

# Pega 255 With Fanuc 18P Control User Pre-installation Guide



Amada America Inc.  
7025 Firestone Blvd.  
Buena Park CA. 90621  
Phone: (714) 739 2111  
Fax.: (714) 739 4099  
Email [info@amada.com](mailto:info@amada.com)

## ***Warning***

- ☐ Qualified personnel must complete all work.
- ☐ Do not apply power to the Pega 255 until an A.E.S.I. (Amada Engineering and Service Incorporated) Engineer is present and has instructed you to do so.
- ☐ Considerable effort has been made to ensure that this manual is free of inaccuracies and omissions. However, as we are constantly improving our product, some of the data contained herein may be out of date. Please check our Internet site, <http://www.amada.com>, for the latest release of this document.

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## Introduction

This manual describes the tasks that the purchaser of a Pega 255 must complete before calling Amada Service to complete the installation and operator training.

An overview of the preparations is as follows:

- ☐ Plan the location of the Pega 255 in the shop, taking into account all of the optional equipment involved and the Safety / Maintenance areas indicated on the floor plan. See page 15, *Planning the Location of the Pega 255*, for details.
- ☐ Prepare the Pega 255 foundation as required. See page 19, *Foundation Requirements*, for details.
- ☐ Uncrate the Pega 255 and place on the floor, do not fill the anchor-bolt holes (if used) until after Amada Service completes the initial installation.
- ☐ Install the electrical supply. See page 12, *Electrical Supply Requirements*, for details.
- ☐ Install the pneumatic supply. See page 14, *Pneumatic Supply Requirements*, for details.
- ☐ Remove the protective coating from the surface of the machine. See page 29, *Removing the Protective Coating*, for details.

Note: It is the purchaser's responsibility to install any safety devices to ensure operator safety.

## Motion Package Specifications

Travel Method	X and Y axes work piece movement
Control Method	X, Y, T & C
Drive Motors	Fanuc AC Servo (X, Y, T, C)
Maximum Sheet Size	50.0" (Y) x 100.0" (X) with one repositioning cycle
Maximum Sheet Thickness	0.250" with Ball Transfer Table 10 gage (0.135") with Brush Transfer Table
Maximum Material Weight	231 lb.(F4), 110 lb. (F1) with Ball Transfer Table 110 lb. (F1) with Brush Transfer Table
Maximum Axis Travel	50.0" (X) x 50.0" (Y)
Max. Linear Table Speed	2559 IPM (X), 1968 IPM (Y),
Punching Accuracy	±0.004"
Positioning Accuracy	±0.0014"
Repeatability	±0.001"

## Punching System Specifications

Press Capacity	22 Tons	
Press Stroke	1.26"	
Stroke Rate (X/Y)	X	Y
1" Centers	230 HPM	210 HPM
Nibbling (0.315" pitch max.)	350 HPM	350 HPM
Maximum Hole Diameter	3.5"	
Tool Type	Amada Thick Turret	
Turret Rotation Speed	35 RPM	
Turret Capacity	31 Stations (3 auto-index)	
Feed Clearance	0.787"	

740mm Disk  
31 Station  
3 Auto Index

Auto Index

	Maximum Size Round	Number of Stations (keyed)
A	½" (12.7mm)	19 (8)
B	1¼" (31.7mm)	6 (6)
C	2" (50.8mm)	1 (1)
D	3½" (88.9mm)	2 (2)
B	1¼" (31.7mm)	2 (2)
C	2" (50.8mm)	1 (1)

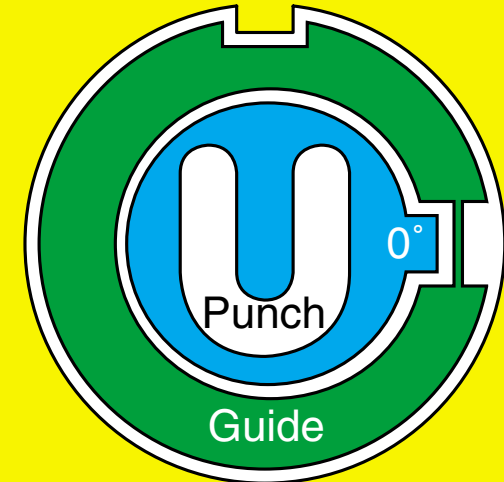


## B-Size Auto-Index

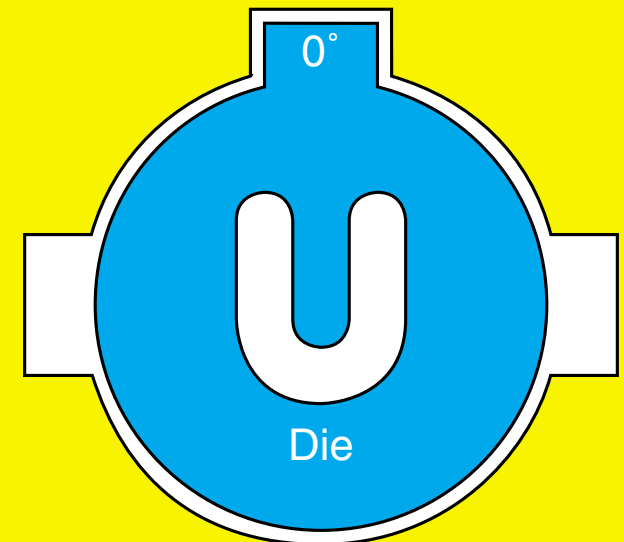
Care must be used when installing or ordering special shape punches and dies for use in the Pega 255 B-Size Auto-Index station as the station is not keyed in the standard 0° position.

All existing punches and dies not keyed per this drawing must be loaded as the keying permits and compensated for in the G-code program.

New Punch Guides and Dies should be ordered keyed to orient the punch and die properly.



B-Size Auto-Index  
Upper Turret Punch Holder



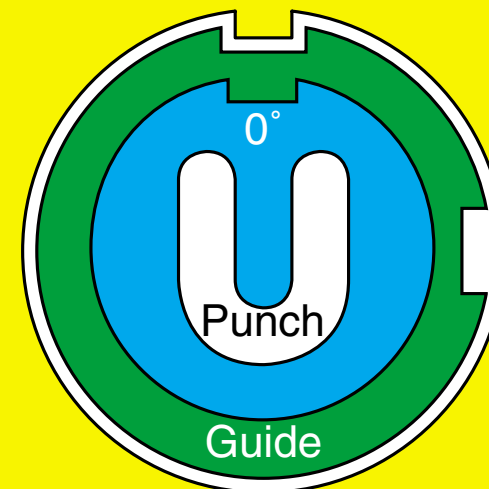
B-Size Auto-Index  
Die Holder Lower Turret

## C Size Auto Index

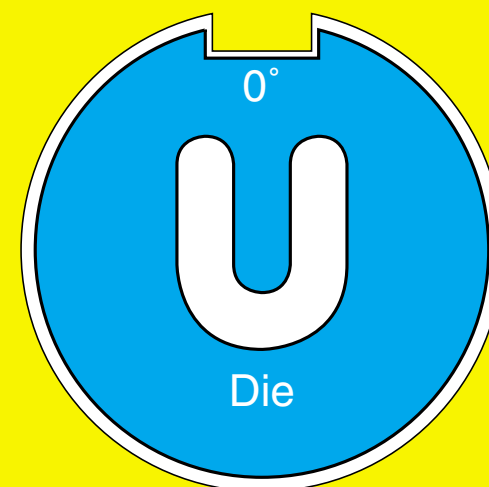
Care must be used when installing or ordering special shape punches and dies for use in the Pega 255 C-Size Auto-Index station as the station is not keyed in the standard 0° position.

All existing punches and dies not keyed per this drawing must be loaded as the keying permits and compensated for in the G-code program.

New Punches, Guides and Dies should be ordered with keying to orient the punch and die properly.



Upper Turret  
C-Size Auto-Index Punch Holder



Lower Turret  
C-Size Auto-Index Die Holder

## CNC Controller

Model	Fanuc 18 (with PHNC)
Control Function	X, Y, T & C
Input Method	MDI, Floppy Disk Drive, DNC
Minimum Command Unit	0.001" (X, Y) .01 <sup>0</sup> (C)
Minimum Travel Unit	0.001" (X, Y) .01 <sup>0</sup> (C)
Operating Modes	Automatic, MDI & Manual
Display Modes	Program Contents, Position Information, Program Check, Parameters, Tool Hit Counter, Self Diagnostics
Interlock Displays	Oil Temperature, Door Open

## Electrical Supply Requirements

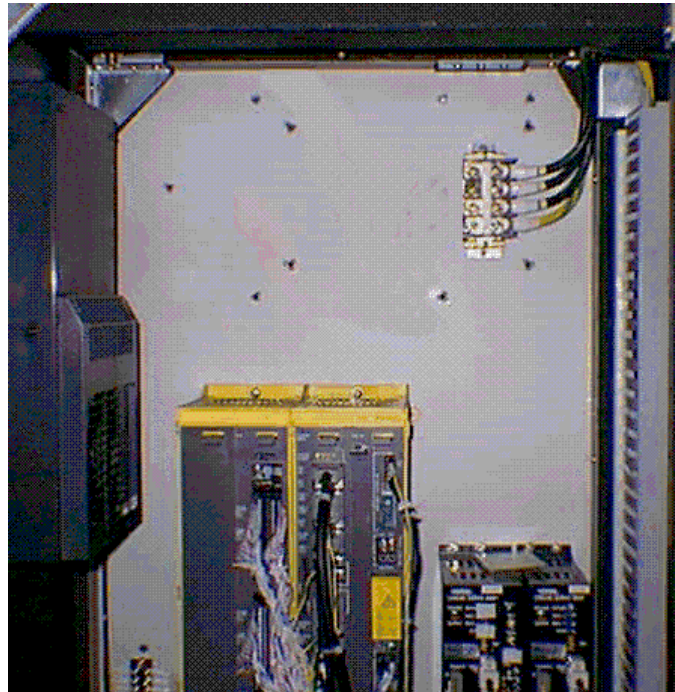
Electrical Power Supply	Pega 255	230 / 460 3ph $\pm 10\%$ , 17 kVA 60 amps @ 230 / 3 / 60 VAC 30 amps @ 460 / 3 / 60 VAC
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## Installing the Electrical Power Supply

The main power source input to the Pega 255 is shown below. The Pega 255 should be supplied from a power line separate from those for welding machines or other machines that produce electrical noise.

