TFC-520
ROLL COMPACTION SYSTEM

INSTALLATION - MAINTENANCE INSTRUCTIONS

FREUND VECTOR

FREUND-VECTOR CORPORATION

Your Global Equipment and Processing Solution

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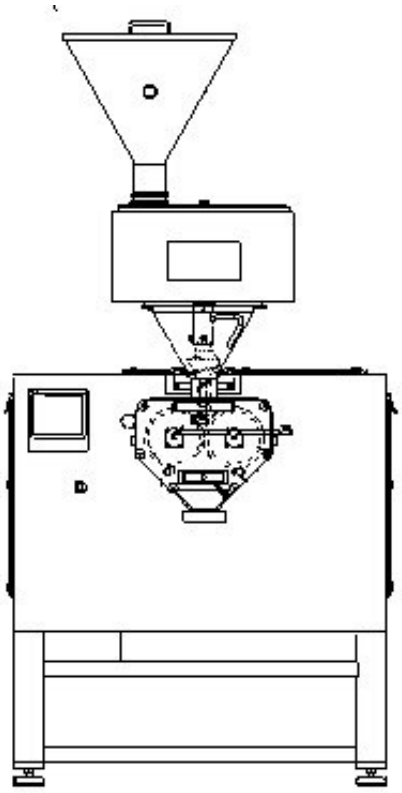
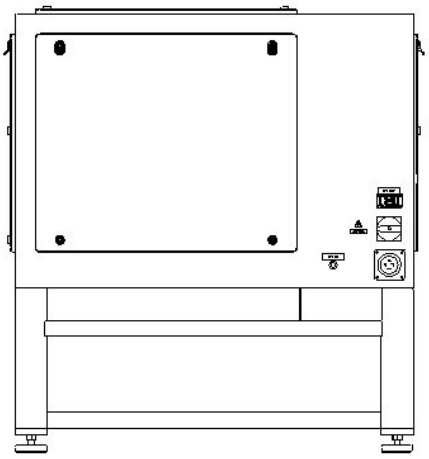
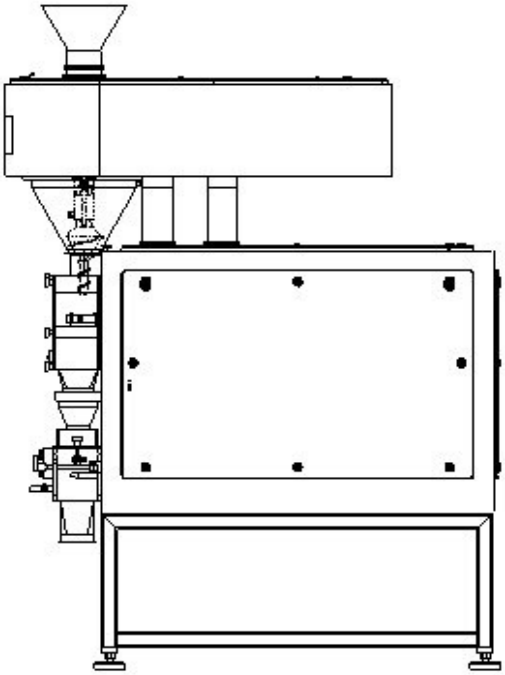
INTRODUCTION

The Freund-Vector Pilot/Production Scale Roll Compaction System is a compacting machine designed to produce a dry compacted granulation. Powder is charged into a hopper where a screw feeder pre-compacts, de-aerates and feeds the powder into a gap between two cantilevered compacting rolls. The compacting rolls process the powder into a compacted sheet that is then fed into a knife mill.







GENERAL INFORMATION

To assure successful operation of this machine, the material presented in this publication must be thoroughly read and understood BEFORE proceeding.

Our goal is to provide you with the most complete and accurate information as possible to help you operate and maintain your machine. The examples and diagrams are included solely for illustrative purposes. Should you find any errors, please be sure to contact us so we may continue to improve the quality of our publications.

Throughout this manual, you will find warnings, cautions and notes. These items are to make you aware of safety considerations.

Warnings - Indicate a potentially hazardous situation with specific procedures or policies that should be followed to avoid serious injury or death.

Cautions - Indicate a potentially hazardous situation with specific procedures or policies that should be followed to avoid minor or moderate injury to personnel OR damage to equipment.

Notes - Indicate specific information that will benefit the reader in the use and care of the machine.

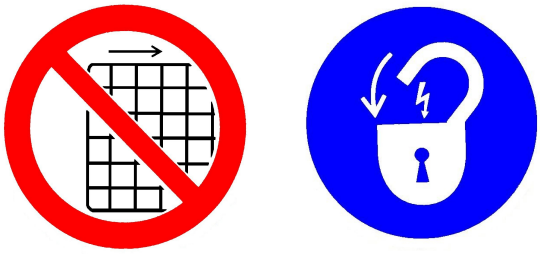
GENERAL INFORMATION

WARNING LABELS

Following is a listing of the various labels used on the Roll Compaction System. Please become familiar with each label and its meaning.

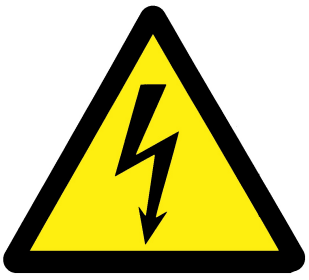
DO NOT OPERATE WITH GUARDS OR COVERS REMOVED

LOCK OUT ELECTRICAL POWER



This combination of labels will be found on all the removable covers on the machine.
The first label informs the operator and service personnel that the covers or guards are NOT to be removed during operation of the equipment.

The second label tells personnel that when the guards or covers are removed for servicing, that electrical power should be locked out to avoid injury.



