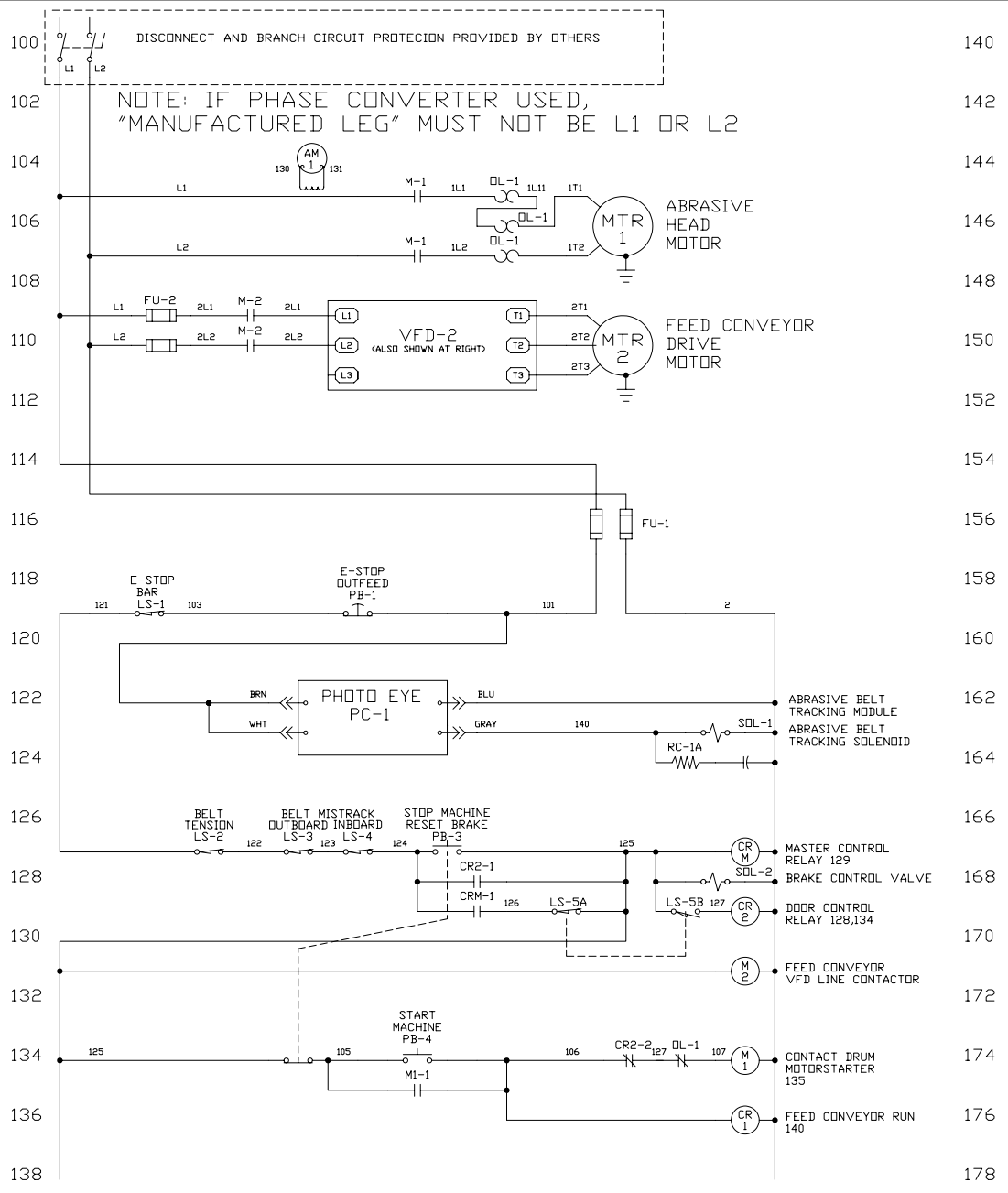
4-10-08 DGL 230, 1 AND 3 PHASE

	PARAM	SETTING	PARAMETER DESCRIPTION
VFD-2			
DELTA VFD-B	00-02	10	RESET TO FACTORY DEFAULTS
	02-00	01	SPEED CONTROL BY ANALOG INPUT
FEED VFD	02-01	01	OPERATION COMMAND BY EXTERNAL INPUTS
10-30 FPM	01-00	90	MAX FREQUENCY
	01-02	230	MAX OUTPUT VOLTAGE
	01-09	6.0	ACCEL TIME
	01-10	1.0	DECEL TIME
	04-00	50	POTENTIOMETER BIAS (04-00=% AT 0V)
	04-02	67	ANALOG INPUT FREQ GAIN
	06-06	00	THERMAL OVERLOAD RELAY
	07-00	43	MOTOR RATED CURRENT % (FLA / VFD RATING X 100)