- ❑ The Pega 255 Electrical inlet is 72" above floor level.

Pega CNC unit left side electrical enclosure:



## Pneumatic Supply Requirements

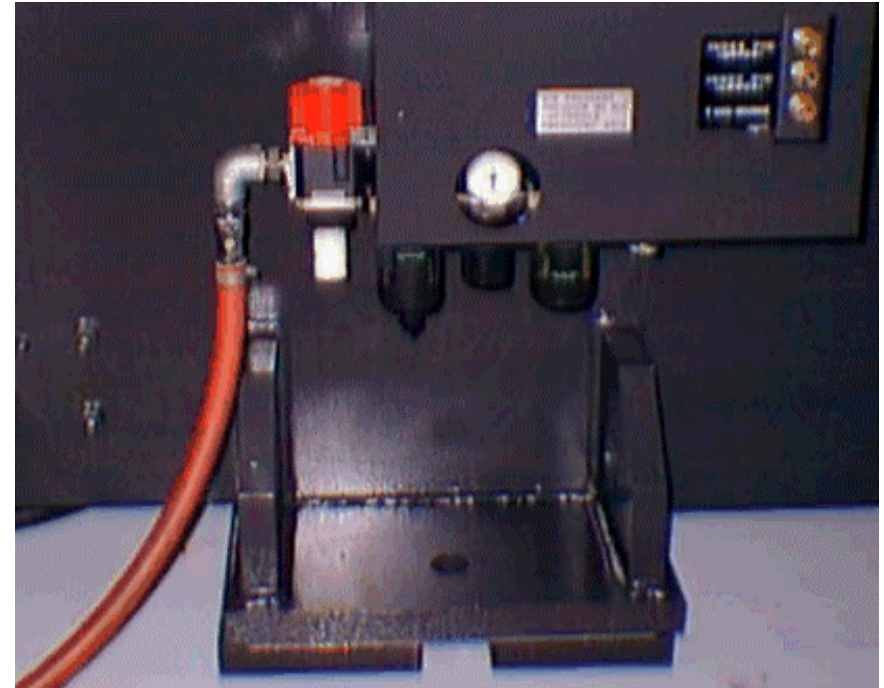
Pega 255	80 psi @ 2.9 ft <sup>3</sup> /min.
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### Installing the Pneumatic Supply

The Pega 255 must be connected to a compressed air system by hose or pipe. The compressed air must be clean and dry.

Please note the following:

- ☐ The minimum inner pipe diameter is ½".
- ☐ The air pressure required is 80 psi.
- ☐ The air volume required is 2.9<sup>3</sup>ft/min.
- ☐ The air inlet is approximately 18" above the floor level.



## Planning the Location of the Pega 255

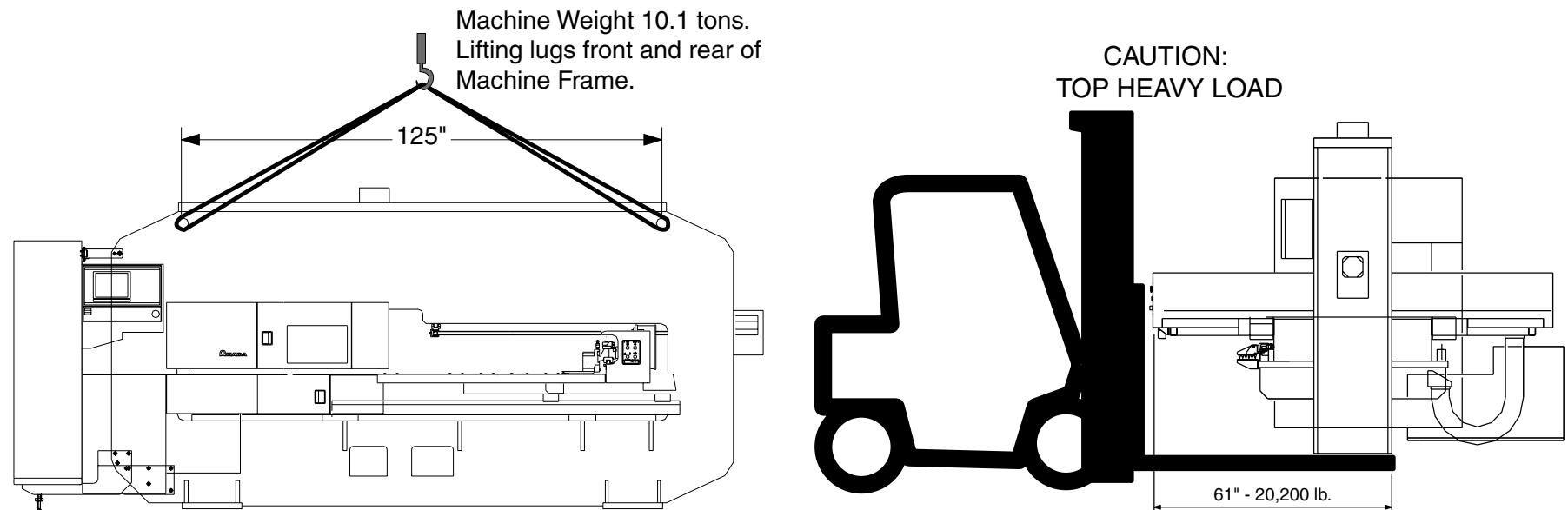
The following diagrams provide the details for positioning the Pega 255.

- ❑ No obstacles are allowed in the worksheet travel area and the ceiling must be at least 40" above the Pega 255.
- ❑ All of the recommended maintenance areas should be used, but at a minimum the doors of the NC unit must be able to be opened. Any reduction of the listed maintenance areas may increase time and expense of installation and maintenance.
- ❑ The Pega 255 machine and control must be protected from direct sunlight or other heat sources. Direct exposure to direct heating sources such as infrared heaters have been shown to affect punch and die alignment.

## Lifting the Machine

Lifting or moving of the Pega 255 should be done only by professional rigging companies well versed in the moving of large and heavy industrial machinery. Acceptable moving methods include, lifting by overhead crane as shown, wheeled dollies beneath the machine feet, or adequately sized forklift forks beneath the machine frame.

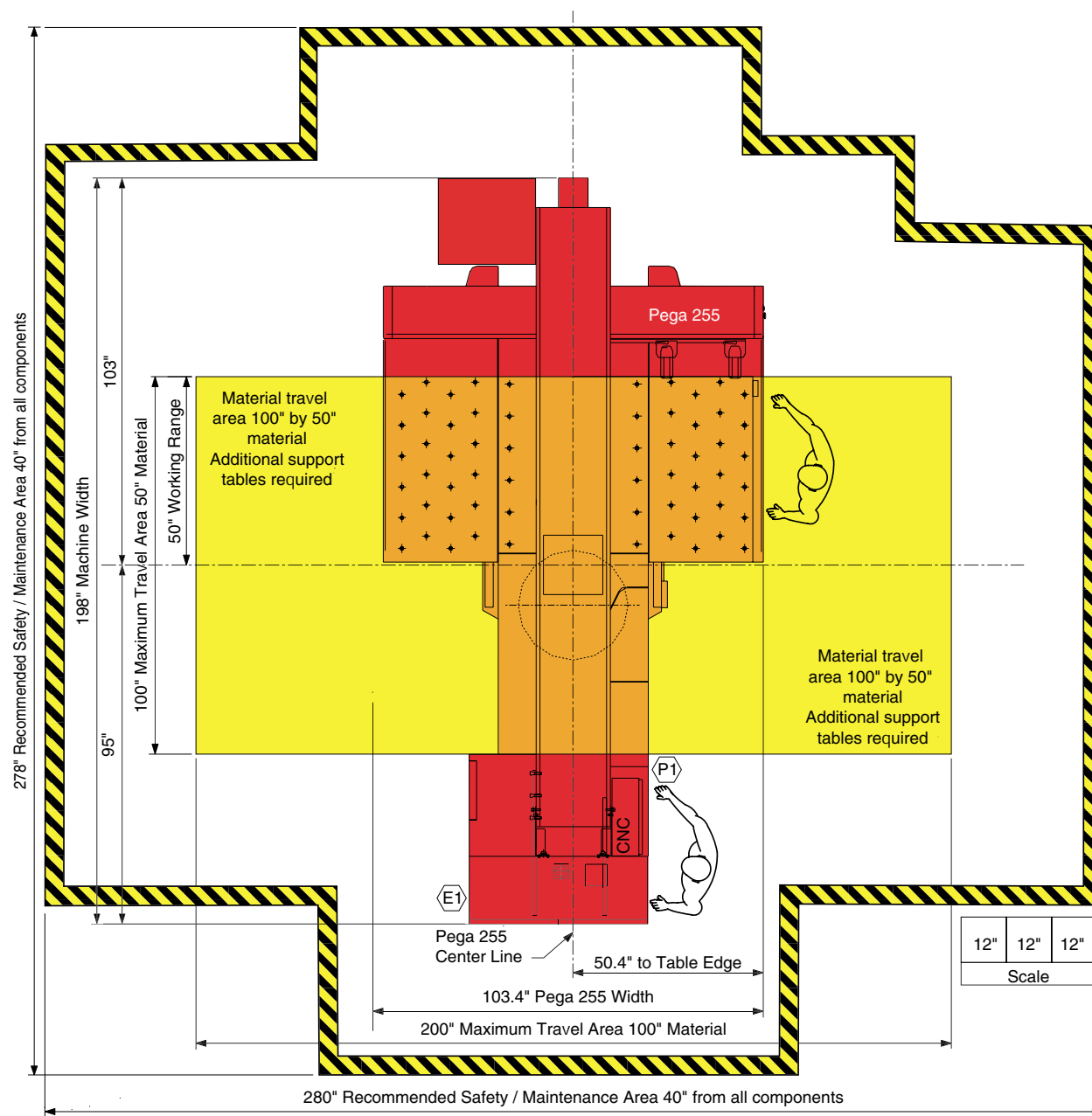
The Pega 255 has a relatively high center of gravity and narrow footprint, care must be taken to prevent inadvertent tipping of the machine while in motion.