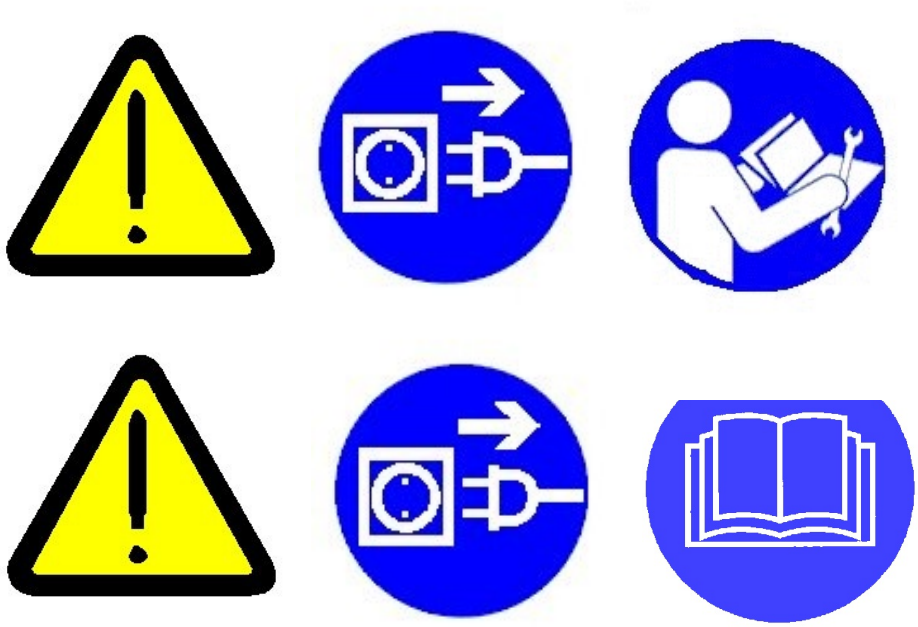
ELECTRICAL SHOCK HAZARD

This label cautions the operator to be aware of the hazard of electric shock. The hazard exists when the guards or covers are removed from the machine or the doors to electrical panels are opened. The operator should take extreme care to avoid the hazard of electric shock, usually by removing the power supply from the area or taking extra precautions for safety.

GENERAL INFORMATION

WARNING LABELS (Continued)

CAUTION
DISCONNECT POWER SUPPLY
BEFORE SERVICING CONSULT SERVICE MANUAL



OR

Your machine could have either of the above combinations.

The first label cautions the operator to pay attention.

The second label tells the operator to disconnect the power supply.

The third label tells the operator to consult the service manual and operation manual before performing any service or maintenance on this machine.

GENERAL INFORMATION

WARNING LABELS (Continued)

CRUSH HAZARD

This label warns the operator of the Crush Hazard that exists when the Upper Cover Assembly is lowered into processing position. The operator MUST keep hands clear of the area between the Lower and Upper Cover Assemblies. When servicing the unit, Lock Out/Tag Out procedures should be initiated to keep the operator or serviceman from injury.

ROLL HAZARD

This label will be found on the compacting roll cover assembly. Although a safety cover is provided for the compacting rolls, this cover may be removed by the operator.

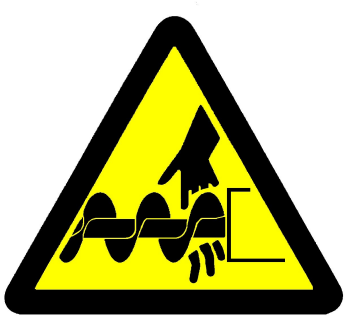
This label cautions the operator to be aware of the hazard of entanglement between the compacting rolls. Keep hands, fingers, tools and ALL objects away from the compacting rolls during operation.

As always, Freund-Vector recommends shutting down the power supply before removing the guards and performing service on the machine.

GENERAL INFORMATION

WARNING LABELS (Continued)

SCREW FEEDER CRUSH HAZARD



This label warns the operator of the screw feeder hazard that exists inside the funnel where the screw feeder is located. DO NOT stick hands or objects inside the funnel at any time. Keep clear of the area during processing. If servicing is required, all electrical power to the machine should be shut down.

SPECIFICATIONS

Knife Mill Motor. . . . . 3 HP 3600 rpm
Knife Mill Variable Rotational Speed . . . . . 360 - 3600 rpm
Mill Perforated Plates. . . . . Assorted sizes from .020" -.093" (0.5 - 2.3 mm)
Rasping Plates. . . . . Assorted sizes from .046 - .079 mm
Roll Motor. . . . . 7.5 HP 1800 rpm
Roll Variable Speed. . . . . 3 - 24 rpm
Roll Gap. . . . . .02" - .25"
(0.5mm - 6.0mm)
Rolls - Cantilevered, variable roll gap. . . . . "S" type (serrated profile)
. . . . . "DP" type (smooth with die & punch profile)
. . . . . "DPS" type (serrated with die & punch profile)
Compacting Roll Force-Maximum. . . . . 15 tons (13608 kg)
Screw Motor. . . . . 3 HP 1800 rpm
Screw Variable Speed. . . . . 5 - 41 rpm
Screw. . . . . Vertical tapered-to-straight
Hopper Volume. . . . . 0.424 cu. ft. (12 liters)
Max. Rated Capacity. . . . . 220 lbs/hr (100 kg/hr)*
Approx. Weight. . . . . 2200 lbs (998 Kg)
Overall Dimensions. . . . . See Spec Drawing

*NOTE: Capacity will vary depending on the bulk density of material. Capacities shown are based on tests using lactose with a compacted bulk density of 0.85gr/cm^3.

SYSTEM DESCRIPTION

The Roll Compaction System consists of the following assemblies:

- Funnel Hopper
- Screw Assembly
- Roll Assembly
- Control Cabinet/Operator Interface
- Mill
- De-Aeration Assembly
- Water Cooling System (Option)

FUNNEL HOPPER

The funnel hopper is used to assist powder transfer from the customer-supplied powder feed system to the screw hopper. The hopper is removable for cleaning.

SCREW ASSEMBLY

The screw assembly consists of an twelve (12) liter hopper, a screw feeder, a screw motor and a stainless steel scraper. Product is placed into the hopper. The screw motor rotates the screw feeder and scraper in the hopper, moving the product through the bottom of the hopper into the top seal of the roll assembly. The screw feeder is used for the processing of both high and low density powders.

The vertical tapered screw feeder rotates to feed material into the roll assembly at a uniform rate. The speed of the screw feeder be adjusted as needed.