NOTE: ALL OTHER SETTINGS ARE TO REMAIN AT FACTORY DEFAULT

*** USE THE TABLE BELOW TO CALCULATE PARAMETER 07-00
 1 AND 3 PHASE

HP	VOLTS	VFD RATING (AMPS)	MOTOR
1	230V	4.2	1.82/1730



SHEET 1 OF 1

USED ON: S311-13-1U S311-14-1U	EXCEPT AS NOTED: TOLERANCE FINISH	MATL. SEE ELEC PARTS LIST	SCALE DRAWN BY: <i>DGL</i> DATE: 4-7-08	REVISIONS
<small>ALL INFORMATION, DRAWINGS AND IDEAS HEREIN CONSTITUTE A CONFIDENTIAL DISCLOSURE OF TIMSAVERS, INC. AND ARE ITS EXCLUSIVE PROPERTY, AND MUST NOT, WITHOUT WRITTEN AUTHORIZATION, BE DIVULGED, REPRODUCED, COPIED, OR APPROPRIATED IN WHOLE OR IN PART FOR ANY PURPOSE, AND THIS SHEET MUST BE RETURNED PROMPTLY UPON REQUEST.</small>				ELECTRICAL SCHEMATIC <small>TIMSAVERS, INC. 3270 HANSON CT MPLS, MN 55429</small>

30423004

37.7 FLA		S311-13-1T, S311-14-1T 230/3/60 ELECTRICAL PARTS LIST 4-8-08 DGL		10 HP 3 PHASE 304231032	
REMAINDER LOAD FLA=.2	QTY	SYMBOL	DESCRIPTION	PART NUMBER	ITEM
	1		ELECTRICAL DIAGRAM	30423103	
	3	CR-M,1,2	CONTROL RELAY, OMRON LY2NJ-AC220/240	P8615A-22-488	E001
	3	CR-M,1,2	CONTROL RELAY SOCKET, OMRON PTF08A	P8615A-22-368	E002
	2	FU-1	BUSSMAN FNM-4	P86509-20-4001	E003
	1	FU-1	FUSE CARRIER TE GK1DD	P865AC-01-032C	E004
	2	FU-2	FUSE BUSSMANN JLN-30 30A, 300V, CLASS T FAST BLOW	P86504-41-0303	E030
	1	FU-2	FUSE HOLDER BUSSMANN T30030-2CR	P86524-01-0303	E031
	1	LS-1	LIMIT SWITCH TEND 8112	P86234-00-001	E005
	3	LS-2,3,4	LIMIT SWITCH TEND 8167	P86234-00-002	E006
	1	LS-5	SWITCH LIMIT OMRON D4DS-35FS	P86230-01-007	E007
	1	LS-5	SWITCH LIMIT KEY OMRON D4DS-K3	P86230-01-007K	E008
	1	AM/CT-1	LOAD CONVERTER & INDICATOR TAHSING	14602800	E032
	1	M-1	MOTORSTARTER TECO CN-25 220VAC	P86166-15-050	E009
	1	M-2	MOTORSTARTER TECO CN-11 220VAC	P86166-00-050	E010
	1	MTR-1	10 HP 1800 ,IP54, FR 132M, B3 MNT, F2 BOX, 208-230/460/3/60	P85C63-18-04058	E011
	1	MTR-2	1/2 TEF 1800 230/3/60 CHENG PANG PRECISION # CV-22 60:1	P85262-18-00270	E012
	1	OL-1	OVERLAD RELAY TECO RHN-80/322 23-32A	P86198-56-032A	E013
	1	PB-1	PB E-STOP ASSY SHAN HO #SHAF-221 TWIST-TO-RELEASE	P86109-01-425T	E014
	1	PB-3	PUSHBUTTON ASSY SHAN HO #SHAB-223-R	P86109-03-225	E015
	1	PB-4	PUSHBUTTON ASSY SHAN HO #SHAB-221-G	P86109-02-155	E016
	1	PC-1	PHOTO ELECTRIC CONTROL OMRON E3JK-R4M28	P87700-39-002	E017
	1	PC-1	REFLECTOR #E39-L7 COMES WITH PHOTO-EYE		REF
	1	PC-1	MOUNTING BRACKET #E39-R2 COMES WITH PHOTO-EYE		REF
	1	POT-1	POTENTIOMETER ,5K OHM,2 WATT,1 TURN WITH KNOB	P87320-50-331G	E020 E021
	2	SOL-1,2	SOLENOID VALVE, MAC 111B-291JA	P86224-21-2A2	REF
	1	VFD-2	DELTA VFD-S1 VFD007S21A 1HP 230V 1or3PH IN,3PH OUT	P87722-31-0043S	E023
	1		PB BOX SHAN-HO #172 4HOLE (56mmx166mm)	P86409-AA-004	E024
	1		OPERATOR PANEL ENGRAVING	P86431-30424800	E025
	1	RC-1	SUPPRESSOR POWERMATION 12859-009	P877330-60-600	E026
	1		INPUT POWER WIRE SOOW-8-3 BLACK, 3 COND W/GND		REF
	1		WARNING LABEL - ATTACH DURING START-UP **FOR CANADA MACHINES, ONLY	82693-136	REF**