# Plan View - Pega 255

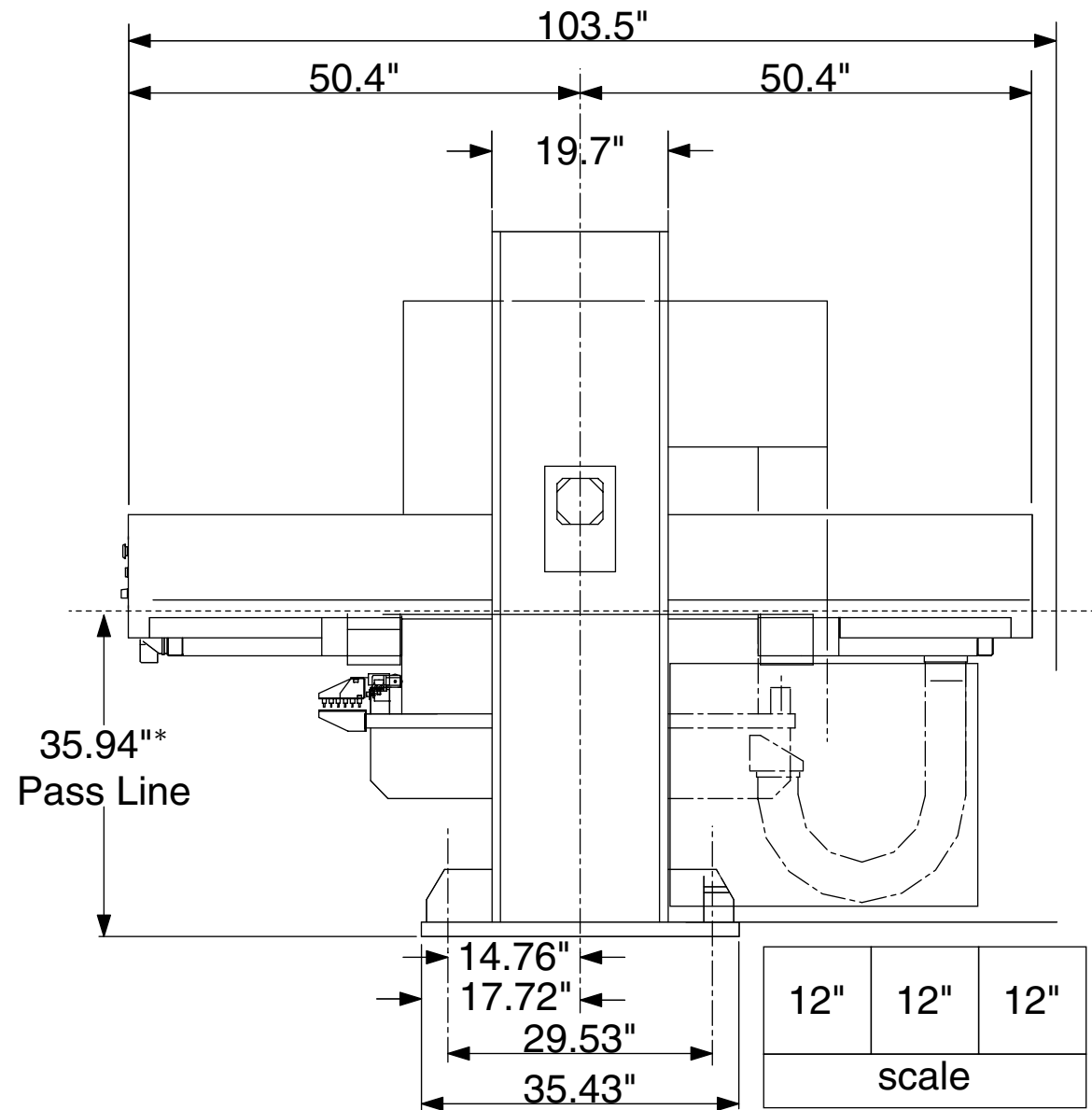
Electrical Requirements:	
(E1) Pega 255	230 / 460 / 3 / 60 ±10%, 17 kVA
	60 amps @ 230 / 3 / 60 VAC
	30 amps @ 460 / 3 / 60 VAC

Compressed Air Requirements:	
(P1) Pega 255	80 psi @ 2.9 ft3/min.

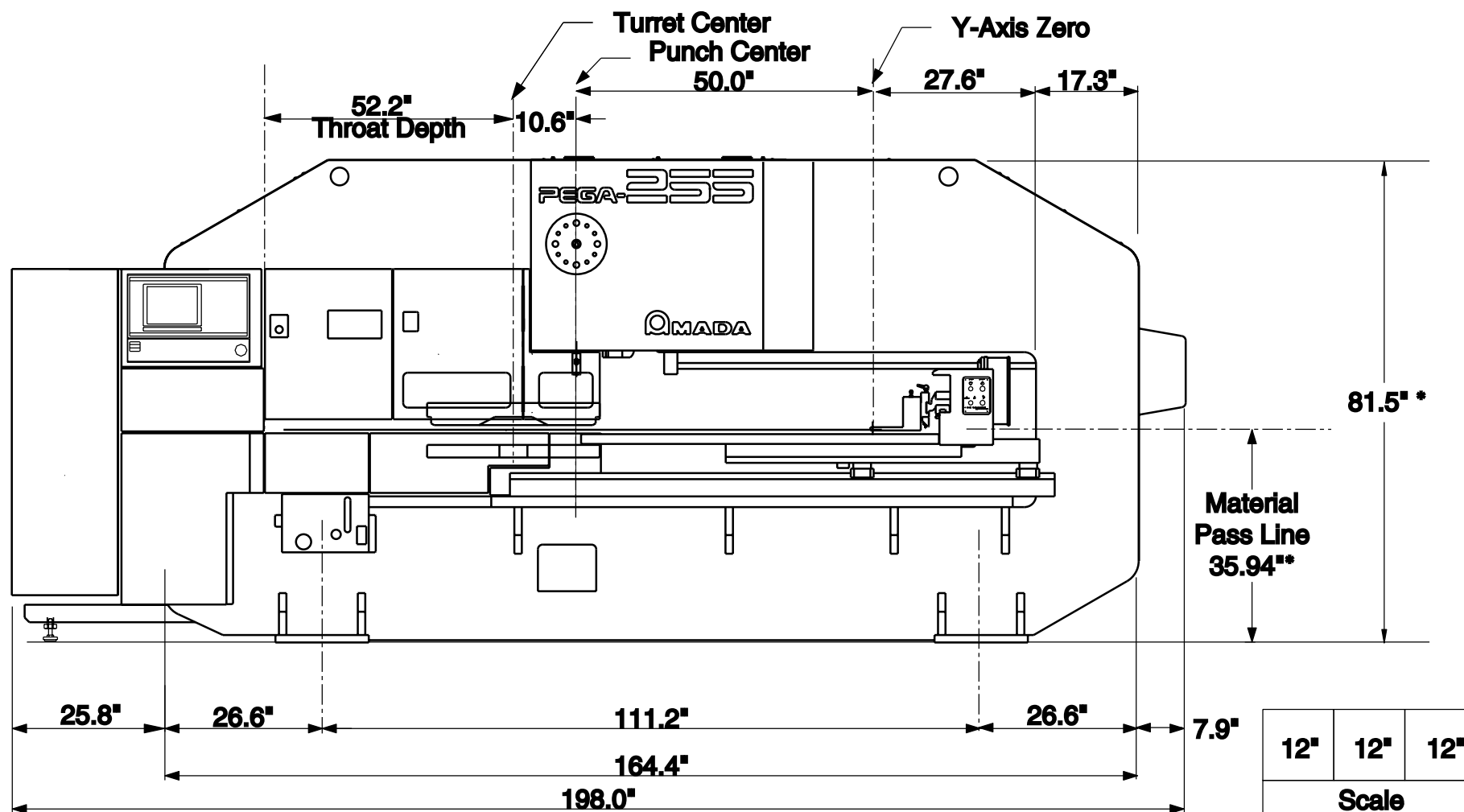




# End View - Pega 255



## Elevation View - Pega 255



\*Material Pass Line will vary depending on installed options

## Foundation Requirements

The Pega 255 does not require a special foundation to perform as expected, however there are minimum requirements that an existing floor must meet in order to assure machine reliability and tool life. If the existing floor does not meet the following minimum requirements, plans for a recommended foundation are given on page 20, *Foundation Anchoring Procedure*.