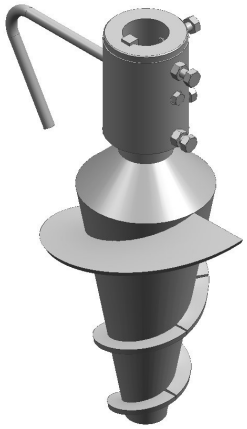


Figure 1. Screw Feeder

SYSTEM DESCRIPTION

ROLL ASSEMBLY

After product has left the hopper, it enters the top seal of the roll assembly. The top seal and side seals surround the pressure rolls keeping the product contained.

The roll assembly, located inside the machine cabinet consists of two pressure rolls supported by four (4) roll bearings. The right roll is adjustable. Under each roll is an under scraper. These scraper blades ride against the face of each pressure roll, cleaning product residue from the rolls.

Three (3) different sets of pressure rolls are available to adapt the equipment to the product being compacted: DP, DPS and S rolls.

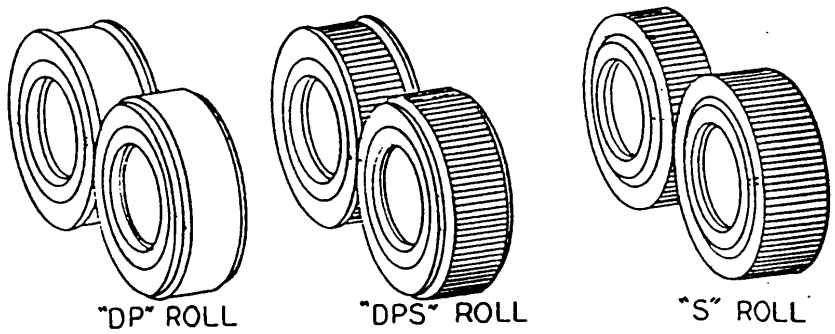


Figure 2. Pressure Rolls

The DP and DPS pressure rolls are designed to provide a uniform distribution of force to the powder, creating a consistent ribbon of product.

SYSTEM DESCRIPTION

ROLL ASSEMBLY (Continued)

The "DP" pressure rolls should be used with materials that are cohesive or compress easily. The smooth surface minimizes any product from building up on rolls.

The "DPS" pressure rolls should be used with materials that are inherently lubricous or do not compress easily and are not fed through the rolls easily. The roll surfaces are grooved to prevent material slippage.

The "S" pressure rolls can be used on materials with characteristics similar to those described for the "DPS" rolls. The "S" rolls do not have the machined profile the other rolls have. The complete roller surface is used for compacting, increasing throughput.

CONTROL CABINET / OPERATOR INTERFACE PANEL with USB Port

The Control Cabinet contains the controllers and relays necessary for the operation of the Roll Compaction System.

The operator controls most of the functions of the Roll Compaction System from the Operator Interface Panel. Instructions for the operator controls are explained in detail in the Operator Interface section of this manual.

A universal USB port is provided and is easily accessible by system operators. The USB port allows batch data to be saved to the supplied USB drive.

SYSTEM DESCRIPTION

MILL

The Mill is used for further processing of the compacted sheet. Comprised of a variable speed drive, a sixteen blade rotor and multiple sizes of perforated plates (or a rasping rotor and multiple sizes of perforated “rasping” plates), the mill processes the compacted sheet into the desired granules. The size of the granule is dependent on the rotation speed of the mill, perforated plate size, and product composition.

DE-AERATION ASSEMBLY

The de-aeration system aids in the removal of entrained air in the uncompressed powder as it moves through the compaction zone. Compressed air moving through an eductor past a de-aeration port creates a vacuum at the port in the side seal to remove air from the powder.

WATER COOLING SYSTEM (Option)

The water cooling system is an available option provided that allows chilled water to circulate in the roll shaft. The chilled water helps to cool the rolls when temperature sensitive materials are processed.

INSTALLATION REQUIREMENTS

For shipment, the TFC-520 is mounted to a wooden skid, braced and blocked for extra support, and covered with heavy plastic sheeting. It is then placed in a shipping container for transport.

Upon arrival of equipment, immediately check shipping container for shipping damages. Report all damage to the carrier. Inspect all invoicing and material lists to ensure all parts are accounted for. Report all shortages immediately. Check for items that may be boxed separately.

Remove the TFC-520 pallet from the shipping container. All lifting devices, straps, clamps, etc. must be rated to handle the weight of the TFC-520 Roll Compaction System. Check the shipping invoice to determine the appropriate lift rating required.

INSTALLATION REQUIREMENTS

INITIAL SYSTEM SETUP

Prior to moving the TFC-520 Roll Compaction System to the installation site, the following precautions must be taken:

WARNING!

Failure to observe the following precautions can result in injury to personnel and/or damage to equipment.

1. **SAFETY FIRST!** Observe all safety rules associated with the lifting equipment as provided by the manufacturer.

2. All lifting devices, straps, clamps, etc. must be rated to handle the weight of the TFC-520 Roll Compaction System (fork lift must have a minimum weight capacity greater than the weight of the TFC-520). Check the shipping invoice to determine the appropriate lift rating required.

3. All lifting equipment should be in good working condition.

4. Double check to ensure proper placement of equipment BEFORE lifting the machine. The center of gravity on the lift must reach further than the center of gravity on the equipment (See Figure 3).

INSTALLATION REQUIREMENTS

INITIAL SYSTEM SETUP (Continued)

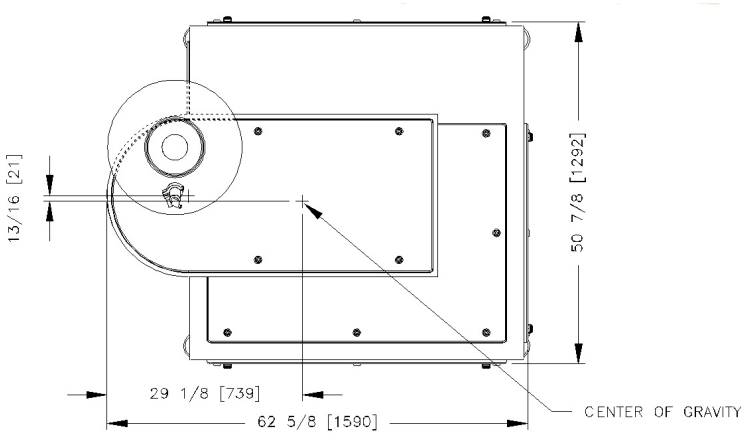


Figure 3. Center of Gravity

Transport the TFC-520 Roll Compaction System to the installation site using properly rated lifting equipment, fork lift or overhead crane.