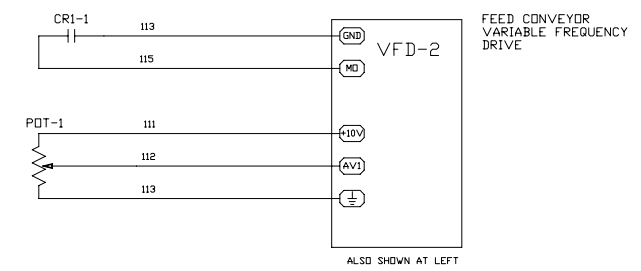
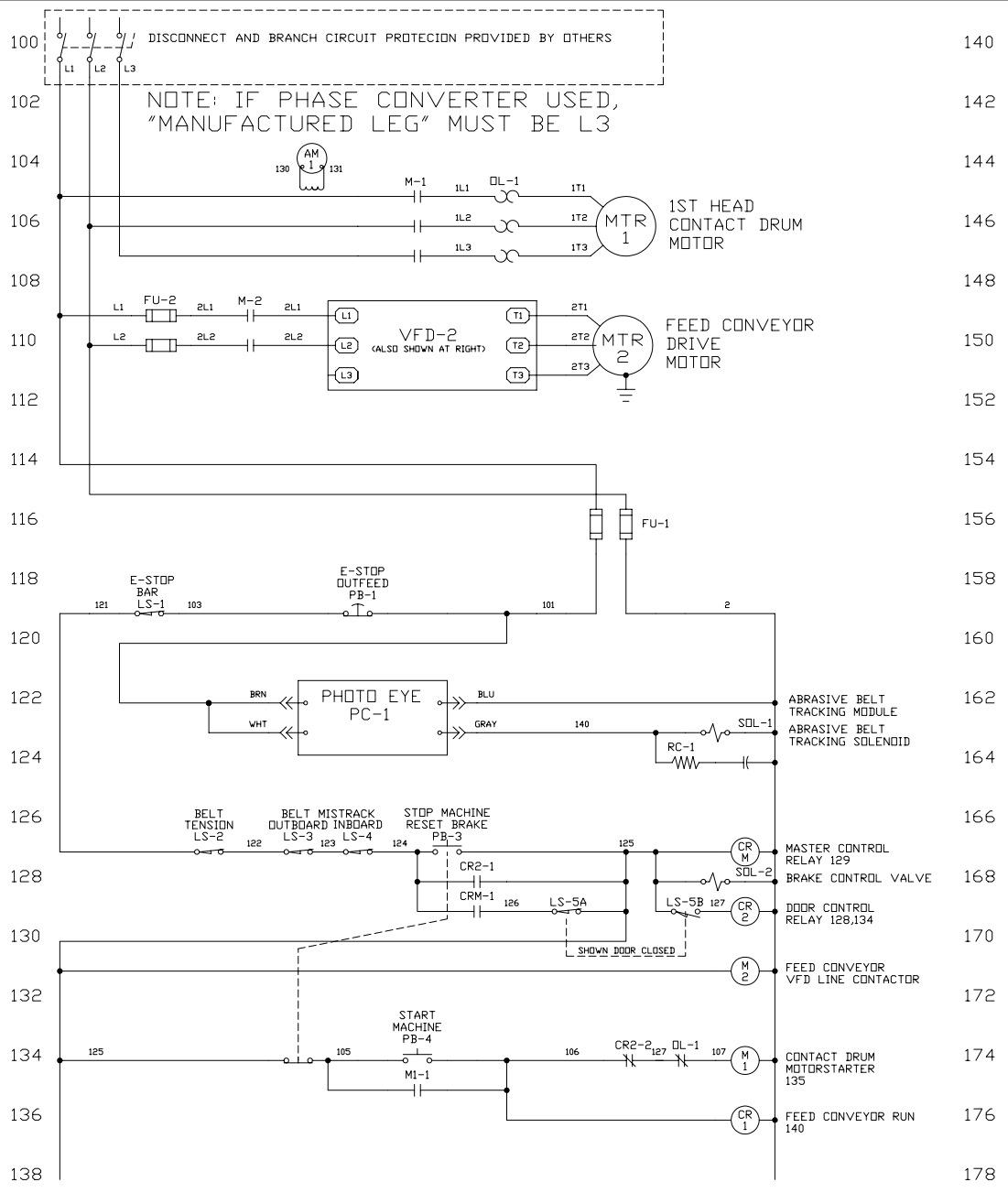
4-10-08 DGL 230, 1 AND 3 PHASE