The minimum acceptable floor conditions to assure a successful installation are:

- ☐ The area of the floor where the Pega 255 machine frame is to be located must be a single, homogeneous slab in good condition. There must be no cracks or other signs of deterioration of the floor.
- ☐ The floor must be 4" to 6" thick.
- ☐ The floor must be capable of supporting 3.5 tons/ft<sup>2</sup>.
- ☐ The floor must be level to 0.032"/ft.

If the existing floor meets the minimum requirement list above, it must still be inspected carefully when the anchor-bolt holes are cut. Voids under the floor, or wetness (not associated with the hole cutting procedure) should be considered signs of an inadequate floor and a new machine location or new foundation must be considered.

It is the customer's responsibility to determine that the floor meets these minimum requirements. Placing the machine on an inadequate, cracked floor, or straddling seams in a floor may be grounds for voiding the machine warranty!

Amada America, Inc. does not recommend the use of vibration isolating mounts under the machine feet, as these devices have been shown to increase the vibration within the machine frame, increasing the likelihood of vibration related problems. Solid leveling devices are acceptable provided they incorporate a means of anchoring the machine to the floor.

**Special Note:** This document details several methods of anchoring the Pega 255 to a new foundation or an existing floor. These methods are designed to install the Pega 255 as a stand-alone machine using the supplied anchor bolts and base plates. Installation or use of additional options such as leveling pads or material handling systems may dictate other methods of anchoring or foundation design not shown in this document. Before committing to a specific method of anchoring the Pega 255, confirm that the chosen method is compatible with all purchased optional items and future planned expansion.

## Foundation Anchoring Procedure

An ideal foundation is given on the following pages. This foundation must be used if the existing floor cannot meet the minimum requirements to support the machine.

The foundation must consist of a single, homogeneous slab. The foundation must be level to within 0.032" / ft. Anchoring the Pega 255 to the floor using the anchor-bolts supplied is essential to ensure reliable performance. Amada generally recommends that the foundation have a minimum load bearing capacity of 3.5 ton/ft<sup>2</sup>. It is the purchaser's responsibility to determine that the foundation meets these requirements.

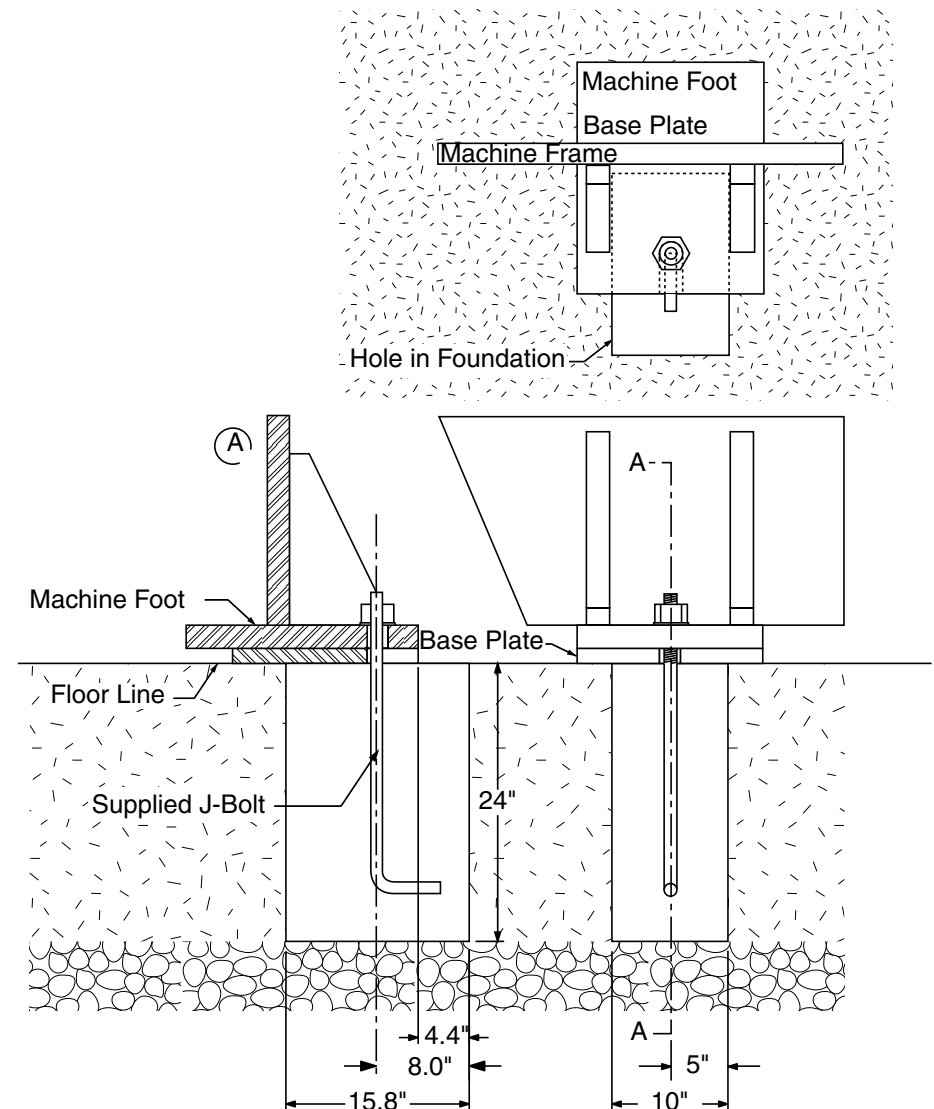
Please see Special Note Page 19.

**Note:** The base plates, shims, anchor bolts, nuts, and washers are shipped Pega 255.

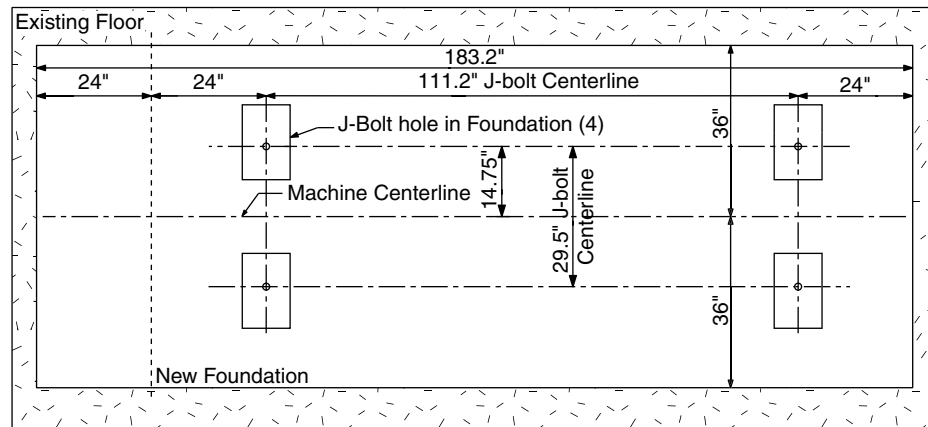
**Note:** The concrete J-bolt pads should be filled after the machine is placed on the foundation.

## Foundation J-bolt Detail

See *Floor J-bolt Mounting Procedure* for proper method of mounting machine on foundation.

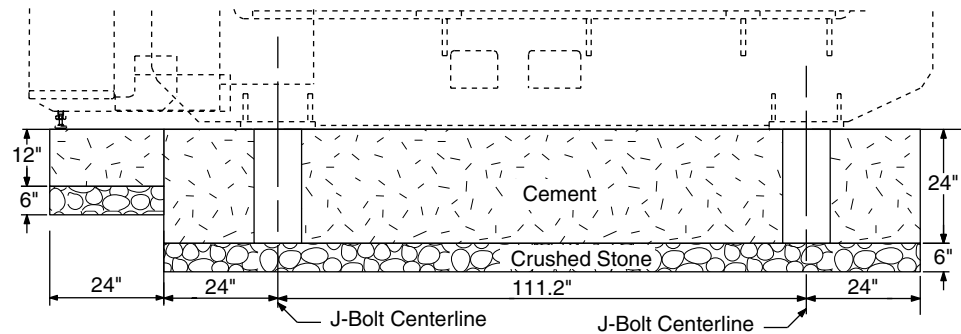


## Plan View - Pega 255 Foundation



12"	12"	12"
Scale		

## Elevation View - Pega 255 Foundation



12"	12"	12"
Scale		

## Pega 255 Anchoring Requirements

To maintain machine reliability, extend tool life, and remain level over an extended period the Pega 255 must be anchored in place on an adequate floor or foundation.