The machine should be set on a level surface.

INITIAL SET-UP

ELECTRICITY

WARNING!

Electrical installation of this equipment must be in accordance with all state and local electrical codes as well as in compliance with the National Electric Code (NEC™). Failure to install this equipment properly could result in damage to equipment, property and loss of life.

Please check the serial number nameplate and/or specific project electrical drawings for voltage/amperage requirements.

The customer is responsible for supplying and installing the primary power cable from the machine plug for connection to the facility main power supply. Freund-Vector recommends a 12-foot (3.5m) length of Type SO cord (8awg).

INITIAL SET-UP

MAIN AIR

Main air supplies air to the pneumatic controls and other controls on the machine. A 3/8" T quick connection on the rear of the unit is provided for connection to the customers' main air supply.

90 psig @ 2 scfm (6 bar @ 57 lpm)

CAUTION!

Supply air must be oil and moisture free (instrument grade). Oil and moisture in air may cause controls to malfunction and contaminate product through air lines.

WATER SUPPLY (Option)

The compacting rolls are cooled by a water circulation system.
The customer makes the water supply connections at the rotary joints on the compacting rolls. On and OFF valves are provided for controlling the water supply to the rolls.

Maximum Water Pressure	50 psi (3.4 bar)
Average Water Usage	7 - 12 gpm (75.7 - 113.55 L/min)
Average Water Temperature	40 - 60°F (4 - 16°C)

WASH PORTS (Option)

When optional wash ports have been purchased, the customer supplies the wash hoses and spray guns and connects to the 1-1/2" tri-clamp connections located in various positions on the TFC-520 Roll Compaction System. Wash ports can be found on either side of the pressure rolls, on the side of the hopper and on the sides of the knife mill (if purchased).

USB PORT

The USB flash drive should be plugged into the USB port located on the Operator Interface Panel.

HYDRAULIC SYSTEM

HYDRAULIC INTENSIFIER PUMP

The TASQ Series Pump is designed to be virtually maintenance free as long as the air supply and hydraulic oil are contaminant free. However, it is recommended that the air cycling valve spook and seals be greased every six months or annually, depending on usage. For detailed instructions on pump maintenance, please reference the manufacturer's vendor information included in this manual.

RESERVOIR FILLING AND DRAINING

It is recommended that a light grade hydraulic oil be used. (Ie. Mobile DTE 24®, Shell Tellus 32®, or equivalent) Consult the manufacturer if your application requires other than light viscosity petroleum based fluids recommended above.

1. Make sure Roll Pressure is OFF.
2. Remove vent/filler cap.
3. Pour clean oil through a strainer into reservoir until full as indicated in the upper bulls-eye.
4. Replace vent/filler cap.
5. Top off the reservoir after the system has been bled.

The reservoir may be drained via the "B" cylinder port.

START-UP AND BLEEDING THE SYSTEM

Once the above requirements are met and the reservoir is full, make sure the air regulator is completely turned out counterclockwise (CCW) before connecting the air supply. Slowly turn in the air regulator clockwise (CW) until the pump just begins to reciprocate. Alternately extend and retract the cylinders, bleeding the lines at the stroked end of each cylinder.

The Hydraulic System layout is detailed on the Piping and Instrumentation Drawing.

MAINTENANCE

Regularly scheduled maintenance will play a big part in the continued optimum performance of this unit. Maintenance schedules vary dependant on the type of product being processed and the frequency of use. It is ultimately the customers responsibility to set up and enforce maintenance schedules.

NOTE: Freund-Vector recommends the use of closed style wrenches, where possible, to remove hardware.

MATERIAL BLOCKAGE

Always keep the supply hopper charged with raw material. Check the roll and screw ammeters. If ammeter readings fluctuate there may be a blockage in the hopper or between the rolls. Stop roll and screw and inspect the unit. Clear the blockage and proceed. It may be necessary to run the rolls in reverse to assist in clearing the blockage.

NOTE

A blockage may occur when the hopper delivery speed is higher than the capacity of the rolls.

SEALS AND SCRAPER

1. Check top seal, side seal and bottom scraper frequently. Replace if worn or damaged.

GRANULATOR SCREEN

1. Inspect granulator screen every time granulator is disassembled for cleaning. Replace if worn or damaged.

MAINTENANCE

PRESSURE ROLLS

1. Check the grooves on the compaction rolls each time they are cleaned. If grooves are packed with material, they should be cleaned, one groove at a time.
2. When exchanging rolls, grease must be applied to the inside surface of the rolls and roll shaft. Rolls are keyed to ensure proper fit - inspect rolls for damage.
3. Bearings must be packed with grease.

NOTE

All bearings are packed with PermaLube FG grease (Food Grade Aluminum Complex Lubricant) manufactured by Certified Labs, a division of NCH Corporation.

MISCELLANEOUS

1. Check V-seals on screw shafts once per month. Replace if worn or damaged.
2. Check all lubricants once per month. Refer to the Lubrication chart on the next page.

MAINTENANCE

LUBRICATION CHART

The following parts should be inspected and serviced. Refer to the manufacturer's maintenance and lubrication recommendations included in this manual for more detailed information.

		Suggested Lubricants
SCREW ASSEMBLY Reducer	Speed Reduction	Refer to the manufacturer's maintenance information.
ROLL ASSEMBLY Reducer	Speed Reduction	Refer to the manufacturer's maintenance information.
Gears	May be applied for corrosion protection if desired	Lubriplate 1200 Multipurpose Grease
Couplings	Once a year	Lubriplate 1200 Multipurpose Grease
Rolls	May be applied for corrosion protection	Lubriplate 1200 Multipurpose Grease

Pressure Roll Surfaces and Shaft Sleeves should be lightly coated with a silicon or mineral oil type lubricant prior to reassembly.