	PARAM	SETTING	PARAMETER DESCRIPTION
VFD-2			
DELTA VFD-B	00-02	10	RESET TO FACTORY DEFAULTS
	02-00	01	SPEED CONTROL BY ANALOG INPUT
FEED VFD	02-01	01	OPERATION COMMAND BY EXTERNAL INPUTS
10-30 FPM	01-00	90	MAX FREQUENCY
	01-02	230	MAX OUTPUT VOLTAGE
	01-09	6.0	ACCEL TIME
	01-10	1.0	DECEL TIME
	04-00	50	POTENTIOMETER BIAS (04-00=% AT 0V)
	04-02	67	ANALOG INPUT FREQ GAIN
	06-06	00	THERMAL OVERLOAD RELAY
	07-00	43	MOTOR RATED CURRENT % (FLA / VFD RATING X 100)

NOTE: ALL OTHER SETTINGS ARE TO REMAIN AT FACTORY DEFAULT

*** USE THE TABLE BELOW TO CALCULATE PARAMETER 07-00
 1 AND 3 PHASE

HP	VOLTS	VFD RATING (AMPS)	MOTOR
1	230V	4.2	1.82/1730



ALSO SHOWN AT LEFT

140
142
144
146
148
150
152
154
156
158
160
162
164
166
168
170
172
174
176
178

SHEET 1 OF 1

USED ON: S311-13-11 S311-14-11	EXCEPT AS NOTED: TOLERANCE FINISH	MATL. SEE ELEC PARTS LIST	SCALE DRAWN BY: <i>DGL</i> DATE: 4-B-08	REVISIONS ELECTRICAL SCHEMATIC
<small>ALL INFORMATION, DRAWINGS AND IDEAS HEREIN CONSTITUTE A CONFIDENTIAL DISCLOSURE OF TIMSAVERS, INC. AND ARE ITS EXCLUSIVE PROPERTY, AND MUST NOT, WITHOUT WRITTEN AUTHORIZATION, BE DIVULGED, REPRODUCED, COPIED, OR APPROPRIATED IN WHOLE OR IN PART FOR ANY PURPOSE, AND THIS SHEET MUST BE RETURNED PROMPTLY UPON REQUEST.</small>				<small>TIMSAVERS, INC. 3270 HANSON CT MPLS, MN 55429</small>

30423103