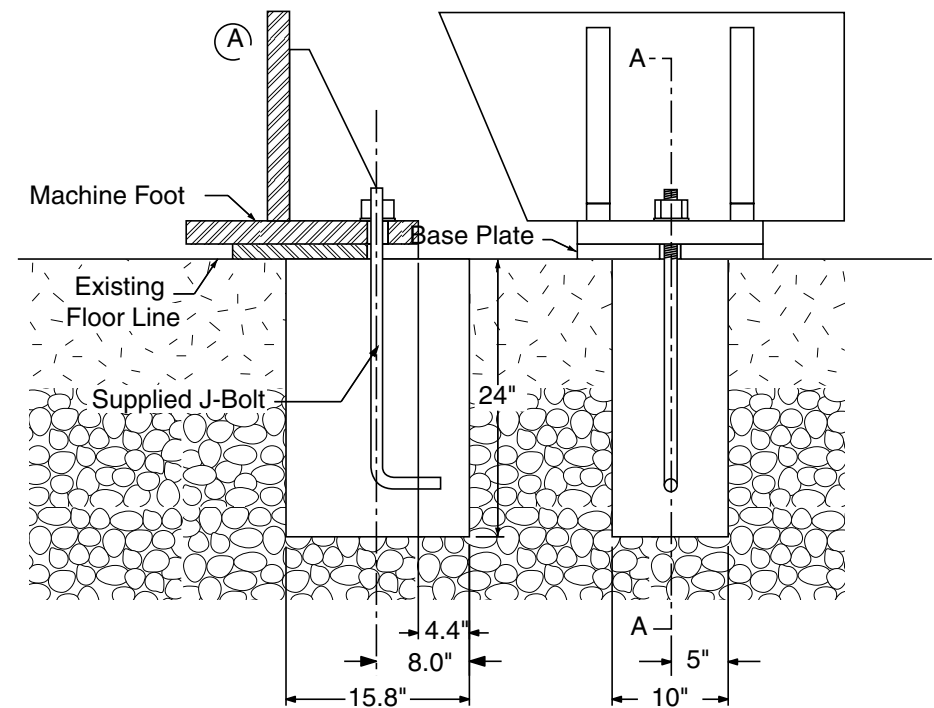
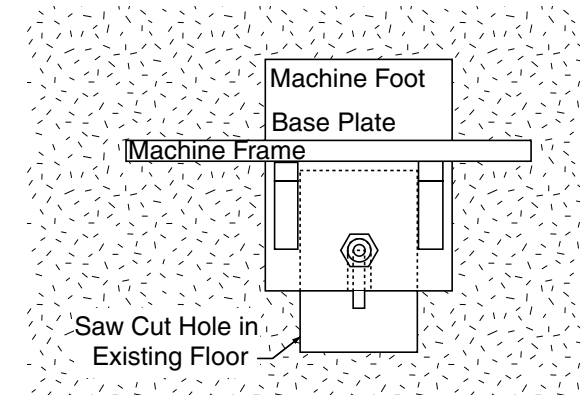
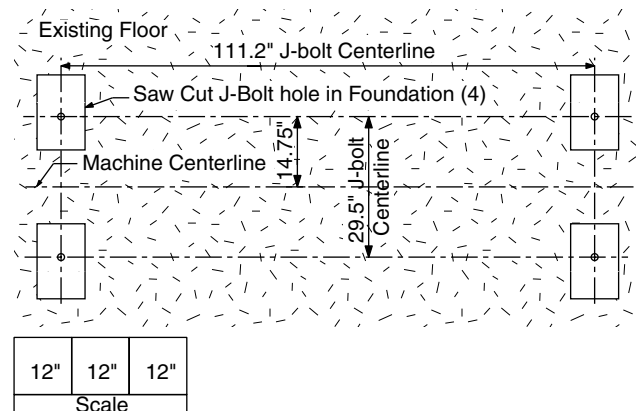
At a minimum the floor must consist of a single, homogeneous slab, level to within 0.032"/ft<sup>2</sup>, and capable of supporting 3.5 tons/ft<sup>2</sup>. It is the purchaser's responsibility to determine that the floor meets these minimum requirements.

### Floor J-bolt Mounting Hole Detail (saw cut hole)

This machine mounting method should be used only if the floor is of such quality that it will support the weight of the Pega 255 with the anchor J-bolts used only for maintaining the location of the machine.

Please see Special Note Page 19.

### Plan View - Floor J-bolt Mounting Hole (saw cut hole)

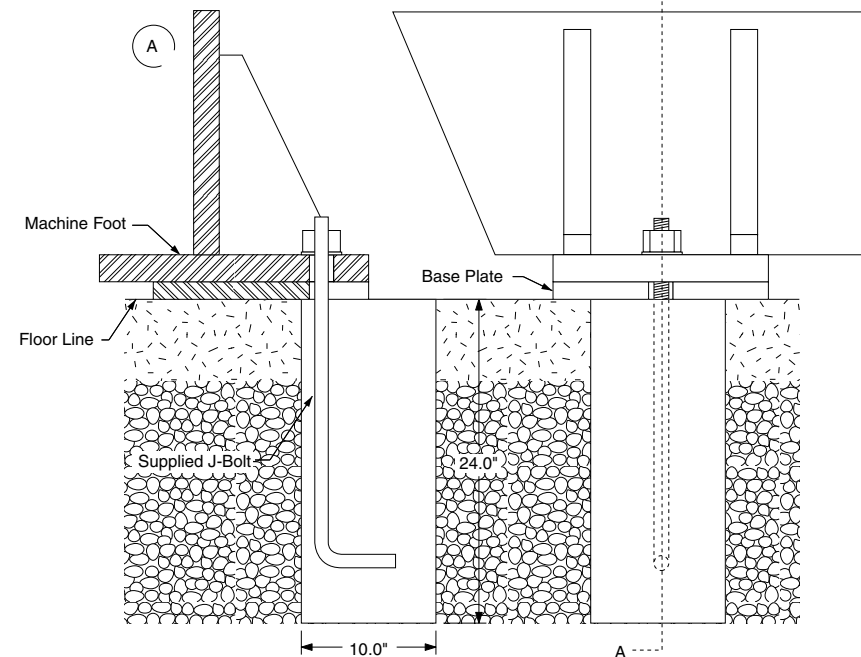
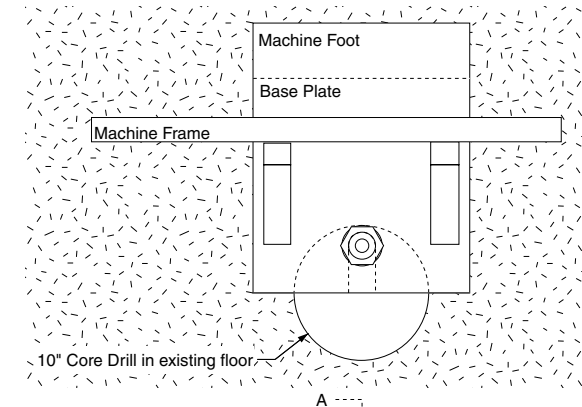
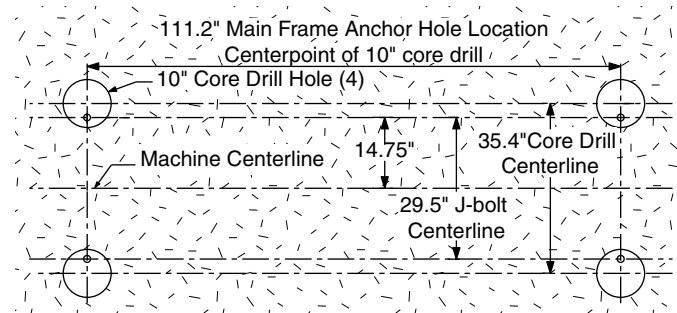


## Alternative Floor J-bolt Mounting Hole Detail (Core Drill)

This machine mounting method should only be used if the floor is of such quality that it will support the weight of the Pega 255 with the anchor J-bolts used only for maintaining the location of the machine.

Please see Special Note Page 19.

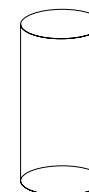
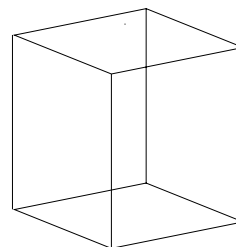
### Plan View - Alternative J-bolt Mounting Method (Core Drill)



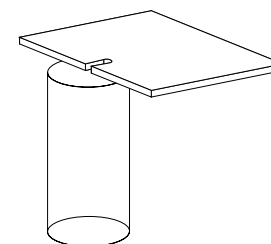
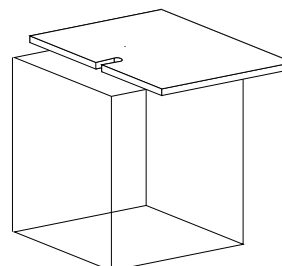
## Floor / Foundation J-bolt Mounting Procedure

- Step 1. Saw cut or Core drill a hole in the existing floor and remove the underlying dirt to the required 24" depth.

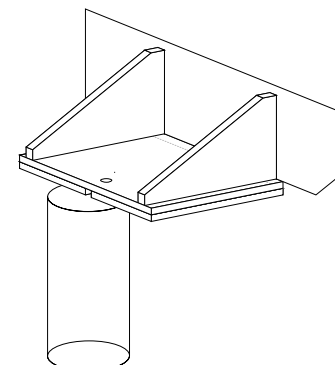
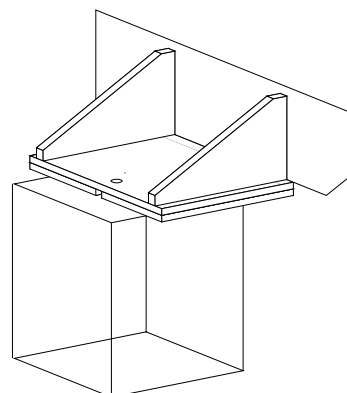
See *Floor J-bolt Mounting Hole Plan View (saw cut hole)* or *Alternative J-bolt Mounting Method Plan View (Core Drill)* for correct layout dimensions of the four anchor holes required.



- Step 2. Set base plate over the hole.