Most of the mechanical components are either painted or electroless nickel-plated to provide corrosion resistance. Some mechanical component are not painted, if desired the operator may apply a coating of light oil to these components to protect from corrosion.

MAINTENANCE

NITROGEN CHARGED ACCUMULATOR

The hydraulic system comes equipped with a bladder accumulator to dampen any pulsation of pressure applied to the pressure rolls during operation. The accumulator is charged with N^2 gas (nitrogen).

CAUTION!

Operating this equipment with the accumulator shut off, without a nitrogen charge, or below the nitrogen charge pressure, will cause large fluctuations in the pressure roll force. These fluctuations will result in comparable variations in the compaction of powder, and could affect the quality of the compaction.

ADJUSTING CHARGE PRESSURE

Usually, nitrogen losses on the accumulator are very low. However, a regular check of the gas pressure is recommended. The charge pressure for the TFC-520 Roll Compaction System should read 550 PSI (+/- 25PSI). If the pressure readings DO NOT fall within this range, the charge pressure should be adjusted.

WARNING!!

Hydraulic accumulators are pressurized and only qualified technicians should adjust or perform repairs. If the charge pressure needs to be adjusted, please contact the Freund-Vector Service Department.

MAINTENANCE

WATER COOLING SYSTEM

The water cooling system is an available option provided to cool the compacting rolls. When performing maintenance on the compacting rolls it may be necessary to remove the water cooling system to disassemble the rolls.

WATER COOLING DISASSEMBLY

Refer to Water Cooled Roll Assembly Drawing

1. Turn off the water.
2. Disconnect coolant hoses at the quick connects.
3. Remove front cover.
4. Unscrew the unions from the shafts. If desired, the operator may disconnect the hoses between the unions.

NOTE

Looking at the front of the machine, the left-hand rotary union has left-handed threads and should be rotated clockwise to loosen. The right-hand rotary union has right-handed threads and should be rotated counterclockwise to loosen.

In some cases, to be determined by the customer, the water cooling system is not needed. Remove the system from the unit as above and then replace the washer that has the center hole with the washer without the center hole.

MAINTENANCE

DISASSEMBLY

During the disassembly process, brush or vacuum any excess powder or debris that may be on the unit.

Refer to Figure 10

1. Move the granulator seal from the top of the granulator by snapping it away from the rim of the granulator.

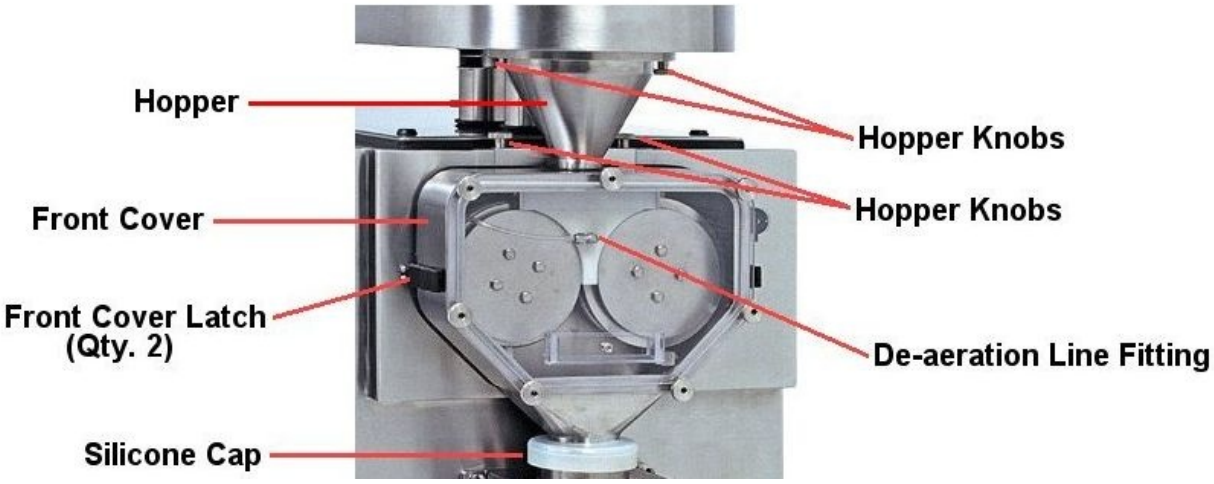


Figure 10

2. Holding the front cover with one hand, release the two latches and remove the cover from the unit.

3. If equipped with de-aeration, remove the de-aeration line from the fitting on the side seal.

MAINTENANCE

DISASSEMBLY (Continued)

SCREW ASSEMBLY DISASSEMBLY

Refer to Figure 10

4. Remove the four (4) threaded knobs from the hopper. Two of the knobs are located just behind the hopper base, securing the hopper to the roll frame. The other two knobs are in the top ring, securing the hopper to the screw housing.

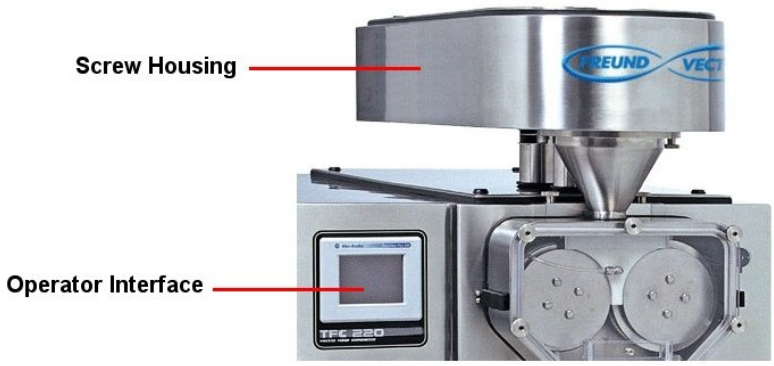


Figure 11

5. Refer to Figure 11. Raise the screw housing by pressing the Raise Hopper button. The Raise Hopper button is found at the Machine Setup Screen in the Operator Interface.