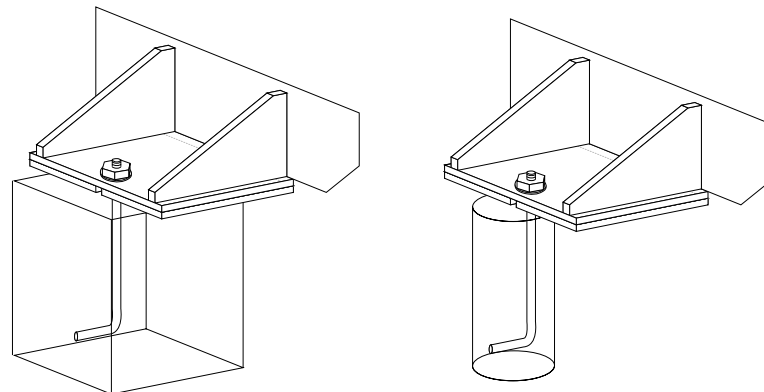


- Step 3. Set the machine on the base plate.

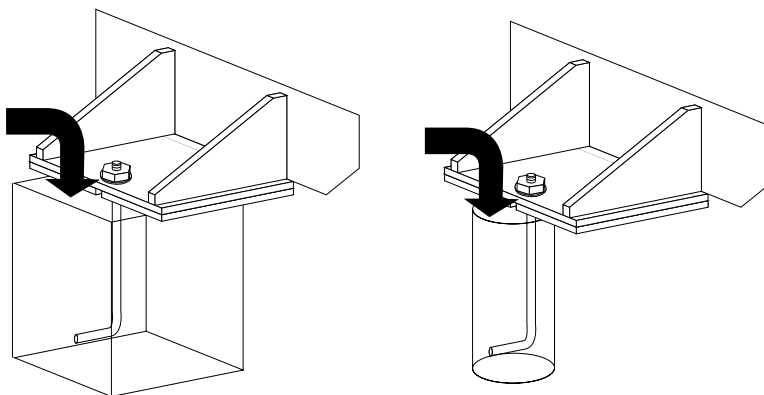




- Step 4. Set the J-bolt through the hole in machine foot, attach washer and nut to hold J-bolt in place.

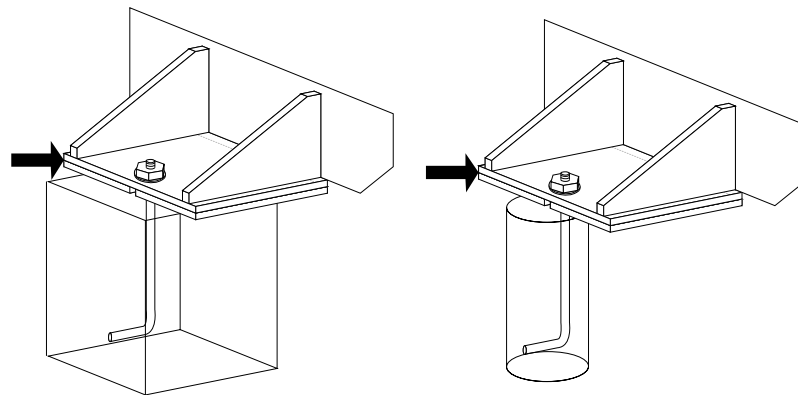


- Step 5 Pour the Concrete.  
Ensure that the J-bolt remains correctly aligned to the machine frame during the pouring and hardening time of the concrete.  
Ensure that the concrete level is equal to the floor level



- Step 6. To complete the mounting procedure, level the machine frame by inserting leveling shims between the machine foot and base plate.

See page 33, *Leveling Procedure* section for correct procedure.

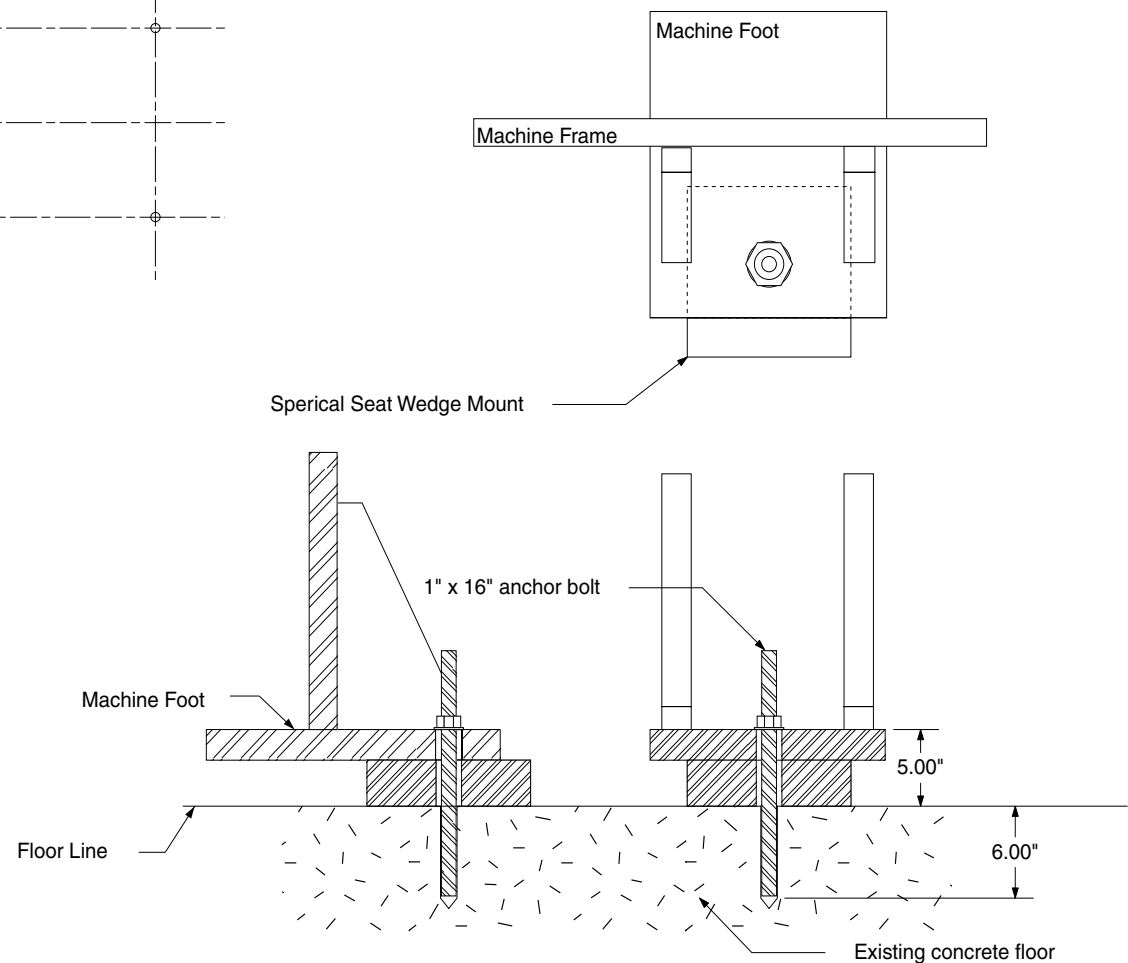
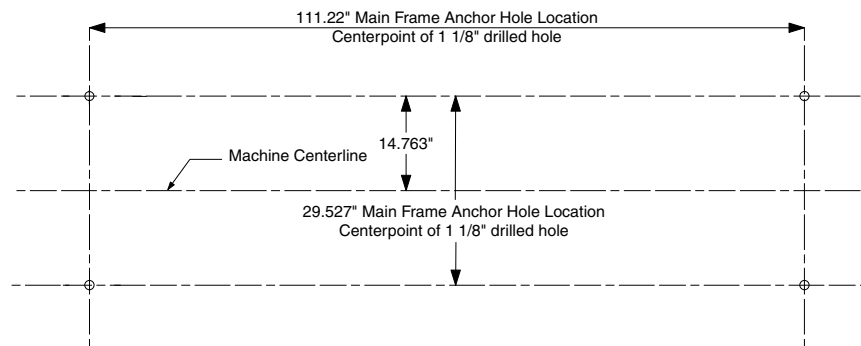


## Alternative Anchoring Method (Drilled Hole with Anchor Rod and Adhesive)

This machine mounting method should only be used if the floor is of such quality that it will support the weight of the Pega 255 with the Anchor Rod used only for maintaining the location of the machine.

Please see Special Note Page 19.

## Plan View - Alternative Floor Bolt Mounting Method (Drilled Hole with Anchor Rod and Adhesive)

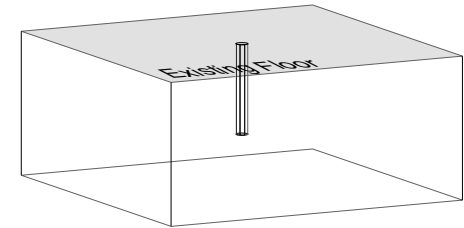


## Drilled Hole with Anchor Rod and Adhesive Mounting Procedure

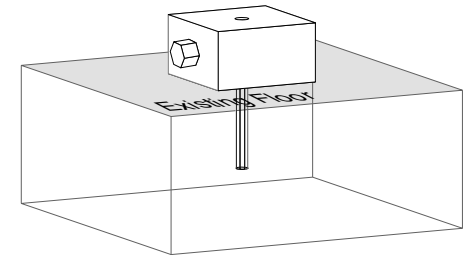
Step 1. Drill the four Anchor Rod holes in the existing floor.