MAINTENANCE

SCREW ASSEMBLY DISASSEMBLY (Continued)

Figure 12. Screw Housing Raised

6. Once the screw housing is raised to its' topmost position, insert the Stop Collar Assembly around the powered hydraulic cylinder rod. Reference Figure 13.

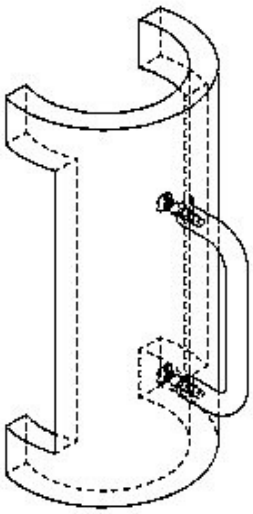
WARNING!!

Refusal to place the Stop Collar Assembly around the hydraulic cylinder rod poses a serious threat to the safety of personnel. This Stop Collar Assembly is used to hold the screw housing in the UP position in the event of hydraulic failure.

If the Stop Collar Assembly is NOT in position and hydraulic failure occurs, crushing of hands and other body parts can occur.

MAINTENANCE

SCREW ASSEMBLY DISASSEMBLY (Continued)



Stop Collar

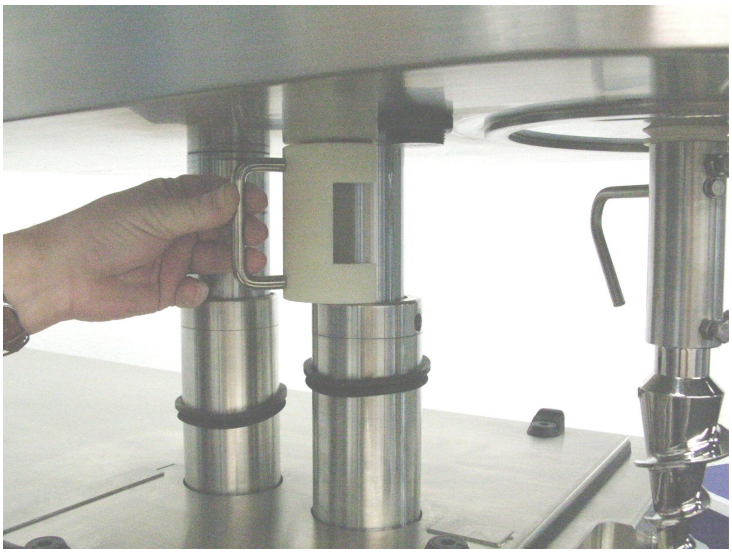


Figure 13. Placing Stop Collar Around Cylinder

7. Lift the hopper out of the top seal and carefully remove the hopper from the machine. Be careful not to bang or knock the hopper into the screw. Removing the hopper exposes the screw. Set the hopper aside.

MAINTENANCE

SCREW ASSEMBLY DISASSEMBLY (Continued)

8. While supporting the screw, loosen the bottom two (2) sets of bolts holding the screw to the screw coupling.
See Figure 14.

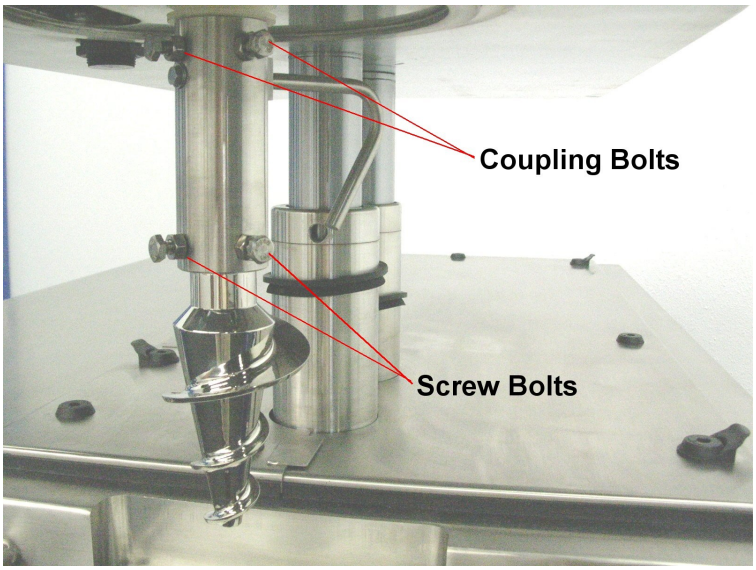


Figure 14

CAUTION!

The screw weighs approximately 9 kg (20 pounds).

Support of the screw while removing the bolts from the screw coupling will take the bind off the bolts and make for easier removal.

9. Slowly lower the screw out of the coupling and remove.

10. Loosen the remaining bolts holding the coupling to the reducer drive shaft and remove the coupling and the v-seal.

MAINTENANCE

SEAL AND SCRAPER DISASSEMBLY

The following instructions assume that the hopper and screw have been removed.

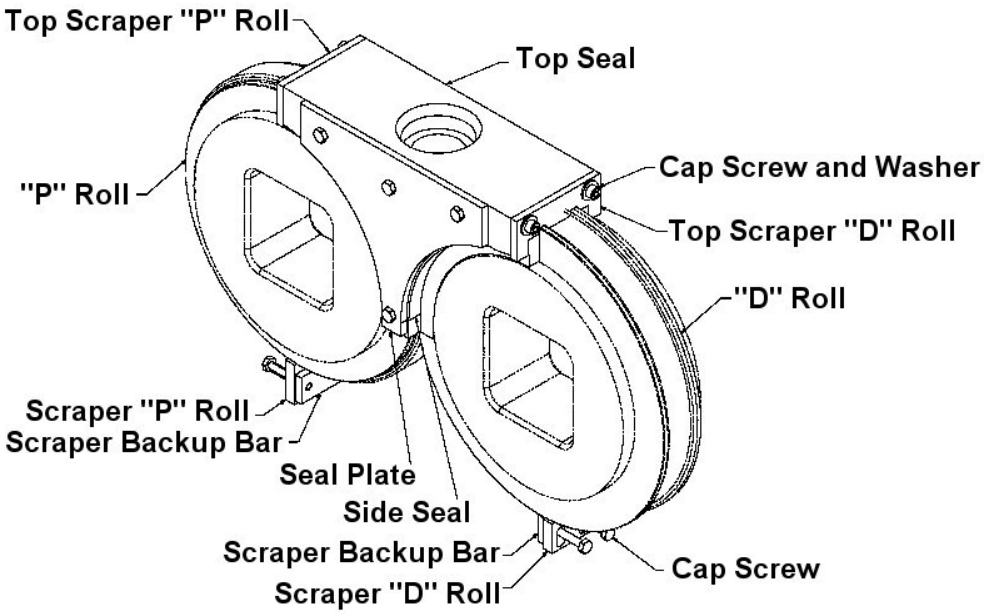


Figure 15. Seal and Scraper Assembly

1. Lift out the top seal with the side seals attached. If seals are too tight, run rolls in reverse to cause the seals to lift away from the rolls.

2. The side seals will now slide out of the groove in the top seal.

3. The top scrapers may be unscrewed from the top seal.

4. The lower scrapers are located in the outlet area of the roll assembly. Remove the (4) screws securing the scraper supports to the frame and remove the scraper support with back up bars and scrapers.

5. Loosen the bolts that clamp the scrapers in place and remove scrapers.

MAINTENANCE

SEALS AND SCRAPER REASSEMBLY

Check all seals and scrapers for wear before reassembly. Replace if worn or damaged.

1. Insert lower scraper into notch on scraper support.

2. Place scraper back up bar (steel) on top of scraper (plastic) and secure with (2) bolts.

CAUTION!

DO NOT over-tighten bolts as plastic scraper will deform.

3. Loosely fasten the scraper assemblies into the outlet area of the roll assembly.

NOTE

Both plastic scrapers must be positioned towards the center of the machine.

4. Push the lower scraper assemblies up until the plastic scrapers contact the bottom of the roll surface and lock in place with (2) bolts each.

5. Loosely fasten the top scrapers to the top seal.

6. To provide the proper clearance between the top scrapers and the roll surface, place a .020 shim between the scraper and the roll. Be sure to use the shim on BOTH top scrapers.

7. Tighten the two screws securing the top scrapers to the top seal.

MAINTENANCE

SEAL AND SCRAPER REASSEMBLY (Continued)

8. Insert side seals into groove in top seal (plastic seals must be facing each other).

9. Position top seal, with side seals, on top of rolls. Side seals should drop down on either side of rolls. If seals do not drop into place, run rolls forward to pull seals into place.

NOTE

When using type DP or DPS rolls, the top seal will fit in one orientation only.

10. Replace the front cover and latch into place.

MAINTENANCE

PRESSURE ROLLS DISASSEMBLY

Refer to Roll Assembly Drawing

Tools required to remove pressure rolls:

7/16, ½ and 9/16 wrenches

Rubber mallet

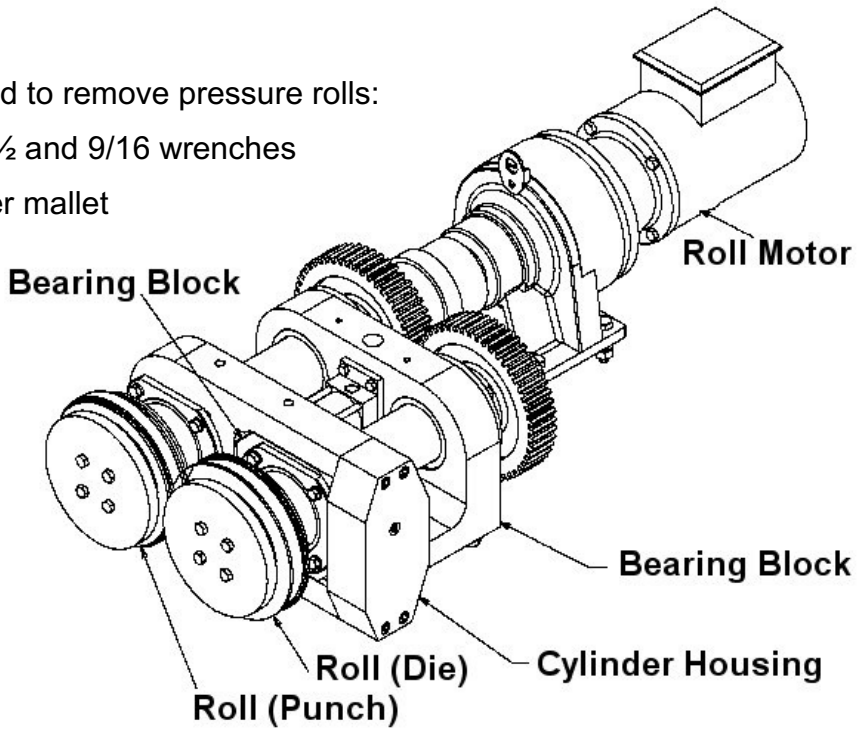


Figure 16. Roll Assembly

1. Remove front cover.

2. Remove screw feeder assembly. (Refer to Screw Disassembly)

3. Remove seals and scrapers. (Refer to Seal and Scraper Disassembly)

4. Disconnect water cooling system (if applicable). (Refer to Water Cooling Disassembly)

NOTE

Looking at the front of the machine, the left-hand rotary union has left-handed threads and should be rotated clockwise to loosen. The right-hand rotary union has right-handed threads and should be rotated counterclockwise to loosen.

MAINTENANCE

PRESSURE ROLLS DISASSEMBLY (Continued)

5. Increase roll gap to maximum value.

6. Remove four (4) bolts in each of the front roll covers and pull off both covers.

7. Rolls may now be slipped off shafts. Be sure to note which roll is on which shaft for reassembly in the proper position.

PRESSURE ROLLS REASSEMBLY

1. Increase roll gap to maximum value.

2. Apply a thin layer of grease to both shafts to prevent rolls from sticking.

NOTE

All bearings are packed with PermaLube FG Grease (Food Grade Aluminum Complex Lubricant) manufactured by Certified Labs, a division of NCH Corporation.