The holes should be drilled approximately 6" deep.

*See Alternative Floor Bolt Mounting Method Plan View (Drilled Hole with Adhesive Anchor Rod) for correct layout dimensions.*



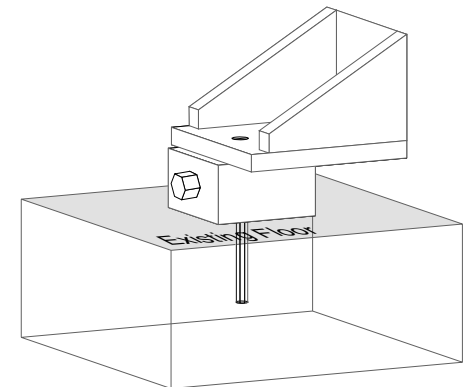
Step 2. Set the Amada Machine Leveling Plates over the drilled holes



Step 3. Set the Pega 255 on the machine leveling plates.

Step 4. Level the machine frame by adjusting the Amada machine leveling plates.

*See page 33, Leveling Procedure section for correct procedure.*



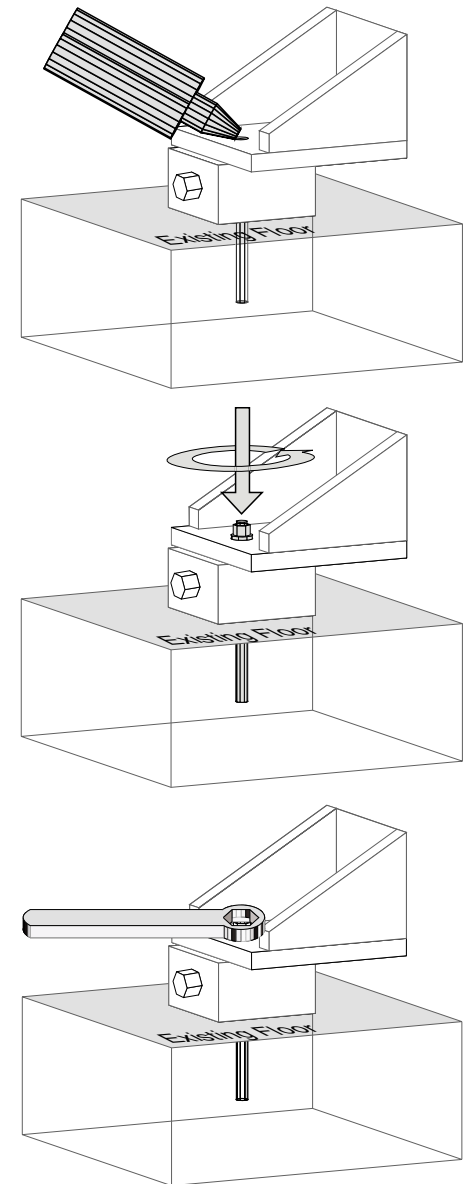
**Step 5** Fill each of the Anchor Rod holes to within 2 inches of the floor surface with the Adhesive compound. Do not overfill.

**Step 6** Attach the hex nut and flat washer on the Anchor Rod and place the Anchor Rod into the drilled hole.

Using a twisting motion to move the Anchor Rod through the epoxy compound, seat the flat washer and hex nut against the top of the machine foot.

**Step 7** Allow the Adhesive to harden for 24 hours.

**Step 8.** Tighten the 4 hex nuts.

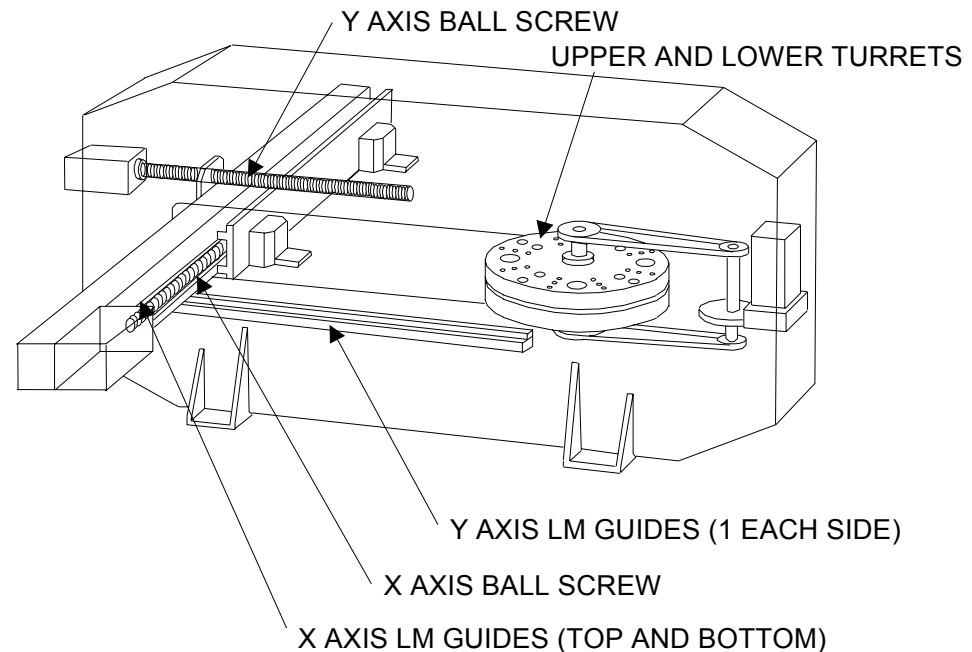


## Removing the Protective Coating

The Pega 255 must be thoroughly cleaned of protective coating. The sheet metal guards can be removed from around the turret to allow cleaning of the upper and lower turrets, tool bores and die holders.

Please note the following:

- ☐ Remove the wrapping paper from the X and Y-axes ball screws then remove the protective coating.
- ☐ Remove the wrapping paper from the X and Y LM guides then remove the protective coating, make sure that you remove the paper from both sides of the carriage.
- ☐ Clean die holders one at a time. Remove a die holder, clean and replace it before removing the next die holder. If the die holders are mixed up, serious turret alignment problems may occur.
- ☐ A suitable solvent should be used to remove the protective coating.



## Machine Leveling

Proper Machine leveling is critical to the Pega 255 performing as designed.

Materials and tools required:

Supplied with the machine:

Assorted thickness machine leveling shim stock

Anchor bolts

Supplied by Amadal service:

Spirit level capable of reading 0.0005"/ft

One (1) 12 ton hydraulic bottle jack

Not supplied:

Additional shim stock of 0.005" thickness may be required to achieve a properly leveled machine.

## Rocking Test

After the machine frame has been leveled the use of the following G-code is necessary to determine that Pega 255 is properly leveled and balanced.

Should the Pega 255 vibrate or move excessively during the rocking test the Pega 255 must be re-leveled using the procedure in this manual.

Should the proper leveling technique not eliminate the excessive Pega 255 motion, consideration must be given to relocation of the Pega 255 or replacement of the existing floor with an adequate foundation.

G92X47.638Y50.000

N1G91X-.25TTTT(Use any valid tool number)

X.25

M97P1

G50

## Floor Condition: Crowned

The flatness of the floor plays an important step in the leveling procedure of the machine. To properly level the machine the weight bearing points must be as far from the centerline of the machine frame as possible.

Should a condition known as crowned exist the weight bearing points of the machine may not be far enough from the machine centerline to ensure a stable machine.

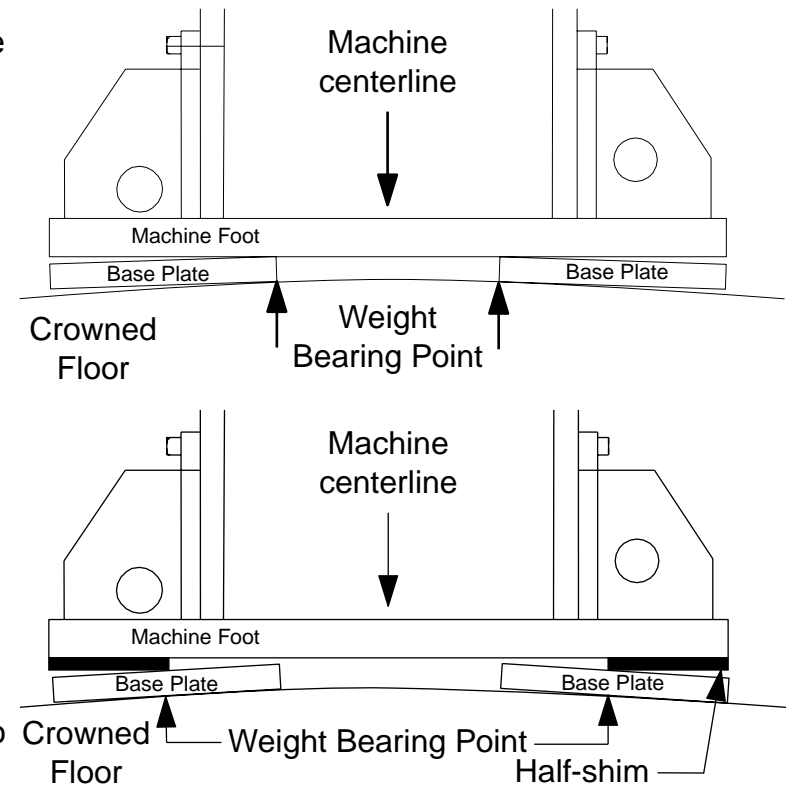
Under these conditions a procedure known as *Half-Shimming* should be used.

To move the weight bearing points further from the machine centerline the use of half-shims of .125" thick on top of the base plate as shown is recommended.

After the half-shims are installed and the machine frame is leveled use the rocking test to determine that the machine frame is stable enough to allow production without damaging the machine.

Under extreme conditions the use of half-shims may not move the machine weight bearing points far enough from the machine centerline to ensure the machine frame is stable.

Under these conditions a more suitable location must be found for the machine, or a new foundation for the machine will be necessary.



## Floor Condition: Slope

The slope of the floor plays an important step in the leveling procedure of the machine. To properly level the machine the weight bearing points must be as far from the centerline of the machine frame as possible.

Should the floor slope excessively the weight bearing points of the machine may not be far enough from the machine centerline to ensure a stable machine.

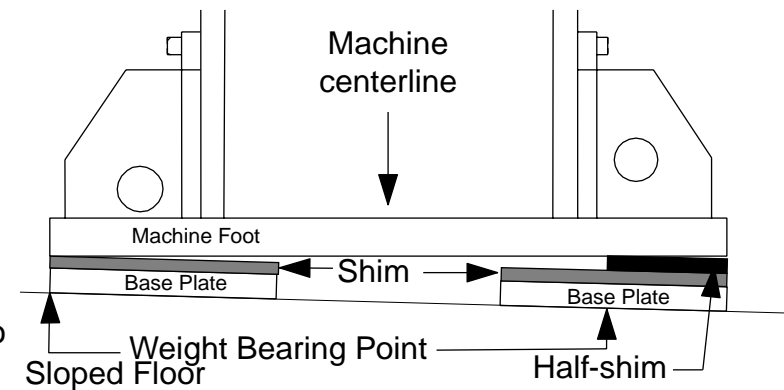
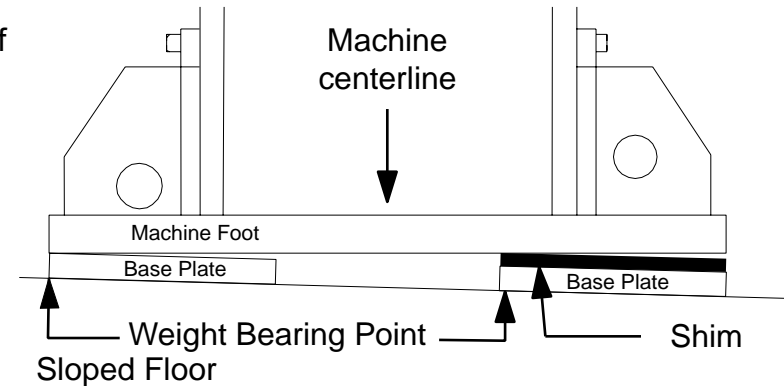
Under these conditions, a procedure known as *Half-Shimming* should be used.

To move the weight bearing points further from the machine centerline the use of half-shims of .125" thick on top of the base plate and leveling shims as shown is recommended.

After the half-shims are installed and the machine frame is leveled, use the rocking test to determine that the machine frame is stable enough to allow production without damaging the machine.

Under extreme conditions the use of half-shims may not move the machine weight bearing points far enough from the machine centerline to ensure the machine frame is stable.

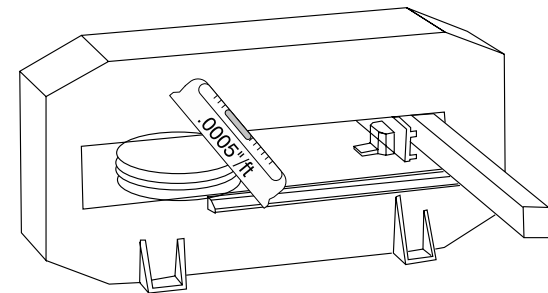
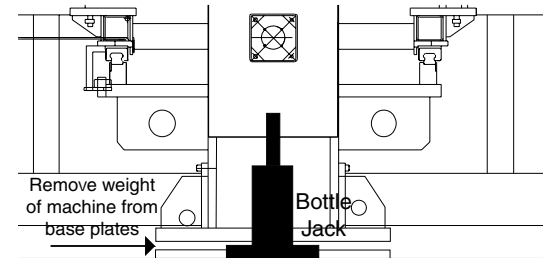
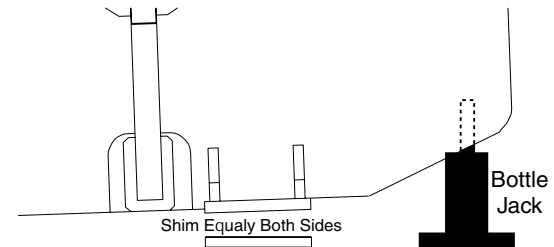
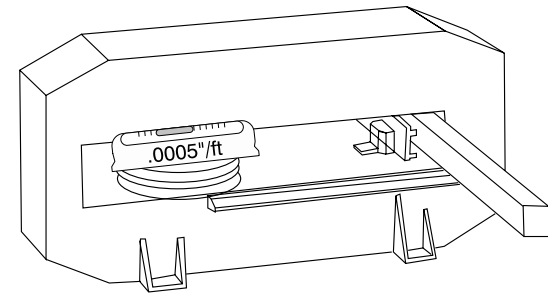
Under these conditions, a more suitable location must be found for the machine, or a new foundation for the machine will be necessary.



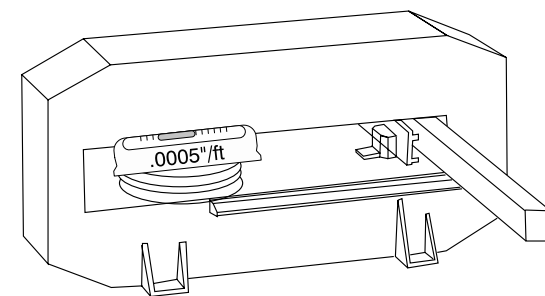
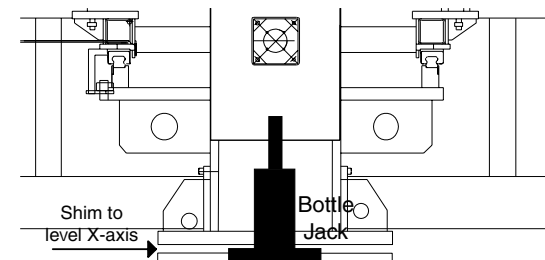
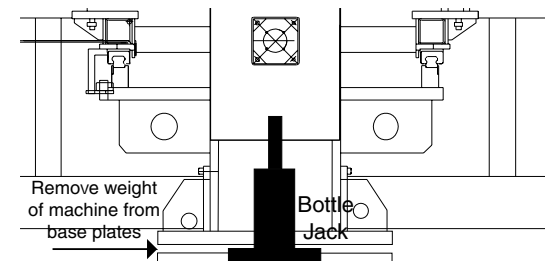
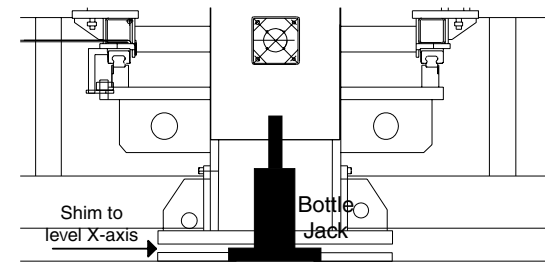


## Leveling Procedure

1. Determine the high end of machine frame by placing the spirit level on the turret to measure the level of the machine frame in the y-axis.
2. Use the bottle jack to lift the low end of the machine frame. Shim equally between both machine feet and the base plates until the machine frame measures near level on the y-axis with the turret end of the machine frame slightly higher than the carriage end.
3. Center the bottle jack under the carriage end of the machine frame. Lift the machine frame until all weight is off the machine feet at the carriage end of the machine frame. Lift the machine frame as little as possible to take the weight off the base plates.
4. With the machine supported on the bottle jack at the carriage end of the machine frame and the machine feet at the turret end of the machine frame, place the spirit level on the turret. Measure and record the level of the turret in the x-axis direction. Lower the machine frame to place all machine feet in contact with the leveling shims and base plates.



5. Lift the turret end of the machine frame to allow shimming between the machine feet and base plates to level the machine frame in the x-axis direction.
6. Repeat steps 3 to 5 until the machine frame measures level to 0.0005"/ft in step 4, then continue.
7. With the bottle jack supporting the weight of the carriage end of the machine monitor the level of the turret in the x-axis as the bottle jack is slowly lowered to place the carriage end machine feet in contact with the base plates.  
Any change in the level indicates that the carriage end of the machine needs to be leveled.
8. Lift the carriage end of the machine frame to allow shimming between the machine feet and base plates to level the carriage end of the machine frame in the x-axis direction.
9. Repeat steps 6 and 7 until no difference in level is noted when the machine weight is on or off of the base plates and shims, then continue.
10. With all of the machine feet setting on the shims and base plates place the spirit level on the turret to measure and note the level of the machine frame in the y-axis.



11. Using the bottle jack lift the low end of the machine frame and shim equally under both machine feet to level the machine frame in the y-axis.
12. Repeat step 8 to 9 until the machine frame measures level to 0.0005"/ft in the y-axis then continue.
13. Run the machine using the rocking test G-code to determine that the machine frame is leveled adequately. Should excessive movement of the machine frame be noticed check for the conditions discussed in *Floor Condition Crowning* and *Floor Condition Slope*.
14. Tighten the anchor bolt nuts to prevent the machine frame from moving when in use. Monitor the machine level while tightening the anchor bolts to assure the machine level is not changed.