3. Slide rolls into the appropriate shafts.

4. Replace washers by replacing the four (4) bolts to each roll.

5. Install roll covers. Latch into place.

6. Reinstall Water Cooling System (if applicable). (Refer to Water Cooling Reassembly)

MAINTENANCE

PRESSURE ROLLS REASSEMBLY

NOTE

Looking at the front of the machine, the left-hand rotary union has left-handed threads and should be rotated counterclockwise to tighten. The right-hand rotary union has right-handed threads and should be rotated clockwise to tighten.

7. Replace seals and scraper. (Refer to Seal and Scraper Reassembly)

8. Replace Screw Feeder Assembly. (Refer to Screw Reassembly)

9. Replace front cover and latch into place.

MAINTENANCE

MILL DISASSEMBLY

Refer to Mill Assembly Drawing

The Mill Assembly consists of either knife mill blades or a rasping bar. The instructions include both options.

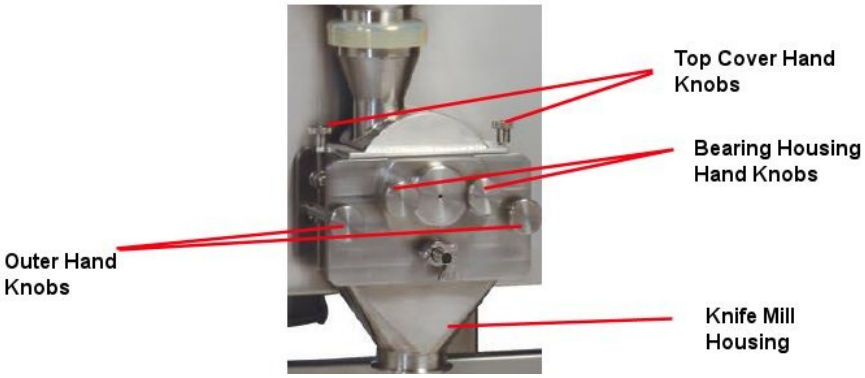


Figure 17. Mill Assembly

WARNING!

The mill assembly contains sharp components. Extra precautions should be taken to avoid injury. During disassembly, the operator should handle components by blunt edges ONLY.

1. Remove front cover from machine.

2. Remove the top cover of the mill housing, by loosening the top cover hand knobs and lift the top cover off and set aside.

3. Remove the top cover gasket.

MAINTENANCE

MILL DISASSEMBLY (Continued)

NOTE

Support knife mill blade assembly or rasping bar to prevent from binding on front bearing shaft.

4. Loosen the bearing housing hand knobs and pull bearing housing away from unit while holding onto the knife mill blades (or rasping bar). The drive shaft assembly for the mill will be attached to the bearing housing.

5. Remove knife blade assembly (or rasping bar).

6. Remove perforated plate (or rasping plates).

CAUTION!

The Mill Housing is heavy! If housing was dropped it could cause injury to personal. Extra precautions should be used when removing.

7. Loosen outer hand knobs and remove mill housing from machine frame.

MILL REASSEMBLY

1. Replace mill housing to machine frame and tighten hand knobs.

2. Take the knife blade assembly (or rasping bar) and insert into mill housing making sure to hold in place.

3. Insert the front bearing housing into the mill housing through the knife blade assembly (or rasping bar) making sure to line up the teeth.

MAINTENANCE

MILL RESASSEMBLY (Continued)

4. Replace the bearing housing hand knobs and tighten.

3. Replace perforated plate (or rasping plate).

4. Re-install top cover gasket.

5. Replace top cover to mill housing by sliding onto housing and tighten top cover hand knobs.

CLEANING

WARNING!

Always disconnect electrical supply before attempting to clean this unit. Failure to do so may result in injury to personnel.

1. Allow machine to cool to ambient temperature.
2. Brush or vacuum excess material from the surface of the unit.
3. Refer to Water Cooling System, Screw Feeder, Seal and Scraper, Pressure Rolls, and Mill Disassembly instructions described earlier to disassembly the various machine components.
4. Wash all parts with the appropriate cleaner.
5. Rinse with fresh water and dry.
6. Wipe down the exterior of the machine, including the compaction rolls, using the appropriate cleaner.

WARNING!

Avoid getting water on or near the controls. Damage to the machine and injury to personnel can occur if controls are wet when machine is plugged in.

7. Dry the exterior of the machine.
8. When all parts are completely dry, reassemble the machine by referring to the reassembly instructions.

SURFACE AREA CALCULATIONS

Roll Compaction System SURFACE AREA CALCULATIONS		
TFC-520	**in^2**	**cm^2**
Screw Drive Housing	292	1883.867
Screw Components	242	1561.287
Screw Hopper	433	2793.543
Rolls	562	3625.799
Roll Seals	297	1916.125
Front Cover Assembly	641	4135.476
Knife Mill Assembly	858	5535.473

SYSTEM CALIBRATION

Listed below are the sensors and controlling devices that required calibration every three to six months. These devices require specialized test equipment, knowledge of Allen-Bradley ® PLC Family of programable logic controllers and familiarity of the process. Freund-Vector service personnel are qualified to perform calibration of the equipment.

DESIGNATOR	DESCRIPTION
IPT6200	Hydraulic Pressure Compaction Roll I/P Transducer
PS2900	Main Air Pressure Switch
PT6200	Compaction Roll Pressure Transmitter
SC1400	Screw Speed Controller
SC6200	Roll Speed Controller
SC6600	Granulator Speed Controller
ZT6200	Roll Gap Position Transmitter

ROLL GAP CALIBRATION

The roll gap is a factory preset tolerance that should only require realignment if the roll gap LVDT sensor has been moved or replaced. To bring the roll gap measurement back into tolerance, use the following procedure:

1. Power up the machine.
2. Access the Machine Setup Screen in the Operator Interface Panel.
3. Follow the instructions displayed on the screen. Refer to the operation instructions for more detailed information on the calibration of the roll gap.